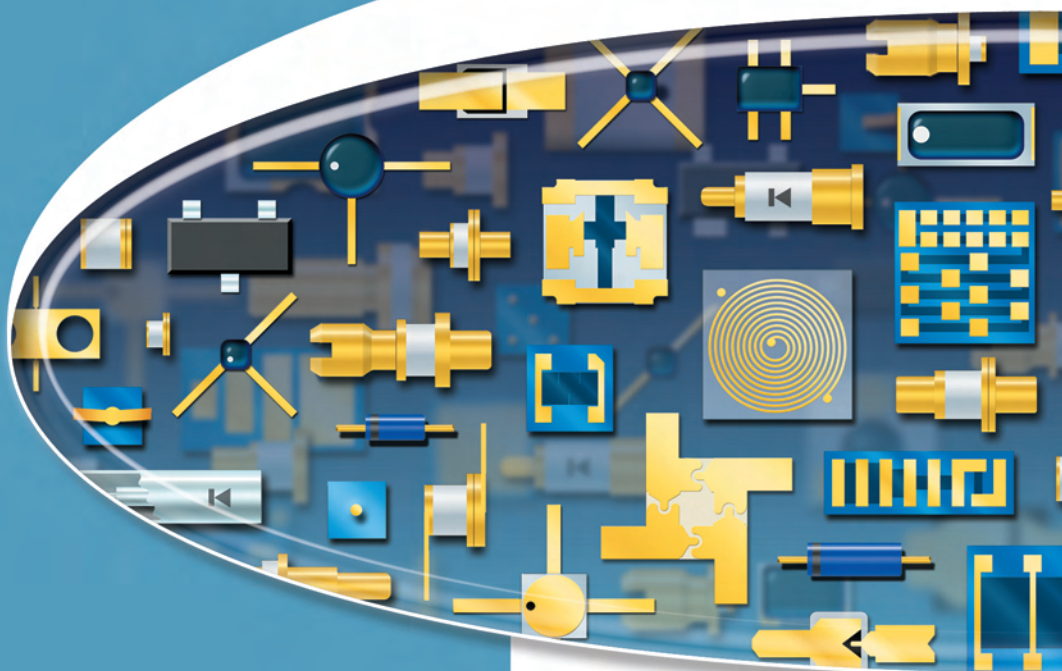




Microwave Diodes & Passive Semiconductor Devices



Short Form Catalog
2008



Endless capabilities and a team you can depend on

On April 12th, 2007 Aeroflex / Metelics purchased the ongoing operations of MicroMetrics, Inc. of Londonderry, New Hampshire. The new combined entity going forward will be known as Aeroflex / Metelics and operate out of two USA based locations—Sunnyvale, California and Londonderry, New Hampshire.

Using this Catalog

Use this short form catalog to down-select to a device that closely fits your needs. You can then request additional electrical and pricing information by e-mailing our sales department at Metelics-sales@aeroflex.com.

Please note: Some previously published catalog part numbers from each company have been removed when performance characteristics were redundant. We continue to support both company's legacy part numbers and any house part numbers that have been assigned.

The combined resources of our two locations will provide customers with new technically advanced products, enhanced applications and engineering support, and continued quality and reliability. Both of our facilities have full capability in wafer fabrication, manufacturing and sales. To enhance our manufacturing capabilities and to provide cost effective parts for the fast paced commercial market, we have also expanded our assembly operations to Nanjing, China.

Our team of scientists, device physicists and process engineers on both coasts work together to optimize our designs and deliver repeatable high quality devices, as well to introduce new and exciting products. We have the capability to provide low cost commercial solutions for demanding markets as well as space qualified components for very advanced satellite and military applications.

Our capabilities are endless and our new combined business unit offers continued quality devices, impeccable customer service and support, and the foundation to be the supplier you turn to for all your microwave diode needs. This new catalog provides a design guide of our capabilities. We welcome your questions and comments and look forward to servicing your requirements well into the 21st century.



Table of Contents

Silicon Schottky P-Type Diodes		Silicon Abrupt Varactors: General Purpose	
Zero Bias.....	4	Ultra-Low Leakage	52
Low Barrier.....	6	Glass Axial Leaded.....	53
Medium Barrier.....	7	Glass Axial Leaded & Plastic	55
Silicon Schottky N-Type Diodes		General Purpose	56
Low Barrier.....	8	Silicon Hyperabrupt Tuning Varactors	
Medium Barrier.....	10	Low Cost.....	60
High Barrier	12	Portable.....	61
Extra-High Barrier	14	Wideband	62
Silicon Schottky Diodes: General Purpose	16	VHF/UHF	64
Tunnel Diodes: MBD Series	18	HF.....	66
Tunnel Diode Detectors: MTD Series	19	VHF.....	67
Capacitors: MNOS Series	20	UHF.....	68
GaAs Diodes		Microwave.....	69
GaAs Schottky Diodes.....	23	Silicon Zener Diodes	70
GaAs Abrupt Varactor Diodes.....	24	Current Limiter Field Effect Diodes	76
GaAs Hyperabrupt Varactor Diodes.....	25	Capacitors	
GaAs Beam Lead Detector Diodes: Zero Bias	26	9000 Series.....	80
GaAs Detector/Mixer Diodes	27	Mounting Capacitors	82
Step Recovery Diodes	28	Binary Chip Capacitors.....	84
Beam Lead Step Recovery Diodes.....	29	High “Q” Thin Film, Spiral Inductors	85
Sampling Phase Detector	30	Thin Film Resistor Chips	86
Silicon PIN Diodes		Thin Film Attenuator Pads	88
High Power Switching & SOT23 & SOD 323	31	Custom Fabricated Device Networks	89
Micro Strip PIN Diodes & Low Capacitance,		InGap HBT Amplifiers	
Fast Switching	32	Darlington Gain Blocks.....	90
Ultra Fast Switching.....	33	Low and Medium Power Amplifiers.....	91
Fast Switching, Low Power.....	34	Silicon Epitaxial Products	92
High Power Switching & Attenuators.....	35	Quality and Reliability Screening	93
Medium Power, General Purpose,		Warranty and Ordering Information	99
PIN Chips & Kilovolt PIN Pill.....	36	Package Styles	100
Silicon MELF PIN Diodes	37	Beam Lead.....	100
Silicon NIP Diodes	38	Flip Chip.....	104
Broadband, Mesa and Planar Beam Lead PIN Diodes	39	Bare Die	105
Silicon Limiter Diodes	40	Resistors & Attenuators.....	107
PIN Diode Switch Elements		Ceramic Microwave Pill.....	108
Medium Power Series Switch Element.....	42	Ceramic Epoxy SMT.....	109
High Power Shunt Switch Element.....	43	Ceramic Hermetic SMT & Ceramic MELF.....	112
Medium Power Shunt Switch Element	44	Plastic SMT.....	113
Series Shunt Integrated Switch Element.....	45	Glass Axial Leaded & Specialty	115
Silicon Abrupt Tuning Varactors	46	Model Number Index	116
30 Volt.....	48	Package Number Cross Reference	122
45 Volt.....	49		
60 Volt.....	50		
90 Volt.....	51		

Silicon Schottky P-Type Diodes: Zero Bias

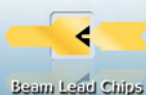
- Very low 1/f Noise
- Detector applications to 40 GHz
- Chip, beam lead or packaged devices

The Aeroflex / Metelics diodes are fabricated on P-Type substrates for low 1/f noise and are optimized for zero-bias operation. Zero-biased devices are processed to yield two distinct video impedance classes, one 1,500 Ohms typical and the other 4,000 Ohms typical. Applications requiring maximum stability and sensitivity will favor the higher video impedance. Biased detector operation offers the designer improved temperature stability and video impedance flexibility via bias current selection.

V _{BR} @ 100 μA = 0.8 V min.						Chip and Beam Lead		
Model	C _J		γ	R _V		T _{SS}	Frequency	Package
	TYP pF	MAX pF	TYP mV / mW	TYP Ω	MAX Ω	TYP dBm	TYP GHz	
MSS20,046-C15	0.08	0.10	5,000	1,500	2,000	-58	18	C15p
MSS20,047-C15	0.08	0.10	8,000	4,000	6,000	-59	18	C15p
MSS20,050-C15	0.12	0.15	5,000	1,500	2,000	-58	12	C15p
MSS20,051-C15	0.12	0.15	8,000	4,000	6,000	-59	12	C15p
MSS20,054-C15	0.18	0.20	5,000	1,500	2,000	-58	8	C15p
MSS20,055-C15	0.18	0.20	8,000	4,000	6,000	-59	8	C15p
MSS20,140-B10D	0.06	0.08	5,000	1,500	2,000	-58	40	B10D
MSS20,141-B10D	0.06	0.08	8,000	4,000	6,000	-59	40	B10D
MSS20,142-B10D	0.08	0.10	5,000	1,500	2,000	-58	26	B10D
MSS20,143-B10D	0.08	0.10	8,000	4,000	6,000	-59	26	B10D
MSS20,145-B10D	0.10	0.12	5,000	1,500	2,000	-58	18	B10D
MSS20,146-B10D	0.10	0.12	8,000	4,000	6,000	-59	18	B10D
Test Conditions	V _R = 0.5 V F = 1 MHz		F = 10 GHz P _{IN} = -30 dBm R _L = 1 MΩ Video BW = 500 KHz NF = 3 dB					
Maximum Ratings	Parameters				Rating			
	Reverse Voltage				Rated V _{BR}			
	Forward Current				35 mA			
	Operation Temperature				-65° C to + 150° C			
	Storage Temperature				-65° C to + 150° C			
	CW Power Dissipation				100 mW, derated linearly to zero at T _A = +150° C			
	Soldering Temperature (Packaged)				+230° C for 5 sec.			
	Absolute Maximum Power Rating				150 mW per junction			



Bare Die



Beam Lead Chips



Ceramic Epoxy SMT



Ceramic Hemetic SMT



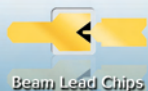
Ceramic Microwave Pill

Silicon Schottky P-Type Diodes: Zero Bias

V_{BR} @ 100 μA = 0.8 V min.										Packaged
Model	C _T		γ	R _V		T _{SS}	C _P	L _P	Frequency	Package
	TYP pF	MAX pF	TYP mV / mW	TYP Ω	MAX Ω	TYP dBm	TYP pF	TYP nH	MAX GHz	
MSS20,140-0402	0.12	0.15	5,000	1,500	2,000	-58	0.05	0.25	26	0402
MSS20,141-0402	0.12	0.15	8,000	4,000	6,000	-59	0.05	0.25	26	0402
MSS20,142-0402	0.15	0.18	5,000	1,500	2,000	-58	0.05	0.25	20	0402
MSS20,143-0402	0.15	0.18	8,000	4,000	6,000	-59	0.05	0.25	20	0402
MSS20,145-0402	0.18	0.20	5,000	1,500	2,000	-58	0.05	0.25	18	0402
MSS20,146-0402	0.18	0.20	8,000	4,000	6,000	-59	0.05	0.25	18	0402
MSS20,046-H27	0.20	0.25	5,000	1,500	2,000	-58	0.12	0.4	18	H27
MSS20,046-E25	0.15	0.20	5,000	1,500	2,000	-58	0.07	0.4	18	E25
MSS20,046-T86	0.26	0.31	5,000	1,500	2,000	-58	0.18	1.0	12	T86p
MSS20,046-0805-2	0.14	0.20	5,000	1,500	2,000	-58	0.06	0.4	20	0805-2
MSS20,047-H27	0.20	0.25	8,000	4,000	6,000	-59	0.12	0.4	18	H27
MSS20,047-E25	0.15	0.20	8,000	4,000	6,000	-59	0.07	0.4	18	E25
MSS20,047-T86	0.26	0.31	8,000	4,000	6,000	-59	0.18	1.0	12	T86p
MSS20,047-0805-2	0.14	0.20	8,000	4,000	6,000	-59	0.06	0.4	20	0805-2
MSS20,050-H27	0.24	0.30	5,000	1,500	2,000	-58	0.12	0.4	12	H27
MSS20,050-E25	0.20	0.25	5,000	1,500	2,000	-58	0.07	0.4	12	E25
MSS20,050-T86	0.30	0.36	5,000	1,500	2,000	-58	0.18	1.0	12	T86p
MSS20,050-0805-2	0.18	0.25	5,000	1,500	2,000	-58	0.06	0.4	18	0805-2
MSS20,051-H27	0.24	0.30	8,000	4,000	6,000	-59	0.12	0.4	12	H27
MSS20,051-E25	0.20	0.25	8,000	4,000	6,000	-59	0.07	0.4	12	E25
MSS20,051-T86	0.30	0.36	8,000	4,000	6,000	-59	0.18	1.0	12	T86p
MSS20,051-0805-2	0.18	0.25	8,000	4,000	6,000	-59	0.06	0.4	18	0805-2
MSS20,054-H27	0.30	0.35	5,000	1,500	2,000	-58	0.12	0.4	8	H27
MSS20,054-E25	0.25	0.30	5,000	1,500	2,000	-58	0.07	0.4	8	E25
MSS20,054-T86	0.36	0.41	5,000	1,500	2,000	-58	0.18	1.0	8	T86p
MSS20,054-0805-2	0.24	0.30	5,000	1,500	2,000	-58	0.06	0.4	12	0805-2
MSS20,055-H27	0.30	0.35	8,000	4,000	6,000	-59	0.12	0.4	8	H27
MSS20,055-E25	0.25	0.30	8,000	4,000	6,000	-59	0.07	0.4	8	E25
MSS20,055-T86	0.36	0.41	8,000	4,000	6,000	-59	0.18	1.0	8	T86p
MSS20,055-0805-2	0.24	0.30	8,000	4,000	6,000	-59	0.06	0.4	12	0805-2
Test Conditions	V _R = 0.5 V F = 1 MHz		F = 10 GHz P _{IN} = -30 dBm R _L = 1 M Ω Video BW = 500 KHz NF = 3 dB							



Bare Die



Beam Lead Chips



Ceramic Epoxy SMT



Ceramic Hemetic SMT



Ceramic Microwave Pill

Silicon Schottky P-Type Diodes: Low Barrier

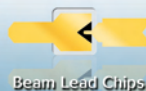
- Superior 1/f noise
- Better temperature stability than zero bias Schottky diode
- Low barrier height
- Passivated with silicon nitride

The Aeroflex / Metelics Schottky diodes are optimized for superior 1/f noise on P-type silicon epitaxial substrate with proprietary process. In general they require a small forward bias (5 ~ 50 μ A) for small power levels below -20dm when used as microwave detectors.

V_F @ 1 mA = 220 ~ 330 mV, V_{BR} @ 10 μA = 3 V min.						Chip and Beam Lead	
Model	V_F		C_J		R_D	F opt	Package
	TYP	MAX	TYP	MAX	MAX	MAX	
MSS25,047-C15c	260	300	0.08	0.10	65	18	C15c
MSS25,049-C15c	220	260	0.10	0.12	52	12	C15c
MSS25,141-B10D	280	330	0.06	0.08	65	40	B10D
MSS25,143-B10D	260	300	0.08	0.10	60	26	B10D
MSS25,145-B10D	220	260	0.10	0.12	52	18	B10D
Test Conditions	$I_F = 1$ mA		$V_R = 0.2$ V $F = 1$ MHz		$I_F = 5$ mA	GHz	
Maximum Ratings	Parameters		Rating				
	Operation Temperature		-65° C to 150° C				
	Storage Temperature		-65° C to 150° C				
	Power Dissipation		150 mW per junction at 25° derate linearly to zero at $T_A = +150^\circ$ C				
	Soldering Temperature		230° C for 5 sec.				



Bare Die



Beam Lead Chips



Ceramic Epoxy SMT



Ceramic Hemetic SMT



Ceramic Microwave Pill

Silicon Schottky P-Type Diodes: Medium Barrier

- Very low 1/f Noise
- Detector applications to 40 GHz
- Chip, beam lead or packaged devices

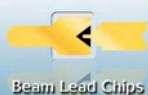
The Aeroflex / Metelics MSS39,000 series of Schottky diodes is fabricated on P-Type epitaxial substrates for superior 1/f noise performance in microwave based-detector applications up to 40 GHz.

V _F @ 1 mA = 380 ~ 480 mV						Chip and Beam Lead	
Model	V _{BR}	C _J		γ	T _{SS}	Frequency	Package
	MIN V	TYP pF	MAX pF	TYP mV / mW	TYP dBm	TYP GHz	
MSS39,045-C15	5.0	0.08	0.10	5,000	-58	18	C15p
MSS39,048-C15	5.0	0.12	0.15	5,000	-58	12	C15p
MSS39,144-B10B	3.5	0.06	0.08	5,000	-58	40	B10Bp
MSS39,146-B10B	3.5	0.08	0.10	5,000	-58	26	B10Bp
MSS39,148-B10B	3.5	0.10	0.12	5,000	-58	20	B10Bp
MSS39,152-B10B	3.5	0.15	0.18	5,000	-58	18	B10Bp
Test Conditions	I _R = 10 μA	V _R = 0 V F = 1 MHz		F = 10 GHz DC BIAS = 20 μA Video BW = 2 MHz R _L = 100 kΩ			
Maximum Ratings	Parameters			Rating			
	Reverse Voltage			Rated V _{BR}			
	Forward Current			50 mA			
	Operation Temperature			-65° C to +150° C			
	Storage Temperature			-65° C to +150° C			
	Power Dissipation			150 mW, derated linearly to zero at T _A = +150° C			
	Soldering Temperature (Packaged)			+230° C for 5 sec.			
	Beam Lead Pull Strength, Min			4 grams			

V_F @ 1 mA = 380 ~ 480 mV							Packaged
Model	C _T		γ	T _{SS}	C _P	L _P	Package
	TYP pF	MAX pF	TYP mV / mW	TYP dBm	TYP pF	TYP nH	
MSS39,045-P55	0.21	0.26	5,000	-58	0.13	0.35	P55p
MSS39,045-P86	0.23	0.23	5,000	-58	0.15	1.0	P86p
MSS39,048-P55	0.25	0.31	5,000	-58	0.13	0.35	P55p
MSS39,048-P86	0.27	0.33	5,000	-58	0.15	1.0	P86p
MSS39,144-H27	0.18	0.24	5,000	-58	0.12	0.4	H27
MSS39,144-0402	0.11	0.16	5,000	-58	0.05	0.25	0402
MSS39,144-0805-2	0.12	0.17	5,000	-58	0.06	0.4	0805-2
MSS39,146-H27	0.20	0.25	5,000	-58	0.12	0.4	H27
MSS39,146-0402	0.13	0.18	5,000	-58	0.05	0.25	0402
MSS39,146-0805-2	0.14	0.20	5,000	-58	0.06	0.4	0805-2
MSS39,148-E25	0.17	0.22	5,000	-58	0.07	0.4	E25
MSS39,148-H20	0.28	0.33	5,000	-58	0.18	0.5	H20
MSS39,148-0402	0.15	0.20	5,000	-58	0.05	0.25	0402
MSS39,148-0805-2	0.16	0.22	5,000	-58	0.06	0.4	0805-2
MSS39,152-E25	0.22	0.28	5,000	-58	0.07	0.4	E25
MSS39,152-H20	0.33	0.39	5,000	-58	0.18	0.5	H20
MSS39,152-0402	0.20	0.25	5,000	-58	0.05	0.25	0402
MSS39,152-0805-2	0.21	0.27	5,000	-58	0.06	0.4	0805-2
Test Conditions	V _R = 0 V F = 1 MHz		F = 10 GHz DC BIAS = 20 μA Video BW = 2 MHz R _L = 100 kΩ				



Bare Die



Beam Lead Chips



Ceramic Epoxy SMT



Ceramic Hemetic SMT



Ceramic Microwave Pill

Silicon Schottky N-Type Diodes: Low Barrier

- V_F , R_D and C_J matching options
- Chip, beam lead or packaged devices
- Hi-Rel screening per MIL-PRF-19500 and MIL-PRF-38534 available

The Aeroflex / Metelics MSS30,000 Series of Schottky diodes are fabricated on N-Type epitaxial substrates using proprietary processes that yield the highest FCOs in the industry. Optimum mixer performance is obtained with LO power of -3 dBm to +3 dBm per diode. These can also be used in doubler, limiter, detector and sampler applications.

VF @ 1 mA = 230 ~ 350 mV, VBR @ 10 μ A = 2 V min.

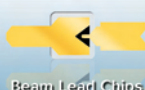
Chip and Beam Lead

Model	Configuration	C_J		R_D	R_S	F_{CO}	Package
		TYP pF	MAX pF	MAX Ω	TYP Ω	TYP GHz	
MSS30,046-C15	Single Junction	0.10	0.12	18	10	160	C15
MSS30,050-C15	Single Junction	0.15	0.18	15	6	175	C15
MSS30,142-B10B	Single Junction	0.07	0.10	22	13	175	B10B
MSS30,148-B10B	Single Junction	0.12	0.15	15	7	190	B10B
MSS30,154-B10B	Single Junction	0.22	0.25	12	3	240	B10B
MSS30,242-B20	Series Tee	0.07	0.10	22	13	175	B20
MSS30,248-B20	Series Tee	0.12	0.15	15	7	190	B20
MSS30,254-B20	Series Tee	0.22	0.25	12	3	240	B20
MSS30,346-B21	Anti-Parallel Pair	0.27	0.30	16	11	55	B21
MSS30,442-B42	Ring Quad	0.07	0.10	22	13	175	B42
MSS30,448-B42	Ring Quad	0.12	0.15	15	7	190	B42
MSS30,454-B40	Ring Quad	0.22	0.25	12	3	240	B40
MSS30,B46-B45	Bridge Quad	0.10	0.125	25	15	80	B45
MSS30,B53-B45	Bridge Quad	0.20	0.25	15	5	80	B45
MSS30,CR46-B49	Crossover Ring Quad	0.09	0.125	22	10	118	B49
MSS30,CR53-B49	Crossover Ring Quad	0.15	0.250	15	5	106	B49
MSS30,PCB46-B48	Coplanar Bridge Quad	0.08	0.12	20	7	166	B48
MSS30,PCR46-B47	Coplanar Ring Quad	0.07	0.13	22	10	152	B47
MSS30,PCR53-B47	Coplanar Ring Quad	0.15	0.25	15	5	106	B47
Test Conditions		$V_R = 0$ V $F = 1$ MHz		$I_F = 5$ mA			

Maximum Ratings	Parameters	Rating
	Reverse Voltage	Rated V_{BR}
	Forward Current	50 mA
	Operation Temperature	-65° C to +150° C
	Storage Temperature	-65° C to +150° C
	Power Dissipation	150 mW per junction at $T_A = 25^\circ$ C, derate linearly to zero at $T_A = +150^\circ$ C
	Soldering Temperature (Packaged)	+260° C for 5 sec.
	Beam Lead Pull Strength	4 grams minimum



Bare Die



Beam Lead Chips



Ceramic Epoxy SMT



Ceramic Hemetic SMT



Ceramic Microwave Pill

Silicon Schottky N-Type Diodes: Low Barrier

$V_F @ 1 \text{ mA} = 230 \sim 350 \text{ mV}$, $V_{BR} @ 10 \mu\text{A} = 2 \text{ V min.}$							Packaged
Model	Configuration	C_T		R_D MAX Ω	C_P TYP pF	L_P MAX nH	Package
		TYP pF	MAX pF				
MSS30,046-P55	Single Junction	0.23	0.30	18	0.13	0.35	P55
MSS30,046-P86	Single Junction	0.25	0.33	18	0.15	1.0	P86
MSS30,050-P55	Single Junction	0.28	0.35	15	0.13	0.35	P55
MSS30,050-P86	Single Junction	0.30	0.38	15	0.15	1.0	P86
MSS30,142-E25	Single Junction	0.14	0.26	22	0.07	0.4	E25
MSS30,142-H20	Single Junction	0.25	0.31	22	0.18	0.5	H20
MSS30,148-E25	Single Junction	0.21	0.31	15	0.07	0.4	E25
MSS30,148-H20	Single Junction	0.30	0.36	15	0.18	0.5	H20
MSS30,154-E25	Single Junction	0.30	0.41	12	0.07	0.4	E25
MSS30,154-H20	Single Junction	0.40	0.46	12	0.18	0.5	H20
MSS30,242-E35	Series Tee	0.15	0.21	22	0.07	0.4	E35
MSS30,242-H30	Series Tee	0.25	0.31	22	0.18	0.5	H30
MSS30,248-E35	Series Tee	0.20	0.25	15	0.07	0.4	E35
MSS30,248-H30	Series Tee	0.30	0.36	15	0.18	0.5	H30
MSS30,254-E35	Series Tee	0.30	0.35	12	0.07	0.4	E35
MSS30,254-H30	Series Tee	0.40	0.46	12	0.18	0.5	H30
MSS30,346-E25	Anti-Parallel Pair	0.35	0.40	16	0.07	0.4	E25
MSS30,346-H20	Anti-Parallel Pair	0.45	0.50	16	0.18	0.5	H20
MSS30,442-E45	Ring Quad	0.15	0.21	22	0.07	0.4	E45
MSS30,442-H40	Ring Quad	0.25	0.33	22	0.18	0.5	H40
MSS30,448-E45	Ring Quad	0.20	0.26	15	0.07	0.4	E45
MSS30,448-H40	Ring Quad	0.30	0.35	15	0.18	0.5	H40
MSS30,454-E45	Ring Quad	0.30	0.35	12	0.07	0.4	E45
MSS30,454-H40	Ring Quad	0.40	0.46	12	0.18	0.5	H40
MSS30,B46-E45	Bridge Quad	0.17	0.25	25	0.07	0.4	E45
MSS30,B46-H40	Bridge Quad	0.28	0.35	25	0.18	0.5	H40
MSS30,B53-E45	Bridge Quad	0.27	0.35	15	0.07	0.4	E45
MSS30,B53-H40	Bridge Quad	0.38	0.46	15	0.18	0.5	H40
MSS30,CR46-E45	Crossover Ring Quad	0.16	0.22	22	0.07	0.4	E45
MSS30,CR46-H40	Crossover Ring Quad	0.27	0.33	22	0.18	0.5	H40
MSS30,CR53-E45	Crossover Ring Quad	0.22	0.35	15	0.07	0.4	E45
MSS30,CR53-H40	Crossover Ring Quad	0.33	0.45	15	0.18	0.5	H40
Test Conditions		$V_R = 0 \text{ V}$ $F = 1 \text{ MHz}$		$I_F = 5 \text{ mA}$			



Bare Die



Beam Lead Chips



Ceramic Epoxy SMT



Ceramic Hemetic SMT



Ceramic Microwave Pill

Silicon Schottky N-Type Diodes: Medium Barrier

- V_F , R_D and C_J matching options
- Chip, beam lead or packaged devices
- Hi-Rel screening per MIL-PRF-19500 and MIL-PRF-38534 available

The Aeroflex / Metelics MSS40,000 Series of Schottky diodes are fabricated on N-Type epitaxial substrates using proprietary processes that yield the highest FCOs in the industry. Optimum mixer performance is obtained with LO power of 0 dBm to +6 dBm per diode. These can also be used in doubler, limiter, detector and sampler applications.

V_F @ 1 mA = 350 ~ 450 mV, V_{BR} @ 10 μ A = 3 V min.

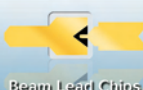
Chip and Beam Lead

Model	Configuration	C_J		R_D	R_S	F_{CO}	Package
		TYP pF	MAX pF	MAX Ω	TYP Ω	TYP GHz	
MSS40,045-C15	Single Junction	0.09	0.12	15	7	253	C15
MSS40,048-C15	Single Junction	0.12	0.15	15	7	190	C15
MSS40,141-B10B	Single Junction	0.06	0.10	22	10	265	B10B
MSS40,148-B10B	Single Junction	0.12	0.15	17	7	190	B10B
MSS40,155-B10B	Single Junction	0.25	0.30	13	5	127	B10B
MSS40,244-B20	Series Tee	0.08	0.12	22	19	105	B20
MSS40,248-B20	Series Tee	0.12	0.15	17	10	133	B20
MSS40,255-B20	Series Tee	0.25	0.30	15	5	127	B20
MSS40,448-B42	Ring Quad	0.12	0.15	17	7	190	B42
MSS40,455-B40	Ring Quad	0.25	0.30	17	5	127	B40
MSS40,B46-B45	Bridge Quad	0.10	0.13	25	15	106	B45
MSS40,B53-B45	Bridge Quad	0.20	0.25	15	5	160	B45
MSS40,CR46-B49	Crossover Ring Quad	0.09	0.125	22	10	177	B49
MSS40,CR53-B49	Crossover Ring Quad	0.15	0.25	15	5	212	B49
MSS40,PCR46-B47	Coplanar Ring Quad	0.07	0.13	22	10	227	B47
MSS40,PCR53-B47	Coplanar Ring Quad	0.15	0.25	15	5	212	B47
MSS40,PCB46-B48	Coplanar Bridge Quad	0.08	0.12	20	7	190	B48
Test Conditions		$V_R = 0$ V $F = 1$ MHz		$I_F = 5$ mA			

Maximum Ratings	Parameters	Rating
	Reverse Voltage	Rated V_{BR}
	Forward Current	50 mA
	Operation Temperature	-65° C to +150° C
	Storage Temperature	-65° C to +150° C
	Power Dissipation	150 mW per junction at $T_A = 25^\circ$ C, derate linearly to zero at $T_A = +150^\circ$ C
	Soldering Temperature (Packaged)	+260° C for 5 sec.
	Beam Lead Pull Strength	4 grams minimum



Bare Die



Beam Lead Chips



Ceramic Epoxy SMT



Ceramic Hemetic SMT



Ceramic Microwave Pill

Silicon Schottky N-Type Diodes: Medium Barrier

V_F @ 1 mA = 350 ~ 450 mV, V_{BR} = @ 10 μA 3 V min.							Packaged
Model	Configuration	C_T		R_D	C_P	L_P	Package
		TYP pF	MAX pF	MAX Ω	TYP pF	TYP nH	
MSS40,045-P55	Single Junction	0.22	0.28	15	0.13	0.35	P55
MSS40,045-P86	Single Junction	0.24	0.30	15	0.15	1.0	P86
MSS40,048-P55	Single Junction	0.25	0.30	15	0.13	0.35	P55
MSS40,048-P86	Single Junction	0.27	0.33	15	0.15	1.0	P86
MSS40,141-E25	Single Junction	0.13	0.22	18	0.07	0.4	E25
MSS40,141-H20	Single Junction	0.24	0.30	18	0.18	0.5	H20
MSS40,141-0402	Single Junction	0.11	0.18	18	0.05	0.25	0402
MSS40,148-E25	Single Junction	0.19	0.28	15	0.07	0.4	E25
MSS40,148-H20	Single Junction	0.30	0.36	15	0.18	0.5	H20
MSS40,148-0402	Single Junction	0.17	0.24	15	0.05	0.25	0402
MSS40,155-E25	Single Junction	0.32	0.41	14	0.07	0.4	E25
MSS40,155-H20	Single Junction	0.43	0.51	14	0.18	0.5	H20
MSS40,155-0402	Single Junction	0.30	0.38	14	0.05	0.25	0402
MSS40,244-E35	Series Tee	0.15	0.24	28	0.07	0.4	E35
MSS40,244-0805-4	Series Tee	0.29	0.36	28	0.06	0.4	0805-4
MSS40,248-E35	Series Tee	0.19	0.28	18	0.07	0.4	E35
MSS40,248-0805-4	Series Tee	0.18	0.25	18	0.06	0.4	0805-4
MSS40,255-E35	Series Tee	0.32	0.41	14	0.07	0.4	E35
MSS40,255-0805-4	Series Tee	0.17	0.40	14	0.06	0.4	0805-4
MSS40,448-E45	Ring Quad	0.19	0.25	15	0.07	0.4	E45
MSS40,448-H40	Ring Quad	0.30	0.36	15	0.18	0.5	H40
MSS40,455-E45	Ring Quad	0.32	0.40	14	0.07	0.4	E45
MSS40,455-H40	Ring Quad	0.42	0.52	14	0.18	0.5	H40
MSS40,B46-E45	Bridge Quad	0.17	0.24	25	0.07	0.4	E45
MSS40,B53-E45	Bridge Quad	0.27	0.36	15	0.07	0.4	E45
MSS40,CR46-E45	Crossover Ring Quad	0.16	0.23	15	0.07	0.4	E45
MSS40,CR46-H40	Crossover Ring Quad	0.27	0.35	15	0.18	0.5	H40
MSS40,CR53-E45	Crossover Ring Quad	0.22	0.35	15	0.07	0.4	E45
MSS40,CR53-H40	Crossover Ring Quad	0.33	0.46	15	0.18	0.5	H40
Test Conditions		$V_R = 0$ V $F = 1$ MHz		$I_F = 5$ mA			



Bare Die



Beam Lead Chips



Ceramic Epoxy SMT



Ceramic Hemetic SMT



Ceramic Microwave Pill

Silicon Schottky N-Type Diodes: High Barrier

- V_F , R_D and C_J matching options
- Chip, beam lead or packaged devices
- Hi-Rel screening per MIL-PRF-19500 and MIL-PRF-38534 available

The Aeroflex / Metelics MSS50,000 Series of Schottky diodes are fabricated on N-Type epitaxial substrates using proprietary processes that yield the highest FCOs in the industry. Optimum mixer and detector performance is obtained with LO power of +2 dBm to +8 dBm per diode. These can also be used in doubler, limiter, detector and sampler applications.

V_F @ 1 mA = 450 ~ 550 mV, V_{BR} @ 10 μ A = 4 V min.

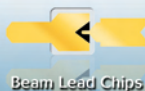
Chip and Beam Lead

Model	Configuration	C_J		R_D	R_S	F_{CO}	Package
		TYP pF	MAX pF	MAX Ω	TYP Ω	TYP GHz	
MSS50,046-C26	Single Junction	0.10	0.12	20	10	190	C26
MSS50,048-C15	Single Junction	0.12	0.15	15	7	190	C15
MSS50,062-C16	Single Junction	0.50	0.55	12	2	160	C16
MSS50,146-B10B	Single Junction	0.07	0.12	18	9	253	B10B
MSS50,155-B10B	Single Junction	0.25	0.30	15	7	90	B10B
MSS50,244-B20	Series Tee	0.15	0.20	16	7	183	B20
MSS50,341-B21	Anti-Parallel Pair	0.20	0.26	16	7	114	B21
MSS50,448-B40	Ring Quad	0.20	0.25	14	6	133	B40
MSS50,B46-B45	Bridge Quad	0.10	0.13	20	10	159	B45
MSS50,B53-B45	Bridge Quad	0.20	0.25	15	5	159	B45
MSS50,CR46-B49	Crossover Ring Quad	0.09	0.125	22	10	177	B49
MSS50,CR53-B49	Crossover Ring Quad	0.15	0.25	15	5	212	B49
MSS50,PCB46-B48	Coplanar Bridge Quad	0.08	0.12	20	7	284	B48
MSS50,PCR46-B47	Coplanar Ring Quad	0.07	0.13	22	10	227	B47
MSS50,PCR53-B48	Coplanar Ring Quad	0.15	0.25	15	5	212	B47
Test Conditions		$V_R = 0$ V $F = 1$ MHz		$I_F = 5$ mA			

Maximum Ratings	Parameters	Rating
	Reverse Voltage	Rated V_{BR}
	Forward Current	50 mA
	Operation Temperature	-65° C to +150° C
	Storage Temperature	-65° C to +150° C
	Power Dissipation	150 mW per junction at $T_a = 25^\circ$ C, derate linearly to zero at $T_a = +150^\circ$ C
	Soldering Temperature (Packaged)	+260° C for 5 sec.
	Beam Lead Pull Strength	4 grams minimum



Bare Die



Beam Lead Chips



Ceramic Epoxy SMT



Ceramic Hemetic SMT



Ceramic Microwave Pill

Silicon Schottky N-Type Diodes: High Barrier

$V_F @ 1 \text{ mA} = 450 \sim 550 \text{ mV}$, $V_{BR} @ 10 \mu\text{A} = 4 \text{ V min.}$							Packaged
Model	Configuration	C_T		R_D	C_P	L_P	Package
		TYP pF	MAX pF	MAX Ω	TYP pF	MAX nH	
MSS50,046-P55	Single Junction	0.23	0.28	20	0.13	0.35	P55
MSS50,046-P86	Single Junction	.025	0.30	20	0.15	1.0	P86
MSS50,048-P55	Single Junction	0.25	0.31	15	0.13	0.35	P55
MSS50,048-P86	Single Junction	0.27	0.33	15	0.15	1.0	P86
MSS50,062-P55	Single Junction	0.63	0.75	12	0.13	0.35	P55
MSS50,062-P86	Single Junction	0.65	0.78	12	0.15	1.0	P86
MSS50,146-E25	Single Junction	0.14	0.24	18	0.07	0.4	E25
MSS50,146-H20	Single Junction	0.25	0.34	18	0.18	0.5	H20
MSS50,146-0402	Single Junction	0.11	0.20	18	0.05	0.25	0402
MSS50,146-0805-2	Single Junction	0.12	0.22	18	0.06	0.4	0805-2
MSS50,155-E25	Single Junction	0.32	0.41	15	0.07	0.4	E25
MSS50,155-H20	Single Junction	0.43	0.51	15	0.18	0.5	H20
MSS50,155-0402	Single Junction	0.30	0.38	15	0.05	0.25	0402
MSS50,155-0805-2	Single Junction	0.31	0.40	15	0.06	0.4	0805-2
MSS50,244-E35	Series Tee	0.22	0.31	16	0.07	0.4	E35
MSS50,244-H30	Series Tee	0.33	0.42	16	0.18	0.5	H30
MSS50,244-0805-4	Series Tee	0.34	0.44	16	0.06	0.4	0805-4
MSS50,341-E25	Anti-Parallel Pair	0.27	0.36	16	0.07	0.4	E25
MSS50,341-H20	Anti-Parallel Pair	0.38	0.48	16	0.18	0.5	H20
MSS50,448-E45	Ring Quad	0.27	0.36	10	0.07	0.4	E45
MSS50,448-H40	Ring Quad	0.38	0.48	10	0.18	0.5	H40
MSS50,448-0805-4	Ring Quad	0.26	0.35	10	0.06	0.4	0805-4
MSS50,B46-E45	Bridge Quad	0.17	0.25	20	0.07	0.4	E45
MSS50,B46-H40	Bridge Quad	0.28	0.35	20	0.18	0.5	H40
MSS50,B53-E45	Bridge Quad	0.27	0.36	15	0.07	0.4	E45
MSS50,B53-H40	Bridge Quad	0.38	0.48	15	0.18	0.5	H40
MSS50,CR46-E45	Crossover Ring Quad	0.16	0.25	22	0.07	0.4	E45
MSS50,CR46-H40	Crossover Ring Quad	0.27	0.36	22	0.18	0.5	H40
MSS50,CR53-E45	Crossover Ring Quad	0.22	0.36	15	0.07	0.4	E45
MSS50,CR53-H40	Crossover Ring Quad	0.33	0.46	15	0.18	0.5	H40
Test Conditions		$V_R = 0 \text{ V}$ $F = 1 \text{ MHz}$		$I_F = 5 \text{ mA}$			



Bare Die



Beam Lead Chips



Ceramic Epoxy SMT



Ceramic Hemetic SMT



Ceramic Microwave Pill

Silicon Schottky N-Type Diodes: Extra High Barrier

- V_F , R_D and C_J matching options
- Chip, beam lead or packaged devices
- Hi-Rel screening per MIL-PRF-19500 and MIL-PRF-38534 available

The Aeroflex / Metelics MSS60,000 Series of Schottky diodes are fabricated on N-Type epitaxial substrates using proprietary processes that yield the highest FCOs in the industry. Optimum mixer and detector performance is obtained with LO power of +6 dBm to +12 dBm per diode. These can also be used in doubler, limiter, detector and sampler applications.

V_F @ 1 mA = 550 ~ 700 mV, V_{BR} @ 10 μ A = 3.5 V min.

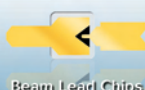
Chip and Beam Lead

Model	Configuration	C_J		R_D	R_S	F_{CO}	Package
		TYP pF	MAX pF	MAX Ω	TYP Ω	TYP GHz	
MSS60,046-C26	Single Junction	0.10	0.12	18	10	190	C26
MSS60,048-C26	Single Junction	0.12	0.15	16	8	190	C26
MSS60,144-B10B	Single Junction	0.08	0.10	25	15	153	B10B
MSS60,148-B10B	Single Junction	0.12	0.15	18	10	133	B10B
MSS60,153-B10B	Single Junction	0.20	0.25	12	5	159	B10B
MSS60,244-B20	Series Tee	0.08	0.10	25	15	133	B20
MSS60,248-B20	Series Tee	0.12	0.15	18	7	133	B20
MSS60,253-B20	Series Tee	0.20	0.25	12	5	159	B20
MSS60,444-B42	Ring Quad	0.08	0.10	25	15	133	B42
MSS60,448-B42	Ring Quad	0.12	0.15	18	7	133	B42
MSS60,453-B41	Ring Quad	0.25	0.30	12	5	159	B41
MSS60,841-B80	8 Junction Ring Quad	0.06	0.08	28	18	133	B80
MSS60,846-B80	8 Junction Ring Quad	0.10	0.12	23	12	106	B80
MSS60,848-B80	8 Junction Ring Quad	0.12	0.15	18	7	133	B80
MSS60,B46-B45	Bridge Quad	0.10	0.13	25	15	106	B45
MSS60,B53-B45	Bridge Quad	0.20	0.25	18	7	114	B45
MSS60,CR46-B49	Crossover Ring Quad	0.09	0.125	22	10	177	B49
MSS60,CR53-B49	Crossover Ring Quad	0.15	0.25	15	7	152	B49
MSS60,PCB46-B48	Coplanar Bridge Quad	0.08	0.12	20	7	284	B48
MSS60,PCR46-B47	Coplanar Ring Quad	0.07	0.13	22	10	227	B47
MSS60,PCR53-B47	Coplanar Ring Quad	0.15	0.25	15	7	152	B47
Test Conditions		$V_R = 0$ V $F = 1$ MHz		$I_F = 5$ mA			

Maximum Ratings	Parameters	Rating
	Reverse Voltage	Rated V_{BR}
	Forward Current	50 mA
	Operation Temperature	-65° C to +150° C
	Storage Temperature	-65° C to +150° C
	Power Dissipation	150 mW per junction at $T_a = 25^\circ$ C, derate linearly to zero at $T_a = +150^\circ$ C
	Soldering Temperature (Packaged)	+260° C for 5 sec.
	Beam Lead Pull Strength	4 grams minimum



Bare Die



Beam Lead Chips



Ceramic Epoxy SMT



Ceramic Hemetic SMT



Ceramic Microwave Pill

Silicon Schottky N-Type Diodes: Extra High Barrier

$V_F @ 1 \text{ mA} = 550 \sim 700 \text{ mV}$, $V_{BR} @ 10 \mu\text{A} = 3.5 \text{ V min.}$							Packaged
Model	Configuration	C_T		R_D	C_P	L_P	Package
		TYP pF	MAX pF	MAX Ω	TYP pF	TYP nH	
MSS60,046-P55	Single Junction	0.23	0.28	18	0.13	0.35	P55
MSS60,046-P86	Single Junction	0.25	0.30	18	0.15	1.0	P86
MSS60,048-P55	Single Junction	0.25	0.31	16	0.13	0.35	P55
MSS60,048-P86	Single Junction	0.27	0.33	16	0.15	1.0	P86
MSS60,144-E25	Single Junction	0.15	0.22	25	0.07	0.4	E25
MSS60,144-H20	Single Junction	0.26	0.31	25	0.18	0.5	H20
MSS60,148-E25	Single Junction	0.19	0.28	18	0.07	0.4	E25
MSS60,148-H20	Single Junction	0.30	0.38	18	0.18	0.5	H20
MSS60,153-E25	Single Junction	0.27	0.36	12	0.07	0.4	E25
MSS60,153-H20	Single Junction	0.38	0.48	12	0.18	0.5	H20
MSS60,244-E35	Series Tee	0.15	0.22	25	0.07	0.4	E35
MSS60,244-H30	Series Tee	0.26	0.36	25	0.18	0.5	H30
MSS60,248-E35	Series Tee	0.19	0.28	18	0.07	0.4	E35
MSS60,248-H30	Series Tee	0.30	0.40	18	0.18	0.5	H30
MSS60,253-E35	Series Tee	0.27	0.37	12	0.07	0.4	E35
MSS60,253-H30	Series Tee	0.38	0.48	12	0.18	0.5	H30
MSS60,444-E45	Ring Quad	0.15	0.22	25	0.07	0.4	E45
MSS60,444-H40	Ring Quad	0.26	0.33	25	0.18	0.5	H40
MSS60,448-E45	Ring Quad	0.19	0.27	18	0.07	0.4	E45
MSS60,448-H40	Ring Quad	0.30	0.38	18	0.18	0.5	H40
MSS60,453-E45	Ring Quad	0.32	0.42	12	0.07	0.4	E45
MSS60,453-H40	Ring Quad	0.43	0.53	12	0.18	0.5	H40
MSS60,841-E45	8 Junction Ring Quad	0.13	0.20	28	0.07	0.4	E45
MSS60,841-H40	8 Junction Ring Quad	0.24	0.31	28	0.18	0.5	H40
MSS60,846-E45	8 Junction Ring Quad	0.17	0.24	23	0.07	0.4	E45
MSS60,846-H40	8 Junction Ring Quad	0.28	0.35	23	0.18	0.5	H40
MSS60,848-E45	8 Junction Ring Quad	0.19	0.27	18	0.07	0.4	E45
MSS60,848-H40	8 Junction Ring Quad	0.30	0.38	18	0.18	0.5	H40
MSS60,B46-E45	Bridge Quad	0.17	0.25	25	0.07	0.4	E45
MSS60,B46-H40	Bridge Quad	0.28	0.36	25	0.18	0.5	H40
MSS60,B53-E45	Bridge Quad	0.27	0.37	18	0.07	0.4	E45
MSS60,B53-H40	Bridge Quad	0.38	0.48	18	0.18	0.5	H40
MSS60,CR46-E45	Crossover Ring Quad	0.16	0.25	22	0.07	0.4	E45
MSS60,CR53-E45	Crossover Ring Quad	0.22	0.37	15	0.07	0.4	E45
Test Conditions		$V_R = 0 \text{ V}$ $F = 1 \text{ MHz}$		$I_F = 5 \text{ mA}$			



Bare Die



Beam Lead Chips



Ceramic Epoxy SMT



Ceramic Hemetic SMT



Ceramic Microwave Pill

Silicon Schottky Diodes: General Purpose

- Fast switching
- High breakdown voltage
- Low cost

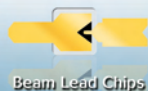
The Aeroflex / Metelics MGR-700 Series are general purpose Schottky Barrier diodes specially designed to achieve a high voltage breakdown. This series of diodes can be used in the UHF and VHF frequency bands for pulse shaping, sampling and as fast logic gates.

