中国航天

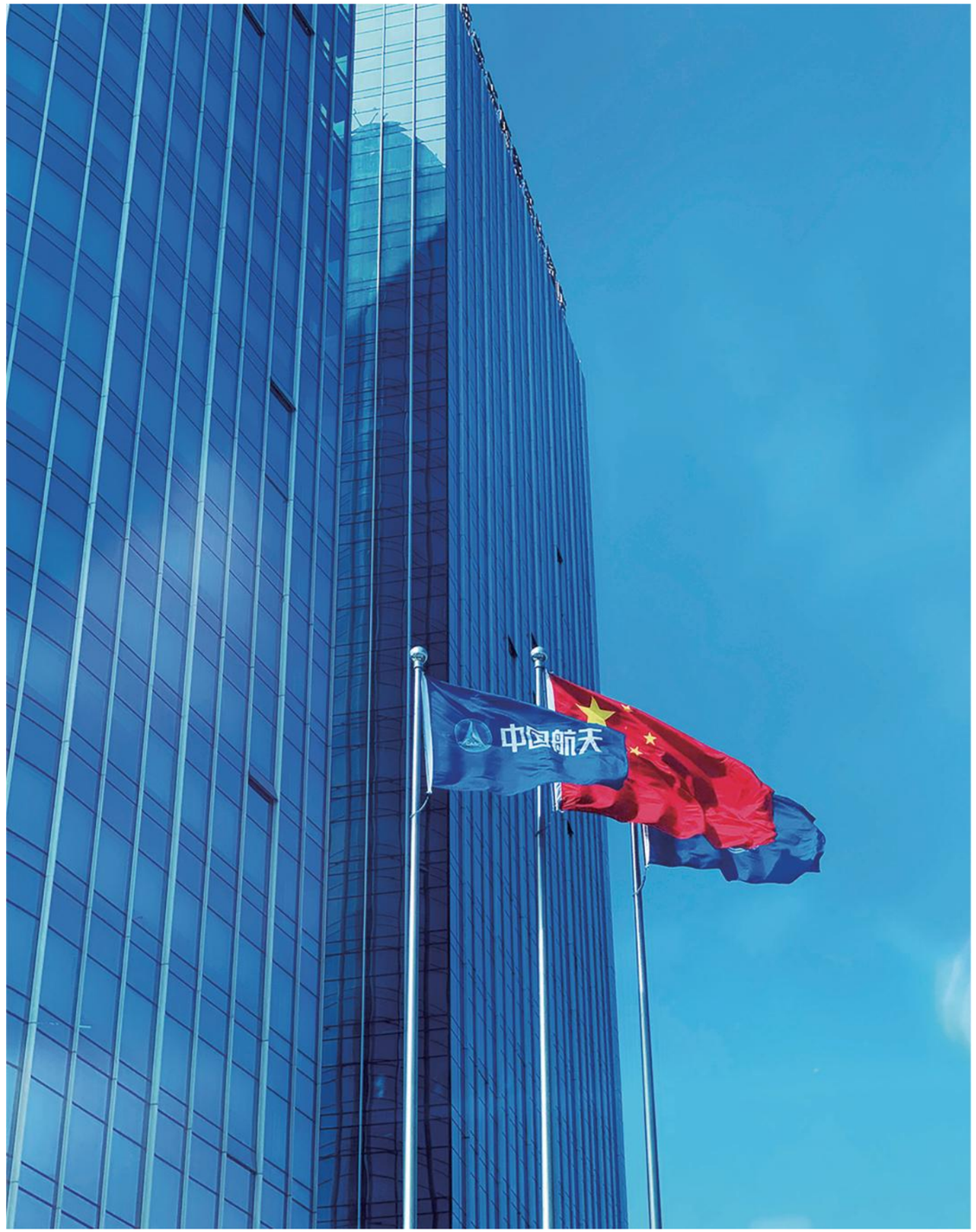
西安微电子技术研究所

Xi'an Microelectronics Technology Institute

XMTI
Products Catalogue

产品选型手册

2025



INSTITUTE **PROFILE**

Xi'an Microelectronics Technology Institute (XMTI) was founded in 1965. Integrating the research and production of computer, semiconductor IC and HIC, XMTI is the only large-scale professional research institute laid out by China's aerospace engineering. It is one of the birthplaces of microelectronics in China and the founder of China's aerospace microelectronics and computer technology. It is also the pioneer of China's microsystem integration technology and product development, the leader of China's aerospace embedded integrated electronic system technology, and the backbone of China's IC design and manufacturing.

At present, it has more than 4,500 employees, and is one of the first master's and doctoral degree granting units approved by the State Council and a national postdoctoral research mobile station for computer science and technology. Since its establishment, XMTI has created "many firsts" in the history of microcomputer, semiconductor IC and HIC in China. It won 131 national and provincial honorary awards and 19 national special prizes for scientific and technological progress.

XMTI makes full use of the unique advantages of the combination of system and chip, monolithic integration and hybrid integration, design and processes, forming a good pattern of scientific development of the three industries of computer, semiconductor IC and HIC. The computer industry has formed a complete industrial system of information processing systems and software for aerospace models. The integrated circuit industry has formed a complete industrial chain including research and development, process manufacturing, advanced packaging, testing and failure analysis. The HIC industry has formed a complete industrial chain integrating system design, advanced substrate manufacturing, multi-chip micro-nano integration, testing and reliability assurance.

In recent decades, XMTI's products and services have been widely used in aerospace, launch vehicles, satellites and other fields. The products are able to meet the special requirements of severe environments in space with leading capability of irradiation and high reliability.

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Professional Advantages

Dedicated to the research and development, batch production and testing of computers, semiconductor integrated circuits and hybrid integrated circuits. Engaged in the research and development, batch production and testing of computers, semiconductor integrated circuits and hybrid integrated circuits. Persevered in the development strategies of transforming core technology from tracking development to original innovation, integrated technology from planar integration to three-dimensional integration, technological innovation from single discipline to multidisciplinary, product form from single unit supporting equipment to system integration, and development mode , we have obtained the unique advantages of multi-disciplinary intersection, multi-specialty integration, whole-machine traction, integrated integration, and chip support.

Engineering system combining research and application

Having been persisting in the development concept of " systematization of complete machine, system-on-chip, and localization of chips", we built a technical system combining development and application, and have a complete industrial chain from chip design, production, testing, packaging, failure analysis to development and production of complete machines, and system integration. We established an open platform that can provide users with a full set of design schemes, trial production and achievement verification from devices to modules or even computer machines, comprehensive electronic system integration and software algorithms, etc. We also provide products and serivces with features of high reliability, miniaturization and low cost.

Domestic leading 3D Micro-system Integration Technology

XMTI is the chairman unit of the "micro-assembly process technology center" of the group company and the supporting unit of the "Shaanxi Three-dimensional Integrated Micro-system Engineering Center" awarded by the Shaanxi Provincial Development and Reform Commission. XMTI possesses scientific research and production platform that enable micro-system design, multi-physics simulation, three-dimensional interconnection manufacturing, automatic testing and reliability testing. The TSV process can realize 4-layer W2W, D2W, 8-layer D2D stacking; the PoP process enables more than 10 functional layers or device stacking. XMTI has developed a variety of micro-system products, such as space-borne information processing, high-performance processing, real-time information processing, and ultra-large-capacity aerospace data storage, which have been used in high-reliability and low-cost in aerospace fields.

Domestic leading irradiation reinforcement technology

XMTI has equipped a complete scientific research and production platform covering the whole industrial chain of aerospace irradiation and irradiation integrated circuit design, manufacturing, packaging, testing and reliability testing. Rad-hard design level reaches while 28nm, while process manufacturing level real 130nm. ICs will domestic leading and international advanced level in anti-radiation power MOS, anti-low dose rate high-precision analog integrated circuit, TSV/PoP/SiP and micro-system and other radiation-resistant stereoscopic integrated device technology. Developed first-class radiation resistance level SoC/SiP integrator devices, CIS devices with billion pixels, high-precision analog devices, high-efficiency power DC/DC, LDO power and other advantageous product series, which widely used in aerospace key model projects.

12-inch wafer-level TSV microsystem manufacturing line

XMTI has acquired semiconductor middle-process technology and microsystem integration technology, wafer-level bonding and debonding, ultra-thin wafer thinning, high aspect ratio silicon etching and dielectric etching, preparation of organic and inorganic insulation layers, high aspect ratio metal sputtering, multi-layer redistribution layer fabrication, high-density micro-bump fabrication, as well as online detection and reliability evaluation capabilities. We are establishing the domestic leading microsystem 3D TSV, 2.5D Interposer, SiP product development center, with the purpose of becoming the premier provider of three-dimensional integrated microsystem technology solutions at the wafer level in China, to meet the needs of miniaturized development of future model projects.

Achievement & Awards

NO.1

Created multiple "First" in the development history of Chinese microcomputers,semiconductor IC, and HIC

16

National Science and Technology Progress Special Prizes

More than 2000

scientific research achievements

124

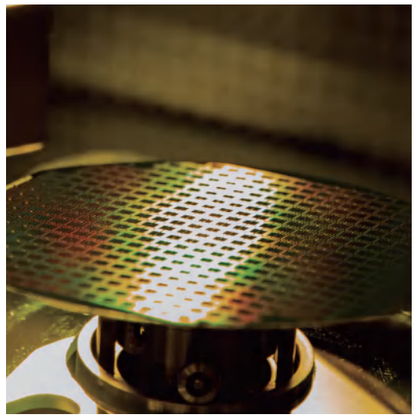
honors and awards of national and provincial level

Quality Certification

- 4 Space Use and High-rel Fabs
- National High-tech Enterprise
- GJB9001C Quality System Certification
- ISO45001 Occupational Health and Safety Management System Certification
- ISO14001 Environmental Management System Certification
- Certification of Process Control Capability System for Aerospace Components
- CNAS National Laboratory Qualification (Software Evaluation, Metrology, and Component Failure Analysis, Screening, and Testing Services)

Comprehensive Capabilities

Semiconductor IC



Design Capability

- Integrated scale exceeds 100 million gates
- Capable of designing at 14nm

Manufacturing Capability

- Process R&D Capability: 0.13μm
- Batch production capacity of process 0.13μm
- Annual production: 900000 pcs
- IC Design Center
- National Standard IC Fabs
- IC Assembly Testing Line
- 12 inch Wafer Level TSV Micro-system Fab

Packaging Capability

- 2 million per year
- 0.2mm × 0.2mm~75mm × 75mm
- Various sizes of mounting
- Min pad 50 μm. 3000 with a spacing of 5 μm
- Batch production of wire bonding under wire

Sieve Capacity

- 1.4 million per year
- R&D capability for 12 inch wafer testing
- 6-inch and 4-inch wafer testing batch production capacity
- Equipped with 8Gbps high-speed testing and development capabilities
- 5Gbps mass production capacity

Secondary Screening Capacity

- 40 million pcs. per year

Hybrid IC

Design Capability

- Power density 500W/inch^3, radiation resis tance 300krad (Si)
- Optoelectronic design platform with a signal transmission rate of 10Gbps
- High speed memory development platform with a data read rate of 800Mbps

Manufacturing Capacity

- Hybrid Integrated Circuit Design Center
- Thin Film National Standard Hybrid Integrated Circuit Production Line
- Thick Film National Standard Hybrid Integrated Circuit Production Line
- LTCC and MCM assembly production line
- Annual production capacity of 250000 units

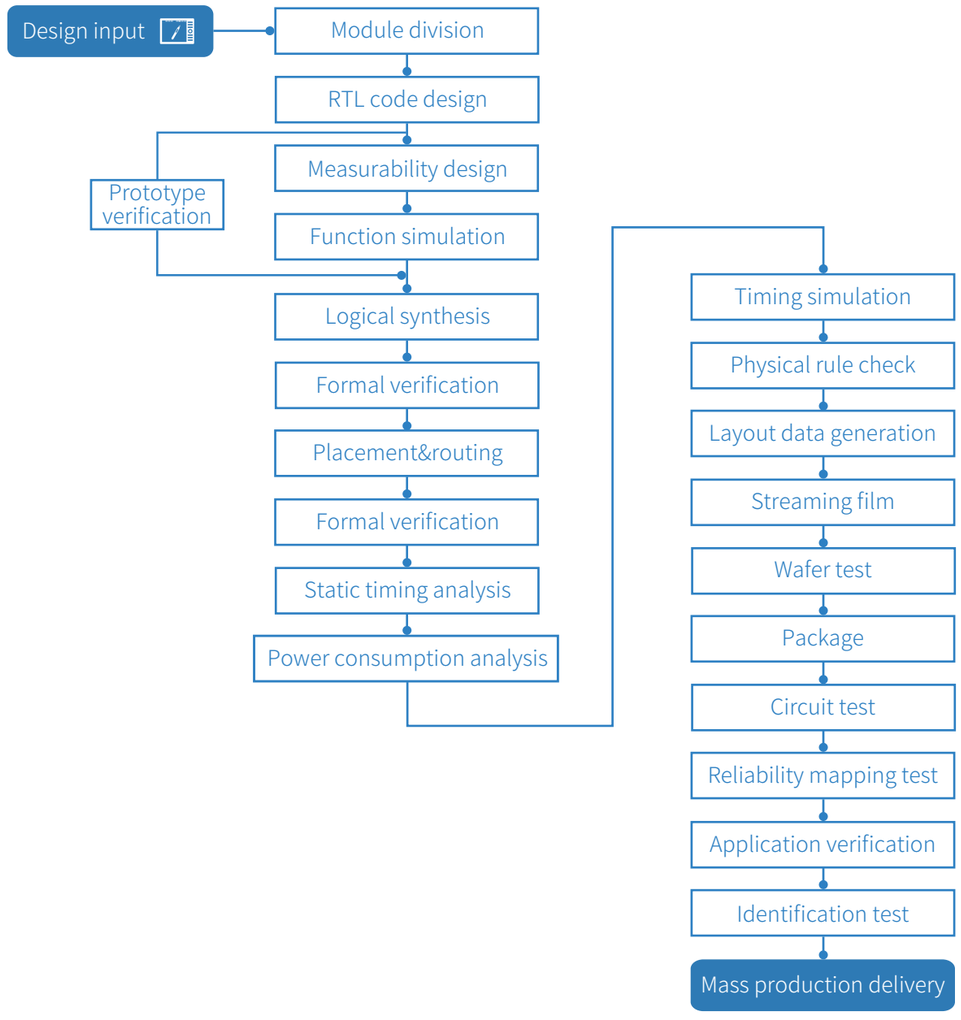
Process Capability

- Thin film line width/spacing 10μm/10μm
- Thick film line width/spacing 30μm/30μm
- LTCC wiring with 80 layers, assembly accuracy of 5 microns, substrate preparation
- 50 layers, achieving engineering practicality of SiP technology
- Breakthrough in high-power chip sintering, coarse wire leads bonding, and DBC
- Substrate application and other processes to enhance the output current capability of high-power circuits
- Up to hundreds of amperes, with an assem bled power density of 150W/in^3, assemble density 1000 pieces/cm^2

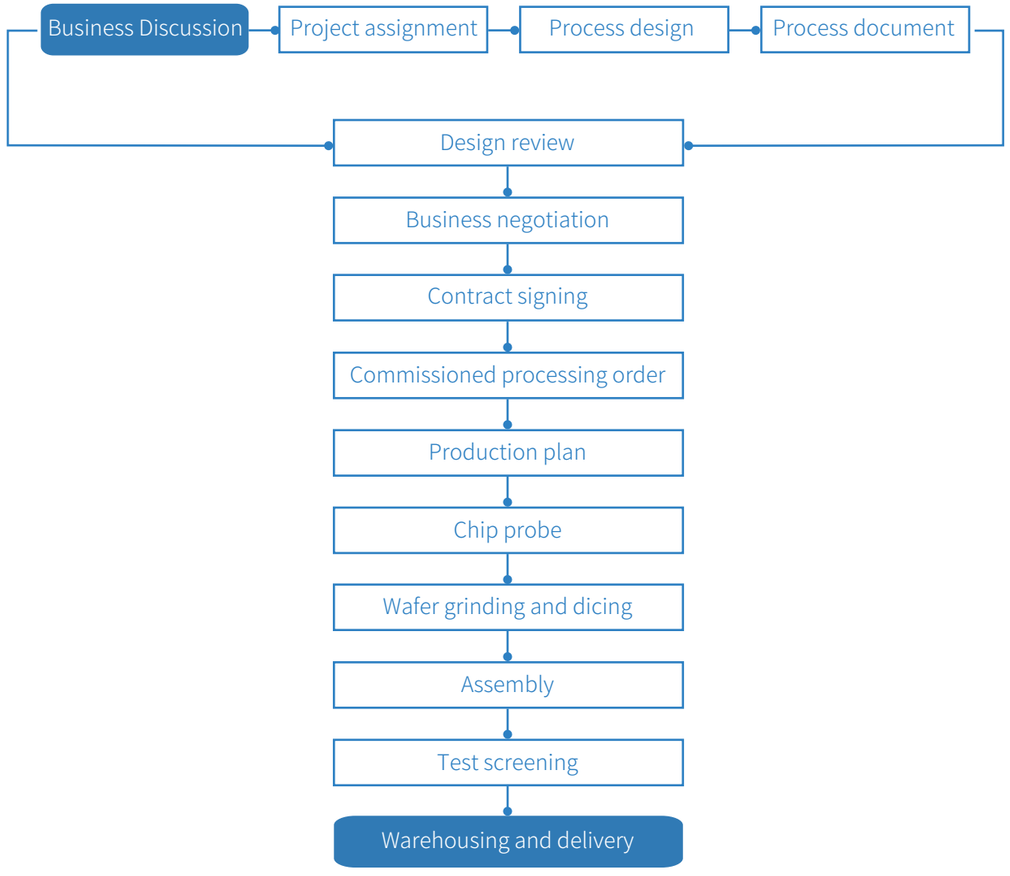
Testing Ability

- Fully automatic, with a power of up to 100A

ASIC R&D Processes



Monolithic IC Packaging and Testing Service Processes

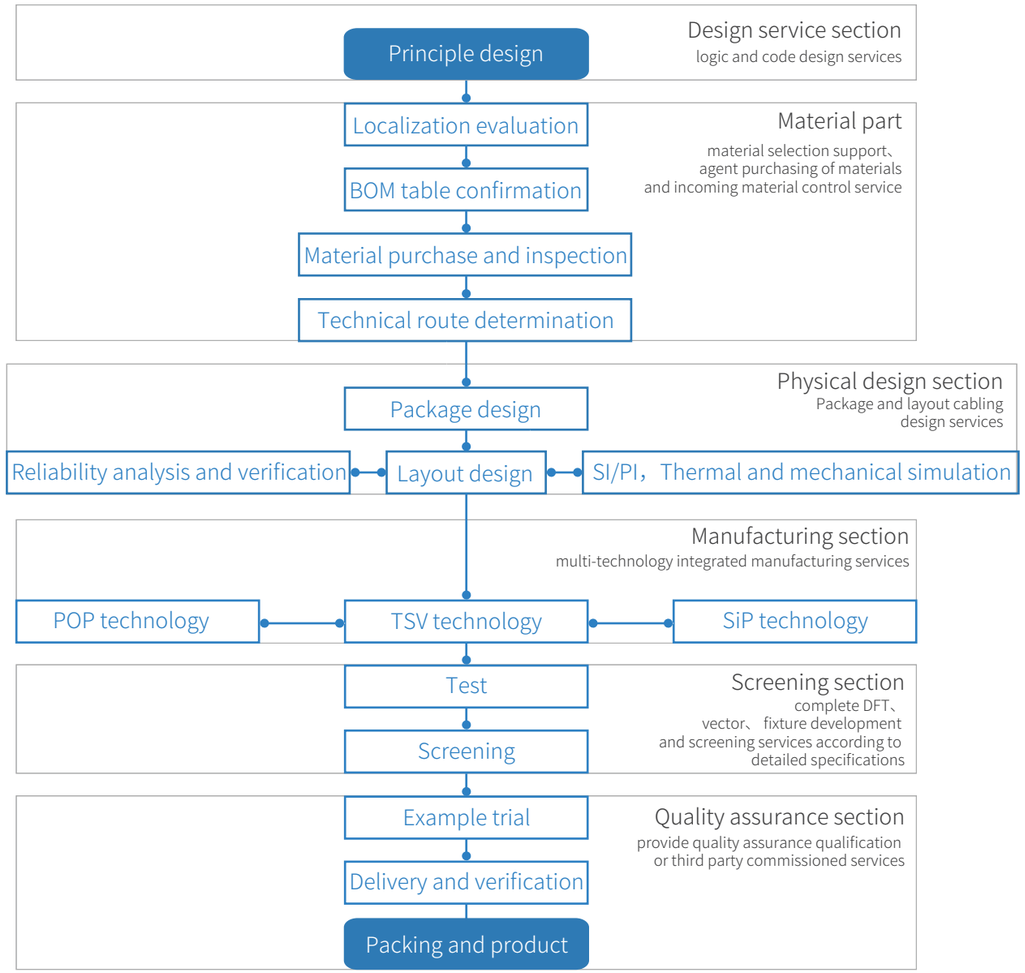


Microsystem Shared Manufacturing Service Platform

One-stop turnkey service for the whole process

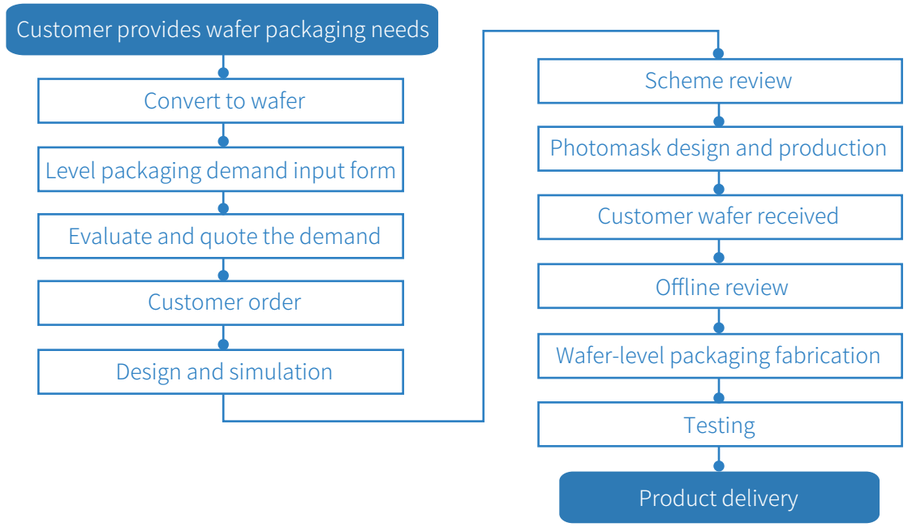
Six plates professional support, free combination

Mass production cooperation or product design and manufacturing

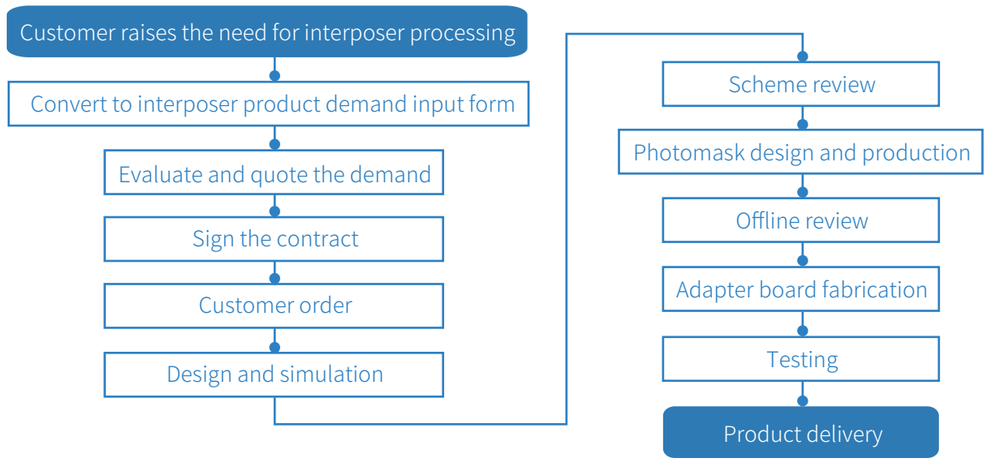


One-stop Solutions to Advanced Packaging Design and Processes

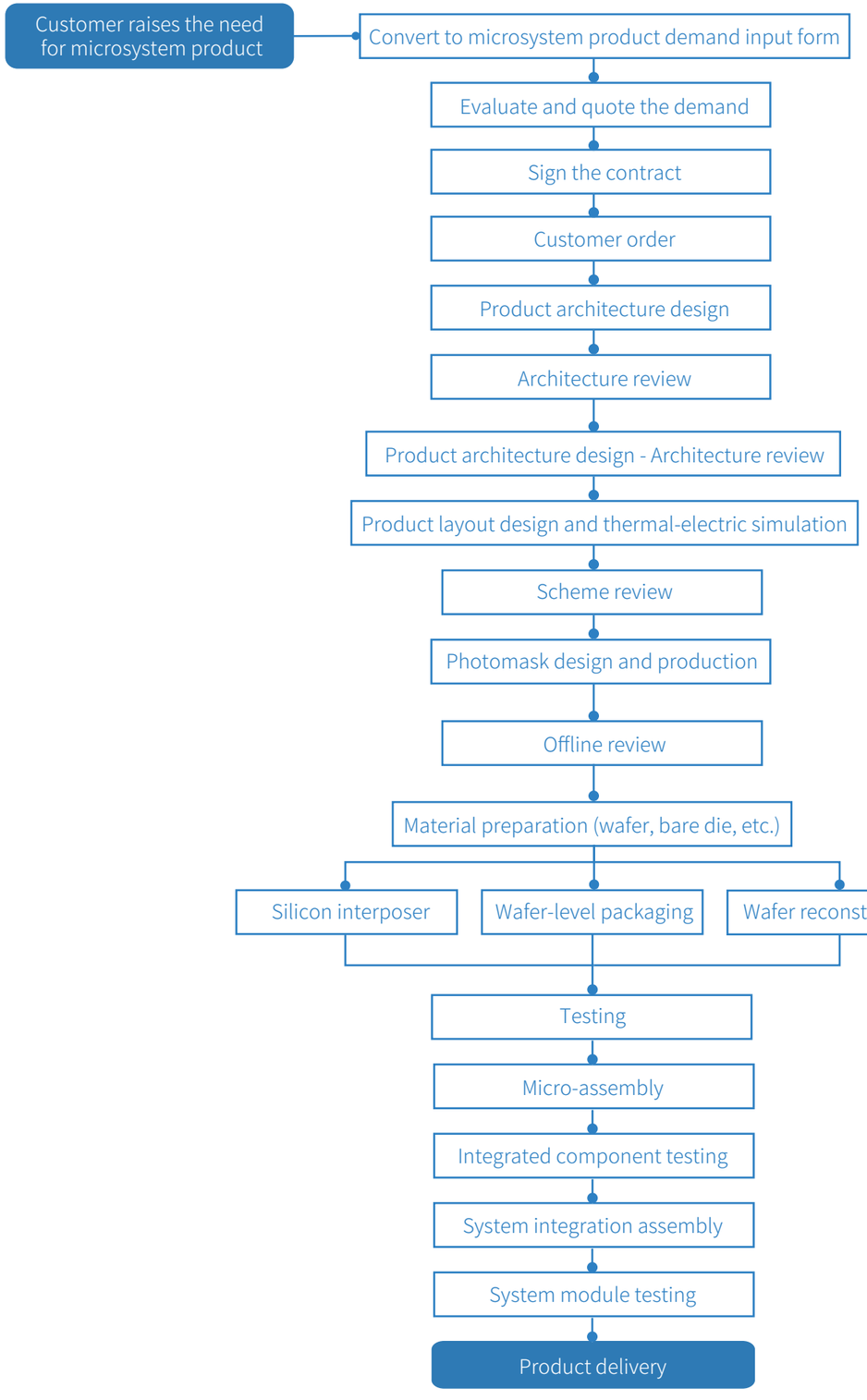
Wafer-level packaging products（3D WLCSP、WLCSP、Bumping）



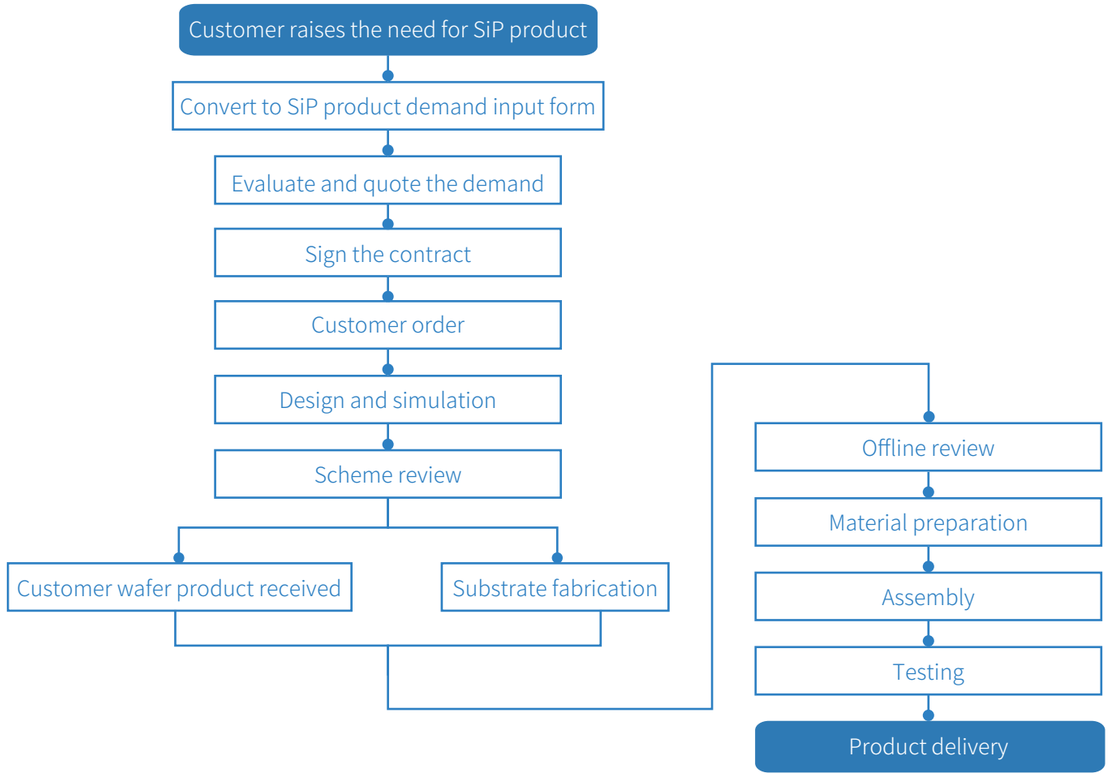
Interposer



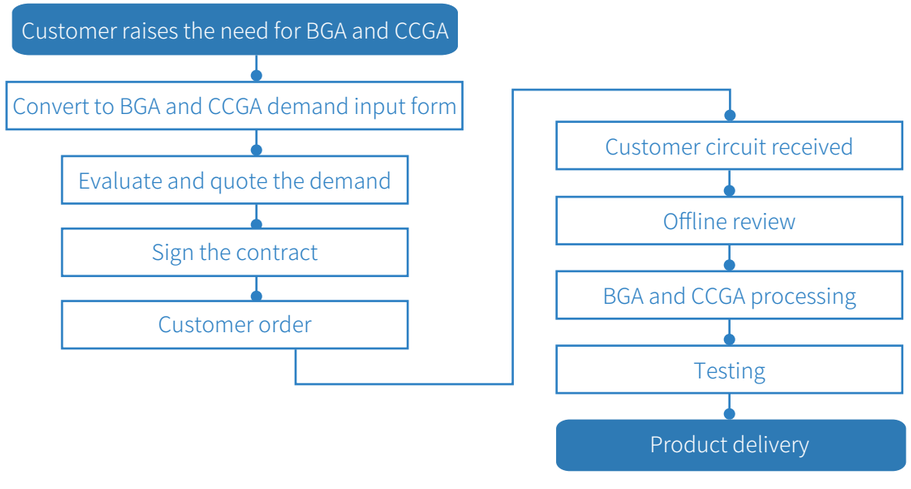
TSV Micro Module



Substrate SiP Products（BGA Substrate）



CBGA/CCGA



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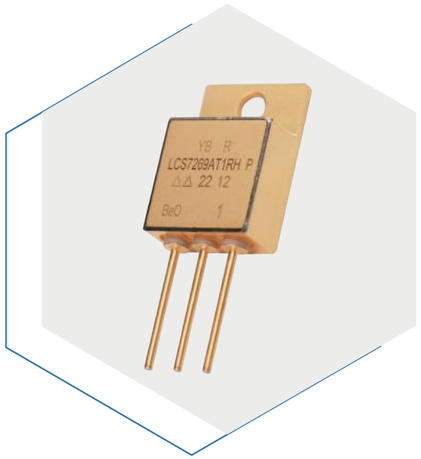
High PowerRad-hard VDMOS Serise for Space Use



FEATURES:

Total dose irradiation≥100krad（Si）
Single Event Effect(SEE) LET≥75MeV·cm²/mg
Fast Switching
Simple Drive Requirements
Easy to parallel
Ambient Operating Temperature Range：-55℃~125℃
Operating Junction：-55℃~150℃

INTRODUCTION:

Aerospace high power radiation hardened power MOSFETs usually used as a switch for space power system, mainly to achieve power processing and conversion functions, including N channel and P channel two type.
The product performance reaches the class of IR company:s sixth generation products, and can be compatible with IR company:s JANS class products with full parameters.
N-channel product breakdown voltage 20V~600V, drain current maximum 69A, on-resistance minimum 5mΩ. P-channel product breakdown voltage 20V~200V, drain current maximum 38A, on-resistance minimum 50mΩ. Products total dose irradiation capability is achieved 100krad(Si), Single-event burnout and gate rupture capability LET is achieved 75MeV·cm² /mg. The technical class is leading in China.To meet the special needs of radiation hardened VDMOS products in harsh environment such as space applications, the products have been widely used in national key projects.

QUALITY CONTROL:

Grade: JCT, YB, YC, QY
Specification:
GJB33*General Specification for Discrete Semiconductor Devices*
Q/QJA20104A-2017*General Specification for Discrete Semiconductor Devices of Space Application*

RAD-HARD PARAMETERS:

Steady-state total dose irradiation≥100krad（Si）
Single-event burnout and gate rupture
LET≥75MeV·cm²/mg

APPLICATIONS:

Rad-hard VDMOS Serise products with its small size, light weight, high power density, high reliability, High radiation hardened capability and other characteristics, usually used as a switch for space power system, mainly to achieve power processing and conversion functions. In aerospace, aviation, satellite, missile and other fields of power converter, electronic switch and other electronic systems have a wide range of applications.
Multiple varieties and models of products have been used in the second generation of navigation, satellite, space station and other key engineering projects.

Approved Products for P Channel

NO.	Part Number	BV_{DSS} V	I_D A	R_{DS} Ω	P_D W	TID krad(Si)	SEB MeV•cm²/mg	SEGR MeV•cm²/mg	Package	Quality Grade	Industry Counterpart	Localization Level
1	LCS7390T2RH	⩾-200	⩾-4	⩽0.8	25	⩾100	⩾75	⩾75	TO-39	JCT, YB, YC, QY	JANSR2N7390 (IRHF9230)	A
2	LCS7382T2RH	⩾-100	⩾-6.5	⩽0.3	25	⩾100	⩾75	⩾75	TO-39	JCT, YB, YC, QY	JANSR2N7389 (IRHF9130CM)	A
3	LCS7426T1RH	⩾-200	⩾-27	⩽0.16	250	⩾100	⩾75	⩾75	TO-254AA	JCT, YB, YC, QY	JANSR2N7426 (IRHM9260)	A
4	LCS7422U1RH	⩾-100	⩾-22	⩽0.08	150	⩾100	⩾75	⩾75	SMD-1	JCT, YB, YC, QY	JANSR2N7422U (IRHN9150SCS)	A
5	LCS7422T1RH	⩾-100	⩾-22	⩽0.08	150	⩾100	⩾75	⩾75	TO-254AA	JCT, YB, YC, QY	JANSR2N7422 (IRHM9150SCS)	A
6	LCS7383T3RH	⩾-200	⩾-6.5	⩽0.8	75	⩾100	⩾75	⩾75	TO-257AA	JCT, YB, YC, QY	JANSR2N7383 (IRHY9230CM)	A
7	LCS7382U3RH	⩾-100	⩾-11	⩽0.29	75	⩾100	⩾75	⩾75	SMD-0.5	JCT, YB, YC, QY	IRHNJ9130	A
8	LCS7425U2RH	⩾-100	⩾-38	⩽0.068	300	⩾100	⩾75	⩾75	SMD-2	JCT, YB, YC, QY	JANSR2N7425U (IRHNA9160)	A
9	LCS7425T1RH	⩾-100	⩾-35	⩽0.073	250	⩾100	⩾75	⩾75	TO-254AA	JCT, YB, YC, QY	JANSR2N7425IRH M9160	A
10	LCS7390U3RH	⩾-200	⩾-6.5	⩽0.8	75	⩾100	⩾75	⩾75	SMD-0.5	JCT, YB, YC, QY	IRHNJ9230	A
11	LCS7382T3RH	⩾-100	⩾-11	⩽0.29	75	⩾100	⩾75	⩾75	TO-257AA	JCT, YB, YC, QY	JANSR2N7382 (IRHY9130CMSCS)	A
12	LCS7422SEU1RH	⩾-100	⩾-22	⩽0.08	150	⩾100	⩾75	⩾75 (VGS=15V, VDS=-100V)	SMD-1	JCT, YB, YC, QY	JANSR2N7422U (IRHN9150SCS)	A
13	LCS7422SET1RH	⩾-100	⩾-22	⩽0.08	150	⩾100	⩾75	⩾75 (VGS=15V, VDS=-100V)	TO-254AA	JCT, YB, YC, QY	JANSR2N7422 (IRHM9150SCS)	A
14	LCS7382SEU3RH	⩾-100	⩾-11	⩽0.29	75	⩾100	⩾75	⩾75 (VGS=15V, VDS=-100V)	SMD-0.5	JCT, YB, YC, QY	IRHNJ9130	A
15	LCS7382SET2RH	⩾-100	⩾-6.5	⩽0.3	25	⩾100	⩾75	⩾75 (VGS=15V, VDS=-100V)	TO-39	JCT, YB, YC, QY	JANSR2N7389 (IRHF9130CM)	A
16	LCS7425SET1RH	⩾-100	⩾-35	⩽0.073	250	⩾100	⩾75	⩾75 (VGS=15V, VDS= 100V)	TO-254AA	JCT, YB, YC, QY	JANSR2N7425 (IRHM9160)	A
17	LCS7625U3RH	⩾-60	⩾-22	⩽0.070	57	⩾100	⩾75	⩾75	SMD-0.5	JCT, QY	JANSR2N7624U3 (IRHLNJ797034)	A
18	LCS7404U3RH	⩾-20	⩾-11	⩽0.040	50	⩾100	⩾75	⩾75	SMD-0.5	JCT, QY	IRL5NJ7404	A

Approved Products for N Channel

1	LCS7262T2RH	⩾200	⩾5.5	⩽0.35	25	⩾100	⩾75	⩾75	TO-39	JCT, YB, YC, QY	JANSR2N7262 (IRHF7230)	A
2	LCS7261T2RH	⩾100	⩾8	⩽0.185	25	⩾100	⩾75	⩾75	TO-39	JCT, YB, YC, QY	JANSR2N7261 (IRHF7130)	A
3	LCS7269AU1RH	⩾200	⩾26	⩽0.1	150	⩾100	⩾75	⩾75	SMD-1	JCT, YB, YC, QY	JANSR2N7269U (IRHN7250)	A
4	LCS7269AT1RH	⩾200	⩾26	⩽0.1	150	⩾100	⩾75	⩾75	TO-254AA	JCT, YB, YC, QY	JANSR2N7269 (IRHM7250)	A
5	LCS7262U3RH	⩾200	⩾9.4	⩽0.40	75	⩾100	⩾75	⩾75	SMD-0.5	JCT, YB, YC, QY	IRHNJ7230	A
6	LCS7583U2RH	⩾200	⩾56	⩽0.028	250	⩾100	⩾75	⩾75	SMD-2	JCT, YB, YC, QY	JANSR2N7583U2 (IRHNA67260)	A
7	LCS7583T1RH	⩾200	⩾45	⩽0.029	208	⩾100	⩾75	⩾75	TO-254AA	JCT, YB, YC, QY	JANSR2N7584T1 (IRHMS67260)	A
8	LCS7450U1RH	⩾500	⩾12	⩽0.51	151	⩾100	⩾75	⩾75	SMD-1	JCT, YB, YC, QY	IRHN7450SE	A
9	LCS7450T1RH	⩾500	⩾12	⩽0.51	151	⩾100	⩾75	⩾75	TO-254AA	JCT, YB, YC, QY	IRHM7450SE	A
10	LCS7587U3RH	⩾100	⩾22	⩽0.042	75	⩾100	⩾75	⩾75	SMD-0.5	JCT, YB, YC, QY	JANSR2N7587U3 (IRHNJ67130)	A
11	LCS7587T3RH	⩾100	⩾20	⩽0.042	75	⩾100	⩾75	⩾75	TO-257AA	JCT, YB, YC, QY	JANSR2N7588T3 (IRHYS67130)	A

Approved Products for N Channel

NO.	PartNumber	BV_{DSS} V	I_D A	R_{DS} Ω	P_D W	TID krad(Si)	SEB MeV•cm²/mg	SEGR MeV•cm²/mg	Package	Quality Grade	Industry Counterpart	Localization Level
12	LCS7591U3RH	⩾200	⩾16	⩽0.13	75	⩾100	⩾75	⩾75	SMD-0.5	JCT, YB, YC, QY	JANSR2N7591U3 (IRHNJ67230)	A
13	LCS7591T3RH	⩾200	⩾16	⩽0.13	75	⩾100	⩾75	⩾75	TO-257AA	JCT, YB, YC, QY	JANSR2N7592T3 (IRHYS67230)	A
14	LCS7469T1RH	⩾100	⩾45	⩽0.014	208	⩾100	⩾75	⩾75	TO-254AA	JCT, YB, YC, QY	JANSR2N7471T1 (IRHMS57160)	A
15	LCS7469U2RH	⩾100	⩾75	⩽0.012	250	⩾100	⩾75	⩾75	SMD-2	JCT, YB, YC, QY	JANSR2N7469U2 (IRHNA57160)	A
16	LCS7394T1RH	⩾60	⩾35	⩽0.030	150	⩾100	⩾75	⩾75	TO-254AA	JCT, YB, YC, QY	JANSR2N7394 (IRHM7054)	A
17	LCS7586U2RH	⩾250	⩾50	⩽0.040	250	⩾100	⩾75	⩾75	SMD-2	JCT, YB, YC, QY	JANSR2N7585U2 (IRHNA67264)	A
18	LCS7586T1RH	⩾250	⩾45	⩽0.041	208	⩾100	⩾75	⩾75	TO-254AA	JCT, YB, YC, QY	JANSR2N7586T1 (IRHMS67264)	A
19	LCS7587SEU3RH	⩾100	⩾22	⩽0.042	75	⩾100	⩾75	⩾75 (VGS=-15V, VDS=100V)	SMD-0.5	JCT, YB, YC, QY	JANSR2N7587U3 (IRHNJ67130)	A
20	LCS7587SET3RH	⩾100	⩾20	⩽0.042	75	⩾100	⩾75	⩾75 (VGS=-15V, VDS=100V)	TO-257AA	JCT, YB, YC, QY	JANSR2N7588T3 (IRHYS67130)	A
21	LCS7591SEU3RH	⩾200	⩾16	⩽0.13	75	⩾100	⩾75	⩾75 (VGS=-15V, VDS=200V)	SMD-0.5	JCT, YB, YC, QY	JANSR2N7591U3 (IRHNJ67230)	A
22	LCS7483T3RH	⩾60	⩾18	⩽0.040	75	⩾100	⩾75	⩾75	TO-257AA	JCT，QY	IRHY57034 (JANSR2N7483T3)	A
23	LCS7589U3RH	⩾150	⩾19	⩽0.088	75	⩾100	⩾75	⩾75	SMD-0.5	JCT，QY	IRHNJ67134 (JANSR2N7589U3)	A
24	LCS7593U3RH	⩾250	⩾12.4	⩽0.21	75	⩾100	⩾75	⩾75	SMD-0.5	JCT, YB, YC, QY	IRHNJ67234 (JANSR2N7593U3)	A
25	LCS7262SET2RH	⩾200	⩾5.5	⩽0.35	25	⩾100	⩾75	⩾75 (VGS=-15V, VDS=200V)	TO-39	JCT, YB, YC, QY	JANSR2N7262 (IRHF7230)	A
26	LCS7583SET1RH	⩾200	⩾45	⩽0.029	208	⩾100	⩾75	⩾75 (VGS=-15V, VDS=200V)	TO-254AA	JCT, YB, YC, QY	JANSR2N7584T1 (IRHMS67260)	A
27	LCS7591SET3RH	⩾200	⩾16	⩽0.13	75	⩾100	⩾75	⩾75 (VGS=-15V, VDS=200V)	TO-257AA	JCT, YB, YC, QY	JANSR2N7592T3 (IRHYS67230)	A
28	LCS7580SEU2RH	⩾100	⩾56	⩽0.01	250	⩾100	⩾75	⩾75 (VGS=-15V, VDS=100V)	SMD-2	JCT, YB, YC, QY	JANSR2N7579U2 (IRHNA67160)	A
29	LCS7580SET1RH	⩾100	⩾45	⩽0.01	208	⩾100	⩾75	⩾75 (VGS=-15V, VDS=100V)	TO-254AA	JCT, YB, YC, QY	JANSR2N7580T1 (IRHMS67160)	A
30	LCS7391T1RH	⩾400	⩾22	⩽0.20	250	⩾100	⩾75	⩾75 (VGS=-15V, VDS=400V)	TO-254AA	JCT, YB, YC, QY	JANSR2N7391 (IRHM7360SE)	A
31	LCS7465AU3RH	⩾400	⩾5	⩽1.39	75	⩾100	⩾75	⩾75 (VGS=-15V, VDS=400V)	SMD-0.5	JCT, YB, YC, QY	JANSR2N7465U3 (IRHNJ7330SE)	A
32	LCS7392T1RH	⩾500	⩾18	⩽0.32	75	⩾100	⩾75	⩾75 (VGS=-15V, VDS=500V)	TO-254AA	JCT, YB, YC, QY	JANSR2N7392 (IRHM7460SE)	A
33	LCS7464T2RH	⩾500	⩾2.5	⩽1.77	25	⩾100	⩾75	⩾75 (VGS=-15V, VDS=500V)	TO-39	JCT, YB, YC, QY	JANSR2N7464T2 (IRHF7430SE)	A

Under-researched Products for N Channel

NO.	Part Number	BV_{DSS} V	I_D A	R_{DS} Ω	P_D W	TID krad(Si)	SEB MeV•cm²/mg	SEGR MeV•cm²/mg	Package	Quality Grade	Industry Counterpart	Localization Level
1	LCS7470U2RH	⩾60	⩾75	⩽0.0056	250	⩾100	⩾75	⩾75 (VGS=-15V, VDS=60V)	SMD-2	Under-research	JANRS2N7468U2	A
2	LCS7470T1RH	⩾60	⩾45	⩽0.0066	250	⩾100	⩾75	⩾75 (VGS=-15V, VDS=60V)	TO-254AA	Under-research	JANRS2N7470T1	A
3	LCS7581U2RH	⩾150	⩾56	⩽0.018	250	⩾100	⩾75	⩾75 (VGS=-15V, VDS=150V)	SMD-2	Under-research	JANRS2N7581U2	A

JFETs

INTRODUCTION:

Junction Field-Effect Transistor (JFET) is a three-terminal active separation device with amplification function composed of p-n junction gate (G) and source (S) and drain (D). It is the simplest type of unipolar field effector, which can be divided into N channel or P channel.

