MMSZ5221BT1 Series

Preferred Device

Zener Voltage Regulators

500 mW SOD−123 Surface Mount

Three complete series of Zener diodes are offered in the convenient, surface mount plastic SOD−123 package. These devices provide a convenient alternative to the leadless 34−package style.

Features

- 500 mW Rating on FR−4 or FR−5 Board
- Wide Zener Reverse Voltage Range − 2.4 V to 110 V
- Package Designed for Optimal Automated Board Assembly
- Small Package Size for High Density Applications
- General Purpose, Medium Current
- ESD Rating of Class 3 (>16 kV) per Human Body Model
- Pb−Free Packages are Available

Mechanical Characteristics

CASE: Void-free, transfer-molded, thermosetting plastic case
FINISH: Corrosion resistant finish, easily solderable
MAXIMUM CASE TEMPERATURE FOR SOLDERING PURPOSES: 260°C for 10 Seconds
POLARITY: Cathode indicated by polarity band
FLAMMABILITY RATING: UL 94 V−0

MAXIMUM RATINGS

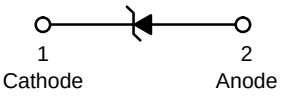
Rating	Symbol	Max	Unit
Total Power Dissipation on FR−5 Board, (Note 1) @ T_L = 75°C Derated above 75°C	P_D	500 6.7	mW mW/°C
Thermal Resistance, (Note 2) Junction−to−Ambient	$R_{\theta JA}$	340	°C/W
Thermal Resistance, (Note 2) Junction−to−Lead	$R_{\theta JL}$	150	°C/W
Junction and Storage Temperature Range	T_J, T_{stg}	−55 to +150	°C

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

1. FR−5 = 3.5 X 1.5 inches, using the minimum recommended footprint.
2. Thermal Resistance measurement obtained via infrared Scan Method.

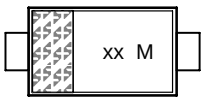
ON Semiconductor®

http://onsemi.com



SOD−123
CASE 425
STYLE 1

MARKING DIAGRAM



xx = Specific Device Code
M = Date Code

ORDERING INFORMATION

Device**	Package	Shipping†
MMSZ52xxBT1	SOD−123	3000/Tape & Reel
MMSZ52xxBT1G	SOD−123 (Pb−Free)	3000/Tape & Reel
MMSZ52xxBT3	SOD−123	10,000/Tape & Reel
MMSZ52xxBT3G	SOD−123 (Pb−Free)	10,000/Tape & Reel

**The “T1” suffix refers to an 8 mm, 7 inch reel.
The “T3” suffix refers to an 8 mm, 13 inch reel.

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

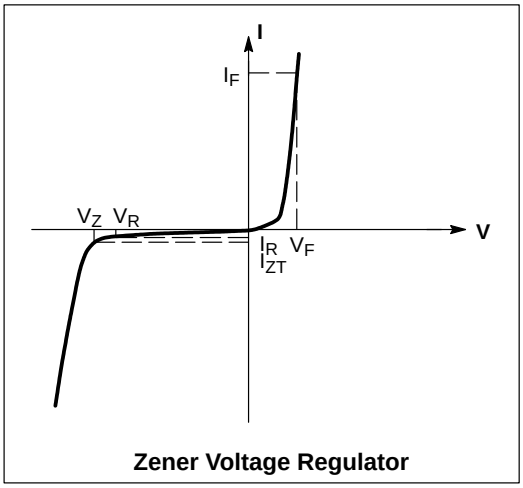
DEVICE MARKING INFORMATION

See specific marking information in the device marking column of the Electrical Characteristics table on page 3 of this data sheet.

Devices listed in ***bold, italic*** are ON Semiconductor **Preferred** devices. **Preferred** devices are recommended choices for future use and best overall value.

