Micro Commercial Components
20736 Marilla Street Chatsworth
CA 91311
Phone: (818) 701-4933
Fax: (818) 701-4939

# MMSZ5221B THRU MMSZ5259B(C)

**500 mW**

**Zener Diodes**

**2.4 to 39 Volts**

## Features

- Lead Free Finish/RoHS Compliant("P" Suffix designates RoHS Compliant. See ordering information)
- Planar Die construction
- Zener Voltages from 2.4V - 39V and 500mW Power Dissipation
- Ideally Suited for Automated Assembly Processes

## Mechanical Data

- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1
- Halogen free available upon request by adding suffix "-HF"
- Approx. Weight: 0.009 grams
- Mounting Position: Any
- Storage & Operating Temperature: -55°C to +150°C

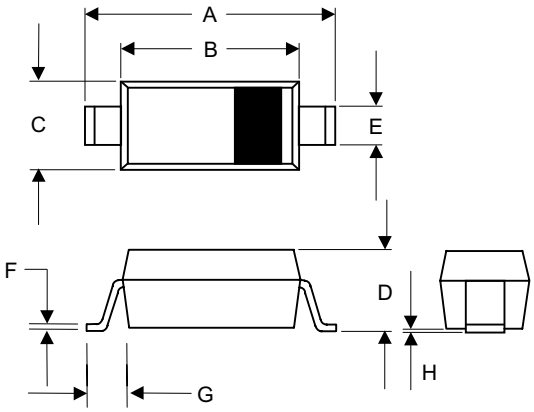
### Maximum Ratings @ 25°C Unless Otherwise Specified

| | | | |
|---|---|---|---|
| Maximum Forward Voltage @ $I_F$=10mA | $V_F$ | 0.9 | V |
| Power Dissipation (Notes A) | $P_{(AV)}$ | 500 | mWatt |

**NOTES:**

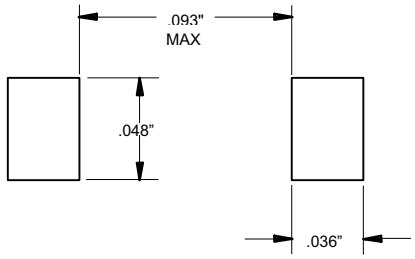
A. Mounted on 5.0mm2(.013mm thick) land areas.

SOD123




| DIMENSIONS | | | | | |
|---|---|---|---|---|---|
| DIM | INCHES | | MM | | NOTE |
| | MIN | MAX | MIN | MAX | |
| A | .141 | .154 | 3.60 | 3.90 | |
| B | .098 | .110 | 2.50 | 2.80 | |
| C | .055 | .071 | 1.40 | 1.80 | |
| D | .037 | .053 | 0.95 | 1.35 | |
| E | .019 | .028 | 0.50 | 0.70 | |
| F | --- | .008 | --- | 0.20 | |
| G | .016 | --- | 0.40 | --- | |
| H | --- | .005 | --- | 0.12 | |