Chip				
Model	Breakdown Voltage I_R 10 μ A	Forward Voltage 1mA	Junction Capacitance @0 Vdc 1 MHz	Leakage Current 80% V_B
	MIN V	TYP V	MAX pF	MAX nA
MGR700	8.0	0.34	1.2	100.0
MGR701	8.0	0.34	1.0	100.0
MGR702	20.0	0.55	1.2	100.0
MGR703	20.0	0.41	1.0	100.0
MGR704	70.0	0.41	2.0	200.0
MGR705	70.0	0.41	1.2	200.0
1N5711	20.0	0.41	1.0	100.0
1N5712	70.0	0.41	1.2	200.0

Maximum Ratings	Parameters	Rating
	Operating Temperature	-55° C to + 150° C
	Storage Temperature	-65° C to + 200° C
	Reverse Voltage	See Voltage Ratings



Bare Die



Beam Lead Chips



Ceramic Epoxy SMT



Ceramic Hemetic SMT



Ceramic Microwave Pill

Silicon Schottky Diodes: General Purpose

SOT23 & SOD323

Model	Configuration	V_{BR}	V_F	C_T	R_D MAX Ω	Package
		MIN V	TYP mV	MAX pF		
SMST3012-SOT23	-0S, 1S, 2ST, 3CA, 4CC	2.0	270	0.25	15	SOT23
SMST4012-SOT23	-0S, 1S, 2ST, 3CA, 4CC	2.0	350	0.25	15	SOT23
SMST6012-SOT23	-0S, 1S, 2ST, 3CA, 4CC	2.0	630	0.25	15	SOT23
SMST3004-SOT23	-0S, 1S, 2ST, 3CA, 4CC	2.0	270	0.60	10	SOT23
SMST4004-SOT23	-0S, 1S, 2ST, 3CA, 4CC	2.0	350	0.60	10	SOT23
SMST6004-SOT23	-0S, 1S, 2ST, 3CA, 4CC	2.0	600	0.60	10	SOT23
SMSD3012-SOD323	—	2.0	270	0.25	15	SOD323
SMSD4012-SOD323	—	2.0	350	0.25	15	SOD323
SMSD6012-SOD323	—	2.0	630	0.25	15	SOD323
SMSD3004-SOD323	—	2.0	270	0.60	10	SOD323
SMSD4004-SOD323	—	2.0	350	0.60	10	SOD323
SMSD6004-SOD323	—	2.0	600	0.60	10	SOD323
Test Conditions		$I_R = 10 \mu A$	$I_F = 1 \text{ mA}$	$V_R = 0 \text{ V}$ $F = 1 \text{ MHz}$	$I_F = 10 \text{ mA}$	

SOT143

Model	Configuration	V_{BR}	V_F	C_T	R_D MAX Ω	Package
		MIN V	TYP mV	MAX pF		
SMSP3012-SOT143	Split Pair	2	270	0.40	15.0	SOT143
SMSP3004-SOT143	Split Pair	2	270	0.65	10.0	SOT143
SMSRQ1200-SOT143	Ring Quad	2	270	0.40	15.0	SOT143
SMSRQ1200-SOT143	Crossover Quad	2	270	0.40	15.0	SOT143
SMSRQ1500-SOT143	Ring Quad	2	270	0.65	8.0	SOT143
SMSRQ1500-SOT143	Crossover Quad	2	270	0.65	8.0	SOT143
SMSRQ2500-SOT143	Ring Quad	2	400	0.65	10.0	SOT143
SMSRQ2500-SOT143	Crossover Quad	2	400	0.65	10.0	SOT143
SMSRQ4500-SOT143	Ring Quad	3	600	0.65	8.0	SOT143
SMSRQ4500-SOT143	Crossover Quad	3	600	0.65	8.0	SOT143
SMSRQ5500-SOT143	Ring Quad	3	1,100	0.55	16.0	SOT143
SMSRQ5500-SOT143	Crossover Quad	3	1,100	0.55	16.0	SOT143
Test Conditions		$I_R = 10 \mu A$	$I_F = 1 \text{ mA}$	$V_R = 0 \text{ V}$ $F = 1 \text{ MHz}$	$I_F = 10 \text{ mA}$	



Tunnel Diodes: MBD Series

- Rugged Germanium Planar Construction
- Excellent temperature stability
- No DC Bias Required
- Wide Video Bandwidth
- MIL-STD-19500 & 883 Capability

The Aeroflex / Metelics MBD series of Planar Back (Tunnel) Diodes are fabricated on germanium substrates with passivated, planar construction and all gold metallization for reliable operation up to +110 °C. Unlike the standard tunnel diode I_P is minimized for detector operation and binned in five values offering varying degrees of sensitivity and video impedance. The back detector is generally operated with zero bias and is known for its excellent temperature stability and fast video rise times.

Chips

Model	I_P		C_J	γ	R_V	I_P / I_V	V_R	V_F	Package
	MIN μA	MAX pF	MAX pF	TYP mV / mW	TYP Ω	MIN	MIN mV	MAX mV	
MBD1057-C18	100	200	0.30	1,000	180	2.5	420	135	C18
MBD2057-C18	200	300	0.30	750	130	2.5	410	130	C18
MBD3057-C18	300	400	0.30	500	80	2.5	400	125	C18
MBD4057-C18	400	500	0.30	275	65	2.5	400	120	C18
MBD5057-C18	500	600	0.30	250	60	2.5	400	110	C18
Test Conditions			$V_R = V_V$ $F = 100 \text{ MHz}$	$P_{IN} = -20 \text{ dBm}$ $R_L = 10 \text{ K}\Omega \quad F = 10 \text{ GHz}$			$I_R = 500 \mu A$	$I_F = 3 \text{ mA}$	

Packaged

Model	I_P		C_T	γ	R_V	I_P / I_V	V_R	V_F	Package
	MIN μA	MAX pF	MAX pF	TYP mV / mW	TYP Ω	MIN	MIN mV	MAX mV	
MBD1057-E28 / 28X	100	200	0.40	1,000	180	2.5	420	135	E28 / 28X
MBD1057-H20	100	200	0.50	1,000	180	2.5	420	135	H20
MBD1057-T54	100	200	0.55	1,000	180	2.5	420	135	T54p
MBD1057-T80	100	200	0.65	1,000	180	2.5	420	135	T80p
MBD1057-0805-2	100	200	0.40	1,000	180	2.5	420	135	0805-2
MBD2057-E28 / 28X	200	300	0.40	750	130	2.5	410	130	E28 / 28X
MBD2057-H20	200	300	0.50	750	130	2.5	410	130	H20
MBD2057-T54	200	300	0.55	750	130	2.5	410	130	T54p
MBD2057-T80	200	300	0.65	750	130	2.5	410	130	T80p
MBD2057-0805-2	200	300	0.40	750	130	2.5	410	130	0805-2
MBD3057-E28 / 28X	300	400	0.45	500	80	2.5	400	125	E28 / 28X
MBD3057-H20	300	400	0.55	500	80	2.5	400	125	H20
MBD3057-T54	300	400	0.60	500	80	2.5	400	125	T54p
MBD3057-T80	300	400	0.70	500	80	2.5	400	125	T80p
MBD3057-0805-2	300	400	0.45	500	80	2.5	400	125	0805.2
MBD4057-E28 / 28X	400	500	0.50	275	65	2.5	400	120	E28 / 28X
MBD4057-H20	400	500	0.60	275	65	2.5	400	120	H20
MBD4057-T54	400	500	0.65	275	65	2.5	400	120	T54p
MBD4057-T80	400	500	0.75	275	65	2.5	400	120	T80p
MBD4057-0805-2	400	500	0.5	275	65	2.5	400	120	0805-2
MBD5057-E28 / 28X	500	600	0.55	250	60	2.5	400	110	E28 / 28X
MBD5057-H20	500	600	0.65	250	60	2.5	400	110	H20
MBD5057-T54	500	600	0.70	250	60	2.5	400	110	T54p
MBD5057-T80	500	600	0.80	250	60	2.5	400	110	T80p
MBD5057-0805-2	500	600	0.55	250	60	2.5	400	110	0805-2
Test Conditions			$V_R = V_V$ $F = 30 \text{ MHz}$	$P_{IN} = -20 \text{ dBm}$ $R_L = 10 \text{ K}\Omega \quad F = 10 \text{ GHz}$			$I_R = 500 \mu A$	$I_F = 3 \text{ mA}$	



Bare Die



Ceramic Epoxy SMT



Ceramic Hemetic SMT



Ceramic Microwave Pill

Tunnel Diode Detectors: MTD Series

- Low temperature drift
- Excellent flatness
- High sensitivity
- Low VSWR

The Aeroflex / Metelics MTD series of Planar Back (Tunnel) Diode Detectors include a variety of options for your commercial and broadband applications. Commercial products operate between 0.5 to 14.5 GHz and offer low temperature drift, high sensitivity, low VSWR, and excellent flatness. Both positive and negative output polarities are available. Broadband products offer high sensitivity and low VSWR.

Commercial

Model	Frequency Range	Sensitivity	MAX VSWR	Flatness	TYP R_V	Output Capacitance
	GHz	MIN mV / mW		dB		TYP Pf
MTDL-8015P	0.8 – 14.5	600	3.50:1	± 1.0	250	50
MTDL-8015N	0.8 – 14.5	600	3.50:1	± 1.0	250	50
MTDH-8015P	0.8 – 14.5	700	2.75:1	± 0.75	250	50
MTDH-8015N	0.8 – 14.5	700	2.75:1	± 0.75	250	50
MTDL-8007P	0.8 – 7.0	600	1.75:1	± 0.5	250	50
MTDL-8007N	0.8 – 7.0	600	1.75:1	± 0.5	250	50
MTDH-8007P	0.8 – 7.0	700	1.50:1	± 0.3	250	50
MTDH-8007N	0.8 – 7.0	700	1.50:1	± 0.3	250	50
MTDL-0611P	6.0 – 11.0	700	2.50:1	± 0.5	250	50
MTDL-0611N	6.0 – 11.0	700	2.50:1	± 0.5	250	50
MTDH-0611P	6.0 – 11.0	800	2.25:1	± 0.3	250	50
MTDH-0611N	6.0 – 11.0	800	2.25:1	± 0.3	250	50
MTDL-1015P	10.0 – 14.5	700	3.50:1	± 0.5	250	50
MTDL-1015N	10.0 – 14.5	700	3.50:1	± 0.5	250	50
MTDH-1015P	10.0 – 14.5	700	2.75:1	± 0.35	250	50
MTDH-1015N	10.0 – 14.5	700	2.75:1	± 0.35	250	50

Package
(contact factory)
2514T / 2540T

Broadband

Model	Frequency Range	Sensitivity	MAX VSWR	Flatness	TYP R_V	Output Capacitance
	GHz	MIN mV / mW		dB		TYP Pf
MTD-1002N	0.1 – 2.0	700	2.0:1	± 0.5	200	100
MTD-0208N	2.0 – 8.0	700	2.0:1	± 0.8	130	20
MTD-0818N	8.0 – 18.0	400	2.3:1	± 1.2	100	10
MTD-0218N	2.0 – 18.0	400	2.5:1	± 1.5	100	10



Ceramic Epoxy SMT



Specialty Packages

Capacitors: MNOS Series

- Low leakage current
- Low insertion loss
- Excellent long-term stability

The Aeroflex / Metelics MIS capacitors utilize a silicon nitride dielectric over a thermally grown silicon dioxide base. The resultant composite dielectric exhibits low leakage current and insertion loss with excellent long-term stability. The temperature coefficient of capacitance is typically +55 ppm / °C.

Chips							
Model	Capacitance Range		DWV	IR	T _{CC}	Dimensions	
	MIN pF	MAX pF	MIN V	MIN MΩ	TYP ppm / °C	D1 mils	D2 mils
MC2DXXX010-010	0.10	5.0	50	1,000	+55	10	10
MC2DXXX015-015	1.5	15	50	1,000	+55	15	15
MC2DXXX020-020	5.0	50	50	1,000	+55	20	20
Test Conditions	F = 1 MHz			V = 25 V	-55 °C to +200 °C		

See Figure 1 in Outline Drawings

XXX = Three digit capacitance code, ex. 005 = 5 pF, 082 = 82 pF, 1.5 = 1.5 pF)

Chips							
Model	Capacitance Range		DWV	IR	T _{CC}	Dimensions	
	MIN pF	MAX pF	MIN V	MIN MΩ	TYP ppm / °C	D1 mils	D2 mils
MC2RXXX010-015	2.0	20	50	1,000	+55	10	15
MC2RXXX015-020	5.0	42	50	1,000	+55	15	20
MC2RXXX015-032	5.0	62	50	1,000	+55	15	32
MC2RXXX022-042	15	120	50	1,000	+55	22	42
MC2RXXX097-107	100	999	50	1,000	+55	97	107
MC2RXXX099-138	100	999	50	1,000	+55	99	138
MC2RXXX127-145	200	1,800	50	1,000	+55	127	145
MC2RXXX142-160	200	2,200	50	1,000	+55	142	160
Test Conditions	F = 1 MHz			V = 25 V	-55 °C to +200 °C		

See Figure 2 in Outline Drawings

XXX = Three or four digit capacitance code, ex. 005 = 5 pF, 082 = 82 pF, 2.5 = 2.5 pF)



Capacitors: MNOS Series

Chips							
Model	Capacitance Range		DWV	IR	T _{CC}	Dimensions	
	MIN pF	MAX pF	MIN V	MIN MΩ	TYP ppm / °C	D1 mils	D2 mils
MC2SXXX010-010	0.25	8.0	50	1,000	+55	10	10
MC2SXXX011-011	1.0	12	50	1,000	+55	11	11
MC2SXXX015-015	3.0	30	50	1,000	+55	15	15
MC2SXXX016-016	3.0	35	50	1,000	+55	16	16
MC2SXXX020-020	5.0	55	50	1,000	+55	20	20
MC2SXXX022-022	5.0	60	50	1,000	+55	22	22
MC2SXXX025-025	10	100	50	1,000	+55	25	25
MC2SXXX030-030	10	120	50	1,000	+55	30	30
MC2SXXX035-035	15	150	50	1,000	+55	35	35
MC2SXXX040-040	20	200	50	1,000	+55	40	40
MC2SXXX050-050	25	250	50	1,000	+55	50	50
MC2SXXX055-055	25	300	50	1,000	+55	55	55
MC2SXXX060-060	35	375	50	1,000	+55	60	60
MC2SXXX070-070	50	550	50	1,000	+55	70	70
MC2SXXX080-080	70	700	50	1,000	+55	80	80
MC2SXXX100-100	100	999	50	1,000	+55	100	100
Test Conditions	F = 1 MHz			V = 25 V	-55 °C to +200 °C		

See Figure 3 in Outline Drawings

XXX = Three digit capacitance code, ex. 005 = 5 pF, 082 = 82 pF

Binary Chips									
Model	Capacitance Range								Package
	C _T ±20% pF	C1 NOM pF	C2 NOM pF	C3 NOM pF	C4 NOM pF	DWV MIN V	IR MIN MΩ	T _{CC} TYP ppm / °C	
MC2B0.8020-020	1.5	0.1	0.2	0.4	0.8	50	1,000	+55	C20
MC2B002020-020	3.75	0.25	0.5	1.0	2.0	50	1,000	+55	C20
MC2B004020-020	8.0	0.5	1.0	2.0	4.0	50	1,000	+55	C20
MC2B008020-020	15	1.0	2.0	4.0	8.0	50	1,000	+55	C20
MC2B016020-020	30	2.0	4.0	8.0	16	50	1,000	+55	C20
Test Conditions	F = 1 MHz						V = 25 V	-55 °C to +200 °C	

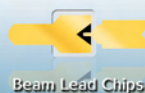
See Figure 4 in Outline Drawings



Bare Die

Capacitors: MNOS Series

Beam Lead					
Model	C_T	DWV	IR	T_{CC}	Package
	$\pm 20\%$ pF	MIN V	MIN m Ω	TYP ppm / °C	
MBC50-1B12	1.0	50	1,000	+55	B12
MBC50-2B12	2.0	50	1,000	+55	B12
MBC50-3B12	3.0	50	1,000	+55	B12
MBC50-4B12	4.0	50	1,000	+55	B12
MBC50-6B12	6.0	50	1,000	+55	B12
MBC50-8B12	8.0	50	1,000	+55	B12
MBC50-10B12	10	50	1,000	+55	B12
MBC50-15B12	15	50	1,000	+55	B12
MBC50-20B12	20	50	1,000	+55	B12
MBC50-33B13	33	50	1,000	+55	B13
MBC50-47B13	47	50	1,000	+55	B13
MBC50-68B13	68	50	1,000	+55	B13
MBC50-82B13	82	50	1,000	+55	B13
MBC50-100B13	100	50	1,000	+55	B13
MBC50-0.2B14	0.2	50	1,000	+55	B14
MBC50-1.0B14	1.0	50	1,000	+55	B14
MBC50-1.5B14	1.5	50	1,000	+55	B14
MBC50-2.0B14	2.0	50	1,000	+55	B14
Test Conditions	F = 1 MHz		V = 25 V	-55 °C to +200 °C	



GaAs Schottky Diodes

- Passivated mesa construction
- Tri-metallization
- Supports limiter, mixer, multiplier and sampler designs
- Operating to 60+ GHz

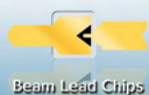
Millimeter wave performance in twelve configurations featuring passivated mesa construction and Aeroflex / Metelics' tri-metallization for ultra-reliable operation in the most demanding environments. Topologies supporting limiter, mixer, multiplier and sampler designs operating to 60+ GHz are available in flip chip, beam lead and packaged form. Screening per MIL-PRF-19500 and MIL-PRF-38534 is available.

Flip Chip

Model	Configuration	V_F		ΔV_F	V_{BR}	C_J	ΔC_J	R_S	Package
		MIN mV	MAX mV	MAX mV	MIN V	MAX pF	MAX pF	MAX Ω	
MGS801	Single Junction	650	750	N/A	5	0.06	N/A	7	GC110
MGS801A	Single Junction	650	750	N/A	5	0.075	N/A	5	GC110
MGS802	Anti-parallel Pair	650	750	20	—	0.10	N/A	7	GC210
MGS802A	Anti-Parallel Pair	650	750	20	—	0.15	N/A	5	GC210
MGS803	Series Tee	650	750	20	5	0.06	0.02	7	GC310
Test Conditions		$I_F = 1 \text{ mA}$			$I_R = 10 \mu\text{A}$	$V_R = 0 \text{ V}$ $F = 1 \text{ MHz}$		$I_F = 5 \text{ mA}$	

Beam Lead

Model	Configuration	V_F		ΔV_F	V_{BR}	C_J	ΔC_J	R_S	Package
		MIN mV	MAX mV	MAX mV	MIN V	MAX pF	MAX pF	MAX Ω	
MGS901	Single Junction	650	750	N/A	5	0.06	N/A	7	GB110
MGS902	Anti Parallel Pair	650	750	20	—	0.10	N/A	7	GB210
MGS903	Series Tee	650	750	20	5	0.06	0.02	7	GB310
MGS904	4 Junction Ring Quad	650	750	20	—	0.06	0.02	7	B85
MGS904A	4 Junction Ring Quad	650	750	20	—	0.08	0.02	5	B85
MGS905	4 Junction Bridge Quad	650	750	20	5	0.06	0.02	7	B86
MGS906	4 Junction Series Tee	1300	1500	40	10	0.04	0.02	14	B90
MGS907	8 Junction Ring Quad	1300	1500	40	—	0.04	0.02	14	B85
MGS907A	8 Junction Ring Quad	1300	1500	40	—	0.06	0.02	12	B85
MGS907B	8 Junction Ring Quad	1300	1500	40	—	0.08	0.02	10	B85
MGS908	8 Junction Bridge Quad	1300	1500	40	10	0.04	0.02	14	B86
MGS909	6 Junction Series Tee	1800	2100	60	15	0.10	0.03	21	B90
MGS910	12 Junction Ring Quad	1800	2100	60	—	0.10	0.03	21	B87
MGS911	12 Junction Bridge Quad	1800	2100	60	15	0.10	0.03	21	B88
MGS912	Four Junction	2500	2900	N/A	20	0.03	N/A	28	B89
Test Conditions		$I_F = 1 \text{ mA}$			$I_R = 10 \mu\text{A}$	$V_R = 0 \text{ V}$ $F = 1 \text{ MHz}$		$I_F = 5 \text{ mA}$	



GaAs Abrupt Varactor Diodes

- Passivated mesa construction
- Applications in tunable filters and oscillators up to 40 GHz
- Die and packaged devices available

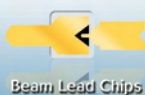
The Aeroflex / Metelics MGVS series of abrupt varactor diodes feature passivated mesa construction for low leakage and excellent post tuning drift. These diodes will find application in tunable filters and oscillators up to 40 GHz. Optimum performance is obtained using die however packaged devices are available as well diodes screened per MIL-PRF-19500 and MIL-PRF-38534. Contact your representative for these and other options.

$V_{BR} = 22 \text{ V min.}$									Chips
Model	Γ TYP	C_J			Tuning Ratio			Q	Package
		MIN pF	TYP pF	MAX pF	MIN	TYP	MAX	MIN	
MGV050-18	0.50	0.25	0.30	0.35	4.0	4.7	5.5	4,000	C01A
MGV050-20	0.50	0.50	0.55	0.61	4.0	4.7	5.5	4,000	C01A
MGV050-22	0.50	0.90	1.00	1.10	4.0	4.7	5.5	3,000	C01A
MGV050-24	0.50	1.35	1.50	1.65	4.0	4.7	5.5	3,000	C01A
MGV050-26	0.50	1.80	2.00	2.20	4.0	4.7	5.5	3,000	C01A
Test Conditions	$V_R = 2 \text{ to } 22 \text{ V}$	$V_R = 4 \text{ V}$ $F = 1 \text{ MHz}$			$V_R = 0 \text{ to } 22 \text{ V}$			$V_R = 4 \text{ V}$ $F = 50 \text{ MHz}$	

$V_{BR} = 22 \text{ V min.}$									Packaged
Model	Γ TYP	C_J			Tuning Ratio			Q	Package
		MIN pF	TYP pF	MAX pF	MIN	TYP	MAX	MIN	
MGV050-18-E28 / 28X	0.50	0.31	0.38	0.45	3.0	3.4	3.9	4,000	E28 / 28X
MGV050-18-H20	0.50	0.41	0.48	0.55	2.0	2.6	3.2	4,000	H20
MGV050-18-0805-2	0.50	0.29	0.36	0.43	3.0	3.6	4.2	4,000	0805-2
MGV050-20-E28 / 28X	0.50	0.55	0.63	0.71	3.3	3.9	4.5	4,000	E28 / 28X
MGV050-20-H20	0.50	0.64	0.73	0.82	2.8	3.2	3.7	4,000	H20
MGV050-20-0805-2	0.50	0.53	0.61	0.69	3.4	4.0	4.8	4,000	0805-2
MGV050-22-E28 / 28X	0.50	0.95	1.08	1.21	3.6	4.2	5.0	3,000	E28 / 28X
MGV050-22-H20	0.50	1.04	1.18	1.32	3.2	3.7	4.4	3,000	H20
MGV050-22-0805-2	0.50	0.93	1.06	1.19	3.7	4.3	5.1	3,000	0805-2
MGV050-24-E28 / 28X	0.50	1.40	1.58	1.76	3.7	4.2	5.3	3,000	E28 / 28X
MGV050-24-H20	0.50	1.49	1.68	1.87	3.4	3.7	4.7	3,000	H20
MGV050-24-0805-2	0.50	1.38	1.56	1.74	3.8	4.3	5.3	3,000	0805-2
MGV050-26-E28 / 28X	0.50	1.85	2.08	2.31	3.8	4.4	5.3	3,000	E28 / 28X
MGV050-26-H20	0.50	1.94	2.18	2.42	3.5	4.0	4.9	3,000	H20
MGV050-26-0805-2	0.50	1.83	2.06	2.29	3.8	4.5	5.4	3,000	0805-2
Test Conditions	$V_R = 2 \text{ to } 22 \text{ V}$	$V_R = 4 \text{ V}$ $F = 1 \text{ MHz}$			$V_R = 0 \text{ to } 22 \text{ V}$			$V_R = 4 \text{ V}$ $F = 50 \text{ MHz}$	



Bare Die



Beam Lead Chips



Ceramic Epoxy SMT



Ceramic Hemetic SMT



Ceramic Microwave Pill



Glass Axial Leaded

GaAs Hyperabrupt Varactor Diodes

- Passivated mesa construction
- Available in three constant gamma families
- Applications in tunable filters and oscillators up to 40 GHz
- Die and packaged devices available

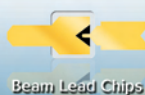
The Aeroflex / Metelics MGV series of hyperabrupt varactor diodes feature passivated mesa construction for low leakage and excellent post tuning drift. Available in three constant gamma families of 0.75, 1.0 and 1.25. These diodes will find application in tunable filters and oscillators up to 40 GHz. Optimum performance is obtained using die however packaged devices are available as well diodes screened per MIL-PRF-19500 and MIL-PRF-38534. Contact your representative for these and other options.

Chips									
Model	Γ TYP	C_J			Tuning Ratio			Q	Package
		MIN pF	TYP pF	MAX pF	MIN	TYP	MAX	MIN	
MGV075-08*	0.75	0.25	0.30	0.35	2.2	2.8	3.5	4,000	C01A
MGV075-09*	0.75	0.35	0.40	0.45	2.2	2.8	3.5	4,000	C01A
MGV075-10*	0.75	0.45	0.50	0.55	2.2	2.8	3.5	3,000	C01A
MGV075-11*	0.75	0.63	0.70	0.77	2.2	2.8	3.5	3,000	C01A
MGV075-12*	0.75	0.72	0.80	0.88	2.2	2.8	3.5	3,000	C01A
MGV075-13*	0.75	0.90	1.00	1.10	2.2	2.8	3.5	3,000	C01A
MGV075-14*	0.75	1.08	1.20	1.32	2.2	2.8	3.5	3,000	C01A
MGV075-15*	0.75	1.35	1.50	1.65	2.2	2.8	3.5	3,000	C01A
MGV075-16*	0.75	1.62	1.80	1.98	2.2	2.8	3.5	3,000	C01A
MGV075-17*	0.75	1.80	2.00	2.20	2.2	2.8	3.5	3,000	C01A
MGV100-08	1.00	0.30	0.35	0.40	2.7	3.4	5.0	4,000	C01A
MGV100-09	1.00	0.40	0.45	0.50	2.7	3.4	5.0	4,000	C01A
MGV100-20	1.00	0.50	0.55	0.61	2.7	3.4	5.0	4,000	C01A
MGV100-21	1.00	0.58	0.65	0.72	2.7	3.4	5.0	4,000	C01A
MGV100-22	1.00	0.72	0.80	0.88	2.7	3.4	5.0	3,000	C01A
MGV100-23	1.00	0.90	1.00	1.10	2.7	3.4	5.0	3,000	C01A
MGV100-24	1.00	1.08	1.20	1.32	2.7	3.4	5.0	3,000	C01A
MGV100-25	1.00	1.35	1.50	1.65	2.7	3.4	5.0	3,000	C01A
MGV100-26	1.00	1.53	1.70	1.87	2.7	3.4	5.0	3,000	C01A
MGV100-27	1.00	1.80	2.00	2.20	2.7	3.4	5.0	3,000	C01A
MGV125-08	1.25	0.25	0.30	0.35	4.0	5.0	8.4	4,000	C01A
MGV125-09	1.25	0.35	0.40	0.45	4.0	5.0	8.5	4,000	C01A
MGV125-20	1.25	0.45	0.50	0.55	4.0	5.0	8.6	4,000	C01A
MGV125-21	1.25	0.63	0.70	0.77	4.0	5.0	8.8	4,000	C01A
MGV125-22	1.25	0.90	1.00	1.10	4.0	5.0	9.0	3,000	C01A
MGV125-23	1.25	1.08	1.20	1.32	4.0	5.0	9.5	3,000	C01A
MGV125-24	1.25	1.35	1.50	1.65	4.0	5.0	10	3,000	C01A
MGV125-25	1.25	1.53	1.70	1.87	4.0	5.0	10	3,000	C01A
MGV125-26	1.25	1.80	2.00	2.20	4.0	5.0	10	3,000	C01A
Test Conditions	$V_R =$ 2 to 20 V * $V_r = 2$ to 18 V	$V_R = 4$ V F = 1 MHz			$V_R = 2$ to 12 V		$V_R =$ 2 to 20 V * $V_r = 2$ to 18 V	$V_R = 4$ V F = 50 MHz	

Note: MGV075 Series is $V_{br} = 18$ V min. and MGV100 and MGV125 Series are $V_{br} = 22$ V min.



Bare Die



Beam Lead Chips



Ceramic Epoxy SMT



Ceramic Hemetic SMT



Ceramic Microwave Pill



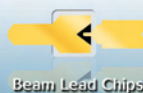
Glass Axial Leaded

GaAs Beam Lead Detector Diodes: Zero Bias

- Low junction capacitance
- Lower temperature coefficient than silicon
- Operation to 110 GHz

The Aeroflex / Metelics MZBD-9161 is a GaAs beam lead detector diode. This diode is designed for zero bias detecting applications at frequencies through 110 GHz.

$T_A = 25^\circ \text{C}$				Beam Lead
Model	C_L	R_V		γ mV / μW
	TYP pF	MIN K Ω	MAX K Ω	
MZBD-9161	.035	2.5	7.5	0.5
Test Conditions	Junction Capacitance F = 1 MHz	Video Resistance Zero Bias		Voltage Sensitivity Zero Bias, 10GHz shunt 50 Ω input matching resistor
Maximum Ratings	Parameters	Rating		
	Operating Temperature	-65° C to + 175° C		
	Storage Temperature	-65° C to + 200° C		
	Burnout Power	20 dBm		
	Beam Lead Strength	3 grams		
Parameter	Units	D1	D2	
B_V	V	10	10	
C_{JO}	pF	0.030	0.030	
E_G	eV	1.42	1.42	
I_{BV}	A	10E-12	10E-12	
I_S	A	12 x 10E-6	84 x 10E-6	
N		1.2	40.0	
R_S	OHM	50	10	
$P_S(V_I)$	V	0.26	0.26	
$P_T(XTI)$		2	3	
M		0.5	0.5	
Note: D1 represents the characteristic of the MZBD-9161 under forward bias and D2 (in the forward direction) gives the V-I curve of the MZBD-9161 under reverse bias.				



GaAs Detector/Mixer Diodes

- Low capacitance and low resistance
- Passivated with silicon dioxide
- Protected with polyimide

The Aeroflex / Metelics low cost surface mount single and anti-parallel pairs of gallium arsenide Schottky diodes in QFN package 0503 (1.37 x 0.86 mm) can be used through millimeter wave frequencies as they have low capacitance and low resistance. They are passivated with silicon nitride and protected with polyimide for high reliability. Typical applications include detectors and single ended mixer on SMGS11 and single balanced and subharmonic pumped mixers and limiters on SMGS21 in instruments, microwave radios, VSAT, and police radar detectors.

Surface Mount									
Model	Configuration	V_F		ΔV_F	C_T		R_D	R_S	V_{BR}
		MIN mV	MAX mV	MAX mV	TYP pF	MAX pF	MAX Ω	TYP Ω	MIN V
SMGS11	single	620	760	N/A	0.10	0.13	13	4	4.5
SMGS21	anti-parallel pairs	620	760	20	0.15	0.18	13	4	4.5
Test Conditions		@ 1mA		@ 1mA	@ 0V, 1MHz		@ 5mA		@ 10 μ A
Maximum Ratings		Parameters			Rating				
		Operating Temperature			-40° C to + 85° C				
		Storage Temperature			-65° C to + 125° C				
		Incident Power			20 dBm (at 25° C)				
		Soldering Temperature			260° C for 5 seconds				



Step Recovery Diodes

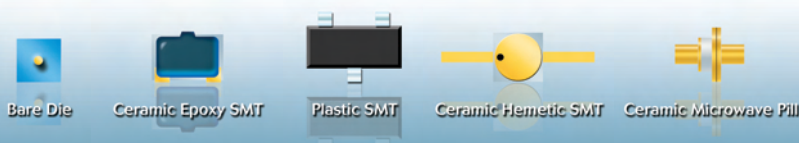
- Wide Selection of Tightend Capacitance Ranges
- Low Transition Times
- High Efficiencies

The Aeroflex / Metelics MSD-700 Series Step Recovery Diodes are epitaxial silicon varactors which provide high output power and efficiencies in harmonic generator applications. Strict material and process controls result in high reproducibility. A unique silicon dioxide passivation process assures greater stability, reliability and low leakage currents at high temperatures.

Diodes are available in various capacitance ranges for each of the 4 voltage ratings. These diodes represent the lowest transition times (snap time) available for each voltage rating. Unless otherwise specified, capacitance will be within the range shown above for each type. A capacitance tolerance of $\pm 10\%$ is available at an additional charge. Diodes can be optimized for custom electrical or mechanical specifications. Custom parameters for capacitance, voltage, transition time, series resistance, etc. are available upon request.

Chips						
Model	C_J	V_B	T_L	T_T	R_s	ΘC_J
	MIN V	MIN V	MIN nS	MAX pS	MAX OHMS	MAX °C/W
MSD700	0.2 - 0.4	15	8	60	1.20	125
MSD701	0.4 - 0.6	15	8	60	1.00	100
MSD702	0.6 - 0.8	15	8	60	0.70	100
MSD703	0.8 - 1.0	15	8	60	0.50	75
MSD704	1.0 - 1.4	15	8	60	0.40	75
MSD705	1.4 - 2.0	15	8	60	0.30	60
MSD706	2.0 - 3.0	15	8	60	0.25	60
MSD710	0.2 - 0.4	20	11	70	1.00	100
MSD711	0.4 - 0.6	20	11	70	0.70	75
MSD712	0.6 - 0.8	20	11	70	0.60	75
MSD713	0.8 - 1.0	20	11	70	0.50	75
MSD714	1.0 - 1.4	20	11	70	0.40	75
MSD715	1.4 - 2.0	20	11	70	0.30	60
MSD716	2.0 - 3.0	20	11	70	0.25	60
MSD720	0.2 - 0.4	30	17	100	0.80	75
MSD721	0.4 - 0.6	30	17	100	0.60	60
MSD722	0.6 - 0.8	30	17	100	0.50	60
MSD723	0.8 - 1.0	30	17	100	0.40	60
MSD724	1.0 - 1.4	30	17	100	0.30	60
MSD725	1.4 - 2.0	30	17	100	0.25	50
MSD726	2.0 - 3.0	30	17	100	0.20	50
MSD730	0.2 - 0.4	40	21	150	0.80	50
MSD731	0.4 - 0.6	40	21	150	0.60	50
MSD732	0.6 - 0.8	40	21	150	0.50	50
MSD733	0.8 - 1.0	40	21	150	0.40	50
MSD734	1.0 - 1.4	40	21	150	0.30	50
MSD735	1.4 - 2.0	40	21	150	0.25	40
MSD736	2.0 - 3.0	40	21	150	0.20	40
Test Conditions	@ -6 V, 1 MHz	@ 10 μ A	IF 6 mA / IR 10mA		@ 25 mA	pulsed

Maximum Ratings	Parameters	Rating
	Storage Temperature	-65° C to + 200° C
	Operating Temperature	-55° C to + 150° C
	Minimum Voltage Breakdown	15, 20, 30 and 40 V at 10 μ A



Beam Lead Step Recovery Diodes

- Low Inductance
- Rugged Beam Lead construction
- Transition times down to 30 picoseconds in 50 Ω system
- Oxide and polyimide passivation

The Aeroflex / Metelics Silicon Mesa Beam Lead Step Recovery diodes provide low capacitance, very fast transition times, and low inductance along with low parasitic capacitance compared to packaged or chip devices.

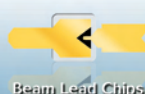
The fast transition times make these devices useful for fast sampling gate drivers, frequency multipliers and comb generators to 40 GHz and beyond.

Beam Lead

Model	V_{BR} Volts		C_T pF		τ nS	T_T pS	
	MIN	MAX	TYP	MAX	TYP	TYP	MAX
MMDB30-B11	14	25	0.15	0.25	4	30	38
MMDB35-B11	16	30	0.13	0.20	4	35	45
MMDB45-B11	25	40	0.11	0.20	8	45	58
Test Conditions	$I_R = 10 \mu A$		$V_R = 6V$ $F = 1 \text{ MHz}$		$I_F = 10 \text{ mA}$ $I_R = 6 \text{ mA}$	$I_F = 3 \text{ mA}$ $V_R = 7 \text{ V}$	

Packaged

Model	V_{BR} Volts	C_T pF		τ nS		T_T pS		C_P pF	L_P nH	Package
	MIN	MIN	MAX	MIN	TYP	TYP	MAX	TYP	TYP	
MMDB30-E28 / 28X	14	0.28	0.36	1.0	4.0	30	38	0.08	0.4	E28 / 28X
MMDB30-0402	14	0.25	0.32	1.0	4.0	30	38	0.05	0.2	0402
MMDB30-0805-2	14	0.26	0.33	1.0	4.0	30	38	0.06	0.4	0805-2
MMDB35-E28 / 28X	16	0.25	0.31	1.0	4.0	35	45	0.08	0.4	E28 / 28X
MMDB35-0402	16	0.22	0.28	1.0	4.0	35	45	0.05	0.2	0402
MMDB35-0805-2	16	0.23	0.29	1.0	4.0	35	45	0.06	0.4	0805-2
MMDB45-E28 / 28X	25	0.24	0.31	3.0	8.0	45	58	0.08	0.4	E28 / 28X
MMDB45-0402	25	0.21	0.28	3.0	8.0	45	58	0.05	0.2	0402
MMDB45-0805-2	25	0.22	0.29	3.0	8.0	45	58	0.06	0.4	0805-2
Test Conditions	$I_R = 10 \mu A$	$V_R = 6V$ $F = 1 \text{ MHz}$		$I_F = 10 \text{ mA}$ $I_R = 6 \text{ mA}$ measured at 50% recovery		$I_F = 3 \text{ mA}$ $V_R = 7 \text{ V}$				



Sampling Phase Detector

- Phase locking to 22 GHz
- Broadband capability
- Fully integrated module
- Phase locks DRO's and VCO's

The Aeroflex / Metelics MSPD Series Integrates an SRD reference frequency multiplier, coupling capacitors and a Schottky diode microwave sampler / phase detector in a 0.075" by 0.100" hybrid. They are used to phase lock microwave oscillators up to 22 GHz to a much lower reference frequency by deriving a locking voltage from the sampled RF and the multiplied reference.

Packaged										
Model	Step Recovery Diode				Cap.	Schottky Diode				Package
	V _{BR}	C _J	τ	T _T	C _T	C _J	V _F	R _D	F _{MW}	
	MIN V	TYP pF	TYP ns	MAX ps	TYP pF	TYP pF	TYP mV	TYP Ω	TYP GHz	
MSPD1000-E50 / E50SM	15	1.0	35	95	20	0.4	270	7.0	0.50	E50 / E50SM
MSPD1000-H50	15	1.0	35	95	20	0.4	270	7.0	0.50	H50
MSPD1002-E50 / E50SM	15	0.5	20	70	3.5	0.22	270	8.0	2.0	E50 / E50SM
MSPD1002-H50	15	0.5	20	70	3.5	0.22	270	8.0	2.0	H50
MSPD1012-E50 / E50SM	15	0.5	10	70	2.5	0.18	270	9.0	12	E50 / E50SM
MSPD1012-H50	15	0.5	10	70	2.5	0.18	270	9.0	12	H50
MSPD2018-E50 / E50SM*	15	0.35	5	55	0.6	0.10	430	16.0	22	E50 / E50SM
MSPD2018-H50*	15	0.35	5	55	0.6	0.10	430	16.0	22	H50
Test Conditions	I _R = 10 μA	V _R = 6V F = 1 MHz	I _F = 10 mA I _R = 6 mA	I _F = 10 mA V _R = 10 V *I _F = 3 mA V _R = 7 V	F = 1 MHz	V _R = 0 V F = 1 MHz	I _F = 1 mA	I _F = 5 mA		
Maximum Ratings	Parameters				Rating					
	Storage Temperature				-65 to +150° C					
	Operating Temperature				-65 to +150° C					
	Soldering Temperature				230° C for 5 sec.					



(Package styles E50, E50SM & H50 only.)

Silicon PIN Diodes

- High Temperature Passivation for Reliability
- Grown Junction for sharp "I" Region Interface
- Full Area Gold Contact for the Lowest Capacitance and Largest Bonding Pad Available
- Lot Traceability and Lot Control, Assuring High Reproducibility

The Aeroflex / Metelics MPN-7000 Series and MMP-7000 Series PIN diodes are manufactured using very high resistivity silicon epitaxial material grown on a highly doped low resistivity substrate. Combined with a grown junction P++ layer, MMP-7000 Series PIN diodes yield a very abrupt structured "I" region with minimum outdoping and low voltage punch-through characteristics.

Our high temperature passivation and state-of-the-art metallization produce diodes that are designed to cover a wide range of applications that fall into the general categories of switching, phase switching, attenuating and limiting. These devices are rugged and able to meet all visual criteria in space and military applications.