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted, V_F = 0.95 V Max. @ I_F = 10 mA)

Symbol	Parameter
V_Z	Reverse Zener Voltage @ I_{ZT}
I_{ZT}	Reverse Current
Z_{ZT}	Maximum Zener Impedance @ I_{ZT}
I_{ZK}	Reverse Current
Z_{ZK}	Maximum Zener Impedance @ I_{ZK}
I_R	Reverse Leakage Current @ V_R
V_R	Reverse Voltage
I_F	Forward Current
V_F	Forward Voltage @ I_F



Zener Voltage Regulator

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted, V_F = 0.9 V Max. @ I_F = 10 mA)

Device	Device Marking	Zener Voltage (Notes 3 and 4)				Zener Impedance (Note 5)			Leakage Current	
		V_Z (Volts)			@ I_{ZT}	Z_{ZT} @ I_{ZT}	Z_{ZK} @ I_{ZK}		I_R @ V_R	
		Min	Nom	Max	mA	Ω	Ω	mA	μA	Volts
MMSZ5221BT1, G	***C1***	***2.28***	***2.4***	***2.52***	***20***	***30***	***1200***	***0.25***	***100***	***1***
MMSZ5222BT1	***C2***	***2.38***	***2.5***	***2.63***	***20***	***30***	***1250***	***0.25***	***100***	***1***
MMSZ5223BT1, G	C3	2.57	2.7	2.84	20	30	1300	0.25	75	1
MMSZ5224BT1	C4	2.66	2.8	2.94	20	30	1400	0.25	75	1
MMSZ5225BT1	***C5***	***2.85***	***3.0***	***3.15***	***20***	***29***	***1600***	***0.25***	***50***	***1***
MMSZ5226BT1, G	D1	3.14	3.3	3.47	20	28	1600	0.25	25	1
MMSZ5227BT1, G	D2	3.42	3.6	3.78	20	24	1700	0.25	15	1
MMSZ5228BT1, G	D3	3.71	3.9	4.10	20	23	1900	0.25	10	1
MMSZ5229BT1, G	***D4***	***4.09***	***4.3***	***4.52***	***20***	***22***	***2000***	***0.25***	***5***	***1***
MMSZ5230BT1, G	***D5***	***4.47***	***4.7***	***4.94***	***20***	***19***	***1900***	***0.25***	***5***	***2***
MMSZ5231BT1, G	***E1***	***4.85***	***5.1***	***5.36***	***20***	***17***	***1600***	***0.25***	***5***	***2***
MMSZ5232BT1, G	***E2***	***5.32***	***5.6***	***5.88***	***20***	***11***	***1600***	***0.25***	***5***	***3***
MMSZ5233BT1, G	E3	5.70	6.0	6.30	20	7	1600	0.25	5	3.5
MMSZ5234BT1, G	***E4***	***5.89***	***6.2***	***6.51***	***20***	***7***	***1000***	***0.25***	***5***	***4***
MMSZ5235BT1, G	E5	6.46	6.8	7.14	20	5	750	0.25	3	5
MMSZ5236BT1, G	F1	7.13	7.5	7.88	20	6	500	0.25	3	6
MMSZ5237BT1, G	F2	7.79	8.2	8.61	20	8	500	0.25	3	6.5
MMSZ5238BT1	F3	8.27	8.7	9.14	20	8	600	0.25	3	6.5
MMSZ5239BT1, G	F4	8.65	9.1	9.56	20	10	600	0.25	3	7
MMSZ5240BT1, G	***F5***	***9.50***	***10***	***10.50***	***20***	***17***	***600***	***0.25***	***3***	***8***
MMSZ5241BT1	H1	10.45	11	11.55	20	22	600	0.25	2	8.4
MMSZ5242BT1, G	***H2***	***11.40***	***12***	***12.60***	***20***	***30***	***600***	***0.25***	***1***	***9.1***
MMSZ5243BT1, G	H3	12.35	13	13.65	9.5	13	600	0.25	0.5	9.9
MMSZ5244BT1, G	H4	13.30	14	14.70	9.0	15	600	0.25	0.1	10
MMSZ5245BT1, G	***H5***	***14.25***	***15***	***15.75***	***8.5***	***16***	***600***	***0.25***	***0.1***	***11***
MMSZ5246BT1, G	***J1***	***15.20***	***16***	***16.80***	***7.8***	***17***	***600***	***0.25***	***0.1***	***12***
MMSZ5247BT1, G	J2	16.15	17	17.85	7.4	19	600	0.25	0.1	13
MMSZ5248BT1, G	***J3***	***17.10***	***18***	***18.90***	***7.0***	***21***	***600***	***0.25***	***0.1***	***14***
MMSZ5250BT1, G	J5	19.00	20	21.00	6.2	25	600	0.25	0.1	15
MMSZ5251BT1, G	K1	20.90	22	23.10	5.6	29	600	0.25	0.1	17
MMSZ5252BT1, G	***K2***	***22.80***	***24***	***25.20***	***5.2***	***33***	***600***	***0.25***	***0.1***	***18***
MMSZ5253BT1	K3	23.75	25	26.25	5.0	35	600	0.25	0.1	19
MMSZ5254BT1, G	K4	25.65	27	28.35	4.6	41	600	0.25	0.1	21
MMSZ5255BT1, G	K5	26.60	28	29.40	4.5	44	600	0.25	0.1	21
MMSZ5256BT1, G	M1	28.50	30	31.50	4.2	49	600	0.25	0.1	23
MMSZ5257BT1, G	M2	31.35	33	34.65	3.8	58	700	0.25	0.1	25
MMSZ5258BT1, G	M3	34.20	36	37.80	3.4	70	700	0.25	0.1	27
MMSZ5259BT1, G	M4	37.05	39	40.95	3.2	80	800	0.25	0.1	30
MMSZ5260BT1, G	M5	40.85	43	45.15	3.0	93	900	0.25	0.1	33
MMSZ5261BT1, G	***N1***	***44.65***	***47***	***49.35***	***2.7***	***105***	***1000***	***0.25***	***0.1***	***36***
MMSZ5262BT1	N2	48.45	51	53.55	2.5	125	1100	0.25	0.1	39
MMSZ5263BT1	N3	53.20	56	58.80	2.2	150	1300	0.25	0.1	43
MMSZ5264BT1	N4	57.00	60	63.00	2.1	170	1400	0.25	0.1	46
MMSZ5265BT1, G	N5	58.90	62	65.10	2.0	185	1400	0.25	0.1	47
MMSZ5266BT1, G	P1	64.60	68	71.40	1.8	230	1600	0.25	0.1	52
MMSZ5267BT1, G	P2	71.25	75	78.75	1.7	270	1700	0.25	0.1	56
MMSZ5268BT1, G	P3	77.90	82	86.10	1.5	330	2000	0.25	0.1	62
MMSZ5269BT1	P4	82.65	87	91.35	1.4	370	2200	0.25	0.1	68
MMSZ5270BT1, G	P5	86.45	91	95.55	1.4	400	2300	0.25	0.1	69
MMSZ5272BT1	R2	104.5	110	115.5	1.1	750	3000	0.25	0.1	84