SUGGESTED SOLDER PAD LAYOUT



# MMSZ5221B thru MMSZ5259B(C)

Micro Commercial Components

## Electrical Characteristics @ 25°C Unless Otherwise Specified

| MCC PART NUMBER | Marking | NORMAL ZENER VOLTAGE Vz@ Izt | TEST CURRENT Izt | MAXIMUM ZENER IMPEDANCE Zzt @ Izt | Zzk @ Izk=0.25mA | MAXIMUM REVERSE LEAKAGE CURRENT Ir @ Vr | | MAXIMUM ZENER VOLTAGE TEMP |
|---|---|---|---|---|---|---|---|---|
| | | VOLTS | mA | OHMS | OHMS | uA | VOLTS | %/°C |
| MMSZ5221B | C1 | 2.4 | 20 | 30 | 1200 | 100 | 1.0 | -0.085 |
| MMSZ5222B | C2 | 2.5 | 20 | 30 | 1250 | 100 | 1.0 | -0.085 |
| MMSZ5223B | C3 | 2.7 | 20 | 30 | 1300 | 75 | 1.0 | -0.080 |
| MMSZ5225B | C5 | 3.0 | 20 | 29 | 1600 | 50 | 1.0 | -0.075 |
| MMSZ5226B | G1/ D1 | 3.3 | 20 | 28 | 1600 | 25 | 1.0 | -0.070 |
| MMSZ5227B | G2/ D2 | 3.6 | 20 | 24 | 1700 | 15 | 1.0 | -0.065 |
| MMSZ5228B | G3/ D3 | 3.9 | 20 | 23 | 1900 | 10 | 1.0 | -0.060 |
| MMSZ5229B | G4/ D4 | 4.3 | 20 | 22 | 2000 | 5.0 | 1.0 | ±0.055 |
| MMSZ5230B | G5/ D5 | 4.7 | 20 | 19 | 1900 | 5.0 | 2.0 | ±0.030 |
| MMSZ5231B | E1 | 5.1 | 20 | 17 | 1600 | 5.0 | 2.0 | ±0.030 |
| MMSZ5232B | E2 | 5.6 | 20 | 11 | 1600 | 5.0 | 3.0 | +0.038 |
| MMSZ5233B | E3 | 6.0 | 20 | 7.0 | 1600 | 5.0 | 3.5 | +0.040 |
| MMSZ5234B | E4 | 6.2 | 20 | 7.0 | 1000 | 5.0 | 4.0 | +0.045 |
| MMSZ5235B | E5 | 6.8 | 20 | 5.0 | 750 | 3.0 | 5.0 | +0.050 |
| MMSZ5236B | F1 | 7.5 | 20 | 6.0 | 500 | 3.0 | 6.0 | +0.058 |
| MMSZ5237B | F2 | 8.2 | 20 | 8.0 | 500 | 3.0 | 6.5 | +0.062 |
| MMSZ5238B | F3 | 8.7 | 20 | 8.0 | 600 | 3.0 | 6.5 | +0.065 |
| MMSZ5239B | F4 | 9.1 | 20 | 10 | 600 | 3.0 | 7.0 | +0.068 |
| MMSZ5240B | F5 | 10 | 20 | 17 | 600 | 3.0 | 8.0 | +0.075 |
| MMSZ5241B | H1 | 11 | 20 | 22 | 600 | 2.0 | 8.4 | +0.076 |
| MMSZ5242B | H2 | 12 | 20 | 30 | 600 | 1.0 | 9.1 | +0.077 |
| MMSZ5243B | H3 | 13 | 9.5 | 13 | 600 | 0.5 | 9.9 | +0.079 |
| MMSZ5244B | H4 | 14 | 9.0 | 15 | 600 | 0.1 | 10.5 | +0.081 |
| MMSZ5245B | H5 | 15 | 8.5 | 16 | 600 | 0.1 | 11 | +0.082 |
| MMSZ5246B | J1 | 16 | 7.8 | 17 | 600 | 0.1 | 12 | +0.083 |
| MMSZ5248B | J3 | 18 | 7.0 | 21 | 600 | 0.1 | 14 | +0.085 |
| MMSZ5250B | J5 | 20 | 6.2 | 25 | 600 | 0.1 | 15 | +0.086 |
| MMSZ5251B | K1 | 22 | 5.6 | 29 | 600 | 0.1 | 17 | +0.087 |
| MMSZ5252B | K2 | 24 | 5.2 | 33 | 600 | 0.1 | 18 | +0.088 |
| MMSZ5254B | K4 | 27 | 4.6 | 41 | 600 | 0.1 | 21 | +0.090 |
| MMSZ5255B | K5 | 28 | 4.5 | 44 | 600 | 0.1 | 21 | +0.091 |
| MMSZ5256B | M1 | 30 | 4.2 | 49 | 600 | 0.1 | 23 | +0.091 |
| MMSZ5257B | M2 | 33 | 3.8 | 58 | 700 | 0.1 | 25 | +0.092 |
| MMSZ5258B | M3 | 36 | 3.4 | 70 | 700 | 0.1 | 27 | +0.093 |
| MMSZ5259B | M4 | 39 | 3.2 | 80 | 800 | 0.1 | 30 | +0.094 |

NOTE:

