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With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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Power Matters.

RF & Microwave Diode and Transistor Products



Microsemi RFIS Integrated Solutions

RF & Microwave Diode and Transistor Products

Within this short form catalog are the combined product selection guides for Microsemi RF Integrated Solutions (RFIS) business unit RF & microwave diodes and power transistors. RFIS diode products are primarily designed, manufactured, and tested at our Lowell Massachusetts facility and the power transistors are primarily designed, manufactured, and tested at our Santa Clara California facility. For sales and technical assistance consult our website, manufacturer's representative or distributor in your area, or contact the appropriate organization directly:

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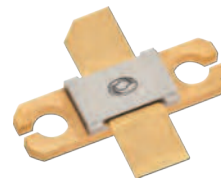
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RF & Microwave Diode and Control Components

Microsemi's RF diode and control component operations, located in Lowell, Massachusetts, brings over 30 years experience in manufacturing of high reliability RF and microwave products. We supply a full range of Silicon and Gallium Arsenide diodes, including PIN and limiter diodes, tuning and multiplier varactors, noise diodes, Schottky-barrier diodes, MNS chip capacitors and Gunn Diodes. We are able to leverage these best in class products in our solid state control components and sensor products. Our extensive product base allows us to support frequencies from 100 Hz through millimeter wave.

With high volume wafer fabrication now in place to meet the competitive needs of our growing commercial and medical customer base, Microsemi's Lowell facility can deliver more cost-effective components faster than ever for our longstanding military customers as well.

From our closely controlled RF/microwave diode inventory we can match characteristics precisely to maintain consistent component performance levels over the full life of your system designs.

Our Lowell operation builds RF and microwave PIN diode switches, limiters, comb generators, attenuators, phase shifters, and detectors in frequency ranges to 40 GHz. All can be hermetically sealed to meet the most stringent military or space requirements and can be combined to include several functions in a single high reliability package. Typical of these integrated packages are switch/limiters, limiter/detectors, switch matrices and switched filters..

Integrated packages can provide higher performance benefits at lower cost than by designing with individual components. To assure the engineering expertise that will attain your desired performance levels, Microsemi only provides assemblies where we can control the high-risk components. In that way, we're able to develop custom packaging that meets your most demanding specifications.

In addition, we are continuing to develop low cost surface mount PIN and Limiter solutions which offer performance more often associated with expensive chip and wire bonding assemblies. They are available in several reflow friendly configurations which allow the customer new opportunities for economical designs.

Microsemi also can offer a significant number of existing configurations to minimize your NRE and provides many customers with microwave components no longer available from their original suppliers. Our extensive library of products and designs gives us the ability to respond quickly with solutions to meet your needs, quickly and cost effectively.

PIN Diodes

- Microsemi has a wide variety of GaAs and Silicon PIN diodes to suit your requirements
- From ultra-low C_j , Beam Lead PIN diodes for broadband switching to high power PIN diodes
- Designed for low frequency, low intermod switching and attenuation

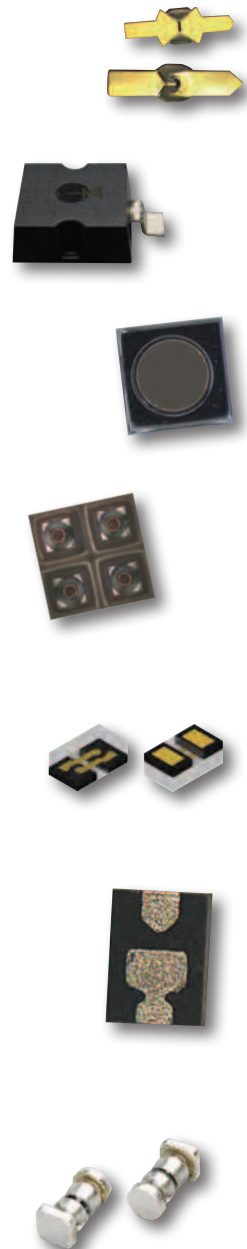
PIN Diode Selection Guide

HIGH SPEED MICROWAVE SWITCHING: Chips & Beam Leaded							
Max Freq (GHz)	Typical C_j (@ V_{pt}) (pF)	40V	50V	70V/75V	100V	250V	Outline
40	0.01					MP61001	GaAs Chip
24	0.03	MP6250	GC4946		GC4801		Beam Leads / GaAs Flip Chip
18	0.06			GC4270	GC4210	GC4220	Chips
12	0.1			GC4271	GC4211	GC4221	Chips
8	0.2		MPP4203	GC4272	GC4212	GC4222	Chips / MMSM™
4	0.50			GC4273	GC4213	GC4223	Chips
2	0.75			GC4275	GC4215	GC4225	Chips

HIGH SPEED MICROWAVE SWITCHING: Packaged							
Max Freq (GHz)	Typical C_T (@ V_{pt}) (pF)	25V	40V/50V	70V/75V	100V	200V/250V	Pkg Type
40	0.02		MP6250				Flip Chip GaAs
24	0.03					MP61001	Ceramic GaAs
18	0.06				MP61004		Ceramic / GaAs
12	0.1		MPP4203	GC4270	GC4210	GC4220	Ceramic / MMSM™
8	0.2	MPP4204		GMP4201	GMP4211	GC4221	Ceramic / GigaMite
4	0.50			GMP4202	GMP4212	GC4222	Ceramic / GigaMite / EPSM
2	0.75			GC4273	GMP4215	GMP4235	Ceramic / GigaMite / EPSM
1	1.2			GC4275	GC4215	GC4225	Ceramic / GigaMite / EPSM

MED - HIGH POWER RF SWITCHING & ATTENUATION: CHIPS							
Max Freq (GHz)	Typical C_j (@ V_{pt}) (pF)	100V	300V	500V	750V	1500V	Outline
18							
12	0.1	GC4410	GC4430		GC4490		Chips
8	0.2	GC4411	GC4431		GC4491		Chips
4	0.5	GC4412	GC4432		GC4492		Chips
2	1	GC4413	GC4433		GC4493		Chips
1	2				GC4494	GC4600	Chips
0.5	4.0					GC4601	Chips

MED - HIGH POWER RF SWITCHING & ATTENUATION: Packaged										
Max Freq (GHz)	Typical C_T (@ V_{pt}) (pF)	100V	300V	500V	600V	750V	1000V	1500V	2000V	Pkg Type
12										
8	0.2	GC4410	GC4430			GC4490				Ceramic
4	0.5	GC4411	GC4431	SM0502	UM6006	GC4491				Ceramic
2	1	GC4413	GC4433	SM0509	UM6606	GC4493		GC4600		Ceramic/MELF/Leaded/Stud
1	2	UM4301			UM4306		UM4310	GC4601		Ceramic/MELF/Leaded/Stud
0.5	4.0						HUM2010	HUM2015	HUM2020	Ceramic/MELF/Leaded/Stud



PIN Diode Power Handling

Typical PIN Diode Power Handling (CW)

PIN Family	Frequency Band (GHz)							
	0.1-0.5	0.5-1.0	1.0-2.0	2.0- 4.0	4.0-12	12-18	18-40	> 40
	HUM Series	UM / GC4600 Series	UM / GC4600 GC4700 Series	GC4400 GC4200 GC4700 Series	GC4400 GC4200 GC4700 Series	GC4200 GC4700 GC4900 Series	GC4800 / GaAs MP Series	GaAs MP Series
Typ. Junction Capacitance	4 pF	2 pF	1 pF	0.5 pF	0.2 pF	0.1 pF	0.05 pF	< 0.05 pF
Incident Power								
+60 dBm	OK	MARGINAL	NO	NO	NO	NO	NO	NO
+50 dBm	OK	OK	MARGINAL	MARGINAL	NO	NO	NO	NO
+40 dBm	OK	OK	OK	OK	MARGINAL	NO	NO	NO
+30 dBm	OK	OK	OK	OK	OK	MARGINAL	MARGINAL	NO
+20 dBm	OK	OK	OK	OK	OK	OK	OK	MARGINAL
+10 dBm	OK	OK	OK	OK	OK	OK	OK	OK

Packaging for Power Handling

Package Type	Lp	Cp	Rs	Thermal Performance (θ_p)	Cost	Max Frequency (GHz)	Hermetic	Comments
Ceramic	Excellent	Excellent	Excellent	Excellent	High	18	Yes	Most products available
MELF	Good	Fair	Excellent	Very Good	Moderate	2	Yes	Only select PIN diodes available
MMSM	Very Good	Very Good	Good	Good	Low	8	No	Only select PINs and varactors
Giga Mite	Good	Very Good	Good	Very Good	Low	6	No	Only select PINs, varactors and Schottkys
EPSM	Good	Good	Good	Good	Moderate	6	No	Most products available
Stripline	Good	Good	Good	Fair	Moderate	8	Yes or No	Most products available
Glass Axial	Fair	Good	Good	Poor	Moderate	1.5	Yes	Only select PINs, varactors, and Schottkys
Plastic	Poor	Fair	Fair	Poor	Low	2	No	Only select PINs, varactors, and Schottkys

PIN Diodes

GC4200 Series/Small Signal/High Speed Switching Chip Electrical Specifications: T_A 25°C