3. The type numbers shown have a standard tolerance of ±5% on the nominal Zener voltage.
4. Nominal Zener voltage is measured with the device junction in thermal equilibrium at T_L = 30°C ±1°C.
5. Z_{ZT} and Z_{ZK} are measured by dividing the AC voltage drop across the device by the ac current applied. The specified limits are for $I_{Z(AC)}$ = 0.1 $I_{Z(dc)}$ with the AC frequency = 1 KHz.

TYPICAL CHARACTERISTICS

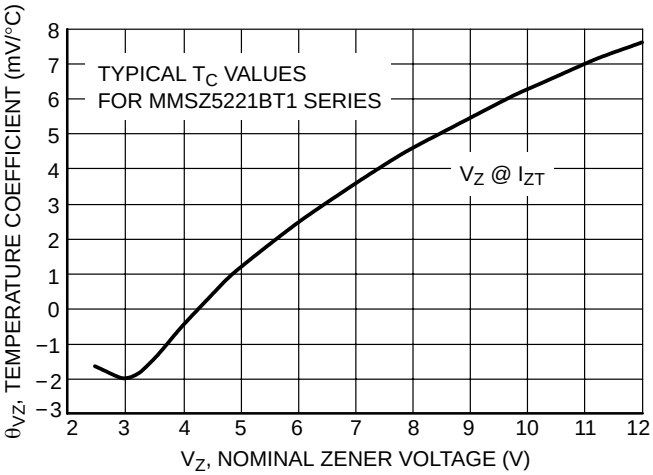


Figure 1. Temperature Coefficients (Temperature Range −55°C to +150°C)