FUNCTION:

According to the common source of its unsaturated zone, saturated zone and breakdown zone, the kind of devices can realize switching, amplification, constant current and other functions in different working states.

FEATURES:

JEET is a sort of electrical; voltage control device, which does not require large signal power,it is a device with majority carrier conductive power, with no minority storage and diffusionproblems, high speed and low noise coefficient; the input end is a reverse biased p-n, and the input impedance is large, and can be used as a constant current source. The junction field-effect transistor of Xi'an Institute of Microelectronics Technology has low noise, small leakage and strong irradiation resistance. Anti-radiation ability can meet the total dose of 100krad (Si) (the first 30k dose rate, 0.01rad (Si)/s, the last 70k dose rate. 0.1rad (Si) /s)

QUALITY CONTROL:

Grade: YB, YC, JCT

Specification:

GJB33 *General Specification for Discrete Semiconductor Devices*

Q/QJA20104A-2017 *General Specification for Aerospace Semiconductor Devices*

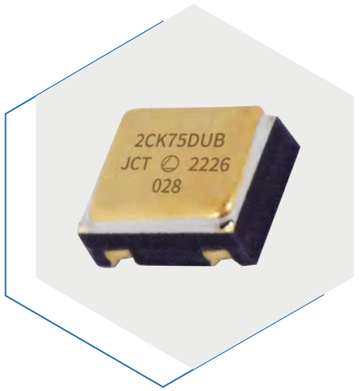
APPLICATIONS:

It is widely used in aerospace, aviation, ships and other fields; it can be applied to all kinds of low-frequency and high-frequency AC amplifiers and DC amplifiers, source followers, choppers and analog switches.

Approved Products

NO.	Part Number	P_{tot} (W)	I_{DSS} (mA)	$V_{(BR)GSSR}$ (V)	$V_{GS(off)}$ (V)	I_{GSS} (nA)	Common Source Noise Coefficient (dB)	Package	Quality Grade	Industry Counterpart
1	F60	1	⩾80	50	3.0~5 .0	⩽100	-	-	JCT	/
2	3DJ6F	0.05	1.0~3.5	30	⩽4 .0	⩽100	-		JCT	/
3	2N4416	0.15	5.0~15	30	⩽6 .0	⩽100	-	-	JCT	/
4	L2N3821	0.3	0.5~2.5	50	⩽4 .0	⩽0.1	2.5	TO-72	YB, YC, JCT	/

Switching Diodes



INTRODUCTION:

Switching diode is a kind of semiconductor diode,is a kind of diode specially designed and manufactured for switching on and off on the circuit, and the time required for it to change from on-off to off or from off to on-on is shorter than that of ordinary diodes.

FUNCTION:

The working principle of the switching diode is that the resistance is very small under the action of the forward voltage and is in the on-state,which is equivalent to a switched on switch;Under the action of reverse voltage, the resistance is very large and is in a cut-off state, like a disconnected switch. The junction capacitance of switching diode is small, and the reverse recovery speed fast.

FEATURES:

Switching diode has the characteristics of fast switching speed, high breakdown voltage, large forward current, small reverse leakage current,etc., widely used in switching circuit, detection circuit, high frequency and pulse rectifier circuit and automatic control circuit to play the role of high frequency switching and rectification.

Switching diode series products, reverse breakdown voltage covers 80V~170V, reverse recovery time is less than 35ns, reverse leakage current is less than 1μA , the maximum working current forward voltage drop is less than 1V, products have achieved stable supply.

QUALITY CONTROL:

Grade: JCT,J T, JP

SPECIfiCATION:

GJB33 *GeneralSpecificationforDiscrete Semiconductor Devices*

APPLICATIONS:

It is widely used in aerospace, aviation, weapons, ships and other fields;It can be used in digital pulse circuit or switching circuit with higher frequency to play the role of switching or rectification.

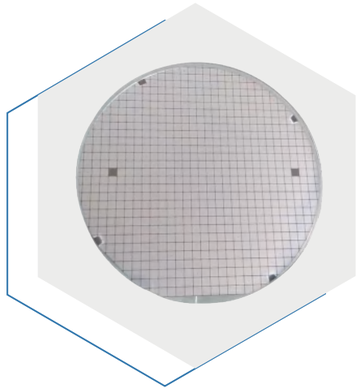
Approved Products

NO.	Part Number	V_{RM}(V)	I_R(μA)	I_R(μA)	V_R(V)	V_F(V)	I_{FM}(mA)	Package	Quality Grade
1	2CK75DUB	100	10	1	75	0.8	300	UB	JP, JT, JCT
2	2CK80NP	80	5	0.1	50	1.15	300	-	JCT
3	L2CS100	100	5	0.1	50	1.2	300	-	JCT

Under-researched Products

1	2CK84E	225	100	0.5	150	1	50	SMD-0.05	YB, YC, JCT
2	2CK78F	105	100	100	70	1	270	SMD-0.05	YB, YC, JCT

Anti-single Particle Schottky Diodes



INTRODUCTION:

Schottky diode is the abbreviation of Schottky barrier diode. It is not made by using the PN junction principle formed by the contact between P-type semiconductor and N-type semiconductor, but by using the metal-semiconductor junction principle formed by the contact between metal and semiconductor. Therefore, Schottky diode is also called the metal-semiconductor doide or surface barrier diode.

FUNCTION:

The working principle of the switching diode is that the resistance is very small under the action of the forward voltage and is in the on-state,which is equivalent to a switched on switch;Under the action of reverse voltage, the resistance is very large and is in a cut-off state, like a disconnected switch. The junction capacitance of switching diode is small, and the reverse recovery speed fast.

FEATURES:

The product adopts advanced Schottky contact technology, cellular design reinforcement technology and highly reliable military packaging technology. It has the characteristics of anti-single particle irradiation, low power consumption, large current, forward pilot voltage reduction, short reverse recovery time and high operating frequency, and can be applied in harsh environments such as high temperature, cold and space irradiation. The device relies on military metal packaging and ceramic packaging technology, the product has high reliability and strong impact resistance. Schottky diode series products, reverse breakdown voltage is 150V, forward current covers 5A-30A, surge current capacity is greater than 400A, anti-single particle irradiation capacity is greater than 75 MeV·cm^2/mg.

QUALITY CONTROL:

GRADE: JCT

SPECIfiCATION:

GJB33 *GeneralSpecificationforDiscrete Semiconductor Devices*

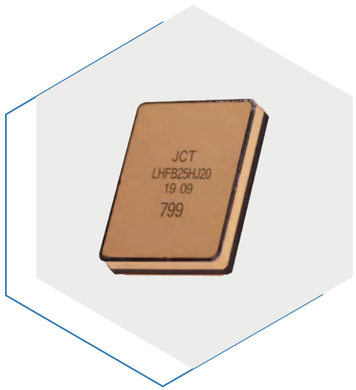
APPLICATIONS:

In aerospace, wireless communication equipment, radar field, power system, computer field, electric vehicles and other fields to play the role of high-frequency switching and rectification.

Approved Products

NO.	Part Number	V_{BR}(V)	I_R(μ A)	I_{FM}(A)	V_{FM}(V)	IFSM(A)	Package	Quality Grade	Industry Counterpart
1	LSC125H150A/S	150	100	15	0.94	280	-	JCT	SC125H150A/S
2	LSC175H150A/S	150	20	30	1.1	570	-	JCT	SC175H150A/S

Fast Recovery Diodes



FEATURES:

Fast recovery diode is a semiconductor diode with good switching characteristics and short reverse recovery,is used as high-frequency rectifier diode, freewheeling diode or damping diode in the circuit.It is widely used in switching power supply, PWM pulse width modulator, frequency converter and other electronic circuits.The forward current of the fast recovery diode product covers 25A~35A, the reverse breakdown voltage is greater than 200V, the reverse recovery time is less than 45ns, and the reverse leakage current is less than 10 μA.The product has achieved stable supply.

INTRODUCTION:

Fast recovery diode belongs to PIN junction diode, specially designed for "turn-on" state and "turn-off" state in circuits. The reverse recovery time of the fast recovery diode is shorter than the other diodes.

FUNCTION:

Fast recovery diodes usually adopt unique minority carrier lifetime control technology and soft recovery technology. The product has high withstand voltage, small conduction voltage drop, less reverse recovery charge, and no severe electromagnetic oscillation.-Compared with ordinary diodes, fast recovery diodes have large current capacity, fast switching speed, low switching loss, and high operating voltage.The application in high-frequency electronic system can greatly reduce switching loss and electromagnetic interference. It is often used as a continuous current, absorption, box position, isolation, output and input rectifier for high-frequency switching devices.

QUALITY CONTROL:

Grade:YB, YC, JCT

Specification:

GJB33 *General Specification for Discrete Semiconductor Devices*

Q/QJA20104A-2017 *General Specification for Aerospace Semiconductor Devices*

APPLICATIONS:

Widely used in aerospace, aviation, ships and other fields; It can be used in electronic circuits such as switching power supply, PWM pulse width modulator, frequency converter, etc.

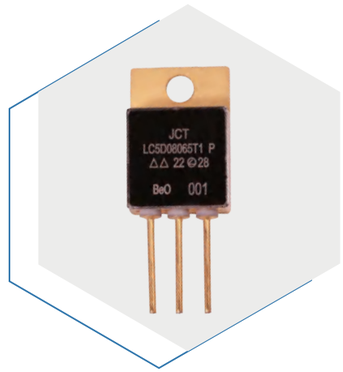
Approved Products

NO.	Part Number	V_{BR}(V)	I_R(μ A)	$I_{F(AV)}$ (A)	I_{FSM}(A)	V_F(V)	t_{rr} (ns)	Q_{rr} (nC)	Package	Quality Grade	Industry Counterpart
1	LHFB25HJ20	200	10	25	150	1.07	35	91.5	SMD-0.5	YB, YC, JCT	HFB25HJ20
2	LMURC120	200	2	1	35	0.855	35			JCT	MURC120

Under-researched Products

1	L2CZ3520CT1	200	10	35	150	1.4	45	122	TO-254AA	YB, YC, JCT	HFB35HB20C
2	L2CZ6020U1	200	5	60	500	1.08	50	120	SMD-1	JCT	HFB60HB20
3	L2CZ6020T8	200	5	60	500	1.08	50	120	TO-258AA	JCT	HFB60HB20
4	2CZ5811U9	150	5	3	125	0.865	30	-	SMD-0.1	JCT	1N5811
5	2CZ0240U10	400	0.5	2	20	1.6	45	-	SMD-0.05	JCT	1N6621
6	2CZ3560T1	600	10	35	225	2.25	97	575	TO-254AA	YB, YC, JCT	HFA35HB60
7	2CZ08120CT1	1200	10	15	80	3.3	100	370	TO-254AA	YB, YC, JCT	HFA08PB120
8	2CZ5040UT1	400	5	50	200	1.6	50	-	SMD-1	YB, YC, JCT	SDR954

Silicon Carbide Schottky Diodes



INTRODUCTION:

SiC Schottky diodes are SiC-based Schottky diodes, which are composed of front anode and back cathode.We have completed the development of 650V, 1200V and 1700V series SiC Schottky diodes, which can provide high-reliability SiC Schottky diodes to meet the needs of users, and can custom ize products and expand series according to the actual application needs of users.

FUNCTION:

SiC Schottky diode adopts the JBS (Junction Barrier Schottky) structure based on SiC. When the forward bias is applied, the current transport is realized by relying on majority carriers in the chottky-semicon ductorcontact. When the reverse bias is applied, the depletion layer is generated in the N-epitaxial region to withstand the high resistance power off voltage of the device. Because JBS structure adds P+implantin the N-epitaxial region, it reduces the reverse leakage current and improves the anti-surge capability of the product.

FEATURES:

Silicon carbide Schottky diode has the characteristics of high breakdown voltage, strong current capacity, forward voltage reduction, small reverse leakage, fast switching speed, etc., and plays the role of rectification, continuous current and switching in the circuit.

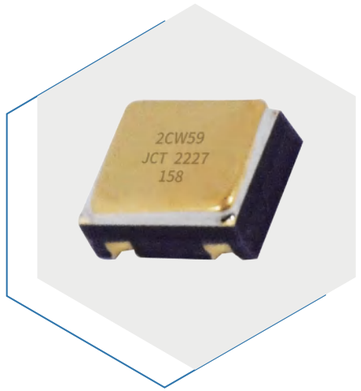
QUALITY CONTROL:

Grade:JCT, JT, JP

Approved Products

NO.	Part Number	V_{BR} (V)	I_R (μA)	I_{FM}(A)	V_{FM}(V)	Package	Quality Grade
1	LC5D08065T1	650	10	8	1.8	TO-254AA	JCT , JT , JP
2	LC5D10120T1	1200	10	10	1.8	TO-254AA	JCT , JT , JP
3	LC5D04065	650	0.5	4	1.4	TO-247 , TO-220	Industrial Grade
4	LC5D06065	650	0.5	6	1.4	TO-247 , TO-220	Industrial Grade
5	LC5D08065	650	0.5	8	1.4	TO-247 , TO-220	Industrial Grade
6	LC5D10065	650	0.5	10	1.4	TO-247 , TO-220	Industrial Grade
7	LC5D15065	650	2	15	1.4	TO-247 , TO-220	Industrial Grade
8	LC5D20065	650	2	20	1.4	TO-247 , TO-220	Industrial Grade
9	LC5D30065	650	5	30	1.4	TO-247 , TO-220	Industrial Grade
10	LC5D50065	650	5	50	1.4	TO-247 , TO-220	Industrial Grade
11	LC5D05120	1200	0.5	5	1.4	TO-247 , TO-220	Industrial Grade
12	LC5D10120	1200	2	10	1.5	TO-247 , TO-220	Industrial Grade
13	LC5D15120	1200	5	15	1.5	TO-247 , TO-220	Industrial Grade
14	LC5D20120	1200	5	20	1.55	TO-247 , TO-220	Industrial Grade
15	LC5D30120	1200	5	30	1.6	TO-247 , TO-220	Industrial Grade
16	LC5D10170	1700	2	10	1.8	TO-247 , TO-220	Industrial Grade
17	LC5D05330	3300	2	5	4	TO-247	Industrial Grade

Voltage-regulator Diodes



INTRODUCTION:

A voltage regulator diode is a semiconductor device that has a high resistance until the critical reverse breakdown voltage, at which point the reverse resistance decreases to a small value, and in this low resistance region the current increases while the voltage remains constant.

FUNCTION:

Voltage regulator diodes usually work in the reverse breakdown area, after the reverse breakdown, when the current flowing through the regulator diode changes in a large range, the voltage at both ends of the regulator diode is almost unchanged, so that a stable voltage can be obtained.

FEATURES:

Voltage regulator diode has the characteristics of high precision voltage regulator value, small reverse leakage current, low voltage temperature coefficient, in the circuit can play overcurrent, overvoltage, short circuit protection and other functions, widely used in surge protection circuit, signal amplification circuit and voltage regulator circuit.

The voltage regulator diode series products range between 4V~110V, the reverse leakage current is less than 1μA, the voltage temperature coefficient is less than5E-6V/°C, and the product has achieved stable supply.

QUALITY CONTROL:

Grade: JCT, JT, JP

Specification:

GJB33*General Specification for Discrete Semiconductor Devices*

APPLICATIONS:

Widely used in aviation, aerospace, weapons, ships and other fields; It can be used in surge protection circuit, signal amplifier circuit and voltage regulator circuit.

Approved Products

NO.	Part Number	Vz(V)	I_Z(mA)	V_R(V)	I_R(μ A)	I_{ZM}(mA)	Package	Quality Grade
1	2CW53	4.8~5.4	5	2	2	41	UB	JCT , JP, JT
2	2CW56	7.0~7.9	5	0.1	5	27	UB	JCT , JP, JT
3	2CW59	9.4~10.6	5	0.1	7.5	20	UB	JCT , JP, JT
4	2CW62	3.0~3.6	5	1	1	90	UB	JCT , JP, JT
5	2CW64	19.61~20.39	5	0.5	19.1	25	UB	JCT , JP, JT
6	2CW54	5.5~6.5	10	0.5	1	35	-	JCT
7	2CW58	9.2~10.5	5	0.5	1	23	-	JCT
8	2CW61	12.2~14	3	0.5	1	10	-	JCT
9	2CW78	15.2~16.0	5	1	0.5	14	-	JCT
10	2DWY6	6.2~7.0	5	0.5	2	-	-	JCT
11	2DWY7	6.4~7.5	10	0.5	2	-	-	JCT
12	2DWY8	8.1~8.9	10	0.5	2	-	-	JCT
13	2DW232	6.0~6.5	5	2	3.6	-	-	JCT
14	2DWY8N	7.9~8.5	10	0.5	2	-	-	JCT
15	L2DK01	⩽1.5	2000	100	170	-	-	JCT

Schottky Diodes

INTRODUCTION:

Schottky diode is the abbreviation of Schottky barrier diode. It is not made by using the PN junction principle formed by the contact between P-type semiconductor and N-type semiconductor, but by using the metal-semi-conductor junction principle formed by the contact between metal and semiconductor. Therefore, Schottky diode is also called the metal-semiconductor doide or surface barrier diode.

FUNCTION:

The working principle of Schottky diode is to realize the forward conduction and reverse cut-off characteristics of the device through Schottky barrier, thus forming the conduction and turn-off of the circuit, realizing the function of rectification and switching.

FEATURES:

The product is characterized by low power consumption, high current, low forward conduction voltage, short reverse recovery time and high working frequency. Relying on metal packaging and ceramic packaging technology, the product has high reliability and strong impact resistance.Schottky diode series products, with reverse breakdown voltage covering 40V~150V, forward current covering 1A~90A, surge current capacity greater than 400A, and turn on voltage less than 1V under maximum working current, have achieved stable supply.

QUALITY CONTROL:

Grade:YB, YC, JCT

Specification:

GJB33 *General Specification for Discrete Semiconductor Devices*

Q/QJA20104A-2017 *General Specification for Aerospace Semiconductor Devices*

APPLICATIONS:

It is applied in aerospace, wireless communication equipment, radar, power system, computer, electric vehicle and other fields to play the role of high-frequency switch and rectifier.

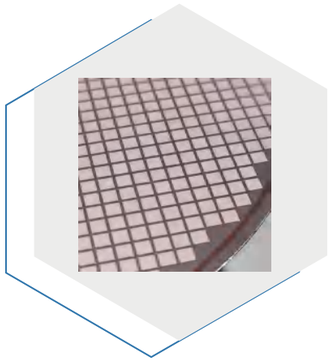
Approved Products

NO.	Part Number	V_{BR}(V)	I_R(μ A)	I_{FM}(A)	V_{FM}(V)	I_{FSM}(A)	Package	Quality Grade	Industry Counterpart
1	L80CLQ150	150	20	80	1.23	400	SMD-1	YB, YC, JCT	80CLQ150
2	L30CLJQ150	150	20	30	1.2	130	SMD-0.5	YB, YC, JCT	30CLJQ150
3	LXT30100CU3	100	10	30	1.27	100	SMD-0.5	YB, YC, JCT	30CLJQ100
4	LXT35150CT1	150	100	35	1.18	400	TO-254AA	YB, YC, JCT	35CGQ150
5	L35CGQ100	100	30	35	1.11	150	TO-254AA	YB, YC, JCT	35CQ100
6	LXT01040U9	40	50	1	0.49	25	SMD-0.1	YB, YC, JCT	1N5822
7	LXT45100CT8	100	800	45	1.13	400	TO-258AA	YB, YC, JCT	45CKQ100SCV
8	LXT7039CT1	150	500	35	1.6	200	SMD-1	YB, YC, JCT	1N7039
9	LXT7039CU1	150	500	35	1.6	200	TO-254AA	YB, YC, JCT	1N7039
10	LXT60045CT8	45	800	45	0.92	400	TO-258AA	YB, YC, JCT	60CKQ045
11	LXT30060U3	60	600	30	1.32	120	SMD-0.5	YB, YC, JCT	30SLJQ060
12	LXT90100CU1	100	70	90	0.98	250	SMD-1	YB, YC, JCT	90CLQ100
13	LXT01040U3	40	50	1	0.49	25	SMD-0.5	YB, YC, JCT	SCD35H040
14	XT03045U9	45	100	3	0.525	80	SDM-0.1	YB, YC, JCT	1N5819
15	XT35200CU1	200	10	35	1.3	150	SDM-1	YB, YC, JCT	-
16	XT35200U3	200	10	35	1.3	150	SDM-0.5	YB, YC, JCT	-
17	LXT16150	150	500	16	1.13	-	T0257	JCT	-

Under-researched Products

1	LXT30060U3	60	600	30	1.32	120	SDM-0.5	YB, YC, JCT	30SLJQ060

Transient Suppression Diodes



INTRODUCTION:

Transient Voltagesuppression diode (TVS) is a new type of high efficiency circuit protection device widely used, with extremely fast response time (sub-nanosecond level) and high surge absorption capacity.

FUNCTION:

When both ends of TVS are subjected to transient high energy impact, TVS can change the impedance value between the two ends from high impedance to low impedance at a very high speed to absorb the transient large current, clamp the voltage at both ends to a predetermined value, and protect the following circuit components from the impact of transient high voltage spike pulses.

QUALITY CONTROL:

Grade:JCT

Specification:

GJB33 *General Specification for Aerospace Semiconductor Devices*

FEATURES:

TVS of Xian Institute of Microelectronics Technology adopts groove structure technology, the maximum peak power is 600W, the maximum pulse current is 9.2A, which can be widely used in aerospace, aviation, weapons and other fields.

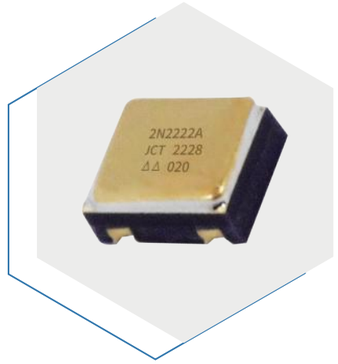
APPLICATIONS:

TVS tube can be mainly used for lightning protection of DC power supply, signal line, etc., has been widely used in computer systems, communication equipment, AC and DC power supply, household appliances, instruments and other fields.

Approved Products

NO.	Part Number	V_{BR}(V)	I_R(μA)	I_{RM}(μA)	V_{OS}(V)	V_C(V)	I_{PP}(A)	C_{TV}(%/°C)	Quality Grade
1	LSY47A	44.7-49.4	1	5	38.1	67.8	9.2	0.101	JCT
2	LSY62A	59.3~64	1	5	53	85	7	0.104	JCT
3	LSY150A	143~158	1	5	128	207	2.9	0.108	JCT
4	LSY82A	77.9~86.1	1	5	70.1	113	5.3	0.105	JCT

NPN Type Bipolar Transistors



Bipolar transistor is called bipolar transistor because it involves the flow of electrons and holes at the same time when it works. It is a discrete device with three terminals of emitter (E), base (B) and collector (C) and has current amplification function. It is a minority carrier device.

INTRODUCTION:

NPN bipolar transistor is a branch of bipolar transistor. NPN-type transistor consists of two layers of N-type doped region and a layer of P-type doped semiconductor (base) between them.

FUNCTION:

The bipolar transistor has four operating regions: forward amplification region, reverse amplification region, saturation region and cut-off region. The device bias can realize amplification, oscillation, switching and other functions under different operating conditions.

FEATURES:

NPN type bipolar transistor is a kind of current-controlled device with low input impedance, two kinds of carriers participating in the conduction process and strong driving ability. It can be used to amplify weak signals and non-contact switch, and has a series of unique advantages such as firm structure, long life, small size, power consumption and so on. NPN type bipolar transistor, product types cover power, switching, high frequency, etc., with small leakage, saturation voltage reduction and other characteristics, power range from 12mW to 225W, can provide devices and chip products.

QUALITY CONTROL:

Grade: JCT, JT, JP

Specification:

GJB33 *General GeneralSpecification for Discrete Semiconductor Devices*

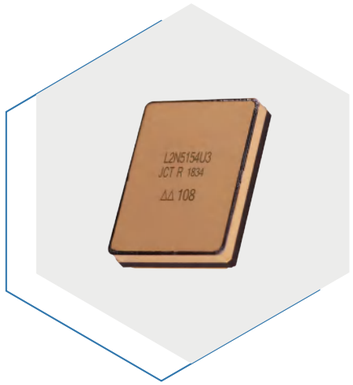
APPLICATIONS:

Widely used in aerospace, aviation, weapons, ships and other fields, it is often used to form amplifier circuits, or drive loudspeakers, motors and other equipment.

Approved Products

NO.	Part Number	P_{tot}(W)	I_{CM}(A)	V_{CEO}(V)	V_{EBO}(V)	$V_{CE(sat)}$(V)	$V_{BE(sat)}$(V)	I_{CEO}(μA)	h_{FE}	V_{CE}(V)	I_C(mA)	Package	Quality Grade
1	2N2222A	0.5	0.8	40	6	1	2	0.01	120～160	10	150	UB	JCT, JT, JP
2	3DG130B	0.7	0.3	80	4	0.6	1	1	80～120	5	50	-	JCT
3	3DK071	0.5	0.3	35	5	0.3	1	0.1	90～130	5	100	-	JCT
4	3DG182D	0.7	0.3	220	4	1	1.2	10	80～130	5	60	-	JCT
5	3DK28	0.012	0.02	40	7~8.5	0.3	0.6~0.8	0.5	60～130	5	10	-	JCT
6	3F11	0.5	0.5	30	5	0.3	1	0.25	100～250	10	5	-	JCT
7	3DK40	225	15	200	5	0.8	1.5	1.0mA	45～65	3	7.5A	-	JCT
8	3DK8	0.5	0.2	35	-	0.4	0.85	0.5	80～150	5	20	-	JCT
9	DK51	50	10	140	5	0.7	-	1	80～170	5	1A	-	JCT
10	3DK7	0.3	0.05	45	4	0.5	-	0.1	80～130	10	10	-	JCT
11	3DG111B	0.3	0.05	30	4	0.35	1	0.1	40～180	10	10	-	JCT
12	2SC2719	0.6	0.3	80	5	0.6	-	5	130～160	5	50	-	JCT
13	LPC100	0.125	-	100	5	0.7	-	1	130～270	5	10	-	JCT

Rad-hard NPN Bipolar Transistors



INTRODUCTION:

Radiation Hardened NPN bipolar transistor is a branch of bipolar transistor. The radiation Hardened performance of the device is significantly better than that of the normal NPN bipolar transistor by adopting radiation Hardened design and process reinforcement.

FUNCTION:

The bipolar transistor has four operating regions: forward amplification region, reverse amplification region, saturation region and cut-off region. The device bias can realize amplification, oscillation, switching and other functions under different operating conditions.

FEATURES:

Bipolar transistor is a current control device with low input impedance; Both kinds of carriers participate in the conduction process, bringing strong driving ability. It can be used to amplify weak signals and be switch without contact. It has a series of unique advantages, such as firm structure, long service life, tiny size and low power consumption.
Radiation Hardened NPN bipolar transistor, with power range of 0.5W to 1.2W, has the characteristics of low leakage, low saturation voltage, strong radiation resistance and low noise coefficient. The irradiation resistance can meet the total dose of 100krad (Si) (the first 30k dose rate is 0.01rad (Si)/s, and the last 70k dose rate is 0.1rad (Si)/s).

QUALITY CONTROL:

Grade: YB, YC, JCT
Specification:
GJB33 *General Specification for Discrete Semiconductor Devices*
Q/QJA20104A-2017 *General Specification for Aerospace Semiconductor Devices*

APPLICATIONS:

Widely used in aerospace, aviation, ships and other fields; It is often used to form amplifier circuit, or drive loudspeaker, motor and other equipment.

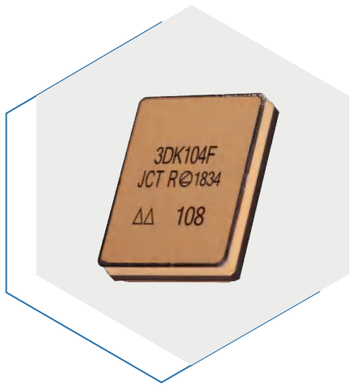
Approved Products

NO.	Part Number	P_{tot}(W)	I_{CM}(A)	V_{CEO}(V)	V_{EBO}(V)	$V_{CE(sat)}$(V)	$V_{BE(sat)}$(V)	I_{CEO}(μ A)	h_{FE}	$V_{CE(V)}$	$I_{C(mA)}$	Package	Quality Grade	Industry Counterpart
1	3DG3501	1	0.3	150	6	0.4	1.2	1	100~300	10	150	TO-39a	YB, YC, JCT	2N3501
2	3DG3500	1	0.3	150	6	0.4	1.2	1	40~120	10	150	TO-39a	YB, YC, JCT	2N3500
3	2SD526	30	4	80	5	1.7	-	0.5	130~150	5	50	-	JCT	/
4	3DK4	0.7	0.8	45	4	0.5	1.1	0.15	85~125	5	100	-	JCT	/
5	LMJ11016	150	30	120	-	4	5	1	⩾1000	5	2000	-	JCT	MJ11016
6	3DK2222AUB	0.5	0.8	50	6	1	2	0.05	100~300	10	150	UB	J, YB, YC, JCT	2N2222AUB
7	3DG5154U3	1	2	80	5.5	1.5	2.2	50	70~200	5	2500	SMD-0.5	YB, YC, JCT	2N5154U3
8	3DG3700AUB	0.5	1	80	5	0.5	11	10	20~300	10	50	UB	YB, YC, JCT	2N3700

Under-researched Products

NO.	Part Number	P_{tot}(W)	I_{CM}(A)	V_{CEO}(V)	V_{EBO}(V)	$V_{CE(sat)}$(V)	$V_{BE(sat)}$(V)	I_{CEO}(μ A)	h_{FE}	$V_{CE(V)}$	$I_{C(mA)}$	Package	Quality Grade	Industry Counterpart
1	3DA5667T2RH	1.2	5	300	6	0.4	1.2	-	25~75	5	1000	TO-39a	YB, YC, JCT	2N5667
2	3DG111	0.3	0.05	45	5	0.3	0.9	0.1	25~250	10	10	A3-01BF	YB, YC, JCT	-
3	3DG122	0.5	0.1	45	5	0.5	1	0.2	40~240	10	30	A3-02B	YB, YC, JCT	-
4	3DG130	0.7	0.3	45	5	0.6	1	1	25~270	10	50	A3-02B	YB, YC, JCT	-
5	3DK103	0.3	0.05	45	5	0.3	0.9	0.1	40~200	10	30	A3-01BF/UB	YB, YC, JCT	-
6	3DK104	0.7	0.4	80	5	0.5	1	1	40~200	3	50	A3-02B/SM52	YB, YC, JCT	-
7	3DG2920	0.3	0.2	60	5	0.35	0.5	0.1	＞50	5	1	LCC6	YB, YC, JCT	2N2920
8	3DK3439	0.8	1	350	7	0.5	1.3	2	40~160	10	20	A3-02B	YB, YC, JCT	2N3439

Anti Single Particle/Low-dose Irradiation NPN Bipolar Transistor



FUNCTION:

The bipolar transistor has four operating regions: forward amplification region, reverse amplification region, saturation region and cut-off region. The device bias can realize amplification, oscillation, switching and other functions under different operating conditions.

FEATURES:

Adopting bipolar transistor anti irradiation design reinforcement and process reinforcement technology, it has the ability to resist single particle irradiation and total dose irradiation, and has a series of unique advantages such as strong structure, long life, small size, low power consumption, and strong driving ability. It can be used in circuits to amplify weak signals and perform contactless switching.

Anti single particle/low-dose irradiation NPN bipolar transistor product, reverse breakdown voltage of 200V-320V, forward current coverage of 0.75A~2A, anti single particle irradiation ability greater than 75MeV · cm2/mg, anti low-dose rate irradiation ability can meet the total dose of 100krad (Si) (the first 30k dose rate is 0.0lrad (Si)/s, and the last 70k dose rate is 0.1rad (Si)/s).

QUALITY CONTROL:

Grade:YB, YC , JCT
Specification:
GJB33 *General Specification for Discrete Semiconductor Devices*
Q/QJA20104A-2017 *General Specification for Aerospace Semiconductor Devices*

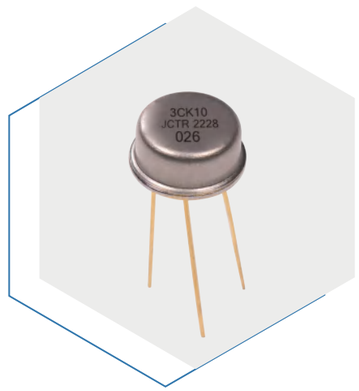
APPLICATIONS:

Widely used in aerospace, aviation, ships and other fields; It is often used to form amplifier circuit, or drive loudspeaker, motor and other equipment.

Approved Products

NO.	Part Number	P_{tot} (W)	I_{CM} (A)	V_{CEO} (V)	V_{EBO} (V)	$V_{CE(sat)}$ (V)	$V_{BE(sat)}$ (V)	I_{CEO} (uA)	h_{ee}	V_{CE} (V)	I_C (mA)	Package	Quality Grade	Industry Counterpart
1	3DK104F	0.5	0.75	200	5	0.7	1	10	15-200	5	750	SMD-0.2	YB, YC, JCT	/
2	3DA20035	1	2	320	6	1	1.2	2	25-75	2	100	/	JCT	/

PNP Bipolar Transistors



INTRODUCTION:

PNP bipolar transistor is a branch of bipolar transistor. PNP bipolar transistor consists of two P-type doped regions and a layer of N-type doped regions and a layer of N-type doped semiconductor inserted between them.

FUNCTION:

The bipolar transistor has four operating regions: forward amplification region,reverse amplification region,saturation region and cut-off region. The device bias can realize amplification, oscillation,switching and other functions under different operating conditions.

FEATURES:

Bipolar transistor is a current control device with low input impedance; Both kinds of carriers participate in the conduction process, bringing strong driving ability. It can be used to amplify weak signals and be switch without contact. It has a series of unique advantages, such as firm structure, long service life, tiny size and low power consumption.

There are more than 10 normal PNP bipolar transistor products, product type characteristics cover power,switching, high frequency, etc., power range from 0.3W to 5W, with small leakage, saturation voltage reduction and other characteristics, can provide devices and chip products.

QUALITY CONTROL:

Grade: JCT Specification:
GJB33 *General Specification for Discrete Semiconductor Devices*

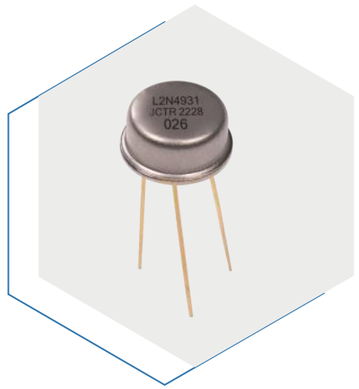
APPLICATIONS:

It is widely used in aerospace, aviation, ships and other fields. It is often used to form amplifier circuit, or drive loudspeaker, motor and other equipment.

Approved Products

NO.	Part Number	P_{tot}(W)	I_{CM}(A)	V_{CEO}(V)	V_{EBO}(V)	$V_{CE(sat)}$(V)	$V_{BE(sat)}$(V)	I_{CEO}(μA)	h_{FE}	$V_{CE(V)}$	$I_{C(mA)}$	Package	Quality Grade
1	3CK10	0.84	1	75	4	1	1.5	0.1	80~180	6	100	TO-39a	JCT
2	3CG180	0.7	0.1	220	4	0.8	1	1	80~250	10	20	-	JCT
3	3CK2E	0.3	0.05	35	5	0.3	0.9	0.1	50~150	1	10	-	JCT
4	2N2907A	0.5	0.6	60	5	0.4	0.6～1.3	0.05	100~300	10	150	-	JCT
5	2SA1152	0.6	0.3	80	4	0.6	-	5	100~160	5	50	-	JCT
6	3CK110	0.3	0.05	45	4	0.3	0.95	0.2	60~100	3	30	-	JCT
7	3CA783	5	0.6	80	5	0.4	-	10	80~120	5	100	-	JCT
8	3CK5F	5	1.5	75	6	0.8	-	30	130~160	5	100	-	JCT
9	3CG317	0.7	0.3	180	4	1	-	1	80~200	5	60	-	JCT
10	3CG110C	0.3	0.05	45	4	0.5	-	0.1	80~130	10	10	-	JCT

Rad-hard PNP Bipolar Transistors



INTRODUCTION:

Radiation Hardened PNP bipolar transistor is a branch of bipolar transistor.The anti-irradiation performance of the device is significantly better than that of the normal PNP bipolar tube by adopting radiation Hardened design reinforcement and process addition.

FUNCTION:

The bipolar transistor has four operating regions: forward amplification region,reverse amplification region,saturation region and cut-off region. The device bias can realize amplification, oscillation,switching and other functions under different operating conditions.

FEATURES:

Bipolar transistor is a current control device with low input impedance; There are two kinds of carriers participating in the conduction process, and the driving ability is strong; It can be used to amplify weak signals and switch without contact. It has a series of unique advantages, such as firm structure, long service life, small size and low power consumption. Radiation Hardened PNP bipolar transistor, with power range of 0.5W to 30W, has the characteristics of small leakage, low saturation voltage, and strong radiation resistance. The irradiation resistance can meet the total dose of 100krad (Si) (the first 30k dose rate is 0.01rad (Si)/s, and the last 70k dose rate is 0.1rad (Si)/s).

QUALITY CONTROL:

Grade: YB, YC, JCT

Specification:

GJB33 *General Specification for Discrete Semiconductor Devices*

Q/QJA20104A-2017 *General Specification for Aerospace Semiconductor Devices*

APPLICATIONS:

It is widely used in aerospace, aviation, ships and other fields. It is often used to form amplifier circuit, or drive loudspeaker, motor and other equipment.

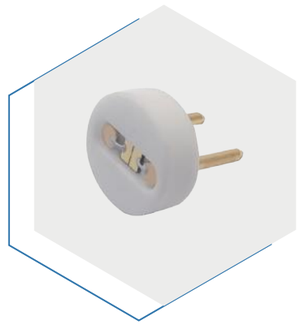
Approved Products

NO.	Part Number	P_{tot}(W)	I_{CM}(A)	V_{CEO}(V)	V_{EBO}(V)	$V_{CE(sat)}$(V)	$V_{BE(sat)}$(V)	I_{CEO}(μA)	h_{FE}	V_{CE}(V)	I_C(mA)	Package	Quality Grade	Industry Counterpart
1	L2N2907AUB	0.5	0.6	60	5	1.6	2.6	0.05	100~300	10	150	UB	J, YB, YC, JCT	2N2907AUB
2	3CK3868	1	3	60	4	1.5	2	1	30~150	2	1500	TO -39a	YB, YC, JCT	2N3868
3	2SB596	30	4	80	5	0.8	-	0.5	100~160	5	50	-	JCT	/
4	3CK3F	0.5	0.2	35	5	0.5	1.1	0.5	90~150	1	50	-	JCT	/
5	3CA4931	1	0.2	250	5	1.2	1.2	-	50~200	10	30	TO -39a	YB, YC, JCT	2N4931
6	3CK5415	0.75	1	200	6	2	-	50	30~120	10	50	TO -39a	YB, YC, JCT	2N5415

Under-researched Products

1	3CG3637UB	1	1	175	5	0.6	0.9	10	100~300	10	50	UB	YB, YC, JCT	2N3637
2	3CG3810	0.35	0.05	60	5	0.25	0.8	0.01	>250	5	10	LCC6	YB, YC, JCT	2N3810
3	3CG130	0.7	0.3	20~75	-	0.6	1	0.1	-	-	-	SMD-0.2	YB, YC, JCT	2N3637
4	3CK2905	0.8	0.6	60		0.2	0.8		20~450	-	-	SMD-0.2	YB, YC, JCT	2N2905

Semiconductor Bridge Pyrotechnics



INTRODUCTION:

Semiconductor bridge initiating explosive device (SCB) is an initiating explosive device that uses microelectronic manufacturing technology to deposit doped polysilicon film on the bottom of the silicon village to form a semiconductor film as the ignition and detonation unit. Customized design can be carried out according to different resistance requirements of users.

FUNCTION:

The working principle of semiconductor bridge initiating explosive device (SCB) is that when the pulse current is applied, the silicon bridge material will vaporize rapidly due to joule heat and form a high temperature weak plasma discharge under the action of the electric field. The plasma will rapidly diffuse into the charge, making it heated to the ignition point and ignite. The device uses the mechanism of convection to ignite the powder, so it has the characteristics of rapid action.

FEATURES:

Semiconductor bridge pyrogenic products are small in size, low ignition energy required, good safety, SCB has negative resistance effect, fast action time, high prompt degree, excellent non-ignition performance, anti-RF, anti-static and anti-stray current ability; SCB uses a combination of microelectronics manufacturing processes and digital logic circuits. Xian Institute of Microelectronics Technology semiconductor bridge explosive products, on-resistance is 0.93Ω~1.07Ω, safety current is 1A, the product is widely used in the field of aerospace, reliable quality, can be used in other fields.

QUALITY CONTROL:

Grade: JCT

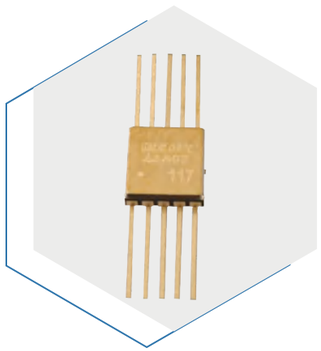
APPLICATIONS:

It is widely used in aerospace, aviation, weapons and other fields, and can be specifically applied to the ignition of digital intelligent weapons and ammunition, ballistic correction and civil building blasting.

Approved Products

NO.	Part Number	R_{on} (Ω)	I(A)	Package
1	HgQB-11/1-10	0.93～1.07	1	Special Ceramic Packaging
2	HgQB-11-1/21-0	0.93～1.07	1	Special Ceramic Packaging
3	DJS-01	0.99～1.17	1	Special Ceramic Packaging

AD/DA Converters



INTRODUCTION:

There are currently 4 AD/DA products that provide high-precision conversion between digital and analog signals.They include DA products with 8-bit and 12-bit resolutions,as well as ADproduct with 12-bit resolution.

QUALITY CONTROL:

Quality Grade: B

General Specifications:

GJB 597-2012 *General Specification for Semiconductor Integrated Circuits*

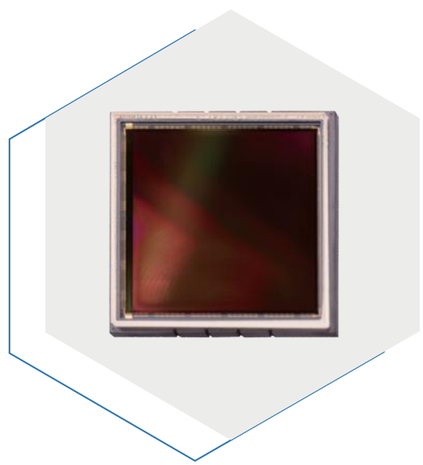
APPLICATIONS:

Satellite attitude and orbit control,voltage monitoring,waveform encoding,broadband communication,and spectral analysis.

Approved Products

NO.	Name	Part Number	Mark on the Case	Key Features	Package	Quality Grade	Aerospace Application	Industry Counterpart
1	8-bit 8-channel D/A conwerter	LDA8803	LDA8803COC	(1) Voltage: 5V; (2) Resolution: 8-bit; (3) Clock frequency: 33MHz; (4) DNL≤±1LSB at three temperatures; (5) INL≤±1 .5LSB at three temperatures; (6) Flatness error ±0 .5LSB at three temperatures	CSOP16EB	B		AD8803
2	Radiation-hardened 12-bit voltage output DAC	LDA1201-RH	LDA1201-RHBRFC	(1) Voltage: 5V; (2) Resolution: 12-bit; (3) Input clock: 20MHz (max); (4) Output setup time: 15us (max); (5) Zero code error: 15mV (max, IOUT=0); (6) Full scale error: -1%FSR (min, IOUT=0); (7) TID≥100krad(Si) (8) SEL≥37.5MeV·cm²/mg; (9) SEU≥37.5MeV·cm²/mg;	FP10P	B	YES	DAC12121S101QML-SP
3	12-bit 8-channel A/D conwerter	LAD1312-CH	LAD1312-CHB-QC	(1) Analog voltage input range: ±10V; (2) Data throughput: 1075ksps (single-channel operation); (3) Number of input signal channels: 8 channels; (4) Resolution: 12-bit; (5) Clock frequency: up to 20MHz (max); (6) Voltage:analog 5V ,digital3V (Typical value); (7) DNL:-1~+1lsb;/INL:-3~+3lsb;	LCQFP48L	N1		MAX1312ECM+
4	12-bit voltage output DAC	LDA1201-CH	LDA1201-CHB-FC	(1) Voltage: 5V; (2) Resolution: 12-bit; (3) Input clock: 20MHz (max); (4) Output setup time: 15us (max); (5) Zero code error: 15mV (max, IOUT=0); (6) Full scale error: -1%FSR (min, IOUT=0);	FP10P	B		DAC12121S101QML-SP

CMOS Image Sensor



INTRODUCTION:

Currently, there are 5 types of CMOS image sensor products available, with pixel array sizes ranging from 752x488 to 15360x15360, covering from hundreds of millions to hundreds of billions of pixels. The pixel size ranges from 3.75 μm x 3.75μm to 7.5μm x 7.5μm. These CMOS image sensors are available in both mono-chrome and color options.They support global and rolling shutter modes and feature on-chip black level correction, sub-sampling, window-ing, and pixel binning functions.

QUALITY CONTROL:

Grade: C1, C2

General Specifications:

GJB 5968-2007 *General Specifications for Optical Devices with Circuit Coupling*

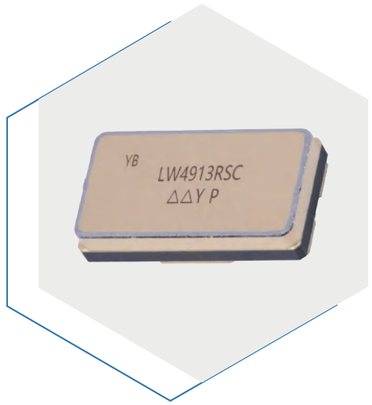
APPLICATIONS:

Surveillance cameras,star trackers,envirronmental assessment image acquisition,etc.