MODEL NUMBER	BREAKDOWN VOLTAGE V_B @ 10 μ A (MIN)(V)	JUNCTION CAPACITANCE ¹ C_J @-10V (MAX) (pF)	SERIES RESISTANCE ² (R_s @20mA, 1 GHz) (MAX) (Ohms)	CARRIER LIFETIME T_L ($I_R=6$ mA, $I_F=10$ mA) (Typ) (nS)	THERMAL RESISTANCE (MAX) (°C/W)
GC4270	70	0.06	1.5	100	80
GC4271	70	0.1	1	100	70
GC4272	70	0.2	0.8	100	70
GC4273	70	0.3	0.7	100	60
GC4274	70	0.4	0.6	100	50
GC4275	70	0.5	0.5	100	40
GC4210	100	0.06	1.5	200	80
GC4211	100	0.1	1	200	70
GC4212	100	0.2	0.75	200	70
GC4213	100	0.3	0.6	200	60
GC4214	100	0.4	0.5	200	50
GC4215	100	0.5	0.35	200	40
GC4220	250	0.06	2.5	500	80
GC4221	250	0.1	2	500	70
GC4222	250	0.2	1.5	500	70
GC4223	250	0.3	1	500	60
GC4224	250	0.4	0.8	500	50
GC4225	250	0.5	0.6	500	40

GC4400 Series/Large Signal Switching/Attenuator Chip Electrical Specifications: T_A 25°C

MODEL NUMBER	BREAKDOWN VOLTAGE V_B @ 10 μ A (MIN)(V)	JUNCTION CAPACITANCE ¹ C_J @-50V (MAX) (pF)	SERIES RESISTANCE ² (R_s @100mA, 100 MHz) (MAX) (Ohms)	CARRIER LIFETIME T_L ($I_R=6$ mA, $I_F=10$ mA) (Typ) (μ S)	THERMAL RESISTANCE (MAX) (°C/W)
GC4410	100	0.1	0.6	0.4	40
GC4411	100	0.25	0.5	0.6	25
GC4412	100	0.5	0.4	0.8	20
GC4413	100	0.75	0.3	1.2	10
GC4430	300	0.1	1.5	0.6	40
GC4431	300	0.25	1.2	1.2	30
GC4432	300	0.5	1	1.5	20
GC4433	300	0.75	0.8	2	10
GC4490	750	0.1	1.5	1	30
GC4491	750	0.25	1.2	2	25
GC4492	750	0.5	1	3	20
GC4493	750	0.75	0.8	4	10
GC4494	750	1.3	0.35	5	7
GC4495	750	2.5	0.3	6	5

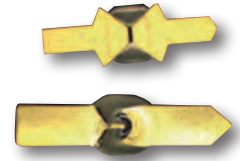
Notes:

1. Capacitance is measured at 1 MHz and -10 volts.
2. Resistance is measured using transmission loss techniques.
3. These devices are not available in all case styles. Please consult the factory for specific package styles offered



PIN Diodes

GC4700 Series/Large Signal Switching/Attenuator Chip Electrical Specifications: T_A 25°C



MODEL NUMBER	BREAKDOWN VOLTAGE V _B @ 10uA (MIN)(V)	JUNCTION CAPACITANCE C _J @ 0V (Typ) (pF)	JUNCTION CAPACITANCE C _J @ -6V (Max) (pF)	JUNCTION CAPACITANCE C _J @ -50V (Max) (pF)	SERIES RESISTANCE ² (R _s @10mA, 1 GHz) (MAX) (Ohms)	CARRIER LIFETIME T _L (I _R =6 mA, I _F =10 mA) (T _{VP}) (uS)	THERMAL RESISTANCE (Typ) (°C/W)
GC4701	20	0.2	0.15	1.5	1.5	5	20
GC4702	20	0.5	0.3	1.2	1.2	10	12
GC4711	45	0.2	0.15	1.5	1.5	10	15
GC4712	45	0.5	0.3	1.2	1.2	15	10
GC4713	45	0.7	0.5	1	1	20	6
GC4721	120	0.2	0.15	1.5	1.5	50	1.2
GC4722	120	0.6	0.3	1	1	50	0.5
GC4723	120	0.8	0.5	0.5	0.5	100	0.3
GC4731	15	0.12	0.1	20	20	5	30
GC4732	15	0.2	0.15	1.5	1.5	5	20
GC4741	30	0.12	0.1	2	2	7	20
GC4742	30	0.2	0.15	1.5	1.5	7	15
GC4750 ³	250			0.25	3.0 @50mA	300	4

Notes: 1. Pulse length 1 microsecond. 2. As measure in style 30 package. 3. Supplied as -002 style, dual mesa.

GC4800 Series/Planar Beam Lead PINs Electrical Specifications: T_A 25°C

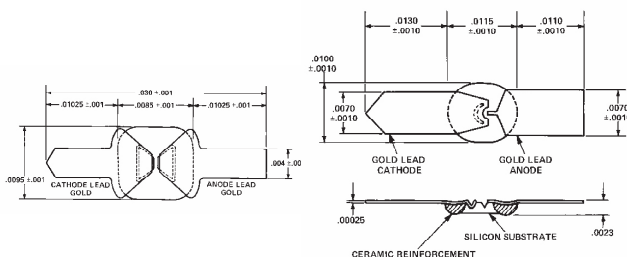
MODEL NUMBER	BREAKDOWN VOLTAGE V _B @ 10uA (MIN)(V)	CAPACITANCE ¹ C _T @-10V (Typ/Max) (pF)	CAPACITANCE ¹ C _T @-50V (Typ/Max) (pF)	SERIES RESISTANCE ¹ (R _s @20mA) (Typ/Max) (Ohms)	SERIES RESISTANCE ¹ (R _s @50mA) (Typ/Max) (Ohms)	CARRIER LIFETIME T _L (I _R =6 mA, I _F =10 mA) (T _{VP}) (uS)	SWITCHING SPEED T _S (Max) (nS)
GC4800A - 14	80	0.016 / 0.020	--	4.5 / 6.5		150	30
GC4801 - 14	80	0.020	0.018 / 0.020		3.5 / 4.0	150	30
GC4802 - 14	100		0.060 / 0.070		2.2 / 3.0	150	30
GC4810 - 16	150		0.025 / 0.035		3.0 / 4.0	300	50

Notes: 1. RS and CT are determined using Loss and Isolation measurements at F = 2.2 GHz.

GC4900 Series/Mesa Beam Lead PINs Electrical Specifications: T_A 25°C

MODEL NUMBER	DC PERFORMANCE				RF PERFORMANCE TYP ¹		
	BREAKDOWN VOLTAGE V _B @ 10uA (MIN)(V)	CAPACITANCE C _T @-10V (Typ/Max) (pF)	SERIES RESISTANCE (R _s @10mA, F=2.2GHz) (Max) (Ohms)	SERIES RESISTANCE (R _s @50mA, F=2.2GHz) (Max) (Ohms)	CARRIER LIFETIME T _L (I _R =6 mA, I _F =10 mA) (T _{VP}) (uS)	Isol (dB) @VR=10V F=2.2 GHz	IL (dB) IF=10mA F=2.2 GHz
GC4902 - 12	100	0.025		3	80		
GC4903 - 12	100	0.030		2.5	80		
GC4941 - 12	50	0.060	1.5		50	22	0.14
GC4942 - 12	50	0.040	2		45	26	0.17
GC4943 - 12	50	0.030	3		40	27.5	0.27
GC4944 - 12	50	0.025	3.5		35	29	0.3
GC4945 - 12	50	0.022	5.5		40	30.5	0.45
GC4946 - 12	50	0.020	6.5		40	32	0.51

Notes: 1. Insertion loss and Isolation are test at F = 2.2 GHz using transmission loss techniques.



PIN Diodes



SM Series Ceramic MELF PINs

Electrical Specifications: T_A 25°C

PART NUMBER	CASE STYLE SUGGESTED	BREAKDOWN VOLTAGE V_B @ 10 μ A (MIN)(V)	TOTAL CAPACITANCE ¹ C_T @ -50V (Max) (pF)	SERIES RESISTANCE ² (R_s @100mA) (MAX) (Ohms)	SERIES RESISTANCE ² (R_s @200mA) (MAX) (Ohms)	T_L ($I_R=6$ mA $I_F=10$ mA) (Typ) (μ S)	THERMAL RESISTANCE (Typ) ($^{\circ}$ C/W)
SM0502	M1	500	0.50	0.70	0.55	1.0	35
SM0504	M1	500	0.60	0.60	0.45	1.5	20
SM0508	M1	500	0.90	0.40	0.25	2.0	15
SM0509	M1	500	1.20	0.35	0.20	2.5	15
SM0511	M1	500	1.25	0.30	0.15	3.0	15
SM0512	M1	500	1.50	0.25	0.12	3.5	15
SM0812	M1	700	1.30	0.40	0.25	4.0	15
SM1001	M1	700	1.30	0.35	0.20	4.5	15
SM1002	M1	50	1.20	.75 @ 50mA	0.20	4.0	15
SM1003	M1	35	1.2 @ 20V	.50 @ 10mA	0.10	0.6	25

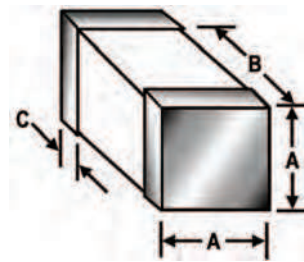
Notes: 1. Total Capacitance measured at F=1 MHz. 2. Series Resistance measured at F=100 MHz.