1. Standard Zener voltage tolerance is ±5% with a "B" suffix (e.g.: MMSZ5225B),suffix "C" is ± 2 % tolerance
2. Specials Available Include:
   A. Nominal zener voltages between the voltages shown and tighter voltage tolerances.
   B. Matched sets.
3. Zener Voltage ($V_Z$) Measurement. Guarantees the zener voltage when measured at 90 seconds while maintaining the lead temperature ($T_L$) at 30°C, from the diode body.
4. Zener Impedance ($Z_Z$) Derivation. The zener impedance is derived from the 60 cycle ac voltage, which results when an AC current having an rms value equal to 10% of the dc zener current ($I_{ZT}$ or $I_{ZK}$) is superimposed on $I_{ZT}$ or $I_{ZK}$.
5. Surge Current ($I_R$) Non-Repetitive. The rating listed in the electrical characteristics table is maximum peak, non-repetitive, reverse surge current of 1/2 square wave or equivalent sine wave pulse of 1/120 second duration superimposed on the test current, $I_{ZT}$, per JEDEC registration; however, actual device capability is as described in Figure 5.

# MMSZ5221B thru MMSZ5259B(C)

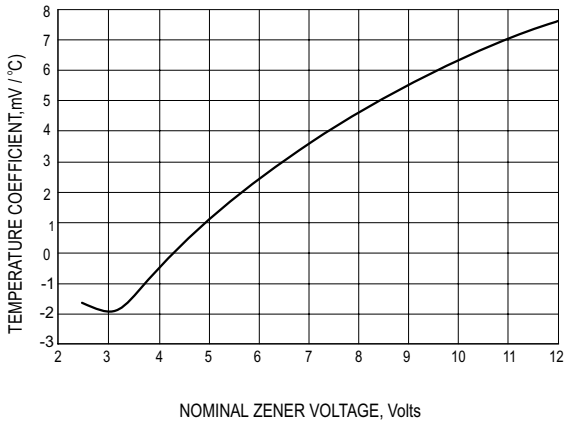
## Electrical Characteristics @ 25°C Unless Otherwise Specified

