UM9701

Low Resistance, Low Distortion, RF Switching PIN Diode

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 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.

KEY FEATURES

- Specified low distortion
- Low Forward Resistance
- High Reverse Resistance
- High Voltage Capability
- Good Power Handling
- Microsemi Ruggedness and reliability
- Compatible with automatic insertion equipment

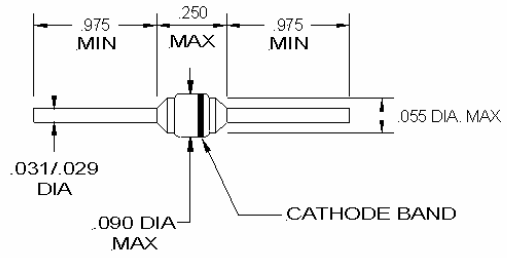
IMPORTANT: For the most current data, consult *MICROSEMI*'s website: **http://www.microsemi.com**

APPLICATIONS/BENEFITS

- Little or no Bias required.
- Available in leaded or surface mount packages.
- RoHS compliant packaging available: use UMX9701B, etc.

ABSOLUTE MAXIMUM RATINGS AT 25º C (UNLESS OTHERWISE SPECIFIED)

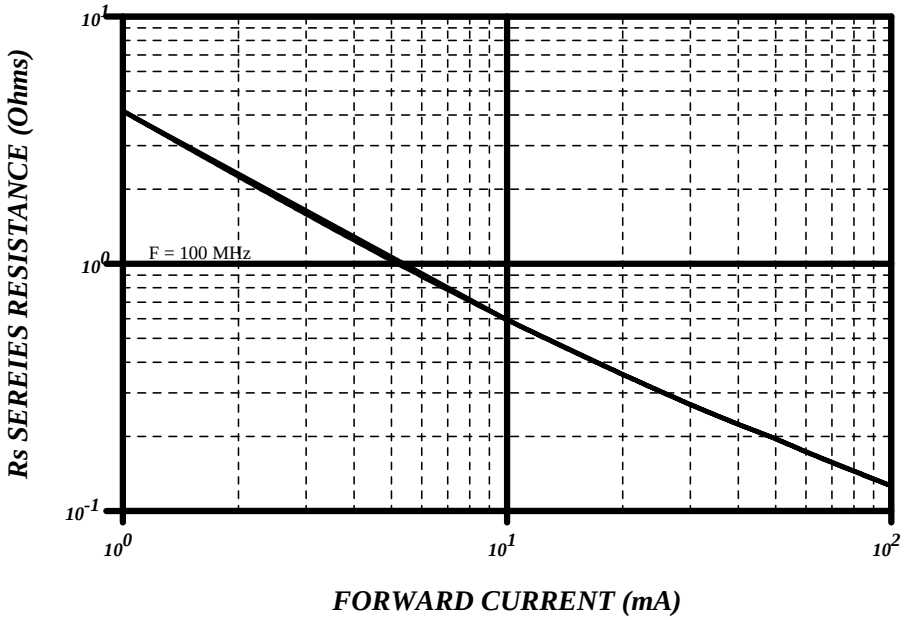
Rating	Symbol	Value	Unit
Reverse Voltage	V_R	100	Volts
AVERAGE Power Dissipation Free Air at 25 °C	P_A	500	mW
Average Power Dissipation ½ " (12.7 mm) Total lead Length to 25 °C Contacts	P_A	2.5 Derate linearly To 175 °C	Watts
Storage Temperature	T stg	-65 to 175	ºC
Operating Temperature	T op	-65 to 175	ºC