RoHS and MRI Models

Base Model	RoHS Compliant PN	Non-Mag. / RoHS PN
SM0502 – M1	SMX0502 – M1	SMX0502MR – M1
SM0504 – M1	SMX0504 – M1	SMX0504MR – M1
SM0508 – M1	SMX0508 – M1	SMX0508MR – M1
SM0509 – M1	SMX0509 – M1	SMX0509MR – M1
SM0511 – M1	SMX0511 – M1	SMX0511MR – M1
SM0512 – M1	SMX0512 – M1	SMX0512MR – M1
SM1002 – M1	SMX1002 – M1	SMX1002MR – M1
SM1003 – M1	SMX1003 – M1	SMX1003MR – M1

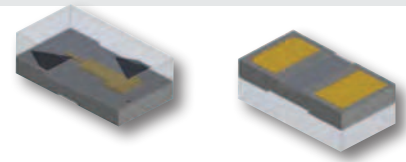
+ 'Non Magnetic' refers to any products that are designed with low and ultra low magnetic materials for use in MRI systems

++ RoHS versions are supplied with a matte tin finish.



DIM	M1	
	INCHES	
	MIN	MAX
A	0.080	0.095
B	0.115	0.135
C	0.008	0.030

Monolithic Microwave Surface Mount (MMSM) PIN Diodes



This series of surface mount PIN diodes utilize new and unique monolithic MMSM technology. The technology is a package/device integration accomplished at the wafer fabrication level. Since the cathode and anode interconnections utilize precision photolithographic techniques rather than wire bonds, parasitic package inductance is tightly controlled. The package parasitics provide smooth non-resonant functionality through 12GHz.

Key Features

- Tape and Reeled for Automatic Assembly
- Low Series Inductance (<0.2nH typical)
- Low Parasitic Capacitance (0.06 pf typical)
- Meets All Commercial Qualification Requirements
- 0204 Outline
- Low thermal resistance

Applications Benefits

- 2.4 GHz PCS communications
- 5.7 GHz Wireless LANS
- Solid State Switches, Attenuators, Limiters
- Phase Shifters
- Widest bandwidth of any commercial surface mounted devices
- Ultra tight parametric distribution

Electrical Specifications: T_A 25°C

PART NUMBER	OUTLINE	BREAKDOWN VOLTAGE V_B @ 10 μ A (Min)(V)	TOTAL CAPACITANCE ¹ C_T @ -10V (Max) (pF)	SERIES RESISTANCE ² (Rs @0.01mA) (Typ) (Ohms)	SERIES RESISTANCE ² (Rs @1mA) (Ohms)	SERIES RESISTANCE ² (Rs @10mA) (Max) (Ohms)	T_L ($I_R=6$ mA $I_F=10$ mA) (Typ) (nS)	APPLICATION
MPP4201	206	70	0.2				150	Attenuator
MPP4202	206	50	0.15				50	MRI
MPP4203	206	50	0.1				50	High Isolation Switch
MPP4204	206	25	0.15			2	20	High Speed Switch
MPP4205	206	70	0.15	250	7-16	5	150	Attenuator
MPP4206	206	200	0.15		5 (Typ)	2.5	500	Attenuator/Switch
MPL4700	206	25	0.15		2	2.0 ^A	20	Receiver Protection
MPL4701	206	15				2.5 ^A	10	Receiver Protection
MPL4702	406	50 ^B			12	2	30	Anti-parallel Pair MRI Surface Coil Detune

Notes:

1. Total Capacitance measured at F=1 MHz.
2. Series Resistance measured at F=100 MHz.

MRI Applications Matrix



Volume/Bird Cage Coils—Switching Diodes

(End ring resonant/anti-resonant Switching Diodes)

Model #	VBR	CT(pF)	Wi (um)	$\tau(\mu\text{s})$	$R_s(\Omega)^1$	@IF(mA)	Application
HUM2015	1500	3.5	275	20	0.1	500	Switching
HUM2020	2000	3.5	275	20	0.1	500	Switching

Surface Coil—Receive Array PIN Diodes

(Loop Array or Strip Array 4 Channels and NX4 Channels)

Model #	VBR	CT(pF)	Wi (um)	$\tau(\mu\text{s})$	$R_s(\Omega)^1$	@IF(mA)	Application
UMX5601	100	2.5	175	5	0.75	50	ULTRA-Low Magnetic Receive Array
UM7201	100	2.2	50	1.5	0.25	100	Receive Array
UM9701	100	1.8	50	1.5	0.8	10	Receive Array
UM9995	100	1.2	100	2	0.6	100	ULTRA-Low Magnetic Receive Array
UMX5101	100	1.2	125	2.5	0.8	50	ULTRA-Low Magnetic Receive Array
UM9989AP ³	75	1.2 ²	--	0.004	2	100	Low Magnetic Receive Array
MPL4702 ³	50	1.2 ²	--	0.03	2	10	Low Magnetic Receive Array

Transmit/Receiver Control Boards

Model #	VBR	CT(pF)	Wi (um)	$\tau(\mu\text{s})$	$R_s(\Omega)^1$	@IF(mA)	Application
UM4001	100	3	175	5	0.25	500	T/R Control
UM4301	100	2.2	325	6	1.5	100	T/R Control
UM7301	100	0.7	325	4	3	100	T/R Control
SMX0512MR	500	1.5	50	3.5	0.35	100	T/R Control
UM7101	100	1.2	100	2	0.6	100	T/R Control
UM6201	100	1.1	50	0.6	0.4	100	T/R Control
UM9415	50	3	175	5	0.75	50	T/R Control

Receiver Protection Circuits

Model #	VBR	CT(pF)	Wi (um)	$\tau(\mu\text{s})$	$R_s(\Omega)^1$	@IF(mA)	Application
UM9989	75	1.2	--	0.006	2	100	Receiver Protection
UM1089	75	1.5	--	0.015	0.8	100	Receiver Protection
UM7201	100	2.2	50	1.5	0.25	100	Receiver Protection
SMX0509MR	500	1.2	50	2.5	0.2	200	Receiver Protection
MPP4204	25	0.15	--	0.02	2	10	Receiver Protection
MPL4702 ³	50	1.22	--	0.03	2	10	Receiver Protection
UM9415	50	3	175	5	0.75	50	Receiver Protection

Notes:

1. Series Resistance (RS) is measured at 100MHz.
2. Nominal Ct per Diode.
3. Anti-parallel Pairs

Power PIN Diodes

Power PIN Diodes for Switching and Attenuation

Featuring fast switching products through High Power / Low IM products for TR switching control

Category	CT@100V (Typ) (pF)	CT@50V (Typ) (pF)	R _p @100V (Min) (kOhms)	R _p @30V (Min) (kOhms)	TL (Min/Typ) (uS)	Rs@100 mA (Max) (Ohms)	RoHS Available	Low Mag	V _b (Min) (V)	PN
HIGH POWER PIN DIODE Up to 2000V	3.4		200	100	10 / 30		Yes		200 500 1000 2000	HUM2002 HUM2005 HUM2010 HUM2020
ULTRA LOW MAGNETING MED Power Switching Up to 1500V		2.6		100	5 / 15	0.5	Yes	Yes	100 500 1000 1500	UMX5601 UMX5605 UMX5610 UMX5515
SWITCHING / ATTENUATION MED Power Up to 1000V		2.2	200		6	1.5	Yes		100 200 600 1000	UM4301 UM4302 UM4306 UM4310
SWITCHING / ATTENUATION MED Power Up to 1000V		0.7	150		4	3	Yes		100 200 600 1000	UM7301 UM7302 UM7306 UM7310

Category	CT@0V (Typ) (pF)	CT@50V (Typ) (pF)	G @0V (Max) (uS)		TL (Typ) (nS)	Rs@100 mA (Typ) (Ohms)	RoHS Available	Low Mag	V _b (Min) (V)	PN
FAST TURN ON RECEIVER PROTECTION	1.2		40		6	2	Yes	Yes	75	UM9989
ANTI PARALLEL CONFIGURATION	2.4									UM9989AP
FAST TURN ON RECEIVER PROTECTION	1.5		40		15	0.8	Yes	Yes	75	UM9989

Category	CT@50V (Typ) (pF)	CT@100 V (Max) (pF)	R _p @0V (Min) (kOhms)	R _p @100V (Min) (kOhms)	TL (Typ) (uS)	Rs@100 mA (Typ) (Ohms)	RoHS Available	Low Mag	V _b (Min) (V)	PN
SURFACE MOUNT SWITCHING DIODE	0.75		5		4	0.5	Yes	Yes	75	UM9989
POWER PIN DIODES		0.4		300	2	2.2	Yes		100 200 600 1000	UM6601 UM6602 UM6606 UM6610