| MCC PART NUMBER | Marking | NORMAL ZENER VOLTAGE Vz@ Izt | TEST CURRENT Izt | MAXIMUM ZENER IMPEDANCE Zzt @ Izt | Zzk @ Izk=0.25mA | MAXIMUM REVERSE LEAKAGE CURRENT Ir @ Vr | | MAXIMUM ZENER VOLTAGE TEMP |
|---|---|---|---|---|---|---|---|---|
| | | VOLTS | mA | OHMS | OHMS | uA | VOLTS | %/°C |
| MMSZ5229C | 2G4/D4 | 4.3 | 20 | 22 | 2000 | 5.0 | 1.0 | ±0.055 |
| MMSZ5230C | 2G5/D5 | 4.7 | 20 | 19 | 1900 | 5.0 | 2.0 | ±0.030 |
| MMSZ5231C | 2E1/E1 | 5.1 | 20 | 17 | 1600 | 5.0 | 2.0 | ±0.030 |
| MMSZ5232C | 2E2/E2 | 5.6 | 20 | 11 | 1600 | 5.0 | 3.0 | +0.038 |
| MMSZ5233C | 2E3/E3 | 6.0 | 20 | 7.0 | 1600 | 5.0 | 3.5 | +0.040 |
| MMSZ5234C | 2E4/E4 | 6.2 | 20 | 7.0 | 1000 | 5.0 | 4.0 | +0.045 |
| MMSZ5235C | 2E5/E5 | 6.8 | 20 | 5.0 | 750 | 3.0 | 5.0 | +0.050 |
| MMSZ5236C | 2F1/F1 | 7.5 | 20 | 6.0 | 500 | 3.0 | 6.0 | +0.058 |
| MMSZ5237C | 2F2/F2 | 8.2 | 20 | 8.0 | 500 | 3.0 | 6.0 | +0.062 |
| MMSZ5238C | 2F3/F3 | 8.7 | 20 | 8.0 | 600 | 3.0 | 6.5 | +0.065 |
| MMSZ5239C | 2F4/F4 | 9.1 | 20 | 10 | 600 | 3.0 | 6.5 | +0.068 |
| MMSZ5240C | 2F5/F5 | 10 | 20 | 17 | 600 | 3.0 | 8.0 | +0.075 |
| MMSZ5241C | 2H1/H1 | 11 | 20 | 22 | 600 | 3.0 | 8.4 | +0.076 |
| MMSZ5242C | 2H2/H2 | 12 | 20 | 30 | 600 | 2.0 | 9.1 | +0.077 |
| MMSZ5243C | 2H3/H3 | 13 | 9.5 | 13 | 600 | 1.0 | 9.9 | +0.079 |
| MMSZ5244C | 2H4/H4 | 14 | 9.0 | 15 | 600 | 0.5 | 10.5 | +0.081 |
| MMSZ5245C | 2H5/H5 | 15 | 8.5 | 16 | 600 | 0.5 | 11 | +0.082 |
| MMSZ5246C | 2J1/J1 | 16 | 7.8 | 17 | 600 | 0.1 | 12 | +0.083 |
| MMSZ5248C | 2J3/J3 | 18 | 7.0 | 21 | 600 | 0.1 | 14 | +0.085 |
| MMSZ5250C | 2J5/J5 | 20 | 6.2 | 25 | 600 | 0.1 | 15 | +0.086 |
| MMSZ5251C | 2K1/K1 | 22 | 5.6 | 29 | 600 | 0.1 | 17 | +0.087 |
| MMSZ5252C | 2K2/K2 | 24 | 5.2 | 33 | 600 | 0.1 | 18 | +0.088 |
| MMSZ5254C | 2K4/K4 | 27 | 4.6 | 41 | 600 | 0.1 | 21 | +0.090 |
| MMSZ5255C | 2K5/K5 | 28 | 4.5 | 44 | 600 | 0.1 | 21 | +0.091 |
| MMSZ5256C | 2M1/M1 | 30 | 4.2 | 49 | 600 | 0.1 | 23 | +0.091 |
| MMSZ5257C | 2M2/M2 | 33 | 3.8 | 58 | 700 | 0.1 | 25 | +0.092 |
| MMSZ5258C | 2M3/M3 | 36 | 3.4 | 70 | 700 | 0.1 | 27 | +0.093 |
| MMSZ5259C | 2M4/M4 | 39 | 3.2 | 80 | 800 | 0.1 | 30 | +0.094 |

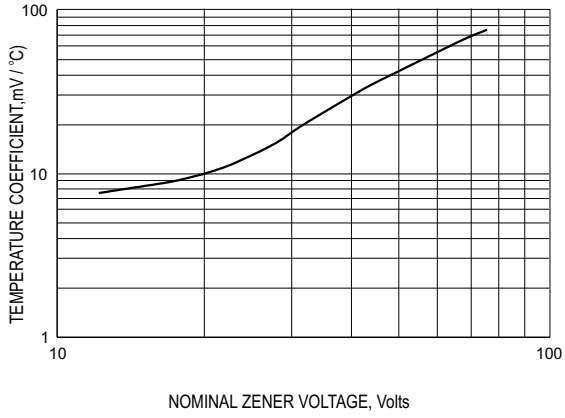
NOTE:

1. Standard Zener voltage tolerance is ±5% with a "B" suffix (e.g.: MMSZ5225B),suffix "C" is ± 2 % tolerance
2. Specials Available Include:
   A. Nominal zener voltages between the voltages shown and tighter voltage tolerances.
   B. Matched sets.
3. Zener Voltage ($V_Z$) Measurement. Guarantees the zener voltage when measured at 90 seconds while maintaining the lead temperature ($T_L$) at 30°C, from the diode body.
4. Zener Impedance ($Z_Z$) Derivation. The zener impedance is derived from the 60 cycle ac voltage, which results when an AC current having an rms value equal to 10% of the dc zener current ($I_{ZT}$ or $I_{ZK}$) is superimposed on $I_{ZT}$ or $I_{ZK}$.
5. Surge Current ($I_R$) Non-Repetitive. The rating listed in the electrical characteristics table is maximum peak, non-repetitive, reverse surge current of 1/2 square wave or equivalent sine wave pulse of 1/120 second duration superimposed on the test current, $I_{ZT}$, per JEDEC registration; however, actual device capability is as described in Figure 5.