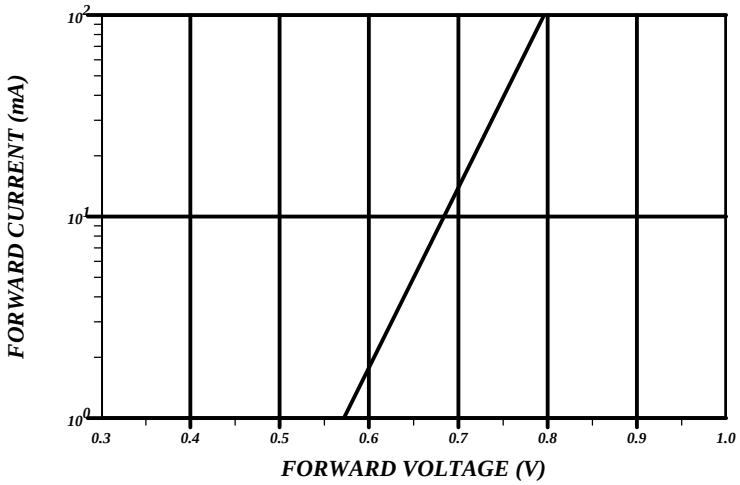
Electrical Specifications

Test	Symbol	UM9701	Conditions
Series Resistance (MAX)	R_S	0.8 Ω	F = 100 MHz, I_F = 10 mA
Total Capacitance (MAX)	C_T	1.8 pF	F = 1 MHz, V_R = 50 V
Parallel Resistance (MIN)	R_P	100 kΩ	F = 100 MHz, V_R = 50 V
Carrier Lifetime (MIN)	τ	1.5 µs	I_F = 10 mA
Reverse Current (MAX)	I_R	10 µA	V_R = 100 V
Forward Voltage (MAX)	V_F	0.8 V	I_F = 10 mA
Forward Bias Third Order IM Distortion (MAX)	R 2ab/a	-90 dB	I_F = 10 mA $P_A = P_B$ = +20 dBm f_A = 43 MHz, f_B = 44 MHz
Reverse Bias Third Order IM Distortion (MAX)	R 2ab/a	-90 dB	V_R = 50 V $P_A = P_B$ = +20 dBm f_A = 43 MHz, f_B = 44 MHz

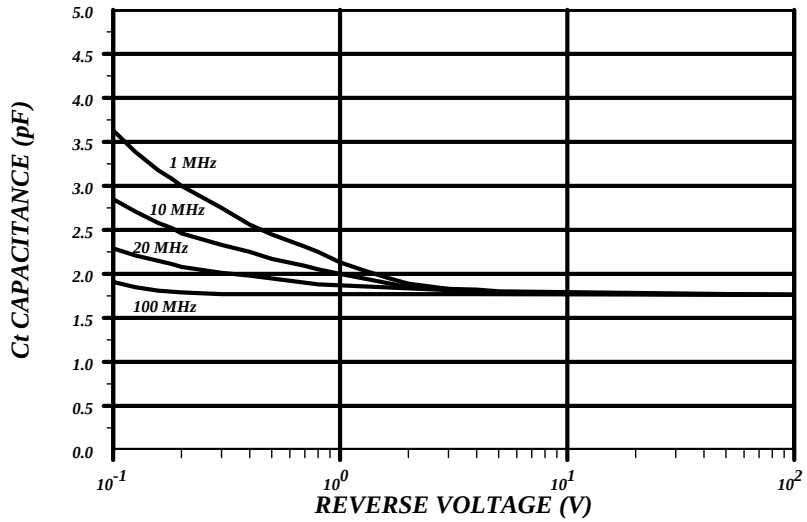
TYPICAL SERIES RESISTANCE VS FORWARD CURRENT