Schottky Diodes



Schottky Mixer Diodes

- Monolithic design for lowest parasitics
- Low Conversion Loss
- Suitable for applications to 26.5 GHz
- Excellent Noise Figure
- Can be supplied as monolithic or as packaged device
- Single, T & Quad configurations available
- RoHS Compliant

Freq. Range	PART NUMBER	Barrier	BREAKDOWN VOLTAGE $V_B @ 10\mu A$ (Min)(V)	TOTAL CAPACITANCE $C_T @ 0V$ (Max) (pF)	FORWARD VOLTAGE $V_F @ 1mA$ (Max) (mV)	$R_d @ I_F = 5mA$ (Max) (Ohms)	NF ssbs Typ (dB)	Zif (Typ) (Ohms)
Ku-Ka	GC9901	ULTRA-LOW	2	0.10	310	18	6.5	140
X	GC9902			0.15	280	14	6	
C	GC9903			0.3	270	12	5.5	
S	GC9904			0.5	250	10	5.5	
Ku-Ka	GC9911	LOW	2	0.10	360	18	6.5	170
X	GC9912			0.15	350	14	6	
C	GC9913			0.3	340	12	5.5	
S	GC9914			0.5	330	10	5.5	
Ku-Ka	GC9921	LOW-MED	2	0.10	440	18	6.5	200
X	GC9922			0.15	430	14	6	
C	GC9923			0.3	410	12	5.5	
S	GC9924			0.5	390	10	5.5	
Ku-Ka	GC9931	MEDIUM	3	0.10	540	18	6.75	250
X	GC9932			0.15	530	14	6.25	
C	GC9933			0.3	520	12	5.75	
S	GC9934			0.5	500	10	5.5	
Ku-Ka	GC9941	HIGH	4	0.10	650	20	7	300
X	GC9942			0.15	630	16	6.25	
C	GC9943			0.3	620	12	5.75	
S	GC9944			0.5	600	10	5.75	

GaAs Schottky Barrier Diodes

Electrical Specifications: T_A 25°C

PART NUMBER	JUNCTION CAPACITANCE $C_J @ 0V$ (Typ) (pF)	R_s^2 (Max) (Ohms)	Typical LO Freq (GHz)	NF ssbs ⁴ (Typ) (dB)	Zif (Typ) (Ohms)	$V_B @ 10\mu A$ (Min)(V)
MS8001	0.12	6	9.375	5.6	250-500	5
MS8002	0.1	6	16	5.6	250-500	5
MS8003	0.07	6	24	6.5	250-500	5
MS8004	0.06	6	36	6.5	250-500	5

Flip Chip GaAs Schottky Barrier Diodes

Electrical Specifications: T_A 25°C

PART NUMBER	CAPACITANCE $C_J @ 0V$ (Max) (pF)	R_s @10mA (Max) (Ohms)	V_F @10mA (mV)	Delta V_F (mV)	$V_B @ 10\mu A$ (Min)(V)	Description
MS8150-P2613	0.08	7	650 - 750	na	3	Low R_s Flip Chip - Single
MS8151-P2613	0.06	9	600 - 800	na	3	Low C_t Flip Chip - Single
MS8250 - P2920	0.08	7	650 - 750	10	3	Low R_s Flip Chip - Antiparallel
MS8251 - P2920	0.06	9	600 - 800	10	3	Low C_t Flip Chip - Antiparallel

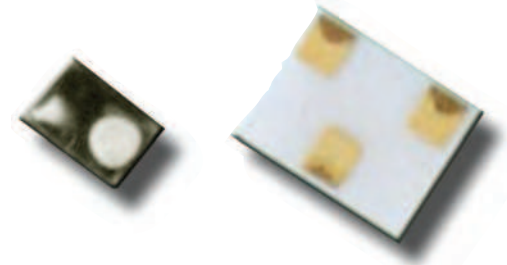


Enhanced Performance Surface Mount

EPISM PIN Diodes

For Switching and Attenuation

PART NUMBER	BREAKDOWN VOLTAGE $V_B @ 10\mu A$ (Min)(V)	TOTAL CAPACITANCE $C_T @ V_R$ (Max) (pF)	$R_s @ I_F$ (Max) (Ohms)	T_L ($I_R=6 mA$, $I_F=10 mA$) (Typ) (nS)	Application
LSP1000	35	0.28 @ 5V	2.5 @ 5mA	80 nS	Switch
LSP1002	100	0.32 @ 50V	4.0 @ 100mA	1500 nS	Attenuator
LSP1004	35	0.75 @ 20V	0.6 @ 10mA	150 nS	Switch
LSP1011	200	0.35 @ 50V	2.0 @ 100mA	2000 nS	Attenuator
LSP1012	20	0.35 @ 10V	1.8 Ohms @ 10mA	5 nS	Limiter



EPISM Super Hyperabrupt 12V

Varactors for Low Voltage VCOs

PART NUMBER	TOTAL CAPACITANCE $C_T @ -1.0V$ (Min) (pF)	TOTAL CAPACITANCE $C_T @ -2.5V$ (Min - Max) (pF)	TOTAL CAPACITANCE $C_T @ -4V$ (Max) (pF)	TOTAL CAPACITANCE $C_T @ -8V$ (Max) (pF)	Q (4V/50MHz) min
KV1913A	36 pF	18 - 27	12	6.20	400
KV1953A	26 pF	13 - 20	9	4.7	500
KV1923A	17 pF	8.5 - 13	6	3.2	600
KV1933A	13 pF	6.5 - 10	4.5	2.7	750
KV1943A	9 pF	4.5 - 6.5	3	1.7	900
KV1963A	4 pF	2.0 - 3.0	1.5	1	1200
KV1973A	1.8 pF	1.1 - 1.5	0.8	0.55	1400
KV1983A	1.2 pF	0.8 - 1.1	0.6	0.45	1600
KV1993A	0.6 pF	0.5 - 0.8	0.4	0.35	1800

Microwave Hyperabrupt 22V Varactors

for Wide Bandwidth VCOs

PART NUMBER	TOTAL CAPACITANCE $C_T @ 0V$ (Typ) (pF)	TOTAL CAPACITANCE $C_T @ -4.0V$ (Min - Max) (pF)	TOTAL CAPACITANCE $C_T @ -20V$ (Max) (pF)	Q (4V/50M Hz) min
KV2163	26 pF	8.75 - 10.80	2.5	400
KV2153	13.5 pF	4.45 - 5.50	1.3	600
KV2143	7 pF	2.65 - 3.30	0.9	700
KV2133	5 pF	1.75 - 2.20	0.7	850
KV2123	3 pF	1.30 - 1.65	0.55	1000
KV2113	2 pF	0.85 - 1.10	0.45	1200

Microwave Abrupt 30V Varactors

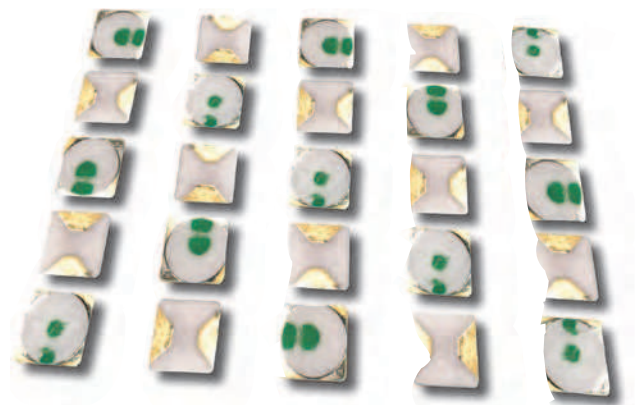
for Moderate Bandwidth, Low Noise VCOs

PART NUMBER	CT0/CT4 (min)	TOTAL CAPACITANCE $C_T @ -4.0V$ (+ / - 10%) (pF)	CT4/CT30 (min)	Q (4V/50M Hz) min
GC1300	1.5	0.8	1.45	3900
GC1301	1.6	1.0	1.55	3800
GC1302	1.7	1.2	1.6	3700
GC1303	1.8	1.5	1.65	3600
GC1304	1.9	1.8	1.7	3500
GC1305	2	2.2	1.75	3400
GC1306	2	2.7	1.8	3300
GC1307	2.1	3.3	1.85	3100
GC1308	2.1	3.9	1.85	2700
GC1309	2.1	4.7	1.85	2600
GC1310	2.1	5.6	1.85	2500

Tuning Varactors

Varactor Category Performance Guide

Category	Model Number or Family	Max Voltage	Typical Ratio	Mod Sens Linearity	Relative Q or VCO Phase Noise
Abrupt GaAs	MV20000	15V	3:1	Poor; Exponential	Best
	MV21000	30V	4:1		
Abrupt Silicon	GC1200; GC1300; GC1500; 1N5400	30V	4:1		
	GC1600; 1N5400	45V	5:1		
	GC1700; 1N5100	60V	6:1		
Hyperabrupt GaAs	MV34000;	15V	6:1		
	MV30000; MV31000 MV32000	30V	11:1		
Hyperabrupt Silicon	KV2100; MPV2100	22V	11:1		
	GMV2100				
	KV2101				
	KV2201				
	KV2301				
	KV2401				
	KV2501				
	KV2601				
	KV2701				
	KV2801				
Low "S" Linear FLTVARS	GC15000	22V	6:1	Excellent	Excellent
	GC15000	22V	11:1	Excellent	Excellent
Silicon Super Hyperabrupts	KV1905A	12V	3:1	Good (Mid-Range)	Very Good
	KV1925A				
	KV1935A				
	KV1945A				
	KV1965A; MPV1965				
	KV1975A	12V	4:1	Good (Mid-Range)	Very Good
	KV1911A-KV1991A	12V	6:1	Good (Mid-Range)	Very Good
	KV1912A-KV1932A				
	KV1913A-KV1993A	12V	13:1	Good (Mid-Range)	Good
	KV1400				
KV1500					
KV1600					
KV1700					
KV1800					