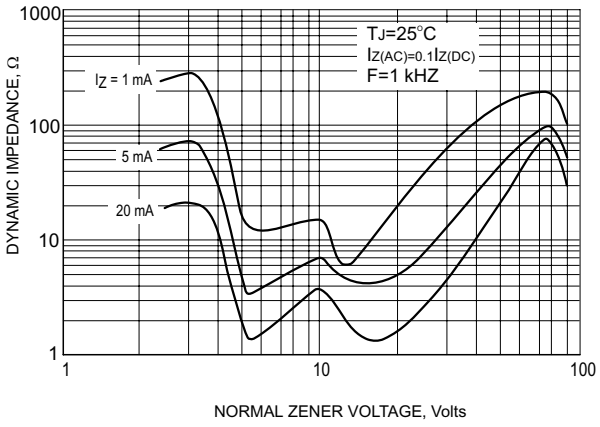
.



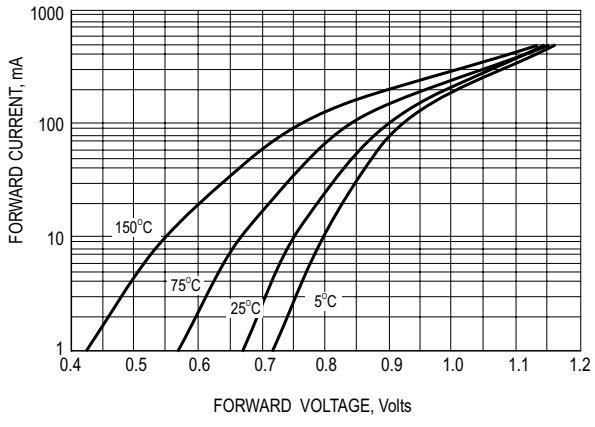

**TYPICAL REVERSE CURRENT**



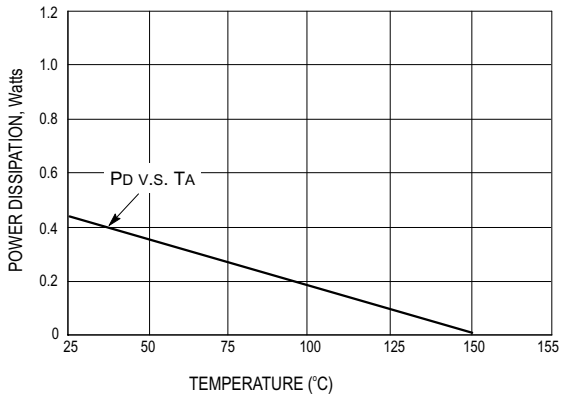

**STEADY STATE POWER DERATING**



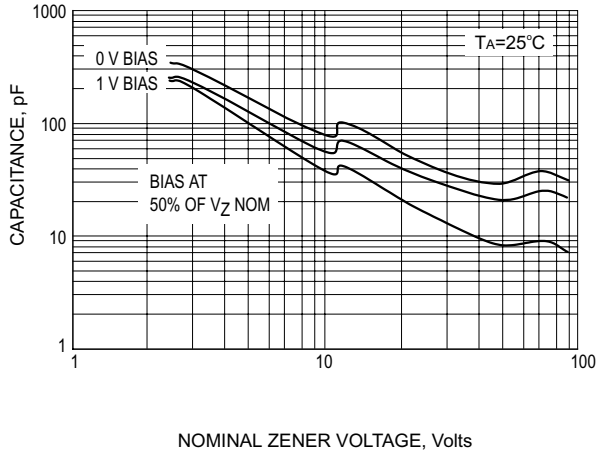

**EFFECT OF ZENER VOLTAGE ON ZENER IMPEDANCE**



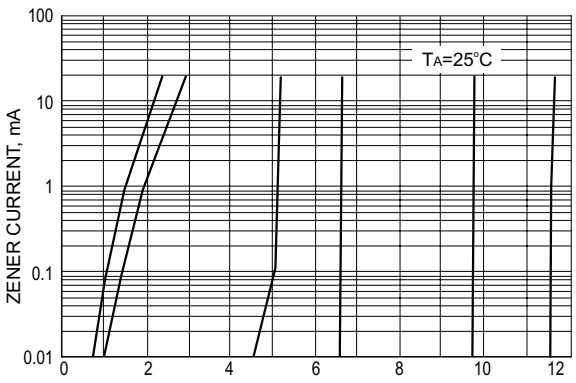

**TYPICAL FORWARD VOLTAGE**



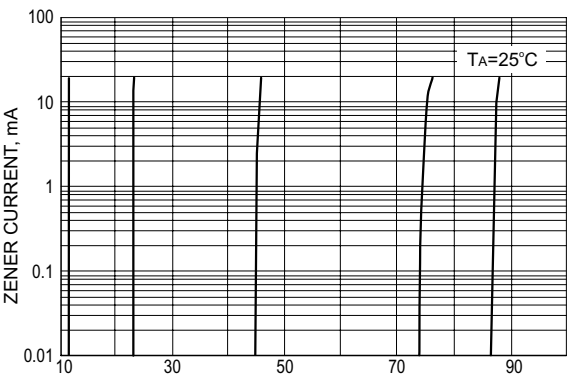

**STEADY STATE POWER DERATING**



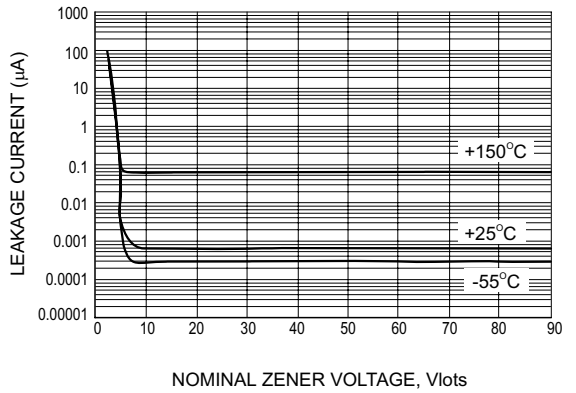

**TYPICAL CAPACITANCE**




**ZENER VOLTAGE V.S. ZENER CURRENT**




**ZENER VOLTAGE V.S. ZENER CURRENT**




**TYPICAL LEAKGE CURRENT**

Micro Commercial Components

## Ordering Information :

| Device | Packing |
|---|---|
| Part Number-TP | Tape&Reel: 3Kpcs/Reel |

Note : Adding "-HF" suffix for halogen free, eg. Part Number-TP-HF

| ***IMPORTANT NOTICE*** |
|---|
| ***Micro Commercial Components Corp.*** reserves the right to make changes without further notice to any product herein to make corrections, modifications , enhancements , improvements , or other changes . ***Micro Commercial Components Corp .*** does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights ,nor the rights of others . The user of products in such applications shall assume all risks of such use and will agree to hold ***Micro Commercial Components Corp .*** and all the companies whose products are represented on our website, harmless against all damages. |
| ***LIFE SUPPORT*** |