High Power Switching and Attenuation										Chips
Model	V_{BR}	C_J		R_S		τ	I-layer	Contact	θ_{JC}	Package
	MIN V	TYP pF	MAX pF	TYP Ω	MAX Ω	TYP μs	NOM microns	MIN mils	MAX $^{\circ}C / W$	
MPN7330	300	0.30	0.40	0.3	0.5	0.5	30	10	10	C40
MPN7345	300	0.30	0.40	0.3	0.5	0.5	45	10	10	C40
MPN7453A	300	0.10	0.15	0.7	1.0	0.7	60	8	20	C22
MPN7453B	400	0.15	0.2	0.6	0.9	2.5	60	8	20	C22
MPN7453C	300	0.18	0.25	0.4	0.7	1.0	60	8	15	C22
MPN7360	600	0.80	1.0	0.2	0.4	2.5	60	20	7	C37
MPN7370	700	2.00	2.3	0.2	0.3	5.0	70	40	5	C39
MPN7380	800	0.40	0.60	0.3	0.5	2.5	80	24	7	C38
MPN7420	400	0.06	0.08	1.0	1.5	1.0	100	5	30	C12
MPN73100	600	0.20	0.30	0.5	0.8	2.2	100	12	10	C32
MPN73120	700	0.30	0.40	0.5	0.8	3.5	120	15	10	C32
Test Conditions	$I_R = 10 \mu A$	$V_R = 50 V$ $F = 1 MHz$		$I_F = 100 mA$ $F = 100 MHz$		$I_F = 10 mA$ $I_R = 6 mA$				

SOT23 & SOD323								Surface Mount
Model	Configuration	V_{BR}	C_T		R_S		TYP ns	Package
		MIN V	TYP pF	MAX pF	TYP Ω	MAX Ω		
SMPN7453-SOT23	-0S, 1S, 2ST, 3CA, 4CC	200	0.25	0.35	4.0	4.5	2500	SOT23
SMPN7380-SOT23	-0S, 1S, 2ST, 3CA, 4CC	200	0.25	0.35	4.0	4.5	1500	SOT23
SMPN7310-SOT23	-0S, 1S, 2ST, 3CA, 4CC	100	0.40	0.50	0.60	1.2	120	SOT23
SMPN7316-SOT23	-0S, 1S, 2ST, 3CA, 4CC	100	0.25	0.55	0.60	1.0	200	SOT23
SMPN7335-SOT23	-0S, 1S, 2ST, 3CA, 4CC	200	0.30	0.40	1.50	2.0	500	SOT23
SMPN7320-SOT23	-0S, 1S, 2ST, 3CA, 4CC	100	0.20	0.30	2.00	4.5	170	SOT23
SMPN7453-SOD323	—	200	0.25	0.35	4.0	4.5	2500	SOD323
SMPN7380-SOD323	—	200	0.25	0.35	4.0	4.5	1500	SOD323
SMPN7310-SOD323	—	100	0.40	0.50	0.60	1.2	120	SOD323
SMPN7316-SOD323	—	100	0.25	0.55	0.60	1.0	200	SOD323
SMPN7335-SOD323	—	200	0.30	0.40	1.50	2.0	500	SOD323
SMPN7320-SOD323	—	100	0.20	0.30	2.00	4.5	170	SOD323
Test Conditions		$I_R = 10 \mu A$	$V_R = 10 V$ $V_R = 50 V$ $F = 1 MHz$		$I_F = 10 mA$ $F = 100 MHz$		$I_F = 10 mA$ $I_R = 6 mA$	



Silicon PIN Diodes

MicroStrip PIN Diodes

Model	Configurations	I_R	V_{BR}	Insertion Loss	Return Loss	Isolation	Package
		MAX nA	MIN V	MAX	TYP	MIN	
MMPN080150	MicroStrip PIN	100	200	4.0	12	-50	C51
MMPN080045	MicroStrip PIN	100	200	1.0	12	-30	C50
Test Conditions		$V_R = 30\text{ V}$	$I_R = 10\text{ }\mu\text{A}$	$V_R = 30\text{ V}$ $F = 2 - 35\text{ GHz}$ $F = 2 - 20\text{ GHz}$		$I_F = 40\text{ mA}$ $F = 2 - 35\text{ GHz}$ $F = 2 - 20\text{ GHz}$	

Low Capacitance, Fast Switching

Chips

Model	V_{BR}	C_J		R_S		τ	Contact	θ_{JC}	Package
	MIN V	TYP pF	MAX pF	TYP Ω	MAX Ω	TYP ns	MIN mils	MAX °C / W	
MPN7302	20	0.08	0.12	1.2	1.5	8	1.5	60	C11
MPN7304	40	0.06	0.08	2.2	2.7	15	1.5	60	C11
MPN7304A	40	0.12	0.15	1.0	1.5	30	2.0	50	C12
MPN7306	70	0.08	0.10	1.2	1.2	50	2.0	50	C12
MPN7310	100	0.05	0.07	1.5	2.0	100	2.0	50	C12
MPN7310A	100	0.18	0.25	0.6	1.0	200	4.0	35	C12
MPN7312A	120	0.08	0.10	1.2	1.5	150	2.0	50	C12
MPN7312B	120	0.18	0.25	0.8	1.0	250	4.0	35	C12
MPN7315	150	0.08	0.12	1.2	1.5	180	2.0	50	C12
MPN7320*	150	0.02	0.03	3.0	4.0	120	1.5	60	C01
Test Conditions	$I_R = 10\text{ }\mu\text{A}$	$V_R = 10\text{ V}$ $F = 1\text{ MHz}$ $*V_R = 50\text{ V}$		$I_F = 10\text{ mA}$ $F = 500\text{ MHz}$		$I_F = 10\text{ mA}$ $I_R = 6\text{ mA}$			

Maximum Ratings	Parameters	Rating
	Power Dissipation	0.5 Watts at 25° C derate to zero at +175° C
	Operating Temperature	-65° C to +175° C
	Storage Temperature	-65° C to +200° C
	Voltage	V_{BR} Rating



Bare Die



Ceramic Epoxy SMT



Plastic SMT



Ceramic Hemetic SMT



Ceramic Microwave Pill



Glass Axial Leaded

Silicon PIN Diodes

Low Capacitance, Fast Switching									Packaged
Model	V _{BR}	C _J		R _S		τ	C _P	L _p	Package
	MIN V	TYP pF	MAX pF	TYP Ω	MAX Ω	TYP ns	TYP pF	MAX nH	
MPN7302-E28 / 28X	20	0.16	0.24	1.2	1.5	8	0.08	0.4	E28 / 28X
MPN7302-H20	20	0.26	0.35	1.2	1.5	8	0.18	0.5	H20
MPN7302-0805-2	20	0.14	0.22	1.2	1.5	8	0.06	0.4	0805-2
MPN7304-E28 / 28X	40	0.14	0.22	2.2	2.7	15	0.08	0.4	E28 / 28X
MPN7304-H20	40	0.24	0.30	2.2	2.7	15	0.18	0.5	H20
MPN7304-0805-2	40	0.18	0.26	2.2	2.7	15	0.06	0.4	0805-2
MPN7304A-E28 / 28X	40	0.20	0.27	1.0	1.5	30	0.08	0.4	E28 / 28X
MPN7304A-H20	40	0.30	0.38	1.0	1.5	30	0.18	0.5	H20
MPN7304A-0805-2	40	0.18	0.23	1.0	1.5	30	0.06	0.4	0805-2
MPN7306-E28 / 28X	70	0.16	0.22	1.2	1.2	50	0.08	0.4	E28 / 28X
MPN7306-H20	70	0.26	0.33	1.2	1.2	50	0.18	0.5	H20
MPN7306-0805-2	70	0.14	0.20	1.2	1.2	50	0.06	0.4	0805-2
MPN7310-E28 / 28X	100	0.13	0.18	1.5	2.0	100	0.08	0.4	E28 / 28X
MPN7310-H20	100	0.23	0.29	1.5	2.0	100	0.18	0.5	H20
MPN7310-0805-2	100	0.11	0.17	1.5	2.0	100	0.06	0.4	0805-2
MPN7310A-E28 / 28X	100	0.26	0.36	0.6	1.0	200	0.08	0.4	E28 / 28X
MPN7310A-H20	100	0.36	0.57	0.6	1.0	200	0.18	0.5	H20
MPN7310A-0805-2	100	0.24	0.35	0.6	1.0	200	0.06	0.4	0805-2
MPN7312A-E28 / 28X	120	0.16	0.21	1.2	1.5	150	0.08	0.4	E28 / 28X
MPN7312A-H20	120	0.26	0.32	1.2	1.5	150	0.18	0.5	H20
MPN7312A-0805-2	120	0.14	0.20	1.2	1.5	150	0.06	0.4	0805-2
MPN7312B-E28 / 28X	120	0.26	0.36	0.8	1.0	250	0.08	0.4	E28 / 28X
MPN7312B-H20	120	0.36	0.57	0.8	1.0	250	0.18	0.5	H20
MPN7312B-0805-2	120	0.24	0.35	0.8	1.0	250	0.06	0.4	0805-2
MPN7315-E28 / 28X	150	0.16	0.23	1.2	1.5	180	0.08	0.4	E28 / 28X
MPN7315-H20	150	0.26	0.34	1.2	1.5	180	0.18	0.5	H20
MPN7315-0805-2	150	0.14	0.21	1.2	1.5	180	0.06	0.4	0805-2
MPN7320-E28 / 28X*	150	0.10	0.14	3.0	4.0	120	0.08	0.4	E28 / 28X
MPN7320-H20*	150	0.20	0.24	3.0	4.0	120	0.18	0.5	H20
MPN7320-0805-2*	150	0.08	0.12	3.0	4.0	120	0.06	0.4	0805-2
Test Conditions	I _R = 10 μA	V _R = 10 V F = 1 MHz *V _R = 50 V		I _F = 10 mA F = 500 MHz		I _F = 10 mA I _R = 6 mA			

Ultra Fast Switching							
Model	V _{BR}	C _J	T _L	Øjc	T _S	R _s	R _s
	MIN V	MAX pF	TYP nS	MAX °C/W	MAX nS	MAX Ohms	TYP Ohms
MMP7010	25	0.1	10	60	1.5	0.7	1.0
MMP7011	25	0.15	10	50	1.5	0.55	0.8
MMP7012	25	0.2	10	40	1.5	0.45	0.7
MMP7013	25	0.25	10	35	1.5	0.4	0.6
Test Conditions	@ 10 μA	@ -10 V, 1 MHz	I _F = 10 mA I _R = 6 mA	pulsed	90% to 10% and 10% to 90% transmission. Drive output = +2- mA and -4 V, 200 mA spike with a rise time of 2 nS	50 mA @ 1 GHz	10 mA @ 1 GHz



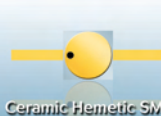
Bare Die



Ceramic Epoxy SMT



Plastic SMT



Ceramic Hemetic SMT



Ceramic Microwave Pill



Glass Axial Leaded

Silicon PIN Diodes

Fast Switching, Low Power

Model	V_{BR}	C_J	T_L	Δj_c	TS	R_s	R_s
	MIN V	MAX pF	TYP nS	MAX °C/W	MAX nS	MAX Ohms	TYP Ohms
MMP7020	70	0.05	60	80	5	0.9	1.2
MMP7021	70	0.1	60	70	5	0.7	1.0
MMP7022	70	0.15	60	60	5	0.6	0.9
MMP7023	70	0.2	60	55	5	0.5	0.7
MMP7024	70	0.25	60	50	5	0.45	0.5
MMP7025	100	0.03	100	90	10	1.2	1.9
MMP7026	100	0.07	100	80	10	0.9	1.5
MMP7027	100	0.1	100	70	10	0.7	1.2
MMP7028	100	0.15	100	60	10	0.6	1.0
MMP7029	100	0.2	100	55	10	0.5	0.9
MMP7030	100	0.3	100	50	15	0.45	0.8
MMP7031	200	0.03	225	90	15	1.9	3.0
MMP7032	200	0.07	225	80	15	1.2	2.2
MMP7033	200	0.1	225	70	15	0.9	1.6
MMP7034	200	0.15	225	60	15	0.8	1.0
MMP7035	200	0.2	225	55	15	0.7	0.8
MMP7036	200	0.3	225	50	15	0.6	0.7
Test Conditions	@ 10 μ A	@ -10 V, 1 MHz	IF = 10 mA IR = 6mA	pulsed	90% to 10% and 10% to 90% transmission. Drive output = +2- mA and -4 volts, 200 mA spike with a rise time of 2 nS	75 mA @ 1 GHz	20 mA @ 1 GHz

Maximum Ratings	Parameters	Rating
	Operating Temperature	-55° C to + 150° C
	Storage Temperature	-65° C to + 200° C
	Reverse Breakdown	from 25 volts to 500 volts
	Voltage	volts at 10 mA
	Junction Capacitance	(C_J -10) from 0.03 pF to 0.5 pF at 10 volts
	Switching Speed	from 1 nS to 25 nS
	Lifetime	from 5 nS to 6.0 μ S
	Chip Thickness	.004 – .007" thick



Bare Die



Ceramic Epoxy SMT



Plastic SMT



Ceramic Hemetic SMT



Ceramic Microwave Pill



Glass Axial Leaded

Silicon PIN Diodes

High Power Switching & Attenuation

Model	V_{BR}	C_J	T_L	RS	RS	RS	θ_{jc}
	MIN V	MAX pF	TYP μs	MAX Ohms	MAX Ohms	MAX Ohms	MAX °C/W
MMP7060	250	0.05	1.0	25	10.0	2.0	20
MMP7061	250	0.08	1.0	20	8.0	1.5	20
MMP7062	250	0.1	1.0	15	6.0	1.2	20
MMP7063	250	0.2	1.0	8	3.5	1.0	15
MMP7064	250	0.3	1.5	6	2.0	0.8	15
MMP7065	500	0.08	1.5	40	8.0	1.5	15
MMP7066	500	0.1	1.5	15	5.0	1.2	15
MMP7067	500	0.2	1.5	10	4.0	1.0	12
MMP7068	500	0.3	2.0	8	3.5	0.8	10
MMP7069	500	0.5	2.0	6	2.0	0.7	10
Test Conditions	@ 10 μA	@ -10V 1 MHz	IF = 10 mA IR = 10 mA	@ 1 mA 100 MHz	@ 10 mA 100 MHz	@ 100 mA 100 MHz	pulsed

High Average Power PIN Diode

Model	V_B	C_T	T_L	RS	VF	Reverse Leakage Current	R_P
	MIN	MAX	MIN u sec	MAX Ohms	TYP	TYP nA	MIN Ohms
MMP7070	100	2.20	6.00	0.50	1.00	100	20k
MMP7071	100	2.00	8.00	1.00	1.20	100	50k
MMP7072	100	0.7	3.00	0.8	1.00	100	200k
MMP7073	100	1.0	2.50	0.5	1.00	100	100k
MMP7074	200	2.20	6.00	0.5	1.00	100	20k
MMP7075	200	2.0	8.00	1.00	1.20	100	50k
MMP7076	200	0.7	3.00	0.8	1.00	100	200k
MMP7077	200	1.0	2.50	0.5	1.00	100	100k
MMP7078	400	1.0	2.50	0.5	1.00	100	100k
MMP7079	600	2.20	6.00	0.5	1.00	100	20k
MMP7080	600	0.7	3.00	0.8	1.00	100	200k
Testing Conditions	@ 10 μA	@ 100 V F = 1 MHz	IF = 10 mA IR = 6 mA	100 mA 100 MHz	@ 100 mA		@ 0 V, 100 MHz

Maximum Ratings	Parameters	Rating
	Operating Temperature	-55° C to + 150° C
	Storage Temperature	-65° C to + 200° C
	Reverse Breakdown	from 25 volts to 1500 volts
	Voltage	volts at 10 μA



Bare Die



Ceramic Epoxy SMT



Plastic SMT



Ceramic Hemetic SMT



Ceramic Microwave Pill



Glass Axial Leaded

Silicon PIN Diodes

Medium Power, General Purpose

Model	V_{BR}	C_J	T_L	Δj_c	TS	RS	RS
	MIN V	MAX pF	TYP nS	MAX °C/W	MAX NS	OHMS MAX	OHMS TYP
MMP7040	200	0.03	400	65	20	2.6	3.5
MMP7041	200	0.07	400	60	20	1.5	2.2
MMP7042	200	0.1	400	55	20	1.3	2.0
MMP7043	200	0.15	400	50	20	1.0	1.9
MMP7044	200	0.2	400	45	20	0.8	1.7
MMP7045	200	0.3	400	40	20	0.7	1.4
MMP7046	200	0.5	400	20	20	0.6	1.2
MMP7047	200	0.03	600	60	25	2.6	3.5
MMP7048	200	0.07	600	55	25	1.6	3.2
MMP7049	200	0.1	600	50	25	1.2	2.0
MMP7050	200	0.15	600	45	25	0.9	1.9
MMP7051	200	0.2	600	40	25	0.8	1.7
MMP7052	200	0.3	600	35	25	0.7	1.4
MMP7053	200	0.5	600	15	25	0.6	1.2
Test Conditions	@ 10 μ A	@ 40 V 1 MHz	IF = 10 mA IR = 6 mA	pulsed	RF Switching speed measured from 90% to 10% and 10% to 90% transmission	@ 75 mA, 1 GHz	@ 20 mA, 1 GHz

PIN Chips

Model	V_B	C_T	T_L	RS	Thermal Resistance
	MIN	MAX pF	MIN usec	MAX Ohms	TYP C/W
MMP7092	500	0.20	1.00	0.60	20
MMP7093	500	0.35	2.00	0.45	15
MMP7094	500	0.70	3.00	0.30	10
MMP7095	1000	0.30	3.00	1.00	15
MMP7096	1000	0.60	4.00	0.70	10
MMP7097	1000	1.30	5.00	0.40	7
Test Conditions	@ 10 μ A	@ -100 V 1 MHz	IF = 10 mA IR = 6 mA	@ 100 mA, 100 MHz	

Kilovolt Pin Pill pkg

Model	V_B	C_T	T_L	RS	Thermal Resistance	Thermal Resistance
	MIN Volts	MAX pF	MIN usec	MAX Ohms	TYP C/W	TYP C/W
MMP7098	2000	3.20	10	0.20	1.20	1.00
MMP7099	3000	4.00	20	0.25	1.20	1.00
Test Conditions	@ 10 μ A	@ -100 V 1 MHz	IF = 10 mA IR = 6 mA	@ 500 mA, 4 MHz		

Maximum Ratings	Parameters	Rating
	Operating Temperature	-55° C to + 150° C
	Storage Temperature	-65° C to + 200° C
	Reverse Breakdown	from 25 volts to 1500 volts
	Voltage	volts at 10 μ A



Silicon MELF PIN Diodes

- Voltage breakdowns up to 1,000 Volts
- Typical lifetime speeds of 1.0 to 8.0 μ sec
- Resistances at 100 mA of 0.5 to 2.0 ohms

The Aeroflex / Metelics high power MELF PIN diodes are produced with a propriety glassing process. This creates large, full-face bonding surfaces on the anode and cathode, delivers low electrical and thermal resistance, and allows for power handling up to 100 Watts.

Low Loss Switching

Model	V_B	C_T	T_L	RS	V_F	Reverse Leakage Current	R_P
	MIN Volts	MAX pF	MIN usec	MAX Ohms	TYP Volts	TYP	MIN Ohms
MMP7081-127	50	1.20	4.00	0.75	1.00	1.00	5k
MMP7082-127	50	1.50	4.00	0.75	1.00	1.00	6k
MMP7083-127	50	2.50	4.00	0.75	1.00	1.00	5k
Test Conditions	@ 10 μ A	@ 50 V 1 MHz	IF = 10 mA IR = 6 mA	@ 50 mA 100 MHz	@100mA	@80 of rated V_B	

General Purpose Switching Diodes

Model	V_B	C_T	T_L	RS	Power Dissipation Rating Watts
	MIN	MAX pF	MIN usec	MAX Ohms	
MMP7084-127	35	1.20	0.30	0.50	1.00
MMP7085-127	200	0.50	1.50	3.00	1.00
MMP7086-127	200	1.50	3.00	0.60	2.00
MMP7087-127	200	0.50	2.00	6.00	1.00
MMP7088-127	200	0.80	6.00	25.00	2.00
Test Conditions	@ 10 μ A	@ -50, 1MHz	IF = 10 mA IR = 6 mA	@ 50 mA 100 MHz	

High Voltage Pin

Model	V_B	C_T	T_L	RS	Power Dissipation Rating Watts
	MIN Volts	MAX pF	MIN usec	MAX Ohms	
MMP7089-127	500	0.50	1.00	0.60	1.50
MMP7090-127	500	0.65	2.00	0.45	1.50
MMP7091-127	500	1.00	3.00	0.30	1.50
Test Conditions	@ 10 μ A	@ -100, 1 MHz	@ 10 mA 100 MHz	@ 10 mA 100 MHz	

Maximum Ratings	Parameters	Rating
	Operating Temperature	-55° C to + 150° C
	Storage Temperature	-65° C to + 200° C
	Reverse Breakdown	from 25 volts to 1500 volts
	Voltage	volts at 10 μ A



Ceramic MELF

Silicon NIP Diodes

- Four different I-layers
- Fully passivated
- Low leakage and reliability

The Aeroflex / Metelics MNP00XX series of NIP diodes are offered in four different I-layers and feature fully passivated, mesa construction for low leakage and reliability. Screening per MIL-PRF-19500 and MIL-PRF-3534 are available.

Chips										
Model	V _{BR}	C _J		R _S		τ TYP ns	Contact MIN mils	I-Layer NOM microns	θ _{JC} MAX °C/W	Outline
	MIN V	TYP V	MAX pF	TYP Ω	MAX Ω					
MNP0008	100	0.08	0.12	2.0	2.5	150	2.0	10	50	C12p
MNP0010	150	0.08	0.12	2.0	2.5	300	3.0	20	50	C12p
MNP0012	300	0.08	0.12	3.5	4.0	350	4.0	40	40	C12p
MNP0012A	350	0.18	0.22	0.55	0.80	650	6.0	40	25	C22p
MNP0014	500	0.12	0.18	1.3	1.6	750	8.0	80	20	C22p
MNP0014A	500	0.18	0.22	0.8	1.2	1,400	10.0	80	10	C32p
Test Conditions	I _R = 10 μA	V _R = 10 V V _R = 50 V * F = 1 MHz		I _F = 10 mA I _F = 100 mA F = 500 MHz		I _F = 10 mA I _R = 6 mA 50% rec.				

Packaged									
Model	V _{BR}	C _T		R _S		τ	C _p	L _p	Outline
	MIN V	TYP pF	MAX pF	TYP Ω	MAX Ω	TYP ns	TYP pF	TYP nH	
MNP0008-ET47P	100	0.48	0.60	2.0	2.5	150	2 x 0.20	2 x 0.25	ET47p
MNP0008-T54P	100	0.28	0.37	2.0	2.5	150	0.20	0.4	T54p
MNP0008-T55P	100	0.21	0.29	2.0	2.5	150	.013	0.25	T55p
MNP0008-T89P	100	0.33	0.43	2.0	2.5	150	0.25	0.4	T89p
MNP0010-ET47P	150	.048	0.60	2.0	2.5	300	2 x 0.20	2 x 0.25	ET47p
MNP0010-T54P	150	0.28	0.37	2.0	2.5	300	0.20	0.4	T54p
MNP0010-T55P	150	0.21	0.29	2.0	2.5	300	.013	0.25	T55p
MNP0010-T89P	150	0.33	0.43	2.0	2.5	300	.025	0.4	T89p
MNP0012-ET47P	300	0.48	0.60	3.5	4.0	350	2 x 0.20	2 x 0.25	ET47p
MNP0012-T54P	300	0.28	0.37	3.5	4.0	350	0.20	0.4	T54p
MNP0012-T55P	300	0.21	0.29	3.5	4.0	350	0.13	0.25	T55p
MNP0012-T89P	300	0.33	0.43	3.5	4.0	350	0.25	0.4	T89p
MNP0012A-ET47P	350	0.58	0.72	0.55	0.8	650	2 x 0.20	2 x 0.25	ET47p
MNP0012A-T54P	350	0.36	0.47	0.55	0.8	650	0.20	0.4	T54p
MNP0012A-T55P	350	0.31	0.39	0.55	0.8	650	0.13	0.25	T55p
MNP0012A-T89P	350	0.43	0.53	0.55	0.8	650	0.25	0.4	T89p
MNP0014-ET47P	450	0.52	0.58	0.8	1.2	750	2 x 0.20	2 x 0.25	ET47p
MNP0014-T54P	450	0.32	0.48	0.8	1.2	750	0.20	0.4	T54p
MNP0014-T55P	450	0.25	0.35	0.8	1.2	750	0.13	0.25	T55p
MNP0014-T89P	450	0.37	0.50	0.8	1.2	750	0.25	0.4	T89p
Test Conditions	I _R = 10 μA	V _R = 10 V V _R = 50 V F = 1 MHz		I _F = 10 mA I _F = 100 mA F = 500 MHz		I _F = 10 mA I _R = 6 mA 50% rec.			



Bare Die



Ceramic Epoxy SMT



Ceramic Hemetic SMT



Ceramic Microwave Pill

Broadband, Mesa & Planar Beam Lead PIN Diodes

- Fast Switching Speed
- Low Capacitance
- Low Resistance
- Rugged Construction

The Aeroflex / Metelics MMP-1000 Series Beam Lead PIN diodes features a unique glass and beam construction which allows for mechanical strength and stability during assembly. They are designed for low resistance, low capacitance and fast switching time.

The Aeroflex / Metelics Mesa Beam Lead PINs are suitable for microstrip or stripline circuits and for circuits requiring high isolation from series mounted diodes as in broadband multi-throw switches, phase shifters, attenuators, limiters and modulators.

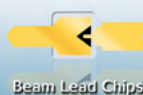
Mesa Beam Lead PIN Diodes

Model	V_B	C_J	R_s	R_s	T_L	T_s
	MIN V	MAX pF	MAX Ohms	MAX Ohms	TYP nS	MAX nS
MPN1000-12	100	.020	6.5	4.0	80	5
MPN1001-12	100	.027	6.0	3.5	80	5
MPN1002-12	100	.030	5.5	3.2	80	5
MPN1003-12	100	.035	5.0	2.9	80	5
MPN1004-12	100	.040	5.0	2.7	80	5
MPN1005-12	100	.048	5.0	2.5	80	5
MPN1006-12	100	.055	4.0	2.3	80	5
MPN1007-12	100	.065	4.0	2.1	80	5
MPN1100-12	50	.025	6.0	3.7	50	3
MPN1101-12	50	.030	5.0	3.5	50	3
MPN1102-12	50	.040	4.5	2.9	50	3
MPN1103-12	50	.060	4.0	2.5	50	3
Test Conditions	@ 10 μ A	@ -10 V, 1 MHz	@ 10 mA, 1 GHz	@ 50 mA, 1 GHz	IF = 10 mA IR = 6 mA	20% - 80%

Maximum Ratings	Parameters	Rating
	Operating Temperature	-55° C to + 150° C
	Storage Temperature	-65° C to + 200° C
	Power Dissipation	250 mW
	Typical Lead Strength	6 grams

Planar Beam Lead

Model	V_{BR}	C_J		R_s		τ	T_{RR}	P_{DISS}	Package
	MIN V	TYP pF	MAX pF	TYP Ω	MAX Ω	TYP ns	TYP ns	MAX MW	
MPND4005-B15	100	0.018	0.020	5.5	6.5	125	—	250	B15
MPND4005-B16	100	0.018	0.020	5.5	6.5	125	—	250	B16
MPND4005-0402	100	0.070	0.090	5.5	6.5	125	—	250	0402
Test Conditions	$I_R = 10 \mu A$	$V_R = 10 V$ $F = 15 GHz$ C_T		$I_F = 20 mA$ $F = 3 GHz$		$I_F = 10 mA$ $I_R = 6 mA$	$I_F = 10 mA$ $V_R = 10 V$	$T_C = +25 ^\circ C$, Derate Linearly to +175 °C	



Silicon Limiter Diodes

- Low Loss
- Greater Bandwidth
- Fast Turn on Time

The Aeroflex / Metelics MLP-7100 Series Limiter diodes are specially processed PIN diodes with a thin intrinsic region designed for use in passive or active limiters over the entire range of frequencies from 100 MHz to beyond 20 GHz. The different "I" region thicknesses and capacitances provide variable threshold and leakage power levels and power handling capability.

MLP7130 – MLP7122

DC PARAMETERS								
Model	V _B	C _J	C _J	R _S	R _S	T _L	Pulsed Thermal Resistance	Thermal Resistance
	TYP V	TYP pF	MAX pF	TYP Ω	TYP Ω	TYP nS	TYP C/W	MAX °C/W
MLP7130	15-30	0.12	0.10	2.0	4.0	5	30.0	120
MLP7131	15-30	0.20	0.15	1.5	3.0	5	20.0	80
MLP7100	20-45	0.20	0.15	1.5	5.0	5	20.0	100
MLP7101	20-45	0.50	0.30	1.2	4.5	10	12.0	80
MLP7102	20-45	0.70	0.50	1.0	4.0	10	10.0	55
MLP7140	30-60	0.12	0.10	2.0	4.0	7	20.0	100
MLP7141	30-60	0.20	0.15	1.5	4.0	7	15.0	70
MLP7110	45-75	0.20	0.15	1.5	4.0	10	15.0	80
MLP7111	45-75	0.50	0.30	1.2	3.5	15	10.0	60
MLP7112	45-75	0.70	0.50	1.0	3.0	20	6.0	40
MLP7120	120-180	0.20	0.15	1.5	3.5	50	1.2	40
MLP7121	120-180	0.60	0.30	1.0	3.0	50	0.5	20
MLP7122	120-180	0.80	0.50	0.5	3.0	100	0.3	15
Test Conditions	@ 10 μA	@ 0 V, 1 MHz	@ -6 V, 1 MHz	@ 10 mA 1 GHz	@ 1 mA 1 GHz	IF = 10 MA IR = 6 MA	1 usec pulse	

Maximum Ratings	Parameters	Rating
	Operating Temperature	-55° C to + 150° C
	Maximum Leakage Current	0.5 mA at 88% of minimum rated breakdown



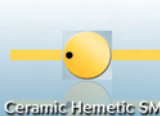
Bare Die



Ceramic Epoxy SMT



Plastic SMT



Ceramic Hemetic SMT



Ceramic Microwave Pill

Silicon Limiter Diodes

MLP7130 – MLP7122

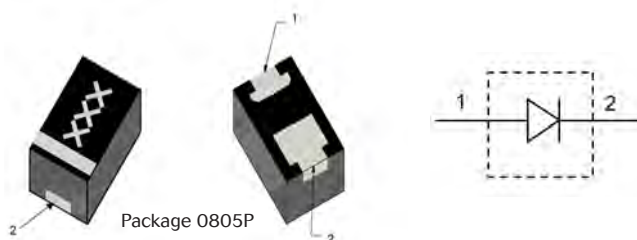
RF CHARACTERISTICS						
Model continued	Peak Power In	Threshold	Leakage Pout	Insertion Loss	CW Power In	Recovery Time
	MAX dBm	TYP dB	TYP dBm	TYP dB	MAX W	TYP nS
MLP7130	+47	+7	+19	0.1	2	5
MLP7131	+50	+7	+22	0.1	3	5
MLP7100	+50	+10	+22	0.1	2	10
MLP7101	+53	+10	+24	0.2	3	10
MLP7102	+56	+10	+25	0.2	4	10
MLP7140	+47	+12	+24	0.1	3	10
MLP7141	+50	+12	+27	0.1	4	10
MLP7110	+53	+15	+27	0.1	3	20
MLP7111	+56	+15	+29	0.2	4	20
MLP7112	+59	+15	+31	0.2	5	20
MLP7120	+60	+20	+39	0.1	5	50
MLP7121	+63	+20	+41	0.2	10	50
MLP7122	+66	+20	+44	0.2	15	50
Test Conditions	Pulsed thermal impedance is given for 1 μ pulse. CW thermal impedance presumes infinite heat sink.	Threshold input power produces 1 dB increase in insertion loss. 1 GHz	Threshold input power produces 1 dB increase in insertion loss. 1 GHz	Chip loss can be represented as a resistance in shunt with the junction capacitance. 3 GHz, zero Bias. Loss data shown for 10 GHz for 0.15 and 0.30 pF chips, 5 CHz for 0.50 pF chips. Measured at -10 dBm input.	Note that CW power and average power are not synonymous. Power ratings are computed in terms of a peak junction temperature of 200° C, for short pulses, an average junction temperature of 125° C, and an ambient of 25° C. Duty factor 0.001 assumed for maximum pulse power input.	Recovery time is measured with ground return (less than 1.0 Ohms) to 1 dB excess loss, at 1 GHz.
Maximum Ratings		Parameters		Rating		
		Operating Temperature		-55° C to + 150° C		
		Maximum Leakage Current		0.5 mA at 88% of minimum rated breakdown		



PIN Diode: Medium Power Series Switch Element

- Supports up to 40 watts power when cold switched
- Low insertion loss 0.25 dB typical up to 2.7 GHz
- Medium isolation 11 dB typical up to 2.7 GHz

The Aeroflex / Metelics' broadband, high linearity, medium power series switch element in a 2.0 X 1.3 mm to QFN package 0805P. This device is designed for WiMax, Wibro, WLAN, TD-SCDMA and other wireless infrastructure applications. It is also suited for 0.1 ~ 3 GHz applications with up to 40 watts of power.



MSWSE-040-10, $T_A = +25^\circ \text{C}$

Model	V_{BR}	V_F	C_J	R_S	R_S		Switching Speed	IL		IL		IRL		IRL		Iso		Iso	
	MIN V	TYP mV	MAX pF	TYP Ω	TYP Ω	MAX Ω	MAX μS	TYP dB	MAX dB	TYP dB	MAX dB	MIN dB	TYP dB	MIN dB	TYP dB	MIN dB	TYP dB	MIN dB	TYP dB
MSWSE-040-10	300	900	0.12	3.0	1.2	2.0	1.0	0.12	0.20	0.25	0.35	15	25	15	20	10	14	9	11
Test Conditions	$I_R = 10 \mu\text{A}$	$V_F = 50 \text{ mA}$	$V_R = 50 \text{ V}$	$I_F = 10 \text{ mA}, F = 500 \text{ MHz}$	$I_F = 50 \text{ mA}$ $F = 500 \text{ MHz}$			$I_F = 50 \text{ mA}$ $F = 2.025 \text{ GHz}$		$I_F = 50 \text{ mA}$ $F = 2.3 \sim 2.7 \text{ GHz}$		$I_F = 50 \text{ mA}$ $F = 2.025 \text{ GHz}$		$I_F = 50 \text{ mA}$ $F = 2.3 \sim 2.7 \text{ GHz}$		$V_R = 10 \text{ V}$ $F = 2.025 \text{ GHz}$		$V_R = 10 \text{ V}$ $F = 2.3 \sim 2.7 \text{ GHz}$	

Maximum Ratings	Rating	Limits
	V_R	300 V
	I_F	100 mA
	Θ_{JC}	20° C/W
	T_J	+150° C
	Storage Temperature	-65° C to +125° C
	Soldering Temperature	+260° C per JEDEC J-STD-20C

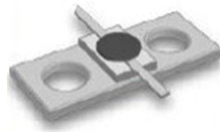


(Package style 0805P only.)

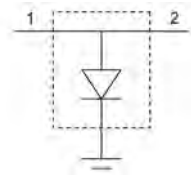
PIN Diode: High Power Shunt Switch Element

- Supports up to 100 watts power when hot switched
- Supports up to 300 watts power when cold switched
- Low insertion loss 0.15 dB typical up to 2.7 GHz
- High isolation 31 dB typical up to 2.7 GHz

The Aeroflex / Metelics' broadband, high linearity, high power shunt switch element in a 10 X 4 mm bolt channel metal package CM22. This device is designed for WiMax, Wibro, WLAN, TD-SCDMA and other wireless infrastructure applications. It is also suited for 0.1 ~ 6 GHz applications with up to 100 watts of power.



Package CM22



MSWSH-100-30, $T_A = +25^\circ \text{C}$

Model	V_{BR}	V_F	C_J	R_S		Switching Speed	IL		IL		IRL		IRL		Iso		Iso	
	MIN V	TYP mV	TYP pF	TYP Ω	MAX Ω	MAX μS	TYP dB	MAX dB	TYP dB	MAX dB	MIN dB	TYP dB	MIN dB	TYP dB	MIN dB	TYP dB	MIN dB	TYP dB
MSWSH-100-30	700	850	0.4	0.4	0.6	1.0	0.15	0.25	0.35	0.45	15	22	10	15	28	31	23	26
Test Conditions	$I_R = 10 \mu\text{A}$	$I_F = 100 \text{ mA}$	$V_R = 50 \text{ V}; F = 1 \text{ MHz}$	$I_F = 100 \text{ mA}$ $F = 500 \text{ MHz}$			$V_R = 50 \text{ V}$ $F = 2.3 \sim 2.7 \text{ GHz}$		$V_R = 50 \text{ V}$ $F = 6.0 \text{ GHz}$		$V_R = 50 \text{ V}$ $F = 2.3 \sim 2.7 \text{ GHz}$		$V_R = 50 \text{ V}$ $F = 6.0 \text{ GHz}$		$I_F = 100 \text{ mA}$ $F = 2.3 \sim 2.7 \text{ GHz}$		$I_F = 100 \text{ mA}$ $F = 6.0 \text{ GHz}$	

Maximum Ratings	Rating	Limits
	I_F	1 Amp
	Θ_{JC}	5.0° C/W
	T_J	+175° C
	Storage Temperature	-65° C to +150° C
	Soldering Temperature	+230° C for 30 seconds

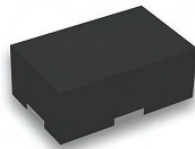


(Package style CM22 only.)

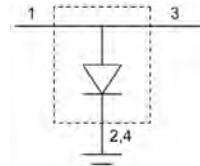
PIN Diode: Medium Power Shunt Switch Element

- Supports up to 20 watts power when cold switched
- Low insertion loss 0.25 dB typical out to 2.7 GHz
- High Isolation 31 dB typical up to 2.7 GHz

The Aeroflex / Metelics' broadband, high linearity, medium power shunt switch element in a 1.9 X 1.1 mm QFN package. This device is designed for WiMax, Wibro, WLAN, TD-SCDMA and other wireless infrastructure applications. It is also suited for 0.1 ~ 6 GHz applications with up to 20 watts of power.



Package 2012



MSWSH-020-30, $T_C = +25^\circ \text{C}$

Model	V_{BR}	C_J	R_S		Switching Speed	IL		IL		IRL		IRL		Iso		Iso	
	MIN V	TYP pF	TYP Ω	MAX Ω	MAX nS	TYP dB	MAX dB	TYP dB	MAX dB	MIN dB	TYP dB	MIN dB	TYP dB	MIN dB	TYP dB	MIN dB	TYP dB
MSWSH-020-30	100	0.13	0.6	0.9	500	0.25	0.35	0.35	0.45	15	19	10	14	26	31	25	27
Test Conditions	$I_R = 10 \mu\text{A}$	$V_R = 10 \text{ V}, F = 1 \text{ MHz}$	$I_F = 50 \text{ mA}$ $F = 500 \text{ MHz}$			$V_R = 10 \text{ V}$ $F = 2.3 \sim 2.7 \text{ GHz}$		$V_R = 10 \text{ V}$ $F = 6.0 \text{ GHz}$		$V_R = 10 \text{ V}$ $F = 2.3 \sim 2.7 \text{ GHz}$		$V_R = 10 \text{ V}$ $F = 6.0 \text{ GHz}$		$I_F = 50 \text{ mA}$ $F = 2.3 \sim 2.7 \text{ GHz}$		$I_F = 50 \text{ mA}$ $F = 6.0 \text{ GHz}$	

Maximum Ratings	Rating	Limits
	V_R	100 V
	I_F	100 mA
	Θ_{JC}	30° C/W
	T_J	+150° C
	Storage Temperature	-65° C to +125° C
	Soldering Temperature	+260° C per JEDEC STD-J-20C

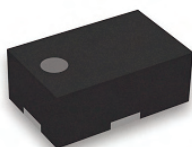


(Package style 2012 only.)

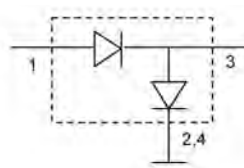
PIN Diode: Series Shunt Integrated Switch Element

- Supports up to 20 watts power when cold switched
- Low insertion loss 0.4 dB typical out to 2.7 GHz
- High isolation 45 dB typical up to 2.7 GHz

The Aeroflex / Metelics' broadband, high linearity, medium power series shunt integrated switch element in a 1.9 X 1.1 mm QFN package. This device is designed for WiMax, Wibro, WLAN, TD-SCDMA and other wireless infrastructure applications. It is also suited for 0.1 ~ 6 GHz applications with up to 20 watts of power.



Package 2012



MSWSS-020-40, $T_C = +25^\circ \text{C}$

Model	V_{BR}	Switching Speed	IL		IL		IRL		IRL		ORL		ORL		Iso		Iso	
	MIN V	MAX μS	TYP dB	MAX dB	TYP dB	MAX dB	MIN dB	TYP dB	MIN dB	TYP dB	MIN dB	TYP dB	MIN dB	TYP dB	MIN dB	TYP dB	MIN dB	TYP dB
MSWSS-020-40	100	1.0	0.3	0.5	0.6	0.8	15	21	10	13	15	22	10	13	40	50	30	35
Test Conditions	$I_R = 10 \mu\text{A}$		$I = -50 \text{ mA}^*$ $F = 2.3 \sim 2.7 \text{ GHz}$		$I = -50 \text{ mA}^*$ $F = 6.0 \text{ GHz}$		$I = -50 \text{ mA}^*$ $F = 2.3 \sim 2.7 \text{ GHz}$		$I = -50 \text{ mA}^*$ $F = 6.0 \text{ GHz}$		$I = -50 \text{ mA}^*$ $F = 2.3 \sim 2.7 \text{ GHz}$		$I = -50 \text{ mA}^*$ $F = 6.0 \text{ GHz}$		$I = +50 \text{ mA}^*$ $F = 2.3 \sim 2.7 \text{ GHz}$		$I = +50 \text{ mA}^*$ $F = 6.0 \text{ GHz}$	

Maximum Ratings	Rating	Limits
	V_R	100 V
	I_F	100 mA
	Θ_{JC}	30° C/W
	T_J	+150° C
	Storage Temperature	-65° C to +125° C
	Soldering Temperature	+260° C per JEDEC STD-J-20C

* Positive current is defined as current going into PIN 3.



(Package style 2012 only.)

Silicon Abrupt Tuning Varactors

- Available in Tape and Reel
- Small and High Volume Commercial Applications
- High Q
- Wide Selection of Capacitance Ranges

The Aeroflex / Metelics abrupt tuning varactors provide extremely high Q and low series resistance available in a 30 volt Silicon diode. These devices are available in single junction, common anode and common cathode configurations. Consult factory for availability.

Single and Common Cathode

Model	C _T pF		Capacitance Ratio	R _S Ω	Q
	MIN	MAX	MIN	MAX	MIN
MSV 1400-08-001	1.62	1.98	4.1	0.60	2900
MSV 1400-108-004	1.62	1.98	4.1	0.60	2900
MSV 1400-09-001	1.98	2.42	4.1	0.50	2800
MSV 1400-109-004	1.98	2.42	4.1	0.50	2800
MSV 1400-10-001	2.43	2.97	4.2	0.45	2600
MSV 1400-110-004	2.43	2.97	4.2	0.45	2600
MSV 1400-11-001	2.97	3.63	4.2	0.40	2500
MSV 1400-111-004	2.97	3.63	4.2	0.40	2500
MSV 1400-13-001	3.51	4.29	4.2	0.35	2400
MSV 1400-113-004	3.51	4.29	4.2	0.35	2400
MSV 1400-14-001	4.23	5.17	4.2	0.30	2200
MSV 1400-114-004	4.23	5.17	4.2	0.30	2200
MSV 1400-15-001	5.04	6.16	4.3	0.27	2100
MSV 1400-115-004	5.04	6.16	4.3	0.27	2100
MSV 1400-16-001	6.12	7.48	4.3	0.24	2000
MSV 1400-116-004	6.12	7.48	4.3	0.24	2000
MSV 1400-17-001	7.38	9.02	4.3	0.22	1800
MSV 1400-117-004	7.38	9.02	4.3	0.22	1800
MSV 1400-19-001	9.00	11.0	4.4	0.20	1600
MSV 1400-20-001	10.8	13.2	4.4	0.18	1500
MSV 1400-21-001	13.5	16.5	4.4	0.18	1200
MSV 1400-22-001	16.2	19.8	4.4	0.18	1000
Test Conditions	@ 4 V, 1 MHz		C _{T0} /C _{T30}	@ -4 V, 50 MHz	@ -4 V, 50 MHz



Silicon Abrupt Tuning Varactors

Single and Common Cathode

Model	Capacitance pF	Quality Factor Q	Capacitance Ratio
		MIN	MIN
SMV2101	6.8	450	2.5
SMV2102	8.2	450	2.5
SMV2103	10.0	400	2.5
SMV2104	12.0	400	2.5
SMV2105	15.0	400	2.5
SMV2106	18.0	350	2.5
SMV2107	22.0	350	2.5
SMV2108	27.0	300	2.5
SMV2109	33.0	200	2.5
SMV2110	39.0	150	2.5
SMV2111	47.0	150	2.5
SMV2112	56.0	150	2.6
SMV2113	68.0	150	2.6
SMV2114	82.0	100	2.6
SMV2115	100.0	100	2.6
Test Conditions	@ -4V, 1 MHz	@ +4 V, 50 MHz	C _J -2V / C _J -30V, 1 MHz

Maximum Ratings	Parameters	Rating
	DC Power Dissipation	@T _A = 25° C 250 mW
	Reverse Breakdown Voltage	@10mA 30 V Min
	Max Reverse Current	@T _A = 25° C 0.1 mA @25 Vdc
	Operating Temperature	-55 to + 125° C
	Storage Temperature	-65 to + 150° C
	Capacitance Tolerance	±10%



Silicon Abrupt Tuning Varactors: 30 Volt

- Low Series Resistance-High Q
- Extensive Selection of Capacitance Values

The Aeroflex / Metelics MTV-4030 Series Tuning Varactors are silicon abrupt junction devices. They offer the highest Q and lowest resistance available in 30 volt tuning diodes.

A unique silicon dioxide passivation process assures greater stability, reliability and low leakage currents at higher temperatures.

Model	Junction Capacitance C_T	Capacitance Ratio	Quality Factor Q
	pF	MIN	MIN
MTV4030-01	0.4	5.0	5000
MTV4030-02	0.6	5.0	5000
MTV4030-03	0.8	5.0	4800
MTV4030-04	1.0	5.0	4800
MTV4030-05	1.2	5.0	4600
MTV4030-06	1.4	5.0	4400
MTV4030-07	1.6	5.0	4400
MTV4030-08	1.8	5.0	4200
MTV4030-09	2.2	5.0	4000
MTV4030-10	2.7	5.0	3800
MTV4030-11	3.3	5.0	3600
MTV4030-12	3.6	5.0	3400
MTV4030-13	3.9	5.0	3400
MTV4030-14	4.7	5.0	3200
MTV4030-15	5.6	5.0	3000
MTV4030-16	6.8	5.0	2800
MTV4030-17	8.2	5.0	2600
MTV4030-18	10.0	5.0	2400
MTV4030-19	12.0	5.0	2200
MTV4030-20	15.0	5.0	2000
MTV4030-21	18.0	5.0	1800
MTV4030-22	22.0	5.0	1600
MTV4030-23	27.0	5.0	1400
MTV4030-24	33.0	5.0	1400
MTV4030-25	39.0	5.0	1200
MTV4030-26	47.0	5.0	1000
Test Conditions	@ -4 V, 1MHz	C_{T0}/C_T -30 V	@ -4V, 50 MHz

Maximum Ratings	Parameter	Rating
	Operating Temperature	-55 to + 150 °C
	Storage Temperature Range	-65 to + 200 °C
	Reverse Voltage	30 V
	Device Dissipation at $T_A = 25^\circ\text{C}$	250 mW



Bare Die



Ceramic Epoxy SMT



Plastic SMT



Ceramic Hemetic SMT



Ceramic Microwave Pill



Glass Axial Leaded

Silicon Abrupt Tuning Varactors: 45 Volt

- Low Series Resistance-High Q
- Extensive Selection of Capacitance Values

The Aeroflex / Metelics MTV-4045 Series Tuning Varactors are silicon abrupt junction devices. They offer the highest Q and lowest resistance available in 45 volt tuning diodes.

A unique silicon dioxide passivation process assures greater stability, reliability and low leakage currents at higher temperatures.

Model	Junction Capacitance	Capacitance Ratio	Quality Factor, Q
	pF	MIN	MIN
MTV4045-01	0.4	7.0	3000
MTV4045-02	0.6	7.0	3000
MTV4045-03	0.8	7.0	2800
MTV4045-04	1.0	7.0	2800
MTV4045-05	1.2	7.0	2600
MTV4045-06	1.4	7.0	2400
MTV4045-07	1.6	7.0	2400
MTV4045-08	1.8	7.0	2300
MTV4045-09	2.2	7.0	2200
MTV4045-10	2.7	7.0	2200
MTV4045-11	3.3	7.0	2100
MTV4045-12	3.6	7.0	2000
MTV4045-13	3.9	7.0	2000
MTV4045-14	4.7	7.0	2000
MTV4045-15	5.6	7.0	1900
MTV4045-16	6.8	7.0	1800
MTV4045-17	8.2	7.0	1700
MTV4045-18	10.0	7.0	1600
MTV4045-19	12.0	7.0	1500
MTV4045-20	15.0	7.0	1400
MTV4045-21	18.0	7.0	1300
MTV4045-22	22.0	7.0	1200
Test Conditions	@ -4 V, 1MHz	C_{T0}/C_{T-45V}	@ -4V, 50 MHz

Maximum Ratings	Parameter	Rating
	Operating Temperature	-55 to + 150 °C
	Storage Temperature Range	-65 to + 200 °C
	Reverse Voltage	45 V
	Device Dissipation at TA = 25°C	250 mW



Bare Die



Ceramic Epoxy SMT



Plastic SMT



Ceramic Hemetic SMT



Ceramic Microwave Pill



Glass Axial Leaded

Silicon Abrupt Tuning Varactors: 60 Volt

- Low Series Resistance-High Q
- Extensive Selection of Capacitance Values

The Aeroflex / Metelics MTV-4060 Series Tuning Varactors are silicon abrupt junction devices. They offer the highest Q and lowest resistance available in 60 volt tuning diodes.

A unique silicon dioxide passivation process assures greater stability, reliability and low leakage currents at higher temperatures.

Model	Junction Capacitance	Capacitance Ratio	Quality Factor
	pF	MIN	MIN
MTV4060-01	0.8	8.0	2100
MTV4060-02	1.0	8.0	2100
MTV4060-03	1.2	8.0	2100
MTV4060-04	1.4	8.0	2000
MTV4060-05	1.6	8.0	2000
MTV4060-06	1.8	8.0	2000
MTV4060-07	2.2	8.0	2000
MTV4060-08	2.7	8.0	1900
MTV4060-09	3.3	8.0	1800
MTV4060-10	3.6	8.0	1700
MTV4060-11	3.9	8.0	1700
MTV4060-12	4.7	8.0	1600
MTV4060-13	5.6	8.0	1500
MTV4060-14	6.8	8.0	1400
MTV4060-15	8.2	8.0	1300
MTV4060-16	10.0	8.0	1200
MTV4060-17	12.0	8.0	1100
MTV4060-18	15.0	8.0	1000
Test Conditions	@ -4 V, 1MHz	C_T0/C_T -60 V	@ -4 V, 50 MHz

Maximum Ratings	Parameter	Rating
	Operating Temperature	-55 to + 150 °C
	Storage Temperature Range	-65 to + 200 °C
	Reverse Voltage	60 V
	Device Dissipation at TA = 25°C	250 mW



Bare Die



Ceramic Epoxy SMT



Plastic SMT



Ceramic Hemetic SMT



Ceramic Microwave Pill



Glass Axial Leaded

Silicon Abrupt Tuning Varactors: 90 Volt

- Low Series Resistance-High Q
- Extensive Selection of Capacitance Values

The Aeroflex / Metelics MTV-4090 Series Tuning Varactors are silicon abrupt junction devices. They offer the highest Q and lowest resistance available in 90 volt tuning diodes.

A unique silicon dioxide passivation process assures greater stability, reliability and low leakage currents at higher temperatures.