Approved Products

NO.	Name	Part Number	Mark on the Case	Key Features	Package	Quality Grade	Aerospace Application
1	Back-illuminated high dynamic range,highprecision, radiation-hardened image sensor	LCIS7P5M	LCIS7P5M C1RGC	(1) Array size 2560×3072; (2) Pixel size 7.5μ m ×7.5μ m; (3) Dynamic range≥50dB; (4) Full well capacity 80ke-; (5) Dark current 30pA/cm2@25℃; (6) MTF≥0.45; (7) Radiation resistance specifications: TID≥50krad(Si); SEL≥37.5MeV·cm²/mg.	PGA288A	C1	yes
2	Back-illuminated high dynamic range,highprecision, radiation-hardened image sensor	LCIS225M	LCIS225M C1 RGC	(1) Array size 15360×15360; (2) Pixel size 7.5μ m×7.5μ m; (3) Dynamic range≥50dB; (4) Full well capacity 80ke-; (5) Dark current 30pA/cm2 @25℃; (6) MTF≥0.45; (7) Radiation resistance specifications: TID≥50krad(Si).	PGA1284	C1	yes
3	High-sensitivity CMOS image sensor	LCIS185	LCIS185C2-CBB	(1) Array size 1945×1225; (2) Pixel size 3.75μm ×3.75 μ m; (3) Frame rate 60fps@1080p.12bit/ 120fps@1080p.10bit; (4) Full well capacity 14ke-; (5) Dynamic range≥60dB;	BGA128	C2	
4	High-speed CMOS image sensor	LCIS4K	LCIS4K-DC	(1) Array size1×4,096(7μ m pixel); 1×2,048 (14 μ m pixel); (2) Pixel size 7μ m ×7μ m ,14μ m×14μ m; (3) Maximum line frequency: ≤18180lps (4K resdution); 32810lsp(2K);54850lps(1K); 82400lps(0.5K);	DIP40	C2	
5	Glbal Shutter CMOS Visible Light Image Sensor	LCIS4000P	LCIS4000PC2-GC	(1) Array size:2048(H) ×2048(V); Pixel sire: 5.5μm×5.5μm; (2) Full well capacity >8.5ke-; (3) Readout noise:9e-@10bit,8.3e-@12bit; (4) Exposure mode:Global; AD bit depth:10/12-bit (5) Frame rate:180 fps@10-bit,37fps@12bit;	PGA95D	C2	

Linear Regulators



INTRODUCTION:

The linear regulators include the Low Dropout Regulators(LDO) and 3-terminal voltage regulators.According to the application environment,It can be divided into the Rad-hard and the general series. According to the input voltage range, the high voltage series can reach to 35V~40V ,such as the W78XX,79XX; the middle voltage series are the LW4913/LW7913 serial product, the range of their input voltage is 2.5V~12V; the low voltage series are the LPS serial product, the range of their input voltage is 2.5V~6V.The output voltage range can reach to 1.22V~18V.The max current ability is 7.5A.

FUNCTION:

Offers a constant voltage for the load, simultaneity,have the EN-control,OVP,OCP,OTP features.

FEATURES:

The W78XX, 79XX series, based on the regular HV bipolar process, have wide input voltage range.The LW4913/LW7913 is a high performance Rad-hard voltage regulator family. Available in various hermetic ceramic packages, it is specifically intended for space and harsh radiation environments. The LPS family based the BiCMOS process is designed to provide a complete power management solution for DSP, processor power, ASIC, FPGA, and digital applications. Differentiated features, such as accuracy, fast transient response, SVS supervisory circuit (power-on reset) manual reset inputs, and enable function, provide a complete system solution.

QUALITY CONTROL:

Grade: YB, YC, B, G

Specification: Q/QJA20084A-2017 *General Specification of Semiconductor Integrated Circuits for Space Application*

Standard Requirements for Electronic Components in Aerospace Unique Project

GJB597B-2012 *General for Semiconductor Integrated Circuits*

QZJ840615 *General Specification for Semiconductor Integrated Circuits*

7-zhuan Technical Requirements for Semiconductor Analog Integrated Circuits

APPLICATIONS:

Constant voltage source and secondary power supply for electrical system.

Approved Products

NO.	Part Number	V_{IN} Range (V)	V_{OUT} Range (V)	MAX Output Current (A)	EN Pin	Rad-hard (rad(Si))	SEL (MeV•cm²/mg)	Package	Quality Grade	Industry Counterpart
1	LPS70302 DUAL-OUTPUT, ADJUSTABLE , LOW DROPOUT VOLTAGE REGULATORS	V_{IN1}: 2.8～5.0 V_{IN2}: 2.8～5.0	V_{OUT1}: V_{REF}～4.0 V_{OUT2}: V_{REF}～4.0	LDO1:1.0 LDO2:2.0	Y	—	—	CSOP24K	YB，YC，B/K+，B，G	TPS70302
2	LPS70345 DUAL-OUTPUT, LOW DROPOUT VOLTAGE REGULATOR	V_{IN1}: 4.3～5.0 V_{IN2}: 2.7～5.0	V_{OUT1}:3.3 V_{OUT2}:1.2	LDO1:1.0 LDO2:2.0	Y	—	—	CSOP24G	B/K，B，G	TPS70345
3	LPS75318 FAST-TRANSIENT-RESPONSE 1.5-A LOW-DROPOUT VOLTAGE REGULATORS	2.8～5.5	1.8	1.5	Y	—	—	CSOP18A	B/K，G	TPS75318
4	LPS75333 FAST-TRANSIENT-RESPONSE 1.5-A LOW-DROPOUT VOLTAGE REGULATORS	4.3～5.5	3.3	1.5	Y	—	—	CSOP18A	B/K，G	TPS75333
5	LW2941 RAD-HARD LOW DROPOUT VOLTAGE REGULATOR	7～26	5～20	1	Y	100k	—	CSOP16	YB，YC，B	LM2941
6	LW4913 RAD-HARD ADJUSTABLE POSITIVE VOLTAGE REGULATOR	3～12	1.23～9	3	Y	100k	75	SM147A	YB，YC，B	RHFL4913SCA-07V
7	LW7913A RAD-HARD ADJUSTABLE NEGTIVE VOLTAGE REGULATOR	V_{INH}=0，-12～-3.7	(-1.22~-9)	3	Y	100k	75	SM147	YB，YC	RHFL7913SCA-03V
8	LPS73HD318 DUAL-OUTPUT LOW-DROPOUT VOLTAGE REGULATORS	V_{IN1}: 4.3～8.0 V_{IN2}: 3.5～8.0	V_{OUT1}:3.3 V_{OUT2}:1.8	LDO1:0.75 LDO2:0.75	Y	—	—	CSOP28K	B/K+	TPS73HD318
9	LPS79118 ULTRALOW NOISE , HIGH PSRR , 1.5-A LOW-DROPOUT VOLTAGE	2.8～5.5	1.8	0.1	Y	—	—	LCC05	B	TPS79118
10	LW2941 RAD-HARD LOW DROPOUT VOLTAGE REGULATOR	7～26	5～20	1	Y	100k	—	TO-253-5-TS	H	LM2941
11	LW6000 RAD-HARD ADJUSTABLE POSITIVE VOLTAGE REGULATOR	2.5～12	1.24～9	2	Y	100k	75	QF0710-16	YB，YC，B	RHFL6000A
12	LW4913-1.5RTC RAD-HARD POSITIVE VOLTAGE REGULATOR	3～12	1.5	3	N	100k	75	TO-257	YB，YC，B	RHFL4913ESY15-03V
13	LW4913-2.5RTC RAD-HARD POSITIVE VOLTAGE REGULATOR	2.5+V_D～12	2.5	3	N	100k	75	TO-257	YB，YC，B	RHFL4913ESY25-03V
14	LW4913-3.3RTC RAD-HARD POSITIVE VOLTAGE REGULATOR	3.3+V_D～12	3.3	3	N	100k	75	TO-257	YB，YC，B	RHFL4913ESY33-03V
15	LW4913-5.0RTC RAD-HARD POSITIVE VOLTAGE REGULATO	5.0+V_D～12	5	3	N	100k	75	TO-257	YB，YC，B	RHFL4913ESY50-03V
16	LW4913-1.5RSC RAD-HARD POSITIVE VOLTAGE REGULATOR	3～12	1.5	3	N	100k	75	SM19G	YB，YC，B	RHFL4913S15-03V

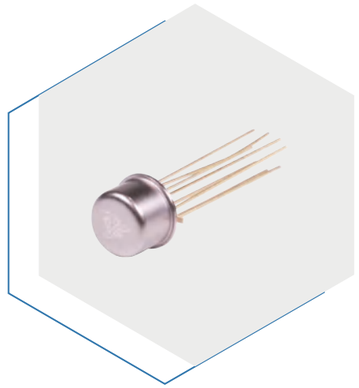
Approved Products

NO.	Part Number	V_{IN} Range (V)	V_{OUT} Range (V)	MAX Output Current (A)	EN Pin	Rad-hard (rad(Si))	SEL (MeV•cm²/mg)	Package	Quality Grade	Industry Counterpart
17	LW4913-2.5RSC RAD-HARD POSITIVE VOLTAGE REGULATOR	2.5+V_D～12	2.5	3	N	100k	75	SM19G	YB，YC，B	RHFL4913S25-03V
18	LW4913-3.3RSC RAD-HARD POSITIVE VOLTAGE REGULATOR	3.3+V_D～12	3.3	3	N	100k	75	SM19G	YB，YC，B	RHFL4913S33-03V
19	LW4913-5.0BRSC RAD-HARD POSITIVE VOLTAGE REGULATOR	5.0+V_D～12	5	3	N	100k	75	SM19G	YB，YC，B	RHFL4913S50-03V
20	LS883-CH Low I_Q，Low Dropout Linear Regulators	6～9	FIXED：5 or ADJUSTABLE：1.25~8.5	0.2	Y	30k	75	DIP08	YB，YC	MAX883
21	LS883-CN Low I_Q，Low Dropout Linear Regulators	6～11.5	FIXED：5 or ADJUSTABLE：1.25~8.5	0.2	Y	-	-	DIP08	B	MAX883

Under-researched Products

NO.	Part Number	V_{IN} Range (V)	V_{OUT} Range (V)	MAX Output Current (A)	EN Pin	Rad-hard (rad(Si))	SEL (MeV•cm²/mg)	Package	Quality Grade	Industry Counterpart
1	LP1706-3.3 LOW DROPOUT VOLTAGE REGULATOR	4.3～5.5	3.3	1	Y	-	-	CSOP8	B	ADP1706ARDZ-3.3
2	LPS79601 LOW DROPOUT VOLTAGE REGULATOR	2.7～5.5	1.2～V_{IN}-V_D	1	Y	-	-	LCC08BA	B	TPS79601
3	LP1708 LOW DROPOUT VOLTAGE REGULATOR	2.5～5.5	0.8～5	1	Y	-	-	CSOP8	B	ADP1708
4	L1592	3～6	0.8～V_{IN}-V_D	3	Y	-	-	CSOP08	B	SC1592
5	LM7150	4.5～16	3.3	0.8	Y	100K	75	D08S2	B	ADM7150

Other Power Management Circuits



INTRODUCTION:

The family includes supervisory circuits,timer, F/V converter and some other special function circuit.

APPLICATIONS:

Supervisory circuits, timer, F/V converter and some other special application environment.

QUALITY CONTROL:

Grade: YB, YC, B, G

Specification:

Q/QJA20084A-2017 *General Specification of Semiconductor Integrated Circuits for Space Application*

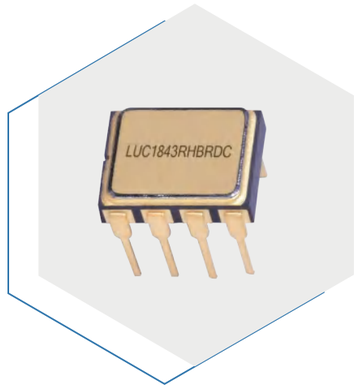
GJB597B-2012 *General for Semiconductor Integrated Circuits*

QZJ840615 *7-zhuan Technical Requirements for Semiconductor Analog Integrated Circuits*

Approved Products

NO.	Part Number	VIN Range (V)	Rad-hard (rad(Si))	Package	Quality Grade	Space Application	Industry Counterpart
1	J555 Timer	5～15	50k	T08A4, D08S2	YB, YC, B, G	Y	LM555 SE555
2	LZ2917F -V convertor	9～28	50k	D14S2	YB, YC, G	Y	LM2917
3	M51957B Voltage Detecting, System Reseting IC	2～17	-	D08S2	B	N	M51957B
4	MC3425 Power supply Supervisor/ OV and UV protection Circuit	4.5～40	-	D08S2	G	N	MC3425
5	LSR706T Supervisory Circuits	-0.3～6.0	-	D08S2	B	N	MAX706T

PWM Controllers



FEATURES:

The supply voltage range is from 8V to 35V,and the range of peak output current is 400mA～2A.

QUALITY CONTROL:

Grade: YB, YC, B

Specification:

Q/QJA20084A-2017 *General Specification of Semiconductor Integrated Circuits for Space Application*

GJB597B-2012 *General for Semiconductor Integrated Circuits*

INTRODUCTION:

The PWM series circuits which fabricated by bipolar/bipolar anti-radiation process,is mainly uesd in switch DC/DC converter.The output voltage of the DC/DC system can be adjusted and controlled by changing the on-duty ratio of the power switch tube.It has obvious advantages such as low temperature drift,high reference voltage accuracy,fast response of the system and flexible and convenient use of external pins.

FUNCTION:

The PWM series include LUC1843, LUC1843RH, LUC1843A, LUC1825, LUC1825A, LUC1875, LUC1901,and their functions cover commonly used voltage/current mode systems with the capability for input voltage feed-forward,phase shift resonant controller,isolated feedback generator. Typical PWM circuits include Under-Voltage Lockout with Hysteresis,trimmed bandgap reference,RC oscillator, error amplifier,PWM comparator ,current limit comparator,soft-start up function ,high current dual totem pole outputs.

APPLICATIONS:

The PWM circuits is mainly used in switching DC-DC converters,among which LUC1875 is mainly used in phase-shifting full-bridge circuits.

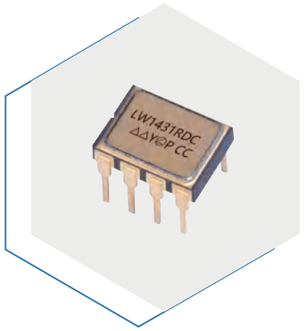
Approved Products

NO.	Device Name	Part Number	Output Channel	Voltage Mode/Current Mode	Supply Voltage Range (V)	MAX Output DC Current (mA)	MAX Output peak Current (A)	Switching Frequencies (kHz)	Maximum Duty Cycle	UVLO	Soft Start	Package	Quality Grade	Industry Counterpart
1	PWM Controller	LUC1843RH	single	Voltage Mode/Current Mode	12～25	200	1	≤500	≥95%	Yes	No	D08S2	B	UC1843
2	Isolated Feedback Generator	LUC1901RH	differential output	-	10～35	35	-	≤3500	fixed 50%	Yes	No	C20P3	YB, YC	UC1901
3	PWM Controller	LUC1845	single	Voltage Mode/Current Mode	12～25	200	1	≤500	46%～50%	Yes	No	D08S2	B	UC1845
4	PWM Controller	LUC1843A	single	Voltage Mode/Current Mode	12～25	200	1	≤500	≥94%	Yes	No	D08S2 LCC20	YB, YC	UC1843A
5	Phase Shift Resonant Controller	LUC1875	two output pair	Voltage Mode/Current Mode	11～20	500	2	≤2000	-	Yes	Yes	D20S2	YB, YC	UC1875
6	High Speed PWM Controller	LEC201 /LUC1825	Dual Totem Pole Outputs	Voltage Mode/Current Mode	10～30	500	1.5	≤1000	≥80% (A+B)	Yes	Yes	D16S2 C20P3	YB, YC	UC1825

Under-researched Products

1	Rad-hard High Speed PWM Controller	LUC1825A	Dual Totem Pole Outputs	Voltage Mode/Current Mode	12～20	500	2	≤1000	≥85% (A+B)	Yes	Yes	D16S2 C20P3	B	UC1825A
2	Rad-hard PWM Controller	LUC1845A	single	Voltage Mode/Current Mode	12～25	200	1	≤500	46%～50%	Yes	No	D08S2	B	UC1845A

Voltage References



FEATURES:

Wide supply voltage:5V～30V
Trimmed initial accuracy
Trimmed temperature coefficient
Endure 100krad (Si) @ 0.1 rad (Si)/s

QUALITY CONTROL:

Grade: YB, YC, B
Specification:
Q/QJA20084A-2017 *General Specification of Semiconductor Integrated Circuits for Space Application*
GJB597B-2012 *General for Semiconductor Integrated Circuits*

INTRODUCTION:

The Voltage references are fabricated on the high voltage bipolar process, which enables the thin film resistor. The Voltage references feature low temperature coefficient, precise initial accuracy, low noise and excellent long-term stability for a wide variety of applications.

FUNCTION:

The products of XMTI include series and shunt voltage references. The voltage references are low temperature coefficient, precise initial accuracy, low noise and excellent long-term stability for a wide variety of applications, such as data conversion and signal conditioning. The voltage references are also commonly used as voltage monitors, current limiters and program-mable sources.

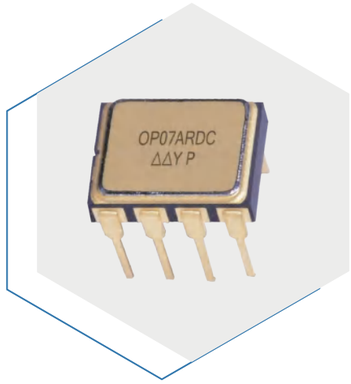
APPLICATIONS:

We offer the shunt voltage references for use in precision signal chain and optocoupler flyback converter applications. The series are also commonly used as voltage monitors, current limiters and programmable sources.

Approved Products

NO.	Part Number	Input Voltage (V)	Output Voltage (V)	Output Voltage Tolerance (%)	Output Voltage Temperature Coefficient (ppm/℃)	Output Current (mA)	Quiescent Current (mA)	Load Regulation (%/mA)	Package	Quality Grade	Industry Counterpart
1	LT431 Programmable Voltage Reference	2.5～36	2.5	-1～1.6	⩽122.2	⩾100	⩽1	⩽0.016	D08S2	B, G	TL431
2	LW1431 Programmable Voltage Reference	2.5～36	2.5	⩽1	⩽122.2	⩾100	⩽1	⩽0.016	D08S2	YB, YC	TL1431
3	L580T High Precision, 2.5V Voltage Reference	4.5～30	2.5	⩽0.4	⩽24.44	⩾10	⩽2	⩽0.04	TO-46、CSOP08	YB, YC, B	AD580TH
4	L584T Pin Programmable Precision Voltage Reference	4.5～30 (⩾Vout + 2V)	10 7.5 5 2.5	⩽0.1 ⩽0.107 ⩽0.12 ⩽0.14	⩽15 ⩽15 ⩽15 ⩽20	⩾10	⩽1	⩽0.005	T08A4	YB, YC, B	AD584SH
5	L584-5.0 High Precision, 5.0V Voltage Reference	7.5～30	5	⩽±0.2	⩽15	⩾10	⩽1	⩽0.005	CSOP08	B	-
6	L581T High Precision, 10V Voltage Reference	13～30	10	⩽±0.1	⩽15	⩾10	⩽1	⩽0.005	CSOP08、B3D	B	AD581TH

Operational Amplifiers (Op Amps)



INTRODUCTION:

The operational amplifier (op amps) is an important part of any analog signal chain, often working as a crucial part of the interface between sensors and our world-leading ADCs. Common analog op amps functions include gain, buffering, filtering, and level-shifting.

FUNCTION:

The operational amplifier (op amps) is an important part of any analog signal chain, often working as a crucial part of the interface between sensors and our world-leading ADCs. Common analog op amps functions include gain, buffering, filtering, and level-shifting. The op amps of XMTI are fabricated on the high voltage bipolar process, including general purpose with dual power supplies op amps, general purpose with single power supply op amps, high input - impedance (P-JFET input) op amps, precision Rail-to-Rail input and output op amps, high precision and low noise op amps, radiation hardened amplifiers.

FEATURES:

Wide supply voltage:5V～30V, ±2.5V～±15V
Low offset voltage: 25μV (precision type), 1mV (general type)
Low input bias current: 75pA (P-JFET input), 2nA (precision type)
Low Noise: 3nV/√Hz
Single, Dual, and Quad Versions
Endure 100krad (Si) @ 0.1 rad (Si)/s
Applied in many Chinese satellites

APPLICATIONS:

Common analog op amps functions include gain, buffering, filtering, and level-shifting.

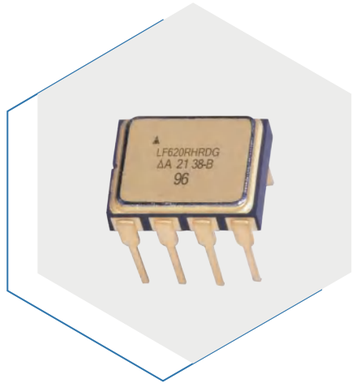
QUALITY CONTROL:

Grade: YB, YC, B, G
Specification:
Q/QJA20084A-2017 *General Specification of Semiconductor Integrated Circuits for Space Application*
Standard Requirements for Electronic Components in Aerospace Unique Project
GJB597B-2012 *General for Semiconductor Integrated Circuits*
QZJ840615 *7-zhuan Technical Requirements for Semiconductor Analog Integrated Circuits*

Approved Products

NO.	Device Type	Part Number	Channels	Supply Voltage (V)	Vos MAX (μV)	IB MAX (nA)	Gain Bandwidth Product (MHz)	Slew Rate (V/μs)	Supply Current (mA)	Package	Quality Grade	Industry Counterpart
1	General Purpose with single power supply Op Amps	F158A Low Power Dual Operational Amplifiers	2	5～30（Single） ±2.5～±15 (Split)	⩽±4000	-100～-1	1	0.25(Typ)	⩽4	D08S2, FP08	YB，YC	LM158A
		F158 Low Power Dual Operational Amplifiers	2	5～30（Single） ±2.5～±15 (Split)	⩽±7000	-300～-1	1	0.25(Typ)	⩽4	D08S2, CSOP08, T08A4	B，G	LM158
		LF33072 Single Supply Dual Operational Amplifiers	2	5～40（Single） ±2.5～±20 (Split)	⩽±3000	⩽-500	⩾3.5	⩾8	⩽4	CSOP08	B	MC33072D
		LF124A Low Power Quad Operational Amplifiers	4	5～32（Single） ±2.5～±16 (Split)	⩽±4000	-100～-0.1	1(Typ)	⩾0.1	⩽4	D14S2, CSOP14, FP14	YB，YC	LM124
		F124 Low Power Quad Operational Amplifiers	4	5～32（Single） ±2.5～±16 (Split)	⩽±7000	⩾-300	1(Typ)	⩾0.1	⩽3	D14S2, CSOP14, FP14	B，G	LM124
2	General Purpose with dual power supply Op Amps	LF148 Quad Operational Amplifiers	4	±5～±20	⩽±6000	⩽±325	0.4～1.4	⩾0.2	⩽4.5	LCC20, D14S2	YB，YC, B	LM148
3	P-JFET Input Op Amps	OP282 Low Power, High Speed P-JFET Dual Operational Amplifiers	2	±4.5～±15	⩽±4500	⩽±0.5	⩾3	⩾7	⩽0.5	SOP8	N1	OP282GS
		OP482 Low Power, High Speed P-JFET Quad Operational Amplifiers	4	±4.5～±15	⩽±6000	⩽±0.5	⩾3	⩾7	⩽1	SOP14	N1	OP482GS
4	high precision and low noise Op Amps	OP07 Ultralow Offset Voltage Operational Amplifier	1	±4.5～±20	⩽±200	⩽±4	0.65(Typ)	⩾0.08	⩽5	D08S2, T08A4, CSOP08	YB，YC	OP07
		OP07A Ultralow Offset Voltage Operational Amplifier	1	±4.5～±20	⩽±60	⩽±4	0.65(Typ)	⩾0.08	⩽5	D08S2, T08A4, CSOP08	YB，YC	OP07
		OP27 Low Noise Precicion Operational Amplifier	1	±5～±18	⩽±200	⩽±95	⩾5	⩾1.7	⩽4.67	T08A4, D08S2, CSOP08	B，G	OP27A
		OP27A Low Noise Precicion Operational Amplifier	1	±5～±18	⩽±60	⩽±60	⩾5	⩾1.7	⩽4.67	T08A4, D08S2, CSOP08	YB，YC, B，G	OP27A
		F108A Precision Operational Amplifier	1	±5～±18	⩽±1000	-1.0～3	0.4(Cf=30p) 3(Cf=3p)	⩾0.05	⩽0.8	T08A4, D08S2, CSOP08	YB，YC	LM108A
		LF270A Dual Very Low Noise Precision Operational Amplifier	2	±18	⩽±175	⩽±60	⩾2	⩾1.7	⩽7.5	D08S2, CSOP08	YB，YC, B，G	OP270A
		LF470 Very Low Noise Quad Operational Amplifier	4	±18	⩽±600	⩽±50	⩾3	⩾1.4	⩽11	D14S2, CSOP16, CSOP14	YB，YC, B	OP470
		LF2228 High Precision, Low Noise Operational Amplifiers	2	±18	⩽±200	⩽±10	⩾11	—	⩽8.4	CSOP08	B	OPA2228U
		LF97 Low Power, High Precision Operational Amplifier	1	±20	⩽±200	⩽±0.75	⩾0.4	⩾0.05	⩽0.8	CSOP08	B	OP97
		LF497 Precision Picoampere Input Current Quad Operational Amplifiers	4	±15	⩽±300	⩽±0.6	⩾0.3	⩾0.05	⩽3	SOP16	N1	OP497
		LF1037 LF1037RH Low Noise, Precision, High Speed Operational Amplifier (A_{VCL}> 5)	1	±15	⩽±300	⩽±150	63(Typ)	⩾11	⩽4.67	D08S2, T08A4, FP08	B	OP37
		LF200 LF200RH Dual Low Offset, Low Power Operational Amplifiers	2	±15	⩽±125	⩽±5	0.5(Typ)	⩾0.1	⩽1.5	D08S2, CSOP08	B	OP200
5	Rail to Rail Input and Output Op Amps	LF484RH Precision Rail-to-Rail Input and Output Operational Amplifiers	4	18	⩽±700	⩽±100	⩾6	⩾2	⩽11.6	FP14	YB，YC	RHF484
		LFA484RH Precision Rail-to-Rail Input and Output Operational Amplifiers	4	±1.5～±15	⩽±200	⩽±450	⩾1	⩾2.4	⩽8	D14S2, FP14	YB，YC	OP484
6	Low Total Harmonic Distortion Op Amps	LF833M Dual Audio Operational Amplifiers	2	±18	⩽8000	⩽-1400	⩾10	⩾5	⩽9	CSOP08	B	LM833M

Instrumentation Amplifiers



INTRODUCTION:

Instrumentation amplifiers are precision gain blocks that have a differential input and an output that may be differential or signle-ended with respect to a reference terminal. These devices amplify the difference between two input signals voltages while rejecting any signals that are common to both inputs.These devices of XMTI are fabricated on the high voltage bipolar process, which enables the thin film resistor.

FUNCTION:

The instrumentation amplifiers are high accuracy which requires only one external resistor to set gains of 1 to 10,000.The products are ideal for use in precision data acquisition systems with its high accuracy of nonlinearity,low offset voltage,and offset drift.Furthermore,the low noise,low input bias current and low power of the devices make it well suited for medical applications.

FEATURES:

Gain set with one external resistor (Gain range 1 to 10,000)
Wide power supply range (±2.3 V to ±18 V)
Higher performance than 3 op amp IA designs
Excellent dc performance
125 μV max, input offset voltage
1 μV/°C max, input offset drift
2.0 nA max, input bias current
93 dB min common-mode rejection ratio (G = 10)
Low noise 9 nV/√Hz @ 1 kHz, input voltage noise and 0.28 μV p-p noise (0.1 Hz to 10 Hz)
Endure 100k rad (Si) @ 0.1 rad (Si)/s

APPLICATIONS:

The instrumentation amplifiers are widely used in many industrial process controls, transducer interface, measurement, data acquisition systems, and medical applicitions where dc precision and gain accuracy must be maintained within a noisy environment, and where large common-mode signals are present.

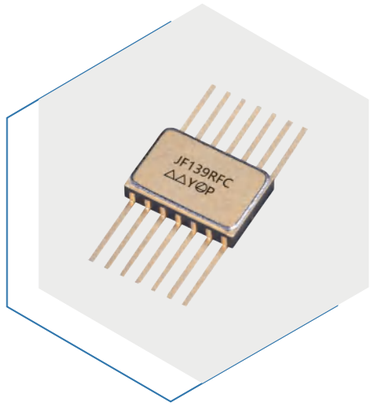
QUALITY CONTROL:

Grade: YB, YC, B
Specification:
Q/QJA20084A-2017*General Specification of Semiconductor Integrated Circuits for Space Application*
GJB597B-2012 *General for Semiconductor Integrated Circuits*

Approved Products

NO.	Part Number	Supply Voltage (V)	Input Offset Voltage (μV)	Input Bias Current (nA)	Gain Bandwidth Product (MHz)	Slew Rate (V/μs)	Quiescent Current (mA)	Gain Error (%)	Common-Mode Rejection Ratio (dB)	Package	Quality Grade	Industry Counterpart
1	LF620 Low Power Instrumentation Amplifier	±2.3～±18	⩽125	⩽2	1 (G=1, Typ)	⩾0.75	⩽1.3	⩽0.3(G=10)	⩾73(G=1)	D08S2 CSOP08	YB，YC, B	AD620SQ

Comparators



FEATURES:

Wide supply voltage range
Very low supply current drain— independent of supply voltage
Low input biasing current
Low input offset current
Low Offset voltage
Input common-mode voltage range includes GND
Output voltage compatible with TTL, DTL, ECL, MOS and CMOS logic systems
Single, Dual, and Quad Versions
Endure 100k rad (Si) @ 0.1 rad (Si)/s
Applied in many Chinese satellites

INTRODUCTION:

The comparator is an important part of analog signal chain, often working as level-shifting, threshold detection, and peak detection. The comparators of XMTI are fabricated on the high voltage bipolar process. These products are precision high speed comparators designed to operate over a wide range of supply voltages down to a single 5V logic supply and ground and have low input currents and high gains.The open collector of the output stage makes compatible with TTL as well as capable of driving lamps and relays at currents up to 25mA. Although designed primarily for applications requiring operation from digital logic supplies, the comparators are fully specified for power supplies up to ±15V.

FUNCTION:

The comparators of XMTI built on a bipolar process, including high-speed (response times as low as 100ns), high voltage (VCC up to 36V). Most of devices were designed specifically to operate from a single power supply over a wide range of voltages. Operation from split power supplies is also possible and the low power supply current drain is independent of the magnitude of the power supply voltage. Some comparators also have a unique characteristic in that the input common-mode voltage range includes ground, even though operated from a single power supply voltage.

QUALITY CONTROL:

Grade: YB, YC, B, G
Specification:
Q/QJA20084A-2017 *General Specification of Semiconductor Integrated Circuits for Space Application Standard Requirements for Electronic Components in Aerospace Unique Project*
GJB597B-2012 *General for Semiconductor Integrated Circuits*
QZJ840615 *7-zhuan Technical Requirements for Integrated Circuits Semiconductor Analog Integrated Circuits*

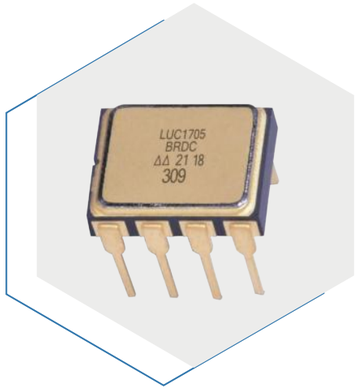
APPLICATIONS:

Application areas include limit comparators, simple analog todigital converters, pulse, squarewave and time delay generators, wide range VCO, MOS clock timers, multivibrators and high voltage digital logic gates.

Approved Products

NO.	Part Number	Channels	Supply Voltage (V)	Vos MAX (mV)	IB MA (nA)	Response Time (ns)	Voltage Gain (dB)	Icc (mA)	Iss (mA)	Package	Quality Grade	Industry Counterpart
1	LM311N Voltage Comparator	1	±15	⩽10	⩽300	⩽640	⩾92	⩽7.5	⩽5	D08S2	B, G	LM311N
2	LF119 High Speed Dual Comparators	2	5～30（Single）±2.5～±15（Split）	⩽6.8	⩽950	80 (Typ)	⩾80	⩽11.5	⩽6	D14S2, CSOP14	YC, YC, B, G	LM119JQMLV
3	JF139 Low Power Low Offset Voltage Quad Comparators	4	5～30（Single）±2.5～±15（Split）	⩽2	⩽300	⩽1300 (Typ)	⩾94	⩽2	-	D14S2, FP14A, CSOP14	YB, YC, B, G	LM139
4	J193 Low Power Dual Voltage Comparators	2	5～30	⩽5	⩽100	1300 (Typ)	⩾94	⩽2.5	-	D08S2, T08A4, CSOP08	B, G	LM193
5	J193A Low Power Dual Voltage Comparators	2	3～30	⩽2	⩽100	1300 (Typ)	⩾94	⩽2.5	-	D08S2	YB, YC	LM193A
6	LF111 Voltage Comparator	1	±15	⩽3	⩽100	⩽300	⩾80	⩽6	⩽5	D08S2, CSOP08, CSOP10	YB, YC, B	LM111
7	LF161 High Speed Differential Comparators	1	±5～±15	⩽3	⩽20000	⩽20	⩾60	⩽5	⩽10	D14S2	YB, YC	LM161

Drivers



INTRODUCTION:

It mainly includes power driver,Darlington driver,PIN diode driver,line driver and other general circuits with specific functions.

FEATURES:

Wide power supply voltage range and large driving current.

QUALITY CONTROL:

Grade: YB, YC, B, G

Specification:

Q/QJA20084A-2017 *General Specification of Semiconductor Integrated Circuits for Space Application*

Standard Requirements for Electronic Components of Aerospace Special Project

GJB597B-2012 *General for Semiconductor Integrated Circuits*

QZJ840615 *7-zhuan Technical Requirements for Semiconductor Analog Integrated Circuits*

SJ331-83 *General Technical Requirements for Semiconductor Integrated Circuits*

APPLICATIONS:

Driving MOSFET,PIN diode,Line-load and other applications.

Approved Products

NO.	Device Name	Part Name	Funcion Description	Power Supply Voltage (V)	Output Current (mA)	Input Voltage Range (V)	Quiescent Current (mA)	Package	Quality Grade	Industry Counterpart
1	Darlington Transistor Arrays	LT2003A	The LT2003A device is high-voltage, high-current Darlington transistor arrays, which consists of seven NPN Darlington pairs that feature high-voltage outputs with common-cathode clamp diodes for switching inductive loads.	⩽50	350	⩽30	-	CSOP16, D16S2	B, G	ULN2003A
2	Darlington Transistor Arrays	LT2004A	The LT2004A device is high-voltage, high-current Darlington transistor arrays, which consists of seven NPN Darlington pairs that feature high-voltage outputs with common-cathode clamp diodes for switching inductive loads.	⩽50	350	⩽30	-	D16S2	G	ULN2004A

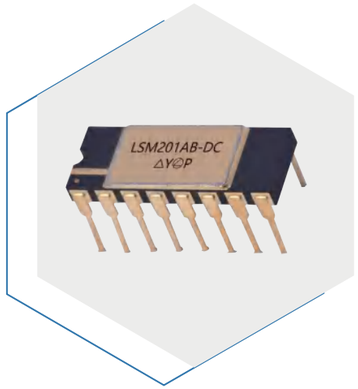
Approved Products

NO.	Device Name	Part Name	Funcion Description	Power Supply Voltage (V)	Output Current (mA)	Input Voltage Range (V)	Quiescent Current (mA)	Package	Quality Grade	Industry Counterpart
3	Quad-Driver	JLQ-22	JLQ-22 is a quad driver, which has independent 4 channel inverse output. JLQ-22 converts input signal which can be TTL or CMOS level, to inverse positive/negative pulse. Each positive/negative drive current up to 60mA.	V_{CC}=5 V_{EE}=-5	60	TTL or CMOS	±12.0	F14X2, FP14A	YB, YC	-
4	Quad-Independent Darlington array	KG25A	KG25A is a Quad-Independent Darlington array,which with large drive current, low saturation voltage drop, strong radio resistance, excellent electromagnetic compatibility etc.	5～15 (Current-limiting resistance Rc is necessary when DC supply-voltage larger than 5V)	200 (T_A⩽70℃) 150 (T_A⩽85℃) 100 (T_A⩽125℃)	V_{CC}-I_{CC}×R_C	-	D14S2	YB, YC, G	-
5	16-channel dual redundant emitter following output driver	KG36	The KG36 is a 16-channel dual redundant emitter following output drive circuit. Each channel through two input to control the output, so as to achieve the purpose of double redundant control.The input voltage of the circuit is compatible with TTL level,the power supply working voltage range is wide, the output terminal can withstand high voltage, the single output drive ability is strong.	10～36	200	TTL	7	CQFP64	B	-
6	Complementary Switch FET Drivers	LUC1715	The LUC1715 Radiation Hardening Complementary Switch FET Drivers is a high speed driver designed to provide drive waveforms for complementary switches. This device requires a PWM-type input to operate and can be interfaced with commonly available PWM controllers. The PWM pin is capable 2A of peak gate drive current, The AUX pin is capable 1A of peak gate drive current. The typical propagation delay of the device is only 60ns. The relative time delay between the two outputs can be assumed to be solely a function of the programmed delays.Complementary switch configurations commonly used in synchronous rectification circuits and active clamp/reset circuits, which can provide zero voltage switching.	7～18	100	TTL	25	FP16W	YB, YC	UC1715
7	High speed power drivers	LUC1705	The LUC1705 Radiation Hardening high speed power drivers is interface between low-level control functions and high-power switching device. Supply voltage of both Vs and Vc can independently range from 5V to 40V. This device is also an optimum choice for capacitive line drivers where up to 1.5A may be switched in either direction. With both inverting and non-inverting inputs available , logic signals of either polarity may be accepted or one input can be used to gate or strobe the other.	5～40	500	TTL	4	D08S2	B	UC1705

Under-researched Products

1	Rad-hard High Current FET Driver	LUC1710	The LUC1710 FET drivers is made with a high-speed Schottky process to interface between low-level control functions and very high-power switching devices-particularly power MOSFET’s. The device accept low-current digital inputs to activate a high-current, totem pole output which can source or sink a minimum of 6A.Supply voltages for both VIN and VC can independently range from 4.7V to 18V. These devices also feature under-voltage lockout with hysteresis.	10V～18V	100，6000peak	TTL	25	D08S2	B	UC1710
2	Rad-hardDual Non-Inverting Power Driver	LUC1708	The LUC1708 power drivers is made with a high-speed, highvoltage Schottky process to interface control functions and high-power switching devices – particularly power MOSFETs. Operating over a 5V to 35V supply range, these devices contain two independent channels.The A and B inputs are compatible with TTL and CMOS logic families,but can withstand input voltages as high as VIN. Each output can source or sink up to 3A as long as power dissipation limits are not exceeded.	10V～35V	500，3000peak	TTL	18	D08S2 D16S2	B	UC1708
3	Rad-hard Dual Channel Power Driver	LUC1707	The LUC1707 family of power drivers is made with a high-speed Schottky process to interface between low-level control functions and high-power switching devices - particularly power MOSFETs. These devices contain two independent channels, each of which can be activated by either a high or low input logic level signal. Each output can source or sink up to 1.5A as long as power dissipation limits are not exceeded.	5V～38V	500，3000peak	TTL	18	D16S2 C20P3	B	UC1707

Analog Switch



INTRODUCTION:

The analog switch is used to implement the transfermation of the signal controllable.

FUNCTION:

The analog switch is used to control the transfermation of the signal through the path.It adopts a pair of MOS transistor;the function is as a mechanical switch. Because of its low power consumption ,fast speed .no mechanical contact ,small size and long service life ,It is widely used in electronic control systems.

FEATURES:

These switches also feature high switching speeds, low RON， wide signal voltage range, and low leakage.

QUALITY CONTROL:

Device Class：B, G

Specifications:

GJB597B-2012 *General specifIcation for semiconductor integratedcircuits*

QZJ840615 *7-zhuan Technical Requirements for Semiconductor Analog Integrated Circuits*

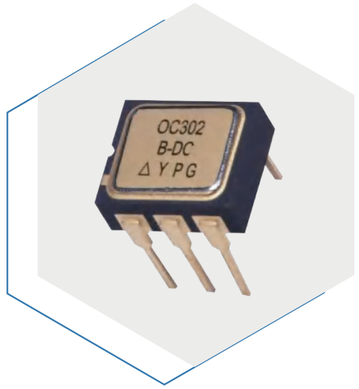
APPLICATIONS:

Implement the transfermation of the signal controllable.

Approved Products

Serial Number	Product Type	Topological Structure	VDD-VSS Range (V)	Analog Signal Range	RON (Ω) (TA=25°C)	OFF Leakage (nA) (TA=25°C)	ON Leakage (nA) (TA=25°C)	Bidirectional Transition	Package	Device class	Replace Type
1	LSM201A Quad SPST Switches	Quad SPST	±10～±16.5	VDD-VSS	⩽90	⩽1	⩽1	Y	DIP16	B	ADG201A
2	LP190 Double SPST Switches	Double SPST Switches	0～+24	6～24	⩽120	⩽500	⩽500	Y	T12A4 , F14X2	G	190KT2
3	LSM706A 16 Channel Analog Multiplexers	16 Channel Analog Multiplexers	0～5.5 -2.5～+2.5	VDD-VSS	⩽4.5	⩽1	⩽1	Y	CSOP28W	B	ADG706

Optocouplers



INTRODUCTION:

Utilizing special assembly techniques, optically coupled function is achieved by combining an AlGaAs infrared emitting diode and a Si-based photosensitive chip in an especial ceramic hermetically sealed package. The optocoupler possesses many features, such as high insulation resistances, adjustable current transfer ratio (CTR), high data transfer rate and high common mode rejection.

FUNCTION:

With infrared light as the medium, the optocoupler can couple the input signal to the output and realize the electrical insulation function, which integrated single, dual and quad channel in a sealed package. TTL compatible, open collector outputs and adjust able CTR are available correspond to OC3XX-CH series.High-speed optocoupler series can divide into high-speed OC56XX-CH series,low voltage high-speed OC063L-CH and ultra-high speed OC6431-CH .

FEATURES:

OC3XX-CH series provide a wide range of power supply and collector-emitter breakdown voltage (VCEO)⩾35V. High-speed data transfer performance can be achieved for high-speed OC56XX-CH series and ultra-high speed OC6431-CH with 10Mbit/s and 20Mbit/s, respectively. The insulation resistance is larger than $10^{10}\,\Omega$ for both.

QUALITY CONTROL:

Grade: H, JCT, B, G

Specification:

Q/QJA20084A-2017 *General Specification of Semiconductor Integrated Circuits for Space Application*

Standard Requirements for Electronic Components in Aerospace Unique Project

GJB 597B-2012 *General Specification for Semiconductor Integrated Circuits*

QZJ 840614 *Technical Conditions for Semiconductor Analog Integrated Circuits*

APPLICATIONS:

Digital logic interfaces, inputs to outputs signal transfer and electrical isolation applications.

Approved Products

NO.	Device Name	Part Number	Input Forward Voltage (V)	Current Transfer Ratio (%)	Isolation Voltage (V)	Rise Time /Fall Time (μ s)	Package	Quality Grade	Industry Counterpart
1	Single channel optocoupler	OC333-CH	⩽1.6	100~300	⩾500	t_r⩽4 t_f⩽4	DIP04	B, G	TLP521-1
2	6-Pin single channel optocoupler	OC302-CH	⩽1.6	100~300	⩾500	t_r⩽4 t_f⩽4	DIP06	JCT, B, G	TLP532
3	Dual channel optocoupler	OC322-CH	⩽1.6	100~300	⩾500	t_r⩽4 t_f⩽4	DIP08	B, G	TLP521-2
4	Quad channel optocoupler	OC302-4-CH	⩽1.6	100~300	⩾500	t_r⩽4 t_f⩽4	DIP16	B, G	TLP521-4

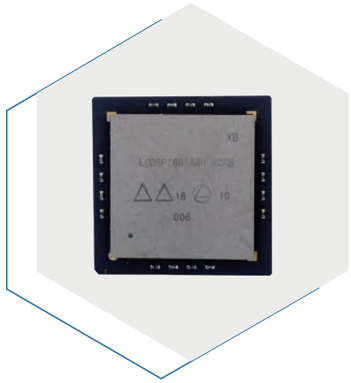
Approved Products

NO.	Device Name	Part Number	Input Forward Voltage (V)	Current Transfer Ratio (%)	Isolation Voltage (V)	Rise Time /Fall Time (μ s)	Package	Quality Grade	Industry Counterpart
1	Single channel optocoupler	OC333F-CH	⩽1.6	100~300	⩾500	t_r⩽4 t_f⩽4	CSOP04	G	TLP281-1
2	Dual channel optocoupler	OC322F-CH	⩽1.6	100~300	⩾500	t_r⩽4 t_f⩽4	CSOP08	JCT, G	TLP281-2
3	Quad channel optocoupler	OC302-4F-CH	⩽1.6	100~300	⩾500	t_r⩽4 t_f⩽4	CSOP16	G	TLP281-4

Approved Products

NO.	Device Name	Part Number	Input Forward Voltage (V)	Current Transfer Ratio (%)	Isolation Voltage (V)	Rise Time /Fall Time (μ s)	Package	Quality Grade	Industry Counterpart
1	High-speed single channel optocoupler	OC5601-CH	⩽1.6	⩾100	⩾500	t_{plh}⩽100 t_{phl}⩽100	DIP08	G	HCPL-5601
2	High-speed dual channel optocoupler	OC5631-CH	⩽1.6	⩾100	⩾500	t_{plh}⩽100 t_{phl}⩽100	DIP08	H, B, G	HCPL-5631
3	High-speed dual channel optocoupler	OC0631-CH	⩽1.6	⩾100	⩾500	t_{plh}⩽100 t_{phl}⩽100	CSOP08	B, G	HCPL-0631
4	Low voltage high-speed dual optocoupler	OC063L-CH	⩽1.6	⩾100	⩾500	t_{plh}⩽90 t_{phl}⩽75	CSOP08	G	HCPL-063L
5	Ultra high-speed dual channel optocoupler	OC6431-CH	⩽1.6	⩾100	⩾500	t_{plh}⩽60 t_{phl}⩽60	LCC20	B	HCPL-6431

DSP



INTRODUCTION:

The processor is multi-core，16 coprocessors support vector, plural, image match and FFT operations, with PowerPC and autonomous instruction sets. The main frequency of the processor core is 400MHz. It delivers 102.4GMACs and 51.2GFLOPs at 400MHz.The DSP peripherals include DDR3/DDR2, QDR, RapidIO, JTAG, HPI, EMIF, DSU and UART.