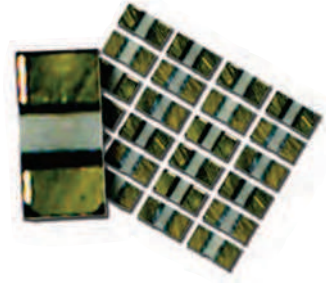
Tuning Varactors

Varactor Diode Selector Guide

Material	Silicon	Silicon	Silicon	Silicon	Silicon	Silicon	Silicon	GaAs	GaAs	GaAs	GaAs	GaAs	GaAs	GaAs
Freq. Band	Super Hyper Vb=12V P/N Series	High "S" Linear Vb=22V P/N	Low "S" Linear Vb=22V P/N	Hyper Vb=22V P/N Series	Abrupt Vb=30V Chip Ceramic Glass*	Abrupt Vb=30V EPSM	Abrupt Vb=30V SOT-23	Hyper Chips** VB=22V Low Gamma	Hyper Chips** VB=22V Medium Gamma	Hyper Chips** VB=22V High Gamma	Hyper Chips** VB=15V Very High Gamma	Hyper Flip Chip Vb=18V Medium Gamma	Abrupt Chips** Vb=15V	Abrupt Chips** Vb=30V
Microwave to 40 GHz								MV32001	MV30011	MV31011	MV34001		MV20001	MV21001
								MV32002	MV30012	MV31012	MV34002		MV20002	MV21002
								MV32003	MV30013	MV31013	MV34003		MV20003	MV21003
								MV32004	MV30014	MV31014	MV34004		MV20004	MV21004
								MV32005	MV30015	MV31015	MV34005		MV20005	MV21005
								MV32006	MV30016	MV31016	MV34006		MV20006	MV21016
								MV32007	MV30017	MV31017	MV34007		MV20007	MV21007
								MV32008	MV30018	MV31018	MV34008		MV20008	MV21008
								MV32009	MV30019	MV31019	MV34009		MV20009	MV21009
								MV32010	MV30020	MV31020	MV34010		MV20010	MV21010
Microwave to 18 GHz				MPV2100	GC1500A	GC1300				MV31021		MV39001		
	KV199x			KV211x	GC1500B	GC1301						MV39002		
	KV198x	GC15006	GC15001	KV212x	GC1500	GC1302				MV31022		MV39003		
	KV197x	GC15007	GC15002	KV213x	GC1501	GC1303								
	KV196x	GC15008	GC15003	KV214x	GC1502	GC1304				MV31023				
	KV194x	GC15009	GC15004	KV215x	GC1503	GC1305	GC1202							
	KV193x	GC15010	GC15005	KV216x	GC1504	GC1306	GC1203			MV31024				
		GMV5007		GMV2114	GC1505	GC1307	GC1204							
				GMV2134	GC1506	GC1308	GC1205			MV31025				
				GMV2154	GC1507	GC1309	GC1206							
UHF to 1.0 GHz								GC1208						
					GC1508			GC1209						
				KV2101	GC1509			GC1210						
	KV192x	GC15011	GC15014	KV3201	GC1510	N/A		GC1211						
	KV195x	GC15012	GC15015	KV3901	GC1511			GC1212						
	KV191x	GC15013	GC15016	KV2801	GC1512			GC1213						
VHF to 250 MHz					GC1513			GC1214						
				KV2001	1N5441			GC1215						
	KV1401	N/A	N/A	KV2201	1N5476	N/A		GC1216						
HF 1 - 50 MHz	KV1501			KV2301	thru			GC1217						
				KV2401										
	KV1601			KV2501										
	KV1701	N/A	N/A	KV2601	N/A	N/A	N/A							
			KV1801	KV2701										

MMSM Varactor Diodes

Monolithic Microwave Surface Mount (MMSM) Varactor Diodes



This series of surface mount PIN diodes utilize new and unique monolithic MMSM technology. The technology is a package/device integration accomplished at the wafer fabrication level. Since the cathode and anode interconnections utilize precision photolithographic techniques rather than wire bonds, parasitic package inductance is tightly controlled. The package parasitics provide smooth non-resonant functionality through 12GHz.

Key Features:

- Tape and Reeled for Automatic Assembly
- Low Series Inductance (<0.2nH typical)
- Low Parasitic Capacitance (0.06 pf typical)
- Meets All Commercial Qualification Requirements
- 0204 Outline

Applications/Benefits

- 2.4 GHz PCS
- 5.7 GHz Wireless LANS
- VCO's (Voltage Controlled Oscillator)
- Tunable Filter
- Widest bandwidth of any commercial surface mounted devices
- Ultra tight parametric distribution

Electrical Specifications: T_A 25°C

PART NUMBER	V _b @10uA (Min) (V)	TOTAL CAPACITANCE C _T @ -1.0V (Min - Max) (pF)	RATIO C _T 1V/C _T 3V	RATIO C _T 1V/C _T 6V	Q (4V/50MHz) (Min)	Outline Dwg Number	Application
MPV1965	15	2.6-3.8	1.4-2.2	2.6-3.6	1500	206	Low Voltage VCO

PART NUMBER	V _b @10uA (Min) (V)	TOTAL CAPACITANCE C _T @ 0V (Typ) (pF)	TOTAL CAPACITANCE C _T @ -4.0V (Min - Max) (pF)	TOTAL CAPACITANCE C _T @ -20V (Min - Max) (pF)	Q (4V/50MHz) (Min)	Outline Dwg Number	Application
MPV2100	22	3.25	0.9-1.5	0.2-0.5	1500	206	Wide Bandwidth VCO

GaAs Varactor Diodes

Microsemi's GaAs varactors are available as Abrupt Junction and Hyperabrupt Junction. Our computer controlled epitaxy provide the optimal C-V characteristics for your application. GaAs varactors feature extremely high Q and lowest phase noise for critical applications/

Electrical Specifications: T_A 25°C

15 Volt Abrupt Junction Varactors, Gamma = 0.6					30 Volt Abrupt Junction Varactors, Gamma = 0.6				
PART NUMBER	TOTAL CAPACITANCE C _T @ -4.0V (+/- 10%) (pF)	RATIO C _T 0V/C _T V _{BR}	V _b @10 uA (Min) (V)	Q (4V/50MHz) (Min)	PART NUMBER	TOTAL CAPACITANCE C _T @ -4.0V (+/- 10%) (pF)	RATIO C _T 0V/C _T V _{BR}	V _b @10 uA (Min) (V)	Q (4V/50MHz) (Min)
MV20001	0.3	2.4	15	8000	MV21001	0.3	2.8	30	8000
MV20002	0.4	2.6	15	7500	MV21002	0.4	3.1	30	7500
MV20003	0.5	2.8	15	7000	MV21003	0.5	3.4	30	7000
MV20004	0.6	2.9	15	6500	MV21004	0.6	3.6	30	6500
MV20005	0.8	3	15	6000	MV21005	0.8	3.8	30	6000
MV20006	1	3.1	15	5700	MV21006	1	4	30	5700
MV20007	1.2	3.2	15	5000	MV21007	1.2	4.2	30	5000
MV20008	1.5	3.3	15	5000	MV21008	1.5	4.3	30	5000
MV20009	1.8	3.4	15	5000	MV21009	1.8	4.5	30	5000
MV20010	2.2	3.4	15	4000	MV21010	2.2	4.6	30	4000

Electrical Specifications: T_A 25°C

15 Volt Hyperabrupt Varactors - Gamma = 1.00					22 Volt Hyperabrupt Varactors - Gamma = 1.00				
PART NUMBER	TOTAL CAPACITANCE C _T @ -4.0V (+/- 10%) (pF)	RATIO C _T 2V/C _T 12V	V _b @10 uA (Min) (V)	Q (4V/50MHz) (Min)	PART NUMBER	TOTAL CAPACITANCE C _T @ -4.0V (+/- 10%) (pF)	RATIO C _T 2V/C _T 12V	V _b @10 uA (Min) (V)	Q (4V/50MHz) (Min)
MV30001	0.6	2.5	15	4000	MV30011	0.6	3.1	22	4000
MV30002	1	3.1	15	3000	MV30012	1	4.1	22	3000
MV30003	1.2	3.2	15	3000	MV30013	1.2	4.3	22	3000
MV30004	1.5	3.4	15	3000	MV30014	1.5	4.8	22	3000
MV30005	1.8	3.5	15	3000	MV30015	1.8	5	22	3000
MV30006	2.2	3.6	15	3000	MV30016	2.2	5.3	22	3000
MV30007	2.5	3.7	15	2500	MV30017	2.5	5.5	22	2500
MV30008	3	3.8	15	2500	MV30018	3	5.7	22	2500
MV30009	3.6	3.8	15	2000	MV30019	3.6	5.9	22	2000
MV30010	4.5	3.9	15	1500	MV30020	4.5	6.1	22	1500

