

UM9552

**PIN DIODE
 ATTENUATOR**

Features

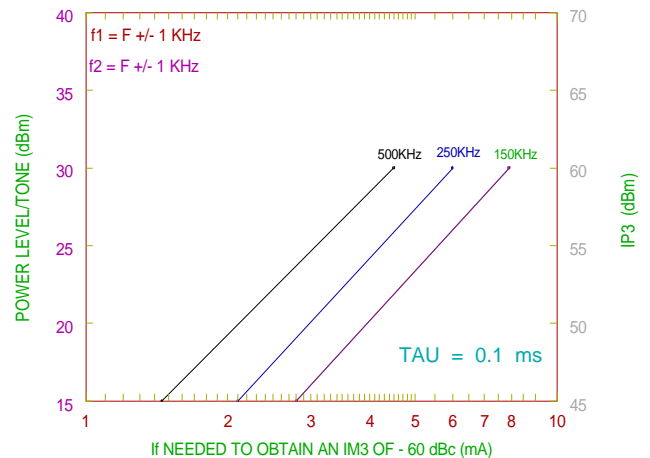
- Low Frequency Attenuator
- HF/LF Band Operation
- Long Lifetime (70 μ s typ.)
- Very Low Distortion (IP3 @ 455 KHz = < 60 dBm)

Description

The UM9552 is a very long minority carrier lifetime (70 μ s typical) PIN DIODE that has been developed for low HF or LF Band Attenuator Applications. They have been evaluated for attenuator linearity and distortion characteristics in a Bridge Tee Attenuator Circuit at 455 KHz (the common intermediate frequency for AM transmitters and receivers). When the UM9552's are used as the two variable resistors in the Bridged Tee Circuit, the Third Order Intermodulation Products are below -60 dBc with 0 dBm input power over an attenuation range of 4 dB to 30 dB.

These thicker, longer lifetime PIN diodes exhibit a more linear forward biased resistance (R_S) vs forward bias current (I_f) relationship, which greatly simplifies the design of the driver circuits that supply the bias currents over the specified attenuation range. This task is simplified if the low attenuation range is truncated and the few dB are compensated by commercially available, inexpensive 4 to 6 dB gain blocks.

TYPICAL POWER LEVEL vs FORWARD BIAS CURRENT

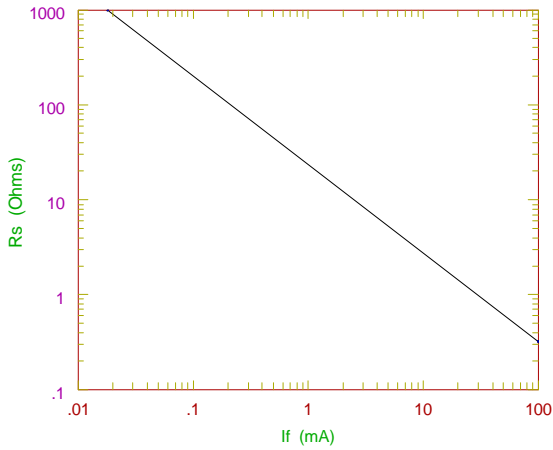


Electrical Specifications (25°C)

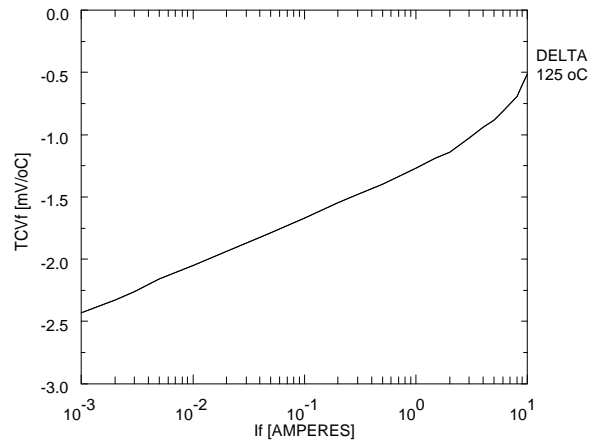
Test	Min.	Typ.	Max.	Units	Conditions
Diode Resistance R_S		18.0		Ω	F = 455 KHz, I_f = 1 mA
		2.0		Ω	F = 455 KHz, I_f = 10 mA
		.25	0.4	Ω	F = 455 KHz, I_f = 100 mA
Capacitance C_T		15	20	pF	F = 1 MHz, 100 V
Reverse Current I_R			10	μ A	V_R = 50 V
Carrier Lifetime τ	50	70		μ s	I_f = 10 mA / 100 V
IP3	50	60		dBm	Power in = 0 dBm / Tone F1 = 454 KHz F2 = 456 KHz Circuit Drawing #B14433
Thermal Resistance			1.0	$^{\circ}$ C / W	25 $^{\circ}$ C Stud Temperature