FEATURES:

16 cores, high reliability, anti-radiation, high performance.

QUALITY CONTROL:

Grade: YB

Specification:

Q/QJA 20084A—2017 *General Specification of Semiconductor Integrated Circuits for Space Application*

RAD-HARD PARAMETERS:

TID⩾100krad(Si)

SEL⩾75MeV·cm²/mg

SEU⩽1E-5Error/device/day

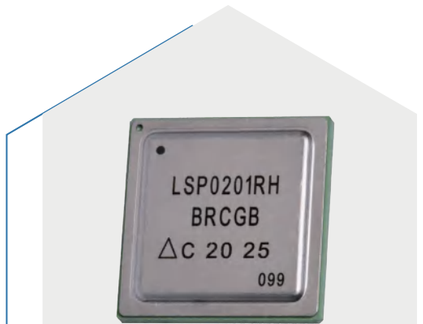
APPLICATIONS:

Navigation control, Radar signal processing, Image processing.

Approved Products

NO.	Product	Part Number	Key Features	Package	Quality Grade	Industry Counterpart
1	Multi-core DSP	LCDSP1601ARH	1) Processor: PowerPC476FP. 2) Coprocessor： sixteen DSP coprocessors support vector, plural, image match and FFT operations, autonomous instruction sets, 32-bit instruction space, dynamic reconfigurable ALU, 64KB program memory, 64KB data memory. 3) Performance: Delivers 102.4GMACs and 51.2GFLOPs at 400MHz. 4) Peripheral Set: Two DDR3/DDR2, one QDR, four RapidIOs, one JTAG, one HPI, one EMIF, one DSU, four UARTs. 5) Software Support： Parallel compilation framework, integrated develop and debugging environment, performance visualization evaluation system and multiple instances OS. 6) Functional Library： Basic matrix operations, product-related image matching operations, FFT and other functions. 7) Clock: 400MHz. 8) Voltage： I/O 2.5V, DDR/QDR 1.5V, Core 1.2V. 9) Power consumption: P_D⩽30W. 10) ESD: V_E⩾2000V. 11) Operating Temperature: -55°C to 125°C. 12) Rad-hard parameters: TID⩾100krad(Si). SEL⩾75MeV•cm²/mg. SEU⩽1E-5 Error/device/day.	CCGA1284	YB	–

Microprocessors



INTRODUCTION:

There are 8 Microprocessors/SoCs with 8051, SPARC, PowerPC and ARM. The peripherals include DDR3/DDR2, EMIF, RapidIO, PCIe, Ethernet, 1553B, CAN, SpaceWire, SPIs, GPIO , I2C and UART. The products can be applied to space vehicles , multi functional integration and communication.

FEATURES:

Anti-radiation,high level of integration,meet the application needs of high,medium and low-end users.

RAD-HARD PARAMETERS:

TID≥100krad（Si）

SEL≥75MeV·cm²/mg

SEU≤1E-5Error/device/day

QUALITY CONTROL:

Grade: B, N, N1

Specification:

GJB597A-1996 *General Specification for Semiconductor Integrated Circuits*

GJB597B-2012 *General Specification for Semiconductor Integrated Circuits*

GJB7400-2011 *General Specification for Semiconductor Integrated Circuits of Qualified manufacturer Certification*

APPLICATIONS:

Flight control, Aerospace control and calculation.

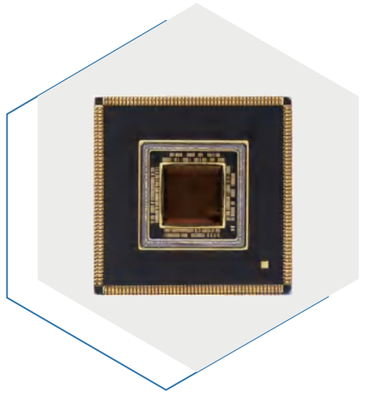
Approved Products

NO.	Name	Part Number	Mark on the Case	Key Features	Package	Quality Grade	Aerospace Application	Industry Counterpart
1	SPARC SoC	LCSoC3201	YB/K+ LCSoC3201-QC	1）Processor Core:Compatible with the SPARCV8 instruction set,supports single and double precision, 80-bit floating-point operations,and 64-bit trigonometric function operations. 2）Functional Peripherals:1 24-bit watchdog,2 24-bit programmable timers,6 16-bit counters, 2 UARTs, 8 GPIOs, 1 1553B interface, 1 PC, hardware debugging unit(DSU), 4 ADCs,7 external interrupts,supports 32-bit PROM, SRAM, and VO memory control. 3）Power Supply Voltage：3.3V（IO）, 1.2V（kernel）; 4）Operating Frequency≤100MHz; 5）Electrostatic Discharge Voltage：VE ≥2000V; 6）Operating Temperature Range: -55℃~+125℃	CQFP240J	YB/K+		
2	Microcontroller	LC801E	LC801EBRBGB	1) Processor: 8051 2) Peripheral Set: One watchdog, five 16- bit timers/counters, fourUARTs, four CANs, three SPIs, 6-channel PWM,two 12-bit ADCs with 8 external inputs each, four 11-bit DACs, 32 GPIOs and one JTAG. 3) Voltage: I/O 3.3V, Core 1.8V. 4) Clock: 50MHz. 5) Power Consumption: PD＜1 W. 6) ESD: VE ≥2000V. 7) Rad-hard parameters: TID≥100krad(Si) . SEL≥75MeV·cm²/mg. SEU≤1E-8 Error/bit/day.	CBGA324	B	YES	
3	PowerPC Microcontroller	LCCORE5554	-LCCORE5554N1BGB	1）Processor Core:A 32-bit embedded CPU core fully compatible with the PowerPC e200z6,with instruction set compatibility with Power ISAV2.03.On-chip memory includes 192KBytes of SRAM and 4 MBytes of FLASH. 2）Peripheral Interfaces:Off-chip memory/bus interface EBI,3-channel CAN controllers,2-channel enhanced serial communication interfaces(eSCI),4-channel serial/deserial-izer peripheral interfaces(DSPI),an enhanced queued analog-to-digital converter(eQADC) with 40 input channels and 12-bit conversion precision,an enhanced DMA controller(eDMA)with 64 channels,an enhanced modular input/output subsystem(eMIOS)with 24 channels,2 enhanced time processing units(eTPU)each with 32 channels, 1 interrupt controller, 1 on-chip interconnect crossbar switch(XBAR), and 1 boot assist module(BAM). 3）Operating frequency≤132MHz. 4） Power supply voltage：3.3/5V(IO), 1.5V(kernel）. 5）Operating power consumption≤1.2W. 6）Operating temperature range：-55℃~+125℃.	PBGA416	N1		MPC5554AZP132
4	Dual-core ARM SoC Circuit	LSoCAM0201	- LSoCAM0201N1BGB	1）Operating frequency≤480MHz. 2）Processor core:DualARM Cortex A9 cores, instruction set ARM Version 7 ARM 32-bit standard instruction set and Thumb-2 16-bit instruction set. 3）Performance:Single-core integer operation capability 2.5 DMIPS/MHz,floating-point operation capability≥1.6 GFLOPS@400MHz. 4）On-chip resources:768KB on-chip storage. 5）Interface resources:2 1553B;2 CAN;40 GPIO;16 PWM;4 SPI;1 QSPI;2 PC;12 UART;4 HDLC, baud rate up to 25Mbps;6 frequency collectors;1 DDR3/DDR2 interface;1 Gigabit Ethernet interface 10M/100M/1000M;supports 16- bit ROMFLASH, RAM external memory: a 16-bit asynchronous EMIF interface; 6）Operating temperature range：-55℃~+125℃	PBGA361	N1		

Approved Products

NO.	Name	Part Number	Mark on the Case	Key Features	Package	Quality Grade	Aerospace Application	Industry Counterpart
5	Dual-core PPC Processing Circuit	LSP0201RH	LSP0201RH BRCGB	1）Processor: dual PowerPC 470, supports single and double precision floating-point operation. 2）SpaceWire ,On-chip Integration:64KB L1 I/DCache, 512KB L2 Cache, 32KB SRAM, 4-channel DMA. 3）Performance: Single core delivers 1136DMIPS at 400MHz. 4）Voltage: 1.5/2 .5/3 .3V(IO),1.2V(core). 5）Power Consumption≤9W. 6）SIngle-core processing performance: 1136 DMIPS@400MHz; 7）Operating Temperature：-55℃~+125℃. 8）Rad-hard parameters: SEL≥75MeV•cm2/mg. SEU≤1E-5Error/device·day. TID≥100krad (Si).	FC-CBGA784	B	YES	
6	Intelligent multifunction processor	LCR3209A	-LCR3209ANPBB	1）Porcessor core:ARM Cortex-R4 core,supporting single and double precision floating-pint operations and lockstep structure; 2）On-chip memory:Integrated SRAM 512KB, FLASH BOOT area 128KB+user program area512KB,all with ECC protection, FLASH supports redundancy backup and hardware-based bad block management; 3）Peripheral interfaces:Integrated with 10 controllers,supporting independent 4-channel chip select spaces,each supporting 4MB,totaling 16MB space,with independetly configurable timung for each channel; includes interrupt controller,2 FlexRays,4 CANs, 1 10/100/1000M Ethernet MAC controller,supporting IEEE1588 standard ,2 I2Cs,4 SPIs,2 1553s,8 UARTs, 12 PWMs,8 capyure/compare units (CAP), 10 quadrature encoder units (QEF), 16 DACs,8 DACs, 16 GPIOs,2 counters, 3 timers and 2 WDGs; supports JTAG debugging and online upgrade functions for FlexRay, Etherent,CAN,and UART. 4）Operating frequency≤300MHz; 5）Power supply voltage:3.3V(I/O), 1.2V(core); 6）Operating power consumption≤4.5W; 7）ESD: VE ≥2000V; 8）Operating temperature range : -55℃~＋125°C;	PBGA484	N		
7	Storage control circuit	LSoCAM2R402ARH	LSoCAM2R402ARH N1RPBB	1） Processor core:Cortex-R4 cores,clocked at. 400MHz;supports dynamic branch prdiction and dual-issue pipeline parallel execution;supports TCMinterface for zero- wait instruction and data access. 2）Dual host interfaces:Compatible with SATA 3.0 host interface(up to 6Gbps) and PCIe Gen2(x4) host interface (up to 20Gbps). 3）ESD: V_E ≥2000V; 4）Operating temperature range：-55℃~＋125℃。 5）Rad-hard parameters： SEL≥75MeV•cm2/mg; SEU≤1E-4Error/device·day. TID≥100krad （Si）.	FC-PBGA625	N1	YES	
8	Space radiation-resistant MCU	LSoCRV1V01RH	LSoCRV1V01RH	1）Processor Core:RISC -V processor with three-stage pipeline,supporting EDAC fault tolerance based on register file； 2）Peripheral Interfaces:Supports 32MB off-chip FLASH and 32MB off-chipSRAM,with ECC support. Supports 32KB on-chipSRAM,4-channel timers, 2-channel watchdogs,2-channel 16-channel ADC.Supports three different modes of 8-bit, 10-bit, and 12-bit.2-channel DAC, 11-bit,2-channel PC bus controller,2-channel UART controller,4 pairs of 8- channel PWM, 1-channel CAN bus controller. Supports 6-channel external interrupts,supports up to 60-channel GPIO,JTAG and SWD debugging interfaces. 3）Operating frequency≤50MHz.； 4）Power supply voltage：3.3V； 5）ESD：V_E≥2000V； 6）Radiation resistance specifications： TID≥100krad （Si）； SEL≥75MeV•cm²/mg； SEU≤1E-4 Error/bit/day； 7）Operating temperature range：-55°C~+125°C.	CBGA324	B	YES	-

ASIC(Large-scale Dedicated Digital Circuits)



INTRODUCTION：

Two ASIC products include mulit-channel serial controllers,AD controllers,command controllers,etc,which can be wued for computing,communication,control,etc,and can provide chip and circuit control.

FEATURES：

Customization,strong radiation resistance, high speed,confidentiality.

RAD-HARD PARAMETERS：

TID≥100krad(Si) Latch-up immune
SEU threshold≥37MeV•cm²/mg

QUALITY CONTROL：

Grade: B, YB, YC
Specification：
GJB597B-2012
General Specification for Semiconductor Integrated Circuits

APPLICATIONS：

Computing, communication and control in aerospace, aviation,weapons and other fields.

Approved Products

NO.	Name	Part Number	Mark on the Case	Key Features	Package	Quality Grade
1	AD Controller	LC3421RH	LC3421RH (Chip)	1）The processor interface is compateible with the timing of 80C32,LCSoC3233 32-bit I/Oand the internal bus interface of the Fifth Academy ； 2）It supports access control of three A/D devices AD1674 、HWD976（AD976A）, AD574ATD； 3） Powersupply：5.0 ×（1±5%）V； 4） Operating frequency≤16MHz； 5）Electrostatic discharge voltage：V_E ≥1000V； 6）Radiation resistance specifications： TID≥100Krad(Si)； immune to single event latch-up； SEU≥37MeV•cm²/mg	CQFP240M	B
2	SIU Controller	LC3422RH	LC3422RH (Chip)	1）The processor interface is compatible with the timing of 80C32， LCSoC3233 32-bit I/O and the internal bus interface of the Fifth Academy； 2） Operating clock： 12MHz； 3）Electrostatic discharge voltage：V_E ≥1000V； 4）Radiation resistance specifications： TID≥100Krad(Si)； immune to single event latch-up； SEU≥37MeV•cm²/mg	CQFP240J	B

SRAM Memory

INTRODUCTION:

This family has 2 types of products,including mainly products of asynchronous 4M SRAM，synchronous 4M SRAM. Chip and circuit can be provided.

FEATURES:

Radiation-resistant,generai-purpose, high-reliability,low-power.

QUALITY CONTROL:

Grade: B

Specification:

GJB597B-2012 *General Specification for Semiconductor Integrated Circuits*

GJB7400-2011 *General Specification for Semiconductor Integrated Circuits for Qualified Contractor Certification*

RAD-HARD PARAMETERS:

TID≥100Krad(Si)

SEL≥75MeV•cm^2/mg

SEU≤5E-7error/bit/day

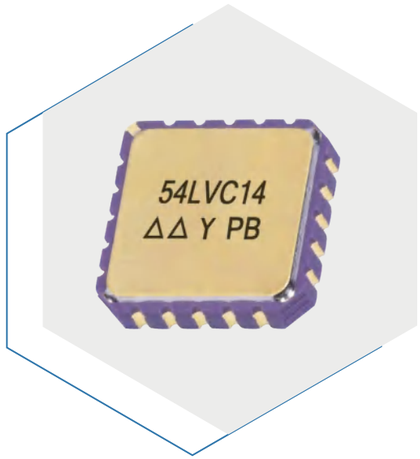
APPLICATIONS:

SRAM-type memory in the fields of aerospace, aviation,weaponry,etc.

Approved Products

NO.	Product	Part Number	Mark on the Case	Key Features	Package	Quality Grade	Industry Counterpart
1	Asynchronous 4M SRAM	LCAM512K 8ARHBRF	LCAM512K8 ARHBRFC (Chip)	1) Capacity：512K×8 bit； 2) Supply voltage：3.3V (IO) , 1.8V (core) ； 3) Operating frequency ≤ 33 MHz； 4) Core operating frequency and core power consumption＜200mW； 5) ESD：V_E ≥2000V； 6) Radiation resistance specifications： TID≥100 krad (Si) ； SEL≥75MeV•cm2/mg； SEU≤5E-7error/bit/day	FP36	B	UT8R512K8
2	Synchronous 4M SRAM	LCSM128K32B -QC	LCSM128K32B -QC	1)Capacity：128K×32bit; 2)Supply voltage：3.3V (IO) , 1.8V (core) ; 3)Operating frequency≤83.3MHz; 4)Power consumption≤1.9W； 5)ESD：V_E ≥2000V； 6)Operating temperature range： -55°C to +125°C;	CQFP100F	B	-

54 Series



INTRODUCTION:

The universal digital circuit produced by silicon gate CMOS process has the advantages of low power consumption,high speed and strong anti-interference ability.

FUNCTION:

Series 54 includes device such as 54HC,54LVC and 54LVT,and its functions cover commonly user small and medium-sized digital logic chips,such as AND,OR,NOT,NOR,complex logic functions such as oscillator,level shift,counter and decoder,and sequential circuits such as flip-flops,latches and registers.

FEATURES:

Supply Voltage: 54HC Series:2V～6V

54LVC Series:2V～3.6V

54LVCH/LVTH Series:2.7V～3.6V

APPLICATIONS:

Digital signal logic operation,buffering, interface conversion and other applicaion.

QUALITY CONTROL:

Grade: YB, YC, LMS, B, G, I_A, N1

Specification:

Q/QJA20084A-2017 *General of Semiconductor Integrated Circuits for Space Application Standard Requirements for Electronic Components in Aerospace Unique Project*

GJB597B-2012 *General Specification for Semiconductor Integrated Circuits*

QZJ840614 *7-zhuan Technical Requirements for Semiconductor Digital Integrated Circuits*

SJ331-83 *General Technical Requirements for Semiconductor Integrated Circuits*

GJB7400-2011 *General Specification for Semiconductor Integrated Circuits of Qualitied Manufacturer Certification*

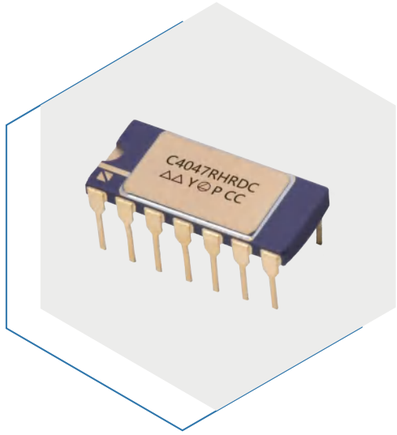
Approved Products

NO.	Device Name (Funcion Description)	Part Number	Power Supply Voltage (V)	Package	Quality Grade	Industry Counterpart
1	Quad 2-Input NAND	54HC00	2～6	D14S2, FP14A	YB, YC, B, G	CD54HC00
2	Quad 2-Input NOR	54HC02	2～6	D14S2	YB, YC, G	CD54HC02
3	HEX Inverter	54HC04	2～6	CSOP14, C20P3, D14S2	YB, YC, B, G	CD54HC04
4	Quad 2-Input AND	54HC08	2～6	CSOP14, C20P3, D14S2, FP14A	YB, YC, B, G	CD54HC08
5	Triple 3-Input NAND	54HC10	2～6	D14S2	B	CD54HC10
6	Dual Retriggerable Monostable Multivibrators with resets	54HC123	2～6	D16S2	YB, YC	SNJ54HC123

Approved Products

NO.	Device Name (Funcion Description)	Part Number	Power Supply Voltage (V)	Package	Quality Grade	Industry Counterpart
7	Quad Three-State Buffer	54HC125	2～6	C20P3, D14S2	YB, YC, B	SNJ54HC125
8	3-line to 8-line Decoders	54HC138	2～6	CSOP16, D16S2, FP16J	YB, YC, B	SNJ54HC138
9	Dual 2-line to-4 line Decoder/Demultiplexer	54HC139	2～6	D16S2	YB, YC	CD54HC139
10	Hex Inverting Schmitt Trigger	54HC14	2～6	C20P3, CSOP14, D14S2, FP14A	YB, YC, B, G	CD54HC14
11	Synchronous Presettable 4-bit Binary Counters	54HC163	2～6	D16S2	G	CD54HC163
12	8-bit Parallel-in/Serial-out Shift Register	54HC165	2～6	D16S2	G	CD54HC165
13	8-bit Parallel-in/Serial-out Shift Register	54HC166	2～6	D16S2	YB, YC, B	CD54HC166
14	Inverting three-state Buffers	54HC240	2～6	D20S2, CSOP20	B	CD54HC240
15	Non-inverting three-state Buffers	54HC244	2～6	D20S2, CSOP20, FP20C	B, G	CD54HC244
16	Octal Three-state Bidirectional Transceivers	54HC245	2～6	C20P3, D20S2, CSOP20, FP20C	YB, YC, B, G	CD54HC245
17	Triple 3-Input NOR	54HC27	2～6	D14S2	B	CD54HC27
18	Octal D-type Flip-Flops	54HC273	2～6	D20S2, CSOP20	YB, YC, B	CD54HC273
19	Quad 2-Input OR	54HC32	2～6	C20P3, CSOP14, D14S2, FP14A	YB, YC, B, G	CD54HC32
20	Octal Transparent D-Type Latches with 3-State Outputs	54HC373	2～6	C20P3, D20S2, CSOP20, FP20C	YB, YC, B, G	CD54HC373
21	Octal D-Type Edge-Triggered Flip-Flops with 3-State Outputs	54HC374	2～6	C20P3, FP20C	B	CD54HC374
22	12-Stage Ripple-Carry Binary Counters/Dividers	54HC4040	2～6	D16S2	YB, YC, B, G	CD54HC4040
23	Octal Transparent D-Type Latches with 3-State Outputs	54HC573	2～6	CSOP20, D20S2, C20P3	YB, YC, G	CD54HC573
24	Dual D-type Positive-Edge-Triggered Flip-Flops With Clear And Preset	54HC74	2～6	C20P3, D14S2, FP14A	B, G	CD54HC74
25	Quad 2-Input Exclusive-OR	54HC86	2～6	D14S2, FP14A	B	CD54HC86
26	HEX Inverter	54HCT04	4.5～5.5	D14S2	B, G	CD54HCT04
27	Hex Inverting Schmitt Trigger	54LVC14	2～3.6	C20P3	B	SN54LVC14
28	Octal Bus Transceivers with 3-State Outputs	54LVC245	2～3.6	D20S2, SSOP20L	B, N1	SN54LVC245
29	Octal Buffers and Line Driverswith 3-State Outputs	54LVCH244	2.7～3.6	C20P3, D20S2	YB, YC, B	SNV54LVCH244
30	Octal Bus Transceivers with 3-State Outputs	54LVTH245	2.7～3.6	C20P3	YB, YC, B	SNJ54LVTH245
31	3-line to 8-line Decoders	54LVC138	2～3.6	D16S2	B	SN54LVC138

4000 Series



INTRODUCTION:

The universal digital circuit produced by 8μm P well aluminum gate CMOS process has the advantages of high supply voltage,low power consumption,high speed and strong anti-interference ability.

FUNCTION:

Series 4000 includes commonly user small and medium-sized high voltage digital logic chips,such as AND,OR,NOT,NOR,complex logic functions such as analog switch,level shift,counter and decoder,and sequential circuits such as flip-flops and registers.

FEATURES:

Supply voltage: 5V～15V

QUALITY CONTROL:

Quality Grade: YB, YC

Specification:

Q/QJA20084A-2017 *General Specification of Semiconductor Integrated Circuits for Space Application*

GJB597B-2012 *General Specification for Semiconductor Integrated Circuits*

QZJ840614 *7-zhuan Technical Requirements for Semiconductor Digital Integrated Circuits*

SJ331-83 *General Technical Requirements for Semiconductor Integrated Circuits*

APPLICATIONS:

Digital signal logic operation, buffering, interface conversion and other applicaion.

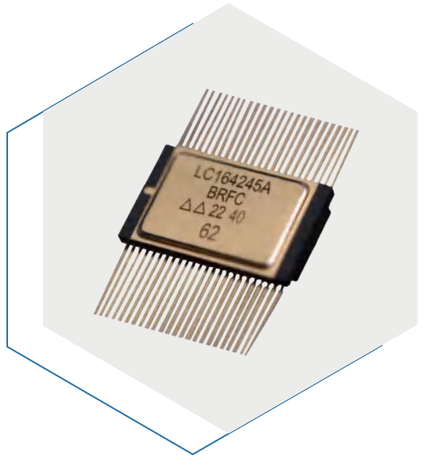
Approved Products

NO.	Device Name (Funcion Description)	Part Number	Power Supply Voltage (V)	Package	Quality Grade	Industry Counterpart
1	Dual 3-Input NOR and Inverters	CC4000	5～15	D14S2	G	HCC4000
2	Quad 2-Input NOR Gates	CC4001	5～15	D14S2, FP14A	B, G	CD4001
3	Dual 4-Input NOR Gates	CC4002	5～15	D14S2, FP14A	B, G	CD4002
4	Quad 2-Input NAND Gates	CC4011	5～15	D14S2, FP14A	B, G	CD4011
5	Dual 4-Input NAND Gates	CC4012	5～15	D14S2, FP14A	B, G	CD4012

Approved Products

NO.	Device Name (Funcion Description)	Part Number	Power Supply Voltage (V)	Package	Quality Grade	Industry Counterpart
6	Dual D-Type Flip-Flops (Rise-edge Trig)	CC4013	5～15	D14S2, FP14A	B, G	CD4013
7	Decade Counters/Dividers with 1-of-10 Decoded Outputs	CC4017	5～15	D16S2	G	CD4017
8	Triple 3-Input NAND Gates	CC4023	5～15	D14S2, FP14A	B, G	CD4023
9	7-Stage Ripple-Carry Binary Counters/Dividers	CC4024	5～15	D14S2	G	CD4024
10	12-Stage Ripple-Carry Binary Counters/Dividers	CC4040	5～15	D16S2, FP16J	G	CD4040
11	Quad NOR R/S Latches with 3-State Outputs	CC4043	5～15	D16S2, FP14A	B	CD4043
12	Hex Buffers/Converters	CC4049	5～15	D16S2, FP16J	B, G	CD4049UB
13	Hex Buffers/Converters	CC4050	5～15	D16S2, FP16J	B, G	CD4050
14	8-Channel Analog Multiplexers/Demultiplexers	CC4051	5～15	D16S2、FP16J	G	CD4051
15	Dual 4-Channel Analog Multiplexers/Demultiplexers	CC4052	5～15	D16S2, FP16J	B	CD4052
16	14-Stage Binary-Ripple Counters/Dividers and Oscillator	CC4060	5～15	D16S2	B, G	CD4060
17	Quad Bilateral Switches	CC4066	5～15	D14S2	G	CD4066
18	Hex Inverters	CC4069	5～15	D14S2, FP14A	G	CD4069UB
19	Quad Exclusive-OR Gates	CC4070	5～15	D14S2	G	CD4070
20	Quad 2-Input OR Gates	CC4071	5～15	D14S2	G	CD4071
21	Dual 4-Input OR Gates	CC4072	5～15	D14S2	G	CD4072
22	Triple 3-Input AND Gates	CC4073	5～15	D14S2, FP14A	B, G	CD4073
23	Triple 3-Input OR Gates	CC4075	5～15	D14S2, FP14A	G	CD4075
24	Quad Exclusive-NOR Gates	CC4077	5～15	D14S2	G	CD4077
25	Quad 2-Input AND Gates	CC4081	5～15	D14S2, FP14A	B, G	CD4081
26	Dual 4-Input AND Gates	CC4082	5～15	CSOP14B	B	CD4082
27	Hex Inverters（Schmitt Trig）	CC40106	5～15	D14S2, FP14A	B, G	CD40106
28	Dual Binary Up Counters	CC4520	5～15	FP16J	B	CD4520
29	Programmable Timer	LC14536	5～15	CSOP16	B	MC14536
30	Single 16-Channel Analog Multiplexers/Demultiplexers	C4067R	5～15	D24L2	YB, YC	CD4067
31	Low-Power Monostable/Astable Multivibrators	C4047RH	5～15	D14S2	YB, YC	HCC4047

Other General Digital ICs



INTRODUCTION:

Including schmitt bidirectional transceiver, multilevel converter, power sequencer and other general digital circuits with some specific functions.

FEATURES:

Please refer to each product datasheet

QUALITY CONTROL:

Grade: B

Specification:

GJB597B-2012 *General for Semiconductor Integrated Circuits*

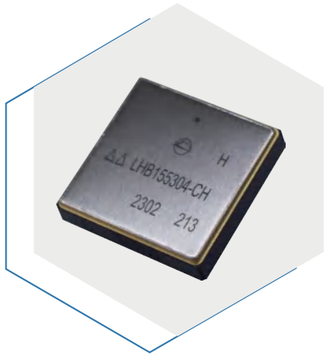
APPLICATIONS:

Digital signal logic operation,control power up & power down of multiple power supplies and other applicaions.

Approved Products

NO.	Device Name	Part Number	Funcion Description	Power Supply Voltage (V)	Package	Quality Grade	Industry Counterpart
1	16-bit Bus Transceiver	LC164245A	An synchronous two-way communication, two independent 8-bit transceivers or one 16-bit transceiver.schmitt input buffering, voltage translation, cold and warm sparing	VDD1:3.0～5.5 VDD2:3.0～5.5	FP48D	B	UT54ACS164245SEI
2	32-bit Bus Transceiver	LC324245	Bidirectional translation between any of the 1.8V, 2.5V, 3.3V, and 5.5V voltage nodes，Asynchronous four-way 8-bit communication、synchronous one-way 32-bit communication，Cold standby.	1.65～5.5	CQFP100	B	-
3	Simple Power Sequencer	LC3988	Offers the easiest method to control power up and power down of multiple power supplies. The input voltage range is 2.7V to 5.5V. The Sequencer is able to adjust timing by small value external capacitor.	2.7～5.5	CFP8	B	LM3881

Bus and Interface Circuit



INTRODUCTION:

This series currently includes 18 standardized bus interface and network circuit products,mainly comprising interface network products such as 1553B,Ethernet,Spacewire,FlexRay,RapidIO,PCIe,TTE,etc.The 1Mbps,4Mbps,10Mbps 1553 series hybrid circuits internally integrate a fully controllable 1553 protocol processor.The 1553 transceiver fully supports the three terminal interface functions of the MIL-STD-1553B protocol,and its software interface is compatible with the foreign BU63825,having been mass-applied in ground and weapon strategic model bus systems.

FEATURES:

1553 series hybrid circuits are characterized by high reliability,support for large network scales,miniaturization, low power consumption,and ease of use.The transceiver series circuits feature high reliability,low power consumption,and support for large network scales.

RAD-HARD PARAMETERS:

TID≥100krad(Si)

SEU threshold≥15MeV•cm²/mgor on-orbit upset rate≤1E-10/bit/day(GEO orbit)

SEL≥75MeV•cm²/mg

QUALITY CONTROL:

Grade: CAST C, YB, B, H, QJB(B)/K, G, N1

Specifications:

GJB597B-2012 *General Specification for Semiconductor Integrated Circuits*

GJB7400-2011 *General Specification for Semiconductor Integrated Circuits for Qualified Manufacturer Certification*

GJB2438 *General Specification for Hybrid Integrated Circuits*

APPLICATIONS:

Communication and network connections in the fields of aerospace,aviation,weapons,etc.

Bus Tansceiver

Approved Products

NO.	Device Name	Part Number	Key Features	Package	Quality Grade
1	1Mbps 1553B Transceiver	LRT1567	1) meet the requirements of 1Mbps 1553 specification; 2) Data transfer rate:1Mbps; 3) Supply voltage：5V±0.25V; 4) Supply Current：≤22mA; 5) Transmitter Rise time：≤300ns; 6) Transmitter Fall time：≤300ns; 7) ESD：V_E≥2000V.	CSOP20 D20S2	YB, YC, B/K+, QJB(B)/K, B
2	4Mbps 1553B Transceiver	LRT2004	1) meet the requirements of 4Mbps 1553 specification; 2) Data transfer rate:4Mbps; 3) Supply voltage：3.3V±0.15V; 4) Supply Current：≤10mA; 5) Transmitter Rise time：25ns～75ns; 6) Transmitter Fall time：25ns～75ns; 7) ESD：V_E≥2000V.	CSOP20	B, G

Approved Products

NO.	Name	Part Number	Mark on the Case	Key Features	Package	Quality Grade	Aerospace Application	Industry Counterpart
1	1553B Bus Controller	LHB155301-CH	LHB155301-CH	1) Integrated protocol processors and bus transceivers 2) Protocol：MIL-STD-1553B; 3) Operating modes：BC, RT, MT, RT/MMT; 4) Software interface:compatible with the software interface of DDC's BU61580; 5) Operating power consumption≤2.5W; 6) Power supply voltage：5V; 7) Clock:Configurable at 16MHz/12MHz.; 8) Electrostatic discharge voltage：V_E ≥2000V; 9) Operating temperature range：-55℃~＋125℃	PGA70	H	-	DDC BU61580
2	1553B Bus Controller	LHB155304-CH	LHB155304-CH	1) Intergrted 1553 protocol chipand and transceiver chip; 2) Protocol：MIL-STD-1553B; 3) Operating modes：BC, RT, MT; 4) Power supply voltage：3.3V; 5) Bus communication rate：4Mbps; 6) Operating power consumption≤2W; 7) ESD voltage：V_E≥2000V; 8) Operating temperature range：-55℃~+125℃; 9) Storage temperature range：-65℃~+150℃	PGA68	H	-	
3	100-Megabit Ethernet Controller	LCE9000V2	- LCE9000V2 N1NB	1) Electrical interface supports 10/100Mbps mode; 2) Host interface supports asynchronous 8/16-bit mode; 3) Half-duplex(IEEE 802.3 CSMA/CD); Full-duplex flow control(IEEE 802.3x); 4) Supports IP/TCP/UDP checksum offloading; 5) EEPROM interface; 6) Power supply voltage：3.3V; 7) Input clock frequency：25MHz; 8) ESD voltage: V_E≥2000V; 9) Operating temperature range：-55 ℃~+125℃	LQFP48	N1	--	DAVICOM DM9000BI
4	Gigabit Ethernet Controller	LCE9000	- LCE9000 N1NB	1) Electrical interface supports 10/100/1000 Mbps modes; 2) Optical interface supports 1.25 Gbps mode,supports SGMII mode; 3) Host interface supports asynchronous 8-bit mode; 4) Half-duplex(IEEE 802.3 CSMA/CD)and full-duplex flow control(IEEE 802.3x); 5) Supports IP/TCP/UDP checksum offloading; 6) EEPROM interface; 7) Power supply voltage:3.3V; 8) Input clock frequency：25MHz; 9) ESD voltage：V_E ≥4000V; 10) Operating temperature range: -55℃~+125℃	LQFP48	N1	--	DAVICOM DM9000BI
5	FlexRay bus switch	LFR4310	LFR4310 B-QC	1) Compatible with FlexRay V2．1A protocol specification; 2) Eletrical interface compatible with FlexRay physical layer; 3) The plastic encapsulated LQFP64L product is fully compatiable with MFR4310 in function,pin definition and packaging,and the ceramic encapsulated CQfp64 is compatible with its function; 4) Fully software-replaceable withMFR4310; 5) The maximum communication rate reaches10Mbps for single channel and 20Mbps for dual channel; 6) Supports three host interfaces：MPC5xx, HCS12 and asynchronous AMIinterface; 7) Single power supply：3.3V; 8) Supports 40MHz external crystal or oscillator,and the internal frequency is doubled to 80MHz working clock; 9) ESD voltageV_E≥2000V	Ceramic packaging: CQFP64 Plastic encapsulation: LQFP64L	B, N1	-	MFR4310
6	1553B Bus Controller	LHB1553V3	LHB1553 V3HGC	1) Integrated 1553 protocol chip and transceiver chip 2) Protocol：MIL-STD-1553B 3) Operating modes：BC, RT, MT; 4) Supply voltage：3.3V; 5) Bus communication rate：1Mbps; 6) Operating power consumption≤2W; 7) ESD voltage：V_E ≥2000V; 8) Operating temperature range：-55℃~+125℃; 9) Storage temperature range：-65℃~+150℃	PGA68	H	NO	

Approved Products

NO.	Name	Part Number	Mark on the Case	Key Features	Package	Quality Grade	Aerospace Application	Industry Counterpart
7	Etherent Controller Gigabit	LCE5396	LCE5396 BRCBB	1) 16-port switching circuit,interfaces support SGMII/1000BASE-X modes; 2) Supports 1 IMP port with GMII/MII/RGMII/RVMII; 3) Supports Layer 2 wire-speed forwarding based on MAC addresses; 4) Supports 4K unicast MAC address entries; 5) Supports unicast/multicast/broadcast frame forwarding; 6) Supports port mirroring; 7) Supports port-based rate control; 8) Supports jumbo frame length up to 9728 bytes ; 9) Supports VLAN based on port and IEEE 802.1Q ; 10) Supports Spanning Tree Protocol and Rapid Spanning Tree Protocol 11) Supports SPI interface and EEPROM for register configuration ; 12) Power supply voltage:I/O supply 2.5V/3.3V,Core voltage 1.2V; 13) Radiation resistance specifications: TID ≥100krad（Si） SEL≥75MeV•cm²/mg	CBGA256	B	YES	BCM5396
8	Etherent Controller Gigabit	LCE82574	LCE82574 N1PNB	1) Supports PCIE 1. 1 x1; 2) Supports 802.3(802.3X,802.3u,802.3ab)Ethernet interface; 3) Supports NC-SI, Smbus , PI, EPROM; 4) GPHY mode supports rates of 10/100/1000 Mbps; 5) Supports auto MDI-X; 6) Supports full-duplex operation mode at 10/100/1000 Mbps; 7) Supports half-duplex operation mode at 10/100 Mbps; 8) Supports SPH(Split Header)mode; 9) Supports TSO(TCP Segment Offload)mode,supports RSS (Receive Side Scaling); 10) Supports domestic operating systems; 11) Maximum power consumption ≤1.5W; 12) Power supply voltage:Single 3.3V or I/O supply 2.5V,Core voltage 1.2V.	QFN64	N	-	Intel is WG82574
9	Gigabit Ethernet PHY	LC88E1145/ LC88E1111	LC88E1145NI-PBB/ LC88E1111NI-PBB	1) Supports single-channel or 4-channel transmit/receive 2) Supports MII/GMII/TBI/RGMII/RTBI/SGMII interfaces; 3) Supports 1000BASE-T; 4) Supports 1000BASE-X; 5) MDI/MDIX Supports automatic MDI/MDIX matching; 6) Supports automatic polarity calibration; 7) Supports IEEE 802.3u auto-negotiation; 8) Supports MDC/MDIO,I2C,IEEE 1149.1 JTAG interface; 9) Power supply voltage:I/O supply 2.5V,Core supply 1.2V; 10) ESD：V_E ≥2000V	PBGA364/ PGBA117	N1/N1	-	Marvell is 88e1145/88e1111
10	Plastic encapsulated miniaturized 1553 bus controller	LSiPC155304	LSiPC155304 N1PBB-	1) Integrated 1553 Protocol Chipand and Ttans-ceiver Chip ; 2) Operating mades:BC, RT, MT; 3) Protocol:MIT-STD-1553B; 4) Bus communication rate is configurable at 1Mbps and 4Mbps; 5) Power supply voltage：3.3V; 6) ESD：V_E ≥2000V; 7) Package size：12mm×12mm×1.34mm; 8) Operating temperature range：-55℃~125℃	BGA121	N1	-	

Approved Products

NO.	Name	Part Number	Mark on the Case	Key Features	Package	Quality Grade	Aerospace Application	Industry Counterpart
11	1553 dual-channel transceiver transformer	LHB2579	LHB2579	1) Supports dual-channel 1553 bus transmission and reception, providing two independent transceiver transformer paths A and B; 2) Supports 1553 bus data transfer rates：1Mbps/4Mbps; 3) Power supply voltage：3.3V; 4）ESD：V_E≥2000V; 5) Operating temperature range：55℃~125℃; 6) Package size：21.4mm×12.4mm×5.3mm	DIP-24	H	-	HI-2579
12	Integrated Transformer 1553B Bus Controller	LSiP2130	LSiP2130 M1PBB-	1) 1553 potocol Chip,2 Transcewer Chips and 2 1553 transformers 2) Protocol：MIL-STD-1553B 3) Operating modes：BC, RT, MT; 4) Bus communication rate is configurable at 1Mbps and 4Mbps; 5) Supply voltage：3.3V; 6) Operating power consumption≤2W; 7) ESD voltage：V_E ≥2000V; 8) Bit error rate: <10^-12; 9) Operating temperature range：-55℃~+100℃; 10) Package size 18.5mm ×18.5mm ×4.4mm	PBGA289	M1		NO
13	Ethernet Controller Gigabit	LC5389	- LC5389 N1PBB	1) 8-port 10/100/1000-Mbps intergratedn witchcontroller via 1.25G SerDes/SGMZZ; 2) Integrates 1 IMP port supporting GMII/RGMII/RVMII interfaces; 3) Supports Layer 2 wire-speed forwarding based on MAC addresses; 4) Supports unicast, multicast,and broadcast frame forwarding; 5) Supports half-duplex,full-duplex modes,and flow control; 6) Supports VLAN based on port and IEEE 802. 1Q,with 4KVLAN entries; 7) Supports port-based rate control; 8) Supports jumbo frame length up to 9728 bytes; 9) Supports EEPROM, MDC/MDIO,SPI, LED,JTAG interfaces; 10) Voltage:I/O:2.5/3.3V,Core:1.2V; 11) Operating temperature range：-55℃~125℃;	PBGA256	N1		BCM5389
14	Etherent ControllerGigabit	LCE5718V2	- LCE5718V 2N1BGB	1) Supports dual-port data communication,each port supports GPHY and Serdes mode GPHY mode supports 10/100/1000 Mbps and MDI-X.Serdes mode supports 1000 base-X portocol. 2) PCIe interface supports Gen1×2 and Gen2×1 modes. 3) Supports INTX/MSI/MSI-X interrupt modes. 4) Supports VLAN tagging (IEEE 802.1Q). 5) Half-duplex(IEEE 802.3 CSMA/CD)/full-duplex data flow control(IEEE 802.3x). 6) Provides programmableinspection rules for packet filteringandclassification. 7) Frame/packet buffering:32KB receive,29KB transmit.. 8) Supportsjumbo frame structure. 9) Multiple receive descriptor queues. 10) SupportsNC-SI,version 1.0.0a. 11) SuppOrtS EEPROM,MDC/M-DIO,SPI,LED,JTAG interfaces. 12) Powersupplyvoltage:I/0 supply2.5V,Core voltage 1.2V.	PBGA169	N1	-	BCM5718

TTE End-System Circuit (Cer Pkg)

INTRODUCTION:

As an end node of time-triggered Ethernet, the TTE End-System Circuit supports time-triggered real-time and standard Ethernet communication with high-precison and reliable synchronization and fault tolerance. The product operates in 2 modes: Network-Controller and Intelligent-Node, providing a compact and highly integrated solution for TTE data access.

FUNCTION:

The product is a core control circuit integrating TTE protocols, which includes core processor, on-chip cache, monitoring control unit, memory management unit, and interface modules or peripheral including PCIe, TTE, Ethernet, EMIF, DDR3, DMA, UART, HDLC, SPI, QSPI, CAN2.0B, I2C, 1554B and GPIO. Network-Controller mode allows the host processor to access the TTE protocol control module through both PCIe and EMIF interfaces, with on-chip arm processor in low-power mode.Intelligent-Node mode is formed by the chip's own dual-core processor as the main control of the TTE protocol control module, together with other on-chip or off-chip parts and resources to form a TTE End-System intelligent node device.

FEATURES:

For time-triggered real-time and standard Ethernet communication; high-precison synchronization; large bandwidth; hard real-time; high reliablility.

QUALITY CONTROL:

Grade: GJB-B

Specification:

QAl.J23778-2022 *Detailed Specification for LSoCAM2A902 TTE End-System Control SOC of Semiconductor Integrated Circuit*

APPLICATIONS:

Real-time Ethernet communication for aerospace, aviation and military equipment.

Approved Products

NO.	Product	Part Number	Key Features	Interfaces	Other Features	Package	Quality Grade	Localization Grade
1	LSoCAM2A902 TTE End System Control SOC	LSoCAM2A902	ARM Cortex A9 CPU: 2 ARM Cortex A9 processor cores; ARM Frequency: 480Mhz; On-Chip RAM: 512KB; TTE Specification: conform to SAE-AS6802、IEEE802.3; support Time-Triggered and Standard Ethernet; support Double/Triple Redundancy; Synchronization Precision: 100ns;	SGMII/1000Base-X Network Port: 3 PCIe Interface: 1 External Memory Interface: SDRAM、QSPI Serial FLASH、SPI Serial FLASH、Async Memory Interface UART Interface: 6 HDLC Interface: 4 CAN Interface: 2 1553B Interface: 2 SPI Interface: 2 QSPI Interface: 1 I^2C Interface: 2	Voltage: Core 1.2×(1±10%)V, Common IO 3.3×(1±10%)V, DDR IO 1.5×(1±10%)V; Operating Temperature: -55°C～ 125°C ESD Grade: 1C, 1000V; Size: 29mm ×29mm	CCGA784	GJB-B	C

TTE Switch Circuit (Cer Pkg)

INTRODUCTION:

The TTE Switch Circuit is a real-time Ethernet communication switching circuit product with hard real-time, high reliability and high bandwidth. The product is fully forward-designed and independently developed, achieving distributed network clock synchronization and deterministic mixed-type traffic co-transmission over one network, and providing a solution for real-time network system.

FUNCTION:

The product is integrated with embedded processor and TTE Switch controller. The processor is based on the RISC instrction set, with a operating frequency of 250MHz. The product can quickly package and parse configuration messages, also can dynamically configure or load configuration information of the whole network. The Switch controller comforms to AS6802 and IEEE 802.3 specifications, implements synchronization and mixed traffic data exchange.

FEATURES:

High-precison synchronization, hard real-time, low delay, low jitter, high reliability

QUALITY CONTROL:

Grade: GJB-B

Spcecification:

Q/Al.J 23880-2022 *Detailed Specification for LCTTES16 TTE Switch Circuit of Semiconductor Integrated Circuit*

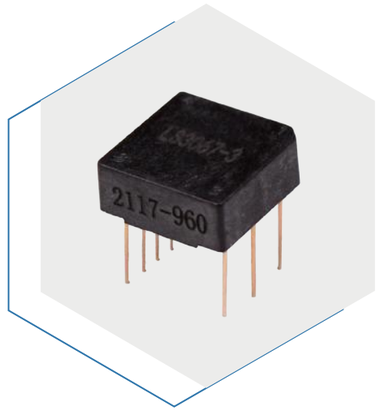
APPLICATIONS:

Real-time Ethernet communication for aerospace, aviation and military equipment.