Electrical Specifications: T_A 25°C

15 Volt Hyperabrupt Varactors - Gamma = 1.25					22 Volt Hyperabrupt Varactors - Gamma = 1.25				
PART NUMBER	TOTAL CAPACITANCE C _T @ -4.0V (+/- 10%) (pF)	RATIO C _T 2V/C _T 12V	V _b @10 uA (Min) (V)	Q (4V/50MHz) (Min)	PART NUMBER	TOTAL CAPACITANCE C _T @ -4.0V (+/- 10%) (pF)	RATIO C _T 2V/C _T 12V	V _b @10 uA (Min) (V)	Q (4V/50MHz) (Min)
MV31001	0.6	3	15	4000	MV31011	0.5	3.2	22	4000
MV31002	1	3.7	15	3000	MV31012	0.7	4	22	4000
MV31003	1.2	3.9	15	3000	MV31013	1	5	22	3000
MV31004	1.5	4.2	15	3000	MV31014	1.2	5.4	22	3000
MV31005	1.8	4.4	15	3000	MV31015	1.5	6	22	3000
MV31006	2.2	4.6	15	3000	MV31016	1.8	6.4	22	3000
MV31007	2.5	4.7	15	2000	MV31017	2	6.6	22	3000
MV31008	3	4.8	15	2000	MV31018	2.2	6.8	22	3000
MV31009	3.6	4.9	15	2000	MV31019	2.7	7.2	22	2000
MV31010	4.5	5	15	1500	MV31020	3.3	7.6	22	2000

Additional Gamma and Capacitance values are available. Consult the factory or www.microsemi.com.

Gunn Diodes

MG1001 - MG1060 Cathode Heat Sink

- 5.9-95GHz, CW designs to 500mW and pulsed designs to 10W
- High reliability, low phase noise, and low 1/f noise
- Transmitters and receivers, beacons, radars, radiometers, and instrumentation
- Motion detectors and automotive collision avoidance



Discrete Frequency: Cathode Ground (CW EPI-Down)								
Minimum Power (mW)	C (5.4-6.9) GHz	X (8.0-12.4) GHz	Ku (12.4-18.0) GHz	K (18.0-26.5) GHz	Ka (18-26.5) GHz	U (40.0-60.0) GHz	V (60.5-85) GHz	W (85.0-95.0) GHz
10							MG1036-M16 V _{OP} = 4.5V @ I _{OP} = 900mA	MG1024-M16 V _{OP} = 4.5V @ I _{OP} = 1100mA
20								MG1025-16 V _{OP} = 4.5V @ I _{OP} = 1000mA
50	MG1001-M11 V _{OP} = 12V @ I _{OP} = 400mA	MG1005-M11 V _{OP} = 10V @ I _{OP} = 400mA	MG1009-M11 V _{OP} = 8V @ I _{OP} = 500mA	MG1013-M16/83B V _{OP} = 6V @ I _{OP} = 600mA	MG1017-M16 V _{OP} = 4.5V @ I _{OP} = 700mA	MG1021-M16 V _{OP} = 4V @ I _{OP} = 800mA	MG1037-M16 V _{OP} = 5V @ I _{OP} = 1100mA	MG1038-M16 V _{OP} = 5V @ I _{OP} = 1200mA
100	MG1002-M11 V _{OP} = 12V @ I _{OP} = 600mA	MG1006-M11 V _{OP} = 10V @ I _{OP} = 700mA	MG1010-M11 V _{OP} = 8V @ I _{OP} = 800mA	MG1014-M16/83B V _{OP} = 6V @ I _{OP} = 1000mA	MG1018-M16 V _{OP} = 4.5V @ I _{OP} = 1100mA	MG1022-M16 V _{OP} = 4V @ I _{OP} = 1200mA		
150							MG1023-M16 V _{OP} = 4V @ I _{OP} = 1600mA (40-50 GHz)	
200				MG1015-M16/83B V _{OP} = 6V @ I _{OP} = 1400mA	MG1019-M16 V _{OP} = 5V @ I _{OP} = 1400mA			
250	MG1003-42 V _{OP} = 12V @ I _{OP} = 1100mA	MG1007-42 V _{OP} = 10V @ I _{OP} = 1200mA	MG1011-42 V _{OP} = 8V @ I _{OP} = 1200mA		MG1020-M16 V _{OP} = 5.5V @ I _{OP} = 1600mA			
300					MG1039-M16 V _{OP} = 5.5V @ I _{OP} = 1700mA (26.5-35 GHz)			
350					MG1040-M16 V _{OP} = 5.5V @ I _{OP} = 1800mA (26.5-35 GHz)			
400				MG1016-83B V _{OP} = 6V @ I _{OP} = 1700mA (18.0-23 GHz)				
500	MG1004-42 V _{OP} = 12V @ I _{OP} = 1300mA	MG1008-42 V _{OP} = 10V @ I _{OP} = 1600mA	MG1012-42 V _{OP} = 8V @ I _{OP} = 1700mA					
5W Pulsed High Power (9.3GHz)		MG1034-42 V _{OP} = 35V @ I _{OP} = 8A						
10W Pulsed Stacked (9.3GHz)		MG1060-42 V _{OP} = 70V @ I _{OP} = 6A						

Polarity: Anode is the cap and Cathode is the heat-sink

MG1041-MG1058 Anode Heat Sink

- 9.5-25Ghz, pulsed and CW designs to 30mW
- High reliability, ultra low phase noise, and low 1/f noise
- Transmitters and receivers, beacons, radars, radiometers, and instrumentation
- Motion detectors and automotive collision avoidance



Discrete Frequency: Anode Ground (CW EPI-Up)		
Minimum	X	K
5		MG1054-30 V _{OP} = 5V @ I _{OP} = 200mA
10	MG1052-30 V _{OP} = 8V @ I _{OP} = 140mA	MG1058-30 V _{OP} = 5V @ I _{OP} = 300mA
20	MG1056-30 V _{OP} = 8V @ I _{OP} = 200mA	

Polarity: cathode is the cap and anode is the heat-sink

Discrete Frequency: Anode Ground (Pulsed EPI-Up)		
Minimum	X	K
5		MG1044-130 V _{OP} = 8V @ I _{OP} = 120mA
10	MG1041-30 V _{OP} = 9V @ I _{OP} = 110mA	MG1045-30 V _{OP} = 8V @ I _{OP} = 150mA
20	MG1042-30 V _{OP} = 9V @ I _{OP} = 140mA	MG1046-30 V _{OP} = 8V @ I _{OP} = 200mA
30	MG1043-30 V _{OP} = 10V @ I _{OP} = 180mA	

Polarity: cathode is the cap and anode is the heat-sink

Note: Operation over a narrow band around a specific center frequency. Other frequencies available upon request. Call factory. Operating voltage (VOP) typ. Operating current (IOP) max. Power measured with diode inserted in critically coupled cavity. Specifications @ 25°C. Specifications subject to change without notice.

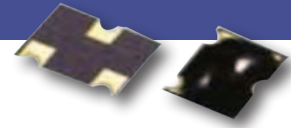
Comb Generators

Model Number		Input	Output level			
		Frequency (MHz)	Up to 4.0 (GHz)	4.0 to 8.0 (GHz)	8.0 to 12.0 (GHz)	12.0 to 18.0 (GHz)
GG770140-01	GG770340-01	100	-10	-20	-	-
GG770140-02	GG770340-02	200	-5	-20	-	-
GG770140-03	GG770340-03	250	-5	-15	-20	-
GG770140-04	GG770340-04	500	0	-10	-20	-
GG770140-05	GG770340-05	1000	5	-5	-15	-15
GG770140-06	GG770340-06	1500	5	0	-10	-10
GG770140-07	GG770340-07	2000	5	0	-5	-10