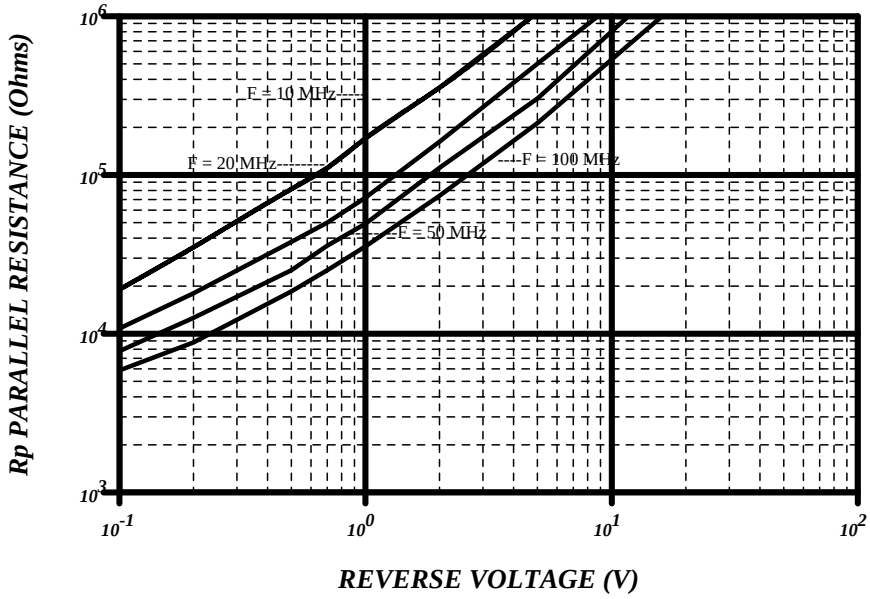
TYPICAL DC CHARACTERISTIC



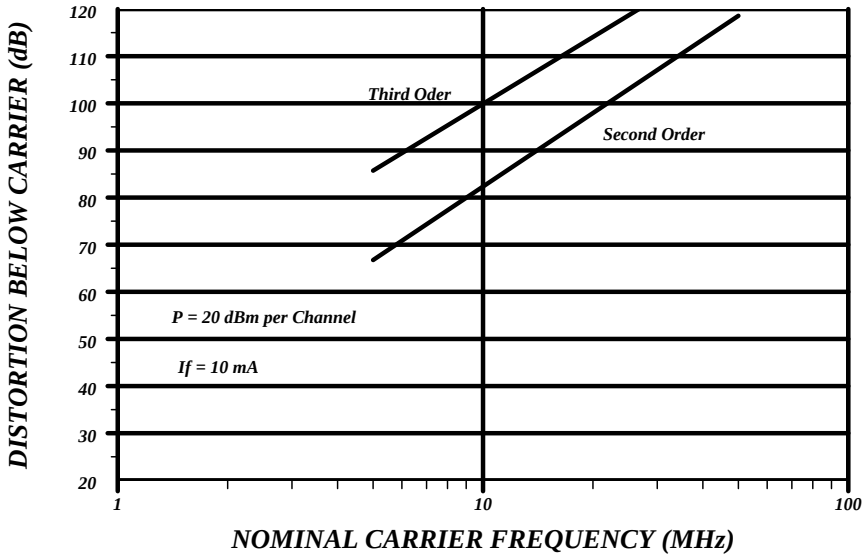
TYPICAL CAPACITANCE CHARACTERISTIC



TYPICAL PARALLEL RESISTANCE VS REVERSE VOLTAGE

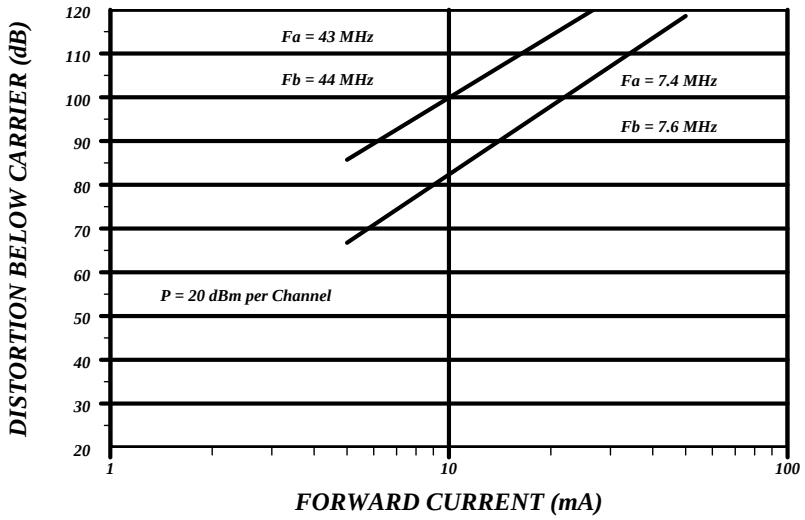


TYPICAL FORWARD BIAS INTERMODULATION DISTORTION VERSUS NOMINAL CARRIER FREQUENCY

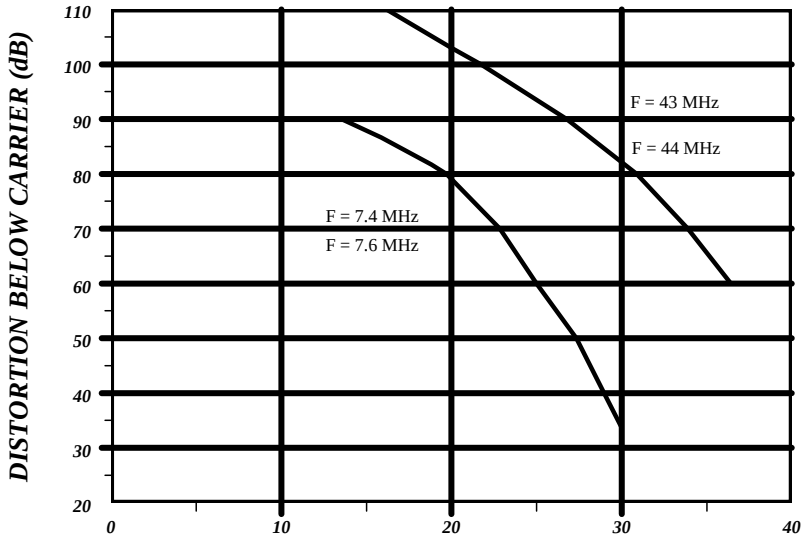


ELECTRICAL