Approved Products

NO.	Product	Part Number	Key Features	Interfaces	Other Features	Package	Quality Grade	Localization Grade
1	LCTTES16 TTE Switch Circuit	LCTTES16	Supports IEEE-802.3/SAE AS6802; 16-port 1Gbps/100Mbps; Supports TT/PCF/BE traffic; Supports data mirroring, 4096 VL, MAC address learning; Synchronization precision less than 100ns; TT jitter less than 1ms; TT one-hop delay less than 20μs;	SGMII/1000Base-X Network Port: 16 GMII Interface: 1 SPI Interface: 1 UART Interface: 1 MDIO Interface: 1 JTAG Interface: 1	Voltage: Core 1.2V, IO: 2.5V; Operating Temperature: -55°C ~ 125°C ESD Grade: 1C, 1000V Size: 17mm ×17mm	CCGA256	GJB-B	C

1533B Bus Isolation Transformers



FUNCTION:

The 1553B bus isolation transformers achieve 1Mbps~4Mbps transmission rate. At the input port of the 1553B bus terminal, the transformer realizes the functions of bus impedance matching and isolation. The transformer is composed of winding parts and a plastic shell. The packaging form of the transformer is dual inline. The inner annular magnetic core is wound and then welded on the pin of the plastic shell. It is encapsulated in the plastic shell using epoxy glue. It is designed according to GJB289-1997 "Aircraft Internal Time Division Command/Response Multiplexing Data Bus" and meets the requirements of GJB5186.7-2005 "Test Method for Data Bus Couple, Terminator and Cable".

FEATURES:

low leakage inductance; small winding parasitic capacitance; high transmission rate; high reliability; no signal distortion.

QUALITY CONTROL:

Grade: QJB, M

Specification:

GJB 1521A-2013 *General Specification for Low Power Pulse Transformers*

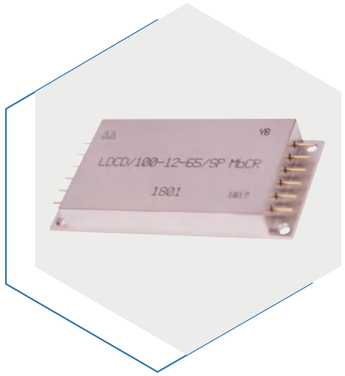
APPLICATIONS:

The 1553B bus communication of the vehicle-mounted, airborne, missile-borne computer system.

Approved Products

NO.	Part Number	Transmission Rate	(N13：N57) Turns Ratio	(N13：N48) Turns Ratio	Direct-current Resistance (Port 1 and Port 3)	Input Resistance	Primary Inductance (Port 1 and Port 3)	Insulation Resistance	Operating Temperature Range	Size (length×width ×height)	Package	Quality Grade
1	LS3067-3	1Mbps～4Mbps	1:2	/	⩽1Ω	⩾3 kΩ	⩾200μ H	⩾100 MΩ	-45℃～+85℃	(15.7±0.5)mm ×(15.7±0.5)mm ×(6.5±0.5)mm	DIP	QJB
2	LS3067-5S	1Mbps	1:1.79	/	⩽1Ω	⩾3 kΩ	⩾3mH	⩾100 MΩ	-55℃～+130℃	(15.7±0.5)mm ×(15.7±0.5)mm ×(6.5±0.5)mm	DIP	QJB
3	LS3226	1Mbps	1:1.79	1:2.5	⩽1Ω	⩾1.5 kΩ	⩾6mH	⩾100 MΩ	-55℃～+130℃	(15.7±0.5)mm ×(15.7±0.5)mm ×(6.5±0.5)mm	DIP	QJB
4	LS3067-3EX	1Mbps～4Mbps	1:2	/	⩽1Ω	⩾3 kΩ	⩾200μ H	⩾1000 MΩ	-55℃～+130℃	(10±0.5)mm ×(10±0.5)mm ×(6.5±0.5)mm	DIP	M
5	LS3067-5EX	1Mbps	1:1.79	/	⩽1Ω	⩾3 kΩ	⩾1mH	⩾1000 MΩ	-55℃～+130℃	(10±0.5)mm ×(10±0.5)mm ×(6.5±0.5)mm	DIP	M
6	LS3226EX	1Mbps	1:1.79	1:2.5	⩽1Ω	⩾3 kΩ	⩾1mH	⩾1000 MΩ	-55℃～+130℃	(10±0.5)mm ×(10±0.5)mm ×(6.5±0.5)mm	DIP	M

Rad-hard DC/DC Converters for Space Use



INTRODUCTION:

The series of products adopt thick film hybrid integration technology, bare chip packaging technology and all-metal sealed packaging, which have the advantages of small size, high reliability, strong radiation resistance and other advantages. The quality grade covers H and YB. The series of products have been applied to many aerospace missions such as communication satellites, remote sensing satellites, navigation satellites, space stations, etc. in batches, with rich in-orbit flight experience and stable and reliable products.

FUNCTION:

The satellite bus voltage is converted into the stable voltage required by each load and platform. The input voltage covers 5V bus, 28V bus, 42V bus, 50V bus and 100V bus. The output includes single, double and three channels, and the output voltage includes 2.5V, 3.3V, 5V, 8V, 12V, 15V, 28V, ± 5V, ± 12V, ± 15V, 5V&± 12V, 5V&± 15V and other common output voltages. Capable of enabling control, synchronous input, synchronous output, short circuit protection, undervoltage protection, parallel current sharing and other functions.

FEATURES:

Thick-film hybrid integrated process, all-metal sealed packaging, fixed working frequency, single-ended topology, magnetic isolation feedback, complete isolation of input and output.

QUALITY CONTROL:

Grade: H, YC, YB

Specification:

GJB2438B-2017 *General Specification for Hybrid Integrated Circuits*

Q/QJA20085A-2017 *General Specification for Hybrid Integrated Circuits for Aerospace Applications*

Quality Control for Process Requirements of Space Prohibited and Restricted Use

RAD-HARD PARAMETER:

TID: 100 krad (si), first 30 krad (si) (dose rate 0.01 rad (si)/s), last 70 krad (si) (dose rate 0.1 rad (si)/s)

LET：⩾75MeV·cm²/mg

APPLICATIONS:

It is applied to satellites, spacecraft, space stations, deep space exploration and other highly reliable and high-performance electronic systems.

Approved Products

NO.	Part Number	Output Power (W)	Input Voltage Range (V)	Output Voltage (V)	Output Current (A)	Typical Efficiency (%)	Typical Weight (g)	Foreign Model	Model of Matched Filter	Package Size (mm)	Quality Grade
80V～120V input irradiation resistant DC/DC converter											
1	LDCD/100-2R5-5/SP	5	80～120	2.5	2	62	34	/	LFE100-461-50	51.30×28.94×8.90	YB
2	LDCD/100-3R3-5/SP	5	80～120	3.3	1.515	63	34	/	LFE100-461-50	51.30×28.94×8.90	YB
3	LDCD/100-5-5/SP	5	80～120	5	1	73	34	/	LFE100-461-50	51.30×28.94×8.90	YB
4	LDCD/100-15-5/SP	5	80～120	15	0.333	73	34	/	LFE100-461-50	51.30×28.94×8.90	YB
5	LDCD/100-12-5/D1	5	80～120	± 12	± 0.208	75	38	/	LFE100-461-50	51.30×28.94×8.90	YB
6	LDCD/100-5-5/D1	5	80～120	± 5	± 0.5	75	38	/	LFE100-461-50	51.30×28.94×8.90	YB

Approved Products

NO.	Part Number	Output Power (W)	Input Voltage Range (V)	Output Voltage (V)	Output Current (A)	Typical Efficiency (%)	Typical Weight (g)	Foreign Model	Model of Matched Filter	Package Size (mm)	Quality Grade
80V～120V input irradiation resistant DC/DC converter											
7	LDCD/100-3R3-15/SP	15	80～120	3.3	4.55	70	50	/	LFE100-461-50	74.00×29.00×10.66	YB
8	LDCD/100-5R-15/SP	15	80～120	5	3	77	34	/	LFE100-461-50	51.30×28.94×8.90	YB
9	LDCD/100-12-15/SP	15	80～120	12	1.25	82.4	50	/	LFE100-461-50	74.00×29.00×10.66	YB
10	LDCD/100-28-15/SP	15	80～120	28	0.536	75	34	/	LFE100-461-50	51.30×28.94×8.90	YB
11	LDCD/100-12-15/D1	15	80～120	±12	±0.625	81	53	/	LFE100-461-80	74.00×29.00×10.66	YB
12	LDCD/100-15-15/D1	15	80～120	±15	±0.5	83	38	/	LFE100-461-80	51.30×28.94×8.90	YB
13	LDCD/100-3R3-20/SP	20	80～120	3.3	6.1	70	50	/	LFE100-461-50	74.00×29.00×10.66	YB
14	LDCD/100-5-20/SP	20	80～120	5	4	80	51	/	LFE100-461-50	74.00×29.00×10.66	YB
15	LDCD/100-12-20/D1	20	80～120	±12	±0.833	83	55	/	LFE100-461-50	74.00×29.00×10.66	YB
16	LDCD/100-15-20/D1	20	80～120	±15	±0.667	83	55	/	LFE100-461-50	74.00×29.00×10.66	YB
17	LDCD/100-512-20/T1	20	80～120	5/±12	2/±0.417	81	59	/	LFE100-461-50	68.59×34.29×10.56	YB
18	LDCD/100-5R-30/SP	30	80～120	5	6	77.5	70	/	LFE100CH-461-100	76.70×38.60×10.66	YB
19	LDCD/100-12-30/SP	30	80～120	12	2.5	83.5	75	/	LFE100CH-461-100	76.70×38.60×10.66	YB
20	LDCD/100-15-30/SP	30	80～120	15	2	83.5	75	/	LFE100CH-461-100	76.70×38.60×10.66	YB
21	LDCD/100-5-30/D1	30	80～120	±5	3	79.8	75	/	LFE100CH-461-100	76.70×38.60×10.66	YB
22	LDCD/100-12-30/D1	30	80～120	±12	1.25	83.8	75	/	LFE100CH-461-100	76.70×38.60×10.66	YB
23	LDCD/100-512-30/T1	30	80～120	5/±12	3/±0.625	81	75	/	LFE100CH-461-100	76.70×38.60×10.66	YB
24	LDCD/100-515-30/T1	30	80～120	5/±15	3/±0.5	81	72	/	LFE100CH-461-100	76.70×38.60×10.66	YB
25	LDCD/100-12-65/SP	65	80～120	12	5.4	84	75	/	LFE100CH-461-100	76.70×38.60×10.66	H
26	LDCD/100-28-65/SP	65	80～120	28	2.321	86	75	/	LFE100CH-461-100	76.70×38.60×10.66	YB
27	LDCD/100-12-65/D1	65	80～120	±12	2.708	86	77	/	LFE100CH-461-100	76.70×38.60×10.66	YB
28	LDCD/100-15-65/D1	65	80～120	±15	2.166	87	77	/	LFE100CH-461-100	76.70×38.60×10.66	YB
29	LDCD/100-130/30-80/D1	80	70～120	130/-30	0.5	83	136	/	LFE100CH-461-100 LFE100CH-461-300	76.4×63.7×11.5	H
30	LDCD/100-12-96/D1	96	70～120	±12	±4	85	76	/	LFE100-461-50	76.70×38.60×10.66	H, SAST
31	LDCD/100W-5-100U/SP	100	70～120	5	20	84	76	/	LFE100-461-1000	76.70×38.60×10.66	YC，H
32	LDCD/100W-5-100U/D1	100	70～120	±5	±10	84	76	/	LFE100-461-1000	76.70×38.60×10.66	YC，H
33	LDCD/100W-8-100U/SP	100	70～120	8	12.5	85	76	/	LFE100-461-1000	76.70×38.60×10.66	YC，H
34	LODCD/100-47R12-120/T1	100	70～120	47/+12/-12	2/0.2/0.12	85	96	/	LFE100-461-400	76.70×38.60×10.66	H
35	LDCD/100W-12-120U/SP	120	70～120	12	10	85	76	/	LFE100-461-1000	76.70×38.60×10.66	YC，H
36	LDCD/100W-12-110U/D1	110	70～120	±12	±4.58	86	76	/	LFE100-461-1000	76.70×38.60×10.66	YC，H
37	LDCD/100W-15-120U/SP	120	70～120	15	8	87	76	/	LFE100-461-1000	76.70×38.60×10.66	YC，H
38	LDCD/100W-28-120U/SP	120	70～120	28	4.28	87	76	/	LFE100-461-1000	76.70×38.60×10.66	YC，H
39	LODCD/100-47R12-120/T1	120	70～120	±15	±4	86	76	/	LFE100-461-1000	76.70×38.60×10.66	YC，H
40	LODCD/100-28-120/SP	120	60～120	28	4.3	85	76	/	LFE100CH-461-100 LFE100CH-461-300 LFE100-461-1000	76.70×38.60×10.66	H
41	LDCD/100W-12-110U/D1	100	80～120	20	20	88	76	/	LFE100-461-400 LFE100-461-1000	76.33×38.23×10.66	YC，H
42	LDCD/100W-15-120U/D1	120	70～120	±15	±4	87	76	/	LFE100-461-1000	76.33×38.23×10.66	YC，H
30V～80V input irradiation resistant DC/DC converter											
43	LDCD/50-5-80/SP	80	30～80	5	16	79	80	AFL5005S	LME/50-461-350	63.90×51.20×10.20	H
44	LDCD/50-8-80/SP	80	30～80	8	10	80	80	AFL5008S	LME/50-461-350	63.50×51.20×10.20	H

Approved Products

NO.	Part Number	Output Power(W)	Input Voltage Range(V)	Output Voltage (V)	Output Current(A)	Typical Efficiency (%)	Typical Weight(g)	Foreign Model	Model of Matched Filter	Package Size (mm)	Quality Grade
20V～50V input irradiation resistant DC/DC converter											
45	LDCD/(20-50)-5-1.5/SP	1.5	20～50	5	0.3	67/63	14	MCH2805S	LFSA(20-50)-461-40	25.24×20.76×6.86	H，YB
46	LDCD/(20-50)-12-1.5/SP	1.5	20～50	12	0.125	67/63	14	MCH2812S	LFSA(20-50)-461-40	25.24×20.76×6.86	H，YB
47	LDCD/(20-50)-5-1.5/D1	1.5	20～50	±5	±0.15	69/65	19	MCH2805D	LFSA(20-50)-461-40	27.31×27.31×6.86	H，YB
48	LDCD/(20-50)-12-1.5/D1	1.5	20～50	±12	±0.0625	67/63	19	MCH2812D	LFSA(20-50)-461-40	27.31×27.31×6.86	H，YB
49	LDCD/(20-50)-5R-5/SP	5	20～50	5	1	70/68	18.5	MSA2805S	LFSA(20-50)-461-40 LFC/(20-50)-461-135 LFE/(20-50)-461-500	27.31×27.31×6.86	H，YB
50	LDCD/(20-50)-12R-5/SP	5	20～50	12	0.417	71/69	18.5	MSA2812S	LFSA(20-50)-461-40 LFC/(20-50)-461-135 LFE/(20-50)-461-500	27.31×27.31×6.86	H，YB
51	LDCD/(20-50)-15R-5/SP	5	20～50	15	0.333	72/70	18.5	MSA2815S	LFSA(20-50)-461-40 LFC/(20-50)-461-135 LFE/(20-50)-461-500	27.31×27.31×6.86	H，YB
52	LDCD/(20-50)-5-5F/ D1	5	20～50	±5	±0.5	72/70	33	MSA2805D	LFSA(20-50)-461-40 LFC/(20-50)-461-135 LFE/(20-50)-461-500	50.75×28.70×8.38	H，YB
53	LDCD/(20-50)-12-5F/D1	5	20～50	±12	±0.208	73/71	33	MSA2812D	LFSA(20-50)-461-40 LFC/(20-50)-461-135 LFE/(20-50)-461-500	50.75×28.70×8.38	H，YB
54	LDCD/(20-50)-3R3-8F/SP	8	20～50	3.3	2.4	72.8/70.5	33	MHF283R3S	LFSA(20-50)-461-40 LFH/(20-50)-461-75 LFC/(20-50)-461-135 LFE/(20-50)-461-500	50.75×28.70×8.38	H，YB
55	LDCD/(20-50)-5R-12F/SP	12	20～50	5	2.4	75.0/74.5	33	MHF2805S	LFSA(20-50)-461-40 LFH/(20-50)-461-75 LFC/(20-50)-461-135 LFE/(20-50)-461-500	50.75×28.70×8.38	H，YB
56	LDCD/(20-50)-5R-15F/SP	15	20～50	5	3	74.0/74.0	33	/	LFSA(20-50)-461-40 LFH/(20-50)-461-75 LFC/(20-50)-461-135 LFE/(20-50)-461-500	50.75×28.70×8.38	H，YB
57	LDCD/(20-50)-12R-15F/SP	15	20～50	12	1.25	79.2/78.9	33	MHF2812S	LFSA(20-50)-461-40 LFH/(20-50)-461-75 LFC/(20-50)-461-135 LFE/(20-50)-461-500	50.75×28.70×8.38	H，YB
58	LDCD/(20-50)-15R-15F/SP	15	20～50	15	1	81.0/80.5	33	MHF2815S	LFSA(20-50)-461-40 LFH/(20-50)-461-75 LFC/(20-50)-461-135 LFE/(20-50)-461-500	50.75×28.70×8.38	H，YB
59	LDCD/42-28-15F/SP	15	20～50	28	0.54	81	33	MHF+2828S	LFSA(20-50)-461-40 LFH/(20-50)-461-75 LFC/(20-50)-461-135 LFE/(20-50)-461-500	50.75×28.70×8.38	H，YB
60	LDCD/(20-50)-5-12F/D1	12	20～50	±5	±1.2	77/76	33	MHF+2805D	LFSA(20-50)-461-40 LFH/(20-50)-461-75 LFC/(20-50)-461-135 LFE/(20-50)-461-500	50.75×28.70×8.38	H，YB
61	LDCD/(20-50)-12-15F/D1	15	20～50	±12	±0.625	80/80	33	MHF+2812D	LFSA(20-50)-461-40 LFH/(20-50)-461-75 LFC/(20-50)-461-135 LFE/(20-50)-461-500	50.75×28.70×8.38	H，YB
62	LDCD/(20-50)-15-15F/D1	15	20～50	±15	±0.5	82/81	33	MHF+2815D	LFSA(20-50)-461-40 LFH/(20-50)-461-75 LFC/(20-50)-461-135 LFE/(20-50)-461-500	50.75×28.70×8.38	H，YB
63	LDCD/(20-50)-512-15F/T1	15	20～50	5/±12	1.5/±0.313	74/73	57	MHF+28512T	LFC/(20-50)-461-135 LFE/(20-50)-461-500	68.75×34.19×10.29	H，YB
64	LDCD/(20-50)-515-15F/T1	15	20～50	5/±15	1.5/±0.250	72/72	57	MHF+28515T	LFC/(20-50)-461-135 LFE/(20-50)-461-500	68.75×34.19×10.29	H，YB
65	LDCD/(20-50)-5R-15VF/SP	15	20～50	5	3	75/75	49	MHV2805S	LFSA(20-50)-461-40 LFH/(20-50)-461-75 LFC/(20-50)-461-135 LFE/(20-50)-461-500	73.91×28.32×10.16	H，YB

Approved Products

NO.	Part Number	Output Power (W)	Input Voltage Range (V)	Output Voltage (V)	Output Current(A)	Typical Efficiency (%)	Typical Weight (g)	Foreign Model	Model of Matched Filter	Package Size (mm)	Quality Grade
66	LDCD/(20-50)-12-15VF/D1	15	20～50	±12	0.625	79/79	52	MHV2812D	LFSA(20-50)-461-40 LFH/(20-50)-461-75 LFC/(20-50)-461-135 LFE/(20-50)-461-500	73.91×28.32×10.16	H，YB
67	LDCD/(20-50)-15-15VF/D1	15	20～50	±15	0.5	80/80	52	MHV2815D	LFSA(20-50)-461-40 LFH/(20-50)-461-75 LFC/(20-50)-461-135 LFE/(20-50)-461-500	73.91×28.32×10.16	H，YB
68	LDCD/(20-50)-3R3-20F/SP	20	20～50	3.3	6.06	74/74	53	MTR283R3SF	LFC/(20-50)-461-135 LFE/(20-50)-461-500	73.91×28.32×10.16	H，YB
69	LDCD/(20-50)-5-25F/SP	25	20～50	5	5	76/75	53	MTR2805SF	LFC/(20-50)-461-135 LFE/(20-50)-461-500	73.91×28.32×10.16	H，YB
70	LDCD/42-08-25F/SP	25	20～50	8	3.125	80	53	MTR2808SF	LFC/(20-50)-461-135 LFE/(20-50)-461-500	73.91×28.32×10.16	H
71	LDCD/(20-50)-12-30F/SP	30	20～50	12	2.5	80/80	53	MTR2812SF	LFC/(20-50)-461-135 LFE/(20-50)-461-500	73.91×28.32×10.16	H，YB
72	LDCD/(20-50)-15-30F/SP	30	20～50	15	2	83/82	53	MTR2815SF	LFC/(20-50)-461-135 LFE/(20-50)-461-500	73.91×28.32×10.16	H，YB
73	LDCD/42-18-30F/SP	30	20～50	18	1.67	83	53	MTR2818SF	LFC/(20-50)-461-135 LFE/(20-50)-461-500	73.91×28.32×10.16	H
74	LDCD/(20-50)-5-25F/D1	25	20～50	± 5	2.5	75.5/76	53	MTR2805DF	LFC/(20-50)-461-135 LFE/(20-50)-461-500	73.91×28.32×10.16	H，YB
75	LDCD/(20-50)-12-30F/D1	30	20～50	±12	1.25	81.5/82	53	MTR2812DF	LFC/(20-50)-461-135 LFE/(20-50)-461-500	73.91×28.32×10.16	H，YB
76	LDCD/(20-50)-512-30F/T1	30	20～50	5/±12	4/ ±0.416	73/73	57	MTR28512TT	LFC/(20-50)-461-135 LFE/(20-50)-461-500	68.75×34.19×10.49	H，YB
77	LDCD/(20-50)-515-30F/T1	30	20～50	5/±15	4/ ±0.333	74/74	57	MTR28515TF	LFC/(20-50)-461-135 LFE/(20-50)-461-500	68.75×34.19×10.49	H，YB
78	LDCD/(20-50)-42-42/SP	42	20～50	42	1	84	76	/	LFC/(20-50)-461-135 LFE/(20-50)-461-500	76.33×38.23×10.16	H
79	LDCD/(20-50)-5-50/SP	50	20～50	5	10	78/78	76	MFL2805S	LFE/(20-50)-461-500	76.33×38.23×10.16	H，YB
80	LDCD/(20-50)-12-60/SP	60	20～50	12	5	82.7/82	76	MFL2812S	LFE/(20-50)-461-500	76.33×38.23×10.16	H，YB
81	LDCD/(20-50)-15-65/SP	65	20～50	15	4.33	82.5/82	76	MFL2815S	LFE/(20-50)-461-500	76.33×38.23×10.16	H，YB
82	LDCD/(20-50)-28-65/SP	65	20～50	28	2.32	83/81	77	MFL2828S	LFE/(20-50)-461-500	76.33×38.23×10.16	H，YB
83	LDCD/(20-50)-5-50/D1	50	20～50	± 5	± 5	79/78	77	MFL2805D	LFE/(20-50)-461-500	76.33×38.23×10.16	H，YB
84	LDCD/(20-50)-12-60/D1	60	20～50	±12	± 2.5	84/83	77	MFL2812D	LFE/(20-50)-461-500	76.33×38.23×10.16	H，YB
85	LDCD/(20-50)-3R3-66/SP	66	20～50	3.3	20	77	76	MOR283R3S	LDCD/(20-50)-461-750	76.7×38.6×10.66	YC，H
86	LDCD/(20-50)-5-100/SP	100	20～50	5	20	82	76	MOR2805S	LDCD/(20-50)-461-750	MbQ6438 76.33×38.23×10.16	YC， CAST H，H
87	LDCD/(20-50)-5-100H/SP	100	20～50	5	20	87	76	MOR2805S	LFE/(20-50)-461-750	76.33×38.23×10.16	YC，H
88	LDCD/(20-50)-6R3-100/SP	100	20～50	6.3	15.9	82	76	MOR2806R3S	LDCD/(20-50)-461-750	76.7×38.6×10.66	YC，H
89	LDCD/(20-50)-8-100/SP	100	20～50	8	12.5	85	76	MOR2808S	LDCD/(20-50)-461-750	76.33×38.23×10.16	YC，H
90	LDCD/(20-50)-9R5-110/SP	110	20～50	9.5	11.6	86	76	MOR2809R5S	LDCD/(20-50)-461-750	76.33×38.23×10.16	YC，H
91	LDCD/(20-50)-12-120/SP	120	20～50	12	10	85	76	MOR2812S	LDCD/(20-50)-461-750	76.33×38.23×10.16	YC，H
92	LDCD/(20-50)-15-120/SP	120	20～50	15	8	86	76	MOR2815S	LDCD/(20-50)-461-750	76.33×38.23×10.16	YC，H

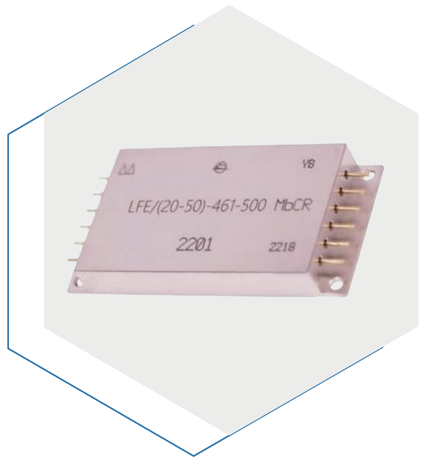
Approved Products

NO.	Part Number	Output Power (W)	Input Voltage Range (V)	Output Voltage (V)	Output Current (A)	Typical Efficiency (%)	Typical Weight (g)	Foreign Model	Model of Matched Filter	Package Size (mm)	Quality Grade
93	LDCD/(20-50)-20-120/SP	120	20～50	20	6	86	76	-	LDCD/(20-50)-461-750	76.33×38.23×10.16	YC，H
94	LDCD/(20-50)-28-112/SP	112	20～50	28	4	86	76	MOR2828S	LDCD/(20-50)-461-750	76.33×38.23×10.16	YC，H
95	LDCD/(20-50)-5-100/D1	100	20～50	±5	±10	82	76	MOR2805D	LDCD/(20-50)-461-750	76.33×38.23×10.16	YC，H
96	LDCD/(20-50)-9R5-110/D1	110	20～50	±9.5	±5.8	84	76	MOR289R5D	LDCD/(20-50)-461-750	76.7×38.6×10.66	YC，H
97	LDCD/(20-50)-12-110/D1	110	20～50	±12	±4.58	85	76	MOR2812D	LDCD/(20-50)-461-750	76.33×38.23×10.16	YC，H
98	LDCD/(20-50)-15-120/D1	120	20～50	±15	±4	86	76	MOR2815D	LDCD/(20-50)-461-750	76.33×38.23×10.16	YC，H
4.5V-5.5V input irradiation resistant DC/DC converter											
99	LDC0505A	0.35	4.5～5.5	5	0.07	50	2.5	/	/	21.75×7.95×3.45	H
irradiation resistant load point power supply for aerospace											
100	SLPL0505S	16.5	3～6	3.3	5	88	14	DVPL0505S	/	24.84×20.32×6.90	H
101	SLPL0510S	33	3～6	3.3	10	91	20	DVPL0510S	/	27.31×27.31×6.86	H
irradiation resistant constant current											
102	LHLY2803P50	50	23～37	/	3	77	83	/	/	84.90×38.50×10.16	H
103	LHLY4203P50	50	33～48	/	3	77	83	/	/	84.90×38.50×10.16	H
104	LHLY2808P120	120	23～37	/	8	80	133	/	/	90.20×50.40×13.00	H
105	LHLY4208P120	120	33～48	/	8	81	133	/	/	90.20×50.40×13.00	H
irradiation resistant surge suppressor											
106	LCL28	200	16～50	/	7	99	20	DVCL28	/	27.31×27.31×6.86	H
107	LCL28F	200	16～50	/	7	99	20	DVCL28F	/	38.7×27.31×6.86	H

Under-researched Products

NO.	Part Number	Output Power (W)	Input Voltage Range (V)	Output Voltage (V)	Output Current (A)	Typical Efficiency (%)	Typical Weight (g)	Foreign Model	Model of Matched Filter	Package Size (mm)	Quality Grade
350W ir radiation resistant DC/DC converter											
1	LDCD/28-5-200H/SP	200	20～36	5	40	87	130	/	LFE/(20-50)-461-750	90.2×50.4×13.8	H
2	LDCD/28-12-350H/SP	350	20～36	12	29.2	89	130	/	LFE/(20-50)-461-750	90.2×50.4×13.8	H
3	LDCD/28-28-350H/SP	350	20～36	28	12.5	90	130	/	LFE/(20-50)-461-750	90.2×50.4×13.8	H
4	LDCD/42-5-200H/SP	200	34～50	5	40	88	130	/	LFE/(20-50)-461-750	90.2×50.4×13.8	H
5	LDCD/42-12-350H/SP	350	34～50	12	29.2	90	130	/	LFE/(20-50)-461-750	90.2×50.4×13.8	H
6	LDCD/42-28-350H/SP	350	34～50	28	12.5	91	130	/	LFE/(20-50)-461-750	90.2×50.4×13.8	H
7	LDCD/100-5-200H/SP	200	70～120	5	40	89	130	/	LFE100-461-1000	90.2×50.4×13.8	H
8	LDCD/100-12-350H/SP	350	70～120	12	29.2	91	130	/	LFE100-461-1000	90.2×50.4×13.8	H
9	LDCD/100-20-350H/SP	350	70～120	20	17.5	92	130	/	LFE100-461-1000	90.2×50.4×13.8	H
10	LDCD/100-28-350H/SP	350	70～120	28	12.5	92	130	/	LFE100-461-1000	90.2×50.4×13.8	H
micropower irradiation resistant DC/DC converter											
11	LDC01-05-12SH	1	4.5～5.5	12	0.083	83	3	DCP010512BP	/	CDIP-14/≤20.0×7.7×5.5	H
12	LDC01-05-05SH	1	4.5～5.5	5	0.2	75	3	DCP010505BP	/	CDIP-14/≤20.0×7.7×5.5	H
13	LDC01-28/42-12SRH	1	20～50	12	0.083	64	3	/	/	10×10×9.5	H

Rad-hard EMI Filters Series for Space Use



INTRODUCTION:

EMI filter products for aerospace use are used together with DC/DC converters to effectively suppress noise interference, improve the anti-interference ability of modules and systems, and make aerospace electronic systems have good electromagnetic compatibility characteristics. The series products adopt thick film hybrid integrated technology and all-metal sealed packaging, which have the advantages of small size, high reliability, strong radiation resistance, etc. The series products have been applied in batches to many aerospace missions such as communication satellites, remote sensing satellites, navigation satellites, space stations, etc. The series products have rich experience in in-orbit flight, and the products are stable and reliable.

FUNCTION:

EMI filter series products are used together with DC/DC converter to reduce the mutual interference between primary power supply and DC/DC converter, so that aerospace electronic system has good electromagnetic compatibility characteristics. The product input includes two series of 20V-50V and 80V-120V, covering 28V, 42V and 100V satellite bus, with output current of 0.8A~15A.

FEATURES:

Thick-film hybrid integrated process, all-metal sealed packaging, differential mode and common mode filter topology, wide operating temperature range, strong noise suppression ability and high reliability.

QUALITY CONTROL:

Grade: H, YB

Specification:

GJB2438B-2017 *General Specification for Hybrid Integrated Circuits*

Q/QJA20085A-2017 *General Specification for Hybrid Integrated Circuits for Aerospace Applications*

Quality Control for Process Requirements of Space Prohibited and Restricted Use

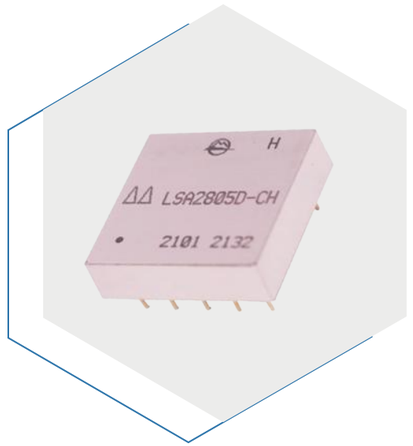
APPLICATIONS:

It is applied to satellites, spacecraft, space stations, deep space exploration and other highly reliable and high-performance electronic systems.

Approved Products

NO.	Part Number	Output Power (W)	Input Voltage Range (V)	Output Current (A)	Typical Weight (g)	Foreign Model	Matching Model	Package Size (mm)	Quality Grade
20V-50V input EMI filter series									
1	LFSA/(20-50)-461-40	40	20～50	0.8	14	FMSA-461	20V～50V input 1.5W/5W series	24.89 × 20.45 × 6.98	H，YB
2	LFH/(20-50)-461-75	75	20～50	1.5	33	FMH-461	20V～50V input 15W series(barring three-way output module)	51.00 × 28.84 × 8.38	H，YB
3	LFC/(20-50)-461-135	135	20～50	2.7	46	FMC-461	20V～50V input 5W/15W/30W series	73.66 × 28.32 × 10.00	H，YB
4	LFCE/(20-50)-461-150	150	20～50	3	35	FMCE-0328	20V～50V input 15Wseries	37.23 × 28.84 × 8.38	H
5	LFCE/(20-50)-461-250	250	20～50	5	48	FMCE-0528	20V～50V input 15W series	73.81×28.40×10.10	H
6	LFE/(20-50)-461-500	500	20～50	10	72	FME-461	20V～50V input below 65W	76.33 × 38.23 × 10.16	H，YB
7	LSFE/(20-50)-461-500	500	20～50	10	72	/	20V～50V input 120W series including surge suppressor	76.33×38.23×10.16	H
8	LDCD/(20-50)-461-750	750	20～50	15	76	/	20V～50V input 120W series	76.33×38.23×10.16	YC，H
30V-80V input EMI filter series									
9	LME/50-461-350	350	-100～100	7	82	/	30V～80V input series	63.63 × 50.93 × 9.59	H
70V-120V input EMI filter series									
10	LFE100-461-50	50	70～120	0.5	33	/	70V～120V input 5W/15W/20W series	51.00 × 28.94 × 8.68	H，YB
11	LFE100-461-80	80	70～120	0.8	33	/	70V～120V input 5W/15W/20W series	51.00 × 28.94 × 8.68	H，YB
12	LFE100CH-461-100	100	70～120	1	76	/	70V～70V input below 65W series including surge suppressor	76.70 × 38.60 × 10.66	H，YB
13	LFE100CH-461-300	300	70～120	3	76	/	70V～120V input below 65W series including surge suppressor	76.70 × 38.60 × 10.66	H，YB
14	LFE100-461-150	150	70～120	1.5	70	/	120Wseries (barring LDCD/100-5-100H/SP)	76.33 × 38.23 × 10.16	H，YC
15	LFE100-461-400	400	70～120	4	76	/	120Wseries	76.70 × 38.60 × 10.66	H，YC
16	LSFE100-461-400	400	70～120	4	76	/	70V～120V input 120W series including surge suppressor	76.70×38.60×10.66	H
17	LFE100-461-1000	1000	70～120	10	76	/	120W series (barring LDCD/100-5-100H/SP)	76.70 × 38.60 × 10.66	H，YC

High Reliability DC/DC Converter



FEATURES:

The thick film hybrid integration process, full metal sealed packaging, single-end topology structure, input and output are isolated by optical coupling/magnetic feedback, the product has a wide operating temperature range and high reliability.

QUALITY CONTROL:

Grade: H

Specification:

GJB2438B-2017 *General for Hybrid Integrated Circuits*

APPLICATIONS:

The products are applied to aviation, weapons, electronics and other high reliability, high performance electronic systems.

INTRODUCTION:

The series adopts thick-film hybrid integration technology, bare chip hybrid integration, and full metal sealed packaging, offering advantages such as small size and high reliability, with quality grades covering H. These products have been mass-produced and applied to multiple key model tasks, including strategic, tactical, airborne, and vehicle-mounted applications, achieving successful launch missions and stable, reliable operation radiation environments.

FUNCTION:

The system bus voltage is converted into stable voltages that meet the power supply requirements of each board, with input voltages covering 5V bus, 28V bus, 270V bus, and other weapon system power supply needs. Output options include single, dual, and triple channels, with output voltages including 3.3V,5V,12V,15V,28V, ±5V, ±12V, ±15V,5V&±12V,5V&±15V, and more common output voltages. It features enable control, synchronous input, synchronous output, short-circuit protection, under-voltage protection, over-voltage protection, adjustable output voltage, and current sharing functions.

Approved Products

NO.	Part Number	Output Power (W)	Input Voltage Range (V)	Output Voltage (V)	Output Current (A)	Typical Efficiency (%)	Typical Weight (g)	Foreign Model	Model of Matched Filter	Package Size (mm)	Quality Grade
Surge protector DC/DC converter											
1	LCH2805S-CH	5	15～50 anti-impulse 80V/s	5	1	76	13.5	DVCH2805S	LFSA-CE102-CH	25.24 × 20.76× 6.73	H
2	LCH2812S-CH	5	15～50 anti-impulse 80V/s	12	0.417	77	13.5	DVCH2812S	LFSA-CE102-CH	25.24 × 20.76× 6.73	H
3	LCH2815S-CH	5	15～50 anti-impulse 80V/s	15	0.333	78	13.5	DVCH2815S	LFSA-CE102-CH	25.24 × 20.76× 6.73	H
4	LCH2805D-CH	5	15～50 anti-impulse 80V/s	±5	±0.5	78	13.5	DVCH2805D	LFSA-CE102-CH	25.24 × 20.76× 6.73	H
5	LCH2815D-CH	5	16～40 anti-impulse 80V/s	±15	±0.166	75	13.5	DVCH2815D	LFSA-CE102-CH	25.24 × 20.76× 6.73	H
6	LSA2805S-CH	8	15～50 anti-impulse 80V/s	5	1.6	78	20	DVSA2805S	LFSA-CE102-CH	27.51 × 27.51 × 7.10	H
7	LSA2805SF-CH	8	15～50 anti-impulse 80V/s	5	1.6	78	23	DVSA2805SF	LFSA-CE102-CH	38.70 × 27.51 × 7.10	H
8	LSA2812S-CH	8	15～50 anti-impulse 80V/s	12	0.66	80	25	DVSA2812S	LFSA-CE102-CH	27.51 × 27.51 × 7.10	H
9	LSA2812SF-CH	8	15～50 anti-impulse 80V/s	12	0.66	80	25	DVSA2812SF	LFSA-CE102-CH	38.70 × 27.51 × 7.10	H
10	LSA2815S-CH	8	15～50 anti-impulse 80V/s	15	0.53	80	25	DVSA2815S	LFSA-CE102-CH	27.51 × 27.51 × 7.10	H
11	LSA2815SF-CH	8	15～50 anti-impulse 80V/s	15	0.53	80	25	DVSA2815SF	LFSA-CE102-CH	38.70 × 27.51 × 7.10	H
12	LSA2805D-CH	8	15～50 anti-impulse 80V/s	±5	±0.8	78	25	DVSA2805D	LFSA-CE102-CH	27.51 × 27.51 × 7.10	H
13	LSA2805DF-CH	8	15～50 anti-impulse 80V/s	±5	±0.8	78	25	DVSA2805DF	LFSA-CE102-CH	38.70 × 27.51 × 7.10	H
14	LSA2812D-CH	8	15～50 anti-impulse 80V/s	±12	±0.33	80	25	DVSA2812D	LFSA-CE102-CH	27.51 × 27.51 × 7.10	H
15	LSA2812DF-CH	8	15～50 anti-impulse 80V/s	±12	±0.33	80	25	DVSA2812DF	LFSA-CE102-CH	38.70 × 27.51 × 7.10	H
16	LSA2815D-CH	8	15～50 anti-impulse 80V/s	±15	±0.26	80	25	DVSA2815D	LFSA-CE102-CH	27.51 × 27.51 × 7.10	H
17	LSA2815DF-CH	8	15～50 anti-impulse 80V/s	±15	±0.26	80	25	DVSA2815DF	LFSA-CE102-CH	38.70 × 27.51 × 7.10	H
18	LHF+2805S-CH	15	15～50 anti-impulse 80V/s	5	3	84	30	DVHF2805S	LFH-CE102-CH，LFH-CE102F-CH	36.96×28.58×8.38	H
19	LHF+2805SF-CH	15	15～50 anti-impulse 80V/s	5	3	84	35	DVHF2805SF	LFH-CE102-CH，LFH-CE102F-CH	50.80×28.58×8.38	H
20	LHF+285R2S-CH	18	15～50 anti-impulse 80V/s	5.2	3.46	84	30	DVHF285R2S	LFH-CE102-CH，LFH-CE102F-CH	36.96×28.58×8.38	H
21	LHF+285R2SF-CH	18	15～50 anti-impulse 80V/s	5.2	3.46	84	35	DVHF285R2SF	LFH-CE102-CH，LFH-CE102F-CH	50.80×28.58×8.38	H
22	LHF+2806S-CH	18	15～50 anti-impulse 80V/s	6	3	84	30	DVHF285R7S	LFH-CE102-CH，LFH-CE102F-CH	36.96×28.58×8.38	H
23	LHF+2806SF-CH	18	15～50 anti-impulse 80V/s	6	3	84	33	DVHF285R7SF	LFH-CE102-CH，LFH-CE102F-CH	50.80×28.58×8.38	H
24	LHF+2812S-CH	20	15～50 anti-impulse 80V/s	12	1.67	83	30	DVHF2812S	LFH-CE102-CH，LFH-CE102F-CH	36.96×28.58×8.38	H
25	LHF+2812SF-CH	20	15～50 anti-impulse 80V/s	12	1.67	83	33	DVHF2812SF	LFH-CE102-CH，LFH-CE102F-CH	50.80×28.58×8.38	H
26	LHF+2815S-CH	20	15～40 anti-impulse 80V/s	15	1.34	85	30	DVHF2815S	LFH-CE102-CH，LFH-CE102F-CH	36.96×28.58×8.38	H
27	LHF+2815SF-CH	20	15～50 anti-impulse 80V/s	15	1.34	85	33	DVHF2815SF	LFH-CE102-CH，LFH-CE102F-CH	50.80×28.58×8.38	H
28	LHF+2805D-CH	15	15～40 anti-impulse 80V/s	±5	±1.5	81	30	DVHF2805D	LFH-CE102-CH，LFH-CE102F-CH	36.96×28.57×8.38	H
29	LHF+2805DF-CH	15	15～50 anti-impulse 80V/s	±5	±1.5	81	33	DVHF2805DF	LFH-CE102-CH，LFH-CE102F-CH	50.80×28.57×8.38	H
30	LHF+2812D-CH	20	15～50 anti-impulse 80V/s	±12	±0.84	85	30	DVHF2812D	LFH-CE102-CH，LFH-CE102F-CH	36.96×28.57×8.38	H
31	LHF+2812DF-CH	20	15～50 anti-impulse 80V/s	±12	±0.84	85	33	DVHF2812DF	LFH-CE102-CH，LFH-CE102F-CH	50.80×28.57×8.38	H
32	LHF+2815D-CH	20	15～50 anti-impulse 80V/s	±15	±0.67	86	29	DVHF2815D	LFH-CE102-CH，LFH-CE102F-CH	36.96×28.57×8.38	H
33	LHF+2815DF-CH	20	15～50 anti-impulse 80V/s	±15	±0.67	86	33	DVHF2815DF	LFH-CE102-CH，LFH-CE102F-CH	50.80×28.57×8.38	H
34	LHF28512T	15	15～50 anti-impulse 80V/s	5/±12	1.5/±0.312	78	30	DVHF+28512T	LFH-CE102-CH，LFH-CE102F-CH	37.16×28.77×8.58	H
35	LHF28512TF	15	15～50 anti-impulse 80V/s	5/±12	1.5/±0.312	78	32	DVHF+28512TF	LFH-CE102-CH，LFH-CE102F-CH	51.80×28.77×8.58	H
36	LHF28515T	15	15～50 anti-impulse 80V/s	5/±15	1.5/±0.25	78	30	DVHF+28515T	LFH-CE102-CH，LFH-CE102F-CH	37.16×28.77×8.58	H
37	LHF28515TF	15	15～50 anti-impulse 80V/s	5/±15	1.5/±0.25	78	32	DVHF+28515TF	LFH-CE102-CH，LFH-CE102F-CH	51.80×28.77×8.58	H
38	LTR283R3S-CH	25	15～50 anti-impulse 80V/s	3.3	7.57	75	50	DVTR283R3S	LFC-CE102-CH，LFC-CE102F-CH，LFCE-CE102F-CH	53.50×28.60 ×10.46	H

