PIN DIODE

Low Resistance, Low Distortion, RF Switching Diode

UM9701

6

Features

- Low Forward Resistance
- High Reverse Resistance
- Specified Low Distortion
- High Voltage Capability
- Good Power Handling
- Microsemi Ruggedness and Reliability

Description

The UM9701 PIN diode was designed for low resistance at low forward bias current and low reverse bias capacitance. This unique Microsemi design results in both forward and reverse bias.

These PIN diodes are characterized for low current drain RF and microwave switch applications particularly for digital filter switch designs. The construction and geometry of these devices provide good voltage and power handling capability.

These devices are constructed using a metallurgical full face bond to both surfaces of the silicon chip. A glass enclosure houses this bond in a reliable and hermetic package. The axial leads are attached to the refractory pins and do not touch the glass enclosure.

Environmentally these, and all Microsemi PIN diodes, can withstand thermal cycling from -195°C to +300°C and exceed all military environmental specifications for shock, vibration, acceleration and moisture resistance.

Maximum Ratings

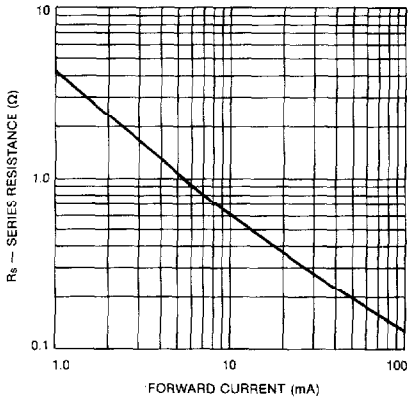
Reverse Voltage	100V
Average Power Dissipation Free Air at 25°C	500mW (Derate linearly to 175°C)
Average Power Dissipation ½" (12.7 mm) Total Lead Length to 25°C Contacts	2.5W (Derate linearly to 175°C)
Operating and Storage Temperature	−65°C to +175°C

Electrical Specifications

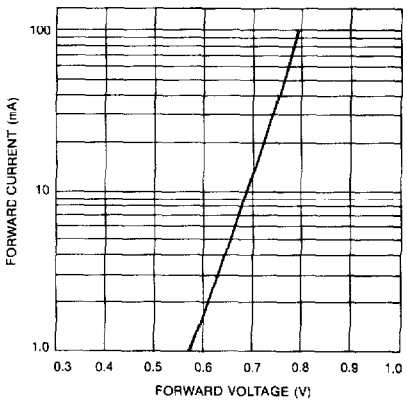
Test	Symbol	UM9701	Condition
Series Resistance (MAX)	R_S	0.8Ω	f = 100MHz, I = 10mA
Total Capacitance (MAX)	C_T	1.8pF	f = 1MHz, V = 50V
Parallel Resistance (MIN)	R_P	100kΩ	f = 100MHz, V = 50V
Carrier Lifetime (MIN)	τ	1.5μs	I = 10mA
Reverse Current (MAX)	I_R	10μA	V = 100V
Forward Voltage (MAX)	V_F	0.8V	I = 10mA
Forward Bias Third Order IM Distortion (MAX)	$R\frac{2ab}{a}$	−90dB	I = 10mA Pa = Pb = +20dBm fa = 43MHz, fb = 44MHz
Reverse Bias Third Order IM Distortion (MAX)	$R\frac{2ab}{a}$	−90dB	V = 50V Pa = Pb = +20dBm fa = 43MHz, fb = 44MHz

Microsemi Corp.
Watertown
The diode experts

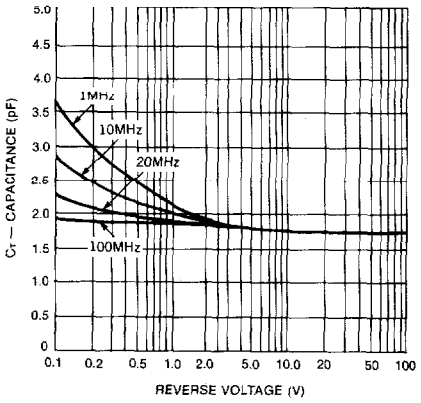
Typical Series Resistance vs Forward Current (F = 100MHz)