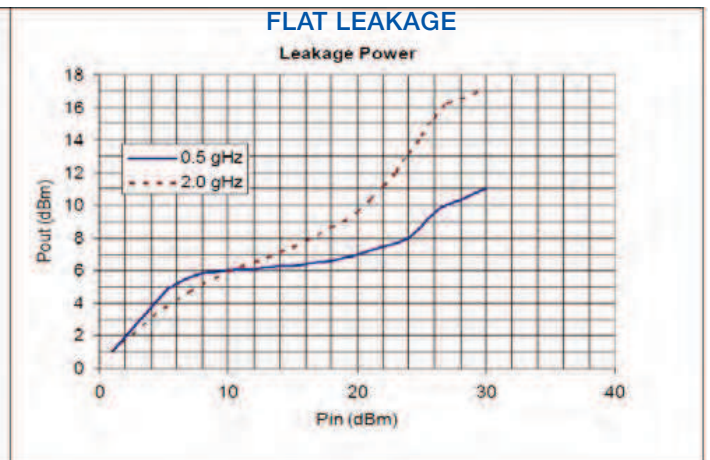
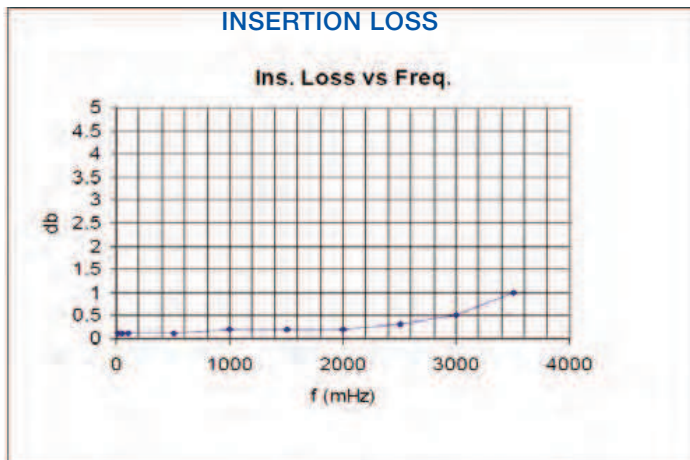
Notes:

1. Minimum output power per line (dBm)
2. All specifications apply at 25°C with 0.5W incident RF power in a 50 ohm system (both source & load)
3. Performance above 12.0GHz is typical performance only.
4. Modular units require an external DC return at the output. Internal or RF decoupled DC returns are available on special order.
5. VSWR is specified at 2.0:1 max (for all model numbers).
6. Modular package style is 210003; Coaxial package style is 210020

Surface Mount Limiter



Model	Freq Range (MHz)	CW Power P_{CW} (W)	Peak Power ¹ P_P (W)	Ins. Loss ² IL(dB) T_{vp} .	VSWR ² Typ.	Flat Leakage ³ (dBm) Typ.			
						<= 1GHz	1.0-1.5GHz	1.5-1.85GHz	1.85-3.5GHz
GG77015-01	10 – 3000	4	20	0.5	1.5:1	15	18	20	23



Notes:

1. Pulse Width = 1 usec, Duty Cycle = 0.001
2. P = -10dBm max
3. P = +30dBm, Pulse Width = 1 usec, Duty Cycle = 0.001
4. RF Power Handling is linearly derated from full power at +25°C to zero power at +150°C

PIN Diode Limiter Assemblies

Standard Broadband Limiter Modules

Frequency Range (GHz)	Insertion Loss (dB max)	VSWR (max)	Survival Peak	Power (Watts) CW	Flat Leakage (mW Max)	Model Number	Package Style
0.5 to 4.0	0.5	1.5:1	100	3	400	GG77012-01	210013
	0.7	1.5:1	200	3	200	GG77010-01	210001
	0.7	1.5:1	200	3	125	GG77011-01	210003
	0.8	1.5:1	1000	5	200	GG77013-01	210003
2.0 to 8.0	0.6	1.7:1	100	2	500	GG77012-02	210013
	0.7	1.7:1	200	2	125	GG77010-02	210001
	0.7	1.7:1	200	2	100	GG77011-02	210003
	1.2	1.7:1	1000	3	200	GG77013-02	210003
4.0 to 12.0	1	1.8:1	200	2	100	GG77010-03	210001
	1	1.8:1	200	2	60	GG77011-03	210003
	1.6	1.8:1	800	3	200	GG77013-03	210003
8.0 to 18.0	1.9	1.9:1	200	2	100	GG77010-04	210001
	1.9	1.9:1	200	2	60	GG77011-04	210003
	2.2	2.0:1	600	3	200	GG77013-04	210003
2.0 to 18.0	2	2.0:1	200	2	125	GG77010-05	210001
	2	2.0:1	200	2	100	GG77011-05	210003
	2.2	2.0:1	600	3	200	GG77013-05	210003

Low Leakage Broadband Limiter Modules

2.0 to 8.0	1.4	1.8:1	10	1	20	GG77014-01	210003
4.0 to 12.4	1.9	2.0:1	10	1	20	GG77014-02	210003
8.0 to 18.0	2.2	2.0:1	10	1	35	GG77014-03	210003

Standard Broadband Connectorized Limiters

Frequency Range (GHz)	Insertion Loss (dB max)	VSWR (max)	Survival Peak	Power (Watts) CW	Flat Leakage (mW Max)	Model Number	Package Style
0.5 to 4.0	0.6	1.5:1	200	3	200	GG77310-01	210019
	0.7	1.5:1	200	3	100	GG77311-01	210019
	0.9	1.5:1	1000	5	200	GG77313-01	210019
2.0 to 8.0	1	1.7:1	200	2	125	GG77310-02	210019
	1	1.7:1	200	2	100	GG77311-02	210019
	1.5	1.7:1	1000	3	200	GG77313-02	210019
4.0 to 12.0	1.5	1.8:1	200	2	100	GG77310-03	210019
	1.5	1.8:1	200	2	60	GG77311-03	210019
	2.1	1.8:1	800	3	200	GG77313-03	210019
8.0 to 18.0	2.2	1.9:1	200	2	100	GG77310-04	210019
	2.5	1.9:1	200	2	60	GG77311-04	210019
	2.5	2.0:1	600	3	200	GG77313-04	210019
2.0 to 18.0	2.2	2.0:1	200	2	125	GG77310-05	210019
	2.5	2.0:1	200	2	100	GG77311-05	210019
	2.5	2.0:1	600	3	200	GG77313-05	210019

Low Leakage Connectorized Limiters

2.0 to 8.0	1.4	1.8:1	10	1	20	GG77314-04	210019
4.0 to 12.4	2	2.0:1	10	1	20	GG77314-05	210019
8.0 to 18.0	2.5	2.0:1	10	1	35	GG77314-06	210019
2.0 to 8.0	1.4	1.8:1	10	1	20	GG77314-07	210032
4.0 to 12.4	2	2.0:1	10	1	20	GG77314-08	210032
8.0 to 18.0	2.5	2.0:1	10	1	35	GG77314-09	210032

Low Frequency Connectorized Limiters

0.01 to 0.1	0.7	1.5:1	100	1	200	GG77315-01	210019
0.1 to 0.5	0.7	1.5:1	100	1	200	GG77315-02	210019
0.5 to 1.0	1	1.5:1	100	1	200	GG77315-03	210019
0.01 to 0.1	0.7	1.5:1	100	1	200	GG77315-04	210093
0.1 to 0.5	0.7	1.5:1	100	1	200	GG77315-05	210093
0.5 to 1.0	1	1.5:1	100	1	200	GG77315-06	210093

Notes:

All low level parameters specified at -10 dBm input power

All limiter modules require an external DC return of 1.0 ohm or less except the GG77014-XX series, which requires external DC blocks at both ends. Model numbers GG77314-XX incorporate DC blocking capacitors and do not require either ground return or external DC blocks

Peak power ratings apply @ 1.0 μ sec pulse width and 0.001 duty cycle

Spike leakage is 0.2 ergs (max) based on the assumption that the pulse rise time of the high power pulse is greater than 20.0 nsec. Spike leakage for the low frequency limiters is specified at 0.1 ergs (max)

Recovery time (3 dB) for all units expect for the GG77014-XX, GG77314-XX and GG77315-XX series is 250nSec @ 100W pulsed input power. Series GG77314-XX and GG77014-XX recovers in 500nSec at rated pulsed power and series GG77315-XX recovers in 1.0 μ Sec at rated pulsed power

Limiting threshold (1 dB compression point) is 5mW (min) except for the GG77014-XX and GG77314-XX series which is 1.0mW (min)

Leakage levels are specified at rated peak power

Absorptive Switches

	Model Number	Frequency Range	Insertion Loss (dB max)	Isolation (dB min)	VSWR (max)	Outline
SPST	GG71420-01	0.5 – 4.0	1.7	55	1.5:1	210059
	GG71420-02	2.0 – 8.0	2.1	50	1.7:1	210059
	GG71420-03	4.0 – 12.4	2.4	45	1.8:1	210059
	GG71420-04	8.0 – 18.0	2.9	45	1.9:1	210059
	GG71420-05	2.0 – 18.0	2.9	45	2.0:1	210059
SP2T	GG72420-01	0.5 – 4.0	1.7	60	1.5:1	210047
	GG72420-02	2.0 – 8.0	2.1	55	1.7:1	210047
	GG72420-03	4.0 – 12.4	2.4	50	1.8:1	210047
	GG72420-04	8.0 – 18.0	2.9	45	1.9:1	210047
	GG72420-05	2.0 – 18.0	2.9	45	2.0:1	210047
SP3T	GG73420-01	0.5 – 4.0	1.7	60	1.5:1	210079
	GG73420-02	2.0 – 8.0	2.2	55	1.7:1	210079
	GG73420-03	4.0 – 12.4	2.5	50	1.8:1	210079
	GG73420-04	8.0 – 18.0	3	45	1.9:1	210079
	GG73420-05	2.0 – 18.0	3	45	2.0:1	210079
SP4T	GG74420-01	0.5 – 4.0	1.8	60	1.5:1	210049
	GG74420-02	2.0 – 8.0	2.3	55	1.7:1	210049
	GG74420-03	4.0 – 12.4	2.7	50	1.8:1	210049
	GG74420-04	8.0 – 18.0	3.2	45	1.9:1	210049
	GG74420-05	2.0 – 18.0	3.2	45	2.0:1	210049
SP5T	GG75420-01	0.5 – 4.0	1.6	45	1.5:1	210050
	GG75420-02	2.0 – 8.0	2.1	40	1.7:1	210050
	GG75420-03	4.0 – 12.4	2.6	40	1.8:1	210050
	GG75420-04	8.0 – 18.0	3.2	35	1.9:1	210050
	GG75420-05	2.0 – 18.0	3.2	35	2.0:1	210050
SP6T	GG75425-01	0.5 – 4.0	1.8	45	1.5:1	210051
	GG75425-02	2.0 – 8.0	2.2	40	1.7:1	210051
	GG75425-03	4.0 – 12.4	2.9	40	1.8:1	210051
	GG75425-04	8.0 – 18.0	3.6	35	1.9:1	210051
	GG75425-05	2.0 – 18.0	3.6	35	2.0:1	210051