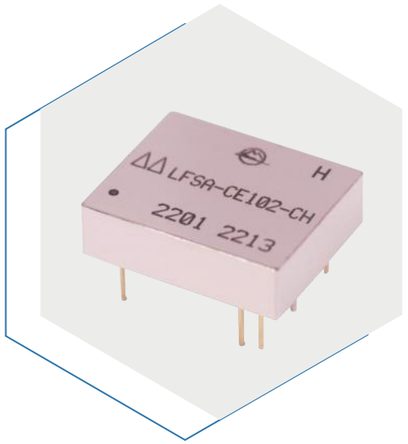
Approved Products

NO.	Part Number	Output Power (W)	Input Voltage Range (V)	Output Voltage (V)	Output Current (A)	Typical Efficiency (%)	Typical Weight (g)	Foreign Model	Model of Matched Filter	Package Size (mm)	Quality Grade
39	LTR283R3SF-CH	25	15～50 anti-impulse 80V/s	3.3	7.57	75	56	DVTR283R3SF	LFC-CE102-CH，LFC-CE102F-CH，LFCE-CE102F-CH	73.81×28.60×10.46	H
40	LTR2805S-CH	30	15～50 anti-impulse 80V/s	5	6	80	50	DVTR2805S	LFC-CE102-CH，LFC-CE102F-CH，LFCE-CE102F-CH	53.50×28.60 ×10.46	H
41	LTR2805SF-CH	30	15～50 anti-impulse 80V/s	5	6	80	56	DVTR2805SF	LFC-CE102-CH，LFC-CE102F-CH，LFCE-CE102F-CH	73.81×28.60×10.46	H
42	LTR285R7S-CH	30	15～50 anti-impulse 80V/s	5.7	5.26	81	50	/	LFC-CE102-CH，LFC-CE102F-CH，LFCE-CE102F-CH	53.50×28.60 ×10.46	H
43	LTR285R7SF-CH	30	15～50 anti-impulse 80V/s	5.7	5.26	81	56	/	LFC-CE102-CH，LFC-CE102F-CH，LFCE-CE102F-CH	73.81×28.60×10.46	H
44	LTR2812S-CH	40	15～50 anti-impulse 80V/s	12	3.33	85	50	DVTR2812S	LFC-CE102-CH，LFC-CE102F-CH，LFCE-CE102F-CH	53.50×28.60 ×10.46	H
45	LTR2812SF-CH	40	15～50 anti-impulse 80V/s	12	3.33	85	56	DVTR2812SF	LFC-CE102-CH，LFC-CE102F-CH，LFCE-CE102F-CH	73.81×28.60×10.46	H
46	LTR2815S-CH	40	15～50 anti-impulse 80V/s	15	2.66	85	50	DVTR2815S	LFC-CE102-CH，LFC-CE102F-CH，LFCE-CE102F-CH	53.50×28.60 ×10.46	H
47	LTR2815SF-CH	40	15～50 anti-impulse 80V/s	15	2.66	85	56	DVTR2815SF	LFC-CE102-CH，LFC-CE102F-CH，LFCE-CE102F-CH	73.81×28.60×10.46	H
48	LTR2818S-CH	40	15～50 anti-impulse 80V/s	18	2.22	87	50	DVTR2818S	LFC-CE102-CH，LFC-CE102F-CH，LFCE-CE102F-CH	53.50×28.60 ×10.46	H
49	LTR2818SF-CH	40	15～50 anti-impulse 80V/s	18	2.22	87	56	DVTR2818SF	LFC-CE102-CH，LFC-CE102F-CH，LFCE-CE102F-CH	73.81×28.60×10.46	H
50	LTR2828S-CH	40	15～50 anti-impulse 80V/s	28	1.43	86	61	DVTR2828S	LFC-CE102-CH，LFC-CE102F-CH，LFCE-CE102F-CH	53.50×28.60 ×10.46	H
51	LTR2828SF-CH	40	16～40 anti-impulse 80V/s	28	1.43	86	61	DVTR2828SF	LFC-CE102-CH，LFC-CE102F-CH，LFCE-CE102F-CH	73.81×28.60×10.46	H
52	LTR2805D-CH	30	15～50 anti-impulse 80V/s	±5	±3	77	58	DVTR2805D	LFC-CE102-CH，LFC-CE102F-CH，LFCE-CE102F-CH	53.50×28.60 ×10.46	H
53	LTR2805DF-CH	30	15～50 anti-impulse 80V/s	±5	±3	77	61	DVTR2805DF	LFC-CE102-CH，LFC-CE102F-CH，LFCE-CE102F-CH	73.81×28.60×10.46	H
54	LTR2812D-CH	40	15～50 anti-impulse 80V/s	±12	±1.66	83	58	DVTR2812D	LFC-CE102-CH，LFC-CE102F-CH，LFCE-CE102F-CH	53.50×28.60 ×10.46	H
55	LTR2812DF-CH	40	15～50 anti-impulse 80V/s	±12	±1.66	83	61	DVTR2812DF	LFC-CE102-CH，LFC-CE102F-CH，LFCE-CE102F-CH	73.81×28.60×10.46	H
56	LTR2815D-CH	40	15～50 anti-impulse 80V/s	±15	±1.33	84	58	DVTR2815D	LFC-CE102-CH，LFC-CE102F-CH，LFCE-CE102F-CH	53.50×28.60 ×10.46	H
57	LTR2815DF-CH	40	15～50 anti-impulse 80V/s	±15	±1.33	84	61	DVTR2815DF	LFC-CE102-CH，LFC-CE102F-CH，LFCE-CE102F-CH	73.81×28.60×10.46	H
58	LTR28512T-CH	30	16～40 anti-impulse 80V/s	5/±12	4/±0.416	80	47	MTR28512T	LFC-CE102-CH，LFC-CE102F-CH，LFCE-CE102F-CH	49.85 × 34.61 × 10.50	H
59	LTR28512TF-CH	30	16～40 anti-impulse 80V/s	5/±12	4/±0.416	80	50	MTR28512TF	LFC-CE102-CH，LFC-CE102F-CH，LFCE-CE102F-CH	68.89 × 34.61 × 10.50	H
60	LTR28515T-CH	30	16～40 anti-impulse 80V/s	5/±15	4/±0.333	80	47	MTR28515T	LFC-CE102-CH，LFC-CE102F-CH，LFCE-CE102F-CH	49.85 × 34.61 × 10.50	H
61	LTR28515TF-CH	30	16～40 anti-impulse 80V/s	5/±15	4/±0.333	80	50	MTR28515TF	LFC-CE102-CH，LFC-CE102F-CH，LFCE-CE102F-CH	68.89 × 34.61 × 10.50	H
62	LFL2805S-CH	100	16～40 anti-impulse 80V/s	5	20	87	75	DVFL2805S	LFE-CE102-CH	76.70 ×38.60 ×10.66	H
63	LFL2812S-CH	120	16～40 anti-impulse 80V/s	12	10	89	75	DVFL2812S	LFE-CE102-CH	76.70 ×38.60 ×10.66	H
64	LFL2815S-CH	120	16～40 anti-impulse 80V/s	15	8	90	75	DVFL2815S	LFE-CE102-CH	76.70 ×38.60 ×10.66	H
65	LFL2828S-CH	120	16～40 anti-impulse 80V/s	28	4.29	89	76	DVFL2828S	LFE-CE102-CH	76.70 ×38.60 ×10.66	H
66	LFL2812D-CH	120	16～40 anti-impulse 80V/s	±12	±5	89	76	DVFL2812D	LFE-CE102-CH	76.70 ×38.60 ×10.66	H

Approved Products

NO.	Part Number	Output Power (W)	Input Voltage Range (V)	Output Voltage (V)	Output Current (A)	Typical Efficiency (%)	Typical Weight (g)	Foreign Model	Model of Matched Filter	Package Size (mm)	Quality Grade
67	LFL2815D-CH	120	16～40 anti-impulse 80V/s	±15	±4	90	76	DVFL2815D	LFE-CE102-CH	76.70 ×38.60 ×10.66	H
Ultra small DC/DC converter											
68	LDWI03-24S5R2	3.12	16～36	5.2	0.6	80	9.5	/	LFSA-CE102-CH	23.7 × 13.7 × 8.0	H
69	LDWI03-24S05	3	16～36	5	0.6	80	9.5	/	LFSA-CE102-CH	23.7 × 13.7 × 8.0	H
70	LPT/12-2805S	12	16～40	5	2.4	84	25	/	LFH-CE102F-CH，LFH-CE102-CH	27.5 × 27.5 × 9.4	H
71	LPT/12-2805SF	12	16～40	5	2.4	84	28	/	LFH-CE102F-CH，LFH-CE102-CH	38.7 × 27.5 × 9.4	H
72	LPT/15-285R2S	15	16～40	5.2	2.9	85	25	/	LFH-CE102F-CH	27.5 × 27.5 × 9.4	
73	LPT/15-285R2SF	15	16～40	5.2	2.9	85	28	/	LFH-CE102-CH	38.7 × 27.8 × 8.4	
74	LPT/15-2812S	15	16～40	12	1.25	84	25	/	LFH-CE102F-CH，LFH-CE102-CH	27.5 × 27.5 × 9.4	H
75	LPT/15-2812SF	15	16～40	12	1.25	86	28	/	LFH-CE102F-CH，LFH-CE102-CH	38.7 × 27.5 × 9.4	H
76	LPT/15-2815S	15	16～40	15	1	87	25	/	LFH-CE102F-CH，LFH-CE102-CH	27.5 × 27.5 × 9.4	H
77	LPT/15-2815SF	15	16～40	15	1	87	28	/	LFH-CE102F-CH，LFH-CE102-CH	38.7 × 27.5 × 9.4	H
78	LPT/30-2812S	30	16～40	12	2.5	83	35	/	LFH-CE102F-CH，LFH-CE102-CH	36.96×28.58×8.38	H
79	LPT/30-2812SF	30	16～40	12	2.5	83	38	/	LFH-CE102F-CH，LFH-CE102-CH	50.80×28.58×8.38	H
80	LFX283R3S	50	16～50	3.3	15.15	87	38	MFX283R3S	LFD-CE102-CH，LFD-CE102F-CH	53.21 × 28.32 × 10.84	H
81	LFX283R3SF	50	16～50	3.3	15.15	87	60	MFX283R3SF	LFD-CE102-CH，LFD-CE102F-CH	70.50 × 28.32 × 10.84	H
82	LFX2805S	50	16～50	5	10	90	58	MFX2805S	LFD-CE102-CH，LFD-CE102F-CH	53.21 × 28.32 × 10.84	H
83	LFX2805SF	50	16～50	5	10	90	60	MFX2805SF	LFD-CE102-CH，LFD-CE102F-CH	70.50 × 28.32 × 10.84	H
84	LFX2815S	50	16～50	15	3.33	89	58	MFX2815S	LFD-CE102-CH，LFD-CE102F-CH	53.21 × 28.32 × 10.84	H
85	LFX2815SF	50	16～50	15	3.33	89	60	MFX2815SF	LFD-CE102-CH，LFD-CE102F-CH	70.50 × 28.32 × 10.84	H
Micro-power isolated power supply											
86	LCR010503S	1	4.5～5.5	3.3	0.3	55	5	DCR010503U	/	CSOP-28 ⩽18.4×9.7×5.5	H
87	LCR010503P	1	4.5～5.5	3.3	0.3	55	5	DCR010503P	/	CDIP-18 ⩽23.5×7.7×5.5	H
88	LCR010505S	1	4.5～5.5	5	0.2	55	5	DCR010505U	/	CSOP-28 ⩽18.4×9.7×5.5	H
89	LCR010505P	1	4.5～5.5	5	0.2	55	5	DCR010505P	/	CDIP-18 ⩽23.5×7.7×5.5	H
90	LCP010505P	1	4.5～5.5	5	0.2	75	5	DCP010505BP	/	CDIP-14 ⩽20.0×7.7×5.5	H
91	LDC010505S-CH	1	4.5～5.5	5	0.2	57	2	/	/	21.8 × 8.0× 3.6	H
92	LDCP010512D	1	4.5～5.5	±12	0.042	80	5	DCP010512DBP	/	21.8 × 8.0× 3.6	H
93	LDCP010515D	1	4.5～5.5	±15	0.033	80	5	DCP010515DBP	/	21.8 × 8.0× 3.6	H
94	LCH0505S-A-CH	2	4.5～5.5	5	0.4	57	25	DCH0505S	/	25.2 × 20.8 × 9.0	H
95	LCR011203S	1.287	10.8～13.2	3.3	0.39	55	5	DCR011203U	/	CSOP-28 ⩽18.4×9.7×5.5	H
96	LCR011203P	1.287	10.8～13.2	3.3	0.39	55	5	DCR011203P	/	CDIP-18 ⩽23.5×7.7×5.5	H
97	LDC011212S	1	10.8～13.2	12	0.083	65	5	DCP011212U	/	21.8 × 8.0× 3.6	H
98	LCR011205S	1	10.8～13.2	5	0.2	55	5	DCR011205U	/	CSOP-28 ⩽18.4×9.7×5.5	H
99	LCR011205P	1	10.8～13.2	5	0.2	55	5	DCR011205P	/	CDIP-18 ⩽23.5×7.7×5.5	H
100	LCP021203S	2	10.8～13.2	3.3	0.606	75	5	DCP021203U	/	CSOP-28 ⩽18.4×9.7×6.0	H
101	LCP021205S	2	10.8～13.2	5	0.4	75	5	DCP021205U	/	CSOP-28 ⩽18.4×9.7×6.0	H
102	LCP021212S	2	10.8～13.2	12	0.166	75	5	DCP021212U	/	CSOP-28 ⩽18.4×9.7×6.0	H
103	LCP021515S	2	13.5～16.5	15	0.133	83	5	DCP021515U	/	CSOP-28 ⩽18.4×9.7×6.0	H
104	LCP021515P	2	13.5～16.5	15	0.133	83	5	DCP021515P	/	CSOP-18 ⩽20.0×7.7×6.0	H

Military EMI Filter



FEATURES:

Thick-film hybrid integrated process, all-metal sealed packaging, differential mode and common mode filter topology, wide operating temperature range, strong noise suppression ability and high reliability.

QUALITY CONTROL:

Grade: H

Specification:

GJB2438B-2017

General Specification for Hybrid Integrated Circuits

INTRODUCTION:

Military EMI filter products are used with DC/DC converters to effectively suppress noise interference, improve the anti-interference capability of modules and systems, and make military electronic systems have good electro-magnetic compatibility characteristics

The series adopts thick film hybrid integration process and full metal sealed packaging, which has the advantages of small size and high reliability, and is completely controllable. It has been successfully applied to strategic, tactical, airborne, vehicle-mounted and other key model tasks, and the launch task was successfully completed with stable and reliable operation of the product.

FUNCTION:

EMI filter series products are used with DC/DC converters to reduce the mutual interference between primary power supply and DC/DC converters, so that military electronic systems meet electromagnetic compatibility standards.

APPLICATIONS:

The products are applied to aviation, weapons, electronics and other high reliability, high performance electronic systems.

Approved Products

NO.	Part Number	Output Power (W)	Input Voltage Range (V)	Output Current (A)	Typical Weight (g)	Foreign Model	Matching Model	Package Size (mm)	Quality Grade
1	LFSA-CE102-CH	50	15～50	0.8	20	DVMSA28	LSA/LCH series	20.56 × 25.04 × 7.30	H
2	LFH-CE102-CH	100	15～50	2	30	DVMH28	LHF+ series	37.13 × 28.74 × 8.48	H
3	LFH-CE102F-CH	100	15～50	2	32	DVMH28	LHF+ series	51.00 × 29.04 × 8.58	H
4	LFC-CE102-CH	135	15～50	2.7	48	DVMC28	LTR series	53.41 × 28.52 × 12.77	H
5	LFC-CE102F-CH	135	15～50	2.7	35	DVMC28F	LTR series	73.66 × 28.52 × 12.77	H
6	LFCE-CE102F-CH	250	15～50	5	50	FMCE-0528	LTR series	73.81 × 28.40 × 10.10	H
7	LFD-CE102F-CH	350	15～50	7	59	DVMD28	LFX series	69.00 × 34.48 × 13.00	H
8	LFE-CE102-CH	750	15～50	15	76	DVME28	LFL series	76.45 ×38.23 ×10.16	H

Military High Density Module Power Supply

FEATURES:

Micro circuit module integration process

High efficiency soft switch topology structure

High reliability quality assurance design, production and screening.

QUALITY CONTROL:

Grade: M1, QA, QB

Specification:

GJB10164-2021 *General Specifications for Microcircuit Modules*

SJ 20668 *General Specifications for Microcircuit Modules*

INTRODUCTION:

The series of products includes automatic regulation rectifier modules, surge suppressors, isolated power supply modules, and load point power supplies. They adopt potting or plastic encapsulation processes, featuring high performance, high reliability, and high power density. The input range for isolated power supplies includes: 9-36V,18-36V,16-40V, etc. The product series offers common packages such as 1/16 brick, 1/8 brick, 1/4 brick, 1/2 brick, etc. These products comply with GJB10164-2021 "General Specifications for Microcircuit Modules" or SJ 20668 "General Specifications for Microcircuit Modules," making them suitable for military electronic equipment systems that require high reliability and performance, such as those in defense and aviation applications.

FUNCTION:

The supply bus voltage is converted into stable voltages that meet the needs of various load devices. The input voltage covers 24V bus, 28V bus, and other ground equipment as well as aviation power supply requirements. It can be applied in high-reliability fields such as aviation, automotive, and marine applications, meeting the demands for high efficiency, high power density, and strong environmental adaptability. It features enable control, short-circuit protection, undervoltage protection, and more.

Approved Products

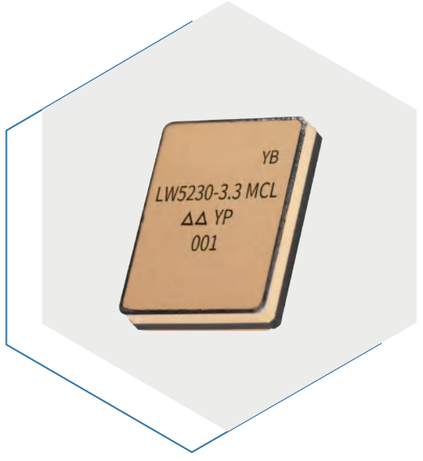
NO.	Part Number	Output Power (W)	Input Voltage Range (V)	Output Voltage (V)	Output Current (A)	Typical Efficiency (%)	Package	Quality Grade
Brick Power Supply Module								
1	LMDC18S15P30	30	9～36	15	2	88	1/16 brick	military
2	LMDC18S12P36	36	9～36	12	3	87	1/16 brick	military
3	LMDC18S05P40	40	9～36	5	8	88	1/16 brick	military
4	LMDC18S12P50	50	9～36	12	4.16	88	1/16 brick	military
5	LMDC18S15P50	50	9～36	15	3.33	89	1/16 brick	military
6	LMDC28S24P60	60	9～36	24	2.5	86	1/16 brick	M1, QA, QB
7	LMDC28S12N96S1A	96	16～40	12	8	89	1/16 brick	M1, QA, QB
8	LMDC28S24P50S1A	50	16～40	24	2.08	89	1/16 brick	M1, QA, QB
9	LMDC287S05N120E1A	100	16～40	5	24	90	1/8 brick	M1, QA, QB
10	LMDC28S12N120E1A	120	16～40	12	10	90	1/8 brick	M1, QA, QB
11	LMDC28S15N150E1A	150	16～40	15	10	91	1/8 brick	M1, QA, QB
12	LMDC24S24P120E2A	120	18～36	24	5	89	1/8 brick	M1, QA, QB
13	LMDC28S05N200Q1A	200	16～40	5	40	89	1/4 brick	M1, QA, QB
14	LMDC28S12N200Q1A	200	16～40	12	25	91	1/4 brick	M1, QA, QB
15	LMDC28S15N200Q1A	200	16～40	15	13.3	91	1/4 brick	M1, QA, QB
16	LMDC28S28N300Q1A	300	16～40	28	10.71	92	1/4 brick	M1, QA, QB
17	LMDC270S28N1K2H1A	1200	200～400	28	43	95	1/2 brick	M1, QA, QB
18	LMDC270S28N1K8F1A	1800	200～400	28	64.3	96	全 brick	M1, QA, QB
inch Power Supply Module								
1	LMDC28S05P5CA	5	16～40	5	1	79	12.7× 12.7 × 11.0	M1, QA, QB
2	LMDC28S12P5CA	5	16～40	12	0.417	84	12.7× 12.7 × 11.0	M1, QA, QB
3	LMDC28S15P5CA	5	16～40	15	0.333	85	12.7× 12.7 × 11.0	M1, QA, QB
4	LMDC28D05P5CA	5	16～40	±5	±0.5	78	12.7× 12.7 × 11.0	M1, QA, QB
5	LMDC28D12P5CA	5	16～40	±12	±0.210	82	12.7× 12.7 × 11.0	M1, QA, QB
6	LMDC28D15P5CA	5	16～40	±15	±0.167	84	12.7× 12.7 × 11.0	M1, QA, QB
7	LMDC18S05P5CA	5	9～40	5	1	80	12.7×12.7 ×11.0	M1, QA, QB
8	LMDC18S12P5CA	5	9～40	12	0.417	82	12.7×12.7 ×11.0	M1, QA, QB
9	LMDC18S15P5CA	5	9～40	15	0.333	83	12.7×12.7 ×11.0	M1, QA, QB
10	LMDC18D05P5CA	5	9～40	±5	±0.5	78	12.7×12.7 ×11.0	M1, QA, QB
11	LMDC18D12P5CA	5	9～40	±12	±0.21	81	12.7×12.7 ×11.0	M1, QA, QB
12	LMDC18D15P5CA	5	9～40	±15	±0.167	82	12.7×12.7 ×11.0	M1, QA, QB
13	LMDC28S05P10DA	10	16～40	5	2	80	25.4× 12.7 × 11.0	M1, QA, QB
14	LMDC28S12P10DA	10	16～40	12	0.833	83	25.4× 12.7 × 11.0	M1, QA, QB
15	LMDC28S15P10DA	10	16～40	15	0.666	84	25.4× 12.7 × 11.0	M1, QA, QB
16	LMDC28D05P10DA	10	16～40	±5	±1	80	25.4× 12.7 × 11.0	M1, QA, QB
17	LMDC28D12P10DA	10	16～40	±12	±0.416	83	25.4× 12.7 × 11.0	M1, QA, QB
18	LMDC28D15P10DA	10	16～40	±15	±0.333	84	25.4× 12.7 × 11.0	M1, QA, QB
19	LMDC18S05P10DA	10	9～36	5	2	87	25.4×12.7 × 11.0	M1, QA, QB

Approved Products

NO.	Part Number	Output Power (W)	Input Voltage Range (V)	Output Voltage (V)	Output Current (A)	Typical Efficiency (%)	Package	Quality Grade
20	LMDC18S12P10DA	10	9～36	12	0.833	83	25.4×12.7 ×11.0	M1, QA, QB
21	LMDC18S15P10DA	10	9～36	15	0.666	83	25.4×12.7 ×11.0	M1, QA, QB
22	LMDC18D05P10DA	10	9～36	±5	±1	80	25.4×12.7 ×11.0	M1, QA, QB
23	LMDC18D12P10DA	10	9～36	±12	±0.416	85	25.4×12.7 ×11.0	M1, QA, QB
24	LMDC18D15P10DA	10	9～36	±15	±0.333	85	25.4×12.7 ×11.0	M1, QA, QB
25	LMDC28S05P15DA	15	16～40	5	3	88	25.4× 12.7 × 11.0	M1, QA, QB
26	LMDC28S12P15DA	15	16～40	12	1.25	85	25.4× 12.7 × 11.0	M1, QA, QB
27	LMDC28S15P15DA	15	16～40	15	1	85	25.4× 12.7 × 11.0	M1, QA, QB
28	LMDC28S27P15DA	15	16～40	27	0.55	87	25.4× 12.7 × 11.0	M1, QA, QB
29	LMDC28S48P15DA	15	16～40	48	0.31	88	25.4× 12.7 × 11.0	M1, QA, QB
30	LMDC28D05P15DA	15	16～40	±5	±1.5	83	25.4× 12.7 × 11.0	M1, QA, QB
31	LMDC28D12P15DA	15	16～40	±12	±0.625	87	25.4× 12.7 × 11.0	M1, QA, QB
32	LMDC28D15P15DA	15	16～40	±15	±0.5	87	25.4× 12.7 × 11.0	M1, QA, QB
33	LMDC28S05P30IA	30	16～40	5	6	82	25.4× 25.4 × 11.0	M1, QA, QB
34	LMDC28S12P30IA	30	16～40	12	2.5	89	25.4× 25.4 × 11.0	M1, QA, QB
35	LMDC28S15P30IA	30	16～40	15	2	90	25.4× 25.4 × 11.0	M1, QA, QB
36	LMDC28D05P30IA	30	16～40	±5	±3	80	25.4× 25.4 × 11.0	M1, QA, QB
37	LMDC28D12P30IA	30	16～40	±12	±1.25	87	25.4× 25.4 × 11.0	M1, QA, QB
38	LMDC28D15P30IA	30	16～40	±15	±1	87	25.4× 25.4 × 11.0	M1, QA, QB
39	LMDC18S05P30IA	30	9～36	5	6	85	25.4×25.4 ×11.0	M1, QA, QB
40	LMDC18S12P30IA	30	9～36	12	2.5	85.5	25.4×25.4 ×11.0	M1, QA, QB
41	LMDC18S15P30IA	30	9～36	15	2	86	25.4×25.4 ×11.0	M1, QA, QB
42	LMDC18S24P30IA	30	9～36	24	1.25	85	25.4×25.4 ×11.0	M1, QA, QB
43	LMDC18D05P30IA	30	9～36	±5	±3	80	25.4×25.4 ×11.0	M1, QA, QB
44	LMDC18D12P30IA	30	9～36	±12	±1.25	85	25.4×25.4 ×11.0	M1, QA, QB
45	LMDC18D15P30IA	30	9～36	±15	±1	85	25.4×25.4 ×11.0	M1, QA, QB
46	LMDC25D8P16	16	16～40	±8.4	±1	86	25.4× 25.4 × 6.8	M1, QA, QB
SiC/IGBT driver power								
1	LMDC12D1508R3A	3	11.4～12.6	15/-8	±0.12	82	20× 10.3 × 13	M1, QA, QB
2	LMDC12D1505R3A	3	11.4～12.6	15/-5	±0.12	82	20× 10.3 × 13	M1, QA, QB
3	LMDC28D1509R3A	3	21～31	15/-9	±0.12	84	20× 10.3 × 13	M1, QA, QB
4	LMDC28D1505R3A	3	21～31	15/-5	±0.12	84	20× 10.3 × 13	M1, QA, QB
5	LMDC15D1508R3A	3	14.25～15.75	15/-8	±0.12	82	20× 10.3 × 13	M1, QA, QB

NO.	Part Number	Output Power (W)	Input Voltage Range (V)	Output Voltage (V)	Output Current (A)	Typical Efficiency (%)	Typical Weight (g)	Foreign Model	Package Size (mm)	Quality Grade
Voltage surge suppressor										
1	LSPCM-12	120	9～40	17～40	/	99	65	VPTPCM-12	59.69 × 39.37 × 11.81	military
2	LSi10-28	200	11～40	11～40	10	/	65	VPTi10-28	59.69 × 39.37 × 11.81	military
3	LPGDS50NK	50	17～37	16～40	/	96	/	PGDS50NK/S/T	40× 26 × 8	military
4	LHUGD-50	50	9～40	9～40	/	98	/	HUGD-50/S/T	40× 26 × 8	military
5	LMSS28P150Q1A	150	16～40	17～40	/	96	/	/	59.69 × 39.37 × 11.81	M1, QA, QB

LDOs Series



INTRODUCTION:

It can be used as the secondary power supply for electrical system. According to the application environment,it can be divided into the rad-hard and the general series. According to the convert voltage type, it can be divided into the positive and negative series. According to the output voltage, it can be divided into the adjustable and the fixed series.It is appliacable to space and harsh radiation environments.

FUNCTION:

It offers a constant voltage for the load, simultaneity,and is of EN-control,OVP,OCP, OTP features.

FEATURES:

This series is featured of good rad-hard ability, wide input voltage range and high speed transient response ability. the whole series is divided into 1.5A,3A,5A and 7.5A.Various package includes SMD-1,FCP10,TO-257-G,TO-257-TD and TO-257-TS package forms.

QUALITY CONTROL:

Grade: YB, YC, H

Specification:

GJB2438A-2002 *General for Hybrid Integrated Circuits*

Q/QJA20085A-2017 *General Specification of Hybrid Integrated Circuits for Space Application*

Standard Requirements for Electronic Components in Aerospace Unique Project

APPLICATIONS:

Constant voltage source and secondary power supply for electrical system.

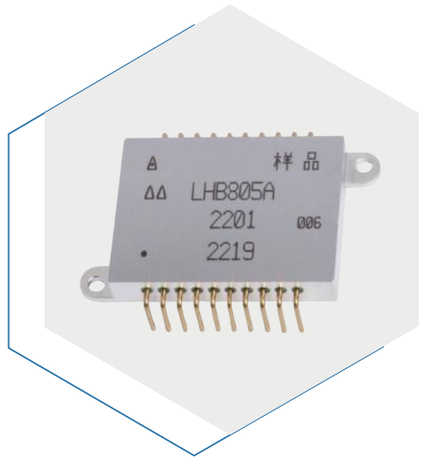
Approved Products

NO.	Part Number	V_{in} Range (V)	V_{out} Range (V)	MAX Output Current (A)	En Pin	Rad-hard (rad(Si))	Package	Quality Grade	Industy Counterpart
1	LSK5101-00	$V_{OUT}+V_D$～26	adjustable (1.24～VIN-VD)	1.5	Y	-	FCP10	QJB(H)/K	MSK5101-00
2	LSK5131-1.5TD	$V_{OUT}+V_D$～26	1.5	3	Y	-	TO-253-5-TD	QJB(H)/K	MSK5131-1.5TD
3	LSK5131-1.8TD	$V_{OUT}+V_D$～26	1.8	3	Y	-	TO-253-5-TD	QJB(H)/K	MSK5131-1.8TD
4	LSK5131-1.9TD	$V_{OUT}+V_D$～26	1.9	3	Y	-	TO-253-5-TD	QJB(H)/K	MSK5131-1.9TD
5	LSK5131-12TD	$V_{OUT}+V_D$～26	12	3	Y	-	TO-253-5-TD	QJB(H)/K	MSK5131-12TD
6	LSK5131-2.5TD	$V_{OUT}+V_D$～26	2.5	3	Y	-	TO-253-5-TD	QJB(H)/K	MSK5131-2.5TD
7	LSK5131-3.3TD	$V_{OUT}+V_D$～26	3.3	3	Y	-	TO-253-5-TD	QJB(H)/K	MSK5131-3.3TD
8	LSK5131-5.0TD	$V_{OUT}+V_D$～26	5	3	Y	-	TO-253-5-TD	QJB(H)/K	MSK5131-5.0TD
9	LSK5215-1.5	$V_{OUT}+V_D$～26	1.5	1.5	N	-	SMD-1	QJB(H)/K	MSK5215-1.5
10	LSK5215-1.8	$V_{OUT}+V_D$～26	1.8	1.5	N	-	SMD-1	QJB(H)/K, H, G	MSK5215-1.8
11	LSK5215-1.9	$V_{OUT}+V_D$～26	1.9	1.5	N	-	SMD-1	QJB(H)/K	MSK5215-1.9
12	LSK5215-12	$V_{OUT}+V_D$～26	12	1.5	N	-	SMD-1	QJB(H)/K	MSK5215-12
13	LSK5215-2.5	$V_{OUT}+V_D$～26	2.5	1.5	N	-	SMD-1	QJB(H)/K, H	MSK5215-2.5
14	LSK5215-3.3	$V_{OUT}+V_D$～26	3.3	1.5	N	-	SMD-1	QJB(H)/K, H, G	MSK5215-3.3
15	LSK5215-5.0	$V_{OUT}+V_D$～26	5	1.5	N	-	SMD-1	QJB(H)/K	MSK5215-5.0
16	LSK5230-1.5	$V_{OUT}+V_D$～26	1.5	3	N	-	SMD-1	QJB(H)/K, H, G	MSK5230-1.5
17	LSK5230-1.8	$V_{OUT}+V_D$～26	1.8	3	N	-	SMD-1	QJB(H)/K, H, G	MSK5230-1.8
18	LSK5230-1.9	$V_{OUT}+V_D$～26	1.9	3	N	-	SMD-1	QJB(H)/K	MSK5230-1.9
19	LSK5230-12	$V_{OUT}+V_D$～26	12	3	N	-	SMD-1	QJB(H)/K	MSK5230-12
20	LSK5230-2.5	$V_{OUT}+V_D$～26	2.5	3	N	-	SMD-1	QJB(H)/K, H, G	MSK5230-2.5
21	LSK5230-3.3	$V_{OUT}+V_D$～26	3.3	3	N	-	SMD-1	QJB(H)/K, H, G	MSK5230-3.3
22	LSK5230-5.0	$V_{OUT}+V_D$～26	5	3	N	-	SMD-1	QJB(H)/K, G	MSK5230-5.0
23	LSK5232-1.5G	$V_{OUT}+V_D$～26	1.5	3	N	-	TO-257-G	QJB(H)/K	MSK5232-1.5G
24	LSK5232-1.5TD	$V_{OUT}+V_D$～26	1.5	3	N	-	TO-257-TD	QJB(H)/K, G	MSK5232-1.5TD
25	LSK5232-1.8G	$V_{OUT}+V_D$～26	1.8	3	N	-	TO-257-G	QJB(H)/K, H, G	MSK5232-1.8G
26	LSK5232-1.8TD	$V_{OUT}+V_D$～26	1.8	3	N	-	TO-257-TD	QJB(H)/K, H, G	MSK5232-1.8TD
27	LSK5232-1.9G	$V_{OUT}+V_D$～26	1.9	3	N	-	TO-257-G	QJB(H)/K	MSK5232-1.9G
28	LSK5232-1.9TD	$V_{OUT}+V_D$～26	1.9	3	N	-	TO-257-TD	QJB(H)/K, H, G	MSK5232-1.9TD
29	LSK5232-12G	$V_{OUT}+V_D$～26	12	3	N	-	TO-257-G	QJB(H)/K	MSK5232-12G
30	LSK5232-2.5G	$V_{OUT}+V_D$～26	2.5	3	N	-	TO-257-G	QJB(H)/K, G	MSK5232-2.5G
31	LSK5232-2.5TD	$V_{OUT}+V_D$～26	2.5	3	N	-	TO-257-TD	G, H, QJB(H)/K	MSK5232-2.5TD
32	LSK5232-3.3G	$V_{OUT}+V_D$～26	3.3	3	N	-	TO-257-G	QJB(H)/K, H, G	MSK5232-3.3G
33	LSK5232-3.3TD	$V_{OUT}+V_D$～26	3.3	3	N	-	TO-257-TD	QJB(H)/K, H, G	MSK5232-3.3TD
34	LSK5232-5.0G	$V_{OUT}+V_D$～26	5	3	N	-	TO-257-G	QJB(H)/K	MSK5232-5.0G
35	LSK5232-5.0TD	$V_{OUT}+V_D$～26	5	3	N	-	TO-257-TD	QJB(H)/K, H	MSK5232-5.0TD
36	LSK5209	$V_{OUT}+V_D$～26 $V_{-OUT}-V_D$～-26	±10	3 -3	N	-	TO-253-5-TD	QJB(H)/K	MSK5209TD
37	LW5101-00	$V_{OUT}+V_D$～26	adjustable (1.24～V_{IN} -V_D)	1.5	Y	50k	FCP10	YB, YC, H	MSK5101-00
38	LW5101-3.3	$V_{OUT}+V_D$～26	3.3	1.5	Y	50k	FCP10	YB, YC, H	MSK5101-3.3

Approved Products

NO.	Part Number	V_{in} Range (V)	V_{out} Range (V)	MAX Output Current (A)	En Pin	Rad-hard (rad(Si))	Package	Quality Grade	Industy Counterpart
39	LW5101-5.0	$V_{OUT}+V_D$～26	5	1.5	Y	50k	FCP10	YB，YC，H	MSK5101-5.0
40	LW5115-00TS	$V_{OUT}+V_D$～26	adjustable (1.24～V_{IN}-V_D)	1.5	Y	50k	TO-253-5-TS	YB，YC，H	MSK5115-00TS
41	LW5130-00TD	$V_{OUT}+V_D$～26	adjustable (1.24～V_{IN}-V_D)	3	Y	50k	TO-253-5-TD	H	MSK5130-00TD
42	LW5131-1.5TD	$V_{OUT}+V_D$～26	1.5	3	Y	50k	TO-253-5-TD	H	MSK5131-1.5TD
43	LW5131-2.5TD	$V_{OUT}+V_D$～26	2.5	3	Y	50k	TO-253-5-TD	H	MSK5131-2.5TD
44	LW5131-3.3TD	$V_{OUT}+V_D$～26	3.3	3	Y	50k	TO-253-5-TD	H	MSK5131-3.3TD
45	LW5215-1.8	$V_{OUT}+V_D$～26	1.8	1.5	N	50k	SMD-1	H	MSK5215-1.8
46	LW5215-3.3	$V_{OUT}+V_D$～26	3.3	1.5	N	50k	SMD-1	H	MSK5215-3.3
47	LW5230-1.5	$V_{OUT}+V_D$～26	1.5	3	N	50k	SMD-1	YB，YC，H	MSK5230-1.5
48	LW5230-1.8	$V_{OUT}+V_D$～26	1.8	3	N	50k	SMD-1	YB，YC，H	MSK5230-1.8
49	LW5230-1.9	$V_{OUT}+V_D$～26	1.9	3	N	50k	SMD-1	YB，YC，H	MSK5230-1.9
50	LW5230-2.5	$V_{OUT}+V_D$～26	2.5	3	N	50k	SMD-1	YB，YC，H	MSK5230-2.5
51	LW5230-3.3	$V_{OUT}+V_D$～26	3.3	3	N	50k	SMD-1	YB，YC，H	MSK5230-3.3
52	LW5230-5.0	$V_{OUT}+V_D$～26	5	3	N	50k	SMD-1	YB，YC，H	MSK5230-5.0
53	LW5232-1.5G	$V_{OUT}+V_D$～26	1.5	3	N	50k	TO-257-G	YB，YC，H	MSK5232-1.5G
54	LW5232-1.5TD	$V_{OUT}+V_D$～26	1.5	3	N	50k	TO-257-TD	YB，YC，H	MSK5232-1.5TD
55	LW5232-1.8G	$V_{OUT}+V_D$～26	1.8	3	N	50k	TO-257-G	YB，YC，H	MSK5232-1.8G
56	LW5232-1.8TD	$V_{OUT}+V_D$～26	1.8	3	N	50k	TO-257-TD	YB，YC，H	MSK5232-1.8TD
57	LW5232-1.9G	$V_{OUT}+V_D$～26	1.9	3	N	50k	TO-257-G	YB，YC，H	MSK5232-1.9G
58	LW5232-1.9TD	$V_{OUT}+V_D$～26	1.9	3	N	50k	TO-257-TD	YB，YC，H	MSK5232-1.9TD
59	LW5232-12G	$V_{OUT}+V_D$～26	12	3	N	50k	TO-257-G	YB，YC，H	MSK5232-12G
60	LW5232-2.5G	$V_{OUT}+V_D$～26	2.5	3	N	50k	TO-257-G	YB，YC，H	MSK5232-2.5G
61	LW5232-2.5TD	$V_{OUT}+V_D$～26	2.5	3	N	50k	TO-257-TD	YB，YC，H	MSK5232-2.5TD
62	LW5232-2.5TS	$V_{OUT}+V_D$～26	2.5	3	N	50k	TO-257-TS	H	MSK5232-2.5TS
63	LW5232-3.3G	$V_{OUT}+V_D$～26	3.3	3	N	50k	TO-257-G	YB，YC，H	MSK5232-3.3G
64	LW5232-3.3TD	$V_{OUT}+V_D$～26	3.3	3	N	50k	TO-257-TD	YB，YC，H	MSK5232-3.3TD
65	LW5232-5.0G	$V_{OUT}+V_D$～26	5	3	N	50k	TO-257-G	YB，YC，H	MSK5232-5.0G
66	LW5232-5.0TD	$V_{OUT}+V_D$～26	5	3	N	50k	TO-257-TD	YB，YC，H	MSK5232-5.0TD
67	LW5232-5.0TS	$V_{OUT}+V_D$～26	5	3	N	50k	TO-257-TS	H	MSK5232-5.0TS
68	LW5275-1.5	$V_{OUT}+V_D$～26	1.5	7.5	N	50k	SMD-1	YB，YC，H	MSK5275-1.5
69	LW5275-1.8	$V_{OUT}+V_D$～26	1.8	7.5	N	50k	SMD-1	H	MSK5275-1.8
70	LW5275-1.9	$V_{OUT}+V_D$～26	1.9	7.5	N	50k	SMD-1	H	MSK5275-1.9
71	LW5275-2.5	$V_{OUT}+V_D$～26	2.5	7.5	N	50k	SMD-1	H	MSK5275-2.5
72	LW5275-3.3	$V_{OUT}+V_D$～26	3.3	7.5	N	50k	SMD-1	YB，YC，H	MSK5275-3.3
73	LW5275-5.0	$V_{OUT}+V_D$～26	5	7.5	N	50k	SMD-1	YB，YC，H	MSK5275-5.0
74	LW5332-5.0	-8～-20	5	3	N	50k	TO-257-G	YB，YC，H	MSK5332-5.0
75	LW5176-1.5	2.5～26	1.5	7.5	Y	100k	TO-253-5-TD	YB，YC，H	MSK5176-1.5
76	LW5231	V_{IN}-V_{OUT} 1.5～35	adjustable	3	N	100k	SMD-1	H	MSK5231
77	LW5251-1.2	3.3～6.5	1.2	5	N	100k	SMD-1	YB，YC，H	MSK5251-1.2

Solid State Electronic Switches



INTRODUCTION:

The circuit uses P channel VDMOS or N channel VDMOS to complete the switch control, output voltage:28V ,42V,60V,100V,output current: 0A~10A，the circuit realizes self-management and fault isolation of power distribution system.TID:100krad(Si),SEE:75MeV•cm²/mg.

FUNCTION:

The circuit contains one or two sets of identical circuits, each circuit uses one safety switch to control serveral electronic switch. Each safety switch has the function of switch, current detection and overcurrent/short-circuit protection/latch.

FEATURES:

When the input is high voltage,the circuit is on;
When the input is low voltage,the circuit is off.
The circuit is based on thick film,metal complete seal.
Temperature range:-55°C~125°C.
TID:100krad(Si);
SEE:75MeV•cm²/mg

QUALITY CONTROL:

Grade: H, YB
Specification:
GJB2438B-2017 *General Specification for Hybrid Integrated Circuits*

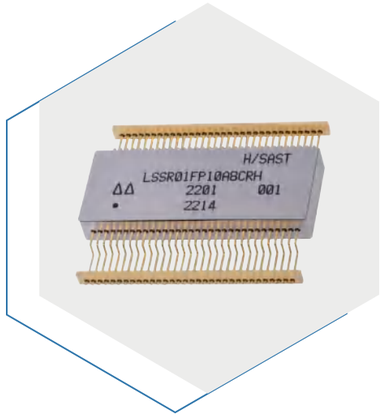
APPLICATIONS:

The products are widely used in vehicles, ships, and other systems,especially heating switch on satallite.

Approved Products

NO.	Product	Part Number	Channels	Input Voltage(V)	Output Voltage(V)	Output Current(A)	Current Sense Precision	Limiting Current	Package	Quality Grade
1	P Type Current Limiter	LHB648	2 safety switch and electronic switch	3.5V～5.5V	28V、42V	1.6A	±0.2	7A~7.5A	MbQ7941-38	YB
2	Solid-State electronic switch	LHB725B	4 electronic switch	3.5V～5.5V	100V	2A	0.05	—	MbQ6031-25	H，YB
3	Current Limiter	LHB728B	2 safety switch	3.8V～5.5V	100V	5A	0.05	6.2A~6.5A	MbQ6034-25	H，YB
4	Current Limiter	LHB728C	2 safety switch	3.8V～5.5V	60V	10A	0.1	10A~15A	MbQ7941-38d	H，YB
5	Solid-State electronic switch	LHB750	10 electronic switch	3.5V～5.5V	60V	2.5A	—	—	MbQ7941-38	H，YB
6	P Type Current Limiter	LHB648A	2 safety switch and electronic switch	3.5V～5.5V	28V、42V	1.6A	±0.2	6.5A~7.5A	MbQ7941-38	H

Solid State Relays



INTRODUCTION:

The solid state relay including two categories of devices,magnetic isolation device and optical coupling isolation device.The radiation-hardened device are provided for satellites, spacecraft platforms and payloads.

FEATURES:

When the input is high voltage,the circuit is on, when the input is low voltage,the circuit is off.
The circuit is based on thick film,metal complete seal.
Output voltage:0V~560V
Output current: ±0.1A～40A
Two ways of operation:DC and Bidirectional
Temperature range:-55℃~125℃
TID:100krad(Si)
SEE:75MeV•cm²/mg

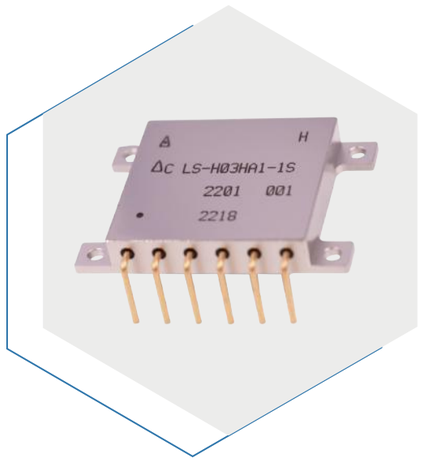
Approved Products

NO.	Part Number	Channels	Output Current (A)	Output Voltage (V)	On-resistance (mΩ)	Package (mm)	Quality Grade
Magnetic Isolation							
1	LSSR-2MA	1	1	60	70	⩽11.1×12.1×8.4	Y，H
2	LSSR-6MD	1	2	450	100	⩽32×22×9	H
3	LSSR-14M	1	2	60	25	⩽11.1×12.1×8.4	H
4	LSSR-0503S	1	3	60	30	⩽20×10×8	H
5	LSSR-0612M	1	8	80	15	⩽32×22×9	H
6	LSSR-15M-2	1	15	60	8	⩽33×22×9	H
7	LSSR-20M	1	20	50	8	⩽33×22×9	H
8	LSSR-26M	1	40	50	4	⩽54×34×10.4	H
9	LSSR-5147M	1	3A(steady) 40A/200ms	50	15	⩽25×15×12	H
10	LSSR-29M	1	10	50	14	⩽42×34×10.4	H
11	LSSR-0614M	1	±15	60	10	⩽32×22×9	H
12	LSSR-12M	2	12	80	8	⩽26.5×24 .5×12	H
13	LSSR-0630S	2	26	60	8	⩽29×29×10	H

Approved Products

NO.	Part Number	Channels	Output Current (A)	Output Voltage (V)	On-resistance (mΩ)	Package (mm)	Quality Grade
14	LSSR-0936S	2	20	90	10	⩽29×29×10	H
15	LSSR-17M	4	4	60	20	⩽26.5×24.5×12	H
16	LSSR-36MA-7	4	7	60	20	⩽43.3×25.4×7.3	H
17	LSSR-37M	4	10	60	10	⩽51.7×28.7×7.5	H
18	LSSR-3002FB	4	±2	300	400	⩽58.5×34×7.3	H
Optical Isolation							
19	LSSR-50M	1	5	270	0.065	⩽23×18×10	H
20	LSSR-6005-1	1	5	560	0.05	⩽28×22×13	M1
21	LSSR-2832S	1	32	60	0.005	⩽29×29×10	G
22	LSSR-47M	2	10	50	0.004	⩽26×26×10	H
23	LSSR-53M	2	10	270	0.044	⩽29×29×10	H
24	LSSR-0204_CN	2	4	60	0.02	⩽30×20×7.5	H
25	LSSR-0604D	2	4	60	0.035	⩽26×13.3×8.5	H
26	LSSR-3035A	4	2	80	0.1	DIP16	H
27	LSSR-0404_CN	4	4	60	0.02	⩽32×28×11	H
28	LSSR-0704M-1	7	4	60	0.025	⩽53.4×32.4×6.9	G
29	LSSR-0704_CN	7	4	60	0.0.25	⩽53.4×32.4×6.9	H
30	LSSR-73M	8	5	60	0.025	⩽32.4×27.4×9.7	H
31	LSSR-3021	1	±0.1	330	±20	DIP4	H
32	LSSR-3019	1	±0.3	80	±0.12	DIP4	H
33	LHB447	1	±1	45	±0.1	⩽10.2×8.5×5.1	G_J
34	LAQY272	1	±2.0	60	±0.09	⩽10.2×10. 1×4.5	G
35	LAQY275	1	±1.3	100	±0.1	⩽10.2×10. 1×4.5	G
36	LAQY277	1	±0.65	200	±0 .4	⩽10.2×10. 1×4.5	G
37	LSSR-3014	1	±0.35/0.5	330	±2.4/0.63	DIP6	H
38	LSSR-3013_CN	1	±0.35/0.5	180	±0.3/0.08	DIP6	H
39	LSSR-3011	1	±1.5/3	60	±0.13/0.05	DIP6	H
40	LSSR-3011S	1	±1.5/3	60	±0.13/0.05	LCC06C	H
41	LSSR-3012	1	±1/2	90	±0.2/0.1	DIP6	H
42	LSSR-30A	1	±2.5/5	50	±0.052/0.025	DIP8	H
43	LSSR-3MD	1	±2.5/5	50	±0.09/0.045	LCC08	H
44	LSSR-3026S	2	±0.1	330	±20	DIP8	G
45	LSSR-3023	2	±0.3	60	±0.25	DIP8	H
46	LSSR-3023A	2	±0.3	60	±0.25	DIP8	H
47	LSSR-3023B	2	±0.15	±36	±1.5	DIP8	H
48	LSSR-225-2	4	±0.15	60	±0.5	CSOP16	H
49	LSSR-3034	4	±0.2	330	±2.4	DIP16D	H
50	LSSR-3036A	4	±0.3	100	±1.3	DIP16D	H
51	LSSR-3011P	1	±1.5/3	60	±0. 13/0.07	SMD6（Plastic encapasulation ）	N1

Intelligent Distribution Switches



INTRODUCTION:

This device is a normally-on intelligent power safety switch by the power supply, which has protection function without bias power supply. After bias power working, it can control the switch off and on through the input signal. At the same time, the circuit possesses the switch and protection state by isolated output monitoring. The circuit can be used as an executive switch in intelligent distribution system.