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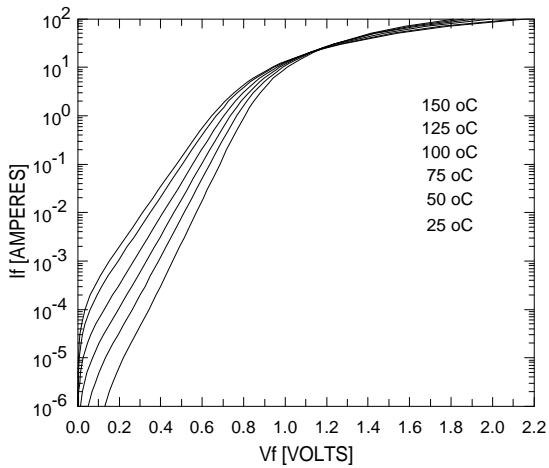
TYPICAL R_s vs FORWARD BIAS CURRENT



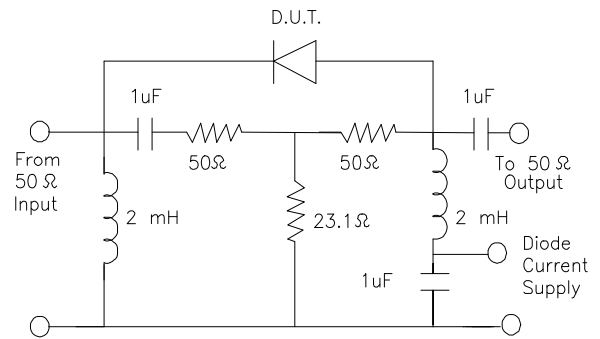
TYPICAL TCV_f vs I_f



TYPICAL I-V CURVE

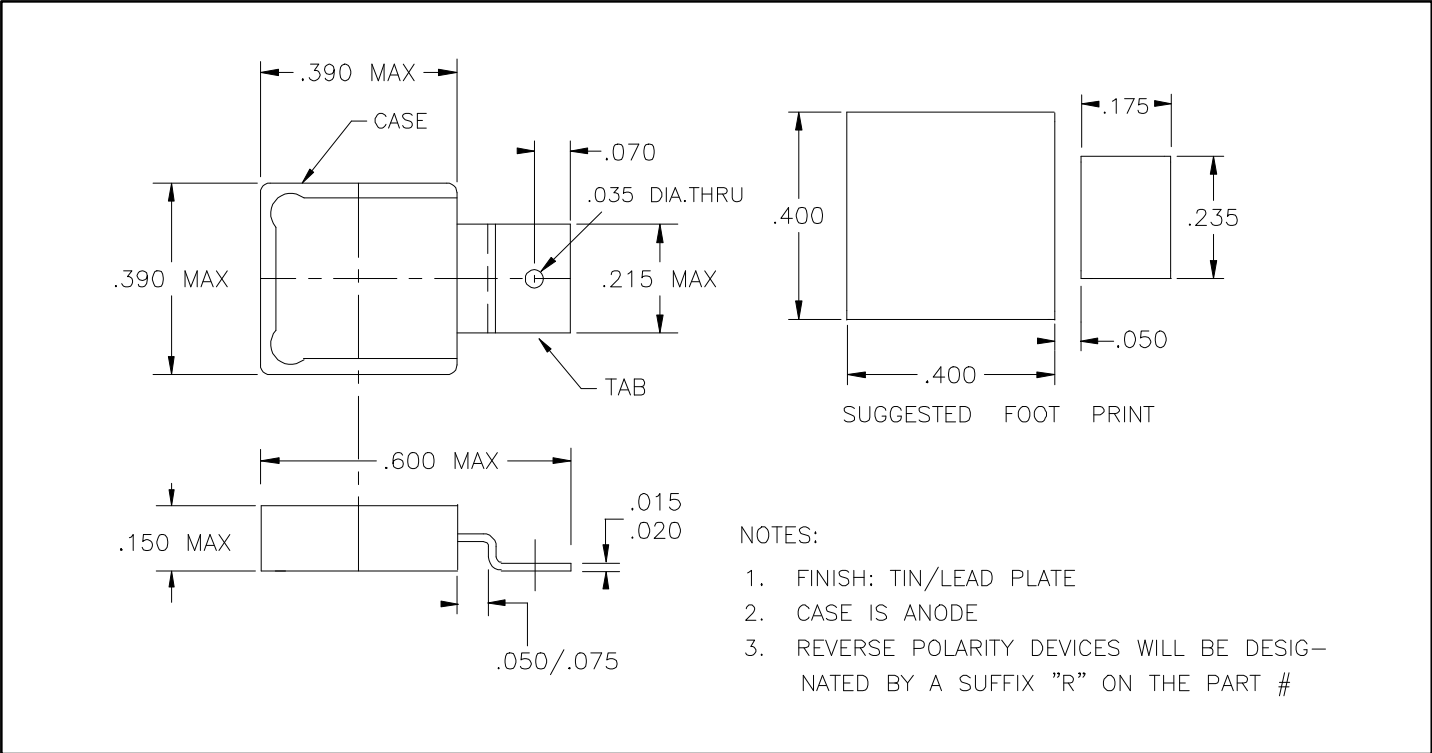


TEST CIRCUIT FOR DISTORTION MEASUREMENTS



NOTE: Diode Current adjusted for 10 dB Attenuation

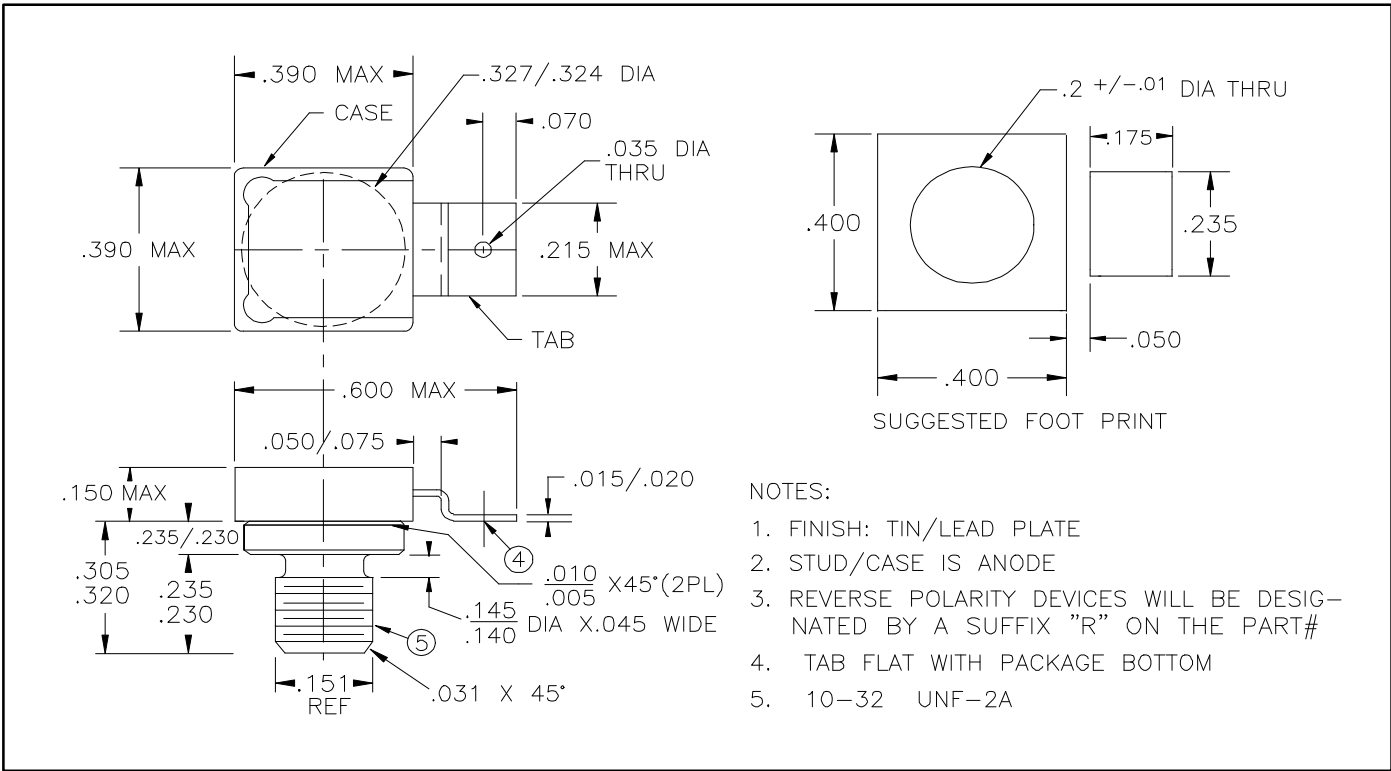
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- NOTES:
1. FINISH: TIN/LEAD PLATE
 2. CASE IS ANODE
 3. REVERSE POLARITY DEVICES WILL BE DESIGNATED BY A SUFFIX "R" ON THE PART #

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- NOTES:
1. FINISH: TIN/LEAD PLATE
 2. STUD/CASE IS ANODE
 3. REVERSE POLARITY DEVICES WILL BE DESIGNATED BY A SUFFIX "R" ON THE PART#
 4. TAB FLAT WITH PACKAGE BOTTOM
 5. 10-32 UNF-2A

UM9552S