Notes:

1. Required D.C. Bias: +5V and -8 to -15V
2. Switching Speed: 1usec maximum (50% TTL to 10/90% RF)
3. Only the switched arms are matched in the isolated state
4. The common arm, J1, is matched only when one path is in the loss state
5. DC blocks incorporated on all RF ports

Reflective Switches

	Model Number	Frequency Range	Insertion Loss (dB max)	Isolation (dB min)	VSWR (max)	Outline
SPST	GG71410-01	0.5 – 4.0	0.9	40	1.5:1	210059
	GG71410-02	2.0 – 8.0	1.3	50	1.7:1	210059
	GG71410-03	4.0 – 12.4	1.5	60	1.8:1	210059
	GG71410-04	8.0 – 18.0	1.7	55	1.9:1	210059
	GG71410-05	2.0 – 18.0	1.8	45	2.0:1	210059
SP2T	GG72430-01	0.5 – 4.0	1	60	1.5:1	210047
	GG72430-02	2.0 – 8.0	1.6	60	1.7:1	210047
	GG72430-03	4.0 – 12.4	2.2	60	1.8:1	210047
	GG72430-04	8.0 – 18.0	2.5	55	1.9:1	210047
	GG72430-05	2.0 – 18.0	2.5	55	2.0:1	210047
SP3T	GG73430-01	0.5 – 4.0	1.1	60	1.5:1	210079
	GG73430-02	2.0 – 8.0	1.8	60	1.7:1	210079
	GG73430-03	4.0 – 12.4	2.4	60	1.8:1	210079
	GG73430-04	8.0 – 18.0	2.7	55	1.9:1	210079
	GG73430-05	2.0 – 18.0	2.7	55	2.0:1	210079
SP4T	GG74430-01	0.5 – 4.0	1.2	60	1.5:1	210049
	GG74430-02	2.0 – 8.0	1.9	60	1.7:1	210049
	GG74430-03	4.0 – 12.4	2.4	60	1.8:1	210049
	GG74430-04	8.0 – 18.0	2.9	55	1.9:1	210049
	GG74430-05	2.0 – 18.0	2.9	55	2.0:1	210049
SP5T	GG75430-01	0.5 – 4.0	1.3	60	1.5:1	210050
	GG75430-02	2.0 – 8.0	2.1	55	1.7:1	210050
	GG75430-03	4.0 – 12.4	2.6	50	1.8:1	210050
	GG75430-04	8.0 – 18.0	3.3	45	1.9:1	210050
	GG75430-05	2.0 – 18.0	3.3	45	2.0:1	210050
SP6T	GG75435-01	0.5 – 4.0	1.5	60	1.5:1	210051
	GG75435-02	2.0 – 8.0	2.3	60	1.7:1	210051
	GG75435-03	4.0 – 12.4	2.8	60	1.8:1	210051
	GG75435-04	8.0 – 18.0	3.6	55	1.9:1	210051
	GG75435-05	2.0 – 18.0	3.6	55	2.0:1	210051

Notes:

1. Required D.C. Bias: +5V and -8 to -15V
2. Switching Speed: 50nsec maximum (50% TTL to 10/90% RF)
3. DC blocks incorporated on all RF ports

RF, Microwave & mmWave Diode Package Styles

Microsemi Lowell offers a wide variety of package styles to meet specific design requirements. Package selection is an important step in the design process. Designers need to be aware of parametric trades-offs for the various package styles. Some considerations are:

- Electrical Performance.
- Thermal Requirements
- Hermetic / Non Hermetic
- Taped and Reeled for automatic assembly
- Cost versus Performance.
- RoHS compliance
- Consult the factory for package selection assistance.

This catalog contains outlines for a selection of our standard package styles. However, we supply numerous variations of these packages to suit specific application needs. Microsemi can also work together with engineers to develop custom package solutions.

Most of our packages are supplied with a gold finish suitable for 'Lead Free' and Pb/Sn assembly techniques. Some RoHS compliant packages are supplied with a Matte Tin finish.

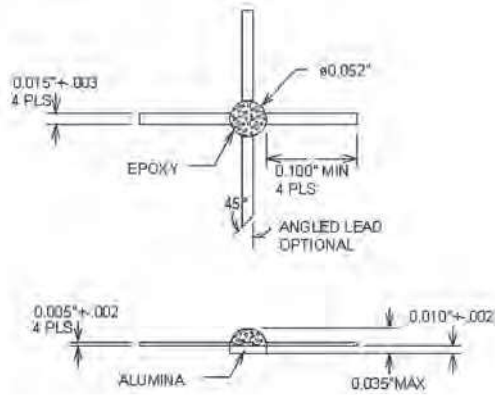
Microsemi offers:

- Hi-Rel Hermetic Packages
- High Frequency / Broadband (Through 40 Ghz) Discrete Packages
 - Chip, Beamlead & Flip Chip devices
- High Power Packages
 - Stud, ASM & SM Styles
- Low Cost High Volume Packages
 - SOT 23
 - Gigamite (GM1)
- Broadband performance, Economically Priced "MMSM"
 - Style 206
- EPSMTM (Enhance Performance Surface Mount)
 - Style 150, 250 and 450 Series
- RoHS Compliant Packaging

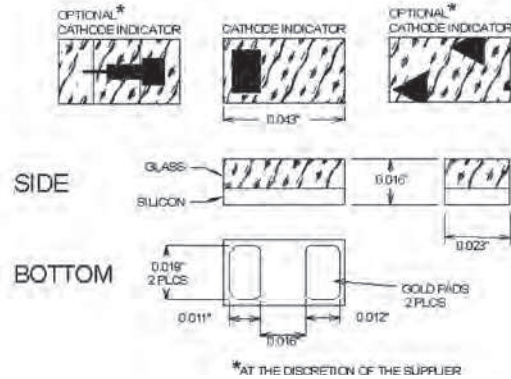
Diode Packages

Packages are RoHS Compliant unless specified

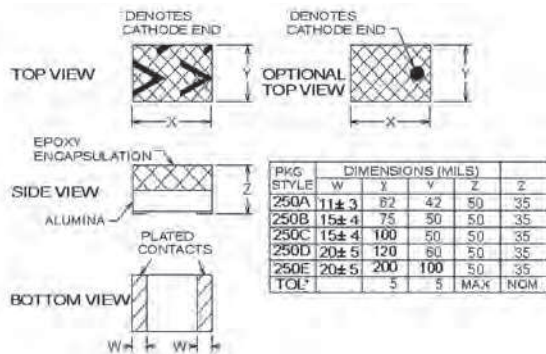
Style 174C



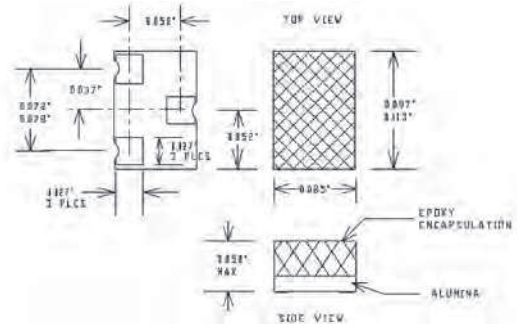
Style 206 (MMSM™)



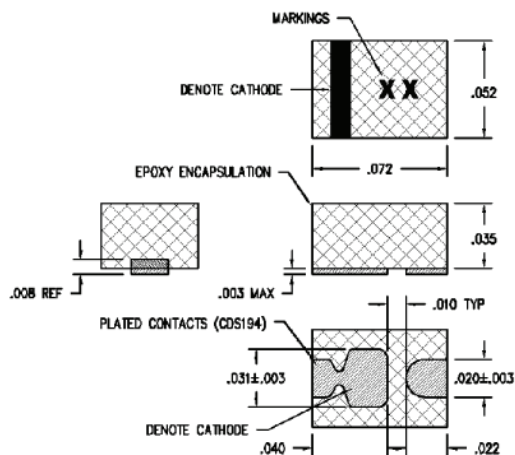
Style 250A - 250D



Style 454



Style GM1



Style M1

