

MONOLITHIC SCHOTTKY DIODES FOR MIXERS TO 26.5 GHz

- Low Capacitance. For Applications to 26.5 GHz
- Silicon Dioxide / Silicon Nitride Passivation
- Monolithic Glass Support Design
- Ultra-Low through High Barrier Heights
- Monolithic Design Insures Matched Junctions
- Wafer Level “SPC”

DESCRIPTION

New Schottky Barrier devices are currently available in single beamlead, dual “T”, ring quad and bridge quad configurations. Devices are available in monolithic form for hybrid applications as well as in hermetic or non-hermetic packages. Monolithic devices are recommended for highest frequency, broadband designs. The beamlead design eliminates the problems associated with wire bonding very small junction devices thus improving reliability and performance in MIC applications. Our in house epitaxy process capability insures repeatability for lowest conversion loss through Ku Band. A broad range of unique metalization schemes produce Microsemi’s complete line of barrier heights. Diodes are currently available with barrier heights as low as 240 mV and up to 625 mV per junction. By optimizing epitaxy and metalization, these devices achieve the lowest R_s - C_j products resulting in exceptional conversion loss performance. “High Rel” screening is available on packaged devices per your requirements.

APPLICATIONS

SCHOTTKY Barrier diodes are suitable for a variety of circuit applications ranging from single ended RF mixers to low level high speed switching. The monolithic beamlead design minimizes parasitic inductance and capacitance insuring repeatable performance through Ku band. Single junction devices such as the style ‘S12’ are well suited for RF Mixers, level detectors, phase detectors, modulators, etc. With junction capacitances as low as .06 pF, Monolithic Quads are ideally suited for broadband double balanced mixer designs through 26.5 GHz. The Ultra-Low Barrier devices (GC9900 Series) are designed for mixers with low or starved Local Oscillator levels where optimal conversion loss is a must. High barrier diodes, (GC9940 Series) are designed for applications where high drive levels are available, such as, Doppler mixers or motion detection. Schottky diodes are available in Ultra-Low, Medium and High Drive levels to fit virtually any circuit requirement.

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TABLE 1: ELECTRICAL SPECIFICATIONS AT T_A=25°C

P/N	BARRIER	FREQ. RANGE	V _b 1 min (V)	C _j ² max (pF)	V _f ³ max (mV)	R _d ⁴ max (Ω)	N _f _{ssp} ⁵ TYP (dB)	Z _{if} ⁶ typ (Ω)
GC9901	ULTRA-LOW	Ku-Ka	2.0	0.10	340	20.0	6.50	140
GC9902		X		0.15	310	16.0	6.00	
GC9903		C		0.30	300	14.0	5.50	
GC9904		S		0.50	280	12.0	5.50	
GC9911	LOW	Ku-Ka	2.0	0.10	360	20.0	6.50	170
GC9912		X		0.15	350	16.0	6.00	
GC9913		C		0.30	340	14.0	5.50	
GC9914		S		0.50	330	12.0	5.50	
GC9921	LOW-MED	Ku-Ka	2.0	0.10	470	20.0	6.50	200
GC9922		X		0.15	460	16.0	6.00	
GC9923		C		0.30	440	14.0	5.50	
GC9924		S		0.50	420	12.0	5.50	
GC9931	MEDIUM	Ku-Ka	3.0	0.10	550	20.0	6.75	250
GC9932		X		0.15	540	16.0	6.25	
GC9933		C		0.30	530	14.0	5.75	
GC9934		S		0.50	510	12.0	5.50	
GC9941	HIGH	Ku-Ka	4.0	0.10	660	20.0	7.00	300
GC9942		X		0.15	640	16.0	6.25	
GC9943		C		0.30	630	14.0	5.75	
GC9944		S		0.50	610	12.0	5.75	