Model	Total Capacitance	Capacitance Ratio	Quality Factor
	pF	MIN	MIN
MTV4090-01	0.8	8.0	1000
MTV4090-02	1.0	8.0	1000
MTV4090-03	1.2	8.0	900
MTV4090-04	1.4	8.0	900
MTV4090-05	1.6	8.0	850
MTV4090-06	1.8	8.0	850
MTV4090-07	2.2	8.0	850
MTV4090-08	2.7	8.0	850
MTV4090-09	3.3	8.0	800
MTV4090-10	3.6	8.0	800
MTV4090-11	3.9	8.0	800
MTV4090-12	4.7	8.0	800
MTV4090-13	5.6	8.0	800
MTV4090-14	6.8	8.0	750
MTV4090-15	8.2	8.0	750
MTV4090-16	10.0	8.0	750
Test Conditions	@ -4 V, 1MHz	C_T0/C_T -90 V	@ -4V, 50 MHz

Maximum Ratings	Parameter	Rating
	Operating Temperature	-55 to + 150 °C
	Storage Temperature Range	-65 to + 200 °C
	Reverse Voltage	90 V
	Device Dissipation at TA = 25° C	250 mW



Silicon Abrupt Varactors: General Purpose

Ultra-Low Leakage

Model	Total Capacitance pF	Capacitance Ratio	Working Voltage Vdc	Breakdown Voltage Vdc
		TYP	MAX	MIN
V907	7	4.1	25	28
V910	10	4.1	25	28
V912	12	4.2	25	28
V915	15	4.2	25	28
V920	20	3.9	20	22
V927	27	4.0	20	22
V933	33	4.1	20	22
V939	39	4.1	20	22
V947	47	3.9	20	22
V956	56	3.5	15	17
V968	68	3.5	15	17
V982	82	3.5	15	17
V900	100	3.5	15	17
V907E	7	6.9	100	110
V910E	10	6.9	100	110
V912E	12	7.5	100	110
V915E	15	7.5	100	110
V920E	20	7.9	90	99
V927E	27	7.4	65	72
V933E	33	6.5	60	66
V939E	39	6.3	55	61
V947E	47	6.1	50	55
V956E	56	5.7	40	44
V968E	68	4.6	30	33
V982E	82	4.0	20	22
V900E	100	4.0	20	22
Test Conditions	@ -4 V, 1MHz	C•0.5V / C•MWV		I _R = 100 µA

Maximum Ratings	Parameter	Rating
	Forward Voltage Drop	1.0 Vdc
	DC Power Dissipation	400 mW
	Max Reverse Current	5 nA
	Operating Temperature	-65° to +150 °C
	Storage Temperature	-65° to +200 °C
	Capacitance Tolerance	+20%



Silicon Abrupt Varactors: General Purpose

KSV2101 – KSV2115				Glass Axial Leaded
Model	Total Capacitance	Quality Factor Q	Capacitance Ratio	
	pF	MIN	MIN	MAX
KSV2101	6.8	450	2.5	3.2
KSV2102	8.2	450	2.5	3.2
KSV2103	10.0	400	2.5	3.2
KSV2104	12.0	400	2.5	3.2
KSV2105	15.0	400	2.5	3.2
KSV2106	18.0	350	2.5	3.2
KSV2107	22.0	350	2.5	3.2
KSV2108	27.0	300	2.5	3.2
KSV2109	33.0	200	2.5	3.2
KSV2110	39.0	150	2.5	3.2
KSV2111	47.0	150	2.5	3.2
KSV2112	56.0	150	2.6	3.3
KSV2113	68.0	150	2.6	3.3
KSV2114	82.0	100	2.6	3.3
KSV2115	100.0	100	2.6	3.3
Test Conditions	@ -4 V, 1MHz	@ -4 V, 50 MHz	$C_T -2 / C_T -30 \text{ V, 1 MHz}$	

Maximum Ratings	Parameters	Rating
	DC Power Dissipation	400 mW
	Reverse Breakdown Voltage	30 V min
	Max Reverse Current @ Ta = 25° C	0.1 µA @ 25 Vdc
	Operating Temperature Topr	-65° to 175° C
	Storage Temperature Tstg	-65° to 200° C
	Capacitance Tolerance:	+10%



Silicon Abrupt Varactors: General Purpose

MV830 – MV840

Glass Axial Leaded

Model	C _T Diode Capacitance pF			Quality Factor Q		Tuning Ratio T _R	
	MIN	TYP	MAX	MIN	TYP	MIN	TYP
MV830	13.5	15.0	16.5	30	35	1.8	2.00
MV831	6.2	18.0	19.8	25	30	1.8	2.00
MV832	19.8	22.0	24.2	25	30	1.8	2.10
MV833	24.3	27.0	29.7	25	30	1.8	2.10
MV834	29.7	33.0	36.3	20	25	1.9	2.12
MV835	35.1	39.0	42.9	20	25	1.9	2.12
MV836	42.3	47.0	51.7	15	20	1.9	2.15
MV837	50.4	56.0	61.6	15	20	1.9	2.15
MV838	61.2	68.0	74.8	15	20	2.0	2.18
MV839	73.8	82.0	90.2	10	15	2.0	2.18
MV840	90.0	100.0	10.0	10	15	2.0	2.18
Test Conditions	@ -4 V, D= 1MHz			@ -4 V, 50 MHz		C _T -4V / C _T -25V, 1 MHz	

Maximum Ratings	Parameters	Value	Rating
	DC Power Dissipation	400 mW	
	Min Reverse Breakdown Voltage	30 Vdc	
	Max Reverse Current	@ 25 Vdc	0.2 µA
	Operating Temperature		-65° to +150° C
	Storage Temperature		-65° to +200° C
	Junction Temperature	+175° C	



Glass Axial Leaded

Silicon Abrupt Varactors: General Purpose

MV1620 – MV1650

Model	Diode Capacitance C_T pF			Quality Factor Q	Tuning Ratio T_R	
	MIN	TYP	MAX		MIN	TYP
MV1620	6.1	6.8	7.5	300	2.0	3.2
MV1622	7.4	8.2	9.0	300	2.0	3.2
MV1624	9.0	10.0	11.0	300	2.0	3.2
MV1626	10.8	12.0	13.2	300	2.0	3.2
MV1628	13.5	15.0	16.5	250	2.0	3.2
MV1630	16.2	18.0	19.8	250	2.0	3.2
MV1632	18.0	20.0	22.0	250	2.0	3.2
MV1634	19.8	22.0	24.2	250	2.0	3.2
MV1636	24.3	27.0	29.7	200	2.0	3.2
MV1638	29.7	33.0	36.3	200	2.0	3.2
MV1640	35.1	39.0	42.9	200	2.0	3.2
MV1642	42.3	47.0	51.7	200	2.0	3.2
MV1644	50.4	56.0	61.6	150	2.0	3.2
MV1646	61.2	68.0	74.8	150	2.0	3.2
MV1648	73.8	82.0	90.2	150	2.0	3.2
MV1650	90.0	100.0	110.0	150	2.0	3.2
Test Conditions	$V_R = 4$ Vdc, F = 1 MHz			@ 4 Vdc, F = 50 MHz	$C_T - 2$ V / $C_T - 20$ V, 1 MHz	

Maximum Ratings	Parameters	Value	Rating
	DC Power Dissipation	@ $T_A = 25^\circ\text{C}$	400 mW
	Min Reverse Breakdown Voltage	@ $I_r = 10$ μA	20 Vdc
	Max Reverse Current	@ 15 Vdc	0.1 μA Max
	Operating Temperature		-65° to $+150^\circ\text{C}$
	Storage Temperature		-65° to $+200^\circ\text{C}$
	Junction Temperature		175°C

MV1652 – MV1666

Model	Diode Capacitance C_T pF			Quality Factor Q	Capacitance Ratio		Reverse Voltage Vdc
	MIN	TYP	MAX		TYP	TYP	MIN
MV1652	108	120	135	250	2.6		20
MV1654	132	150	165	250	2.6		20
MV1656	162	180	198	200	2.6		20
MV1658	180	200	220	200	2.6		20
MV1660	198	220	242	200	2.6		20
MV1662	225	250	275	150		2.3	15
MV1664	243	270	300	100		2.3	15
MV1666	297	330	363	100		2.3	15
Test Conditions	$V_R = 4$ Vdc, F = 1 MHz			1 $V_B = 4$ Vdc, F = 20 MHz	$C_T - 2$ V / $C_T - 20$ V	$C_T - 2$ V / $C_T - 15$ V	@ 10 μA

Maximum Ratings	Parameters	Value	Rating
	DC Power Dissipation	@ $T_A = 25^\circ\text{C}$	475 mW
	Max Reverse Current	@ 15 Vdc	0.1 μA (MV1652-MV1660)
	Max Reverse Current	@ 10 Vdc	0.1 μA (MV1662-MV1666)
	Operating Temperature		-65° to $+150^\circ\text{C}$
	Storage Temperature		-65° to $+200^\circ\text{C}$
	Junction Temperature		175°C



Silicon Abrupt Varactors: General Purpose

1N5139 – 1N5148, 1N5139A – 1N5148A

Model	Capacitance pF			Capacitance Ratio	Quality Factor Q
	MIN	TYP	MAX	MIN	MIN
1N5139	6.12	6.8	7.48	2.7	350
® 1N5139A	6.46	6.8	7.14	2.7	350
1N5140	9.0	10.0	11.0	2.8	300
® 1N5140A	9.5	10.0	10.5	2.8	300
1N5141	10.8	12.0	13.2	2.8	300
® 1N5141A	11.4	12.0	12.6	2.8	300
1N5142	13.5	15.0	16.5	2.8	250
® 1N5142A	14.3	15.0	15.7	2.8	250
1N5143	16.2	18.0	19.8	2.8	250
® 1N5143A	17.1	18.0	18.9	2.8	250
1N5144	19.8	22.0	24.2	3.2	200
® 1N5144A	20.9	22.0	23.1	3.2	200
1N5145	24.3	27.0	29.7	3.2	200
® 1N5145A	25.7	27.0	28.3	3.2	200
1N5146	29.7	33.0	36.3	3.2	200
® 1N5146A	31.4	33.0	34.6	3.2	200
1N5147	6.1	39.0	42.9	3.2	200
® 1N5147A	37.1	39.0	40.9	3.2	200
1N5148	42.3	47.0	51.7	3.2	200
® 1N5148A	44.7	47.0	49.3	3.2	200
Test Conditions	@ -4 Vdc, 1 MHz			$C_T - 2 \text{ V} / C_T - 60 \text{ V}$	@ 4 Vdc F = 50 MHz

Maximum Ratings	Parameters	Value	Rating
	DC Power Dissipation	400 mW	
	Forward Current	250 mA	
	Min Reverse Breakdown Voltage	@ $I_R = 10 \mu\text{Adc}$	65 Vdc
	Max Reverse Current	@ $V_R = 55 \text{ Vdc}$	20 μAdc
	Max Reverse Current	@ $V_R = 55 \text{ Vdc}$; $T_a = 150^\circ \text{C}$	20 μAdc
	Temp Coefficient of Capacitance	@ $V_R = 4 \text{ Vdc}$; $T_a -40 \text{ to } +85^\circ \text{C}$	03% / $^\circ \text{C}$
	Operating Temperature Range	$-65^\circ \text{ to } +175^\circ \text{C}$	
	Storage Temperature Range	$-65^\circ \text{ to } +200^\circ \text{C}$	
	Voltage Tolerance	Standard Device	+10%
	Suffix A	+5%	

® Denotes Military approval for JAN - JANTX - JANTXV



Silicon Abrupt Varactors: General Purpose

1N5441 – 1N5456				
Model	Capacitance pF	Tuning Ratio		Quality Factor Q
		MIN	MAX	MIN
1N5441	6.8	2.5	3.1	450
1N5442	8.2	2.5	3.1	450
1N5443	10.0	2.6	3.1	400
1N5444	12.0	2.6	3.1	400
1N5445	15.0	2.6	3.1	400
1N5446	18.0	2.6	3.1	350
1N5447	20.0	2.6	3.1	350
1N5448	22.0	2.6	3.2	350
1N5449	27.0	2.6	3.2	350
1N5450	33.0	2.6	3.2	350
1N5451	39.0	2.6	3.2	300
1N5452	47.0	2.6	3.2	250
1N5453	56.0	2.6	3.3	200
1N5454	68.0	2.7	3.3	175
1N5455	82.0	2.7	3.3	175
1N5456	100.0	2.7	3.3	175
Test Conditions	@ 4 Vdc, 1 MHz	$C_T - 2 \text{ V} / C_T - 30 \text{ V}$ F=1-MHz		@ 4 Vdc F = 50 MHz



Plastic SMT



Glass Axial Leaded

Silicon Abrupt Varactors: General Purpose

1N5461– 1N5476

Model	Capacitance pF	Tuning Ratio		Quality Factor Q
		MIN	MAX	MIN
® 1N5461	6.8	2.7	3.1	600
® 1N5462	8.2	2.8	3.1	600
® 1N5463	10.0	2.8	3.1	550
® 1N5464	12.0	2.8	3.1	550
® 1N5465	15.0	2.8	3.1	550
® 1N5466	18.0	2.9	3.1	500
® 1N5467	20.0	2.9	3.1	500
® 1N5468	22.0	2.9	3.2	500
® 1N5469	27.0	2.9	3.2	500
® 1N5470	33.0	2.9	3.2	500
® 1N5471	39.0	2.9	3.2	450
® 1N5472	47.0	2.9	3.2	400
® 1N5473	56.0	2.9	3.3	300
® 1N5474	68.0	2.9	3.3	250
® 1N5475	82.0	2.9	3.3	225
® 1N5476	100.0	2.9	3.3	200
Test Conditions	@ 4 Vdc, 1 MHz	C _T -2 V / C _T -30 V F = 1 -MHz		@ 4 Vdc F = 50 MHz

Maximum Ratings	Parameters	Value	Rating
	DC Power Dissipation (Pd)	@ Ta = 25° C	400 mW
	Min Reverse Breakdown Voltage	@ Ir = 10 µA	30 V
	Max Reverse Current	@ 25 Vdc	0.02 µA
	Max Reverse Current	@ 25 Vdc 150° C	20 µA
	Temp Coefficient of Capacitance	@ Vr = 4 Vdc; Ta -65 to +85° C	.04%/°C
	Operating Temperature Range		-65° to +175° C
	Storage Temperature Range		-65° to +200° C
	Capacitance Tolerance	Standard Device	+20%
	Suffix A	+10%	
	Suffix B	+5%	
	Suffix C	+2%	

® Denotes Military Approval For JAN - JANTX - JANTXV (B&C Tolerance only)



Silicon Abrupt Varactors: General Purpose

1N5681– 1N5709								
Model	Capacitance pF	Quality Factor Q	Capacitance Ratio				Working Voltage Vdc	Reverse Breakdown Voltage
		MIN	MIN	TYP	MIN	TYP	MAX	MIN
1N5681	6.8	600	3.1	3.3			40	45
1N5682	8.2	600	3.1	3.3			40	45
1N5683	10.0	550	3.2	3.4			40	45
1N5684	12.0	550	3.2	3.4			40	45
1N5685	15.0	550	3.2	3.4			40	45
1N5686	18.0	500	3.2	3.4			40	45
1N5687	22.0	500	3.3	3.5			40	45
1N5688	27.0	500	3.3	3.5			40	45
1N5689	33.0	500	3.3	3.5			40	45
1N5690	39.0	450	3.3	3.5			40	45
1N5691	47.0	400	3.3	3.5			40	45
1N5692	56.0	300	3.3	3.5			40	45
1N5693	68.0	250	3.3	3.5			40	45
1N5694	82.0	225	3.3	3.5			40	45
1N5695	100.0	200	3.3	3.5			40	45
1N5696	6.8	450			2.7	2.9	60	65
1N5697	8.2	450			2.7	2.9	60	65
1N5698	10.0	400			2.8	3.0	60	65
1N5699	12.0	400			2.8	3.0	60	65
1N5700	15.0	400			2.8	3.0	60	65
1N5701	18.0	375			2.8	3.0	60	65
1N5702	22.0	375			3.2	3.4	60	65
1N5703	27.0	350			3.2	3.4	60	65
1N5704	33.0	350			3.2	3.4	60	65
1N5705	39.0	325			3.2	3.4	60	65
1N5706	47.0	300			3.2	3.4	60	65
1N5707	56.0	225			3.2	3.4	60	65
1N5708	68.0	175			3.2	3.4	60	65
1N5709	82.0	150			3.2	3.4	60	65
Test Conditions	@ 4Vdc 1 MHz	@ 4 Vdc F = 50 MHz	C _T -2 V / C _T -40 V		C _T -4 V / C _T -60 V			@ 10μA

Maximum Ratings	Parameters	Value	Rating
	DC Power Dissipation	400 mW	
	Max Reverse Current	@ T _a = 25° C	20 nA @ MWV
	Max Reverse Current	@ T _a = 150° C	20 μA @ MWV
	Operating Temperature Range	-65° to +175° C	
	Storage Temperature Range	-65° to +200° C	
	Capacitance Tolerance:	Standard Device	+20%
	Suffix A	+10%	
	Suffix B	+5%	



Low Cost Silicon Hyperabrupt Tuning Varactors

- Low Inductance
- Wide Capacitance Swing
- High Q
- Superior Reproducibility

The Aeroflex / Metelics Low Cost Hyperabrupts offer high Qs. These diodes are excellent for octave tuning up to 800 MHz and for straight-line frequency tuning between 3 and 8 Volt of bias. They achieve high Q values when tuned between 9 and 20 volts.

TV3201, TV3901, TV 3902

Model	C _T Diode Capacitance pF		T _R Tuning Ratio		Q		V _{BR} Vdc	I _R nA	Cathode Strip	Case Style
	MIN/MAX	MIN/MAX	MIN	MAX	MIN	TYP	MIN	MAX		
TV3201	9/13	2.0/2.3	4.5	5.8	300	415	30	50	White	DO34
TV3901	26/32	4.5/6.0	5.0	6.5	200	280	30	50	Yellow	DO34
TV3902	22.5/27.5	2.9/3.5	6.8	8.9	115	160	30	50	Green	DO34
Test Conditions	@ -3 Vdc F = 1 MHz	@ -25 Vdc F = 1 MHz	C _T -3 / C _T -25 F = 1 MHz		@ -3 Vdc F = 50 MHz		@ 10 µA	@ -28 Vdc		

Maximum Ratings	Parameter	Value
	Reverse Voltage	30 Vdc
	Forward Current	200 mAdc
	Power Dissipation at TA = 25° C	400 mW
	Derate Above 25° C	4.0 mW / °C
	Maximum Junction Temperature	+125 °C
	Storage Temperature	-65 to +200 °C

KSV1401-KSV1412

Model	Diode Capacitance C _T pF				Tuning Ratio T _R		Quality Factor Q
	MIN	MAX	MIN	MAX	MIN	MIN	MIN
KSV1401	440	660			14:1		200
KSV1402			45	69		10:1	200
KSV1403			140	210		10:1	200
KSV1404			96	144		10:1	200
KSV1405			200	300		10:1	200
KSV1406			80	120		10:1	200
KSV1407			54	82		10:1	200
KSV1408			37	57		10:1	200
KSV1409			26	40		10:1	200
KSV1410			17	27		9.5:1	200
KSV1411			12	18		8.5:1	200
KSV1412			8	12		7.5:1	200
Test Conditions	@ -1 V, F = 1 MHz		@ -2 V, F = 1 MHz		C _T -1V / C _T -10V @ F = 1 MHz	C _T -2V / C _T -10V @ F = 1 MHz	@ -2 V F = 1 MHz

Maximum Ratings	Parameter	Value
	Device Dissipation TA = 25° C	400 mW
	Junction Temperature	175 °C
	Reverse Breakdown Voltage	10 µAdc, 12 Vdc Min
	Max Reverse Leakage Current	V _r = 10 Vdc, 0.1 µVdc
	Operating Temperature	-55° to + 150 °C
	Storage Temperature	-65° to + 200 °C
	Capacitance Tolerance	+ 20%
	Suffix A	+ 10%
	Suffix B	+ 5%

To order devices screened to MIL-PRF-19500 JANTX level, Appendix E, Table IV add suffix H.



Silicon Hyperabrupt Tuning Varactors: Portable

- Available in Tape and Reel
- Small and High Volume Commercial Applications
- Wide Selection of Capacitance Ranges

The Aeroflex / Metelics Hyperabrupt Varactors come in a wide variety of capacitance values and high capacitance ratios. These devices are available in single junction, common anode and common cathode configurations.

Single and Common Cathode							Surface Mount	
Model	Capacitance pF		Capacitance RATIO		Capacitance RATIO		RS Ω	Q
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
MSV1104-33-323	3.00	3.60	1.40	1.90	2.60	3.30	1.20	1200
MSV1204-33-001	3.00	3.60	1.40	1.90	2.60	3.30	1.20	1200
MSV1204-133-004	3.00	3.60	1.40	1.90	2.60	3.30	1.20	1200
MSV1104-34-323	5.8	7.15	1.60	2.00	2.80	3.40	0.80	1000
MSV1204-34-001	5.85	7.15	1.60	2.00	2.80	3.40	0.80	1000
MSV1204-134-004	5.85	7.15	1.60	2.00	2.80	3.40	0.80	1000
MSV1104-35-323	10.35	12.65	1.60	2.00	2.90	3.40	0.60	750
MSV1204-35-001	10.35	12.65	1.60	2.00	2.90	3.40	0.60	750
MSV1204-135-004	10.35	12.65	1.60	2.00	2.90	3.40	0.60	750
MSV1104-36-323	15.50	18.50	1.60	2.00	3.00	3.50	0.50	700
MSV1204-36-001	15.50	18.50	1.60	2.00	3.00	3.50	0.50	700
MSV1204-136-004	15.50	18.50	1.60	2.00	3.00	3.50	0.50	700
MSV1204-37-001	45.00	54.00	1.60	2.00	3.00	3.50	0.25	500
Test Conditions	C _T @ -1 Vdc, F = 1 MHz		C _T 1 V / C _T 3 V		C _T 1 V / C _T 6 V		@ 50 MHz	@ 3 V, 50 MHz
Maximum Ratings	Parameters		Rating					
	Reverse Breakdown Voltage		10 mA: 15 V MIN					
	Reverse Leakage Current		12 V: 50 nA MAX					



Silicon Hyperabrupt Tuning Varactors: Wideband

- Available in Tape and Reel
- Small and High Volume Commercial Applications
- Wide Selection of Capacitance Ranges

The Aeroflex / Metelics Hyperabrupt Varactors come in a wide variety of capacitance values and high capacitance ratios. These devices are available in single junction, common anode and common cathode configurations.

Single and Common Cathode Super Hyperabrupt Varactors For VCXOs

DESIGNED FOR 3 AND 5 VOLT CIRCUITS

Model	C_T pF	C_T pF		C_T pF	RS
	MIN	MIN	MAX	MAX	MAX
SMV30222	18	5	7	2.4	4.0 Ω
SMV30223	36	10	14	4.8	2.3 Ω
SMV30224	54	15	21	7.2	1.9 Ω
SMV30225	72	20	28	9.6	1.5 Ω
Test Conditions	@ -1 Vdc, F = 1 MHz	@ 2.5 Vdc, F = 1 MHz		@ -4 Vdc, F = 1 MHz	@ 50 Vdc, F = 50 MHz

DESIGNED FOR 3 VOLT CIRCUITS

Model	C_T RATIO		C_T pF		C_T RATIO		RS
	MIN	TYP	MIN	MAX	MIN	TYP	MAX
SMV30332	3.0	4.0	5.5	7.0	3.0	4.0	16.0 Ω
SMV30333	3.0	4.0	11.0	14.0	3.0	4.0	9.0 Ω
Test Conditions	C_T @ 0.3 V / C_T @ 1.65 V		C_T @ 1.65 V		C_T @ 1.65 V / C_T @ 3.0 V		@ 1.65 V 50 MHz

Maximum Ratings	Parameters	Value	Rating
	Reverse Breakdown Voltage	10 μ Adc	8 Volt MIN
	Max Reverse Leakage Current	$V_R = 6$ Volts	0.1 μ Adc
	Device Dissipation	$T_a = 25^\circ \text{C}$	250 mW
	Operating Temperature		-55° to 125° C
	Storage Temperature		-65° to 150° C



Silicon Hyperabrupt Tuning Varactors: Wideband

Model	C _T pF		C _T pF		RATIO	Q @ V _R 1, 50 MHz	V _R 1 V	V _R 2 V
	MIN	MAX	MIN	MAX	MIN	MIN	TYP	TYP
MSV1200-04-001	10.5	12.5	2.1	2.50	4.60	400	3.0	20
MSV1200-104-004	10.5	12.5	2.1	2.50	4.60	400	3.0	20
MSV1200-07-001	25.0	31.0	4.5	5.30	4.80	300	3.0	20
MSV1200-107-004	25.0	31.0	4.5	5.30	4.80	300	3.0	20
MSV1204-04-001	02.5	03.3	0.6	0.85	3.00	500	4.0	20
MSV1204-104-004	02.5	03.3	0.6	0.85	3.00	500	4.0	20
MSV1204-05-001	04.5	05.5	0.9	1.20	4.20	500	4.0	20
MSV1204-105-004	04.5	05.5	0.9	1.20	4.20	500	4.0	20
MSV1202-03-001	18.0	22.0	3.1	3.90	4.60	300	4.0	20
MSV1202-08-001	45.0	55.0	7.3	9.20	5.00	200	4.0	20
MSV1202-12-001	100	125	15.0	20.00	5.20	125	4.0	20
Test Conditions	@ -1 V _R 1, F = 1 MHz		C _T -2 @ V _R 2, F = 1 MHz		C _T -1 / C _T -2	@ -1 Vdc, F = 50 MHz		

Model	V _B	I _R nA	C _T pF		C _T pF		C _T		Q
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	TYP	MIN
MSV1204-99-001	12	50	11	14	4.0	16.5	1.2	1.9	250
MSV1204-199-004	12	50	11	14	4.0	16.5	1.2	1.9	250
Test Conditions	@ 10μA	-8 Vdc	C _T @ -0.2 Vdc, F = 1 MHz		C _T @ -2 Vdc, F = 1 MHz		@ -6 Vdc, F = 50 MHz		@ -2 Vdc, F = 50 MHz

Model	C _T pF		C _T pF		C _T pF		Q
	MIN	TYP	MIN	TYP	MIN	TYP	MIN
MSV1204-11-001	95.0	100	40.0	65.0	20.0	25.0	80
MSV1204-12-001	42.0	50.0	18.0	27.0	09.0	12.0	150
MSV1204-13-001	17.0	22.0	08.5	10.5	04.0	05.5	200
MSV1204-14-001	14.5	16.0	06.5	07.8	03.0	04.8	300
MSV1204-15-001	8.7	09.5	04.3	5.50	02.0	02.9	350
MSV1201-97-001	85.0	—	—	—	15.0	30.0	500*
Test Conditions	@ -1 Vdc, F = 1 MHz		@ -2.5 Vdc, F = 1 MHz		@ -4 Vdc, F = 1 MHz		@ -4 Vdc, F = 50 MHz

Model	C _T pF		C _T RATIO		C _T RATIO		Q
	MIN	MAX	MIN	MAX	MIN	MAX	MIN
MSV1204-22-001	18.0	27.0	01.5	02.0	1.50	2.00	150
MSV1204-23-001	09.0	13.0	01.5	02.0	1.50	2.00	200
MSV1204-24-001	06.0	80.0	01.5	02.0	1.50	2.00	300
MSV1204-25-001	04.2	05.6	01.5	02.0	1.50	2.00	350
Test Conditions	@ 2.5 Vdc, F = 1 MHz		C _T -1 V / C _T -2.5 V		C _T -2.5 V / C _T -4 V		@ -4 V, F = 50 MHz



Silicon Hyperabrupt Tuning Varactors: Wideband

- High Capacitance Ratios
- Linear Tuning Between 2 and 8 Volts
- Available Over a Broad Range of Junction Capacitances
- Satisfies a Large Number of Wideband Applications through the VHF Frequency Band

Model	Diode Capacitance C_T pF		Diode Capacitance C_T pF		Tuning Ratio T_R		Quality Factor Q
	MIN	MAX	MIN	MAX	MIN	MIN	MIN
SMV 1401	440	660			14:1		200
SMV 1402			45	69		10:1	200
SMV 1403			140	210		10:1	200
SMV 1404			96	144		10:1	200
SMV 1405			200	300		10:1	200
SMV 1406			80	120		10:1	200
SMV 1407			54	82		10:1	200
SMV 1408			37	57		10:1	200
SMV 1409			26	40		10:1	200
SMV 1410			17	27		9.5:1	200
SMV 1411			12	18		8.5:1	200
SMV 1412			8	12		7.5:1	200
Test Conditions	@ 1 Vdc, F = 1 MHz		@ 2 Vdc, F = 1 MHz		$C_T - 1V/C_T - 10V$	$C_T - 2V/C_T - 10V$	@ -2V, F = 50 MHz

Maximum Ratings	Parameters	Value	Rating
	Device Dissipation	Ta - 25° C	250 mW
	Reverse Breakdown Voltage	10 μ Adc	12 Volt Vdc Min
	Max Reverse Leakage Current	VR = 10 Vdc	0.1 μ Adc
	Junction Temperature		125° C
	Operating Temperature		-55° to + 125° C
	Storage Temperature		-65° C to + 150° C
	Capacitance Tolerance		Standard Device + 20%



Silicon Hyperabrupt Tuning Varactors: VHF/UHF

- Superior Performance in Highly Stable Oscillator Designs
- Uniform Capacitance / Temperature Coefficient
- Highly Reproducible Ion Implanted Structure

Model	C _T pF		C _T RATIO		C _T RATIO		Q
	MIN	MAX	MIN	MAX	MIN	MAX	MIN
SMV20422	18.0	27.0	1.8	2.5	1.8	2.5	150
SMV20423	9.0	13.0	1.8	2.5	1.8	2.5	200
SMV20424	6.0	8.0	1.8	2.5	1.8	2.5	300
SMV20425	4.2	5.6	1.8	2.5	1.8	2.5	350
Test Conditions	@ 2.5 Vdc, F = 1 MHz		C _T @ -1 V / C _T -2.5 V		C _T -2.5 V / C _T -4 V		@ -4 Vdc, F = 50 MHz

Model	C _T pF		C _T pF		C _T pF		Q
	MIN	TYP	MIN	MAX	TYP	MAX	MIN
SMV20411	95.0	100.0	40.0	65	20.0	25.0	80
SMV20412	42.0	54.0	18.0	27	8.7	12.0	150
SMV20413	17.0	22.0	8.5	10.5	4.0	5.5	200
SMV20414	14.5	16.0	6.5	7.8	3.0	4.8	300
SMV20415	8.7	11.3	4.3	5.5	2.2	2.9	350
Test Conditions	@ -1 Vdc, F = 1 MHz		@ -2.5 Vdc, F = 1 MHz		@ -4 Vdc, F = 1 MHz		@ -4 Vdc, F = 50 MHz

Maximum Ratings	Parameters	Value	Rating
	Reverse Breakdown Voltage	10 μ Adc	12 Volt Min
	Max Reverse Leakage Current	Vr = 8 Volts	20 nAdc
	Power Dissipation	@ Ta = 25° C	250 mW
	Junction Temperature	125° C	
	Operating Temperature	-55° to + 125° C	
	Storage Temperature	-65° C to + 150° C	



Silicon Hyperabrupt Tuning Varactors: HF

- High Reliability, Silicon Planar
- Large Capacitance Ratios
- High Q
- Straight-Line Frequency Performance
Over a 1.5 to 4 Volt Tuning Range

The Aeroflex / Metelics High Frequency Hyperabrupt Diodes feature ion implanted epi construction. They are ideal for tuning LC resonant circuits up to 100 MHz with frequency ratios as high as 4:1. Capacitance values range from 46 pF to 270 pF at -2 Vdc.

Model	Total Capacitance pF								Tuning Ratio				Q				V _{BR} Vdc		I _R nAdc		
	MIN	TYP	MAX	TYP	MIN	TYP	MAX	TYP	TYP	MIN	TYP	MAX	MIN	TYP	MIN	TYP	MIN	TYP	TYP	MAX	
TV1401	46	57	68	6.1	4.2	4.7	5.2	81.5	13	10	12.0	17.0	—	—	75	140	12	20	10	50	
TV1402	46	57	68	6.1	4.2	4.7	5.2	81.5	13	10	12.0	17.0	200	700	—	—	12	20	50	100	
TV1403	46	57	—	6.1	—	4.7	5.2	81.5	13	10	12.0	—	200	700	—	—	12	20	100	1000	
TV1501	100	125	150	13.0	8.6	9.6	10.6	180	14	10	13.0	17.5	—	—	50	130	12	20	10	50	
TV1502	100	125	150	13.0	8.6	9.6	10.6	180	14	10	13.0	17.5	200	500	—	—	12	20	50	100	
TV1503	100	125	—	13.0	—	9.6	10.6	180	14	10	13.0	—	200	500	—	—	12	20	100	1000	
TV1601	140	175	210	18.5	12.6	14.0	15.4	255	14	10	12.5	17.0	—	—	50	120	12	20	10	50	
TV1602	140	175	210	18.5	12.6	14.0	15.4	255	14	10	12.5	17.0	200	500	—	—	12	20	50	100	
TV1603	140	175	—	18.5	—	14.0	15.4	255	14	10	12.5	—	200	500	—	—	12	20	100	1000	
TV1701	180	225	270	24.0	16.2	18.0	19.8	325	14	10	12.5	17.0	—	—	50	115	12	20	10	50	
TV1702	180	225	270	24.0	16.2	18.0	19.8	325	14	10	12.5	17.0	200	500	—	—	12	20	50	100	
TV1703	180	225	—	24.0	—	18.0	19.8	325	14	10	12.5	—	200	500	—	—	12	20	100	1000	
TV1801	—	350	—	30.5/35/37.5	—	26.5	—	400/500/550	12/14/18	—	13.0	—	—	—	—	—	12	20	10	50	
TV1802	—	350	—	30.5/35/37.5	—	26.5	—	400/500/550	12/14/18	—	13.0	—	—	—	—	—	12	20	50	100	
Test Conds.	@ 2.0 Vdc, F=1 MHz			@ -7 Vdc, F=1 MHz		@ -10Vdc, F = 1 MHz		@ 1.25 Vdc, F = 1 MHz		C _T 1.25/ C _T -7		C _T -2 / C _T -10		@ -2 Vdc, F=1 MHz		@ -2 Vdc, F= 10 MHz		@ 10 μA		@ VR -10Vdc	
Maximum Ratings				Parameter				Value													
				Reverse Voltage				Same as V _{BR} (Volts)													
				Forward Current				100 mA													
				Power Dissipation				250 mW													
				Operating Temperature				-55 to + 150 °C													
				Storage Temperature				-65 to + 200 °C													



Plastic SMT



Glass Axial Leaded

Silicon Hyperabrupt Tuning Varactors: UHF

- High Reliability, Silicon Planar
- Octave Tuning at UHF
- Octave Tuning at VHF
- Straight-Line Frequency Applications
Over a 3 to 8 Volt Bias Range
- Low Cost Applications

The Aeroflex / Metelics UHF Tuning Varactors offer higher Qs than their VHF counterparts, but have slightly lower capacitance ratios. These diodes are excellent for octave tuning up to 800 MHz and for straight-line-frequency tuning between 3 and 8 volts of bias. They also achieve exceptionally high Q values and large signal capabilities when tuned between 9 and 20 volts, which extends their useful range to over 1 GHz. Closely matched sets are available, designed by suffix "A".

Model	Total Capacitance pF						Tuning Ratio				Q		V _{BR}		I _R nAdc					
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	TYP	MIN	TYP	TYP	MAX	TYP	MAX	TYP	MAX
TV2101	10.5	12.5	4.3	5.7	2.0	2.3	5.0	5.8	—	—	300	350	22	30	—	—	—	—	10	100
TV2101A	10.9	12.1	4.6	5.4	2.0	2.3	5.0	5.8	—	—	300	350	22	30	—	—	—	—	10	100
TV2102	10.5	12.5	4.3	5.7	2.0	2.4	4.7	5.5	—	—	200	300	22	30	—	—	—	—	10	100
TV2102A	10.9	12.1	4.6	5.4	2.0	2.4	4.7	5.5	—	—	200	300	22	30	—	—	—	—	10	100
TV2103	10.5	12.5	4.3	5.7	—	—	—	—	1.9	2.7	200	300	15	18	—	—	50	500	—	—
TV2103A	10.9	12.1	4.6	5.4	—	—	—	—	2.0	2.6	200	300	15	18	—	—	50	500	—	—
TV2104	10.5	12.5	—	—	—	—	—	—	—	—	100	150	8	12	50	500	—	—	—	—
TV2801	25.0	31.0	10.0	13.5	4.5	5.1	5.2	6.1	—	—	200	250	22	30	—	—	—	—	20	100
TV2801A	26.5	29.5	11.0	13.0	4.5	5.1	5.2	6.1	—	—	200	250	22	30	—	—	—	—	20	100
TV2802	25.0	31.0	10.0	13.5	4.5	5.3	4.9	5.8	—	—	150	200	22	30	—	—	—	—	20	100
TV2802A	26.5	29.5	11.0	13.0	4.5	5.3	4.9	5.8	—	—	150	200	22	30	—	—	—	—	20	100
TV2803	25.0	31.0	10.0	13.5	—	—	—	—	1.9	2.8	150	200	15	18	—	—	50	500	—	—
TV2803A	26.5	29.5	11.0	13.0	—	—	—	—	2.0	2.7	150	200	15	18	—	—	50	500	—	—
TV2804	25.0	31.0	—	—	—	—	—	—	—	—	75	100	8	12	50	500	—	—	—	—
Test Conds.	@ -3 Vdc, F = 1 MHz		@ -8 Vdc, F = 1 MHz		@ -20 Vdc, F = 1 MHz		C _T 3 / C _T 20		C _T 3 / C _T 8		@ -3 Vdc, F = 50 MHz		@ 10 μA		@ -6 V		@ -10 V		@ -20 V	

Maximum Ratings	Parameter	Value
	Reverse Voltage	Same as V _{BR} (Volts)
	Forward Current	100 mA
	Power Dissipation	250mW
	Operating Temperature	-55 to + 150 °C
	Storage Temperature	-65 to + 200 °C



Silicon Hyperabrupt Tuning Varactors: VHF

- High Reliability, Silicon Planar Hermetically Sealed
- Octave Tuning or Ultra-High Q Applications
- Straight-Line Frequency Applications Over a 3 to 8 Volt Bias Range
- Low Cost Applications

The Aeroflex / Metelics VHF Tuning Varactors are Ion-implanted highly reproducible hyperabrupt diodes which allow octave tuning of LC tanks up to 500 MHz or, with a reduced 1.5 to 1 frequency ratio, straight-line frequency tuning over a 3 to 8 volt tuning range. These UHF diodes give a full capacitance range of 20 to 200pF at 4 volts bias, ultra high Q and excellent large signal handling capabilities, along with a 2 to 1 capacitance ratio by tuning from 9 to 20 volts of reverse bias. Closely matched sets of all VHF diodes are available along with "A" suffix versions having $\pm 5\%$ capacitance tolerance at 4 volts of reverse bias.

Model	Total Capacitance pF						Tuning Ratio				Q		V _{BR} Vdc		I _R nAdc					
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	TYP	MIN	TYP	TYP	MAX	TYP	MAX	TYP	MAX
TV2001	18	22	7.5	10.5	3.1	3.9	—	—	5.4	6.6	160	220	22	30	—	—	—	—	15	100
TV2001A	19	21	7.8	9.2	3.1	3.9	—	—	5.4	6.6	160	230	22	30	—	—	—	—	15	15
TV2002	18	22	7.5	10.5	—	—	1.8	2.7	—	—	160	220	15	18	—	—	15	100	—	—
TV2002A	19	21	7.8	9.2	—	—	2.0	2.7	—	—	160	220	15	18	—	—	15	100	—	—
TV2004	18	22	7	11	—	—	—	—	—	—	80	120	8	12	50	250	—	—	—	—
TV2201	45	55	18	25	7.3	9.2	—	—	5.6	6.9	125	165	22	30	—	—	—	—	20	100
TV2201A	47.5	52.5	18.4	21.6	7.3	9.2	—	—	5.6	6.9	125	165	22	30	—	—	—	—	20	100
TV2202	45	55	18	25	—	—	1.8	2.8	—	—	125	165	15	18	—	—	20	100	—	—
TV2202A	47.5	52.5	18.4	21.6	—	—	2.2	2.8	—	—	125	165	15	18	—	—	20	100	—	—
TV2204	45	55	17	26	—	—	—	—	—	—	65	100	8	12	50	250	—	—	—	—
TV2301	100	120	39	55	15	19	—	—	5.9	7.3	80	110	22	30	—	—	—	—	30	100
TV2301A	105	115	41.5	48.6	15	19	—	—	5.9	7.3	80	110	22	30	—	—	—	—	30	100
TV2302	100	120	39	55	—	—	1.8	2.8	—	—	80	110	15	18	—	—	30	100	—	—
TV2302A	105	115	41.5	48.6	—	—	2.15	2.8	—	—	80	110	15	18	—	—	30	100	—	—
TV2304	100	120	36	58	—	—	—	—	—	—	40	60	8	12	50	250	—	—	—	—
TV2401	140	170	55	80	22.5	28	—	—	5.8	7.1	70	90	22	30	—	—	—	—	50	500
TV2401A	147	163	59.8	70.2	22.5	28	—	—	5.8	7.1	70	90	22	30	—	—	—	—	50	500
TV2402	140	170	55	80	—	—	1.8	2.8	—	—	70	90	15	18	—	—	50	500	—	—
TV2402A	147	163	59.8	70.2	—	—	2.1	2.7	—	—	70	90	15	18	—	—	50	500	—	—
TV2404	140	170	50	85	—	—	—	—	—	—	35	50	8	12	50	500	—	—	70	500
TV2501	180	220	70	105	29	36	—	—	5.8	7.1	60	80	22	30	—	—	—	—	—	—
TV2501A	190	210	78	92	29	36	—	—	5.8	7.1	60	80	22	30	—	—	—	—	70	500
TV2502	180	220	70	105	—	—	1.8	2.8	—	—	60	80	15	18	—	—	70	500	—	—
TV2502A	190	210	78	92	—	—	2.0	2.7	—	—	60	80	15	18	—	—	70	500	—	—
TV2504	180	220	65	110	—	—	—	—	—	—	30	45	8	12	50	500	—	—	—	—
Test Conditions	@ -4 Vdc, F=1MHz		@ -8 Vdc, F=1MHz		@ -20 Vdc, F= 1 MHz		C _T 4 / C _T 8		C _T 4 / C _T 20		@ -4 V, F = 50 MHz		@ 10 μA		@ -6 V		@ -10 V		@ -20 V	
Maximum Ratings			Parameter				Value													
			Reverse Voltage				Same as V _{BR} (Volts)													
			Forward Current				100 mA													
			Power Dissipation				250 mW													
			Operating Temperature				-55 to + 150 °C													
			Storage Temperature				°C													



Silicon Hyperabrupt Varactors: Microwave

- All EPI Mesa Construction
- High Reliability
- Frequency Linear Profiles
- Glass Passivation
- High Q
- Wide Tuning Ratios

The Aeroflex / Metelics MHV-500 Series Microwave Hyperabrupt Tuning Varactors are silicon epitaxial mesa devices with high reliability glass passivation which ensures optimum VCO settling time and flat post tuning drift response. They offer Q values well above ion-implanted hyperabrupt diodes. These diodes offer octave tuning through 9 GHz. They are available in a wide variety of case styles for surface mount and/or cavity requirements. Chip devices are recommended for wide bandwidth performance and frequency response.

Model	Junction Capacitance pF									Ratio		Q
	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	MIN	MAX	
MHV500	2.25	2.5	2.75	.70	.80	.90	.13	.20	.30	3.0	5.5	2600
MHV501	2.8	3.1	3.4	.90	1.0	1.1	.16	.24	.36	3.0	5.5	2500
MHV502	3.3	3.7	4.1	.98	1.2	1.32	.18	.28	.44	3.0	5.5	2400
MHV503	4.2	4.7	5.2	1.35	1.5	1.65	.24	.36	.55	3.0	5.5	2300
MHV504	5.0	5.6	6.2	1.63	1.8	1.98	.30	.43	.66	3.0	5.5	2200
MHV505	6.1	6.8	7.5	1.98	2.2	2.42	.36	.52	.80	3.0	5.5	2000
MHV506	7.2	8.4	9.2	2.43	2.7	2.97	.44	.64	1.0	3.0	5.5	1800
MHV507	9.0	10.0	11.0	2.97	3.3	3.63	.54	.78	1.21	3.0	5.5	1500
MHV508	10.8	12.0	13.2	3.51	3.9	4.29	.64	.93	1.43	3.0	5.5	1200
MHV509	13.1	14.6	16.1	4.23	4.7	5.17	.77	1.12	1.72	3.0	5.5	1000
MHV510	15.7	17.4	19.1	5.04	5.6	6.16	.91	1.33	2.05	3.0	5.5	800
MHV511	18.9	21.0	23.1	6.12	6.8	7.48	1.11	1.62	2.5	3.0	5.5	700
MHV512	22.9	25.4	28.0	7.38	8.2	9.02	1.34	1.95	3.0	3.0	5.5	650
MHV513	27.9	31.0	34.1	9.0	10.0	11.0	1.64	2.38	3.67	3.0	5.5	600
Test Conditions	V _R = 0 V, F = 1MHz			V _R = 4 V, F = 1 MHz			V _R = 20 V, F = 1 MHz			C _{J 4} / C _{J 20}		
Maximum Ratings				Parameter			Value			Units		
				Operating Temperature			-55 to + 150 °C			°C		
				Storage Temperature Range			-65 to + 200 °C			°C		
				Minimum Voltage Breakdown			22 Volts			Volts		
				Maximum Leakage Current			50 nA			nA		



Bare Die



Ceramic Epoxy SMT



Ceramic Hemetic SMT



Ceramic Microwave Pill

Silicon Zener Diodes

- Sharper Breakdown
- Lower Leakage Current Characteristics in the 4–10 Volt range and the 5–9 Volt range

The family of Aeroflex / Metelics Silicon Zener Avalanche Diodes includes a variety of models in various voltage ranges. They feature sharp breakdown and low leakage LVA regulators. Certain models also feature exceptionally low noise, low impedance and sharp knees for high performance, low current applications.

Sharp Breakdown, Low Leakage LVA Regulator, 4–10 Volt Range

Model	Voltage Vz @ Izt Vdc	Test Current Izt mA	Zener Impedance Zzt @ Izt Ω	Reverse Leakage Current MAX		Noise Density @ 250 μ A
	TYP		MAX	I _R μ Adc	V _R Vdc	MAX
LVA43A	4.3	20	18	4.0	1.5	4
LVA47A	4.7	10	15	4.0	2.0	4
LVA51A	5.1	5	15	0.1	2.0	4
LVA56A	5.6	1	40	0.05	3.0	4
LVA62A	6.0	1	50	0.05	4.0	4
LVA68A	6.8	1	50	0.05	5.0	4
LVA75A	7.5	1	100	0.01	6.0	4
LVA82A	8.2	1	100	0.01	6.5	4
LVA91A	9.1	1	100	0.01	8.0	4
LVA100A	10.0	1	100	0.01	9.0	4

Maximum Rating	Parameters	Value	Rating
	Package style	CS85 (DO-7)	
	Forward Voltage	@ If = 200 mAdc	1.5 Vdc
	Noise Density	@ Iz = 250 μ Adc	4.0 μ V / $\sqrt{\text{Hz}}$
	Power Dissipation	@ Ta = 25° C	400 mW
	Operating Temperature		-65° C to + 175° C
	Storage Temperature		-65° C to + 200° C
	Voltage Tolerance	Standard Device	±10%
	Suffix A	±5%	
	Suffix B	±2%	

Noise Density measured from 1000 to 3000 Hz.