| MCC's products are not authorized for use as critical components in life support devices or systems without the express written approval of Micro Commercial Components Corporation. |
| ***CUSTOMER AWARENESS*** |
| Counterfeiting of semiconductor parts is a growing problem in the industry. Micro Commercial Components (MCC) is taking strong measures to protect ourselves and our customers from the proliferation of counterfeit parts. MCC strongly encourages customers to purchase MCC parts either directly from MCC or from Authorized MCC Distributors who are listed by country on our web page cited below. Products customers buy either from MCC directly or from Authorized MCC Distributors are genuine parts, have full traceability, meet MCC's quality standards for handling and storage. **MCC will not provide any warranty coverage or other assistance for parts bought from Unauthorized Sources.** MCC is committed to combat this global problem and encourage our customers to do their part in stopping this practice by buying direct or from authorized distributors. |

# OCEAN CHIPS
## Океан Электроники
## Поставка электронных компонентов

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «**JONHON**», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «**FORSTAR**».

AVIC JONHON

**«JONHON»** (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

**«FORSTAR»** (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).

FORSTAR®

Телефон: 8 (812) 309-75-97 (многоканальный)
Факс: 8 (812) 320-03-32
Электронная почта: ocean@oceanchips.ru
Web: http://oceanchips.ru/
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А