

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

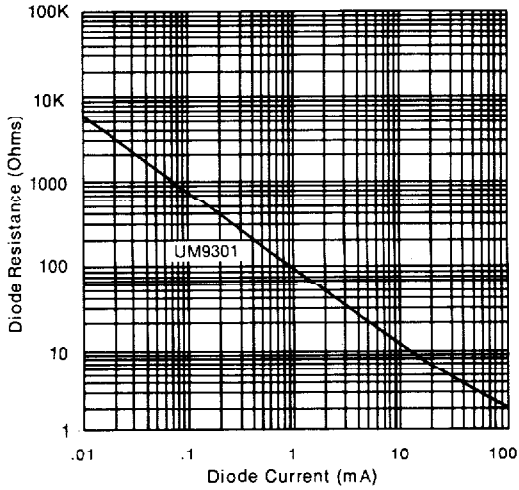
Reverse Voltage (V_R) — Volts ($I_R = 10 \mu A$)	75V
Average Power Dissipation @ (P_A) Leads $\frac{1}{2}$ in. (12.7mm) Total to 25°C Contact	1.0W (Derate linearly to 175°C)
Operating and Storage Temperature Range	- 65°C to + 175°C

Electrical Specifications (25 °C)

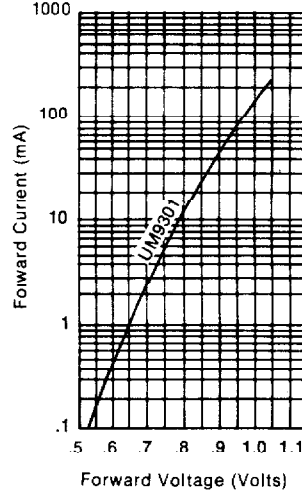
Test	Min	Typ	Max	Units	Conditions
Diode Resistance R_S		1.7 80 3000	3.0 150	Ω Ω Ω	$I = 100 \text{ mA}, f = 100 \text{ MHz}$ $I = 1 \text{ mA}, f = 100 \text{ MHz}$ $I = 0.01 \text{ mA}, f = 100 \text{ MHz}$
Current for $R_S = 75\Omega$ I_R	0.5	1.1	2.0	mA	$f = 100 \text{ MHz}$
Capacitance C_T			0.8	pF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

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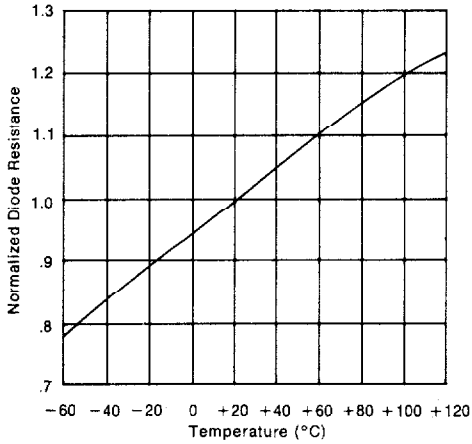
DIODE RESISTANCE VS DIODE CURRENT (TYPICAL)



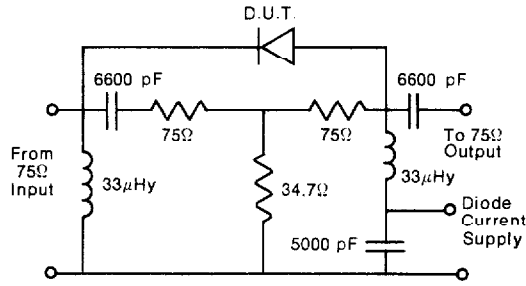
FORWARD CURRENT VS FORWARD VOLTAGE (TYPICAL)



NORMALIZED R_3 VS TEMPERATURE

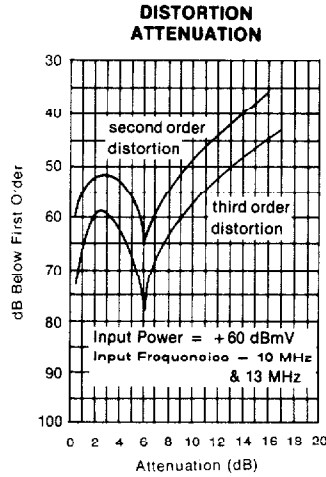
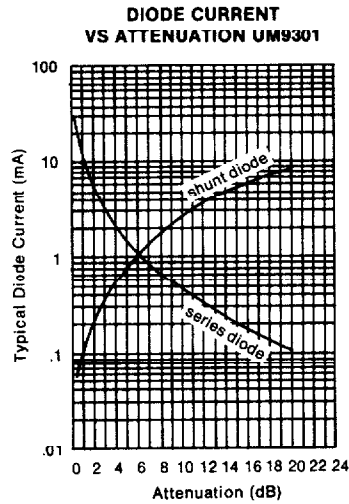


TEST CIRCUIT FOR DISTORTION MEASUREMENTS



Note: Diode Current adjusted for 10dB Attenuation

TYPICAL BRIDGED TEE ATTENUATOR PERFORMANCE



MECHANICAL SPECIFICATIONS