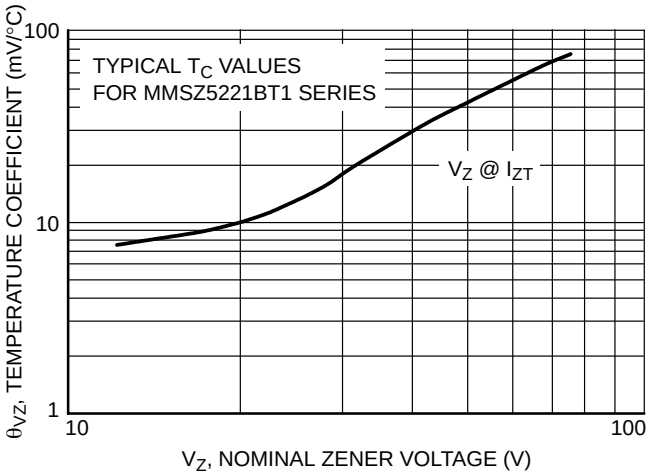


Figure 2. Temperature Coefficients (Temperature Range −55°C to +150°C)

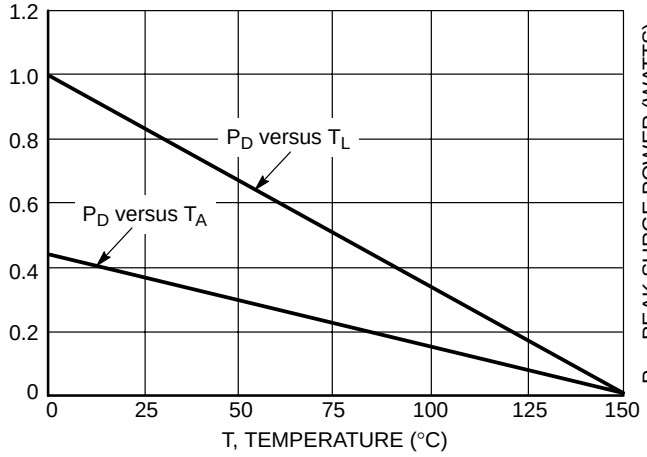


Figure 3. Steady State Power Derating

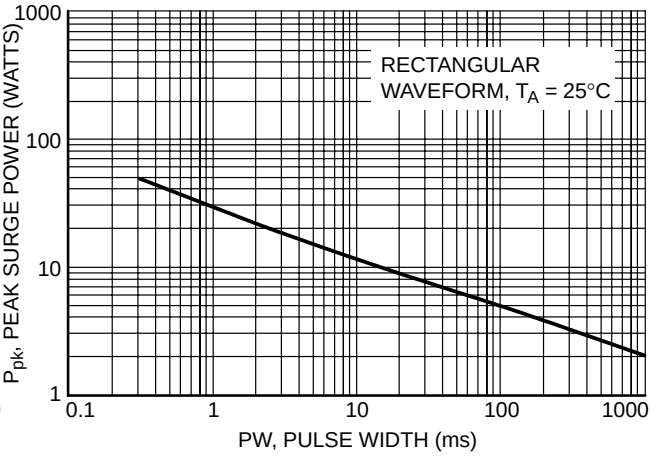


Figure 4. Maximum Nonrepetitive Surge Power

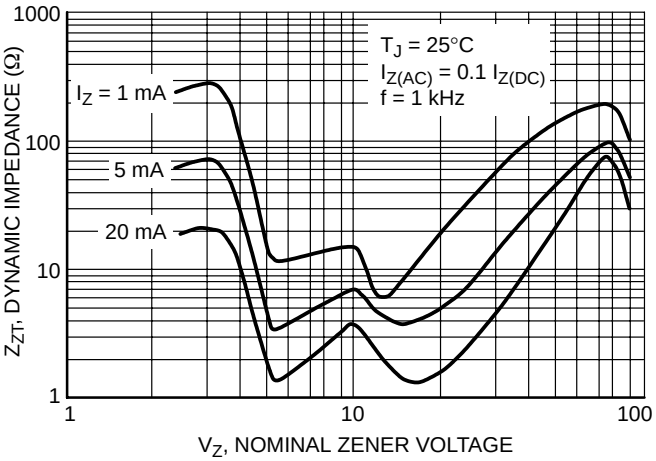


Figure 5. Effect of Zener Voltage on Zener Impedance

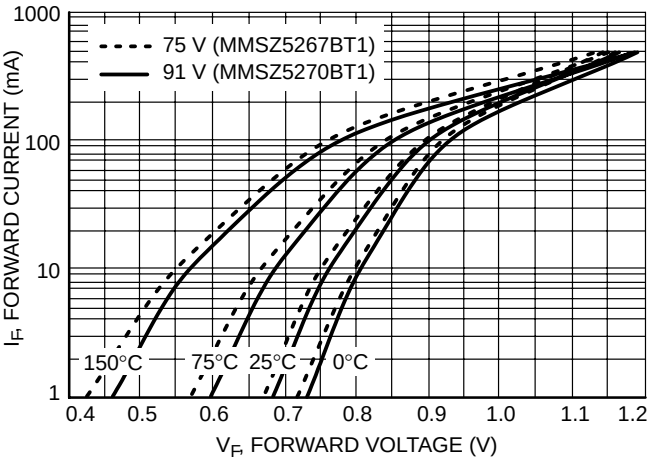


Figure 6. Typical Forward Voltage

TYPICAL CHARACTERISTICS

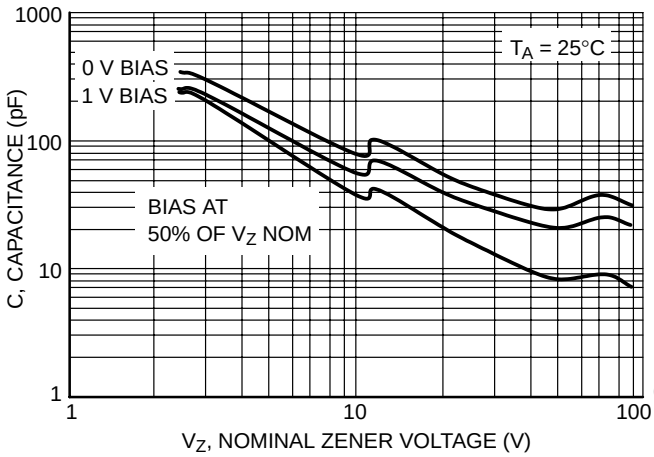


Figure 7. Typical Capacitance

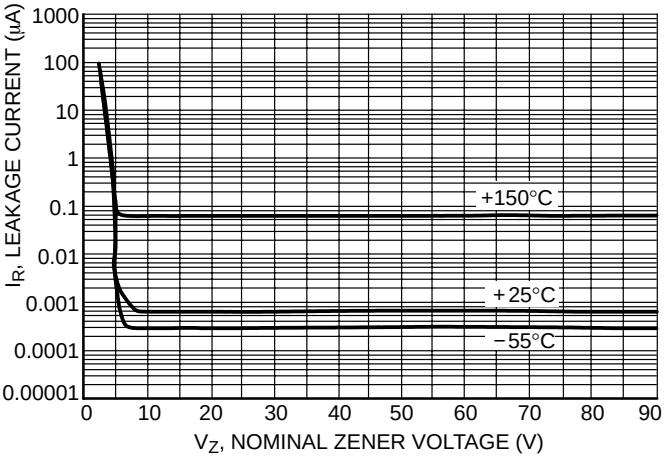