TYPICAL THIRD ORDER INTERMODULATION DISTORTION (R 2ab/a) VERSUS FORWARD BIAS CURRENT

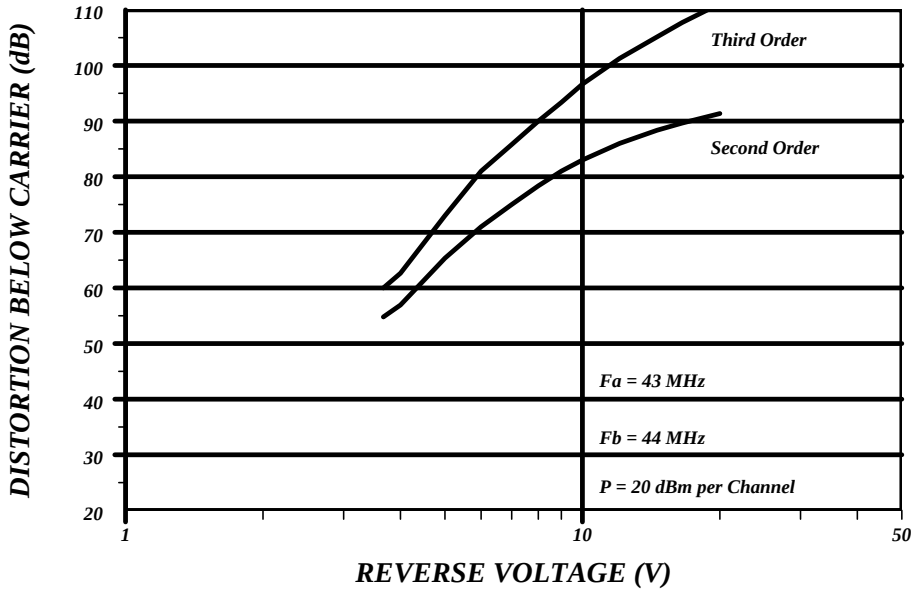


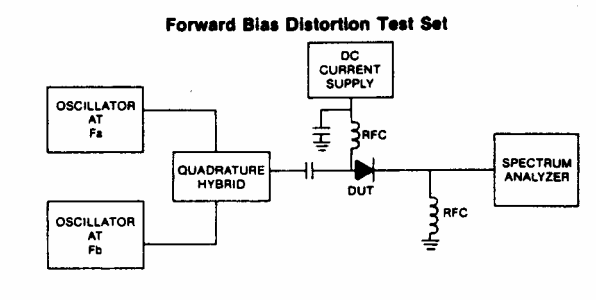
FORWARD BIAS THIRD ORDER INTERMODULATION DISTORTION (R 2ab/a) VS INPUT POWER PER CHANNEL

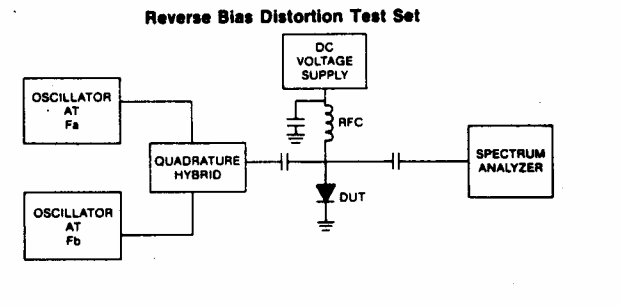


ELECTRICAL

TYPICAL REVERSE BIAS INTERMODULATION DISTORTION







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