CONDITIONS

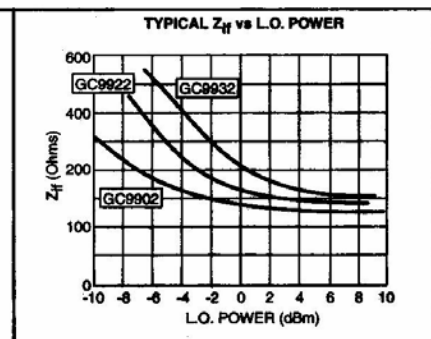
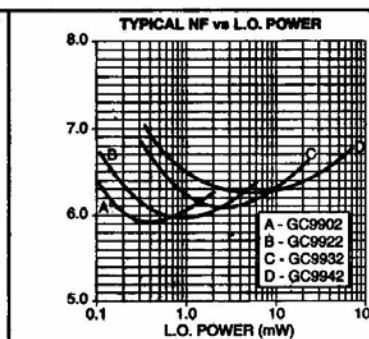
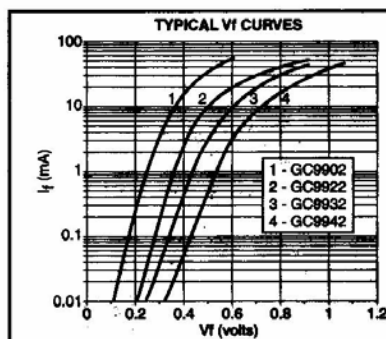
- V_b measured at 10μA (N/A on ring quads).
- 0 Volts, F=1 MHz (diagonal leads on quads).
- I_f = 1.0 mA
- I_f = 5.0 mA
- L.O. = 0 dBm, N_{if} = 1.5 dB, F = 10 GHz
- L.O. = 0 dBm

MAXIMUM RATING

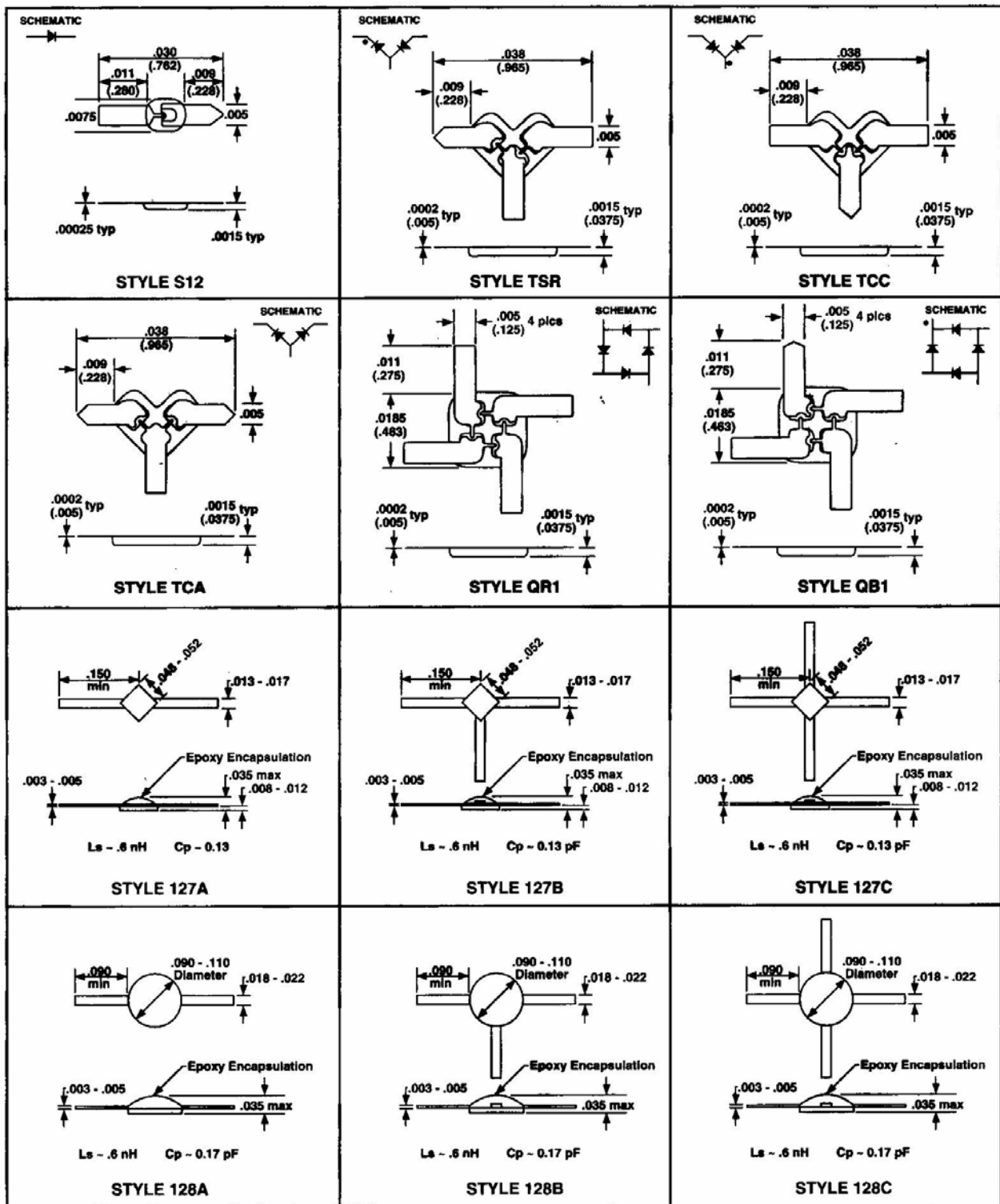
T_{oper} : -65 to 150°C
 T_{stg} : -65 to 170°C
 Power Handling: 100 mW
 (Derate Linearly to zero at 150°C)