Figure 8. Typical Leakage Current

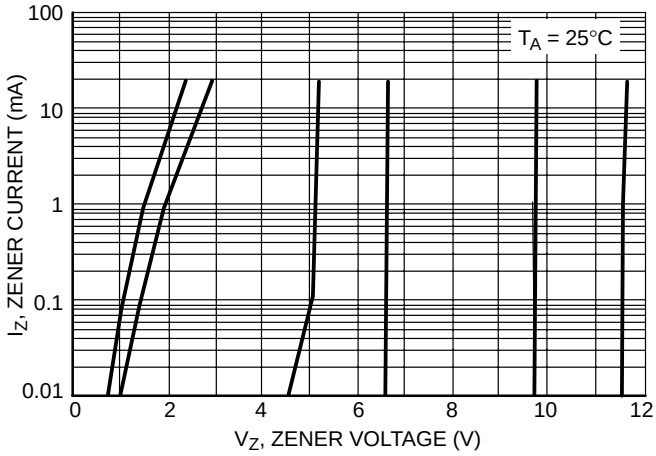


Figure 9. Zener Voltage versus Zener Current (V_Z Up to 12 V)

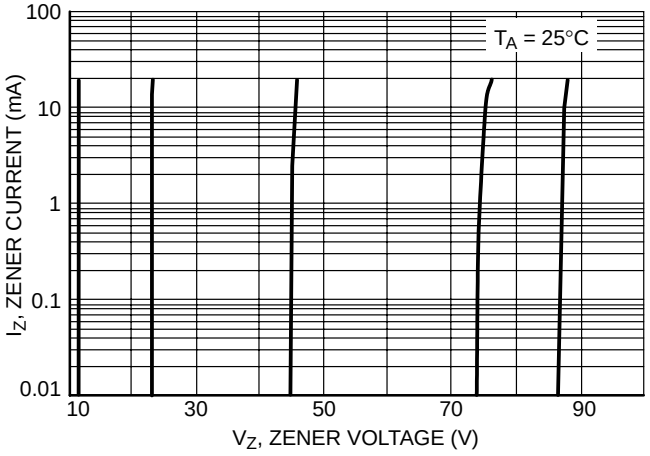
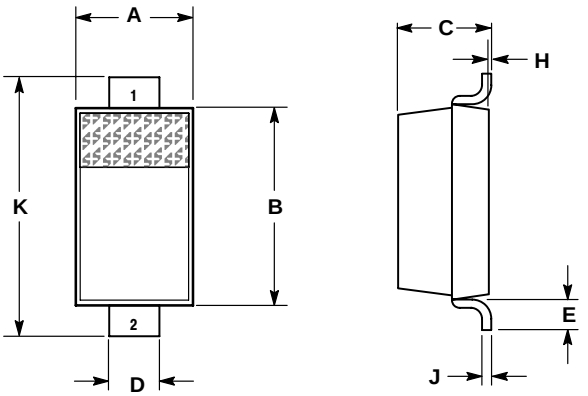


Figure 10. Zener Voltage versus Zener Current (12 V to 91 V)

PACKAGE DIMENSIONS

SOD−123
CASE 425−04
ISSUE C

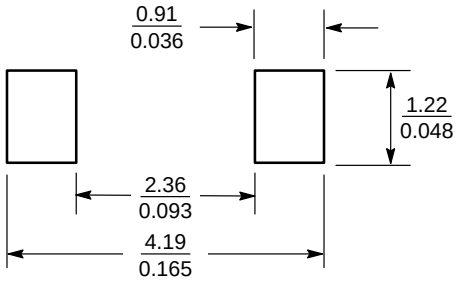


NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.055	0.071	1.40	1.80
B	0.100	0.112	2.55	2.85
C	0.037	0.053	0.95	1.35
D	0.020	0.028	0.50	0.70
E	0.01	−−−	0.25	−−−
H	0.000	0.004	0.00	0.10
J	−−−	0.006	−−−	0.15
K	0.140	0.152	3.55	3.85

STYLE 1:
PIN 1. CATHODE
2. ANODE

SOLDERING FOOTPRINT*



SCALE 10:1 $\left(\frac{\text{mm}}{\text{inches}}\right)$

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

PUBLICATION ORDERING INFORMATION

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Phone: 81−3−5773−3850

ON Semiconductor Website: http://onsemi.com

Order Literature: http://www.onsemi.com/litorder

For additional information, please contact your local Sales Representative.

MMSZ5221BT1/D

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®

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