Silicon Zener Diodes

Sharp Breakdown, Low Leakage LVA Regulator, 5–9 Volt Range

Model	Voltage	Zener Impedance ¹	Reverse Leakage		Regulation Factor			T _C	Noise Density
	TYP	TYP	μAdc MAX	Vdc MAX	DVz Vdc MAX	Izh mAdc MAX	IzL μAdc MAX	TYP	MAX
LVA450A	5.0	700	10.0	4.00	0.40	1.0	100	0.75	1
LVA453A	5.3	250	5.0	4.24	0.20	1.0	100	1.33	1
LVA456A	5.6	100	1.0	4.48	0.10	1.0	50	1.96	1
LVA459A	5.9	100	0.5	4.72	0.10	1.0	10	2.30	1
LVA462A	6.2	100	0.1	4.96	0.10	1.0	10	2.67	1
LVA465A	6.5	100	0.05	5.20	0.10	1.0	10	3.06	1
LVA468A	6.8	100	0.01	5.44	0.10	1.0	10	3.40	1
LVA471A	7.1	175	0.01	5.68	0.10	1.0	10	3.76	1
LVA474A	7.4	175	0.01	5.92	0.10	1.0	10	4.07	1
LVA477A	7.7	175	0.01	6.16	0.10	1.0	10	4.47	1
LVA480A	8.0	175	0.01	6.40	0.10	1.0	10	4.80	1
LVA483A	8.3	175	0.01	6.64	0.10	1.0	10	5.15	1
LVA486A	8.6	175	0.01	6.88	0.10	1.0	10	5.50	1
LVA489A	8.9	175	0.01	7.12	0.10	1.0	10	5.87	2
LVA492A	9.2	175	0.01	7.36	0.10	1.0	10	6.16	2
LVA495A	9.5	175	0.01	7.60	0.10	1.0	10	6.46	2
LVA498A	9.8	175	0.01	7.84	0.10	1.0	10	6.86	2
Test Conditions	@ 250 μA	@ 250 μAdc	I _R @ V _R					@ 250 μAdc MV/°C	@ 250 μA

Maximum Rating	Parameters	Value	Rating
	Package style	CS85 (DO-7)	
	Forward Voltage	@ If=200 mAdc	1.5Vdc
	Noise Density	@ Iz=250 μAdc ²	1.0 μV / √Hz
	Power Dissipation	@ Ta=25° C	400 mW
	Operating Temperature	-65° C to + 175° C	
	Storage Temperature	-65° C to + 200° C	
	Voltage Tolerance:	Standard Device	+0.20 Vdc

Notes:

1. Impedance measured with 10% 60 Hz AC superimposed on Izt.

2. Noise Density on devices LVA489 to LVA498 increases to 2.0 max. Noise Density measured from 1000 to 3000 Hz.



Silicon Zener Diodes

- Designed for Use at Low Current Levels
- Low Leakage
- Low Impedance
- Low Noise
- Sharp Knees

IN5000 Series, Low Voltage, High Performance, Low Noise, Low Leakage

Model	Zener Voltage V _Z	Test Current I _{zt} mA	Zener Impedance ² Ω	Reverse Leakage Current			Noise Density ³	Regulation Factor ⁴		Regulator Current I _{zm} mAdc
	TYP		MAX	I _r μAdc MAX	V _R ¹ MAX	V _R ² Volts MAX	MAX	Δ V _Z Volts MAX	I _{zL} mAdc MAX	MAX
1N5518	3.3	20	26	5.0	0.9	1.0	0.5	0.90	2.0	115
1N5519	3.6	20	24	3.0	0.9	1.0	0.5	0.90	2.0	105
1N5520	3.9	20	22	1.0	0.9	1.0	0.5	0.85	2.0	98
1N5521	4.3	20	18	3.0	1.0	1.5	0.5	0.75	2.0	88
1N5522	4.7	10	22	2.0	1.5	2.0	0.5	0.60	1.0	81
1N5523	5.1	5	26	2.0	2.0	2.5	0.5	0.65	0.25	75
1N5524	5.6	3	30	2.0	3.0	3.5	1.0	0.30	0.25	68
1N5525	6.2	1	30	1.0	4.5	5.0	1.0	0.20	0.01	61
1N5526	6.8	1	30	1.0	5.5	6.2	1.0	0.10	0.01	56
1N5527	7.5	1	35	0.5	6.0	6.8	2.0	0.05	0.01	51
1N5528	8.2	1	40	0.5	6.5	7.5	4.0	0.05	0.01	46
1N5529	9.1	1	45	0.1	7.0	8.2	4.0	0.05	0.01	42
1N5530	10.0	1	60	0.05	8.0	9.1	4.0	0.10	0.01	38
1N5531	11.0	1	80	0.05	9.0	9.9	5.0	0.20	0.01	35
1N5532	12.0	1	90	0.05	9.5	10.8	10.0	0.20	0.01	32
1N5533	13.0	1	90	0.01	10.5	11.7	15.0	0.20	0.01	29
1N5534	14.0	1	100	0.01	11.5	12.6	20.0	0.20	0.01	27
1N5535	15.0	1	100	0.01	12.5	13.5	20.0	0.20	0.01	25
1N5536	16.0	1	100	0.01	13.0	14.4	20.0	0.20	0.01	24
1N5537	17.0	1	100	0.01	14.0	15.3	20.0	0.20	0.01	22
1N5538	18.0	1	100	0.01	15.0	16.2	20.0	0.20	0.01	21
1N5539	19.0	1	100	0.01	16.0	17.1	20.0	0.20	0.01	20
1N5540	20.0	1	100	0.01	17.0	18.0	20.0	0.20	0.01	19
1N5541	22.0	1	100	0.01	18.0	19.8	25.0	0.25	0.01	17
1N5542	24.0	1	100	0.01	20.0	21.6	30.0	0.30	0.01	16
1N5543	25.0	1	100	0.01	21.0	22.4	35.0	0.35	0.01	15
1N5544	28.0	1	100	0.01	23.0	25.2	40.0	0.40	0.01	14
1N5545	30.0	1	100	0.01	24.0	27.0	45.0	0.45	0.01	13
1N5546	33.0	1	100	0.01	28.0	29.7	50.0	0.50	0.01	12
Test Conditions	@ I _{zt} (Volts)		Z _{zt} @ I _{zt}				@ I _z = 250 μA ND μV / √Hz			

Notes

1. Package style CS85 (DO-7)
 2. Suffix denotes V_Z tolerance: non suffix +20%, A suffix +10%; I_R @ V_R1, V_Z, + V_f only. Suffix B +5%: I_r @ V_R2, V_Z, DV_Z, V_f, ND.
 3. Measured with 10%, 60 Hz AC superimposed on I_{zt}.
 4. Measured from 1000 to 3000 Hz.
 5. Difference between V_Z as I_{zt} and I_{zL}.
 6. Forward Voltage (V_f): I_f = 200 mA, T_a = 25° C, mA = 1.1 Vdc.
- MILITARY SCREENING AVAILABLE



Silicon Zener Diodes

1N6000 Series Low Voltage, High Performance, Low Noise, Low Leakage

Model	Zener Voltage	Test Current Izt mA	Zener Impedance ²	Reverse Leakage Current		Noise Density ³	Regulation Factor ⁴		LVA TYPE ¹
	TYP		Ω MAX	Ir μ Adc MAX	Vr ² Volts MAX	MAX	Δ Vz Volts MAX	IzL mAdc MAX	
1N6082	4.3	20	18	2.0	1.5	1.0	0.75	2.0	LVA343A
1N6083	4.7	10	10	2.0	2.0	1.0	0.50	1.0	LVA347A
1N6084	5.1	5	10	2.0	3.0	1.0	0.30	0.25	LVA351A
1N6085	5.6	1	40	2.0	4.5	1.0	0.10	0.05	LVA356A
1N6086	6.2	1	45	0.5	5.6	1.0	0.10	0.01	LVA362A
1N6087	6.8	1	50	0.05	6.2	1.0	0.10	0.01	LVA368A
1N6088	7.5	1	50	0.01	6.8	1.0	0.10	0.01	LVA375A
1N6089	8.2	1	60	0.01	7.5	1.0	0.10	0.01	LVA382A
1N6090	9.1	1	60	0.01	8.2	2.0	0.10	0.01	LVA391A
1N6091	10.0	1	60	0.01	9.1	2.0	0.10	0.01	LVA3100A
Test Conditions	Vz @ Izt Volts		Zzt @ Izt			@ Iz = 250 μ A (ND μ V / $\sqrt{\text{Hz}}$)			

Notes:

- Suffix denotes Vz tolerance: non suffix +20%, A suffix +10%.
- Measured with 10%, 60 Hz AC superimposed on Izt.
- Measured from 1000 to 3000 Hz.
- Difference between Vz as Izt and IzL.
- VF @ 200mA = 1.2V max.
- Power rating is 400 mW @ 25° C, derate linearly to zero @ 175° C.



Silicon Zener Diodes

Low Level, Very Low Voltage, Low Leakage					
Model	Zener Voltage Vdc	Dynamic Impedance Ω		Reverse Current	
				I _r μ A _{dc}	V _r Vdc
	TYP	MAX	MAX	MAX	
K120	1.2	20	125	.05	0.4
K150	1.5	20	125	.05	0.5
K180	1.8	20	125	.05	0.6
K210	2.1	20	125	.05	0.9
K240	2.4	20	125	.05	1.2
K270	2.7	20	125	.05	1.7
K300	3.0	20	125	.05	1.9
K330	3.3	20	125	.05	2.2
K360	3.6	20	125	.05	2.5
K390	3.9	20	125	.05	2.7
K430	4.3	25	135	.05	3.1
K470	4.7	25	135	.05	3.5
K510	5.1	25	135	.05	3.8
Test Conditions	V _z @ I _z = 10 mA	Z _z @ I _z = 10 mA	Z _K @ I _z = 1 mA	@25° C	
Maximum Rating	Parameters		Value	Rating	
	DC Power Dissipation		@ T _a = 50° C	250 mW	
	Operating Temperature (T _{OPR})		-65 to + 175° C		
	Storage Temperature (T _{STG})		-65 to + 200° C		
	Voltage Tolerance:		Standard Device	+10%	
	Other package styles available				



Silicon Zener Diodes

Low Level Zener Diodes, Sharp Knee, Low Impedance

Model	Zener Voltage Vz Vdc	Dynamic Impedance		Reverse Current	
	TYP	Zz Ω MAX	Zzk Ω	Ir μA MAX	Vr Vdc
K511	5.1	50	15	.05	2.5
K561	5.6	45	15	.05	3.5
K621	6.2	35	18	.05	5.6
K681	6.8	25	18	.05	6.4
Test Conditions	@ Iz = 250 μA	@ Iz = 250 μA	@ Iz = 1 mA	@ 25° C	

Maximum Rating	Parameters	Value	Rating
	DC Power Dissipation	@Ta = 50° C	250 mW
	Derate above 50° C		2 mW/° C
	Forward Voltage Drop	@ If = 100 mA	1.3 Vdc
	Operating Temperature		-65 to + 175° C
	Storage Temperature		-65 to + 200° C
	Voltage Tolerance:	Standard Device	+10%



Silicon Zener Diodes

Low Level Zener Diodes, Low Current: 250 μ A - Low Noise						
Model	Zener Impedance Z _{zt} Ω	Zener Impedance Z _{zt} Ω	Reverse Leakage Current		Zener Vol Max Noise Density Volts	Regulator Current I _{zm} mA _{dc}
	TYP	MAX	I _r μ A _{dc} MAX	V _r V _{dc} MAX	TYP	MAX
1N4099	6.8	200	10.0	5.17	40	35.0
1N4100	7.5	200	10.0	5.70	40	31.8
1N4101	8.2	200	1.0	6.24	40	29.0
1N4102	8.7	200	1.0	6.61	40	27.4
1N4103	9.1	200	1.0	6.92	40	26.2
1N4104	10.0	200	1.0	7.60	40	24.8
1N4105	11.0	200	0.05	8.44	40	21.6
1N4106	12.0	200	0.05	9.12	40	20.4
1N4107	13.0	200	0.05	9.87	40	19.0
1N4108	14.0	200	0.05	10.65	40	17.5
1N4109	15.0	100	0.05	11.40	40	16.3
1N4110	16.0	100	0.05	12.15	40	15.4
1N4111	17.0	100	0.05	12.92	40	14.5
1N4112	18.0	100	0.05	13.67	40	13.2
1N4113	19.0	150	0.05	14.44	40	12.5
1N4114	20.0	150	0.01	15.20	40	11.9
1N4115	22.0	150	0.01	16.72	40	10.8
1N4116	24.0	150	0.01	18.25	40	9.9
1N4117	25.0	150	0.01	19.00	40	9.5
1N4118	27.0	150	0.01	20.46	40	8.8
1N4119	28.0	200	0.01	21.28	40	8.5
1N4120	30.0	200	0.01	22.80	40	7.9
1N4121	33.0	200	0.01	25.08	40	7.2
Test Conditions	@ 250 μ A	@ 250 μ A			@ I _z = 250 μ A μ V _z / $\sqrt{\text{Hz}}$ tag V _z @ = 250 μ A	



Silicon Zener Diodes

Low Level Zener Diodes, Low Current: 250 μ A - Low Noise						
Model	Zener Voltage V_z Volts	Zener Impedance Z_{zt} Ω	Reverse Leakage Current		Noise Density	Regulator Current I_{zm} mA _{dc}
	TYP	MAX	I_r μ A _{dc} MAX	V_r V _{dc} MAX	MAX	MAX
1N4614	1.8	1200	7.5	1.0	1	120.0
1N4615	2.0	1250	5.0	1.0	1	110.0
1N4616	2.2	1300	4.0	1.0	1	100.0
1N4617	2.4	1400	2.0	1.0	1	95.0
1N4618	2.7	1500	1.0	1.0	1	90.0
1N4619	3.0	1600	0.8	1.0	1	85.0
1N4620	3.3	1650	7.5	1.5	1	80.0
1N4621	3.6	1700	7.5	2.0	1	75.0
1N4622	3.9	1650	5.0	2.0	1	70.0
1N4623	4.3	1600	4.0	2.0	1	65.0
1N4624	4.7	1550	10.0	3.0	1	60.0
1N4625	5.1	1500	10.0	3.0	2	55.0
1N4626	5.6	1400	10.0	4.0	4	50.0
1N4627	6.2	1200	10.0	5.0	5	45.0
Test Conditions	@ = 250 μ A	@ 250 μ A			@ $I_z = 250 \mu$ A μ V _z / $\sqrt{\text{Hz}}$	
Maximum Rating		V _z Tolerance $\pm 5\%$.				
		Forward Voltage (VF) Maximum 1.0 V _{dc} (1N4614-1N4627 $I_F = 100$ mA; 1N4099-1N4121 $I_F = 200$ mA).				
		Noise Density measured from 1000 to 3000 Hz.				

MILITARY SCREENING AVAILABLE



Silicon Zener Diodes

Low Level Zener Diodes, Ultra-Low Current: 50 μ A – Low Leakage

Model	Zener Voltage Vz Volts	Reverse Leakage Current		Regulation Factor Volts	Regulator Current Izm mAdc
	TYP	Ir μ Adc MAX	Vr Vdc MAX	MAX	MAX
1N4678	1.8	7.5	1.0	0.70	120.0
1N4679	2.0	5.0	1.0	0.70	110.0
1N4680	2.2	4.0	1.0	0.75	100.0
1N4681	2.4	2.0	1.0	0.80	95.0
1N4682	2.7	1.0	1.0	0.85	90.0
1N4683	3.0	0.8	1.0	0.90	85.0
1N4684	3.3	7.5	1.5	0.95	80.0
1N4685	3.6	7.5	2.0	0.95	75.0
1N4686	3.9	5.0	2.0	0.97	70.0
1N4687	4.3	4.0	2.0	0.99	65.0
1N4688	4.7	10.0	3.0	0.99	60.0
1N4689	5.1	10.0	3.0	0.97	55.0
1N4690	5.6	10.0	4.0	0.96	50.0
1N4691	6.2	10.0	5.0	0.95	45.0
1N4692	6.8	10.0	5.1	0.90	35.0
1N4693	7.5	10.0	5.7	0.75	31.8
1N4694	8.2	1.0	6.2	0.50	29.0
1N4695	8.7	1.0	6.6	0.10	27.4
1N4696	9.1	1.0	6.9	0.08	26.2
1N4697	10.0	1.0	7.6	0.10	24.8
1N4698	11.0	0.05	8.4	0.11	21.6
1N4699	12.0	0.05	9.1	0.12	20.4
1N4700	13.0	0.05	9.8	0.13	19.0
1N4701	14.0	0.05	10.6	0.14	17.5
1N4702	15.0	0.05	11.4	0.15	16.3
1N4703	16.0	0.05	12.1	0.16	15.4
1N4704	17.0	0.05	12.9	0.17	14.5
1N4705	18.0	0.05	13.6	0.18	13.2
1N4706	19.0	0.05	14.4	0.19	12.5
1N4707	20.0	0.01	15.2	0.20	11.9
1N4708	22.0	0.01	16.7	0.22	10.8
1N4709	24.0	0.01	18.2	0.24	9.9
1N4710	25.0	0.01	19.0	0.25	9.5
1N4711	27.0	0.01	20.4	0.27	8.8
1N4712	28.0	0.01	21.2	0.28	8.5
1N4713	30.0	0.01	22.8	0.30	7.9
1N4714	33.0	0.01	25.0	0.33	7.2
Test Conditions	@ = 50 μ A			100 μ Adc To 10 μ Adc DVz	
Maximum Rating	Vz Tolerance $\pm 5\%$.				



Current Limiter Field Effect Diodes

- Mechanical Reliability
- Low Noise Figure

Model	Regulator Current Ip mA			Regulator Impedance Zs M Ω	Knee Impedance Zk M Ω	Limiting Voltage VL MIN Volts
	TYP	MIN	MAX	MIN	MIN	MAX
1N5283	0.22	0.198	0.242	25.00	2.750	1.00
1N5284	0.24	0.216	0.264	19.00	2.350	1.00
1N5285	0.27	0.243	0.297	14.00	1.950	1.00
1N5286	0.30	0.270	0.330	9.00	1.600	1.00
1N5287	0.33	0.297	0.363	6.60	1.350	1.00
1N5288	0.39	0.351	0.429	4.10	1.000	1.05
1N5289	0.43	0.387	0.473	3.30	0.870	1.05
1N5290	0.47	0.423	0.517	2.70	0.750	1.05
1N5291	0.56	0.504	0.616	1.90	0.560	1.10
1N5292	0.62	0.558	0.682	1.55	0.470	1.13
1N5293	0.68	0.612	0.748	1.35	0.400	1.15
1N5294	0.75	0.675	0.825	1.15	0.335	1.20
1N5295	0.82	0.738	0.902	1.00	0.290	1.25
1N5296	0.91	0.819	1.00	0.88	0.240	1.29
1N5297	1.00	0.900	1.100	0.80	0.205	1.35
1N5298	1.10	0.990	1.210	0.70	0.180	1.40
1N5299	1.20	1.080	1.320	0.640	0.155	1.45
1N5300	1.30	1.170	1.430	0.580	0.135	1.50
1N5301	1.40	1.260	1.540	0.540	0.115	1.55
1N5302	1.50	1.350	1.650	0.510	0.105	1.60
1N5303	1.60	1.440	1.760	0.457	0.092	1.65
1N5304	1.80	1.620	1.980	0.420	0.074	1.75
1N5305	2.00	1.800	2.200	0.395	0.061	1.85
1N5306	2.20	1.980	2.420	0.370	0.052	1.95
1N5307	2.40	2.160	2.640	0.345	0.044	2.00
1N5308	2.70	2.430	2.970	0.320	0.035	2.15
1N5309	3.00	2.700	3.300	0.300	0.029	2.25
1N5310	3.30	2.970	3.630	0.280	0.024	2.35
1N5311	3.60	3.240	3.960	0.265	0.020	2.50
1N5312	3.90	3.510	4.290	0.255	0.017	2.60
1N5313	4.30	3.870	4.730	0.245	0.014	2.75
1N5314	4.70	4.230	5.170	0.235	0.012	2.90
Test Conditions	@ Vs = 25V			@ Vs = 25 V	@ Vk = 6 V	@ IL = 0.8 Ip

Maximum Rating	Parameters	Rating
	Operating Temperature	-55° C to + 175° C
	Storage Temperature	-55° C to + 175° C
	Package style	DO-7
	DC Power Dissipation	500 mW
	Peak Operating Voltage	100 V



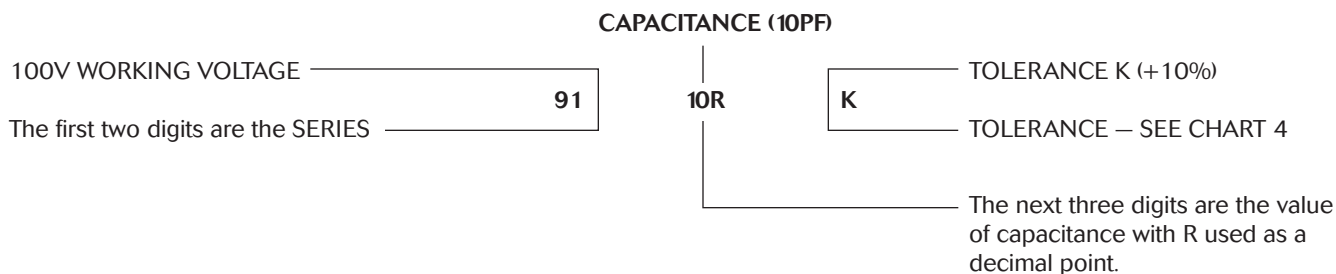
Capacitors: 9000 Series

- High Reliability Silicon Nitride/Oxide Dielectric
- Low Loss and High Q
- Long Term Reliability and Stability
- Gold Metallization Front and Back

The Aeroflex / Metelics MMI-9000 and 9100 Series Chip Capacitors feature high stand-off voltage and low dielectric loss due to our use of nitride/oxide dielectric layers. Gold bonding surfaces, top and bottom provide ease of bonding and minimum contact resistance. MIS capacitors have high insulation resistance, low dissipation factor, and low temperature coefficient, which are features that produce devices with excellent long term stability.

HOW TO ORDER:

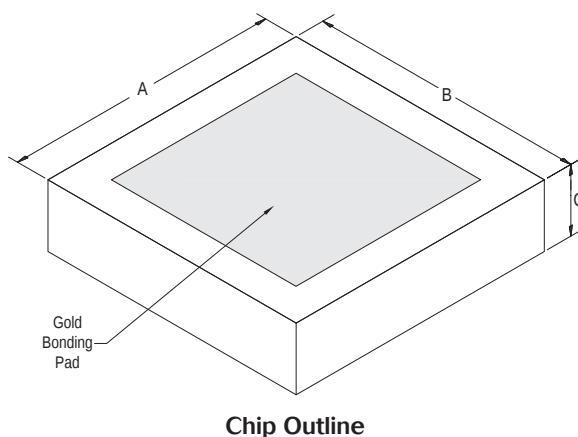
- Go to CHART 1 (9100 Series > 100 Volt Working Voltage).
Select capacitance range required.
Check CHIP size for compatibility with your circuit.
- Go to CHART 2 (9000 Series > 50 Volt Working Voltage)
for smaller chip size with lower working voltage.
- Go to CHART 3 for Beam Lead product
- Specify part number.



EXAMPLES:

9110RK => 100 WVDC 10 pF + 10% with a .020" CHIP SIZE.

902ROJ => 50 WVDC 2.0 pF + 5% with a .010" CHIP SIZE



Capacitors: 9000 Series

9100 Series Capacitors Working Voltage > 100V

Model	Capacitance Range	Chip Size + .002" Dim A x Dim B x Dim C
910R1 thru 911R9	.1 pF thru 1.9 pF	.010" x .010" x .005"
912R0 thru 919R9	2.0 pF thru 9.9 pF	.015" x .015" x .005"
9110R thru 9129R	10.0 pF thru 29 pF	.020" x .020" x .006"
9130R thru 9149R	30.0 pF thru 49 pF	.030" x .030" x .006"
9150R thru 9199R	50.0 pF thru 99 pF	.040" x .040" x .008"
91100 thru 91199	100 pF thru 199 pF	.050" x .050" x .008"
91200 thru 91399	200 pF thru 399 pF	.070" x .070" x .008"

Chart 2 9000 Series Capacitors Working Voltage > 50V

Model	Capacitance Range	Chip Size + .002" Dim A x Dim B x Dim C
902R0 thru 9010R	2.0 pF thru 10.0 pF	.010" x .010" x .005"
9010R thru 9029R	10.0 pF thru 29 pF	.015" x .015" x .005"
9030R thru 9049R	30.0 pF thru 49 pF	.020" x .020" x .006"
9050R thru 9099R	50.0 pF thru 99 pF	.030" x .030" x .006"
90100 thru 90199R	100 pF thru 199 pF	.040" x .040" x .008"
90200 thru 90399R	200 pF thru 399 pF	.050" x .050" x .008"
90400 thru 90600R	400 pF thru 600 pF	.070" x .070" x .008"

Chart 3 Beam Lead Capacitors 9000 Series VB > 50V

Model	Capacitance Range	Pkg Style
90R1 thru 90R9	.1 to .9 pF	14-1
901R0 thru 901R5	1.0 to 1.5 pF	14-1
90R5 thru 901R0	.5 to 1.0 pF	14-2
901R0 thru 902R2	1.0 to 2.2 pF	14-2
902R2 thru 904R7	2.2 to 4.7 pF	14-2
905R6M	5.6 + 20% pF	14-2
906R8M	6.8 + 20% pF	14-2
908R2M	8.2 + 20% pF	14-2
9010R0M	10 + 20% pF	14-3
9015R0M	15 + 20% pF	14-3
9022R0M	22 + 20% pF	14-3
9033R0M	33 + 20% pF	14-3
9047R0M	47 + 20% pF	14-4
9068R0M	68 + 20% pF	14-4
9082R0M	82 + 20% pF	14-4
90100R0M	100 + 20% pF	14-4

Chart 4

Tolerance +	
A = .05 pF	G = 2%
B = .1 pF	J = 5%
C = .25 pF	K = 10%
D = .5 pF	M = 20%
F = 1%	
Standard Tolerance is +10%	



Beam Lead Chips



Capacitor Chips

Mounting Capacitors

- High Reliability Silicon Nitride/Oxide Dielectric
- Low Loss and Very High Q
- Long Term Reliability and Stability

The Aeroflex / Metelics Mounting Capacitors are designed for transient protection for MICs and FETs. Since the capacitor substrate is silicon, it provides an optimum match both thermally and mechanically with the device to be mounted. A wide range of sizes and capacitance values are available as standard products. Our design flexibility and fast turn-around allow us to offer a custom design service with a two to four week delivery of prototypes. There is virtually no limit to size or capacitance value available.

HOW TO ORDER:

Capacitance (100 pF)

91100RK-SP = 100 WVDC 100 pF + 10% With a chip size of .070 x .070

The first two digits are the SERIES

91

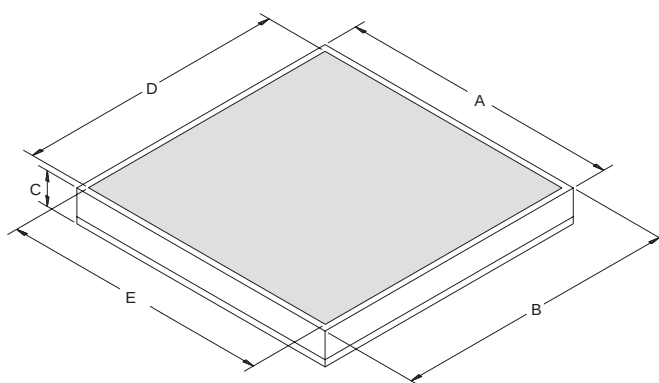
100R

K - SPXXX

CHIP SIZE see chart

TOLERANCE see chart 4 on page 81

The next three digits are the value of capacitance
with R used as a decimal point.



Chip Outline

Mounting Capacitors

MIC Mounting Capacitors: Special Capacitance and Chip Sizes

Model Suffix	Capacitance Range	Chip Size		Pad Size		Customer Specified
		A	B	D	E	
-SP87	15.0 – 150	0.013	0.120	0.009	16	.005 – .0207
-SP49	5.0 – 50.0	0.014	0.034	0.011	0.031	.005 – .020
-SP06	10.0 – 100.0	0.014	0.055	0.012	0.053	.005 – .020
-SP51	8.0 – 80.0	0.015	0.045	0.013	0.043	.005 – .020
-SP81	17.0 – 170.0	0.015	0.090	0.013	0.088	.005 – .020
-SP80	13.0 – 130	0.016	0.065	0.014	0.063	.005 – .020
-SP14	9.0 – 90.0	0.020	0.040	0.016	0.036	.005 – .020
-SP84	7.0 – 70.0	0.020	0.040	0.016	0.030	.005 – .020
-SP12	14.0 – 140	0.020	0.055	0.018	0.053	.005 – .020
-SP89	12.0 – 120	0.020	0.060	0.014	0.055	.005 – .020
-SP88	25.0 – 250	0.021	0.121	0.015	0.115	.005 – .020
-SP34	9.0 – 90.0	0.024	0.034	0.020	0.030	.005 – .020
-SP22	24.0 – 240	0.025	0.080	0.021	0.075	.005 – .020
-SP48	29.0 – 290	0.035	0.065	0.031	0.061	.005 – .020
-SP64	75.0 – 750	0.055	0.102	0.051	0.098	.005 – .020
-SP120	90.0 – 900	0.055	0.120	0.050	0.115	.005 – .020
-SP07	100 – 1000	0.085	0.085	0.081	0.081	.005 – .020
-SP38	200 – 2000	0.094	0.152	0.091	0.148	.005 – .020
-SP05	200 – 1000	0.100	0.100	0.095	0.095	.005 – .020
-SP68	175 – 1750	0.101	0.124	0.097	0.120	.005 – .020
-SP40	200 – 2000	0.107	0.134	0.103	0.130	.005 – .020
-SP02	150 – 1500	0.110	0.110	0.100	0.100	.005 – .020
-SP01	200 – 2000	0.110	0.140	0.100	0.130	.005 – .020
-SP55	360 – 3600	0.117	0.220	0.113	0.216	.005 – .020
-SP77	300 – 3000	0.118	0.175	0.114	0.171	.005 – .020
-SP39	200 – 2000	0.120	0.134	0.110	0.130	.005 – .020
-SP20	200 – 2000	0.120	0.140	0.110	0.130	.005 – .020
-SP29	200 – 2000	0.121	0.121	0.115	0.115	.005 – .020
-SP52	300 – 3000	0.130	0.170	0.124	0.164	.005 – .020
-SP44	350 – 3500	0.140	0.170	0.135	0.165	.005 – .020
-SP104	350 – 3500	0.142	0.171	0.138	0.167	.005 – .020
-SP111	350 – 3500	0.143	0.180	0.138	0.167	.005 – .020
-SP37	350 – 3500	0.151	0.168	0.147	0.164	.005 – .020
Maximum Ratings	Parameters		Rating			
	Operating Temperature		-55° C to + 150° C			
	Storage Temperature		-65° C to + 200° C			
	Voltage Breakdown		>100V Dropping the working voltage to >50V will double the high capacitance range No.			



Binary Chip Capacitors

- High Reliability Silicon Nitride-Oxide Dielectric
- Low Loss
- Long Term Reliability and Stability

The Aeroflex / Metelics BOO and BSP Series Capacitors are designed to facilitate bread-boarding or to use where a trimming capability is required. These devices feature the same dielectric layer and bonding surfaces as our 9000 and 9100 Series chip capacitors. By connecting the pads in parallel, the capacitance values are additive, so many combinations are possible.

The BSP-1 chip offers the same capacitance values as BOO and BSP-3, but in a slightly larger chip with a more accommodating layout for ease of bonding.

.015 x .015	911R5K-BSP-3	913R0K-BSP-3	913R7K-BSP-3	915R6K-BSP-3
PAD 1	0.1 pF	0.2 pF	0.25 pF	0.35 pF
PAD 2	0.2 pF	0.4 pF	0.5 pF	0.75 pF
PAD 3	0.4 pF	0.8 pF	1.0 pF	1.5 pF
PAD 4	0.8 pF	1.6 pF	2.0 pF	3.0 pF
TOTAL	1.5 pF	3.0 pF	3.75 pF	5.6 pF

.020 x .020	913R7K-BOO	917R5K-BOO	9115R0K-BOO	9122R5K-BOO
PAD 1	0.25 pF	0.5 pF	1.0 pF	1.5 pF
PAD 2	0.5 pF	1.0 pF	2.0 pF	3.0 pF
PAD 3	1.0 pF	2.0 pF	4.0 pF	6.0 pF
PAD 4	2.0 pF	4.0 pF	8.0 pF	12.0 pF
TOTAL	3.75 pF	7.5 pF	15 pF	22.5 pF

.030 x .020	913R7K-BSP-1	917R5K-BSP-1	9115R0K-BSP-1	9122R5K-BSP-1
PAD 1	0.25 pF	0.5 pF	1.0 pF	1.5 pF
PAD 2	0.5 pF	1.0 pF	2.0 pF	3.0 pF
PAD 3	1.0 pF	2.0 pF	4.0 pF	6.0 pF
PAD 4	2.0 pF	4.0 pF	8.0 pF	12.0 pF
TOTAL	3.75 pF	7.5 pF	15 pF	22.5 pF

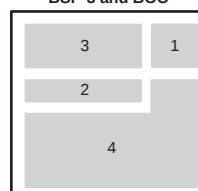
Maximum Ratings	Parameters	Rating
	Operating Temperature	-55° C to + 150° C
	Storage Temperature	-65° C to + 200° C
	Temperature Coefficient	190 ppm/°C Max
		40 ppm/°C Typical
	Voltage Breakdown	100 Volts

Insulation Resistance: 1012 Ohms Typ.
Thermal Conductivity: 1.2°C/cm/W
Capacitance Range: 0.1 pF to 600 pF

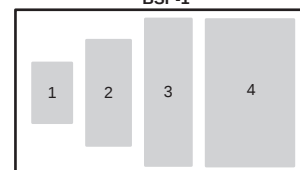
SIZES

BSP-3 = .015" x .015"
BOO = .020" x .020"
BSP-1 = .020" x .030"

BSP-3 and BOO



BSP-1



Capacitor Chips

High “Q”, Thin Film, Spiral Inductors

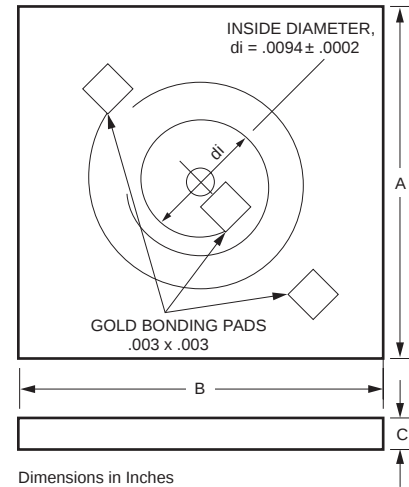
- NO need for “Staking” Coil
- Passivated Protective Coating Over Coil
- Dimensional Uniformity
- Planar Solid Structure Coil

The Aeroflex / Metelics MMI-300 Series of Spiral Inductors are formed by photolithography and plating techniques on quartz substrates. They eliminate the need for hand forming and “staking” of coil in hybrid circuits.

They provide uniformity, durability and repeatability in circuit fabrication. The coils are polyimide coated to protect from ambient contaminants, and to eliminate the need for conformal coating. Quartz substrates are rugged and reduce dielectric losses. Chips may be bonded using either conductive or non conductive epoxies, and wire bonded with gold wire or ribbon by thermocompression bonding.

Dimensions: Inches

Model	DIM “A” MAX	DIM “B” MAX	DIM “C” MAX
MMI297	.030	.030	.012
MMI298	.030	.030	.012
MMI299	.040	.040	.012
MMI300	.040	.040	.012
MMI301	.040	.040	.012
MMI302	.045	.045	.012
MMI303	.055	.055	.012
MMI304	.065	.065	.012
MMI305	.075	.075	.012
MMI306	.085	.085	.012



Spiral Inductors

Model	# of Turns	Inductance Ls(mH) MIN/ TYP/MAX	R _S DC	R _S 1GHz	Q @ F _T MIN/ MAX	Test Frequency, F _T (GHz)	Resonant Frequency, F _R (GHz)
MMI297	1.5	1.0/1.5/2.0	8.5	1.0	60/75	1.5	4.0
MMI298	2.5	2.0/2.3/2.6	1.0	1.4	50/60	1.5	3.6
MMI299	3.5	3.6/4.2/5.0	1.15	2.0	40/45	1.5	3.2
MMI300	4.5	5.0/7.5/9.0	1.75	3.5	37/43	1.5	2.3
MMI301	5.5	8.0/10/12.0	1.85	3.75	33/38	1.0	2.05
MMI302	7.5	15/20/25	2.4	4.25	27/33	0.5	1.85
MMI303	9.5	32/40/48	4.0	70	23/27	0.5	1.4
MMI304	12.5	80/90/100	9.5	22	18/24	0.5	0.975
MMI305	15.5	150/200/250	16.5	36	14/18	0.5	0.460
MMI306	18.5	250/300/350	20	42	10/15	0.5	0.250

Design Notes:

Other Values and sizes available on request. Custom design services also available.



Thin Film Resistor Chips

- Low Noise
- Excellent TCR
- Small Size
- Tight Tolerance to + .1%

The Aeroflex / Metelics Thin Film Resistors offer proven stability, low noise and excellent TCR of Tantalum Nitride in a large selection of resistance values and tolerances.

Parameter	Test Condition		
TCR	-55° C to +125° C	+150 ppm/°C (Standard value)	MAX
TCR	-55° C to +125° C	+100 ppm/°C	MAX
TCR	-55° C to +125° C	+50 ppm/°C	MAX
TCR	-55° C to +125° C	+10 ppm/°C (Special Request, NiCR only)	MAX
Operating Voltage	-55° C to 125° C	00 Vdc	MAX
Power Rating (RTotal)	@ 70° C (derate linearly to zero @ 150° C)	250 mW	MAX
Single Series	@ 70° C (derate linearly to zero @ 150° C)	250 mW	MAX
Center-Tap	@ 70° C (derate linearly to zero @ 150° C)	250 mW	MAX
Multi-Tap	@ 70° C (derate linearly to zero @ 150° C)	250 mW	MAX
Thermal Shock	Method 107 MIL-STD-202 F	+0.5%@DR	MAX
High Temperature Exposure	100 Hrs @ 150° C Ambient	+0.25%@DR	MAX
Moisture Resistance	Method 106 MIL-STD-202 F	+0.5%@DR	MAX
Life	Method 108 MIL-STD-202 F (125°C/1000 hr)	+0.5%@DR	MAX
Noise	Method 308 MIL-STD-202 F	-20 dB	MAX
Insulation Resistance	@25° C	1 X 10 ¹² Ohms	MIN

Mechanical Specification for Silicon Body Only (all others to customer requirements)

	Substrate	Silicon 10 + 2 mils thick
	Isolation Layer	SiO ₂ 10,000Å thick, min
	Backing	Lapped surface only (no metal)
	Solderable	Gold Plated Backside (optional)
	Metallization	Gold 10,000Å thick, min, Front Contacts
	Gold Bonding Pads	Front Contact > .0035" Sq.)



Thin Film Resistor Chips

Resistor Ordering System

Example

1 2 3 4 5 6 7 8

MTR - 2R2K - SR2 - K - NA - G - 1 - T

1) Is the three letter device type designation

MTR	Single Value through Chip Resistor (Resistance top to bottom)
MIR	Single Value Pad to Pad Chip Resistor (Resistance Top pad to Top pad)
MCR	Dual Value Center Tap Ratio Chip Resistor (Res. #1 = Prime Value / Res. #2 = Ratio Value)
MMR	MultiTap Chip Resistor.
XXX	as needed.

2) Is the resistance value in ohms

2R2K	2,200 Ohms
200R	200 Ohms
20R	20 Ohms
2R2M	2,200,000 Ohms
20R2K	20,200 Ohms
200RK	200,000 Ohms
2R	2.0 Ohms

3) Is the chip substrate material and chip outline dimensions (case style) R1 thru R8

S	Silicon Body	R1	20 Tap Multi Tap	.038"X.038" SR1
C	Ceramic (99.6% Alumina)	R2	Dual Value	.030"X.030" CR2
B	Berilium Oxide	R3	Single Value	.020"X.020" BR3
Q	Quartz	R3A*	Single Low Value	.020"X.020" QR3A
N	Aluminum Nitride	R4	Six Value Ladder	.020"X.060" NR4
SP	Special Material	R5	12 Tap Multi Tap	.030"X.030" SPR5
		R6	Single Low Value	.030"X.030" XR6
		R7	Single Value	.020"X.040" XR7
		R8		XR8

Please consult factory for special substrate materials (SP)
*R3A outline for resistances < 250 Ohms

4) Is the resistor value total % + tolerance See chart below

5) Is the 2nd resistor value total % ±tolerance (if applicable)

A	+ 0.5 Ohm	F	+ 1%
B	+ 1.0 Ohm	G	+ 2%
C	+ 2.5 Ohm	J	+ 5%
D	+ .01%	K	+ 10%
E	+ .1%	M	+ 20%
NA	Not applicable		

A) On Dual Value Resistors, (MCR), this is the res. ratio of the 2nd resistor (Ratio Res.) To value of the 1st resistor (Prime Res.).
B) On Multi Tap Resistors (MMR). This is the tolerance of each of the small value Resistor Taps. The large value Resistor Taps are called out on (4)

6) Backing

G	Solderable Gold
GS	Gold Silicon eutectic attachment
B	Bare

7) The temperature coefficient (TCR) of the resistor, in PPM

0	+ 150 PPM
1	+ 100 PPM
2	+ 50 PPM
3	+ 10 PPM

8) Resistor Material

T	Tantalum Nitride TaN (Self Passivating)
N	NiChrome NiCr

Example: Aeroflex / Metelics part no. MTR-200RK-SR3-F-NA-G-0-T

This would be a silicon body .020" x .020" x .010" single value through chip resistor with a total resistance tolerance of + 1%, a Solderable gold back, and Tantalum Nitride as the resistor layer and a TCR of + 150PPM.

Example: Aeroflex / Metelics part no. MCR-10RK-SR2-F-E-B-1-T

This would be a silicon body .030" x .030" x .010" two value ratio resistor with the first value resistance tolerance of + 1%, and the second, ratio resistor, tolerance being + .1% of the first value. Resistance would be the total value of the two resistor. A Bare lapped silicon back, and Tantalum Nitride as the resistor layer and a TCR of + 100PPM.

Example: Aeroflex / Metelics part no. MIR-2R5K-SR3-J-NA-B-2-N

This would be a silicon body .020" x .020" x .010" single value Top pad to Top pad chip resistor with a total resistance tolerance of + 5%, a bare silicon back, with NiChrome as the resistor layer and a TCR of + 50PPM.

Example: Aeroflex / Metelics part no. MMR-11RK-SR1-F-K-G-1-T

This would be a silicon substrate device .038" x .038" x .010". It would have a total resistance of 11KOhms + 1%. It would have ten large tops of 1KOhm + 1% each and ten small tops of 100 Ohms + 10% each. It would have a solderable gold back with a TCR of + 100ppm and a Tantalum Nitride resistive layer.

Thin Film Attenuator Pads

- Medium Power Handling 2W CW
- Flat Response From DC to 40 GHZ
- Return Loss > 18 dB DC to 12 GHZ
- Return Loss > 16 dB 13 to 40 GHZ
- Space Saving Footprint .030" X .030" (.762 X .762mm)
- Very Good Stability Over Temperature (TCR < 100 PPM)
- Ground Wrap to Top (No ground bonding required)

The Aeroflex / Metelics fixed attenuator chips are fabricated using our state of the art thin film metallization and advanced photolithography technology.

All devices are available in chip form with a metallized ground connection on the back. This ground is wrapped around on the four corners of the chip so additional ground bonding ribbon is not required.

The chips may be attached using conductive epoxy or solder preform. Gold contacts on the input and output pads make assembly, using standard bonding equipment, fast and reliable.

Custom values and configuration available on request.

Attenuator Pads

Model	Attn. (dB)	IL (dB)	RL (dB)
MAT10010	1.0	+/- .30	>18
MAT10020	2.0	+/- .30	>18
MAT10030	3.0	+/- .30	>18
MAT10040	4.0	+/- .30	>18
MAT10050	5.0	+/- .30	>18
MAT10060	6.0	+/- .35	>18
MAT10070	7.0	+/- .35	>18
MAT10080	8.0	+/- .35	>18
MAT10090	9.0	+/- .35	>18
MAT10100	10.0	+/- .35	>18
MAT10110	11.0	+/- .40	>18
MAT10120	12.0	+/- .40	>18
MAT10130	13.0	+/- .40	>18
MAT10140	14.0	+/- .40	>18
MAT10150	15.0	+/- .40	>18
MAT10160	16.0	+/- .50	>18
MAT10170	17.0	+/- .50	>18
MAT10180	18.0	+/- .50	>18
MAT10190	19.0	+/- .50	>18
MAT10200	20.0	+/- .50	>18
MAT10210	21.0	+/- .60	>18
MAT10220	22.0	+/- .60	>18
MAT10230	23.0	+/- .60	>18
MAT10240	24.0	+/- .60	>18
MAT10250	25.0	+/- .60	>18
MAT10260	26.0	+/- 1.0	>18
MAT10270	27.0	+/- 1.0	>18
MAT10280	28.0	+/- 1.0	>18
MAT10290	29.0	+/- 1.0	>18
MAT10300	30.0	+/- 1.0	>18

Notes:

Resistor pattern may vary from one value to another.

Specifications are subject to change without notice or obligation.



Custom Fabricated Device Networks

Aeroflex / Metelics Custom Fabricated Devices and Device Networks

In support of your ongoing device integration requirements, Aeroflex / Metelics is pleased to offer the following turnkey device fabrication services. A wide variety of substrate materials are available.

- Resistor networks
- Inductor networks
- Capacitor networks
- Integrated Resistor, Inductor and Capacitor networks and circuit layouts

We continually improve our service in these areas by building on our state of the art wafer fabrication labs, extensive device experience, and worldwide assembly capabilities.

Our application engineering team is available to assist you with integrating our products into ever smaller and more economical packages. In fact, we've made it our mission to offer unsurpassed engineering support and unrivaled customer service to offer you a total solution to your complex device integration requirements.

Please contact your Aeroflex / Metelics sales professional for a complete review of your custom application.

InGaP HBT Amplifiers: Darlington Gain Blocks

- Flat gain response from 100 MHz up to 12 GHz
- High linearity
- RoHS compliant
- Also available as bare die and in hermetic package
- Hi-Rel screening available in accordance with MIL-PRF-38534

The Aeroflex / Metelics InGaP Heterojunction Bipolar Transistor (HBT) MMIC amplifiers are specially designed as broadband Darlington gain blocks for instruments, CATV, and wireless infrastructure applications. These gain blocks combine different levels of small signal gain, noise and bandwidth for applications where signal gain is necessary. They are also ideal for buffer IF amplifier.