FUNCTION:

Exhausted type and enhanced type VDMOS
Current limitation
Overcurrent protection and short-circuit protection
Protection latching
Status feedback

FEATURES:

Output Voltage: 10V～120V
Input Control Signal: 3.5～5.5V
Output Current of Electronic Switch: 1A~10A
TID: 100krad(Si)
SEE:75MeV•cm²/mg
Temperature range:-55℃~125℃

QUALITY CONTROL:

Grade: H, G
Specification:
GJB2438B-2017 *General Specification for Hybrid Integrated Circuits*

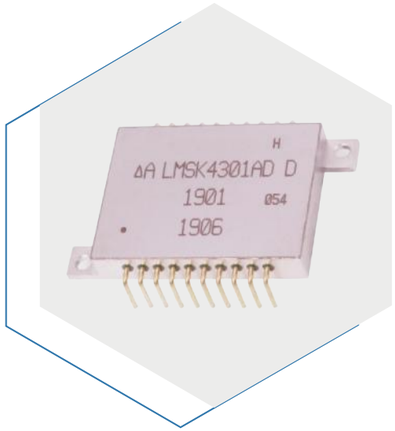
APPLICATIONS:

The products are widely used in vehicles, ships and other systems.

Approved Products

NO.	Product	Part Number	VOUT (V)	IOUT (A)	Ron (Ω)	Maximum Load Starting Capacitor (uF)	Package	Quality Grade
1	Radiation-Hardened 100V Solid-State Power Contronller	LS-H01HA1-1S	10～120	1	0.1	100	MbQ3232-11	H
2	Radiation-Hardened 100V Solid-State Power Contronller	LS-H03HA1-1S	10～120	3	0.1	140	MbQ3232-11	H
3	Radiation-Hardened 100V Solid-State Power Contronller	LS-H05HA1-1S	10～120	5	0.1	180	MbQ3232-11	H
4	Radiation-Hardened 100V Solid-State Power Contronller	LS-H10HA1-1S	10～120	10	0.1	200	MbQ3232-11	H
5	Radiation-Hardened 28V Solid-State Power Contronller	LSPC-2810SRH	10～36	10	0.02	200	MbQ3232-11	H
6	Radiation-Hardened 100V Solid-State Power Contronller	LSPC-10010SRH	10～120	10	0.02	200	MbQ3232-11	H
7	Radiation-Hardened 100V Solid-State Power Contronller	LSPC-10025SRH	10～120	25	0.02	200	MbQ6034-25	H
8	Regularize-Hardened 28V Solid-State Power Contronller	LSPC-2810S	10～36	10	0.02	200	MbQ3232-11	H
9	Regularize-Hardened 28V Solid-State Power Contronller	LSPC-2825S	10～36	25	0.02	200	MbQ3232-11	H
10	Radiation-Hardened 100V Solid-State Power Contronller	BSC-LS-S-H01HA1-1SD	10～120	1	0.3	140	MbQ5338-10	H
11	Radiation-Hardened 100V Solid-State Power Contronller	BSC-LS-S-H03HA1-1SD	10～120	3	0.1	180	MbQ6934-10	H
12	Radiation-Hardened 100V Solid-State Power Contronller	BSC-LS-S-H10HA1-1SD	10～120	10	0.032	300	MbQ7650-10	H
13	Radiation-Hardened 100V Solid-State Power Contronller	BSC-LS-S-H15HA1-1SD	10～120	15	0.025	450	MbQ7650-10	H
14	Radiation-Hardened 100V Solid-State Power Contronller	LSSR-42MA	80～120	23	0.04	470	MbQ5634-07	H

Rad-hard Motor Drivers



FEATURES:

Bus voltage: 28V-100V
Maximum output current 1A-45A
Gate drive, speed loop,
PWM control open-loop multiple topologies Thick film hybrid integrated process, metal fully sealed packaging
operating temperature (Tc): - 55 °C~125 °C

QUALITY CONTROL:

Grade: H, G_J
Specification:
GJB2438B-2017 *General Specification for Hybrid Integrated Circuits*

INTRODUCTION:

The anti-irradiation motor driver series covers the space application of bus voltage 24V, 28V, 42V and 100V. The single-particle resistance of the core components reaches 99MeV·cm²/mg, which has been successfully applied to thermal control, environmental control, wind control and propellant replenishment systems of space models, and has been listed in the preferred list of the Fifth Academy of Sciences. LHKF series of national-produced anti-irradiation motor driver products have a total dose resistance capacity of 1E5rad (si) and a single particle resistance capacity of 99MeV·cm²/mg, meeting the application of deep space exploration.

FUNCTION:

The anti-irradiation motor driver is mainly used in the servo control drive system of space-borne, and other models to realize the power drive of the motor. This series of products includes two series of H-bridge and three-phase bridge motor drivers, including door drive, speed loop control, PWM open-loop control and other topological structures, covering the 28V, 42V and 100V bus requirements of the system.

RAD-HARD PARAMETERS:

Total dose 10krad (Si), 20krad (Si), 100krad (Si)
Single particle ⩾ 75MeV • cm²/mg

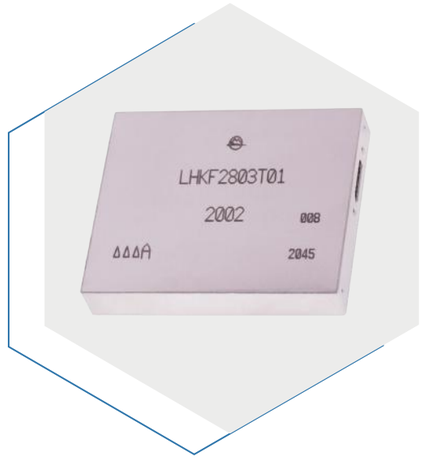
APPLICATIONS:

It is applicable to electronic systems with irradiation requirements such as aerospace and satellite, and is used to drive and control stepping motors, brushless motors, brushless motors, AC motors, etc.

Approved Products

NO.	Product	Part Number	Maximum power voltage	Maximum output current	Recommended control supply voltage	Recommended power voltage	Recommended working current	SEE	Total Ionization Dose	Topology	Package	Quality Grade
1	3- phase motor drive	LMSK4300D	75V	10A	12V	24V-32V	3A	⩾75 MeV·cm²/mg	20krad(Si)	gate drive	MbQ3325-18	YB
2	3- phase motor drive	LMSK4301AD	75V	29A	12V	24V-32V	10A	⩾75 MeV·cm²/mg	20krad(Si)	gate drive	MbQ3325-18	H, YB
3	3- phase motor drive	LMSK43010D/ LMSK4310U	55V	10A	±15V	24V-32V	3A	⩾75 MeV·cm²/mg	15krad(Si)	speed loop control	MbQ3325-18a MbQ3325-18	YB
4	3- phase motor drive	LHKF10006T01	120V	6A	12V	100V	3A	⩾75 MeV·cm²/mg	100krad(Si)	speed loop control	MbQ5440-20	YB
5	3- phase motor drive	LHKF12014T01D	120V	45A	15V	100V	14A	⩾75 MeV·cm²/mg	10krad(Si)	isolated gate drive	MbQ9748-48D	
6	H- bridge gate drive	LLMD18200-2D	55V	3A	28V	28-42V	1.5A	⩾37 MeV·cm²/mg	100krad(Si)		DIP24-2A	CAST H1, YB

Intelligent Motor Drivers



INTRODUCTION:

The intelligent motor driver series is an intelligent control and drive product developed according to user requirements.It can be used for the control of permanent magnet synchronous motors,intelligent control of brushed motors,and intelligent control of brushless motors respectively.

FUNCTION:

he modules of the intelligent control driver series are used for the intelligent control of brushed motors,brushless motors,and permanent magnet synchronous motors.This series of products uses an MCU as the core control device to achieve the closed-loop control of the motor.

FEATURES:

It encompasses units such as power conversion, ADC conversion, position detection, power drive, current sampling, and temperature sampling.By receiving external input signals,it can control the motor's rotation speed, current, and direction. Additionally, it has over-temperature protection, short-circuit protection,and over-voltage protection functions. It is also compatible with communication protocols like CAN and RS-232.

QUALITY CONTROL:

Grade: G_J, M1, M2
GJB2438B-2017 *Specification for Hybrid Integrated Circuits*
GJB10164-2021 *Specification for Microcircuit Modules*

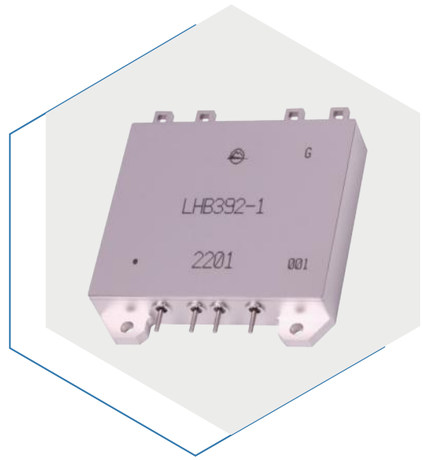
APPLICATIONS:

It is applicable to electronic systems in aerospace,aviation,weaponry,and marine industries.It enables intelligent driving and control of stepper motors,brushed motors,brushless motors, and permanent-magnet synchronous motors.

Approved Products

NO.	Product	Part Number	Maximum power voltage/Recommended bus voltage	Maximum current/Recommended operating current	Processor	Operating temperature	Package	Quality Grade
1	Four-channel intelligent motor driver	LSMD2806FT01	50V/28V	6A/2A	DSP (TMS320F2811 Made in China)	-40°C~+85°C	φ 90mm ×12mm	H
2	Intelligent servo motor driver	LSMD2820RT01A	70V/28V	20A/10A	DSP (TMS320F28335 Made in China)	-40°C~+85°C	56mm×47mm ×16mm	H
3	Brushless motor power control driver	LHKF2803T01	40V/28V	5A/3A	DSP (TMS320F2812 Made in China)	-55°C~+125°C	60mm×50mm ×10mm	H
4	Brushless motor control	LSP335-1	15V±0 .5V	-	DSP (TMS320F28335 Made in China)	-55°C~+125°C	42mm×42mm ×10mm	G
5	Fpur-channel brushless motor control driver	LSMD5605FT01	70V/28V～56V	30A/5A	MCU (TMS32F103 Made in China)	-45°C~+105°C	83mm×34mm ×32mm	M1、M2

Normal-state Motor Driver



INTRODUCTION:

Normal-state motor drivers are mainly applied to servo control and drive systems of missile-borne,air-borne,vehicle-borne,and ship-borne models.They are used to achieve the power drive of motors,covering the motor bus voltage requirements from 28V to 270V in the system.

FUNCTION:

The normal-state motor driver series includes two major types of products:H-bridge and three-phase bridge. It contains four control modes:gate-drive control, speed-loop control, current-loop control,and PWM open-loop control.

The normal-state motor driver series includes two major types of products:H-bridge and three-phase bridge.It contains four control modes:gate-drive control,speed-loop control,current-loop control, and PWM open-loop control.

-The gate-drive control type receives PWM control signals to control the direction and speed of the motor.

-The speed-loop control driver receives speed command signals and motor Hall signals to achieve the closed-loop control of the motor speed.

-The current-loop control driver receives current command signals and motor Hall signals to achieve the closed-loop control of the motor current.

-The PWM open-loop control driver receives PWM signals and Hall signals to control the switching of the upper-bridge power transistors,thus achieving the adjustment of the motor current.

FEATURES:

Bus Voltage: 28V - 270V
Maximum Output Current:120A
Multiple Topologies
Gate drive, current loop, speed loop, PWM open-oop control Manufacturing and Packaging Thick-film hybrid integrated technology, with either fully - sealed metal packaging or micro-circuit module potting encapsulation
Operating Temperature (Tc): -55°C～125°C

QUALITY CONTROL:

Grade: H, G, G_J
GJB2438B-2017 *General Specification for Hybrid Integrated Circuits*

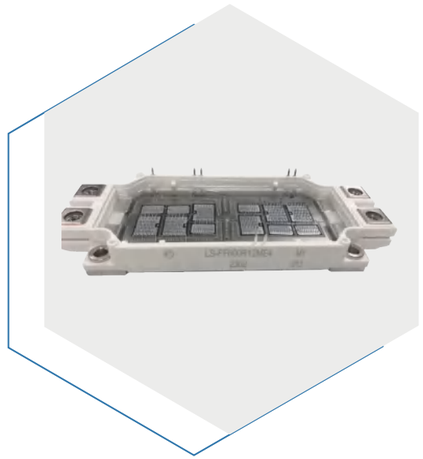
APPLICATIONS:

Suitable for electronic systems in aerospace,aviation,military weapons, and marine sectors.It is used for the drive control of stepper motors,brushed motors,brushless motors,and permanent magnet synchronous motors.

Approved Products

NO.	Product	Part Number	Maximum power voltage	Maximum current	Recommended bus voltage	Recommended operating current	Package	Quality Grade
1	Brushless DC Motor Drive	LHKF5620T01A	69V	40A	56V±3V	20A	MbQ5942-13a	H, G_J
2	Brushless DC Motor Drive	LHKF9008T01- CH	105V	25A	90V±3V	8A	MbQ5942-13a	H, G
3	Brushless Motor Power Drive	LMSK4362D	75V	30A	28V±1V	15A	MbQ7941-43d	H
4	Brushless Motor Power Drive	LHKF2707T02	35V	5A	28V±1V	5A	MQ3533-14	H
5	H-Bridge Motor Power Drive	LHKF2805D01- CH	42A	7A	28V±1V	5A	MQ2727-10c	H, II
6	Brushless Motor Power Drive	LMSK4351-1BD-CH	500V	45A	270V±30V	25A	MbQ9748-48D	H
7	Brushless Motor Power Drive	LMSK4351-1BU -CH	500V	45A	270V±30V	25A	MbQ9748-48U	H
8	H-Bridge Motor Power Drive	LMSK4205-CH	60V	30A	28V±1V	15A	MQ4138-12	G, H
9	Dual-channel H-Bridge Motor Power Drive	LLMD18200-2D	55V	3A	28-42V	1.5A	DIP24-2	H, D
10	H-Bridge Pulse-Width Modulation(PWM) Amplifier	LMSK4201-CH	50V	6A	28V±1V	2A	TO25-08	H, G_J
11	Brushless Motor Drive	CHMSK4310- CH	55V	10A	28V±1V	5A	MbQ4333-20a MbQ4333-20	H
12	Brushless Motor Drive	LMSK4301	75V	29A	28V±1V	5A	MbQ4333-20	H, II
13	Brushless Motor Drive	LHKF2810T03	100V	6A	15V～40V	3A	MbQ3836-13a	G
14	H-Bridge Pulse-Width Modulation(PWM) Amplifier	LMSK4203	75V	10A	27V±5V	3A	MbQ3325-18	H, G
15	Actuator Assembly Motor Driver	LHB560	±20V	5A	±20V	2A	MQ3528-24	G
16	Brushless DC Motor Drive	LHKF9510T01	270V	20A	20V～ 125V	10A	MbQ4936-16	G_J
17	Brushless Motor Power Drive	LHKF2830T01S	75V	120A	28V±1.0V	60A	MbQ7050-20	H
18	Brushless Motor Power Drive	LHKF2850T01	75V	100A	28V±1.0V	50A	MbQ5131-19	H
19	Brushless DC Motor Drive	LHKF56010T01	560V	5A	450V	1A	73mm×44mm ×20mm	SJ 20668-98

Intelligent Motor Drivers



INTRODUCTION:

IGBT module products can be classified by structure into DUAL,three-phase bridge,-three-phase rectifier PIM and IPM modules,with power ratings ranging from 600V/50A to 1200V/600A.By quality level,they are divided into plastic-encapsulated micro-circuit modules and metal-encapsulated hybrid integrated circuits.

FUNCTION:

Inside the IGBT module, it mainly integrates IGBTs and their supporting FRDs.Based on different structures,it can be classified into half - bridges,full - bridges, and three-phase bridges.According to functions,it can be divided into standard IGBT modules and IPM modules(which include gate-drive and protection functions).

FEATURES:

Based on the production line compliant with national military standards,the hybrid power integration process is adopted,enabling the power rating to reach 1200V/600A.The products implement the quality management system for military-grade products, effectively ensuring product reliability and consistency.

QUALITY CONTROL:

Grade: H, G, Military-grade Microcircuit Modules

GJB2438B-2017 *General Specification for HybridIntegrated Circuits*

GJB597B-2012 *General Specification for Semiconductor Integrated Cricuits*

SJ20668-1998 *General Specification for Micro-circuit Modules*

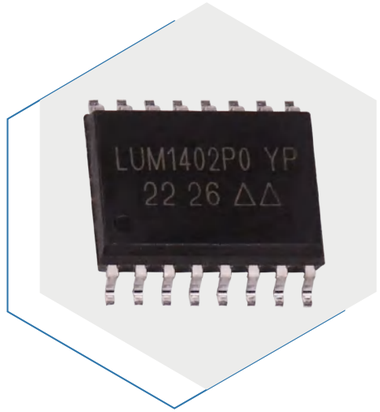
APPLICATIONS:

In the military field,the products are widely used in systems of vehicles,boats, ships,and missiles.Besides,they can be applied to industrial and civil sectors such as general-purpose drive.

Approved Products

NO.	Part Number	VCES (V)	IC (A)	ICRM (A)	Package	Quality Grade	Compatible Models
IGBT Module							
1	LS-DD75S12K01	1200	75	150	-	M1	STTH12012TV
2	LS-FD300R17KE6	1700	300	600	62mm	M1	FD300R17KE4P
3	LS-F3L100R07W2E3	650	100	200	EasyPACK™ 2B	M1	F3L100R07W2H3
4	LS-F3L200R07W2E3	650	200	400	EasyPACK™ 2B	M1	F3L200R07W2S5F
5	LS-F3L100R12W2E3	1200	100	200	EasyPACK™ 2B	M1	F3L100R12W2H3
6	LS-F3L200R12N2E3	1200	200	400	EconoPACK™ 2	M1	F3L200R12N2H3
7	LS-FF100R12RT4	1200	100	200	34 mm	M1	FF100R12RT4
8	LS-FF200R12KE4P	1200	200	400	62 mm	M1	FF200R12KE4P
9	LS-FF600R12ME4	1200	600	1100	EconoDUAL™ 3	M1	FF600R12ME4
10	LS-FF400R12KE3	1200	400	800	62 mm	M1	FF400R12KE3
11	LS-F4-50R07W1E3	650	50	100	EasyPACK™ 1B	M1	F4-50R07W1H3
12	LS-F4-100R12KE3	1200	100	200	EconoPACK™ 3	M1	F4-100R12KS4
13	LS-FS50R06W1E3	650	50	100	EasyPACK™ 1B	M1	FS50R06W1E3
14	LS-FS100R07N2E4	650	100	200	EconoPACK™ 2	M1	FS100R07N2E4
15	LS-FS200R06KE3	650	200	400	EconoPACK™ 3	M1	FS200R06KE3
16	LS-FS50R12N2H3	1200	50	100	EconoPACK™ 2	M1	FS50R12N2T7
17	LS-FS100R12N2H4	1200	100	200	EconoPACK™ 2	M1	FS100R12N2T4
18	LS-FS200R12KH3	1200	200	400	EconoPACK™ 3	M1	FS200R12KT4R
PIM/CI Module							
1	LS-FP50R06KE3	650	50	100	EconoPIM™ 2	M1	FP50R06KE3
2	LS-FP100R06KE3	650	100	200	EconoPIM™ 3	M1	FP100R06KE3
3	LS-FP50R12KH4	1200	50	100	EconoPIM™ 2	M1	FP50R12KT4P
4	LS-FP100R12N2H4	1200	100	200	EconoPIM™ 2	M1	FP100R12N2T7
5	LS-FP200R12N3H4	1200	200	400	EconoPIM™ 3	M1	FP200R12N3T7
IPM Module							
1	LSMD27075T01	650	75	150	⩽80×33	M1	FNA27560
2	LS-PM150RL1A120	1200	150	300	⩽135×110	M1	PM150RL1A120

Digital Isolators



INTRODUCTION:

Digital Isolator series products are based on digital signal isolation between stages and OOK modulation technique to realize signal isolation, minimize EMI.

FUNCTION:

The digital Isolator use capacitive isolation and the isolation of power system between stages to minimize EMI.

FEATURES:

Insulation withstand voltage:4.0kvrms
Power supply voltage: +3.0V~+5.5V
temperature (Tc): - 55 °C~125 °C

APPLICATIONS:

General-purpose mulichannel isolation isolated SPI, RS422, RS485 security and protection montoring.

QUALITY CONTROL:

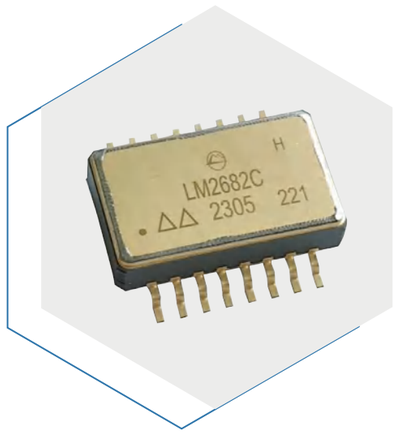
Grade: H, N1
Specification:
GJB-2438B-2017 *General Specification for Hybrid Integrated Circuits*
GJB-7400-2011 *General Specification for Semiconductor Integrated Circuits for Qualified Contractor Certification*

Under-researched Products

NO.	Product	Part Number	Power Voltage	Data Rate	I_{DD}	Output Current	Input Logic Level	Radiation Resistance	Channel Numbers	Package	Quality Grade
1	Signal and Power Isolated RS422 Transceiver	LM2682P	3.0V～5.5V	16Mbps	110mA	–	–	–	2.5kVrms	SOP16 (W)	N1
2	Signal and Power Isolated RS422 Transceiver	LM2682C	3.0V～5.5V	16Mbps	110mA	–	–	–	2.5kVrms	CSOP16 (W)	H
3	Signal and Power Isolated CAN Transceiver	LM3053P	4.5V～5.5V	5Mbps	150mA	–	–	–	4.0kVrms	SOP20 (W)	N1
4	Signal and Power Isolated CAN Transceiver	LM3053C	4.5V～5.5V	5Mbps	150mA	–	–	–	4.0kVrms	CSOP20 (W)	H

NO.	Product	Part Number	Power Voltage	Data Rate	I_{DD1} (5V)	I_{DD2} (5V)	I_{DD1} (3.3V)	I_{DD2} (3.3V)	Rated Dielectric Insulation Voltage	Package	Quality Grade
5	Quad-Channel Digital Isolators（4/0）	LUM1400P0/LUM1400P1/LUM1400C0/LUM1400C1	2.5V～5.5V	150Mbps	7.5mA	27.7mA	12.6mA	22.7mA	2.5kVrms	SOP16 (W)	N1 H
6	Quad-Channel Digital Isolators（3/1）	LUM1401P0/LUM1401P1/LUM1401C0/LUM1401C1	2.5V～5.5V	150Mbps	6.7mA	19.6mA	9.9mA	16.3mA	2.5kVrms	SOP16 (W)	N1 H
7	Quad-Channel Digital Isolators（2/2）	LUM1402P0/LUM1402P1/LUM1402C0/LUM1402C1	2.5V～5.5V	150Mbps	25mA	25mA	20mA	20mA	2.5kVrms	SOP16 (W)	N1 H
8	Dual-Channel Digital Isolators（2/0）	LUM1200P0/LUM1200P1	2.5V～5.5V	150Mbps	3.8mA	13.9mA	8.78mA	8.8mA	2.5kVrms	SOP8	N1
9	Dual-Channel Digital Isolators（1/1）	LUM1201P0/LUM1201P1	2.5V～5.5V	150Mbps	3.3mA	9.8mA	6.6mA	6.6mA	2.5kVrms	SOP8	N1
10	Quad-Channel Isolators with Integrated DC-to-DC Converter(3/1)	LUM6401P0/LUM6401P1/LUM6401C0/LUM6401C1	2.5V～5.5V	150Mbps	230mA	100mA	–	–	5kVrms	SOP16 (W)	N1 H
11	Quad-Channel Isolators with Integrated DC-to-DC Converter(2/2)	LUM6402P0/LUM6402P1/LUM6402C0/LUM6402C1	2.5V～5.5V	150Mbps	230mA	100mA	–	–	5kVrms	SOP16 (W)	N1 H

Isolator Interfaces



INTRODUCTION:

The isolation interface and drive series products are hybrid integrated circuits for digital interfaces and interface drives.This series of isolation interface products achieve modular miniaturization and high-reliability integration based on interfaces such as RS485 and RS422 and isolation technologies.The drive products achieve direct current/voltage drive of signals and current/voltage drive implemented by isolation technologies.

FUNCTION:

The isolation interface products integrate isolation devices, interface/drive circuits,and miniature isolation power supplies,featuring an isolation withstand voltage of 2.5 kVrms. The driver products consist of direct drive or isolated drive,and the output stage can provide a certain current-driving capability.

FEATURES:

Ceramic-encapsulated Products
-Standard:GJB2438B-2017 H-level
-Isolation Voltage:2500Vrms
-Lead Forming:Meets aerospace requirements
Plastic - encapsulated Products
-Standard: GJB7400-2011 N1-level
-Isolation Voltage:4000Vrms

QUALITY CONTROL:

Grade: H, G_J, N1
GJB2438B-2017*General Specification for HybridIntegrated Circuits*
GJB7400-2011 *General Specification for HybridIntegrated Circuits for Qualified Manufacturer Certification*

APPLICATIONS:

Signal Processing Unit Applied in the Digital System of Weapon Modles.

Approved Products

NO.	Product	Part Number	Operating Voltage (V)	Operating Current (mA)	Transfer Rate (Mbps)	Interface Type	Quality Grade	Package	Compatible Models
1	Isolated RS422 Bus Transceiver	LM2682P	3.0～5.5	≤150（@5V）	16	RS485 RS422	N1	SOP16	ADM2682E ADM2682
		LM2682P5V	4.5～5.5						
		LM2682C	3.0～5.5				H	CSOP16	
		LM2582P	3.0～5.5				N1	SOP20	ADM2582E
		LM2582C					H	CSOP20	
2	Four-channel Isolated RS422 Bus Transceiver	LM2682-4	3.0～5.5	≤200（@5V）	10	RS422	M1	BGA77 (17.3mm×12.2mm)	-
3	Four-channel Isolated RS422/RS485 Bus Transceiver	LM2682-4S	3.0～5.5	≤110（@5V）	16	RS485 RS422	M1	BGA127 (18.0mm×13.0mm ×5.3mm)	-
4	Isolated CAN Interface Circuit	LM3053P	VDD:4.5～5.5 VDDL:3.0~5.5	≤100（@5V）	5	CAN	N1	SOP20	ADM3053
		LM3053C					H	CSOP20	
		LM3053C-A					H	CSOP20	
		LM3053P-B					N1	SOP16	
5	I^2C Transceiver	LM1250P	3.0～5.5	≤4.3/4（@5V）	2MHz	I^2C	N1	SOP8	ADUM1250
		LM1250C					H	CSOP8	
Non-Isolated Bus Products									
6	Isolated RS422 Bus Transceiver	LM3490P	3.0～5.5	≤20(@5V)	16	RS485	N1	SOP14	ADM3490
		LM3491P	3.0～5.5	≤20(@5V)	16	RS422	N1	SOP8	ADM3491
7	Isolated CAN Interface Circuit	LM1051P	4.5～5.5	≤75(@5V)	5	CAN	N1	SOP8	TCAN1051
8	Four-Channel RS485/RS422 Signal Acceptor	LM3030C	3.0～5.5	≤10（@5V）	16	RS485 RS422	H	CSOP16	MAX3030
		LM96F174MD	3.0～5.5	≤10（@5V）	16	RS485 RS422	H	DIP16	DS96F174
		LM96F174MC	3.0～5.5	≤10（@5V）	16	RS485 RS422	H	LCC20	DS96F174
9	Four-Channel RS485/RS422 Signal Emitter	LM3096C	3.0～5.5	≤10（@5V）	16	RS485 RS422	H	CSOP16	MAX3096
		LM96F175MD	3.0～5.5	≤10（@5V）	16	RS485 RS422	H	DIP16	DS96F175
		LM96F175MC	3.0～5.5	≤10（@5V）	16	RS485 RS422	H	LCC20	DS96F175

Isolated Drivers

INTRODUCTION:

Isolated driver series products are oriented to digital interface and interface drive hybrid integrated circuits. The isolated interface products are based on isolation technique to realize module miniaturization and highly reliable integration, realize directed signal current / voltage drive and current / voltage drive using isolation technique.

FUNCTION:

The isolated interface products integrate isolated components, interface/driver circuits and miniature isolated power.
The driver products consist of direct drive or isolated drive, the output stage can provide a certain current drive capability.

FEATURES:

Isolated withstand voltage of the isolated interface products: 2kVrms
Current drive capability of the driver products: ⩾100mA
Operating temperature (Tc): -55℃~125℃

QUALITY CONTROL:

Grade: H, G_J, N1
Specification:
GJB2438B-2017 *General Specification for Hybrid Integrated Circuits*
GJB7400-2011 *General Specification for Semiconductor Integrated Circuits for Qualified Contractor Certification*

APPLICATIONS:

Signal processing unit of digital systems.

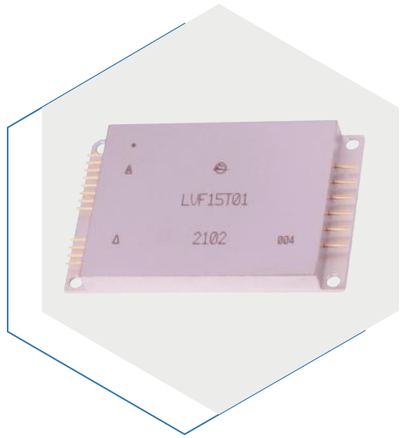
Approved Products

NO.	Product	Part Number	Power Voltage	Data Rate	I_{DD}	Output current	Input Logic Level	Radiation Resistance	Channel Numbers	Package	Quality Grade
1	MOSFET isolated driver module	LGD-1	4.5V~5.5V	100kHz	20mA	5A (peak)	3.5~5V	—	1	MP2010-08C	SJ (SJ20668-1998)

Under-researched Products

NO.	Product	Part Number	Input Power Voltage	Input Logic Level	Output Power Forward Voltage	Output Power Negative Voltage	Output Voltage	Output Current	Channel Numbers	Package	Quality Grade
1	IGBTisolated driver module	LGD-1200SI LGD-1200SI-P	3V~5.5V	0V~5.5V	13V~20V	-12V~0V	—	2A/-2A	1	CSOP16-B SOP16L(W)	H, N1

Current/Frequency Converter (I/F)



INTRODUCTION:

The Current/Frequency Converter (I/F) converts the input direct-current into pulse output.It is a key component for inertial navigation measurement systems and for controlling the accuracy of aircraft and moving objects.Currently,there are four types of products:three-channel high-precision I/F conversion circuits,three - channel low-power-consumption I/F conversion circuits,radiation - resistant I/F conversion circuits,and V/F conversion circuits.

FUNCTION:

The I/F converter is developed based on the charge-balance principle.The circuit mainly consists of a high-precision integrator,a switching circuit,a constant-current source,a logic control circuit,and a frequency-standard circuit.The power consumption of the three-channel I/F converter in the low-power-consumption series is only 0.5W.All components of the device are domestically produced.The quality levels cover GJB H-level hybrid circuits and SJ20668 micro-circuit modules.It is packaged in a fully-sealed metal case and can be customized according to usage requirements.

FEATURES:

Integrated non-linearity: ⩽10ppm
Temperature coefficient: ⩽1ppm/℃
Stability: ⩽5ppm

QUALITY CONTROL:

Grade: H,G,and military-grade as per SJ20668 standard
Specifications:
GJB 2438B-2017 *General Specification for Hybrid Integrated Circuits*
SJ 20668-1998 *General Specification for Micro-circuit Modules*

APPLICATIONS:

It is applied in inertial measurement units,converting the current signals output by accelerometers into digital signals.

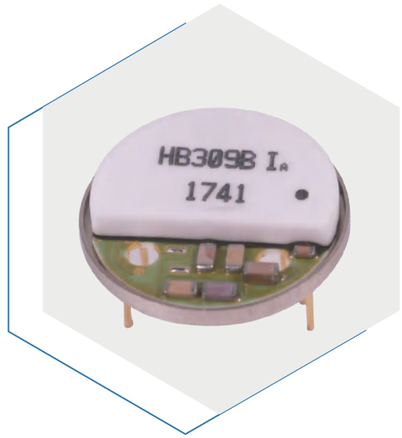
Approved Products

NO.	Name	Part Number	Range (mA)	Nonlinearity (ppm)	TCR (ppm/℃)	Zero drift (nA)	Scale Factor (Pulse/s·mA)	Stability (ppm)	Package	Power (W)	Quality Grade
Voltage/Frequency Converter											
1	Three-channel high-precision I/F	LIF02T01	±2mA	⩽3	⩽0.5	⩽1	⩾100000	⩽3	MbQ8060-20a	-40~+70	M2
		LIF08T01	±8mA	⩽3	⩽0.5	⩽1	⩾50000	⩽3	MbQ8060-20a	-40~+70	M2
		LIF18T01	±18mA	⩽10	⩽0.5	⩽10	⩾13000	⩽4	MbQ8060-20a	-40~+70	M2
		LIF23T01	±23mA	⩽10	⩽0.5	⩽10	⩾10000	⩽5	MbQ8060-20a	-40~+70	M2
		LIF35T01	±35mA	⩽10	⩽0.5	⩽20	⩾7000	⩽6	MbQ8060-20a	-40~+70	M2
		LIF48T01	±48mA	⩽10	⩽0.5	⩽20	⩾6500	⩽8	MbQ8060-20a	-40~+70	M2

Approved Products

NO.	Name	Part Number	Range (mA)	Nonlinearity (ppm)	TCR (ppm/°C)	Zero drift (nA)	Scale Factor (Pulse/s·mA)	Stability (ppm)	Package	Power (W)	Quality Grade
Voltage/Frequency Converter											
2	Three-channel high-precision I/F	LIF16T04	±16mA	⩽10	⩽0.5	⩽10	⩾13000	⩽4	M109060(AI)	-40～+70	M2
		LIF23T04	±23mA	⩽10	⩽0.5	⩽10	⩾10000	⩽5	M109060(AI)	-40～+70	M2
		LIF35T04	±35mA	⩽10	⩽0.5	⩽20	⩾7000	⩽6	M109060(AI)	-40～+70	M2
		LIF48T04	±48mA	⩽10	⩽0.5	⩽20	⩾6500	⩽8	M109060(AI)	-40～+70	M2
Voltage/Frequency Converter											
3	Three-channel Low Power Consumption I/F	LVF15T01	±15mA	⩽20	⩽3	⩽20	⩾15000	⩽0.5	MbQ6540-18	-40～+70	M2
		LVF23T01	±23mA	⩽20	⩽3	⩽20	⩾9500	⩽0.5	MbQ6540-18	-40～+70	M2
		LVF35T01	±35mA	⩽20	⩽3	⩽20	⩾6500	⩽0.5	MbQ6540-18	-40～+70	M2
		LVF47T01	±47mA	⩽20	⩽3	⩽20	⩾4400	⩽0.5	MbQ6540-18	-40～+70	M2
		LVF15T03	±15mA	⩽20	⩽3	⩽50	⩾15000	⩽0.5	MQ4840-19	-40～+70	M2
		LVF23T03	±23mA	⩽20	⩽3	⩽50	⩾9500	⩽0.5	MQ4840-19	-40～+70	M2
		LVF35T03	±35mA	⩽20	⩽3	⩽50	⩾6500	⩽0.5	MQ4840-19	-40～+70	M2
		LVF47T03	±47mA	⩽20	⩽3	⩽50	⩾4400	⩽0.5	MQ4840-19	-40～+70	M2
		LVF15T04	±15mA	⩽20	⩽3	⩽50	⩾15000	⩽0.5	M4840（AI）	-40～+70	M2
		LVF23T04	±23mA	⩽20	⩽3	⩽50	⩾9500	⩽0.5	M4840（AI）	-40～+70	M2
		LVF35T04	±35mA	⩽20	⩽3	⩽50	⩾6500	⩽0.5	M4840（AI）	-40～+70	M2
		LVF47T04	±47mA	⩽20	⩽3	⩽50	⩾4400	⩽0.5	M4840（AI）	-40～+70	M2
		LVF70T04	±70m	⩽50	⩽5	⩽50	⩾6000	⩽0.5	M4840（AI）	-55～+85	M2
		LVF85T05	±85mA	⩽50	⩽5	⩽50	⩾6000	⩽0.5	M3925(AI)	-40～+70	M2
		LVF15T06	±15mA	⩽20	⩽3	⩽50	⩾15000	⩽0.5	MQ3925-16	-40～+70	M2
		LVF23T06	±23mA	⩽20	⩽3	⩽50	⩾9500	⩽0.5	MQ3925-16	-40～+70	M2
		LVF35T06	±35mA	⩽20	⩽3	⩽50	⩾6500	⩽0.5	MQ3925-16	-40～+70	M2
		LVF47T06	±47mA	⩽20	⩽3	⩽50	⩾4400	⩽0.5	MQ3925-16	-40～+70	M2
		LVFXXT08	10mA~100mA可调	⩽50	⩽10	⩽100	-	⩽0.5	BGA136（25mm×25mm）	-40～+70	M2
4	High-precision V/F	LVF05T01	±10V	⩽20	⩽1	⩽10uV	⩾50000Hz/V	-	MQ4940-16	-40～+70	M2
		LVF10T01	±10V	⩽20	⩽1	⩽10uV	⩾25000Hz/V	-	MQ4940-16	-40～+70	M2
		LVF650	±10V	⩽20	⩽50	⩽20uV	/	⩽0.9	MQ2525-18	-45～+85	G
5	Single-channel I/F	LIF20S01	±20mA	⩽10	⩽0.5	⩽10	⩾2000	⩽2	MQ5133-16	-40～+70	M2
6	Custom-made	LIFXXXXX	±2mA~±48mA	⩽10	0.5～3	10～50	/	⩽8	⩽108x60x15	-45～+85	M2
		LVFXXXXX	±2mA~±70mA	⩽20	2～10	20～100	/	⩽0.5	⩽64x50x10	-45～+85	M2

Accelerometer Servo Circuits



INTRODUCTION:

Accelerometer servo circuit is a dedicated circuit matching the sensor head of the accelerometer. The circuit is used to measure the low frequency acceleration of the carrier. It has been widely used in inertial measurement and attitude control of rockets, airplanes, spacecrafts, ships and other aircraft, as well as oil drilling, geological prospecting, building tilt measurement and other civil fields.

The accelerometer servo circuit is developed by thick film hybrid integration technology. It is encapsulated by bonding the semi-circular ceramic cover plate to the thick film substrate with epoxy adhesive. It can also be packaged by capacitor discharge welding or parallel seam welding. The operating temperature range of the circuit include -55℃～200℃, -40℃～85℃,-55℃～125℃.

FUNCTION:

The accelerometer servo circuit consists of voltage regulators, a differential capacitance voltage converter, a transconductance/compensation amplifier and a feedback network. Its function is to detect the change of the differential capacitance signal and convert it into a current signal to provide the system with carrier acceleration information.

FEATURES:

Localization of components
Configurable temperature sensor
High output current
Low output noise voltage
Dynamic parameters can be adjusted according to different sensors
Connector Connected with Sensor

QUALITY CONTROL:

Grade: H/K, H, G, GS, I_A , II, YC, SG
Specification:
GJB2438B-2017 *General Specification for Hybrid Integrated Circuits*

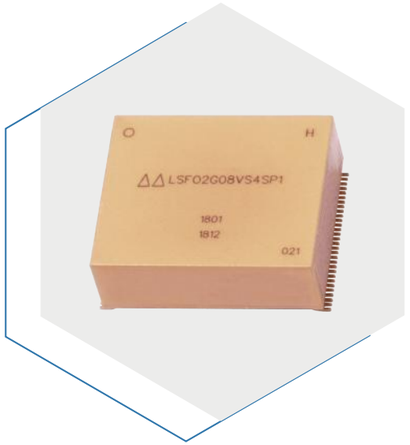
APPLICATIONS:

The circuit is used in the inertial measurement device to measure the constant value and low frequency acceleration.

Approved Products

NO.	Part Number	Supply voltage (V)	Quiescent current (mA)	Output noise voltage (mV)	Maximum output current (mA)	Maximum output DC saturation voltage (V)	Bandwidth (Hz)	Resonant frequency (Hz)	Overshoot (%)	Operating temperature (°C)	Temperature sensor interface	Package	Quality Grade
1	HB309B	±15	⩽15	⩽5	⩾60	⩾11	800~2000	350~750	⩽35	-40~+85	–	TtQ-10, TtQ-10 (304# stainless steel), (304#，for CC)	H/K, Gs, I_A, II, YC
2	HB309C	±15	⩽15	⩽3	⩾60	⩾11	800~2000	350~750	⩽35	-55~+125	–	TtQ-10a, TtQ-10d, TtQ-10d(L)	Gs, I_A, II
3	HB309M	±15	⩽15	⩽5	⩾60	⩾11	800~2000	350~750		-55~+125	–	TP-13	H, G
4	LHB609A	±15	⩽10	⩽5	⩾100	⩾12.5	800~2000	350~750	⩽35	-55~+125	√	TtQ-11	G_J, H

Rad-hard 3D Packaged Laminated Memories



FUNCTION:

Radiation tolerant three-dimensional package laminated memory provides an integrated memory solution, the product has the characteristics of radiation resistance.Three-dimensional packaging laminated memory uses PoP technology to stack and interconnect multiple pieces of memory in vertical direction, realizing up to 8 layers of stacking and miniaturizing integration.It has formed 8 series products including SRAM, SDRAM, DDR2, SDRAM, DDR3 SDRAM, DDR4 SDRAM, NAND FLASH, NOR FLASH, SPI NOR FLASH, MRAM and EEPROM.The high speed memory with high integration density is integrated with filter capacitor and terminal resistor so that the module has better signal integrity.

FEATURES:

High density, compared to the monolithic device can save 80% PCB board footprint. The product has a wide operating temperature range. High-speed components such as SDRAM, DDR2, DDR3 and DDR4 work at temperatures ranging from -40°C to 105°C. Other products work at temperatures ranging from -55°C to 125°C . Each series of products has different data bit widths and capacities to meet different controller configuration requirements. Production processes are in a series standerds in accordance with the requirements of quality control, the production process can be traced and the product hashigh reliability.

RAD-HARD PARAMETERS:

SRAM,SDRAM,DDR2 and DDR3 series products:TID>50krad(Si).
MRAM series products: TID> 50krad(Si).
NAND FLASH series products: TID> 50krad(Si).
NOR FLASH series products: TID> 20krad(Si).
SEL >75MeV·cm²/mg

APPLICATIONS:

High reliability, anti-radiation field, can be widely used in aerospace, aviation embedded systems, mass storage systems.