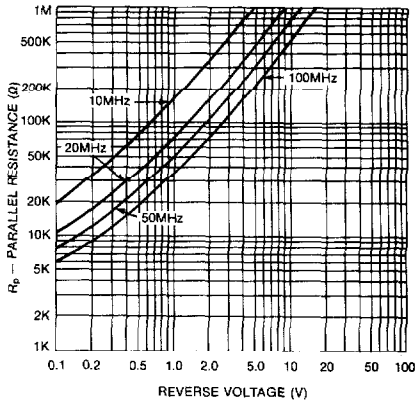
Typical DC Characteristic



Typical Capacitance Characteristic



Typical Parallel Resistance Characteristic



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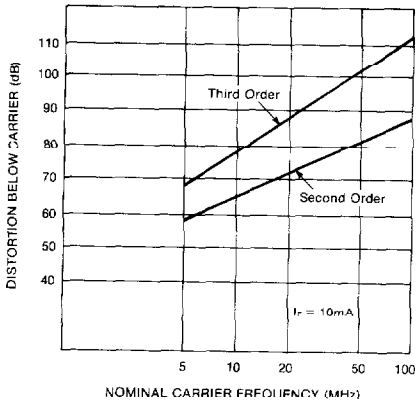
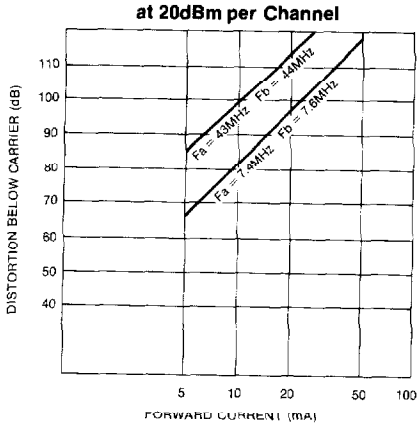
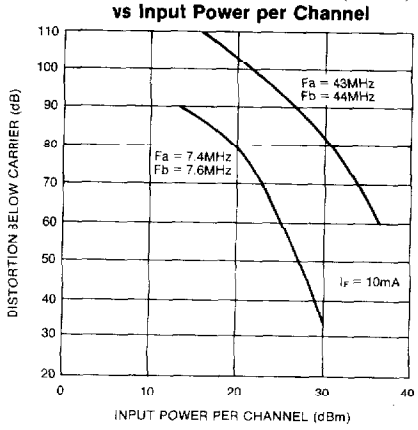
Typical Forward Bias Intermodulation Distortion vs Nominal Carrier Frequency at 20dBm per Channel



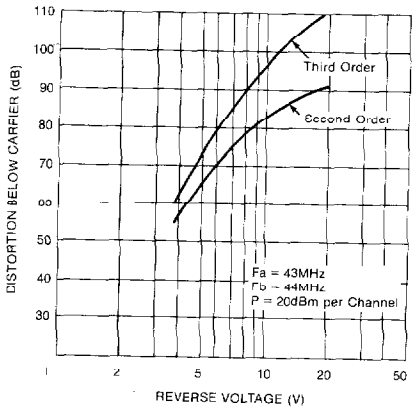
Typical Third Order Intermodulation Distortion $\left(R\ \frac{2ab}{a}\right)$ vs Forward Bias Current at 20dBm per Channel



Typical Forward Bias Third Order Intermodulation Distortion $\left(R\ \frac{2ab}{a}\right)$ vs Input Power per Channel



Typical Reverse Bias Intermodulation Distortion



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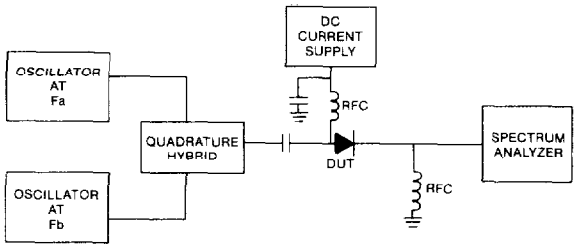
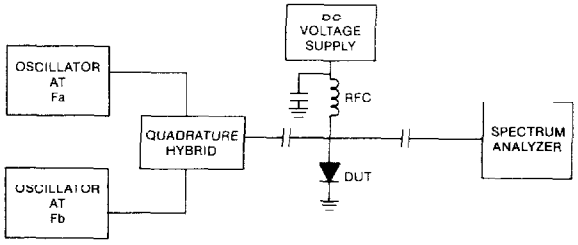
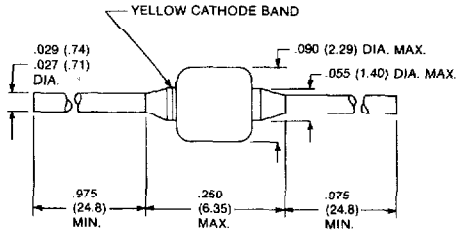
Forward Bias Distortion Test Set



Reverse Bias Distortion Test Set



Mechanical Specifications



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