50 Ω Input / Output Darlington Amplifiers: RF Specifications @ 2 GHz

Model	Frequency Range MHz	SS Gain dB	Pout @ -1dB dBm	OIP3 dBm TYP	Noise Figure dB	VSWR		Device Voltage V	Ic mA	Package
						INPUT	OUTPUT			
MMA500	DC – 2000	20	+17	+28	3.0	1.30:1	1.30:1	4.0	45	SOT89
MMA703	DC – 4000	18	+17	+28	3.5	1.30:1	1.20:1	5.0	45	2012
MMA704	DC – 3000	17	+17	+28	3.5	1.50:1	1.50:1	5.0	45	SOT89
MMA705	DC – 4000	14	+14	+27	4.0	1.50:1	1.50:1	5.0	45	SOT89
MMA706	DC – 6000	15	+15	+27	4.0	1.40:1	1.40:1	5.0	45	2012
MMA708	DC – 4000	13	+20	+38	6.0	1.40:1	2.00:1	7.0	95	2012
MMA710	DC – 4000	13	+20	+38	6.5	1.40:1	1.90:1	7.0	95	SOT89
MMA712	DC – 12000	12	+11	+26	5.5	1.50:1	1.40:1	5.0	45	2012 CM22



InGaP HBT Amplifiers: Low and Medium Power

- High gain from 100 MHz up to 2650 GHz
- Superior MTTF resulting from low thermal resistance.
- RoHS compliant
- Also available as bare die and in hermetic package
- Hi-Rel screening available in accordance with MIL-PRF-19500

The Aeroflex / Metelics InGaP Heterojunction Bipolar Transistor (HBT) low and medium power amplifiers are specifically designed for high efficiency, Class A driver devices in wireless infrastructure applications. Their high spur free dynamic range is ideal for multi-carrier (OFDM) and digital applications. Their output power ranges from 0.25 to 4 watts. They are also ideal for high efficiency, high linearity narrow bandwidth IF amplifiers.

Medium Power Amplifiers (MPA)

Model	Frequency MHz	Gain dB	P1dB dBm	OIP3 dBm	NF dB	Bias Condition V/mA	Package
MMA701A	1930~1990	12.5	+27	+47	4.5	7/130	SOT89
	2110~2170	12.0	+27	+47	4.5		
MMA707	1930~1990	12.0	+31	+50	6.0	7/350	3030 SOIC8
	2110~2170	11.5	+31	+50	6.0		
MMA709	1930~1990	11.0	+34	+54	6.5	7/700	3030 SOIC8
	2110~2170	10.0	+34	+54	6.5		
MMA717	880~915	18.0	+31	+50	6.0	7/350	3030
MMA718	880~915	18.0	+34	+54	6.5	7/700	3030
MMA719	880~915	13.0	+36.5	+56	7.0	7/1400	6060
MMA727	430~470	19.0	+31	+50	6.0	7/350	3030
MMA728	430~470	18.0	+34	+54	6.5	7/700	3030
MMA729	430~470	18.5	+36.5	+56	7.0	7/1400	6060 SOIC8



Silicon Epitaxial Wafers

Aeroflex / Metelics is a supplier of silicon epitaxial wafers. We offer a wide range of capabilities to serve manufacturers of discrete Si devices. Our epi wafers are grown to customer-furnished specifications, based upon the following capabilities.

Epi Capabilities

Wafer Diameter:
3", 100mm, 125mm

Silicon substrate:
Bulk Czochralski, bulk floatzone or SOI

Substrate Dopant:
FZ: Boron or Phosphorus
Cz: Boron, Phosphorus, Arsenic or Antimony

Epi Layer Dopant:
Boron, Phosphorus or Arsenic

Number of Epi Layers:
1, 2 or 3

Epi Layer Resistivity Available Range:
p-type: .009 to 1000 ohm-cm (thickness dependent)
n-type: .005 to 2000 ohm-cm (thickness dependent)

Epi Layer Thickness Available Range:
0.5 to 500 m

Epi for a Variety of Devices

Aeroflex / Metelics is an experienced manufacturer of epi wafers tailored for the following discrete silicon devices:

- PIN diodes (RF and photodiode)
- Varactor diodes
- Schottky diodes
- Bipolar transistors
- MOSFETs
- JFETs
- IGBTs
- MEMs

Quality Assurance

Aeroflex / Metelics is an ISO 9001 facility. Epi wafers are inspected per the relevant SEMI standards. Our in-house epi measurement equipment includes:

- FTIR for measurement of epi layer thickness;
- C-V Hg-probe for measurement of epi resistivity;
- Spreading resistance profile (SRP) for measurement of epi resistivity vs depth;
- Four point probe for measurement of epi resistivity atop a p-n junction;
- 100% visual inspection using a high intensity Yamada inspection lamp.

Capacity

Aeroflex / Metelics can grow small quantity, one-time orders as well as high volume blanket orders. We can rapidly add production shifts in order to fulfill surge demand for epi wafers.

Experience

Aeroflex / Metelics silicon epi group is comprised of highly skilled and experienced technical staff, some with over 25 years of experience in the silicon epi industry. Like the rest of Aeroflex / Metelics, we are highly customer focused. We conduct production / planning meetings daily in order to promote on time delivery.

Quality and Reliability

Aeroflex / Metelics is committed to quality through interactions between engineering, manufacturing, and quality assurance groups at design, development, manufacture, test, and environmental screening levels for all Aeroflex / Metelics products.

Aeroflex / Metelics is firmly committed to producing and providing the highest level of quality products free of defects and deviations. Our primary goal is to achieve consistently high standards and Customer satisfaction based on internal and Customer expectations and requirements by:

- Documenting procedures and specifications used in the manufacturing, testing, and environmental screening of all Aeroflex / Metelics products
- Calibrating equipment with standards traceable to National Institute of Standards and Technology (NIST)
- Adhering to Aeroflex / Metelics internal Electrostatic Discharge (ESD) program requirements based on ANSI/ESD S20.20. All Aeroflex / Metelics Semiconductor and Thin Film products are treated to the most sensitive product ESDS threshold level Class 1 per MIL-STD-19500.
- Assuring all incoming materials conform to documented specifications
- Verifying process controls at fabrication, manufacturing, and test levels
- Performing environmental screening and conformance inspection up to and including space level per MIL-PRF-19500 and/or Customer specific requirements

Aeroflex / Metelics Sunnyvale, CA facility is ISO 9001 registered achieving certification to ISO 9001:2000 in March of 2004. A copy of our ISO certificate is available upon request.

Aeroflex / Metelics Londonderry, NH facility, is ISO 9001 registered achieving certification to ISO 9001:2000 in September 2003. A copy of our ISO certificate is available upon request.

Element Evaluation, Environmental Screening, and Conformance Inspection

Aeroflex / Metelics provides standard high reliability test programs for our Semiconductor and Thin Film products. Element Evaluations are performed in accordance with MIL-PRF-38534 Class H and Class K levels for passive components and semiconductor die. Environmental Screening and Conformance Inspection are performed in accordance with MIL-PRF-19500 JAN, JANTX, JANTXV, and JANS requirements and/or per Customer specified requirements.

Tables 1 and Table 2 represent Aeroflex / Metelics standard Element Evaluation, Environmental Screening, and Conformance Inspection testing. Certain process steps may be omitted or modified due to device performance restraints, package styles, or screening levels.

Table 1 - MIL-PRF-38534 Element Evaluation for Passive Components

Step	Class		Process	Conditions	Comments
	K	H			
1			Subgroup 1		
2	X	X	Die Electrical	Rs(Resistors) Vr, Cj (Capacitors)	100% electrical, remove rejects
3			Subgroup 2		
4	X	X	Die Visual	MIL-STD-883, Meth 2032	100% visual inspection, remove rejects
5			Subgroup 3		
6	X		Temperature Cycling	MIL-STD-883, Meth 1010, Cond C	10 Cycles, t= 10 minutes min, Ta= -65∞ C to +150∞ C
7	X		Constant Acceleration	MIL-STD-883, Meth 2001, Cond D	20,000 g's, Y1 direction
8	X		Aging (Capacitors only)	MIL-STD-883, Meth 1015, Cond A	t= 240 hrs min, Ta= +125∞ C, Vr= ____V
9	X	X	Visual Inspection	MIL-STD-883, Meth 2017	
10	X	X	End-point Electricals	Rs (Resistors) Vr, Ir, Ct (Capacitors)	Read & Record
11			Subgroup 4		
12	X	X	Bond Strength	MIL-STD-883, Meth 2011 Bond strength= 3.0g min	.001" Au wire or equivalent, 10(0) wires or 20 (1) wires

Quality and Reliability

Table 2 - MIL-PRF-38534 Element Evaluation for Semiconductor Die

Step	Class		Process	Conditions	Comments
	K	H			
1			Subgroup 1		
2	X	X	Die Electrical		100% electrical, remove rejects
3			Subgroup 2		
4	X	X	Die Visual	MIL-STD-883, Meth 2010	100% visual inspection, remove rejects
5			Subgroup 3		
6	X	X	Internal Visual	MIL-STD-883,Meth 2010 or MIL-STD-750, Meth 2072 or 2073	
7			Subgroup 4		
8	X		Temperature Cycling	MIL-STD-883, Meth 1010, Cond C	10 Cycles, t= 10 minutes min, Ta= -65° C to +150° C
9	X	X	Constant Acceleration	MIL-STD-883, Meth 2001, Cond D	20,000 g's y1 direction
10	X	X	Pre Burn-In Electrical		Go/No Go
11	X		HTRB	MIL-STD-883, Meth 1015, Cond A	t= 240 hrs min, Ta= +125° C, Vr= ____V
12	X	X	Post Burn-In Electrical		Go/No Go
13	X		Steady State Life (when conditions provided)	MIL-STD-883, Meth 1005, Cond B	t= 1000 hrs min, Ta= +125° C, Vr= __V or If=__mA
14	X	X	Final Electricals		Read & Record
15			Subgroup 5		
16	X	X	Bond Strength	MIL-STD-883, Meth 2011 Bond strength= 3.0g min	.001" Au wire or equivalent, 10(0) wires or 20 (1) wires
17			Subgroup 6		
18	X		SEM	MIL-STD-883, Meth 2018 or MIL-STD-750, Meth 2077	

Quality and Reliability

Table 3 - MIL-PRF-19500 100% Environmental Screening Semiconductor Packaged Diodes

Step	Process	Conditions	Comments	JANS	JANTXV	JANTX
1	Visual Inspection	MIL-STD-750, Meth 2073	Performed at chip level prior to assembly	X	when specified	N/A
2	Pre-cap Visual	MIL-STD-750, Meth 2074		X	X	N/A
3	Temperature Storage	MIL-STD-750 Meth 1032	t=___ hrs, Ta= +150° C	X	X	X
4	Temperature Cycling	MIL-STD-750 Meth 1051, Cond F	20 Cycles, t(text)= 10 min Ta= -65° C to +150° C	X	X	X
5	Constant Acceleration	MIL-STD-750 Meth 2006	20,000 G's min Y1 axis only (Au ribbon/wire bond only)	X	X	X
6	PIND	MIL-STD-750 Meth 2052, Cond A	Shock Pulse= 1000 +200 g's, Noise= +20mV peak to peak	X	N/A	N/
7	FIST / BIST (axial lead diodes only)	MIL-STD-750 Meth 2081(FIST), 2082(BIST)	Acc=_, Pulse=_, t=ms, f=Hz _blows in_direction, V=_V,I=_A	X	N/A	N/A
8	Fine Leak	MIL-STD-750 Meth 1071, Cond H	5x10 ⁻⁸ atm cc ³ /s max	N/A	X	X
9	Gross Leak	MIL-STD-750 Meth 1071, Cond C		N/A	X	X
10	Initial Electricals	Ir (or as specified)	Read & Record serialize diode	X	X	X
11	HTRB ¹	MIL-STD-750 Meth 1038, Cond A	t= 48 hrs min, Ta= +150° C, Vr= ___V	X	X	X
12	Interim Electricals	Ir (or as specified)	Read & Record w/in 16 hrs from removal of applied bias	X	X	X
13	Delta HTRB Measurements	Delta Ir= +_nA or 100% whichever is greater	Read & Record delta Ir from Initial to Interim electricals	X	X	X
14	PDA ²	PDA = 5% max, Actual PDA = ___	PDA = (qty rej delta Ir/qty acc delta Ir) x 100	X	X	X
15	Forward Burn In 1	MIL-STD-750 Meth 1038, Cond B	t= 240 hrs min, Ta= + ___°C, If=___ mA	X	X	X
16	Final Electricals	Ir (or as specified)	Read & Record w/in 96 hrs from removal of applied bias	X	X	X
17	Delta Forward B Measurements	Delta Ir= +_nA or 100% whichever is greater	Read & Record delta Ir from Interim to Final electricals	X	X	X
18	PDA ²	PDA = 5% max, Actual PDA = ___	PDA = (qty rej delta Ir/qty acc delta Ir) x 100	X	X	X
19	Fine Leak	MIL-STD-750 Meth 1071, Cond H	5x10 ⁻⁸ atm cc ³ /s max	X	N/A	N/A
20	Gross Leak	MIL-STD-750 Meth 1071, Cond C		X	N/A	N/A
21	Radiography	MIL-STD-750, Meth 2076	2 views, X and Y	X	N/A	N/A
22	External Visual Inspection	MIL-STD-750 Meth 2071		X	N/A	N/A

Notes:

1 - Burn-In methods and conditions to be provided by Customer and agreed upon by Aeroflex / Metelics engineering.

2 - PDA for JANTX & JANTXV level screening is +10%; PDA for JANS level screening is +5%.

Quality and Reliability

Table 4 - MIL-PRF-19500 Group A Conformance Inspection (all levels)

Group A Inspection	Sample size ¹	Conditions	Comments
Subgroup 1			
Visual & Mechanical Inspection	15	MIL-STD-750, Meth 2071	
Subgroup 2			
Electrical Tests	116 (45) ²	Ta= +25° C	Read & Record (satisfied with 100% Post BI data)
Subgroup 3			
DC (static) tests	116 (45) ²	Ta= - ____ ° C	Read & Record Ta= min rated operating temperature
DC (static) tests	116 (45) ²	Ta= + ____ ° C	Read & Record Ta= max rated operating temperature
Subgroup 4			
Dynamic tests	116 (45) ²	Ta= +25° C	

Quality and Reliability

Table 5 - MIL-PRF-19500 Group B Conformance Inspection

Group B Inspection	Sample size ^{1,2}	Conditions	Comments	JANS	JANTXV	JANTX
Subgroup 1 ⁴			Electrical rejects may be used			
Physical Dimensions	22 (8)	MIL-STD-750 Meth 2066	Specified case outline dimensions	X	N/A	N/A
Subgroup 2 ⁴			Electrical rejects may be used			
Solderability	15 (6) leads	MIL-STD-750 Meth 2026	Leads from a minimum of 3 devices shall be tested	X	X	X
Resistance to Solvents	15 (6)	MIL-STD-750 Meth 1022		X	X	X
Subgroup 3 ⁴						
Temperature Cycling	22 (6)	MIL-STD-750 Meth 1051, Cond F	45 Cycles including screening, t _{test} = 10 min Ta= -65° C to +150° C (JANS 100 cycles)	X	X	X
Thermal Shock	22 (6)	MIL-STD-750 Meth 1056, Cond B	10 Cycles (JANS 25 cycles) (glass axial lead only)	X	X	X
Surge	22 (6)		only when specified	X	X	X
Fine Leak	22(6)	MIL-STD-750, Meth 1071, Cond H	5x10 ⁻⁸ atm cc ³ /s max	X	X	X
Gross Leak	22 (6)	MIL-STD-750 Meth 1071, Cond C		X	X	X
Electrical Tests ³	22 (6)		Read & Record	X	X	X
Intermittent Operating Life	22 (12)	MIL-STD-750 Meth 1037, 2000 cycles	submit to 6000 cycles to satisfy Grp C Subgrp 6 requirement	N/A	X	X
Electrical Tests ³	22 (12)		Read & Record	N/A	X	X
De-cap Internal Visual	6 (6)	MIL-STD-750 Meth 2075	Decap devices	X	X	X
Bond Strength	22 (12) wires or 1 (6) devices	MIL-STD-750 Meth 2037	use for die shear	X	X	X
SEM	22 (12)	MIL-STD-750, METH 2077	when specified	X	X	X
Die Shear	11 (6)	MIL-STD-750, METH 2017	use bond pull samples	X	N/A	N/A
Subgroup 4 ⁴						
Intermittent Operating Life	22 (12)	MIL-STD-750 Meth 1037, 2000 cycles	submit to 6000 cycles to satisfy Grp C Subgrp 6 requirement	X	N/A	N/A
Electrical Tests	22 (12)		Read & Record satisfy w/Grp C Subgrp 6	X	N/A	N/A
Subgroup 5 ⁴						
Accelerated Steady State Life	22 (12)	MIL-STD-750, Meth 1027 *Schottky= Tj max, 240 hrs	t= 96 hrs, Ta= +275° C Vr=__V(pk), Io=__mA, f=__Hz	X	N/A	N/A
Electrical Tests ³	22 (12)		Read & Record	X	N/A	N/A
Subgroup 6 ⁴						
Thermal Resistance	22 (8)	MIL-STD-750 Meth 408 (Meth 3101 option JANS)	Read & Record	X	X	X
High Temp Life (Non-operating)	22 (12)	MIL-STD-750 Meth 1032	t= 340 hrs, Ta= T STG(MAX)	N/A	X	X
Electrical Tests ³	22 (12)		Read & Record	N/A	X	X

Notes:

1 - Small lot sample size defined in parentheses (). Inspection lot quantity shall not exceed 2,500 pcs for JANTX & JANTXV

Group A small lot sampling; inspection lot quantity shall not exceed 1,000 pcs for JANS Group A small lot sampling.

Group B small lot sampling; inspection lot quantity shall not exceed 1,000 pcs for JANS Group B small lot sampling.

2 - Electrical test parameters shall be defined by product type and specific requirements; test limits at temperature may vary from those published in this catalog.

3 - Endpoint electricals tests parameters shall be defined by product type and specific requirements.

4 - Test sequence may differ according to JAN screening level.

Quality and Reliability

Table 6 - MIL-PRF-19500 Group C Conformance Inspection (all levels)

Group C Inspection	Sample size ^{1,2}	Conditions	Comments
Subgroup 1			
Physical Dimensions	15 (6)	MIL-STD-750, Meth 2066	
Subgroup 2			
Thermal Shock	22 (6)	MIL-STD-750 Meth 1056, Cond A	glass axial lead only
Terminal Strength	22 (6)	MIL-STD-750 Meth 2036, Cond E	leaded packages only, w=__oz, t=__sec
Fine Leak	22 (6)	MIL-STD-750 Meth 1071, Cond H	5x10-8 atm cc3/s max
Gross Leak	22 (6)	MIL-STD-750 Meth 1071, Cond C	
Moisture Resistance	22 (6)	MIL-STD-750, Meth 1021	Omit initial conditioning
End-point Electricals ²	22 (6)		Read & Record
Subgroup 3			
Shock	22 (6)	MIL-STD-750 Meth 2016	Non-operating, 1500G, 0.5ms, 5 blows X1, Y1, Z1
Variable Frequency	22 (6)	MIL-STD-750 Meth 2056	
Acceleration	22 (6)	MIL-STD-750 Meth 2006	1 minute min, 20K G X1, Y1, Z1
End-point Electricals ²	22 (6)		Read & Record
Subgroup 4			
Salt Atmosphere	15 (6)	MIL-STD-750, Meth 1041	Electrical rejects may be used
Subgroup 5			
Thermal Resistance	15 (6)	MIL-STD-750, Meth 4081	Read & Record
Subgroup 6			
Intermittent Operating Life	22 (12)	MIL-STD-750, Meth 1037 6000 cycles	Units from Group B-2000 cycle test may be used to complete the 6000 cycles
End-point Electricals ²	22 (12)		Read & Record
Bond Strength	11 wires	MIL-STD-750 Meth 2037	Only when Group B units continue to satisfy Group C requirement, Read & Record
Subgroup 7			
Internal Water Vapor	3	MIL-STD-750, Meth 1018	3 devices c= 0 or 5 devices c= 1

Notes:

1 - Small lot sample size defined in parentheses (). Inspection lot quantity shall not exceed 2,500 pcs for JANTX & JANTXV Group A small lot sampling; inspection lot quantity shall not exceed 1,000 pcs for JANS Group A small lot sampling.

2 - Electrical test parameters shall be defined by product type and specific requirements; test limits at temperature may vary from those published in this catalog.

Warranty / Ordering

Orders

Orders may be placed with your local sales representative or directly with our sales team at:

Aeroflex / Metelics, Inc.
East Coast Operations
54 Grenier Field Road
Londonderry, NH 03053
Tel: (603) 641-3800
Fax: (603) 641-3500

Sales: (888) 641-SEMI (7364)
Email: metelics-sales@aeroflex.com

Aeroflex / Metelics, Inc.
West Coast Operations
975 Stewart Drive
Sunnyvale, CA 94085
Tel: (408) 737-8181
Fax: (408) 733-7645

Price and Delivery Information

The price and delivery of any items listed in this catalog ordered directly from the factory are quoted in U.S. Dollars, F.O.B. factory origin and are subject to change without notice. All quoted prices are exclusive of any federal, state or local taxes, and are the sole responsibility of the buyer. Terms are NET 30 days if credit has been established. Foreign payments and terms are arranged on an individual basis.

Warranty

Aeroflex / Metelics warrants their products to be free of defects in material and workmanship for one year from the date of original shipment. Our obligation at Metelics is limited to repair, replace, or credit. This warranty shall not apply to any products which have been subjected to accident, misuse, improper installation, alteration or abuse. Metelics shall have the final determination in regard to the cause and existence of any defect under warranty.

Applications

If you should have any application questions related to the products outlined in this catalog please contact our engineering staff. We gladly offer consultations on circuit design or application problems. We also offer special product design.

Returned Material

When returning material for repair or replacement, it is necessary to first contact the factory for an approval and authorization number. Complete information must be included with the return shipment stating reason for return, purchase order on which the product was originally purchased, new purchase order if applicable, and address where material is to be returned.

Specifications

Aeroflex / Metelics reserves the right to discontinue products and change specifications without notice.

Federal Supply Code

Aeroflex / Metelics, Inc. Federal Supply Code for manufactures assigned number is:

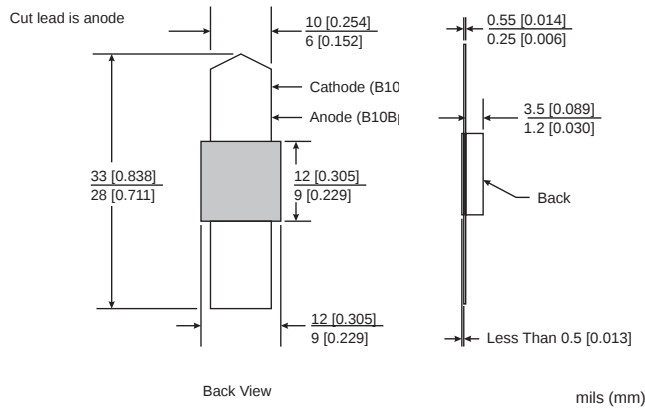
61322 Londonderry
59365 Sunnyvale

Outline Drawings

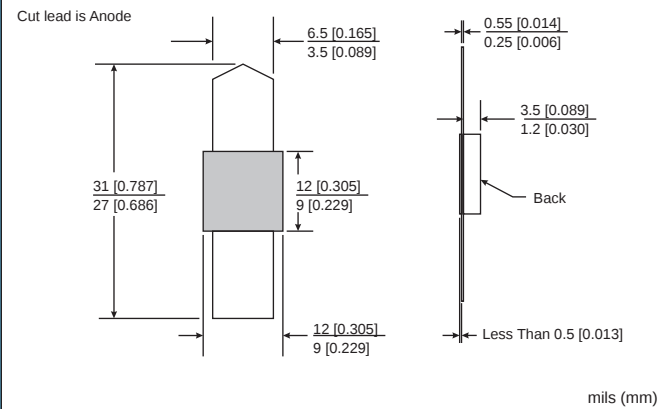


Beam Lead

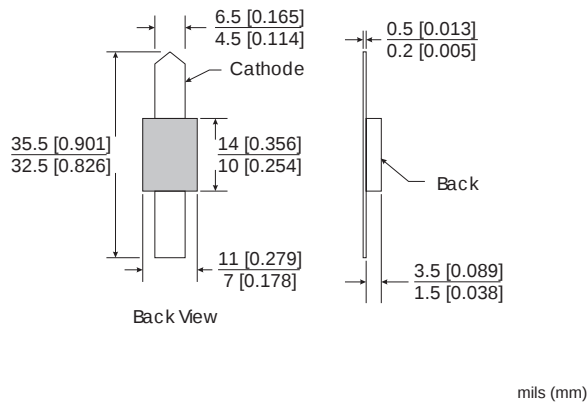
B10B



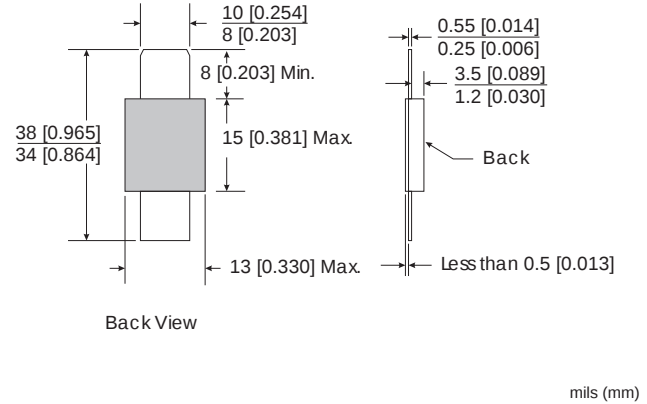
B10D



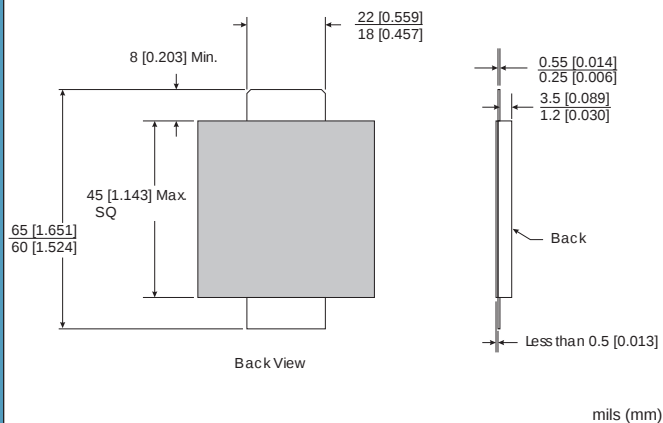
B11



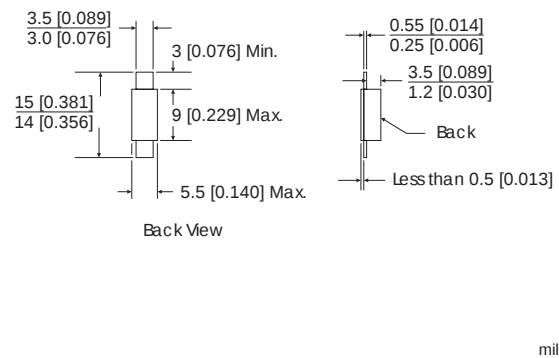
B12



B13



B14

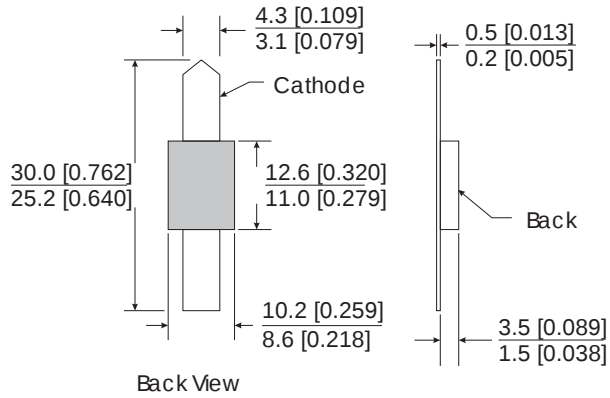


Outline Drawings



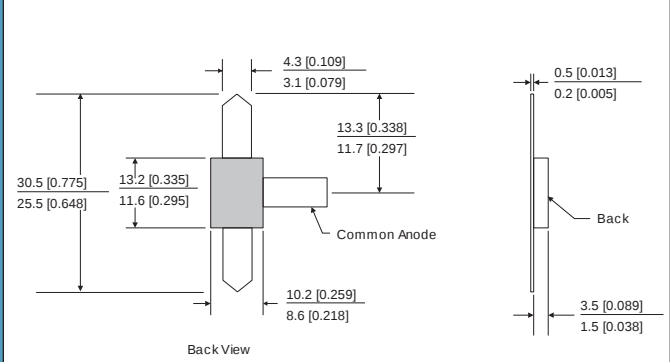
Beam Lead

B15



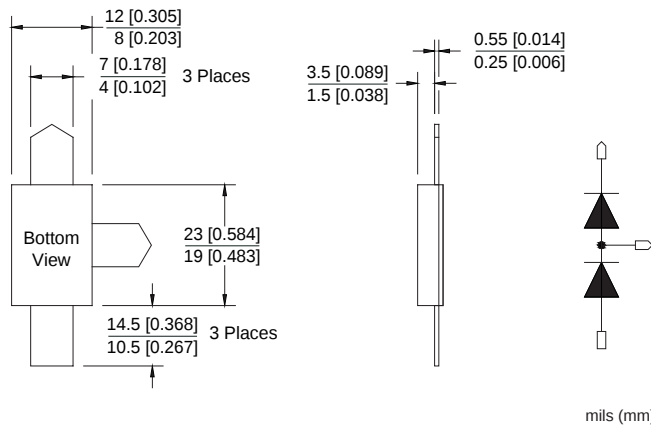
mils (mm)

B16



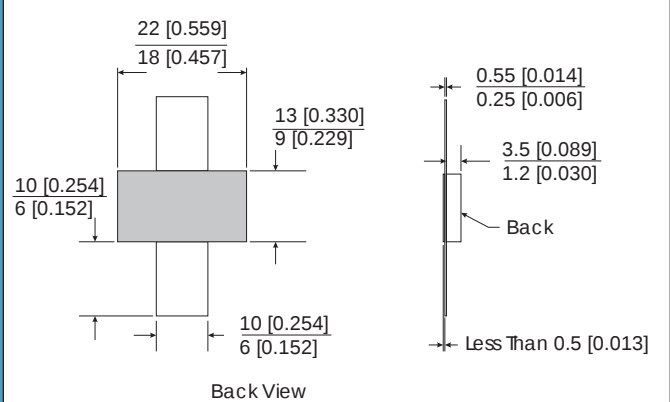
mils (mm)

B20



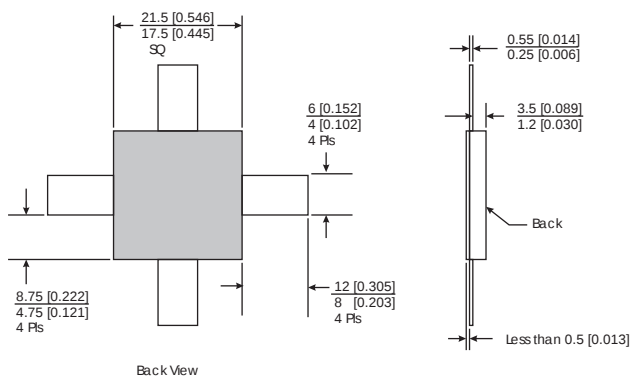
mils (mm)

B21



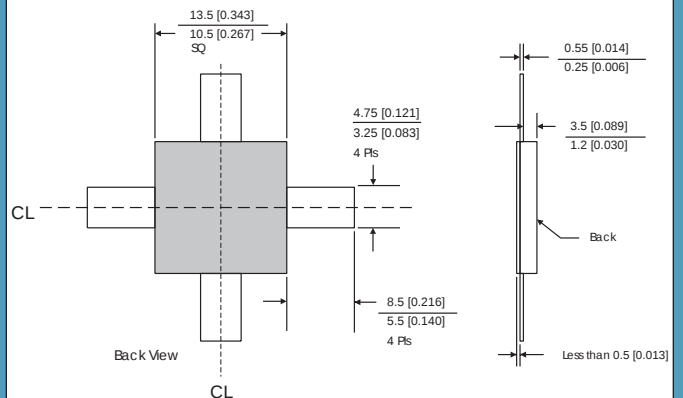
mils (mm)

B40



mils (mm)

B41



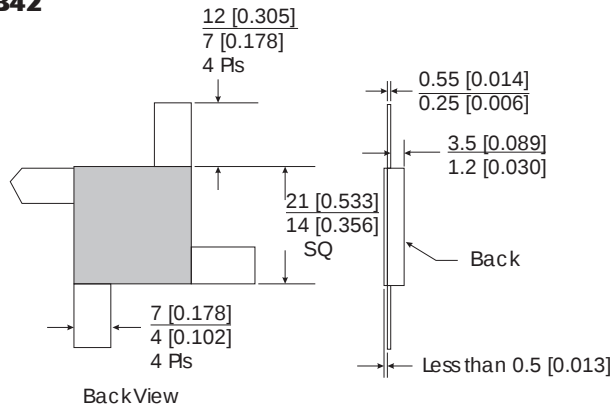
mils (mm)

Outline Drawings

Beam Lead

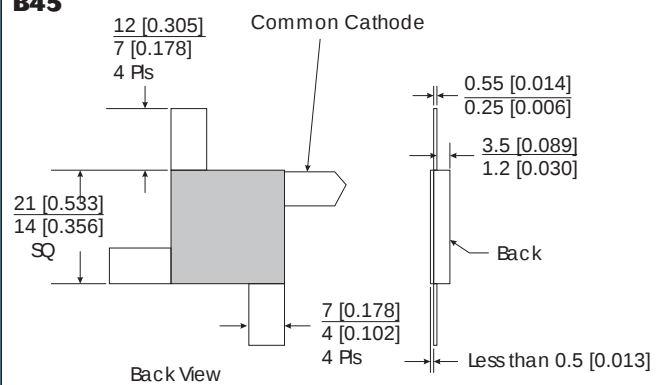


B42



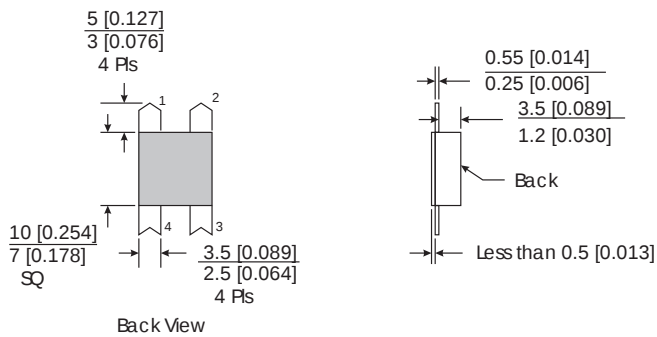
mils (mm)

B45



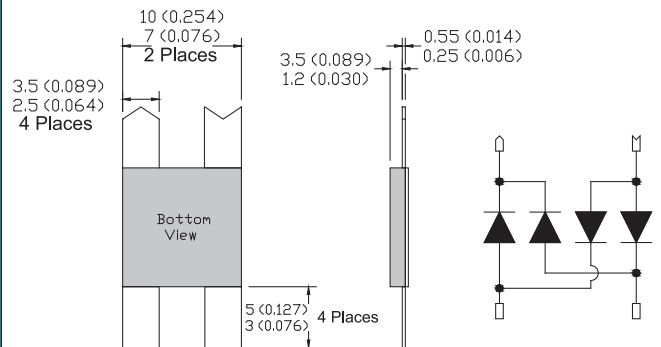
mils (mm)

B47



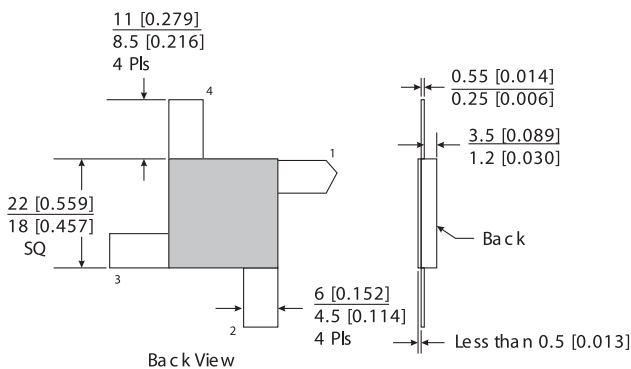
mils (mm)

B48



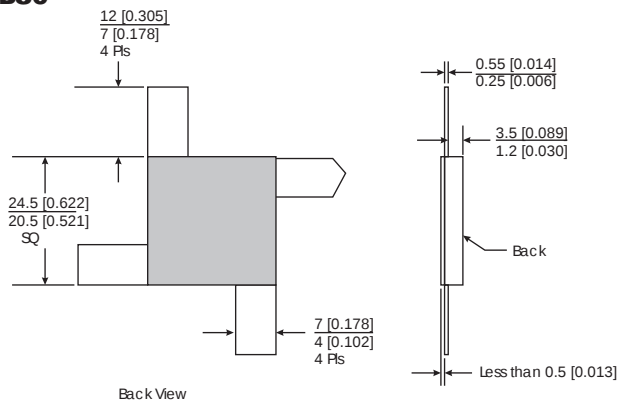
mils (mm)

B49



mils (mm)

B80



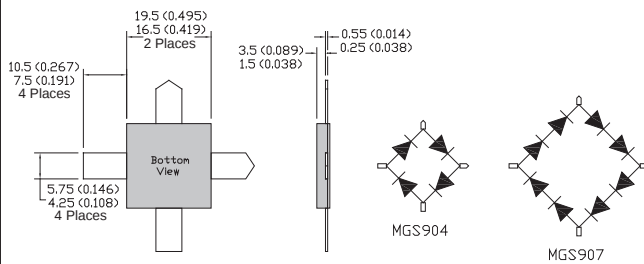
mils (mm)

Outline Drawings



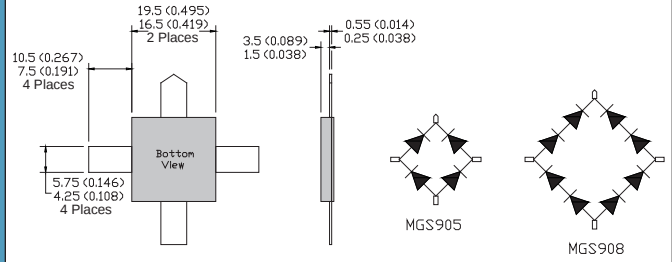
Beam Lead

B85



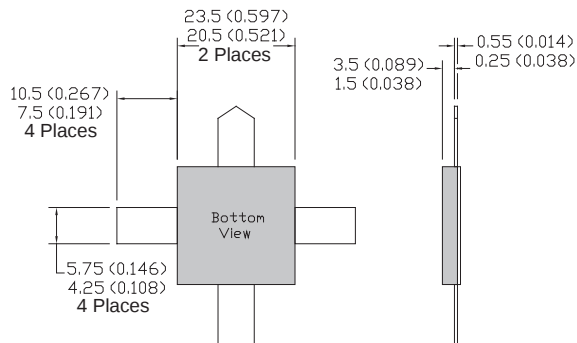
mils (mm)

B86



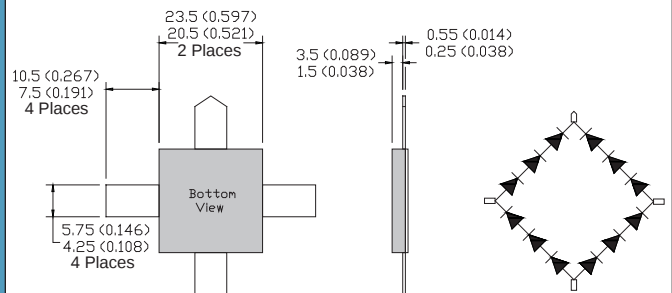
mils (mm)

B87



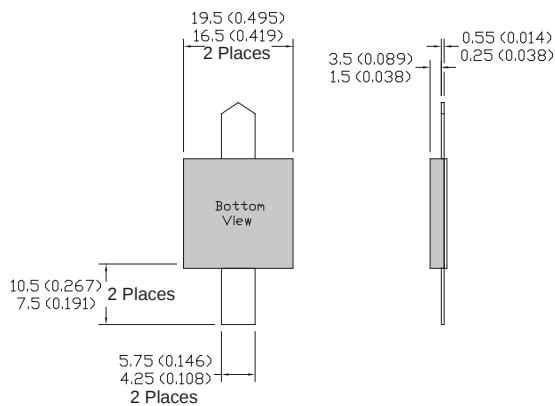
mils (mm)

B88



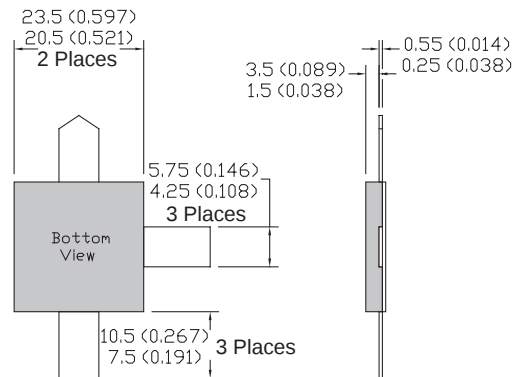
mils (mm)

B89



mils (mm)

B90



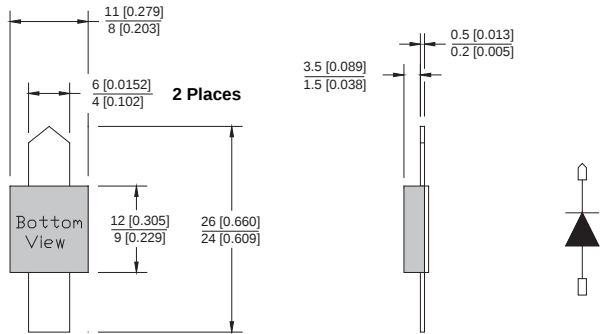
mils (mm)

Outline Drawings

Beam Lead

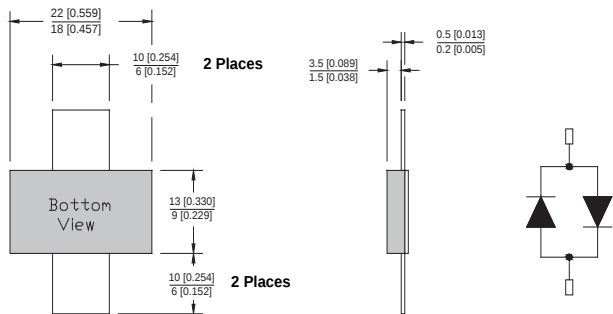


GB110



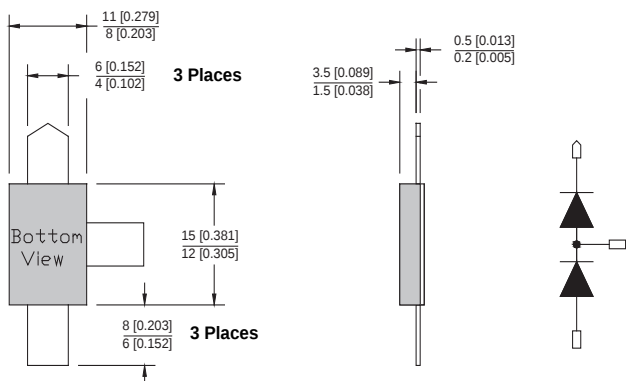
mils (mm)

GB210



mils (mm)

GB310

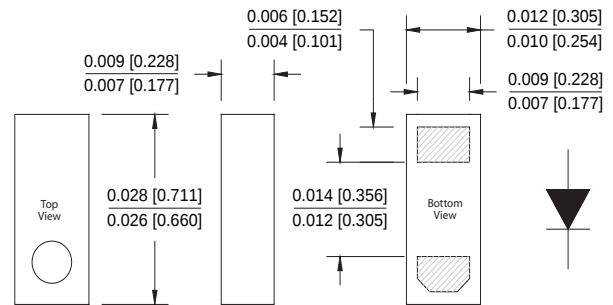


mils (mm)

Flip Chip

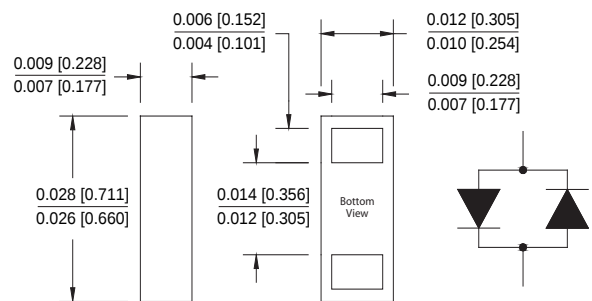


GC110



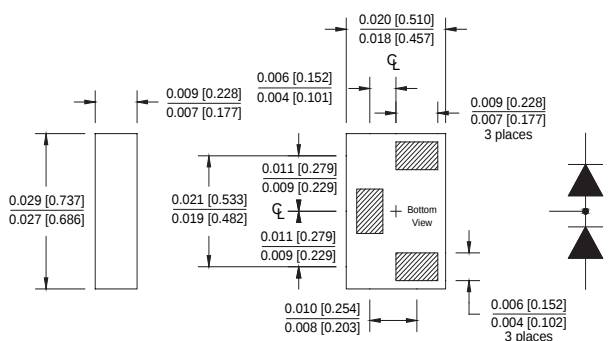
inches (mm)

GC210



inches (mm)

GC310



inches (mm)

Outline Drawings

Bare Die



Fig. 1

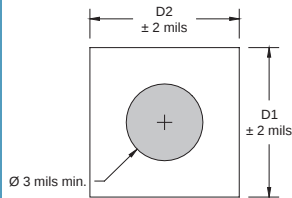


Fig. 2

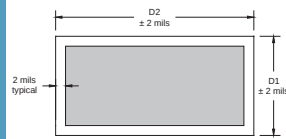


Fig. 3

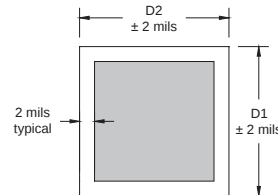
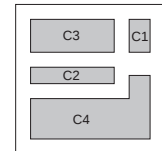
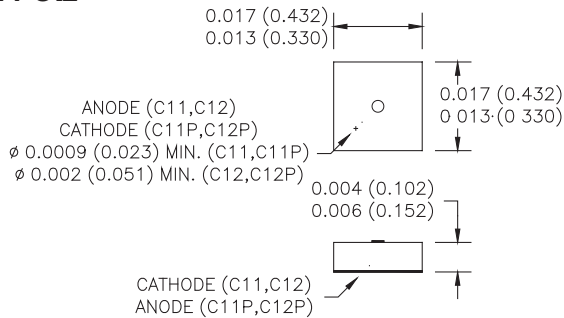


Fig. 4

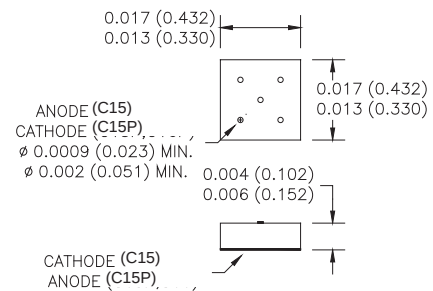


C11 / C12



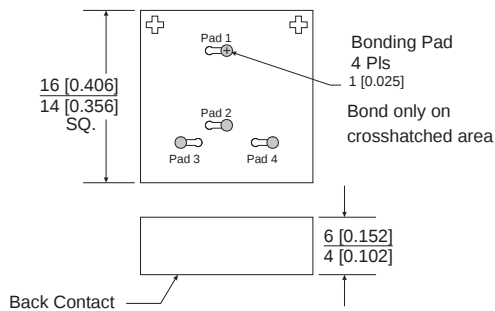
inches (mm)