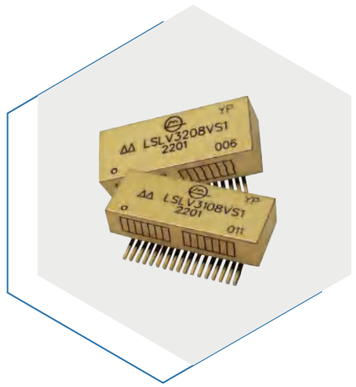
Approved Products

NO.	Family	Part Number	Density (bit)	Config	I/O Voltage	Speed/Clock	Temperatute (℃)	Radiation Tolerance		Package
								TID (Krad（Si）)	SEL (MeV.cm²/mg)	
1	DDR4	LS4D64G80LB2CH1	64G	1024M×80	1.2V	1200MHz	-40～105	50	37	TBD
2		LS4D48G48LB2CH1	48G	1024M×48	1.2V	1200MHz	-40～105	50	37	BGA259
3		LS4D32G72LB2CH1	32G	512M×72	1.2V	1200MHz	-40～105	50	37	BGA259
4		LS4D24G48LB2CH1	24G	512M×48	1.2V	1200MHz	-40～105	50	37	BGA259
5		LS4D16G72LB2CH1	16G	256M×72	1.2V	1200MHz	-40～105	50	37	BGA259
6	DDR3	LS3D16G16WB2I1	16G	1G ×16	1.5V/1.35V	667MHz	-40～105	75	75.4	BGA96
7		LS3D16G72WB2I1	16G	256M ×72	1.5V/1.35V	667MHz	-40～105	75	75.4	BGA199
8		LS3D24G48WB2I1	24G	512M ×48	1.5V/1.35V	667MHz	-40～105	75	75.4	BGA239
9	DDR2	LS2D1G08US1I1	1G	128M×8	1.8V	333MHz	-40～105	100	86.5	SOP74
10		LS2D2G08US2I1	2G	256M×8	1.8V	333MHz	-40～105	100	86.5	SOP74
11		LS2D2G16UB2I1	2G	128M×16	1.8V	333MHz	-40～105	100	86.5	BGA95
12		LS2D4G08US4I1	4G	512M×8bit	1.8V	333MHz	-40～105	100	86.5	SOP74
13		LS2D4G72UB3I1	4G	64M×72bit	1.8V	333MHz	-40～105	100	86.5	BGA191
14		LS2D8G08US8I1	8G	1G×8bit	1.8V	333MHz	-40～105	100	86.5	SOP88

Approved Products

NO.	Family	Part Number	Density (bit)	Config	I/O Voltage	Speed/Clock	Temperatute (℃)	Radiation Tolerance		Package
								TID (Krad（Si）)	SEL (MeV.cm²/mg)	
15	SDRAM	LSSD512M16VS1I1	512M	32M ×16	3.3V	133MHz	-40～105	50	75.4	SOP54
16		LSSD1G08VS2I1	1G	128M ×8	3.3V	133MHz	-40～105	50	75.4	SOP54
17		LSSD1G16VS2I1	1G	64M ×16	3.3V	133MHz	-40～105	50	75.4	SOP54
18		LSSD1G32VS2I1	1G	32M ×32	3.3V	133MHz	-40～105	50	75.4	SOP70
19		LSSD1G48VB2I1	1G	32M ×48	3.3V	133MHz	-40～105	50	75.4	BGA215
20		LSSD2G08VS4I1	2G	256M ×8	3.3V	133MHz	-40～105	50	75.4	SOP54
21		LSSD2G16VS4I1	2G	128M ×16	3.3V	133MHz	-40～105	50	75.4	SOP54
22		LSSD2G32VS4I1	2G	64M ×32	3.3V	133MHz	-40～105	50	75.4	SOP70
23		LSSD2G64VB4I1	2G	32M ×64	3.3V	133MHz	-40～105	50	75.4	BGA119
24		LSSD2G40VS5I1	2G	64M ×40	3.3V	133MHz	-40～105	50	75.4	SOP70
25		LSSD2G72VS5I1	2G	32M ×72	3.3V	133MHz	-40～105	50	75.4	BGA134
26		LSSD4G08VS8I1	4G	512M ×8	3.3V	133MHz	-40～105	50	75.4	SOP58
27		LSSD4G16VS8I1	4G	256M ×16	3.3V	133MHz	-40～105	50	75.4	SOP62
28	MRAM	LSMR1M08VS1E1	1M	128K×8	3.3V	20MHz	-55～95	50	99.3	SOP44
29		LSMR2M16VS2E1	2M	128K×16	3.3V	20MHz	-55～-105	50	80.3	SOP54
30		LSMR4M08VS4E1	4M	512K×8	3.3V	20MHz	-55～95	50	80.3	SOP44
31		LSMR8M08VS8E1	8M	1M×8	3.3V	20MHz	-55～95	50	99.3	SOP44
32		LSMR8M32VS8E1	8M	256K×32	3.3V	20MHz	-55～95	50	80.3	SPO68
33		LSMR16M08VS1E1	16M	2M×8	3.3V	20MHz	-55～95	50	99.3	SOP54
34		LSMR64M08VS4E1	64M	256K×32	3.3V	20MHz	-55～95	50	99.3	SOP54
35	NOR FLASH	LSFO64M16VS1SP1	64M	4M×16	3.3V	5MHz	-55～125	20	99.8	SOP54
36		LSFO128M16VS2SP1	128M	8M×16	3.3V	5MHz	-55～125	20	99.8	SOP54
37		LSFO256M16VS4SP1	256M	16M×16	3.3V	5MHz	-55～125	20	99.8	SOP54
38		LSFO512M16VS8SP1	512M	32M×16	3.3V	5MHz	-55～125	20	99.8	SOP56
39		LSFO2G08VS4CH1	2G	256M×8	3.3V	5MHz	-55～125	10	37.4	SOP60
40		LSFO2G08VS4CH2	2G	256M×8	3.3V	5MHz	-55～125	20	37.4	SOP60
41		LSFO2G16VS4CH1	2G	128M×16	3.3V	5MHz	-55～125	20	37.4	SOP60
42	NAND FLASH	LSFN8G08VS1M1	8G	1G×8	3.3V	5MHz	-55～125	50	75	SOP50
43		LSFN16G08VS1M1	16G	2G×8	3.3V	5MHz	-55～125	50	62.5	SOP50
44		LSFN16G08VS2M1	16G	2G×8	3.3V	5MHz	-55～125	50	75	SOP50
45		LSFN32G08VS2M1	32G	4G×8b	3.3V	5MHz	-55～125	100	82.1	SOP50
46		LSFN32G08VS4M1	32G	4G×8b	3.3V	5MHz	-55～125	50	75	SOP50
47		LSFN64G08VS4M1	64G	8G×8	3.3V	5MHz	-55～125	50	62.5	SOP50
48		LSFN64G08VS8M1	64G	8G×8	3.3V	5MHz	-55～125	50	75	SOP50
49		LSFN128G08VS8M1	128G	16G×8	3.3V	5MHz	-55～125	50	62.5	SOP50
50		LSFN2T16VB4K1	2T	128G×16	3.3V	5MHz	-55～125	TBD	TBD	BGA193
51		LSFN2T32VB4K1	2T	64G×32	3.3V	5MHz	-55～125	TBD	TBD	BGA193
52	SRAM	LSSR4M16VS1R1	4M	256K×16	3.3V	15ns	-55～125	100	81.4	SOP44
53		LSSR8M16VS2R1	8M	512K×16	3.3V	15ns	-55～125	100	81.4	SOP54
54		LSSR8M32VS2R1	8M	256K×32	3.3V	15ns	-55～125	100	81.4	SOP64
55		LSSR16M16VS4R1	16M	1M×16	3.3V	15ns	-55～125	100	81.4	SOP54
56		LSSR16M32VS4R1	16M	512K×32	3.3V	15ns	-55～125	100	81.4	SOP64
57		LSSR20M40VS6R1	20M	512K×40	3.3V	15ns	-55～125	100	81.4	SOP84
58		LSSR32M32VS8R1	32M	1M×32	3.3V	15ns	-55～125	100	81.4	SOP68
59		LSSR64M32VS8CH1	64M	2M×32	3.3V	15ns	-55～125	TBD	TBD	TBD
60	EEPROM	LSEE1M08VS1R1	1M	128K ×8	3.3V/5V	250ns	-55～125	10	79.24	SOP40
61		LSEE2M08VS2R1	2M	256K ×16	3.3V/5V	250ns	-55～125	10	79.24	SOP40
62		LSEE4M08VS4R1	4M	512K ×8	3.3V/5V	250ns	-55～125	10	79.24	SOP40
63		LSEE4M32VS4R1	4M	128K ×32	3.3V/5V	250ns	-55～125	10	79.24	SOP40
64		LSEE5M40VS5R1	5M	128K ×40	3.3V/5V	250ns	-55～125	10	79.24	S0P40
65		LSEE8M08VS8R1	8M	1M ×8	3.3V/5V	250ns	-55～125	10	79.24	SOP40
66		LSEE8M32VS8R1	8M	256K ×32	3.3V/5V	250ns	-55～125	10	79.24	SOP60
67	TMR SPI	LSFS128M01US3CH1	128M	128M×1	1.8V	104MHz	-55～105	TBD	82.5	SOP20
68	SPI FLASH	LSFS512M04US2CH1	512M	128M×4	1.8V	104MHz	-55～105	TBD	82.5	SOP18
69		LSFS2G04US2CH1	2G	512M×4	1.8V	133MHz	-55～105	TBD	TBD	S0P32

LVDS Interface



FUNCTION:

The Radiation Tolerant Low Voltage Differential Signal (LVDS) line drivers and receivers with 8 LVDS channels in a single highly miniaturized package, enabling the maximum area and weight savings for space applications board’s design.

Approved Products

NO.	Family	Part Number	I/O Voltage	Speed/Clock	Channel	Temperatute (℃)	Radiation Tolerance		Package
							TID (Krad（Si）)	SEL (MeV.cm²/mg)	
1	LVDS Driver	LSLV3108VS1	3.3V	400Mbps	8	-55～125	300	75	SOP34
2	LVDS Receiver	LSLV3208VS1	3.3V	400Mbps	8	-55～125	300	75	SOP34

Information Processing Micro-system (Plastic Package)

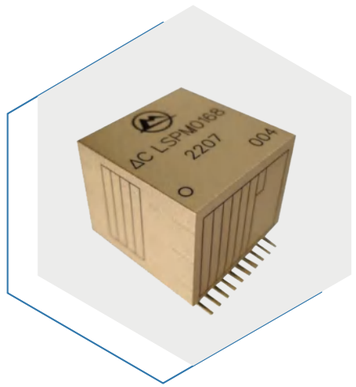
INTRODUCTION:

The microsystem module, based on the FMQL20 programmable system-on-chip (SoC), utilizes an FPGA as its core component, integrating FLASH memory, DDR3 memory, analog-to-digital converters (ADC), reset circuitry, and other elements into a unified design. This forms a multi-channel AD data acquisition system that combines FPGA and storage, serving as a compact, cost-effective solution for low-cost, high-reliability applications. Adhering to lightweight and miniaturized design principles, the module leverages a plastic-packaged process development platform to achieve minimal system integration.

Approved Products

NO.	Family	Part Number	System Architecture	Controller	RAM	ROM	Interface	Temperatute (℃)	Package
1	Information Processing micro-system	LMSAD20S-PB	SoPC+Memory+ADC	Equivalent to Xilinx XC7Z020	8Gb 32bit DDR3	256Mb SPI FLASH	CAN×2，UART×2，GPIO×118	-45～85	BGA484

Latch-up Current Limiter(LCL)



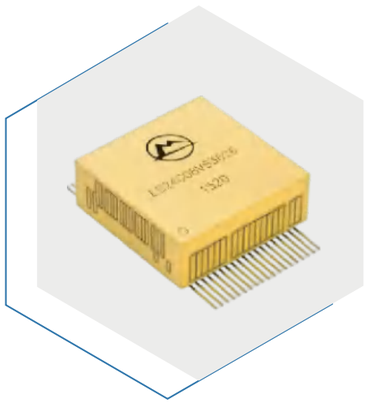
INTRODUCTION:

The Latch-up current limiter(LCL) monitors the power supply line of the semiconductor device and switches it off instantaneously in case of any over current or “radiation induced SEL” in order to protect the device from overheating.

Approved Products

NO.	Family	Part Number	Description	Temperatute (°C)	Radiation Tolerance		Package
					TID (Krad (Si))	SEL (MeV·cm²/mg)	
1	LCL	LSPM0168-2-S	Overcurrent protection for power lines from 0.8V to 5.5V and up to 2A 0.5～300ms switch - off time	-40～115	100	80	SOP20

Radiation Intelligent Memory Stack (RTIMS)



INTRODUCTION:

Radiation Intelligent Memory Stack (RTIMS) is a user-friendly, high-density, plug-and-play NAND FLASH memory designed to provide radiation protection. This cutting-edge memory solution features and embedded FLASH Memory Controller (FMC) and NAND FLASH memories.

FUNCTION:

The NAND FLASH memories used in RTIMS FLASH are SLC-based, ensuring high performance and immunity to latch-up. The FMC offers comprehensive protection against Single Event Upsets (SEUs) through either Triple Modular Redundancy (TMR) or Error Detection And Correction (EDAC) methods..

APPLICATIONS:

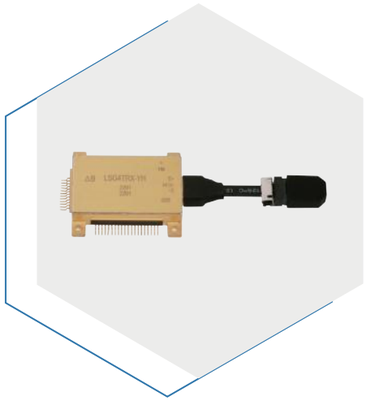
Reliable, radiation-protected data storage.

Approved Products

NO.	Family	Part Number	Density (bit)	Interface	Dissipation	Temperatute (°C)	Radiation Tolerance		Package
							TID (Krad (Si))	SEL (MeV.cm²/mg)	
1	RTIMS	LSSS24G08VS3E1	TMR MODE 8Gb; EDAC MODE 16Gb; 24Gb	Flash×1 SPI×1	⩽15W	-40～85	50	60	SOP38

Photoelectric Interconnection Products

(1) Photoelectric Conversion Module



FEATURES:

High bandwidth,high speed,low power consumption, low loss,small size,lightweight and high reliability.

RAD-HARD PARAMETERS:

Cobalt 60 gamma rays:Total dose≥100krad(Si)
Heavy ion:SEL≥75MeV·cm²/mg
Neutron:displacement damage ≥5×10¹¹N /cm²

QUALITY CONTROL:

Grade: YC, QJB
Specification:
GJB7391 *General Specification for Optical Fiber Digital Transceiver Modules*
GJB8120 *General Specification for Semiconductor Optoelectronic Modules*

INTRODUCTION:

The optical transceiver modules which can perform the conversion between optical signal and electrical signal is one of the core opto-electronic interconnect products in optical fiber communication.It fulfills the demands of applications requiring high-speed and high-density data transmission such as real-time image processing and data transfer in board to board communication,and has been widel deployed in aviation,areospace and ground-based weapon systems.

FUNCTION:

The optical transceiver modules own transmitters to convert electrical into optical signal and receivers to conver opticalinto electrical signal.The key components of the modules are composed of microcontroller unit, VCSEL laser whose working wavelength is 850 nm, photodiode detector, laser driver,transimpedance amplifier and fiber array with MT connector. It also provides the digital diagnosis function of real-time monitoring and reporting via I2C interface such metrics as the supply voltage, operating temperature, average optical power, alarm information and so on. The supply voltage is 3.3V. The module supports two kind of package types, one is the LCC package which is mainly used for aviation, ground-based system and naval, and the other is the Butterfly-52 package which is mainly used for areospace application for its excellent RAD-HARD performances. Both packages support integrated quad-channel transmit and quad-channel receive,12-channel transmit and 12channel receive. Maximum supported data rate for every of the channel is up to 10.3125Gbps.

APPLICATIONS:

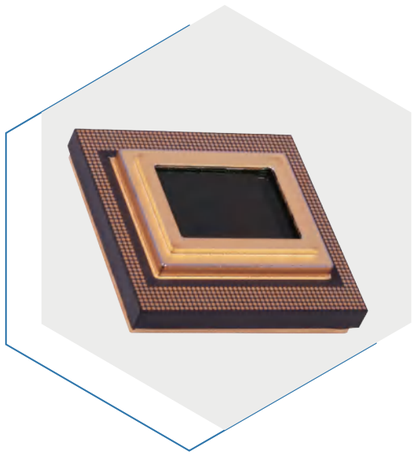
It is widely used in the field of ground,aerospace, aviation,phased array radar and other defense, space and commercial aerospace, such as large-capacity data and image transmission, board-to-board,payload-to-payload connection, optical interconnection and fiber communication.

(1) Photoelectric Conversion Approved Products

SN (Serial Number)	Product Name	Product Model	Center wavelength (nm)	Bit rate (Gbps)	Supply Voltage (V)	Supply Current (mA)	Average optical power/ per-channel (dBm)	Extinction rate(dB)	Sensitivity/ per-channel (dBm)	Optical power saturation/ per-channel (dBm)	Package	Quality Grade	Aerospace application
1	Digital diagnose Parallel 4-lane transceiver	LG0827-CH	850	0.125-10.5	3.3	⩽450	-5～1	⩾3	-10 (BER10^-12)	1	LCC48	Enterprise military standard	High altitude, low orbit
2	Digital diagnose parallel 12-lane transmit	LSG0825-CH	850	0.125-10.5	3.3	⩽550	-5～2	⩾3	/	/	LCC48	Enterprise military standard	High altitude, low orbit
3	Digital diagnose parallel 12-lane receive	LSG0826-CH	850	0.125-10.5	3.3	⩽600	/	/	-10 (BER10^-12)	1	LCC48	Enterprise military standard	High altitude, low orbit
4	Radiation Hardended parallel 4-lane transceiver	LSG4TRX-YH-CH	850	0.125-10.5	3.3	⩽450	-3～1	⩾3	-10 (BER10^-12)	1	Butterfly-52PIN	YC	LEO, GEO satelites
5	Radiation Hardended parallel 12-lane transmit	LSG12TX-YH-CH	850	0.125-10.5	3.3	⩽600	-3～1	⩾3	/	/	Butterfly--52PIN	YC	LEO, GEO satelites
6	Radiation Hardended parallel 12-lane receive	LSG12RX-YH-CH	850	0.125-10.5	3.3	⩽600	/	/	-11 (BER10^-12)	1	Butterfly--52PIN	YC	LEO, GEO satelites

Note: LCC and butterfly package photoelectric modules must to be welded manually when used.

Rad-hard Optical Target Detection and Recognition Microsystem



INTRODUCTION:

Based on the design concept of microsystem integration, microsystem architecture, microscale spatial multivariate coupling, 2.5DTSV silicon substrate, high-density heterogeneous three-dimensional integration and other technologies are used to realize anti-irradiation optical target detection and recognition microsystems with optical image acquisition, image information processing and control.

FEATURES:

High performance anti-irradiation processor and programmable logic devices; rely on 2.5DTSV to realize the integration of complex microsystem modules.

QUALITY CONTROL:

Grade: YC

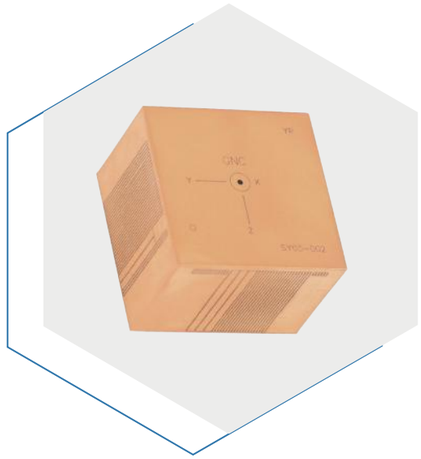
Specification:

Q/QJA20085A-2017 *General Specification for Hybrid Integrated Circuits for Aerospace*

Under-researched Products

NO.	Product	Part Number	Processor	Programmable Devices	Internal Memory	Image Sensor	External interface	Operating Temperture	Package Size	Package	Quality Grade	Aerospace Application
1	Radiation-resistant optical target detection and recognition microsystem	LM7P5 MSCRH	1 domestic dual-core anti-irradiation DSP processor; Main frequency 400MHz; 1 domestic dual-core anti-irradiation PPC processor, main frequency 400MHz	1 domestic anti-irradiation FPGA with 9.5 million logic gates, timing and readback refresh functions	1 domestic anti-irradiation 64Mits NORFLASH for DSP andPPCconfiguration data;6 radiation-resistant DDR2 chips, with a single capacity of 2Gbits, a total of 12Gbits; 1 piece of domestic anti-irradiation 16Mbits SRAM for PPC program running, with EDAC	1 domestic anti-irradiation CMOS image sensor, area array size 2560×3072, pixel size 7.5um (X) ×7.5um, pixel resolution up to 16bit, support stepwise multi-frame exposure mode, support roller exposure	1 RapidIO high-speed serial interface, supporting 1X, 2X, 4X mode; 3 Ethernet interface; 4- UART interface; 128-channel GPIO/64-channel LVDS	-40°C ~+85°C	50mm×50mm×12.5mm	CCGA810 ceramic encapsulation	YC	Yes

The Navigation,Guidance and Control Modules



INTRODUCTION:

This prouduct is mainly comprised of a high-performance dual core processor, a FPGA, some MEMS sensors, an AD circuit, and a secondary power supply etc. In addition,owing to the FPGA itself is configurable, easy to modify, and convenient for debug, the system has high versatility and easy to upgrade etc.

FEATURES:

The measurement,acquisition,flight control and rudder control of inertial information can be realized.

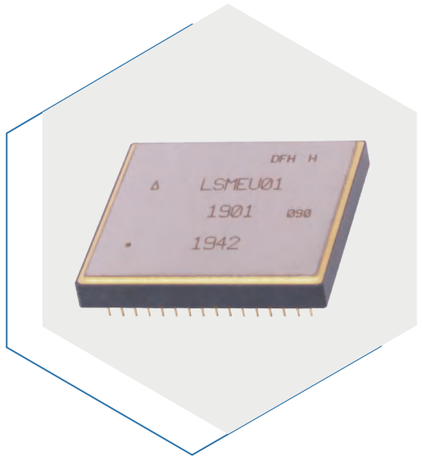
APPLICATIONS:

Adapted to the projectile fields such as small diameter rocket projectile, air defense, target missile, low precision missile, and the UAV (unmanned aerial vehicle)etc.

Approved Products

NO.	Series	Part Number	power supply (V)	power (W)	Work frequency (MHz)	ADC	MEMS Angular	MEMS Accelerometer	CAN	SPI	UART	Package	Size (mm^3)	Weight (g)	Datasheet Download
1	The Navigation, Guidance and Control module	LS-GNC-G001	5	⩽5	up to 400MHz	8channel, single-ended input, voltage range -5V~+5V, 16bit	Range:±4000°/s Zero Bias: ⩽ 300°/h Zero offset stability: ⩽30°/h(1σ) Zero bias repeatability: ⩽30°/s(1σ)	Range:±50g, Zero Bias: ⩽10mg Zero offset stability: ⩽2mg(1σ) Zero bias repeatability: ⩽2mg(1σ)	2	1	6	PGA	30×30×26.5	55	The Navigation Guidance and Control module
2		LS-GNC-G003	5	⩽5	up to 400MHz	8channel, single-ended input, voltage range -5V~+5V, 16bit	Range:±2000°/s Zero Bias: ⩽ 300°/h Zero offset stability: ⩽30°/h(1σ) Zero bias repeatability: ⩽30°/s(1σ)	Range:±30g, Zero Bias: ⩽ 20mg Zero offset stability: ⩽2mg(1σ) Zero bias repeatability: ⩽2mg(1σ)	2	1	6	PGA	30×30×26.5	55	The second generation of Navigation

8-bit Rad-hard Processors



INTRODUCTION:

The 8-bit Rad-hard Processor SiP is a system-level integration product for high-reliability applications. Also the system cascade in a single package volume implemented based on generalization and miniaturization design. The functional density is enhanced by SoC technique, high density LTCC substrate manufacturing technique and integrated HTCC wiring shell technique etc.

FUNCTION:

Based on Rad-hard C51 core with MCU and memory architecture design, extending FLASH and SRAM etc. The SiP processor has a minimum system with UART, CAN, SPI, GPIO, AD, DA and peripheral interface.

FEATURES:

The minimal processor system and abundant peripheral resources management with small volume, light weight, high reliability based on ceramic fully sealed cavity packaging technique.

QUALITY CONTROL:

Grade: H, YC, H (EK)

Specification:

GJB2438A-2002/GJB 2438B-2017

General Specification for Hybrid Integrated Circuits

APPLICATIONS:

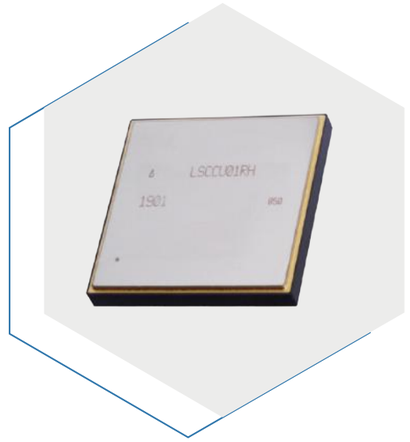
Electronic system products in space aircraft

Approved Products

NO.	Product	Part Number	CPU Minimum System	Bus Interface	Peripheral Interface	Radiation Resistance	Other Parameters	Package	Quality Grade
1	Embedded management execution unit SiP module	LSMEU01	Inner core:C51; Operating frequency:16MHz; Program storage：48KB, 8KB+8KB program upload; Data storage: 32KB on-chip SRAM with EDAC; 32KB×16 page off-chip SRAM	4 CAN2.0B Interface ; 4 UART (128 byte FIFO); 31 12-bit AD input; 4 11-bit DA output; 3 SPI interface; 6 PWM output	GPIO: 27; Interrupt: 2; Expending interface: 6 IO interface; supporting 2KB×6 external IO and data storage	TID: 20krad(Si)	Supply voltage: 5V/12V/-12V; Operating temperature: -55°C ~ +125°C; Power consumption: < 1.5W; ESD: 1500V; 16 OC Instructions; 5 Universal timing counter; Weight: 41g; Dimension: 46mm×46mm×6.5mm	PGA192	YC
2	Aerospace SiP interface management circuit	LSMEU03Z	Inner core:C51; Operating frequency:16MHz; Program storage：64KB; Data storage: 32KB on-chip SRAM with EDAC; 32KB×16 page off-chip SRAM	4 CAN2.0B Interface ; 4 UART (128 byte FIFO); 9 12-bit AD input; 4 11-bit DA output; 3 SPI interface; 6 PWM output	GPIO: 32; Interrupt: 2; Expending interface: 4 IO interface; supporting 8KB×4 external IO and data storage	TID: 50krad(Si); SEL:37MeV·cm²/mg; SEU:≤5E-07 Error/(bit•Day)	Supply voltage: 3.3V; Operating temperature: -55°C ~ +125°C; Power consumption: < 1W; ESD: 1000V; 5 Universal timing counter; Weight: 11g; Dimension: 25mm×25mm×5.5mm	PGA136	H(EK)

32-bit Rad-hard Processors

(1)Information Processing Control SiP(Ceramic Package)



INTRODUCTION:

Information Processing Control SiP is a system-level integrated product for highly-reliability control and information processing. Based on the design concept of generalization and miniaturization, the series of products, relying on advanced SoC technology, high density LTCC substrate manufacturing technology and HTCC shell design and manufacturing technology, realize the system cascade within a single package volume, and effectively improve the functional density of the system.

FUNCTION:

Based on high-performance Rad-hard SPARC V8 core as the SiP core, using SoC + Memory + drive architecture, through the extension of FLASH, RAM, ect., with the minimum CPU system and UART, CAN, 1553B and other rich peripheral interface.

FEATURES:

Relying on the high-density miniaturized hybrid assembly technology, it encapsulates the CPU, Memory, Bus controller and Bus Driver, realizing the minimum processor system and abundant peripheral management resources. It has the advantages of small size, light weight, high reliability , anti-harsh environment and high performance.

QUALITY CONTROL:

Grade: H, YB

Specification:

GJB2438B-2017

General Specification for Hybrid Integrated Circuits

APPLICATIONS:

All kinds of electronic system products of space vehicle, complete command safety control and output functions

Approved Products

NO.	Product	Part Number	CPU Minimum System	Bus Interface	Peripheral Interface	Radiation Performose	Other Parameters	Package	Quality Grade
1	LSCCU01RH (Central Control Unit SiP)	LSCCU01RH	Working Frequency: 80MHz; Processor: SPARC V8 based processor; Seven-level pipeline structure; instruction and data cache 16KB each; support 32-bit integer operations and single and double precision floating-point operations; RAM Memory: 2MB SRAM (with EDAC); FLASH Memory: 8MB FLASH	1553B interface:1-channel,supports MIL-STD-1553B protocol, 1Mbps; CAN interface:2-channel,support CAN 2.0A and CAN 2.0B protocols; RS422 interface:2-channel (differential interface); TM interface:2-channel, supporting differential and OC interfaces; TC interface:2 channels, support differential and OC interface	GPIO: 11 channels; Interruption: 6 channels; External expansion interface: supports RAM, ROM, and IO external extensions	TID: 100krad (Si); SEL: 75 MeV·cm²/mg; SEU:2.14×10-7 times/(bits/day)	Power supply voltage: 5V/3.3V/1.8V; Operating Temperatue Range: -55°C~+125°C; Power consumption: ⩽1.6W; ESD：1500V; Weight: 92g; Dimension: 64mm×64mm×9.20mm	PGA220	YB
2	LSCCU01 (Central Control Unit SiP)	LSCCU01	Working Frequency: 80MHz; Processor: SPARC V8 based processor; Seven-level pipeline structure, instruction and data cache 16KB each, support 32-bit integer operations and single and double precision floating-point operations; RAM Memory: 4MB SRAM (with EDAC); FLASH Memory: 8MB FLASH	1553B interface:1-channel, supports MIL-STD-1553B protocol, 1Mbps; CAN interface: 2-channel,support CAN 2.0A and CAN 2.0B protocols; RS422 interface:2-channel (differential interface); TM interface: 2-way, differential and OC interface (with OC gate); TC interface: 2 channels, support differential and OC interface	GPIO: 11 channels; Interruption: 6 channels; External expansion interface: supports RAM, ROM, and IO external extensions	/	Power supply voltage: 5V/3.3V/1.8V; Operating Temperatue Range: --55°C~125°C; Power consumption: ⩽1.6W; ESD: 1500V; Weight: 92g; Dimension: 64mm×64mm×9.2mm	PGA220	H

(2) Information Processing Control SiP(Plastic Package)

INTRODUCTION:

Information Processing Control SiP is a system-level integrated product for highly reliable control and information processing. Based on the design concept of generalization and miniaturization, this series of products, relying on advanced SoC technology, low-cost design technology of space environment and high-density carrier design and assembly technology, realize the system cascade within a single package volume, and effectively improve the functional density of the system.

FUNCTION:

Based on high-performance rad-hard SPARC V8 core or dual-core Power PC processor SoC as the core, using SoC + Memory, through the extension of FLASH, RAM, ect., with the minimum CPU system and UART,CAN,1553B and other rich peripheral interface and PCIe, RapidIO, Ethernet and other high speed interface.

FEATURES:

Relying on the high-density miniaturized hybrid assembly technology, it encapsulates CPU, memory, bus controller and bus driver, realizing the minimum processor system and abundant peripheral management resources. It has the advantages of small size, light weight, low cost and anti-harsh environment and high performance.

QUALITY CONTROL:

Grade: N1

Specification:

GJB7400-2011 *General Specification for Semiconductor Integrated Circuits of Qualified Manufacturer Certification*

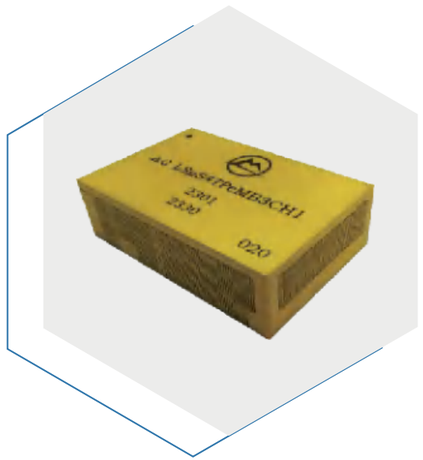
APPLICATIONS:

All kinds of electronic system products of space vehicle, complete command safety control and output functions.

Approved Products

NO.	Product	Part Number	CPU Minimum System	Bus Interface	Peripheral Interface	Radiation Performose	Other Parameters	Package	Quality Grade
1	LSCCU02P (Central Control Unit SiP)	LSCCU02P	Working Frequency: 80MHz; Processor: SPARC V8 based processor; Seven-level pipeline structure, instruction and data cache 16KB each, support 32-bit integer operations and single and doubleprecision floating-point operations; RAM Memory: 4MB SRAM (with EDAC); FLASH Memory: 8MB FLASH	1553B interface:1-channel, supports MIL-STD-1553B protocol, 1Mbps; CAN interface:2-channel,support CAN 2.0A and CAN 2.0B protocols; RS422 interface:2-channel (differential interface); TM interface: differential and OC interface (with OC gate); TC interface: 2 channels, support differential and OC interface	GPIO: 12 channels; Interruption: 6 channels; External expansion interface: supports RAM, ROM, and IO external extensions	TID: 30krad (Si)	Power supply voltage: 3.3V/1.8V/1.2V; Operating Temperatue Range: -40°C~+105°C; Power consumption: ⩽1.6W; ESD：1500V; Weight: 10g; Dimension: 34mm×34mm×2.1mm	PBGA536	N1

(3)Solid State Disk



INTRODUCTION:

The large capacity solid state storage module (Sugar 1) is a system-level integrated product for low cost, high performance and high reliability. It is based on the mature POP and 3D packaging processes.

FUNCTION:

The large capacity solid state storage module (sugar 1) takes LSoCAM2R402RH-type storage control circuit as the core, integrates SPI FLASH memory, NAND FLASH particles, power chip, etc., and has PCIe and SATA high-speed interfaces.

FEATURES:

With the characteristics of high storage density, low cost, high bandwidth, large capacity, miniaturization, adaptation and wide range, it is the latest effective way to solve the integrated volume and cost limit of space aircraft storage system, and can promote innovation and reform in the field of remote sensing and investigation.

APPLICATIONS:

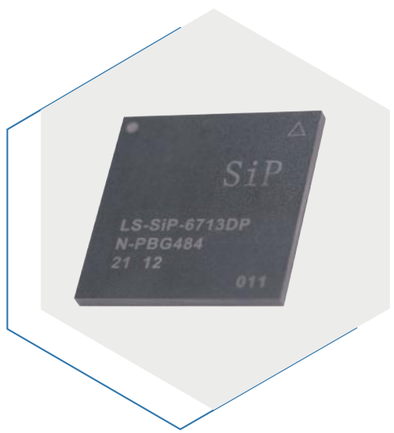
Aerospace and aviation storage fields.

Approved Products

NO.	Family	Part Number	Density (bit)	Interface	Dissipation	Temperatute (℃)	Radiation Tolerance		Package
							TID (Krad（Si）)	SEL (MeV.cm²/mg)	
1	SSD	LSuS2TPeMB3K1	2Tb	SATA3.0×1 PCIe(×4)×1 CAN2.0×1 UART×1 GPIO×1	⩽5W	-40～85	TBD	TBD	BGA270
2		LSuS4TPeMB3K1	4Tb	SATA3.0×1 PCIe(×4)×1 CAN2.0×1 UART×1 GPIO×1	⩽5W	-40～85	TBD	TBD	BGA270

Military 32-bit Processor SiP

(1)Military Plastic Packaging SiP



INTRODUCTION:

The product is used in the field of low cost and high reliability. Based on the design philosophy of lightweight and miniaturization, the stacking of multi chips and system integration is achieved in a packaging module. The advanced technology of SoC, Silicon change stacking and plastic package are applied successfully.

FUNCTION:

Processor and FPGA architecture is used in the product which also has abundant peripherals such as UART、CAN、1553、SPI、I2C、GPIO and so on.

FEATURES:

Single or Dual-core SoC (MCU) and FPGA architecture, mass storage devices, the fast realization of system application.

Based on the technology of military plastic packaging, this product has the characteristic of small size, light quality and anti-vibration impact ability.

QUALITY CONTROL:

Quality Grade：N1

Specification：

GJB 7400-2011 *General Specification for Semiconductor Integrated Circuits of Qualified Manufacturer Certification*

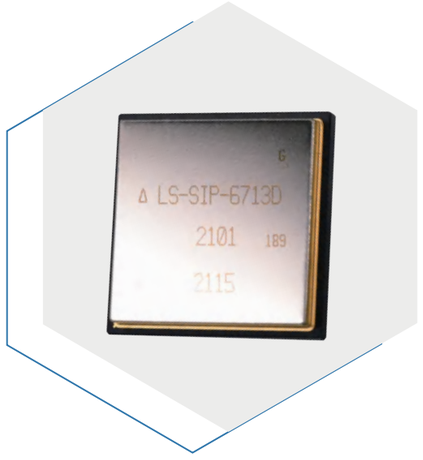
Approved Products

NO.	Product	Part Number	Processor	Programmable Devices	Internal Storage	Interface	Temperature	Size	Package	Quality Grade
1	No.1 Sophon Single-Core Military Plastic Packaging SiP	LS-SiP-6713SP	SoC which is compatible with TMS320C6713, operating frequency is 200MHz;	／	128Mbits SDRAM,frequency is 100MHz;32Mbits NOR FLASH;	32-bit EMIF;16-bit HPI interface; 3-way HDLC;7-way UART;2-way CAN;1-way 1553B;1-way SPI; 8-channel Etimer;16-channel GPIO,support userself-configuration;	-55℃～+125℃	16mm ×16mm ×2.40mm	PBGA361	N1
2	No.2 Sophon Dual-Core Military Plastic Packaging SiP	LS-SiP-6713DP	2 SoC which is compatible with TMS320C6713, operating frequency is 200MHz;	1M system gates FOGA which is compatible with XC2V1000;	4Mbits PROM;2 SDRAM with single capacity of 128Mbits,frequency is 100MHz; 2 NOR FLASH with single capacity of 32Mbits;	16-bit EMIF;8-way HDLC; 16-way UART;4-way CAN; 2-way 1553B; 2-way SPI;112-channel GPIO,support userself-configuration;	-55℃～+125℃	29mm ×29mm ×2.52mm	PBGA484	N1
3	No.1 Mozi Single-Core Military Plastic Packaging SiP	LSP3209SP	MCU based on ARM Cortex-R4,operating frequency is 300MHz;	1M system gates FOGA which is compatible with XC2V1000;	4Mbits PROM for FPGA configuration	16-bit EMIF;8-way UART; 4-way CAN;1-way 1553B; 4-way SPI;2-way Flexray; 1-way Ethernet,112-channel GPIO,3-channel timer; 2-channel counter, 12-channel PWM;7-channel interrupt;16-channel AD; 8-channel DA;	-55℃～+125℃	18mm ×18mm ×2.44mm	PBGA484	N1

Under-researched Products

NO.	Product	Part Number	Processor	Programmable Devices	Internal Storage	Interface	Temperature	Size	Package	Quality Grade
1	High-Performance General-Purpose Information Processing SiP	LMS6678S-FCBGA	One domestic 6678 (8 FT-M66X cores), single core operating frequency 1GHz;	/	On-chip large-capacity shared storage for processors, 8 cores sharing 4MB SRAM; The processor peripheral integrates 4 DDR3 chips, and the single-chip capacity is 4Gbits; 1 parallel NOP FLASH with a capacity of 512Mbits;	1-way I2C、2-way SPI、1-way UART、1-way-1553B、SRIO、PCIE、GMAC；	-40℃～+105℃	27mm ×23mm ×4.45mm	FCBGA920	-
2	High-Performance Programmable Information Processing SiP	LMS7045S-FCBGA	FMQL45T900, 32-bit quad-core processor; 1.9DMIPS/MHz(single core);	Logic scale: 3.5 million， Block RAM: 19.2Mb， DSP Slices (18 x 25 MACCs) 900;	2 DDR3 chips，and the single-chip capacity is 4Gbits; 1 parallel NOP FLASH with a capacity of 512Mbits;	Eth、1553、UART、CAN、I2C、SPI、RF interface; 48 PS IO， 150 HR IO， 16-way GTX;	-40℃～+105℃	36mm ×36mm ×4mm	FCBGA1932	-

(2)Master Control System Integration SiP



INTRODUCTION:

The product is used in the field of high reliability. Based on the design philosophy of long-life and miniaturization, the stacking of multi chips and system integration is achieved in a packaging module. The advanced technology of SoC, LTCC substrates of double cavity, HTCC package of large cavity are applied successfully.

FUNCTION:

Dual-core architecture is used in the product which also has mass storage devices and FPGA with high performance. This product has abundant peripherals such as UART、1553、CAN、I2C and so on. FPGA can be programed by the users.

FEATURES:

Dual-core SoC and FPGA architecture, mass storage devices, the fast realization of system application.

Based on the sealing technology of ceramic cavity full, this product has the characteristic of high reliability, long-life and anti-adverse environment.

QUALITY CONTROL:

Grade：H、G_J

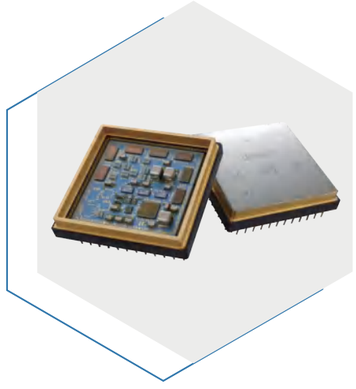
Specification：

GJB 2438A-2002 *General Specification for Hybrid Integrated Circuits*

Approved Products

NO.	Part Number	Processor	Programmable Devices	Internal Storage	Interface	Temperature	Size	Package	Quality Grade
1	LS-SIP-6713D	2 SoC which is compatible with TMS320C6713, operating frequency is 200MHz;	1M system gates FOGA which is compatible with XC2V1000;	4Mbits PROM;2 SDRAM with single capacity of 128Mbits,frequency is 100MHz;2 NOR FLASH with single capacity of 16Mbits;	16-bit EMIF;6-way HDLC;12-way UART;4-way CAN;3-way 1553B; 2-way SPI;178-channel GPIO,support userself-configuration;	-55℃～＋125℃(H) -45℃～＋85℃(G_J)	48mm ×48mm ×8.7mm	PGA360	H、G_J

AD Acquisition Modules



INTRODUCTION:

AD acquisition module is a system-level integrated product for high-reliability telemetry acquisition. Also the system cascade in a single package volume implemented based on generalization and miniaturization design. The functional density is enhanced by McM high density 3D assembly technique, high density LTCC substrate manufacturing technique and integrated HTCC technique etc.

FUNCTION:

Based on AD acquisition control circuits, analog channel selection and multi-channel AD intelligent acquisition achieved by expending multiplexer and ADC.

FEATURES:

The analog channel selection and multi-channel AD intelligent acquisition with small volume, light weight, high reliability based on high density miniaturization hybrid assembly technique.

QUALITY CONTROL:

Grade: H

Specification:

GJB2438B-2017 *General Specification for Hybrid Integrated Circuits*

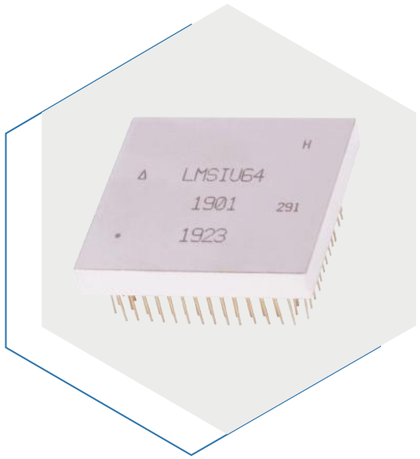
APPLICATIONS:

Electronic system product in space aircraft.

Approved Products

NO.	Product	Part Number	Working Frequency	AD Interface	Access Interface	Radiation Performance	Other Parameters	Package	Quality Level
1	LMUX160A Multiplexing circuit	LMUX160A		Number of channels: 128 analog differential channels; 160 single-ended analog acquisition(4:1); 144 differential analog inputs(9:1); Analog acquisition range: -5V ~ +10V		TID:100krad(Si); SEL immunized	Power supply voltage: +10.8V～+16.5V/-16.5V～-10.8V; Operating temperature: -55°C ~ +125°C; Power consumption: < 1W; Weight：23g Dimension:35.6mmX35.6mmX6.5mm	PGA251	H
2	LMRAD64A ADC	LMRAD64A		Number of channels: 64 analog differential channels(4:1); 12 analog differential channels(1:1); Analog acquisition range: 0V ~ +5V; Acquisition error: 5mV; Resolution: 12bit; Single sampling conversion time: 35 μs		TID: 100krad(Si); SEU:≥75MeV·cm²/mg	Power supply voltage: +10.8V～+16.5V/-16.5V～-10.8V; Operating temperature: -55°C ~ +125°C; Power consumption: < 2W; Weight: 23g; Dimension: 35.6mm×35 .6mm×6 .5mm	PGA251	H

Instruction Modules



INTRODUCTION:

Instruction module is a system-level integrated product for high-reliability instruction control. Based on the design concept of generalization and miniaturization, the series of products, relying on advanced MCM high-density assembly technology, high-density LTCC substrate manufacturing technology, HTCC shell design and manufacturing technology, high-density IC carrier board design and assembly technology and plastic encapsulation technology, realize the security command management and control function within a single package volume, and effectively improve the functional density of the system.

FUNCTION:

With rad-hard instruction control ASIC as the core, security instruction management, multi-channel OC instruction or OE instruction control output functions can be realized by extending instruction driver.

FEATURES:

Relying on the high-density miniaturized hybrid assembly technology, it realizes the serial redundant instruction drive, instruction coding, instruction verification and other safety instruction control functions. The instruction type(pulse instruction and level instruction)is optional. It has the advantages of small size, light weight, high reliability and anti-harsh environment.

QUALITY CONTROL:

Grade: N1, H, YC

Specification:

GJB7400-2011 *General Specification for Semiconductor Integrated Circuits of Qualified Manufacturer Certification*

GJB2438B-2017 *General Specification for Hybrid Integrated Circuit*

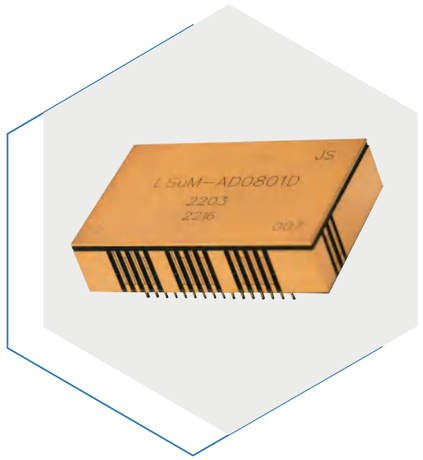
APPLICATIONS:

All kinds of electronic system products of space vehicle, complete command safety control and output functions.

Approved Products

NO.	Product	Part Number	Working Frequency	Instruction Interface	Access Interface	Radiation Performose	Other Parameters	Package	Quality Grade
1	LMSIU64 safe instruction management module	LMSIU64	12MHz	Command channel: 64 channels; Command type: level type or negative pulse type, Pulse width can be configured by software; Saturation voltage: ⩽ 1.5V; Drive current: ⩽ 200mA	8-bit/16-bit parallel bus access	TID:100krad(Si); SEL:⩾75 MeV•cm²/mg; SEU: 37MeV • cm²/mg	Power supply voltage: 5V; Operating Temperatue Range: - 55 °C~125 °C; Power consumption: ⩽ 0.4W (static); Power consumption: ⩽ 0.5W (dynamic); ESD：1500V; Weight: 42g; Dimension: 45mm × 45mm × 6.5mm	PGA104	YC
2	LMSIU64P safe instruction management module	LMSIU64P	12MHz	Command channel: 64 channels; Command type: Support level command and negative pulse command, Negative pulse width command width can be output through software programming; Saturation voltage: ⩽ 1.5V; Drive current: ⩽ 200mA	Data bus interface, Support 8-bit/16-bit options	TID: 50krad (Si)	Power supply voltage: 5V; Operating Temperatue Range: - 40 °C~+105 °C; Power consumption: ⩽ 4W; ESD：1500V; Weight: 8g; Dimension: 25mm × 25mm × 1.95mm	PBGA480	N1
3	LSIU128-OE type command sending circuit	LSIU128-OE	6.5536MHz	Command channel: 128 channels; Command type: positive pulse command; Saturation voltage: ⩽ 3.8V; Drive current: ⩽ 200mA	Three-wire system/two-wire system RS422 interface	TID:100krad(Si); SEL:⩾75MeV•cm²/mg; SEU: 37MeV • cm²/mg	Power supply voltage: remote control instruction decoding power supply voltage (VDD_PAD):4.5V～5.5V; Remote control instruction decoding power supply (VDD_CORE):1.62V～1.98V; Command forward drive power supply voltage (VDD1～VDD8) ： 12V～33V; Operating Temperatue Range: - 55 °C~+125 °C; Power consumption: ⩽ 3W; ESD：2000V; Weight: 55g; Dimension: 52.6mm × 52.6mm × 6.5mm	PGA379	H

LSuM-AD0801DE Product



INTRODUCTION:

LSuM-AD0801DE module is a micro-integrated module product for multi-channel analog isolation acquisition.The product adopts over-sampling and noise reduction technology,and based on three-dimensional stacked PoP packaging process,realizes the miniaturization of multi-channel analog acquistion.It has the characteristics of simplified design,easy to use and standard interface.

FEATURES:

LSuM-AD0801DE product is an integrated solution for analog signal isolution measurement,applicable to scenarios such as telemetry,power moniting,and health management.

APPLICATIONS:

Power monitoring,health management,telemetry system with miniaturization requirements embedded in aerospace and other systems.

Approved Products

NO.	Family	Part Number	I/O Voltage	sampLing rate	Channel	Measurement accuracy	Isolation voltage	Temperatute (°C)	Package
1	Analoy Signal Measurement	LSuM-AD0801DE	3.3V	100kHz	8	0.5%FSR	1500V	-55～100	DIP32