NOTE

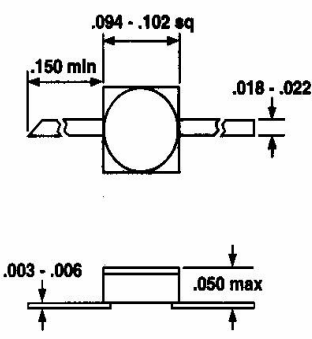
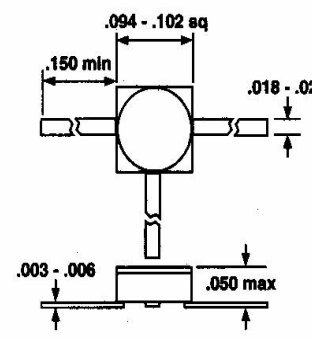
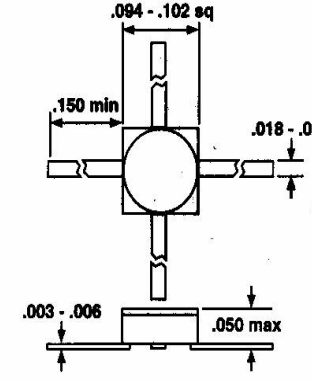
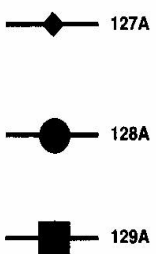

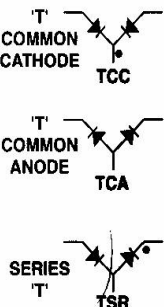
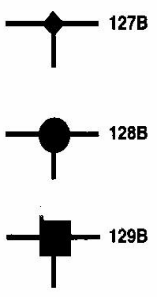
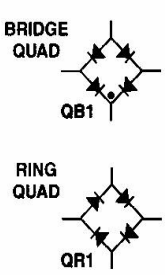
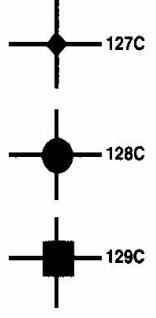
When ordering, specify appropriate package style.
 Specifications subject to change without notice.



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 <p>STYLE 129A Ls - 22nH Cp - .17 pF</p>	 <p>STYLE 129B Ls - 22nH Cp - .17 pF</p>	 <p>STYLE 129C Ls - 22nH Cp - .17 pF</p>
<p>PACKAGE</p>  <p>127A 128A 129A</p> <p>SCHEMATIC</p>  <p>S12</p> <p>EXAMPLE: - ORDER P/N GC9933-S12 FOR 'BEAMLEAD' - ORDER P/N GC9933-S12-129B FOR A HERMETIC PACKAGED SCHOTTKY BARRIER DIODE</p>	<p>SCHEMATIC</p>  <p>'T' COMMON CATHODE 'T' COMMON ANODE SERIES 'T'</p> <p>PACKAGE</p>  <p>127B 128B 129B</p> <p>EXAMPLE: ORDER P/N GC9901-TSR-128B FOR A SERIES 'T' IN A 128B EPOXY PACKAGE</p>	<p>SCHEMATIC</p>  <p>BRIDGE QUAD RING QUAD</p> <p>PACKAGE</p>  <p>127C 128C 129C</p> <p>EXAMPLE: ORDER P/N GC9922-QR1-129C FOR A RING QUAD IN A 129C HERMETIC PACKAGE.</p>

Dimensions in inches.

Specifications subject to change without notice

Other packages and configurations available. Consult factory for details.

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