C15



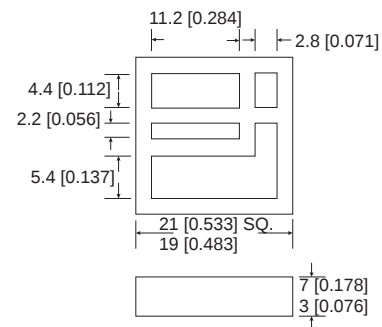
inches (mm)

C18



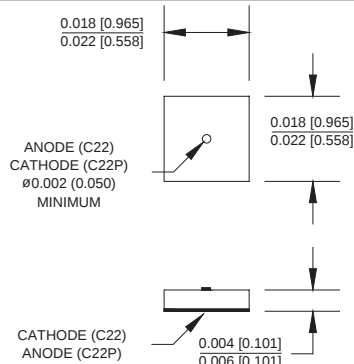
mils (mm)

C20



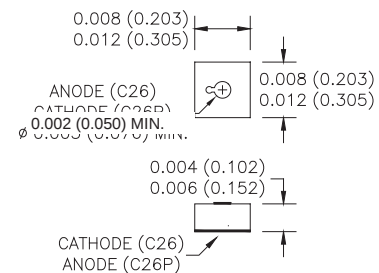
mils (mm)

C22



inches (mm)

C26



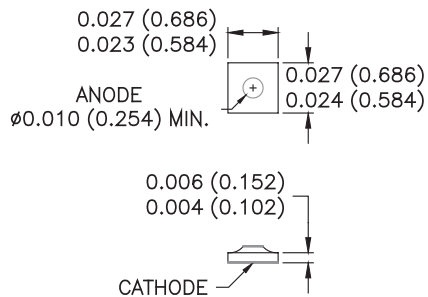
inches (mm)

Outline Drawings

Bare Die

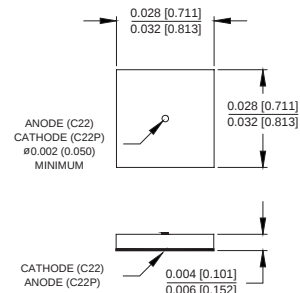


C40



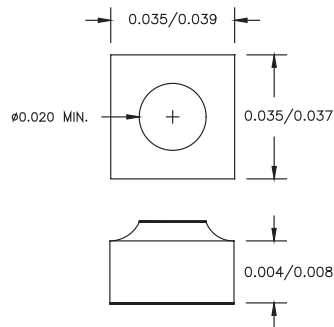
inches (mm)

C32



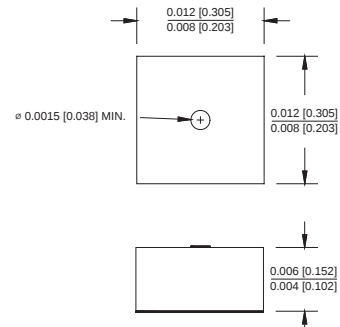
inches (mm)

C37



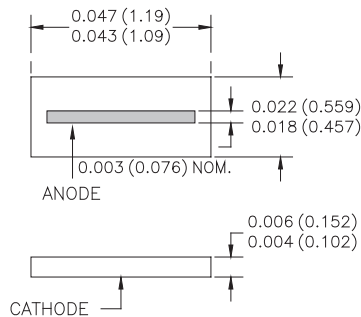
inches (mm)

C01A



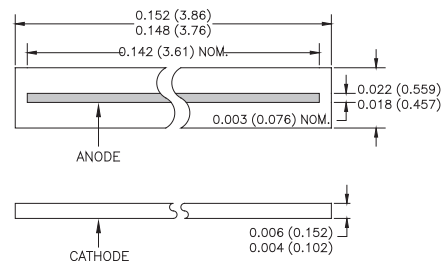
inches (mm)

C50



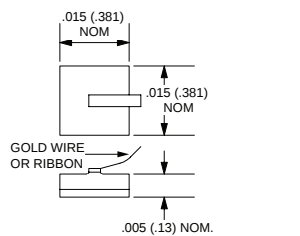
inches (mm)

C51



inches (mm)

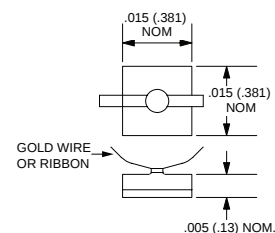
CS08



NOTES:
1. TOP CONTACT & CHIP SIZE DEPENDS ON
DIODE PARAMETERS
2. TOP AND BOTTOM CONTACTS GOLD
3. CONSULT FACTORY

inches (mm)

CS09



NOTES:
1. TOP CONTACT & CHIP SIZE DEPENDS ON
DIODE PARAMETERS
2. TOP AND BOTTOM CONTACTS GOLD
3. CONSULT FACTORY

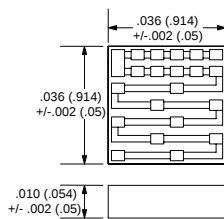
inches (mm)

Outline Drawings

Resistors



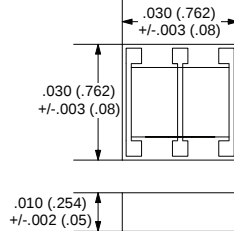
R1



NOTES:
1. The top gold bonding pads are .004" Square Typ. (.0035 Min and 15000 A thick Min)
2. There is a min separation between the edge of the chip and any top bonding pads of .001"

inches (mm)

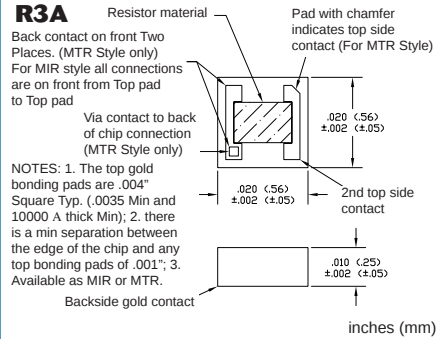
R2



NOTES:
1. The top gold bonding pads are .004" Square Typ. (.0035 Min and 15000 A thick Min)
2. There is a min separation between the edge of the chip and any top bonding pads of .001"

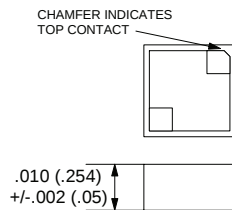
inches (mm)

R3A



inches (mm)

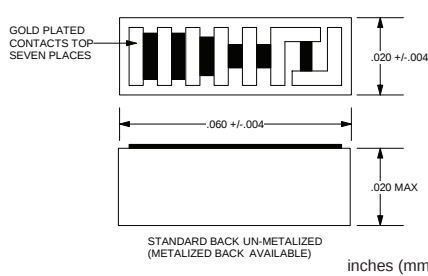
R3



NOTES:
1. The top gold bonding pads are .004" Square Typ. (.0035 Min and 15000 A thick Min)
2. There is a min separation between the edge of the chip and any top bonding pads of .001"
3. Available as thru-chip

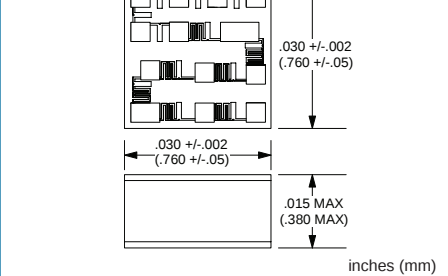
inches (mm)

R4



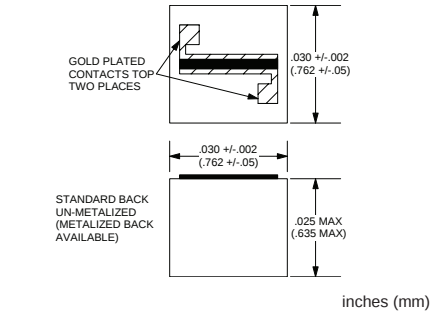
inches (mm)

R5



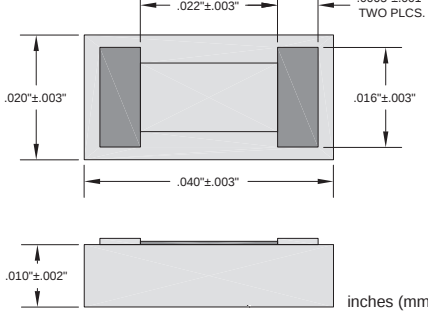
inches (mm)

R6



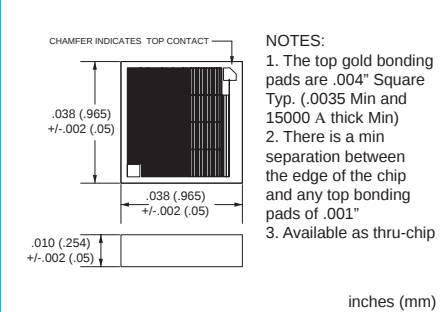
inches (mm)

R7



inches (mm)

R8



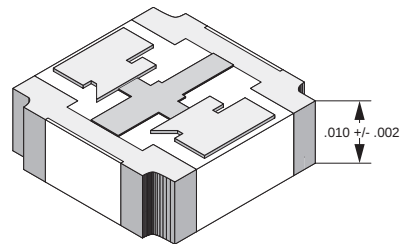
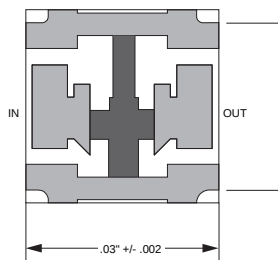
inches (mm)

Attenuator Pad



CS07

Front to Back Metallization in Four Places Bonding Pad Sizes and Resistor Outline may differ from value to value



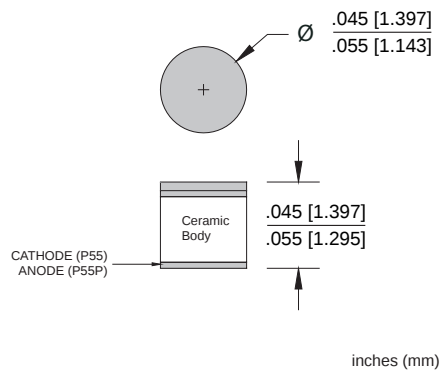
Front to Back Metallization in Four Places

Outline Drawings

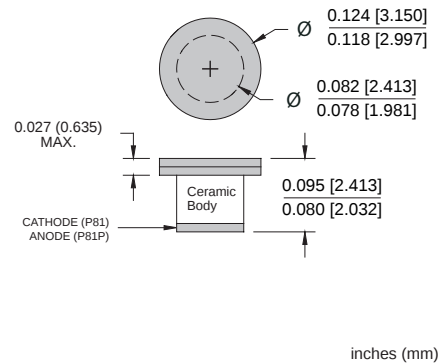


Ceramic Microwave Pill (Hermetic)

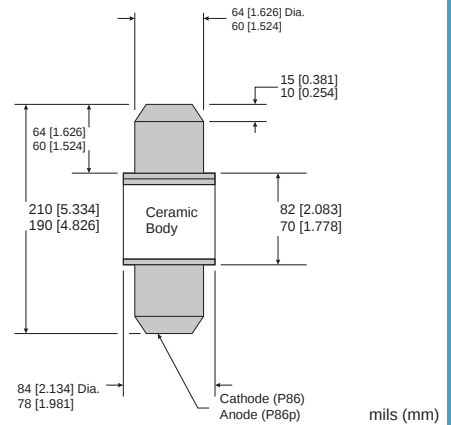
P55 / P55p



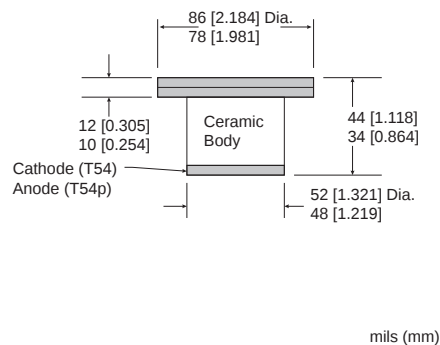
P81 / P81p



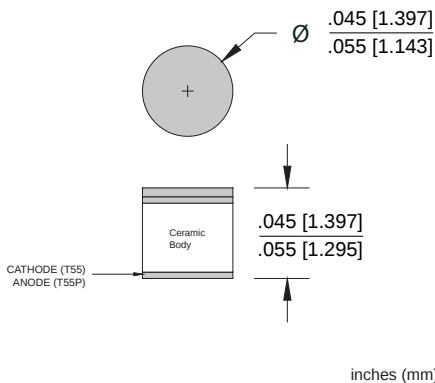
P86 / P86p



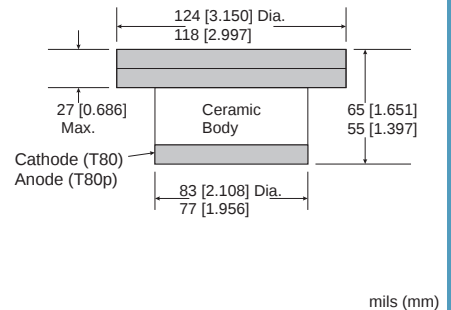
T54 / T54p



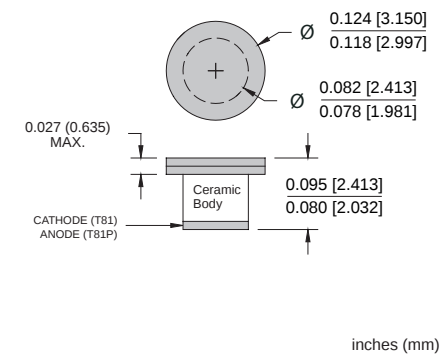
T55 / T55p



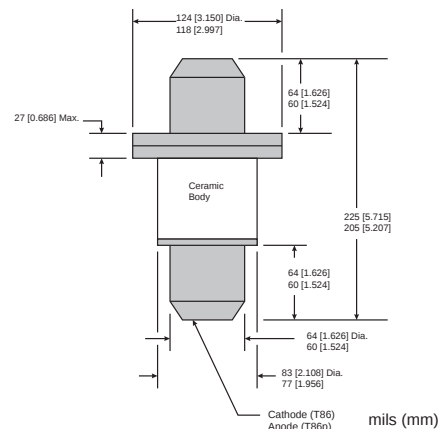
T80 / T80p



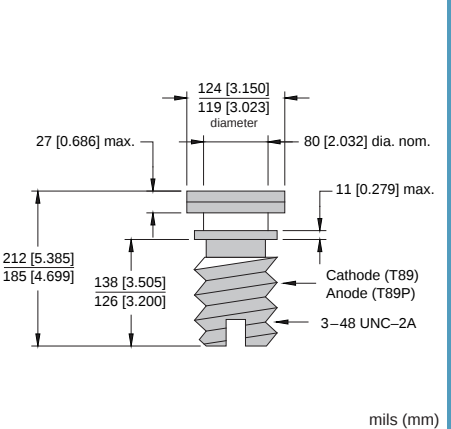
T81 / T81p



T86 / T86p



T89 / T89p

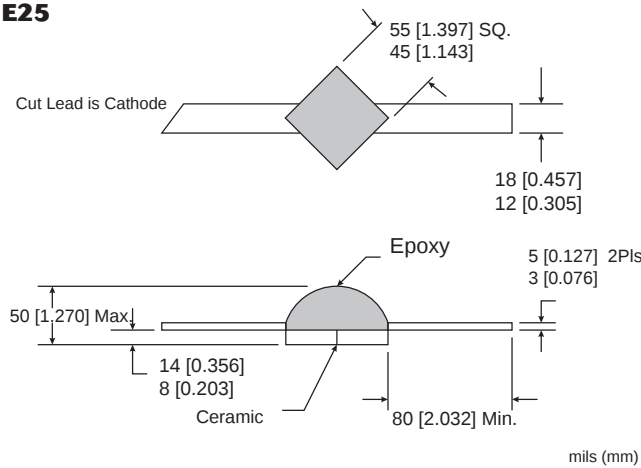


Outline Drawings

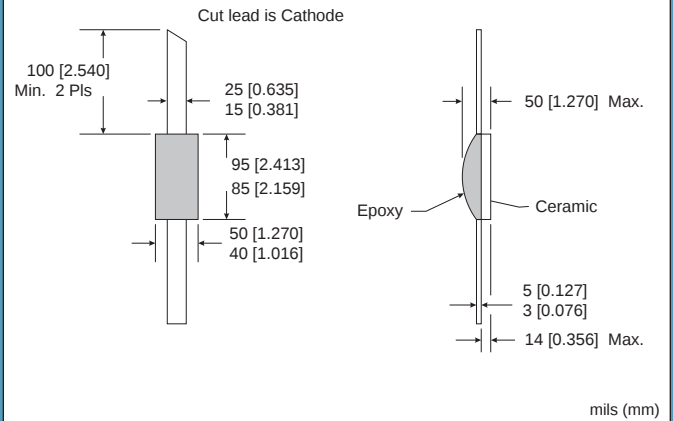


Ceramic Epoxy SMT

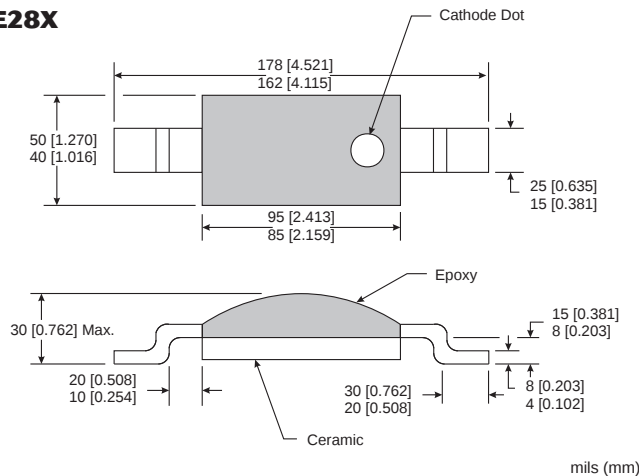
E25



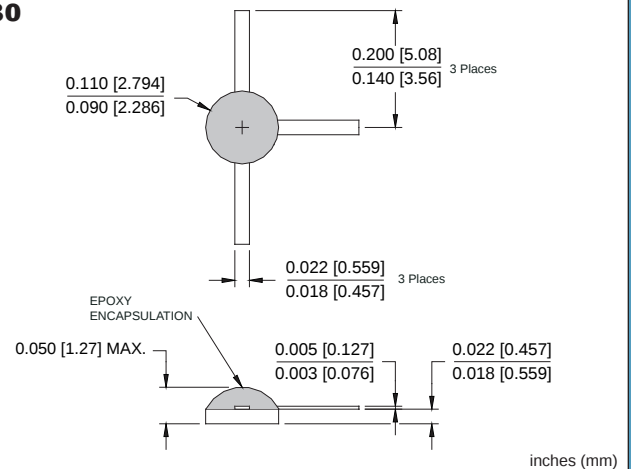
E28



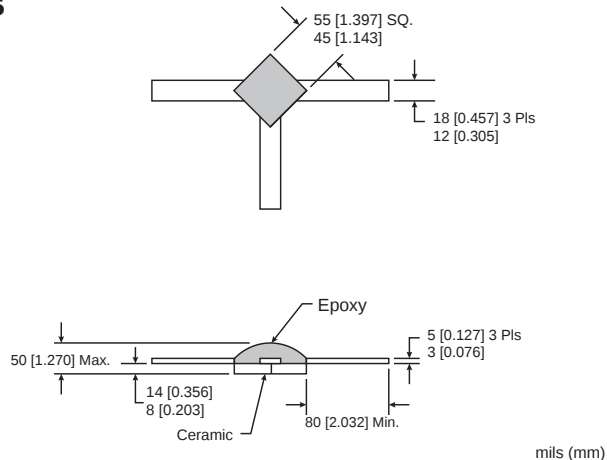
E28X



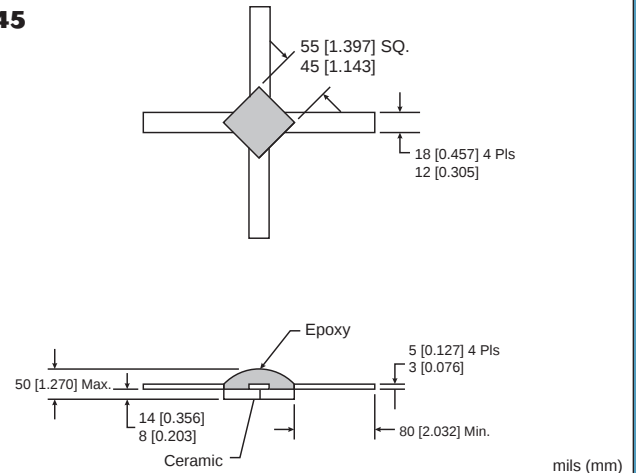
E30



E35



E45

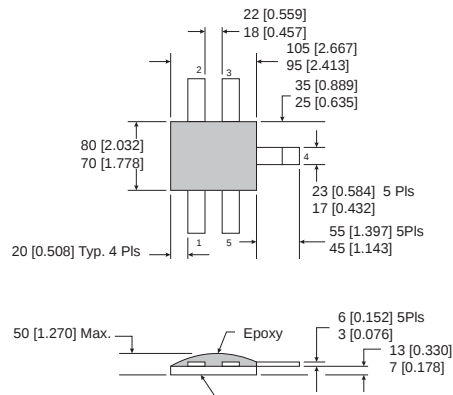


Outline Drawings

Ceramic Epoxy SMT

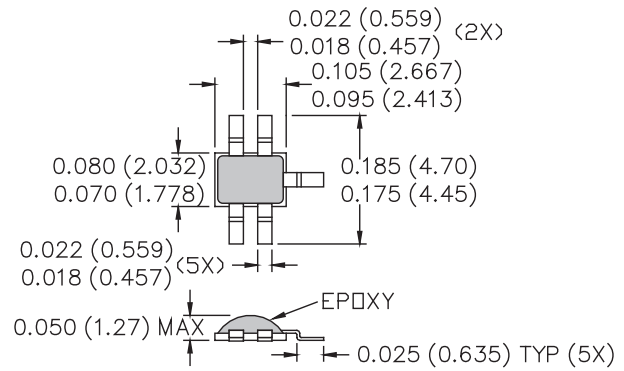


E50



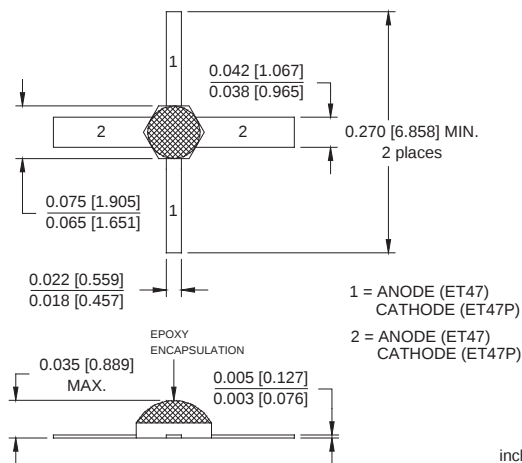
mils (mm)

E50SM



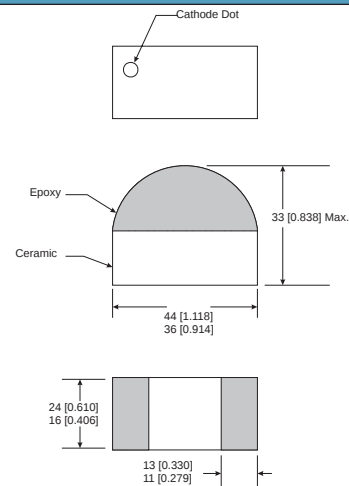
inches (mm)

ET47



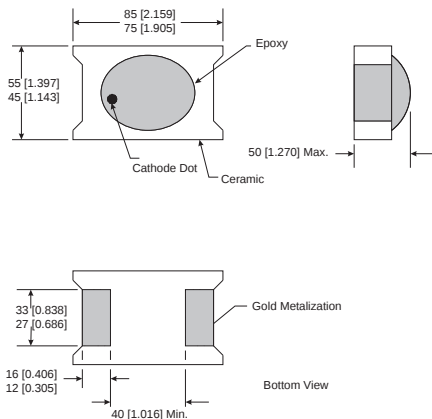
inches (mm)

O402



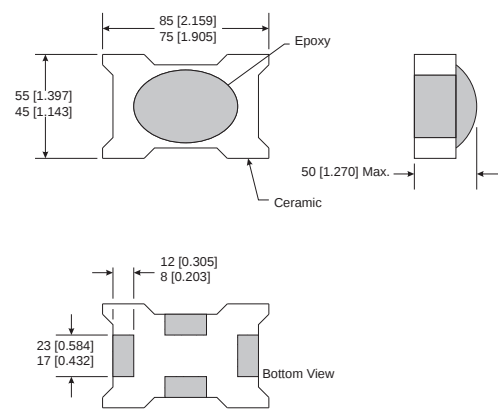
mils (mm)

O805-2



mils (mm)

O805-4



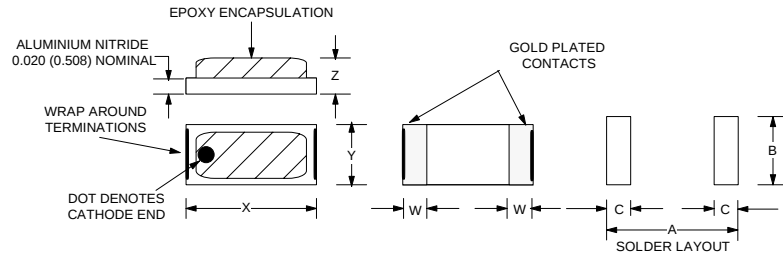
mils (mm)

Outline Drawings

Ceramic Epoxy SMT



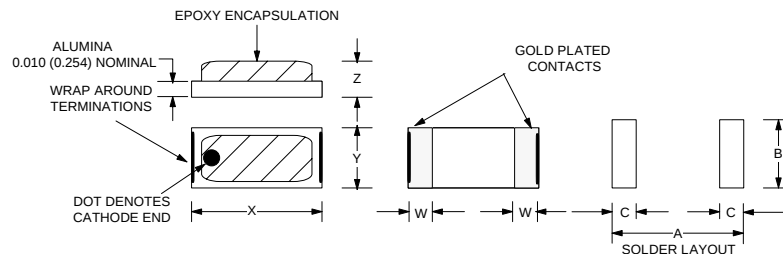
CS16



PKG STYLE	DIMENSIONS				SOLDER LAYOUT (TYP.)			PACKAGE CP AND LP
	W DIM.	X DIM.	Y DIM.	Z DIM.	A	B	C	
CS16-1	.012 (.304)	.060 (1.52)	.040 (1.01)	.050 (1.27)	.072 (1.83)	.040 (1.01)	.020 (.508)	.09 pF .35 nH
CS16-2	.012 (.304)	.075 (1.91)	.050 (1.27)	.050 (1.27)	.087 (2.21)	.070 (1.78)	.020 (.508)	.11 pF .4 nH
CS16-3	.012 (.304)	.100 (2.54)	.050 (1.27)	.050 (1.27)	.112 (2.84)	.070 (1.78)	.020 (.508)	.14 pF .4 nH
CS16-4	.012 (.304)	.120 (3.05)	.060 (1.52)	.050 (1.27)	.132 (3.35)	.080 (2.03)	.020 (.508)	.09 pF .4 nH
CS16-5	.012 (.304)	.200 (5.08)	.100 (2.54)	.050 (1.27)	.212 (5.38)	.120 (3.05)	.020 (.508)	.09 pF .5 nH
CS16-6	.010 (.254)	.040 (1.01)	.020 (.508)	.050 (1.27)	.050 (1.27)	.030 (.762)	.018 (.457)	.06 pF .35 nH
CS16-7	.010 (.254)	.060 (1.52)	.020 (.508)	.050 (1.27)	.070 (1.78)	.030 (.762)	.018 (.457)	.08 pF .35 nH
TOL. ±	.002 (.051)	.003 (.076)	.003 (.076)	MAX	NOM.	NOM.	NOM.	NOM.

inches (mm)

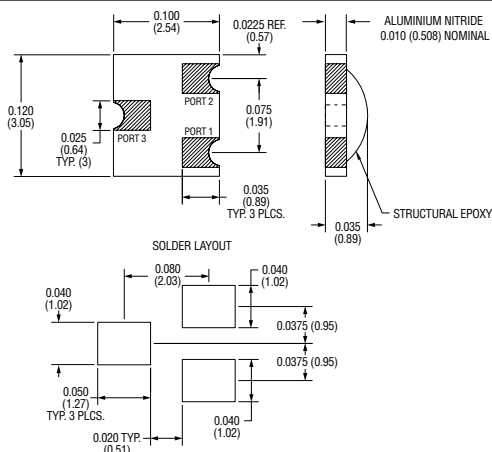
CS19



PKG STYLE	DIMENSIONS				SOLDER LAYOUT (TYP.)			PACKAGE CP AND LP
	W DIM.	X DIM.	Y DIM.	Z DIM.	A	B	C	
CS19-1	.012 (.304)	.060 (1.52)	.040 (1.01)	.030 (.762)	.072 (1.83)	.040 (1.01)	.020 (.508)	.09 pF .35 nH
CS19-2	.012 (.304)	.075 (1.91)	.050 (1.27)	.035 (.889)	.087 (2.21)	.070 (1.78)	.020 (.508)	.11 pF .4 nH
CS19-3	.012 (.304)	.100 (2.54)	.050 (1.27)	.035 (.889)	.112 (2.84)	.070 (1.78)	.020 (.508)	.14 pF .4 nH
CS19-4	.012 (.304)	.120 (3.05)	.060 (1.52)	.035 (.889)	.132 (3.35)	.080 (2.03)	.020 (.508)	.09 pF .4 nH
CS19-5	.012 (.304)	.200 (5.08)	.100 (2.54)	.035 (.889)	.212 (5.38)	.120 (3.05)	.020 (.508)	.09 pF .5 nH
CS19-6	.010 (.254)	.040 (1.01)	.020 (.508)	.030 (.762)	.050 (1.27)	.030 (.762)	.018 (.457)	.06 pF .35 nH
CS19-7	.010 (.254)	.060 (1.52)	.020 (.508)	.030 (.762)	.070 (1.78)	.030 (.762)	.018 (.457)	.08 pF .35 nH
TOL. ±	.002 (.051)	.003 (.076)	.003 (.076)	MAX	NOM.	NOM.	NOM.	NOM.

inches (mm)

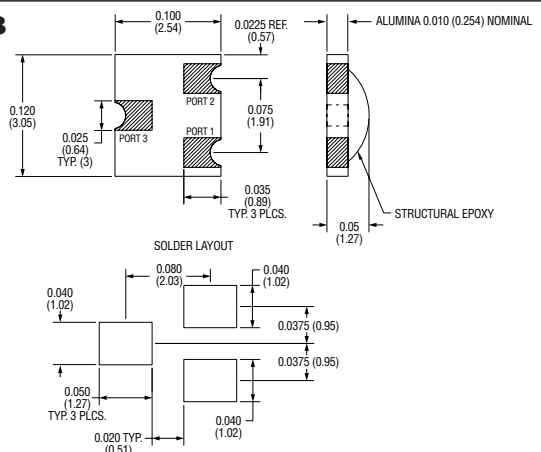
CS23



See SOT 23 Configuration Code on page 113

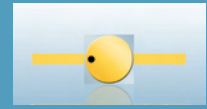
inches (mm)

CS223



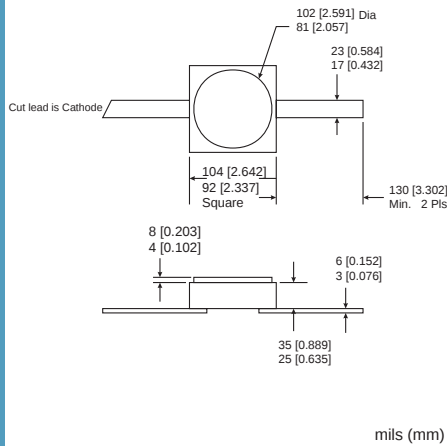
inches (mm)

Outline Drawings

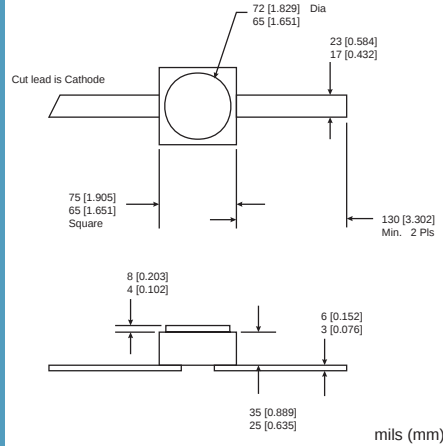


Ceramic Hermetic SMT

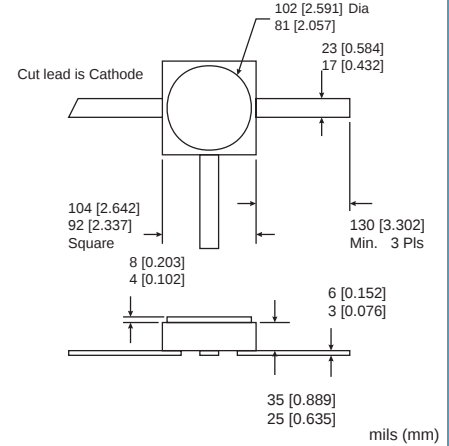
H20



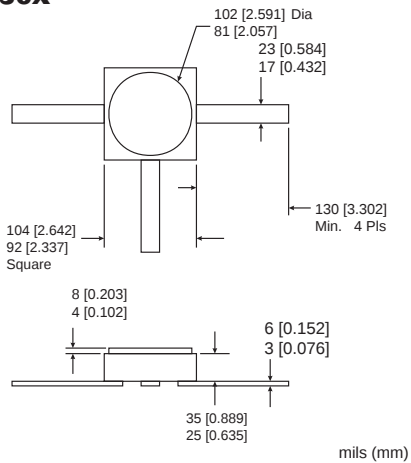
H27



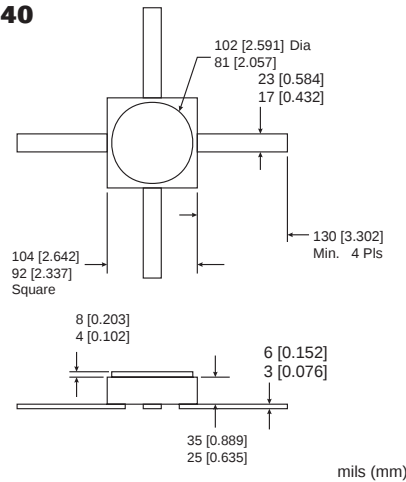
H30



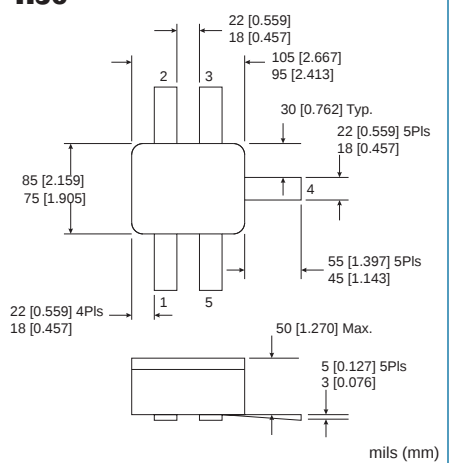
H30X



H40

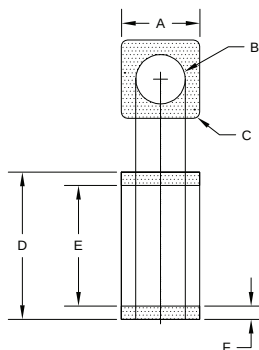


H50



Ceramic MELF

CS127



DIMENSIONS IN MILS						
CS	A	B	C	D	E	F
127-1	.080 ⁺ .004 -.002	Ø .050 [±] .002	R.003/.005	.112 ⁺ .003 -.002	.096 [±] MIN	.0087 [±] .005 TYP.
127-2	.080 ⁺ .004 -.002	Ø .050 [±] .002	R.003/.007	.158 ⁺ .003 -.002	.142 [±] MIN	.0087 [±] .005 TYP.
127-3	.100 ⁺ .006 -.004	Ø .063 [±] .002	R.003/.012	.188 ⁺ .003 -.004	.155 [±] MIN	.0177 [±] .008 TYP.
127-4	.143 ⁺ .005 -.004	Ø .097 [±] .002	R.003/.012	.181 ⁺ .003 -.002	.165 [±] MIN	.0257 [±] .008 TYP.

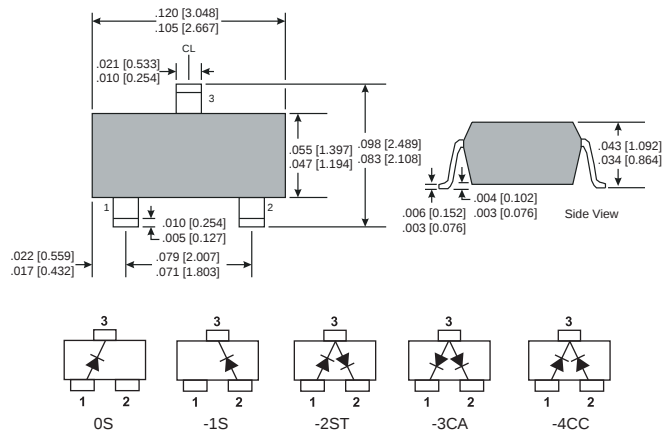
inches (mm)

Outline Drawings

Plastic SMT



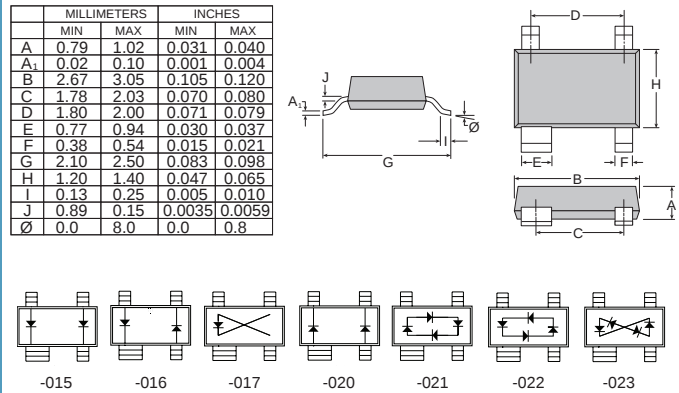
SOT23



inches (mm)

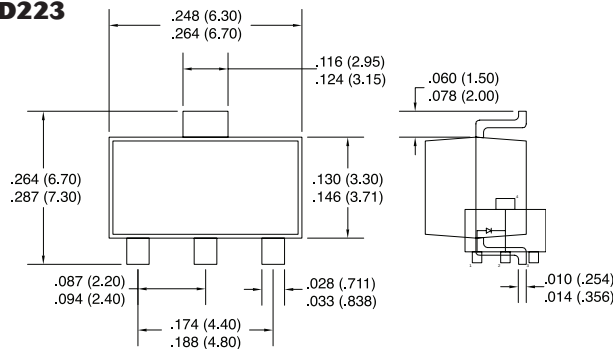
SOT143

	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.79	1.02	0.031	0.040
A ₁	0.02	0.10	0.001	0.004
B	2.67	3.05	0.105	0.120
C	1.78	2.03	0.070	0.080
D	1.80	2.00	0.071	0.079
E	0.77	0.94	0.030	0.037
F	0.38	0.54	0.015	0.021
G	2.10	2.50	0.083	0.098
H	1.20	1.40	0.047	0.065
I	0.13	0.25	0.005	0.010
J	0.89	0.15	0.0035	0.0059
Ø	0.0	8.0	0.0	0.8



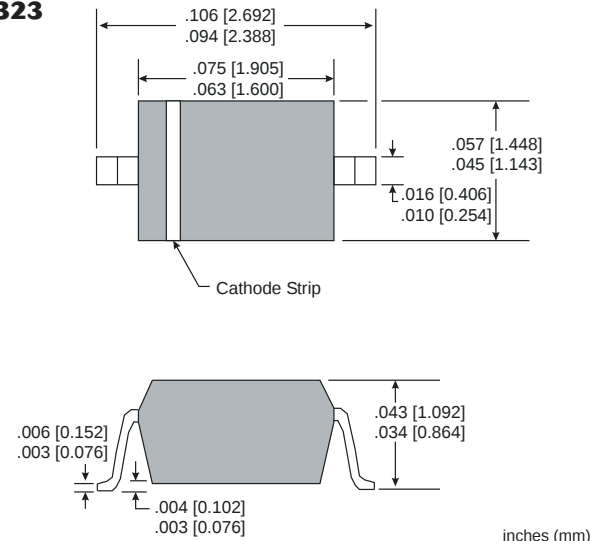
inches (mm)

SOD223



inches (mm)

SOD323



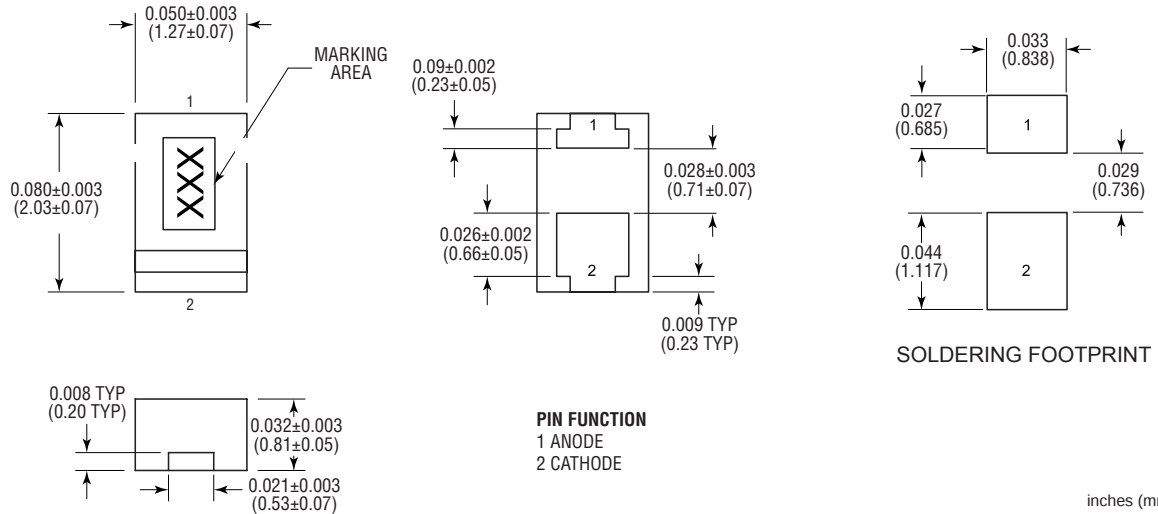
inches (mm)

Outline Drawings

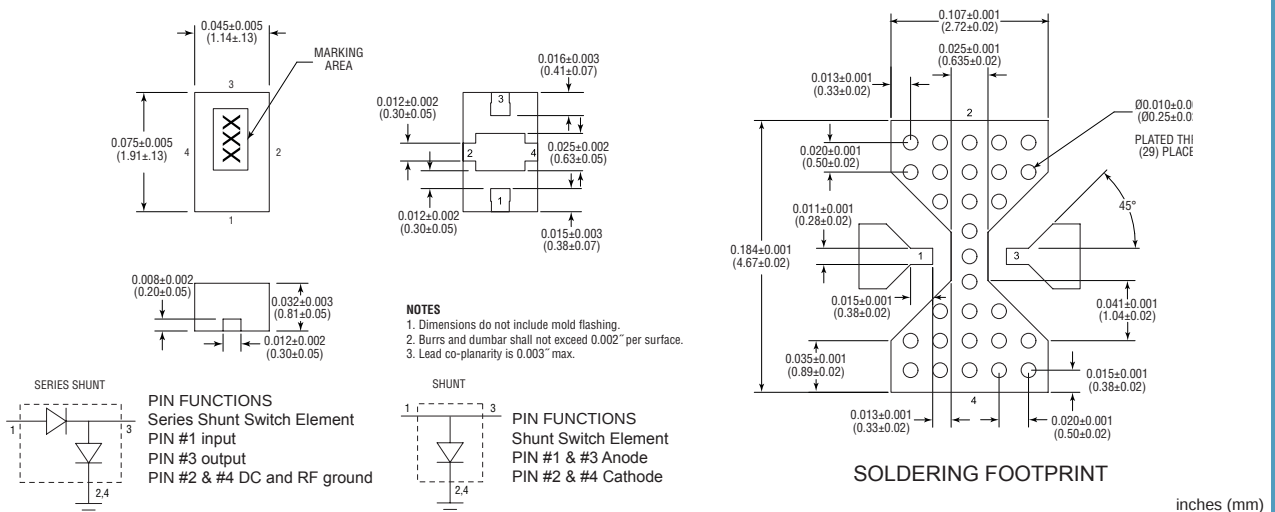
Plastic SMT



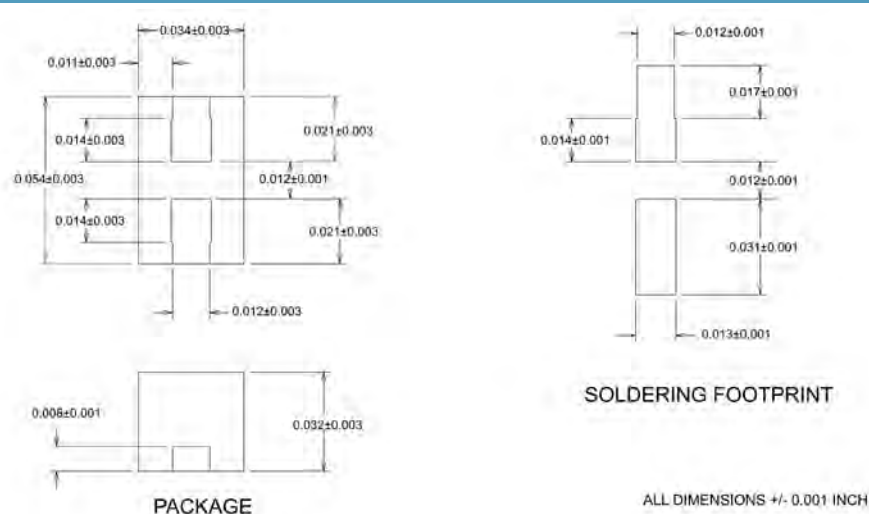
0805P



2012



0503



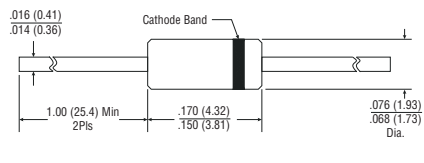
Outline Drawings

Glass Axial Leaded



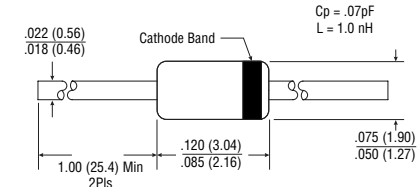
A15

(hermetic)



