COMMERCIAL ATTENUATOR DIODE

Features

- Specified low distortion
- Low rectification properties at low reverse bias
- Resistance specified at 3 current points
- High reliability fused-in-glass construction

Description

The UM9301 PIN Diode utilizes a special overall chip geometry with an extremely thick intrinsic "I" region, to offer unique capabilities in both RF switch and attenuator applications. Volume production also makes the diode an economical choice suitable for many commercial low power equipments.

The UM9301 has been designed for use in bridged TEE attenuator circuits commonly utilized for gain and slope control in CATV amplifiers. Low distortion and high dynamic range are characteristic of the diodes' outstanding performance.

The UM9301 is also appropriate for switch applications, when little or no bias voltage is available. Frequent applications occur in portable 12 volt-powered communications equipments, operating at frequencies as low as 2 MHz.

MAXIMUM RATINGS

Reverse Voltage (V_R) — Volts (I_R = 10 μA)	75V
Average Power Dissipation @ (P_A) Leads ½ in. (12.7mm) Total to 25°C Contact	1.0W (Derate linearly to 175°C)
Operating and Storage Temperature Range	−65°C to +175°C

Electrical Specifications (25 °C)

Test	Min	Typ	Max	Units	Conditions
Diode Resistance R_S		1.7	3.0	Ω	I = 100 mA, f = 100 MHz
		80	150	Ω	I = 1 mA, f = 100 MHz
	3000	5000		Ω	I = 0.01 mA, f = 100 MHz
Current for R_S = 75Ω I_R	0.5	1.1	2.0	mA	f = 100 MHz
Capacitance C_T			0.8	pF	V = 0V, f = 100 MHz
Return Loss	25			dB	Frequency Range: 10 - 300MHz R_S = 75Ω @ 100 MHz Diode Terminates 75Ω line
Second Order Distortion		55	50	– dB	f_1 = 10 MHz, f_2 = 13 MHz P = 50 dBmV, See Test Circuit
		70		– dB	F_1 = 67 MHz, F_2 = 77 MHz P = 50 dBmV, See Test Circuit
Third Order Distortion		75	65	– dB	F_1 = 10 MHz, F_2 = 13 MHz P = 50 dBmV, See Test Circuit
		95		– dB	Triple Beat; 205 + 67 – 77 MHz P = 50 dBmV, See Test Circuit
Cross Modulation Distortion		75		– dB	12 Channel Test P = 50 dBmV, See Test Circuit Dix Hills Test Set
Reverse Current I_R			10	μA	V = 75V
Carrier Lifetime τ	4.0			μs	I = 10 mA

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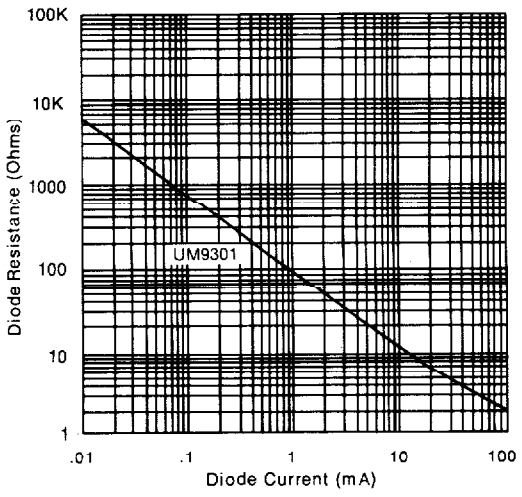
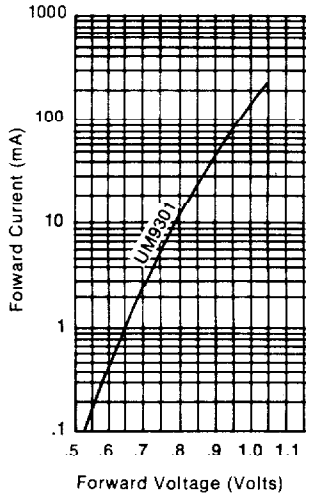
DIODE RESISTANCE VS DIODE CURRENT (TYPICAL)



FORWARD CURRENT VS FORWARD VOLTAGE (TYPICAL)



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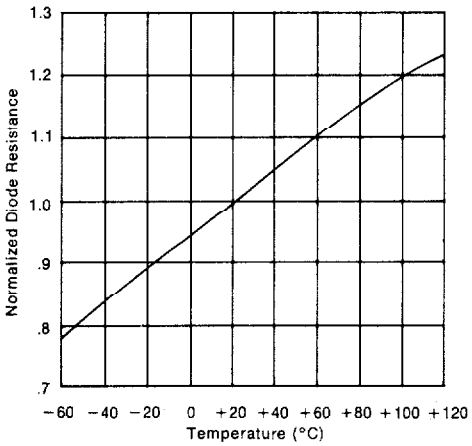
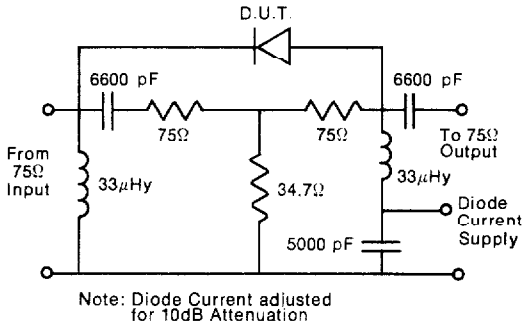
NORMALIZED R_S VS TEMPERATURE



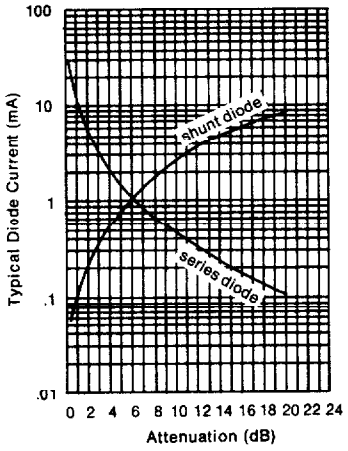
TEST CIRCUIT FOR DISTORTION MEASUREMENTS



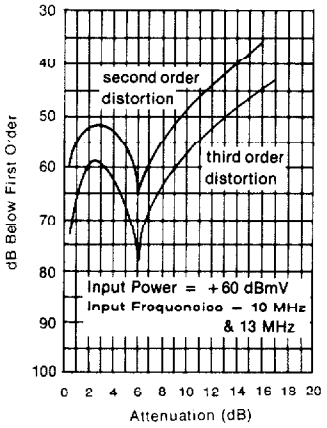
Note: Diode Current adjusted for 10dB Attenuation

TYPICAL BRIDGED TEE ATTENUATOR PERFORMANCE

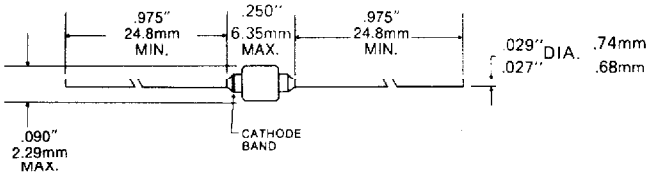
DIODE CURRENT VS ATTENUATION UM9301



DISTORTION ATTENUATION



MECHANICAL SPECIFICATIONS



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