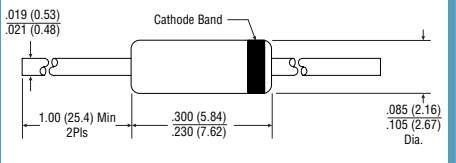
inches (mm)

CS65



inches (mm)

CS85



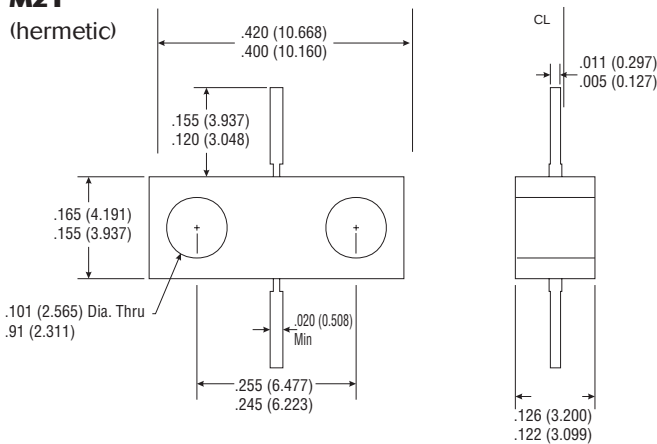
inches (mm)

Specialty



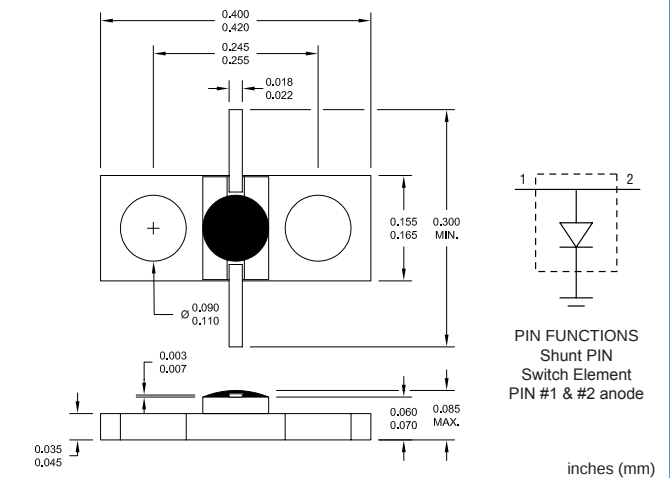
M21

(hermetic)



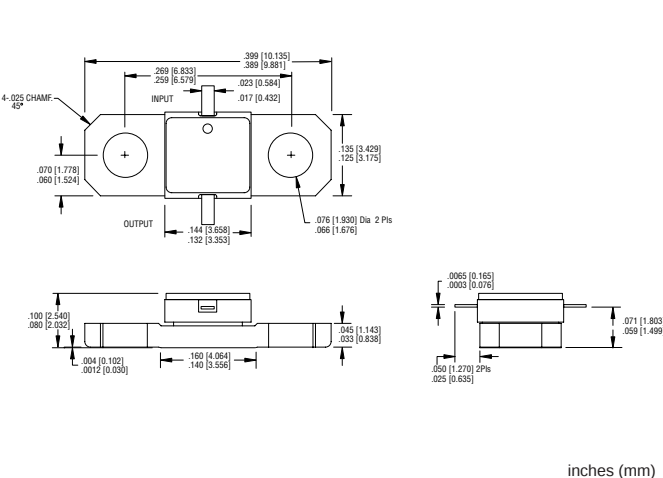
inches (mm)

CM22



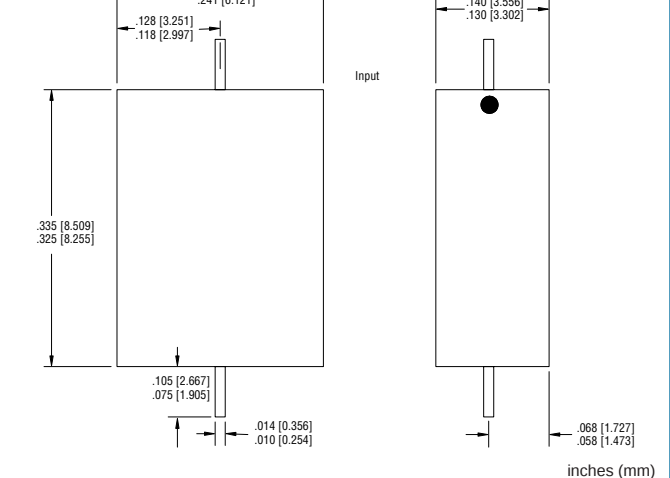
inches (mm)

M23



inches (mm)

M33



inches (mm)

Index

Model Number	Page	Model Number	Page	Model Number	Page	Model Number	Page
® 1N5139A	56	1N4622	77	1N5445	57	1N5697	59
® 1N5140A	56	1N4623	77	1N5446	57	1N5698	59
® 1N5141A	56	1N4624	77	1N5447	57	1N5699	59
® 1N5142A	56	1N4625	77	1N5448	57	1N5700	59
® 1N5143A	56	1N4626	77	1N5449	57	1N5701	59
® 1N5144A	56	1N4627	77	1N5450	57	1N5702	59
® 1N5145A	56	1N4678	78	1N5451	57	1N5703	59
® 1N5146A	56	1N4679	78	1N5452	57	1N5704	59
® 1N5147A	56	1N4680	78	1N5453	57	1N5705	59
® 1N5148A	56	1N4681	78	1N5454	57	1N5706	59
® 1N5461	58	1N4682	78	1N5455	57	1N5707	59
® 1N5462	58	1N4683	78	1N5456	57	1N5708	59
® 1N5463	58	1N4684	78	1N5518	72	1N5709	59
® 1N5464	58	1N4685	78	1N5519	72	1N5711	16
® 1N5465	58	1N4686	78	1N5520	72	1N5712	16
® 1N5466	58	1N4687	78	1N5521	72	1N6082	73
® 1N5467	58	1N4688	78	1N5522	72	1N6083	73
® 1N5468	58	1N4689	78	1N5523	72	1N6084	73
® 1N5469	58	1N4690	78	1N5524	72	1N6085	73
® 1N5470	58	1N4691	78	1N5525	72	1N6086	73
® 1N5471	58	1N4692	78	1N5526	72	1N6087	73
® 1N5472	58	1N4693	78	1N5527	72	1N6088	73
® 1N5473	58	1N4694	78	1N5528	72	1N6089	73
® 1N5474	58	1N4695	78	1N5529	72	1N6090	73
® 1N5475	58	1N4696	78	1N5530	72	1N6091	73
® 1N5476	58	1N4697	78	1N5531	72	9000 Series	81
1N4099	76	1N4698	78	1N5532	72	90 Series	83
1N4100	76	1N4699	78	1N5533	72	9100 Series	81
1N4101	76	1N4700	78	1N5534	72	91 Series	83
1N4102	76	1N4701	78	1N5535	72	BOO Series	84
1N4103	76	1N4702	78	1N5536	72	BSP-1 Series	84
1N4104	76	1N4703	78	1N5537	72	BSP-3 Series	84
1N4105	76	1N4704	78	1N5538	72	K120	74
1N4106	76	1N4705	78	1N5539	72	K150	74
1N4107	76	1N4706	78	1N5540	72	K180	74
1N4108	76	1N4707	78	1N5541	72	K210	74
1N4109	76	1N4708	78	1N5542	72	K240	74
1N4110	76	1N4709	78	1N5543	72	K270	74
1N4111	76	1N4710	78	1N5544	72	K300	74
1N4112	76	1N4711	78	1N5545	72	K330	74
1N4113	76	1N4712	78	1N5546	72	K360	74
1N4114	76	1N4713	78	1N5681	59	K390	74
1N4115	76	1N4714	78	1N5682	59	K430	74
1N4116	76	1N5139	56	1N5683	59	K470	74
1N4117	76	1N5140	56	1N5684	59	K510	74
1N4118	76	1N5141	56	1N5685	59	K511	75
1N4119	76	1N5142	56	1N5686	59	K561	75
1N4120	76	1N5143	56	1N5687	59	K621	75
1N4121	76	1N5144	56	1N5688	59	K681	75
1N4614	77	1N5145	56	1N5689	59	KSV1401	60
1N4615	77	1N5146	56	1N5690	59	KSV1402	60
1N4616	77	1N5147	56	1N5691	59	KSV1403	60
1N4617	77	1N5148	56	1N5692	59	KSV1404	60
1N4618	77	1N5441	57	1N5693	59	KSV1405	60
1N4619	77	1N5442	57	1N5694	59	KSV1406	60
1N4620	77	1N5443	57	1N5695	59	KSV1407	60
1N4621	77	1N5444	57	1N5696	59	KSV1408	60

Index

Model Number	Page	Model Number	Page	Model Number	Page	Model Number	Page
KSV1409	60	MAT10120	88	MBD4057-E28 / 28X	18	MGS904A	23
KSV1410	60	MAT10130	88	MBD4057-H20	18	MGS905	23
KSV1411	60	MAT10140	88	MBD4057-T54	18	MGS906	23
KSV1412	60	MAT10150	88	MBD4057-T80	18	MGS907	23
KSV2101	53	MAT10160	88	MBD5057-0805-2	18	MGS907A	23
KSV2102	53	MAT10170	88	MBD5057-C18	18	MGS907B	23
KSV2103	53	MAT10180	88	MBD5057-E28 / 28X	18	MGS908	23
KSV2104	53	MAT10190	88	MBD5057-H20	18	MGS909	23
KSV2105	53	MAT10200	88	MBD5057-T54	18	MGS910	23
KSV2106	53	MAT10210	88	MBD5057-T80	18	MGS911	23
KSV2107	53	MAT10220	88	MC2B0.8020-020	21	MGS912	23
KSV2108	53	MAT10230	88	MC2B002020-020	21	MGV050-18	24
KSV2109	53	MAT10240	88	MC2B004020-020	21	MGV050-18-0805-2	24
KSV2110	53	MAT10250	88	MC2B008020-020	21	MGV050-18-E28 / 28X	24
KSV2111	53	MAT10260	88	MC2B016020-020	21	MGV050-18-H20	24
KSV2112	53	MAT10270	88	MC2DXXX010-010	20	MGV050-20	24
KSV2113	53	MAT10280	88	MC2DXXX015-015	20	MGV050-20-0805-2	24
KSV2114	53	MAT10290	88	MC2DXXX020-020	20	MGV050-20-E28 / 28X	24
KSV2115	53	MAT10300	88	MC2RXXX010-015	20	MGV050-20-H20	24
LVA100A	70	MBC50-0.2B14	22	MC2RXXX015-020	20	MGV050-22	24
LVA43A	70	MBC50-1.0B14	22	MC2RXXX015-032	20	MGV050-22-0805-2	24
LVA450A	71	MBC50-1.5B14	22	MC2RXXX022-042	20	MGV050-22-E28 / 28X	24
LVA453A	71	MBC50-100B13	22	MC2RXXX097-107	20	MGV050-22-H20	24
LVA456A	71	MBC50-10B12	22	MC2RXXX099-138	20	MGV050-24	24
LVA459A	71	MBC50-15B12	22	MC2RXXXX127-145	20	MGV050-24-0805-2	24
LVA462A	71	MBC50-1B12	22	MC2RXXXX142-160	20	MGV050-24-E28 / 28X	24
LVA465A	71	MBC50-2.0B14	22	MC2SXXX010-010	21	MGV050-24-H20	24
LVA468A	71	MBC50-20B12	22	MC2SXXX011-011	21	MGV050-26	24
LVA471A	71	MBC50-2B12	22	MC2SXXX015-015	21	MGV050-26-0805-2	24
LVA474A	71	MBC50-33B13	22	MC2SXXX016-016	21	MGV050-26-E28 / 28X	24
LVA477A	71	MBC50-3B12	22	MC2SXXX020-020	21	MGV050-26-H20	24
LVA47A	70	MBC50-47B13	22	MC2SXXX022-022	21	MGV075-08	25
LVA480A	71	MBC50-4B12	22	MC2SXXX025-025	21	MGV075-09	25
LVA483A	71	MBC50-68B13	22	MC2SXXX030-030	21	MGV075-10	25
LVA486A	71	MBC50-6B12	22	MC2SXXX035-035	21	MGV075-11	25
LVA489A	71	MBC50-82B13	22	MC2SXXX040-040	21	MGV075-12	25
LVA492A	71	MBC50-8B12	22	MC2SXXX050-050	21	MGV075-13	25
LVA495A	71	MBD1057-0805-2	18	MC2SXXX055-055	21	MGV075-14	25
LVA498A	71	MBD1057-C18	19	MC2SXXX060-060	21	MGV075-15	25
LVA51A	70	MBD1057-E28 / 28X	18	MC2SXXX070-070	21	MGV075-16	25
LVA56A	70	MBD1057-H20	18	MC2SXXX080-080	21	MGV075-17	25
LVA62A	70	MBD1057-T54	18	MC2SXXX100-100	21	MGV100-08	25
LVA68A	70	MBD1057-T80	18	MGR700	16	MGV100-09	25
LVA75A	70	MBD2057-0805-2	18	MGR701	16	MGV100-20	25
LVA82A	70	MBD2057-C18	18	MGR702	16	MGV100-21	25
LVA91A	70	MBD2057-E28 / 28X	18	MGR703	16	MGV100-22	25
MAT10010	88	MBD2057-H20	18	MGR704	16	MGV100-23	25
MAT10020	88	MBD2057-T54	18	MGR705	16	MGV100-24	25
MAT10030	88	MBD2057-T80	18	MGS801	23	MGV100-25	25
MAT10040	88	MBD3057-0805-2	18	MGS801A	23	MGV100-26	25
MAT10050	88	MBD3057-C18	18	MGS802	23	MGV100-27	25
MAT10060	88	MBD3057-E28 / 28X	18	MGS802A	23	MGV125-08	25
MAT10070	88	MBD3057-H20	18	MGS803	23	MGV125-09	25
MAT10080	88	MBD3057-T54	18	MGS901	23	MGV125-20	25
MAT10090	88	MBD3057-T80	18	MGS902	23	MGV125-21	25
MAT10100	88	MBD4057-0805-2	18	MGS903	23	MGV125-22	25
MAT10110	88	MBD4057-C18	18	MGS904	23	MGV125-23	25

Index

Model Number	Page	Model Number	Page	Model Number	Page	Model Number	Page
MGV125-24	25	MMI304	85	MMP7079	35	MPN1101-12	39
MGV125-25	25	MMI305	85	MMP7080	35	MPN1102-12	39
MGV125-26	25	MMI306	85	MMP7081-127	37	MPN1103-12	39
MHV500	69	MMP7010	33	MMP7082-127	37	MPN7302	32
MHV501	69	MMP7011	33	MMP7083-127	37	MPN7302-0805-2	33
MHV502	69	MMP7012	33	MMP7084-127	37	MPN7302-E28 / 28X	33
MHV503	69	MMP7013	33	MMP7085-127	37	MPN7302-H20	33
MHV504	69	MMP7020	34	MMP7086-127	37	MPN7304	32
MHV505	69	MMP7021	34	MMP7087-127	37	MPN7304-0805-2	33
MHV506	69	MMP7022	34	MMP7088-127	37	MPN7304-E28 / 28X	33
MHV507	69	MMP7023	34	MMP7089-127	37	MPN7304-H20	33
MHV508	69	MMP7024	34	MMP7090-127	37	MPN7304A	32
MHV509	69	MMP7025	34	MMP7091-127	37	MPN7304A-0805-2	33
MHV510	69	MMP7026	34	MMP7092	36	MPN7304A-E28 / 28X	33
MHV511	69	MMP7027	34	MMP7093	36	MPN7304A-H20	33
MHV512	69	MMP7028	34	MMP7094	36	MPN7306	32
MHV513	69	MMP7029	34	MMP7095	36	MPN7306-0805-2	33
MLP7100	40, 41	MMP7030	34	MMP7096	36	MPN7306-E28 / 28X	33
MLP7101	40, 41	MMP7031	34	MMP7097	36	MPN7306-H20	33
MLP7102	40, 41	MMP7032	34	MMP7098	36	MPN7310	32
MLP7110	40, 41	MMP7033	34	MMP7099	36	MPN7310-0805-2	33
MLP7111	40, 41	MMP7034	34	MMPN080045	32	MPN7310-E28 / 28X	33
MLP7112	40, 41	MMP7035	34	MMPN080150	32	MPN7310-H20	33
MLP7120	40, 41	MMP7036	34	MNP0008	38	MPN73100	31
MLP7121	40, 41	MMP7040	36	MNP0008-ET47P	38	MPN7310A	32
MLP7122	40, 41	MMP7041	36	MNP0008-T54P	38	MPN7310A-0805-2	33
MLP7130	40, 41	MMP7042	36	MNP0008-T55P	38	MPN7310A-E28 / 28X	33
MLP7131	40, 41	MMP7043	36	MNP0008-T89P	38	MPN7310A-H20	33
MLP7140	40, 41	MMP7044	36	MNP0010	38	MPN73120	31
MLP7141	40, 41	MMP7045	36	MNP0010-ET47P	38	MPN7312A	32
MMA701	91	MMP7046	36	MNP0010-T54P	38	MPN7312A-0805-2	33
MMA703	90	MMP7047	36	MNP0010-T55P	38	MPN7312A-E28 / 28X	33
MMA704	90	MMP7048	36	MNP0010-T89P	38	MPN7312A-H20	33
MMA704X	90	MMP7049	36	MNP0012	38	MPN7312B	32
MMA705	90	MMP7050	36	MNP0012-ET47P	38	MPN7312B-0805-2	33
MMA706	90	MMP7051	36	MNP0012-T54P	38	MPN7312B-E28 / 28X	33
MMA707	91	MMP7052	36	MNP0012-T55P	38	MPN7312B-H20	33
MMA708	90	MMP7053	36	MNP0012-T89P	38	MPN7315	32
MMA709	91	MMP7060	35	MNP0012A	38	MPN7315-0805-2	33
MMA710	90	MMP7061	35	MNP0012A-ET47P	38	MPN7315-E28 / 28X	33
MMA712	90	MMP7062	35	MNP0012A-T54P	38	MPN7315-H20	33
MMA717	91	MMP7063	35	MNP0012A-T55P	38	MPN7320	32
MMA718	91	MMP7064	35	MNP0012A-T89P	38	MPN7320-0805-2	33
MMA719	91	MMP7065	35	MNP0014	38	MPN7320-E28 / 28X	33
MMA727	91	MMP7066	35	MNP0014-ET47P	38	MPN7320-H20	33
MMA728	91	MMP7067	35	MNP0014-T54P	38	MPN7330	31
MMA729	91	MMP7068	35	MNP0014-T55P	38	MPN7345	31
MMDB30-B11	29	MMP7069	35	MNP0014A	38	MPN7360	31
MMDB35-B11	29	MMP7070	35	MPN1000-12	39	MPN7370	31
MMDB45-B11	29	MMP7071	35	MPN1001-12	39	MPN7380	31
MMI297	85	MMP7072	35	MPN1002-12	39	MPN7420	31
MMI298	85	MMP7073	35	MPN1003-12	39	MPN7453A	31
MMI299	85	MMP7074	35	MPN1004-12	39	MPN7453B	31
MMI300	85	MMP7075	35	MPN1005-12	39	MPN7453C	31
MMI301	85	MMP7076	35	MPN1006-12	39	MPND4005-0402	39
MMI302	85	MMP7077	35	MPN1007-12	39	MPND4005-B15	39
MMI303	85	MMP7078	35	MPN1100-12	39	MPND4005-B16	39

Index

Model Number	Page	Model Number	Page	Model Number	Page	Model Number	Page
MSD700	28	MSS20,054-C15	4	MSS30,B46-B45	8	MSS40,244-0805-4	11
MSD701	28	MSS20,054-E25	5	MSS30,B46-E45	9	MSS40,244-B20	10
MSD702	28	MSS20,054-H27	5	MSS30,B46-H40	9	MSS40,244-E35	11
MSD703	28	MSS20,054-T86	5	MSS30,B53-B45	8	MSS40,248-0805-4	11
MSD704	28	MSS20,055-0805-2	5	MSS30,B53-E45	9	MSS40,248-B20	10
MSD705	28	MSS20,055-C15	4	MSS30,B53-H40	9	MSS40,248-E35	11
MSD706	28	MSS20,055-E25	5	MSS30,CR46-B49	8	MSS40,255-0805-4	11
MSD71	28	MSS20,055-H27	5	MSS30,CR46-E45	9	MSS40,255-B20	10
MSD710	28	MSS20,055-T86	5	MSS30,CR46-H40	9	MSS40,255-E35	11
MSD712	28	MSS20,140-0402	5	MSS30,CR53-B49	8	MSS40,448-B42	10
MSD713	28	MSS20,140-B10D	4	MSS30,CR53-E45	9	MSS40,448-E45	11
MSD714	28	MSS20,141-0402	5	MSS30,CR53-H40	9	MSS40,448-H40	11
MSD715	28	MSS20,141-B10D	4	MSS30,PCR46-B48	8	MSS40,455-B40	10
MSD716	28	MSS20,142-0402	5	MSS30,PCR46-B47	8	MSS40,455-E45	11
MSD720	28	MSS20,142-B10D	4	MSS30,PCR53-B47	8	MSS40,455-H40	11
MSD721	28	MSS20,143-0402	5	MSS39,045-C15	7	MSS40,B46-B45	10
MSD722	28	MSS20,143-B10D	4	MSS39,045-P55	7	MSS40,B46-E45	11
MSD723	28	MSS20,145-0402	5	MSS39,045-P86	7	MSS40,B53-B45	10
MSD724	28	MSS20,145-B10D	4	MSS39,048-C15	7	MSS40,B53-E45	11
MSD725	28	MSS20,146-0402	5	MSS39,048-P55	7	MSS40,CR46-B49	10
MSD726	28	MSS20,146-B10D	4	MSS39,048-P86	7	MSS40,CR46-E45	11
MSD730	28	MSS30,046-C15	8	MSS39,144-0402	7	MSS40,CR46-H40	11
MSD731	28	MSS30,046-P55	9	MSS39,144-0805-2	7	MSS40,CR53-B49	10
MSD732	28	MSS30,046-P86	9	MSS39,144-B10B	7	MSS40,CR53-E45	11
MSD733	28	MSS30,050-C15	8	MSS39,144-H27	7	MSS40,CR53-H40	11
MSD734	28	MSS30,050-P55	9	MSS39,146-0402	7	MSS40,PCB46-B48	10
MSD735	28	MSS30,050-P86	9	MSS39,146-0805-2	7	MSS40,PCR46-B47	10
MSD736	28	MSS30,142-B10B	8	MSS39,146-B10B	7	MSS40,PCR53-B47	10
MSPD1000-E50 / E50SM	30	MSS30,142-E25	9	MSS39,146-H27	7	MSS50,046-C26	12
MSPD1000-H50	30	MSS30,142-H20	9	MSS39,148-0402	7	MSS50,046-P55	13
MSPD1002-E50 / E50SM	30	MSS30,148-B10B	8	MSS39,148-0805-2	7	MSS50,046-P86	13
MSPD1002-H50	30	MSS30,148-E25	9	MSS39,148-B10B	7	MSS50,048-C15	12
MSPD1012-E50 / E50SM	30	MSS30,148-H20	9	MSS39,148-E25	7	MSS50,048-P55	13
MSPD1012-H50	30	MSS30,154-B10B	8	MSS39,148-H20	7	MSS50,048-P86	13
MSPD2018-E50 / E50SM	30	MSS30,154-E25	9	MSS39,152-0402	7	MSS50,062-C16	12
MSPD2018-H50	30	MSS30,154-H20	9	MSS39,152-0805-2	7	MSS50,062-P55	13
MSS20,046-0805-2	5	MSS30,242-B20	8	MSS39,152-B10B	7	MSS50,062-P86	13
MSS20,046-C15	4	MSS30,242-E35	9	MSS39,152-E25	7	MSS50,146-0402	13
MSS20,046-E25	5	MSS30,242-H30	9	MSS39,152-H20	7	MSS50,146-0805-2	13
MSS20,046-H27	5	MSS30,248-B20	8	MSS40,045-C15	10	MSS50,146-B10B	12
MSS20,046-T86	5	MSS30,248-E35	9	MSS40,045-P55	11	MSS50,146-E25	13
MSS20,047-0805-2	5	MSS30,248-H30	9	MSS40,045-P86	11	MSS50,146-H20	13
MSS20,047-C15	4	MSS30,254-B20	8	MSS40,048-C15	10	MSS50,155-0402	13
MSS20,047-E25	5	MSS30,254-E35	9	MSS40,048-P55	11	MSS50,155-0805-2	13
MSS20,047-H27	5	MSS30,254-H30	9	MSS40,048-P86	11	MSS50,155-B10B	12
MSS20,047-T86	5	MSS30,346-B21	8	MSS40,141-0402	11	MSS50,155-E25	13
MSS20,050-0805-2	5	MSS30,346-E25	9	MSS40,141-B10B	10	MSS50,155-H20	13
MSS20,050-C15	4	MSS30,346-H20	9	MSS40,141-E25	11	MSS50,244-0805-4	13
MSS20,050-E25	5	MSS30,442-B42	8	MSS40,141-H20	11	MSS50,244-B20	12
MSS20,050-H27	5	MSS30,442-E45	9	MSS40,148-0402	11	MSS50,244-E35	13
MSS20,050-T86	5	MSS30,442-H40	9	MSS40,148-B10B	10	MSS50,244-H30	13
MSS20,051-0805-2	5	MSS30,448-B42	8	MSS40,148-E25	11	MSS50,341-B21	12
MSS20,051-C15	4	MSS30,448-E45	9	MSS40,148-H20	11	MSS50,341-E25	13
MSS20,051-E25	5	MSS30,448-H40	9	MSS40,155-0402	11	MSS50,341-H20	13
MSS20,051-H27	5	MSS30,454-B40	8	MSS40,155-B10B	10	MSS50,448-0805-4	13
MSS20,051-T86	5	MSS30,454-E45	9	MSS40,155-E25	11	MSS50,448-B40	12
MSS20,054-0805-2	5	MSS30,454-H40	9	MSS40,155-H20	11	MSS50,448-E45	13

Index

Model Number	Page	Model Number	Page	Model Number	Page	Model Number	Page
MSS50,448-H40	13	MSS60,848-E45	15	MSV 1400-11-001	46	MTV4030-16	48
MSS50,B46-B45	12	MSS60,848-H40	15	MSV 1400-110-004	46	MTV4030-17	48
MSS50,B46-E45	13	MSS60,B46-B45	14	MSV 1400-111-004	46	MTV4030-18	48
MSS50,B46-H40	13	MSS60,B46-E45	15	MSV 1400-113-004	46	MTV4030-19	48
MSS50,B53-B45	12	MSS60,B46-H40	15	MSV 1400-114-004	46	MTV4030-20	48
MSS50,B53-E45	13	MSS60,B53-B45	14	MSV 1400-115-004	46	MTV4030-21	48
MSS50,B53-H40	13	MSS60,B53-E45	15	MSV 1400-116-004	46	MTV4030-22	48
MSS50,CR46-B49	12	MSS60,B53-H40	15	MSV 1400-117-004	46	MTV4030-23	48
MSS50,CR46-E45	13	MSS60,CR46-B49	14	MSV 1400-13-001	46	MTV4030-24	48
MSS50,CR46-H40	13	MSS60,CR46-E45	15	MSV 1400-14-001	46	MTV4030-25	48
MSS50,CR53-B49	12	MSS60,CR53-B49	14	MSV 1400-15-001	46	MTV4030-26	48
MSS50,CR53-E45	13	MSS60,CR53-E45	15	MSV 1400-16-001	46	MTV4045-01	49
MSS50,CR53-H40	13	MSS60,PCB46-B48	14	MSV 1400-17-001	46	MTV4045-02	49
MSS50,PCB46-B48	12	MSS60,PCR46-B47	14	MSV 1400-19-001	46	MTV4045-03	49
MSS50,PCR46-B47	12	MSS60,PCR53-B47	14	MSV 1400-20-001	46	MTV4045-04	49
MSS50,PCR53-B48	12	MSV 1104-33-323	61	MSV 1400-21-001	46	MTV4045-05	49
MSS60,046-C26	14	MSV 1104-34-323	61	MSV 1400-22-001	46	MTV4045-06	49
MSS60,046-P55	15	MSV 1104-35-323	61	MSWSE-040-10	42	MTV4045-07	49
MSS60,046-P86	15	MSV 1104-36-323	61	MSWSH-020-30	44	MTV4045-08	49
MSS60,048-C26	14	MSV 1200-04-001	63	MSWSH-100-30	43	MTV4045-09	49
MSS60,048-P55	15	MSV 1200-07-001	63	MSWSS-020-40	45	MTV4045-10	49
MSS60,048-P86	15	MSV 1200-104-004	63	MTD-0208N	19	MTV4045-11	49
MSS60,144-B10B	14	MSV 1200-107-004	63	MTD-0218N	19	MTV4045-12	49
MSS60,144-E25	15	MSV 1201-97-001	63	MTD-0818N	19	MTV4045-13	49
MSS60,144-H20	15	MSV 1202-03-001	63	MTD-1002N	19	MTV4045-14	49
MSS60,148-B10B	14	MSV 1202-08-001	63	MTDH-0611N	19	MTV4045-15	49
MSS60,148-E25	15	MSV 1202-12-001	63	MTDH-0611P	19	MTV4045-16	49
MSS60,148-H20	15	MSV 1204-04-001	63	MTDH-1015N	19	MTV4045-17	49
MSS60,153-B10B	14	MSV 1204-05-001	63	MTDH-1015P	19	MTV4045-18	49
MSS60,153-E25	15	MSV 1204-104-004	63	MTDH-8007N	19	MTV4045-19	49
MSS60,153-H20	15	MSV 1204-105-004	63	MTDH-8007P	19	MTV4045-20	49
MSS60,244-B20	14	MSV 1204-11-001	63	MTDH-8015N	19	MTV4045-21	49
MSS60,244-E35	15	MSV 1204-12-001	63	MTDH-8015P	19	MTV4045-22	49
MSS60,244-H30	15	MSV 1204-13-001	63	MTDL-0611N	19	MTV4060-01	50
MSS60,248-B20	14	MSV 1204-133-004	61	MTDL-0611P	19	MTV4060-02	50
MSS60,248-E35	15	MSV 1204-134-004	61	MTDL-1015N	19	MTV4060-03	50
MSS60,248-H30	15	MSV 1204-135-004	61	MTDL-1015P	19	MTV4060-04	50
MSS60,253-B20	14	MSV 1204-136-004	61	MTDL-8007N	19	MTV4060-05	50
MSS60,253-E35	15	MSV 1204-14-001	63	MTDL-8007P	19	MTV4060-06	50
MSS60,253-H30	15	MSV 1204-15-001	63	MTDL-8015N	19	MTV4060-07	50
MSS60,444-B42	14	MSV 1204-199-004	63	MTDL-8015P	19	MTV4060-08	50
MSS60,444-E45	15	MSV 1204-22-001	63	MTV4030-01	48	MTV4060-09	50
MSS60,444-H40	15	MSV 1204-23-001	63	MTV4030-02	48	MTV4060-10	50
MSS60,448-B42	14	MSV 1204-24-001	63	MTV4030-03	48	MTV4060-11	50
MSS60,448-E45	15	MSV 1204-25-001	63	MTV4030-04	48	MTV4060-12	50
MSS60,448-H40	15	MSV 1204-33-001	61	MTV4030-05	48	MTV4060-13	50
MSS60,453-B41	14	MSV 1204-34-001	61	MTV4030-06	48	MTV4060-14	50
MSS60,453-E45	15	MSV 1204-35-001	61	MTV4030-07	48	MTV4060-15	50
MSS60,453-H40	15	MSV 1204-36-001	61	MTV4030-08	48	MTV4060-16	50
MSS60,841-B80	14	MSV 1204-37-001	61	MTV4030-09	48	MTV4060-17	50
MSS60,841-E45	15	MSV 1204-99-001	63	MTV4030-10	48	MTV4060-18	50
MSS60,841-H40	15	MSV 1400-08-001	46	MTV4030-11	48	MTV4090-01	51
MSS60,846-B80	14	MSV 1400-09-001	46	MTV4030-12	48	MTV4090-02	51
MSS60,846-E45	15	MSV 1400-10-001	46	MTV4030-13	48	MTV4090-03	51
MSS60,846-H40	15	MSV 1400-108-004	46	MTV4030-14	48	MTV4090-04	51
MSS60,848-B80	14	MSV 1400-109-004	46	MTV4030-15	48	MTV4090-05	51

Index

Model Number	Page	Model Number	Page	Model Number	Page	Model Number	Page
MTV4090-06	51	SMPN7335-SOT23	31	SMV2107	47	TV2501	68
MTV4090-07	51	SMPN7380-SOD323	31	SMV2108	47	TV2501A	68
MTV4090-08	51	SMPN7380-SOT23	31	SMV2109	47	TV2502	68
MTV4090-09	51	SMPN7453-SOD323	31	SMV2110	47	TV2502A	68
MTV4090-10	51	SMPN7453-SOT23	31	SMV2111	47	TV2504	68
MTV4090-11	51	SMSCQ1200-SOT143	17	SMV2112	47	TV2801	67
MTV4090-12	51	SMSCQ1500-SOT143	17	SMV2113	47	TV2801A	67
MTV4090-13	51	SMSCQ2500-SOT143	17	SMV2114	47	TV2802	67
MTV4090-14	51	SMSCQ4500-SOT143	17	SMV2115	47	TV2802A	67
MTV4090-15	51	SMSCQ5500-SOT143	17	SMV30222	62	TV2803	67
MTV4090-16	51	SMSD3004-SOD323	17	SMV30223	62	TV2803A	67
MV1620	55	SMSD3012-SOD323	17	SMV30224	62	TV2804	67
MV1622	55	SMSD4004-SOD323	17	SMV30225	62	TV3201	60
MV1624	55	SMSD4012-SOD323	17	SMV30332	62	TV3901	60
MV1626	55	SMSD6004-SOD323	17	SMV30333	62	TV3902	60
MV1628	55	SMSD6012-SOD323	17	TV1401	66	V900	52
MV1630	55	SMSP3004-SOT143	17	TV1402	66	V900E	52
MV1632	55	SMSP3012-SOT143	17	TV1403	66	V907	52
MV1634	55	SMSRQ1200-SOT143	17	TV1501	66	V907E	52
MV1636	55	SMSRQ1500-SOT143	17	TV1502	66	V910	52
MV1638	55	SMSRQ2500-SOT143	17	TV1503	66	V910E	52
MV1640	55	SMSRQ4500-SOT143	17	TV1601	66	V912	52
MV1642	55	SMSRQ5500-SOT143	17	TV1602	66	V912E	52
MV1644	55	SMST3004-SOT23	17	TV1603	66	V915	52
MV1646	55	SMST3012-SOT23	17	TV1701	66	V915E	52
MV1648	55	SMST4004-SOT23	17	TV1702	66	V920	52
MV1650	55	SMST4012-SOT23	17	TV1703	66	V920E	52
MV1652	55	SMST6004-SOT23	17	TV1801	66	V927	52
MV1654	55	SMST6012-SOT23	17	TV1802	66	V927E	52
MV1656	55	SMV1401	64	TV2001	68	V933	52
MV1658	55	SMV1402	64	TV2001A	68	V933E	52
MV1660	55	SMV1403	64	TV2002	68	V939	52
MV1662	55	SMV1404	64	TV2002A	68	V939E	52
MV1664	55	SMV1405	64	TV2004	68	V947	52
MV1666	55	SMV1406	64	TV2101	67	V947E	52
MV830	54	SMV1407	64	TV2101A	67	V956	52
MV831	54	SMV1408	64	TV2102	67	V956E	52
MV832	54	SMV1409	64	TV2102A	67	V968	52
MV833	54	SMV1410	64	TV2103	67	V968E	52
MV834	54	SMV1411	64	TV2103A	67	V982	52
MV835	54	SMV1412	64	TV2104	67	V982E	52
MV836	54	SMV20411	65	TV2201	68		
MV837	54	SMV20412	65	TV2201A	68		
MV838	54	SMV20413	65	TV2202	68		
MV839	54	SMV20414	65	TV2202A	68		
MV840	54	SMV20415	65	TV2204	68		
MZBD-9161	26	SMV20422	65	TV2301	68		
SMGS11	27	SMV20423	65	TV2301A	68		
SMGS21	27	SMV20424	65	TV2302	68		
SMPN7310-SOD323	31	SMV20425	65	TV2302A	68		
SMPN7310-SOT23	31	SMV2101	47	TV2304	68		
SMPN7316-SOD323	31	SMV2102	47	TV2401	68		
SMPN7316-SOT23	31	SMV2103	47	TV2401A	68		
SMPN7320-SOD323	31	SMV2104	47	TV2402	68		
SMPN7320-SOT23	31	SMV2105	47	TV2402A	68		
SMPN7335-SOD323	31	SMV2106	47	TV2404	68		

Package Number Cross Reference

Metelics	Device Description	Micrometrics
B 10B	Single Junction, Si, BL Schottky	CS12
B 10Bp	"P" Type Single J, Si, BL Schottky	CS12
B 10D	Zero Bias, Single J, Si, BL Schottky	CS12
B 11	Beam Lead PIN & SRD	CS12
B 12	Beam Lead Capacitor	CS14-1
B 13	Beam Lead Capacitor	CS14-2
B 14	Beam Lead Capacitor	CS14-3
B 15	Beam Lead PIN Diode	CS12,
B 16	Series Tee Beam Lead PIN Diode	NA
B 20	Series Tee, Beam Lead Schottky	NA
B 21	Anti Parallel Pair, B L Schottky	NA
B 40	Ring Quad, BL Schottky	CS12-4
B 41	Small, Ring Quad, BL Schottky	NA
B 42	Large, Ring Quad, BL Schottky	CS12-4
B 45	Bridge Quad, BL Schottky	NA
B 47	Coplanar Bridge Quad, BL Schottky	NA
B 48	Coplanar Ring Quad, BL Schottky	NA
B 49	Crossover Ring Quad, BL Schottky	NA
B 80	8 Junction Ring Quad Schottky BL	NA
B 85	4 Junction Ring Quad Schottky BL	NA
B 86	4 Junction Bridge Quad Schottky BL	NA
B 87	12 Junction Ring Quad Schottky	NA
B 88	12 Junction Bridge Quad Schottky	NA
B 89	4 Junction Schottky BL	NA
B 90	6 Junction Series Tee Schottky BL	NA
GB1 10	GaAs, Single Junction, Beam Lead	NA
GB2 10	GaAs, Anti Parallel Pair, Beam Lead	NA

Metelics	Device Description	Micrometrics
GB3 10	GaAs, Series Tee, Beam Lead	NA
GC1 10	GaAs, Single Junction, Flip Chip	NA
GC2 10	GaAs, Anti Parallel Pair, Flip Chip	NA
GC2 10	GaAs, Series Tee, Flip Chip	NA
2012	MSWSH-020-30 Shunt Switch Element	NA
C11	15X15 Diode chip Anode up, .0009" Min. Anode Size	CS11
C11P	15X15 Diode chip Cathode up, .0009" Min. Anode Size	CS11
C12	15X15 Diode chip Anode up, .002" Min. Anode Size	CS11
C12P	15X15 Diode chip Cathode up, .002" Min. Anode Size	CS11
C15	5 Anode, 15X15 Schottky Chip, Anode up, .0009" Min. Anode Size	CS10
C15P	5 Anode, 15X15 Schottky Chip, Cathode up, .0009" Min. Size	CS10
C18	5 Anode, 15X15 Tunnel Chip	NA
C20	20X20, Binary Chip Capacitor	B00
C22	20X20 Diode Chip, Anode up, Min. anode size .002"	CS11
C20P	20X20 Diode Chip, Cathode up, Min. anode size .002"	CS11
C26	20X20 off set bonding pad Schottky	CS11
C32	30X30 Diode Chip, Anode up, Min. anode size .002"	CS11
C32P	30X30 Diode Chip, Cathode up, Min. anode size .002"	CS11
C37	37X37 Diode Chip, Cathode up, Min. anode size .020"	CS11
C40	30X30 Diode Chip, Cathode up, Min. anode size .010"	CS11
C01A	10X10 Diode Chip, Anode up, Min. anode size .0015"	CS11
NA	Chip with Lead (Series)	CS08
NA	Chip with Lead (Shunt)	CS09
C50	20 X45 Micro Strip PIN Diodes	NA
C51	20 X150 Micro Strip PIN Diodes	NA
NA	100 X65 Glass Axial Lead Pkg.	CS65
A15	160 X70 Glass Axial Lead Pkg.	CS75 DO-35

Package Number Cross Reference

Metelics	Device Description	Micrometrics
NA	250 X95 Glass Axial Lead Pkg.	CS85 DO-7
M21	400X160 Hermetic Bolt Channel Pkg.	CS111
SOD323	Two Lead 90X50 Plastic, Injection Molded Pkg.	SOD323
SOT23	Three Lead 110X90 Plastic, Injection Molded Pkg.	SOT23
NA	Epoxy Top, SM, 3, Lead, Alumina, SOT23 Footprint	CS23
NA	Epoxy Top, SM, 3,Lead, Aluminum Nitride, SOT23 Footprint	CS223
SOT143	Four Lead 110X55 Plastic, Injected Molded Pkg.	SOT143
H20	Two Lead, 100X100, Hermetic, Ceramic, Strip line Pkg.	CS20
H27	Two Lead, 70X70, Hermetic, Ceramic, Strip line Pkg.	NA
H30	Three Lead, 100X100, Hermetic, Ceramic, Strip line Pkg.	CS21
H30X	Three Lead, 100X100, Hermetic, Heat Sink Strip line Pkg.	CS21
H40	Four Lead, 100X100, Hermetic, Ceramic, Strip line Pkg.	CS22
H50	Five Lead, 100X80, Hermetic, Ceramic, Strip line Pkg.	CS99H
E25	Two Lead, 50 Sq, Epoxy Top, Strip line Pkg.	CS28
E28	Two Lead, 45X90, Epoxy Top, Strip line Pkg.	NA
E28X	Two Lead, 45X90, Epoxy Top, Gull Wing, Strip line Pkg.	NA
E30	Three Lead, 100 Round, Epoxy Top, Strip line Pkg.	CS30
E35	Three Lead, 50 Sq, Epoxy Top, Strip line Pkg.	CS29
E45	Four Lead, 50 Sq, Epoxy Top, Strip line Pkg.	CS26
E50	Five Lead, 100X75, Epoxy Top, Ceramic, Pkg.	CS99
E50SM	Five Lead, 100X75, Epoxy Top, Ceramic, Gull Wing, Pkg.	NA
ET47	Five Lead, 70 Round, Epoxy Top, Ceramic, Transistor Pkg.	NA
0402	SM, Epoxy top, .040"X.020"X.033" 2 lead Ceramic Body	NA
0805-2	SM, Epoxy top, .080"X.050"X.050" 2 lead Ceramic Body	NA
0805-4	SM, Epoxy top, .080"X.050"X.050" 4 lead Ceramic Body	NA
NA	SM, Epoxy top, .7 Sizes, 2 lead Aluminum Nitride Body	CS16 7 Sizes
NA	SM, Epoxy top,, 7 Sizes, 2 lead Alumina Body	CS19 7 Sizes

Metelics	Device Description	Micrometrics
P55	0.050" Dia. Solder Cap, Metal Ceramic Pkg., Anode up	CS32
P55p	0.050" Dia. Solder Cap, Metal Ceramic Pkg., Cathode up	NA
P81	0.120" Dia. Weld Cap, Metal Ceramic Pkg., Anode up	CS35
P81p	0.120" Dia. Weld Cap, Metal Ceramic Pkg., Cathode up	NA
P86	0.080" Dia. Solder Prong Cap, Metal Ceramic Pkg., Anode up	CS50
P86p	0.080" Dia. Solder Prong Cap, Metal Ceramic Pkg., Cathode up	NA
T54	.080" Dia. Weld Cap, Metal Ceramic Pkg., Cu Base, Anode up	CS34sp
T54p	.080" Dia. Weld Cap, Metal Ceramic Pkg., Cu Base, Cathode up	NA
T55	.050" Dia. Solder Cap, Metal Ceramic Pkg., Cu Base, Anode up	CS32sp
T55p	.050" Dia. Solder Cap, Metal Ceramic Pkg., Cu Base, Cathode up	NA
T80	0.120" Dia. Weld Cap, Metal Ceramic Pkg., Cu Base, Anode up	CS40sp
T80p	0.120" Dia. Weld Cap, Metal Ceramic Pkg., Cathode up	NA
T81	0.120" Dia. Weld Cap, Metal Ceramic Pkg., Cu Base, Anode up	CS35sp
T81P	0.120" Dia. Weld Cap, Metal Ceramic Pkg., Cu Base, Cathode up	NA
T86	0.120" Dia. Weld Cap, Metal Ceramic Pkg., Cu Base, Anode up	CS37sp
T86P	0.120" Dia. Weld Cap, Metal Ceramic Pkg., Cu Base, Cathode up	NA
T89	0.120" Dia. Weld Cap, Metal Ce. Pkg., Cu Screw Base, Anode up	CS106
T89p	0.120" Dia. Weld Cap, Metal Ce. Pkg., Cu Screw Base, Cathode up	NA
NA	0.080" Dia. Weld Cap, Cathode up	CS31
NA	0.080" Dia. Weld Cap, Cathode up	CS33
NA	0.080" Dia. Weld Cap, Cathode up	CS34
NA	0.120" Dia. Weld Cap, Cathode up	CS36
NA	0.120" Dia. Weld Cap, Cathode up	CS38
NA	0.120" Dia. Weld Cap, Cathode up	CS39
NA	0.120" Dia. Weld Cap, Cathode up	CS41
NA	0.120" Dia. Weld Cap, Cathode up	CS42
NA	0.120" Dia. Weld Cap, Cathode up	CS43

ISO 9001: 2000

Aeroflex / Metelics, Inc.

Aeroflex / Metelics, Inc.
East Coast Operations
54 Grenier Field Road,
Londonderry, NH 03053
Tel: (603) 641-3800

Sales: (888) 641-SEMI (7364)
metelics-sales@aeroflex.com

Aeroflex / Metelics, Inc.
West Coast Operations
975 Stewart Drive,
Sunnyvale, CA 94085
Tel: (408) 737-8181

www.aeroflex.com/Microwave

www.aeroflex.com/Metelics

Aeroflex / Metelics, Inc. reserves the right to make changes to any products and services herein at any time without notice. Consult Aeroflex or an authorized sales representative to verify that the information in this brochure is current before using these products. Aeroflex does not assume any responsibility or liability arising out of the application or use of any product or service described herein, except as expressly agreed to in writing by Aeroflex; nor does the purchase, lease, or use of a product or service from Aeroflex convey a license under any patent rights, copyrights, trademark rights, or any other of the intellectual rights of Aeroflex or of third parties.

Copyright 2008 Aeroflex / Metelics. All rights reserved.

Revision Date: 06/12/08



Our passion for performance is defined by three attributes represented by these three icons: solution-minded, performance-driven and customer-focused.

A17091(-)