PIN DIODE

UM7500

FEATURES

- Voltage Ratings to 1400 Volts
- Fully Passivated PIN Chip
- Low Leakage, IR < 0.5 μA
- Voidless, Particle Free Construction
- Hermetic, Fused in Glass Non-Magnetic Packages
- Low Loss, Low Distortion
- Surface Mount Package Available
- Metallurgically Bonded, Thermally Matched Construction

DESCRIPTION

The UM7500 series features Microsemi-Watertown's innovative passivated chip design which takes advantage of the latest in silicon wafer bonding and junction passivation techniques.

This new series of PIN diodes incorporates all of the desirable RF properties of previous Microsemi-Watertown diodes plus extremely low leakage and very stable reverse characteristics.

Power dissipation capability is assured by Microsemi-Watertown's metallurgically bonded, fused in glass construction. This technique continues to be the optimum approach for applications requiring reliable, high power diodes.

Low distortion is achieved by maintaining high carrier lifetime and accurately controlling I-Region thickness throughout the process.

The UM7500 series is designed for use in a broad range of RF and microwave switch and attenuator circuits. The non-magnetic packages make this series suitable for many high-end medical applications such as MRI and CAT scan equipment.

For military applications, the new series is capable of meeting all the requirements of MIL-STD-750 including HTRB screening at 80% of the rated voltage at 150°C.

6

MAXIMUM RATINGS

Average Power Dissipation and Thermal Resistance Ratings

PACKAGE	CONDITION	P_D	θ
A	25°C Pin Temperature	10W	15°C/W
B&E (Axial Leads)	½ in. (12.7mm) Total Lead Length to 25°C Contact	5.5W	27.5°C/W
B&E (Axial Leads)	Free Air	1.5W	—
C (Studded)	25°C Stud Temperature	10W	15°C/W
D (Insulated Stud)	25°C Stud Temperature	7.5W	20°C/W
SM (Surface Mount)	25°C End Cap Temperature	7.5W	20°C/W
PEAK POWER DISSIPATION RATING			
All Packages	1 μs Pulse (Single) at 25°C Ambient	35 KW	
OPERATING AND STORAGE TEMPERATURE RANGE: −65°C to +175°C			

VOLTAGE RATINGS (25°C)

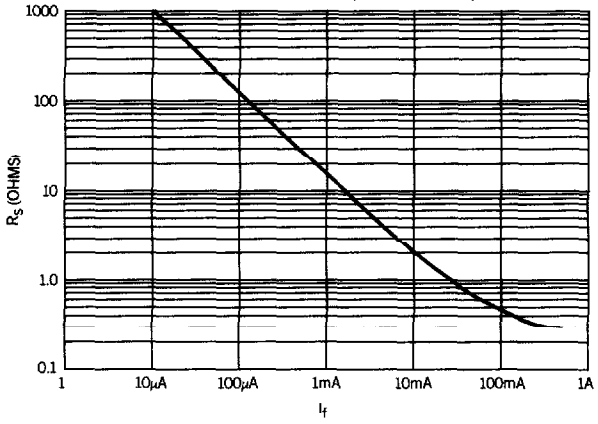
REVERSE VOLTAGE (V_R) – VOLTS (I_R = .5μA)	TYPES
100V	UM7501
200V	UM7502
400V	UM7504
600V	UM7506
800V	UM7508
1000V	UM7510
1200V	UM7512
1400V	UM7514

Microsemi Corp.
Watertown
The diode experts

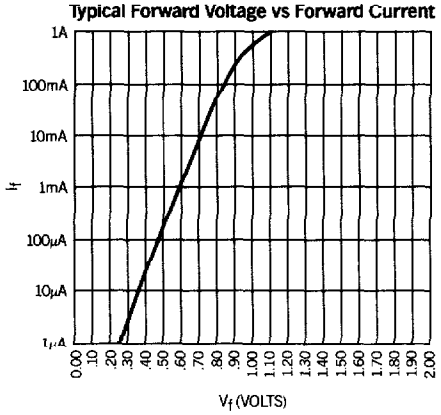
ELECTRICAL CHARACTERISTICS (25°C)

TEST	SYMBOL	MIN.	TYPICAL	MAX.	CONDITION
Total Capacitance	C_T		0.8pF	1.0pF	100V, 1 MHz
Series Resistance	R_S		0.8Ω	1.0Ω	50mA, 100 MHz
Parallel Resistance	R_P	100KΩ	150KΩ		100V, 100 MHz
Parallel Resistance	R_P	10KΩ	15KΩ		0V, 100 MHz
Carrier Lifetime	τ	2.5μs	3.5μs		I_F = 10mA
Reverse Current	I_R		0.1μA	0.5μA	V_R = Rating
I-Region Width	W		100μm		
Forward Voltage	V_F		0.8V	1.0V	I_F = 50mA
Forward Bias Harmonic Distortion	$(R\frac{2a}{a}, R\frac{3a}{a})$	80dBc	90dBc		100 MHz, P = 30W I_F = 50mA
Reverse Bias Harmonic Distortion	$(R\frac{2a}{a}, R\frac{3a}{a})$	60dBc	70dBc		100 MHz, P = 0 dBm V = 0V

UM7500 Series Typical Forward Resistance vs Forward Current (F = 100 MHz)



UM7500 Series Typical Forward Voltage vs Forward Current



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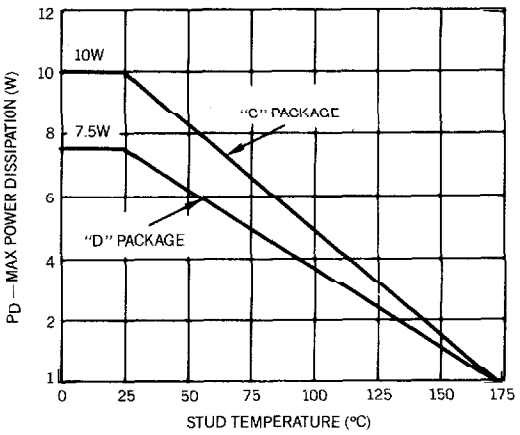
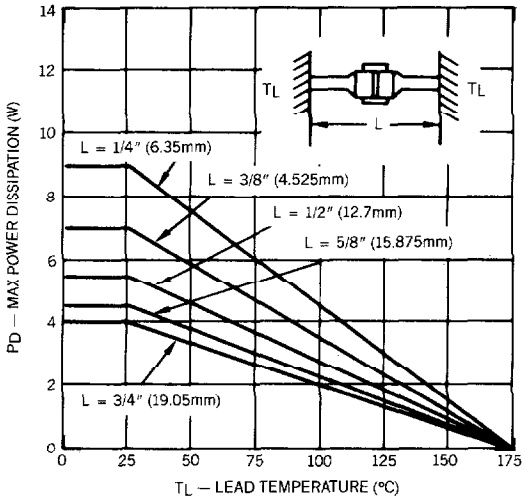
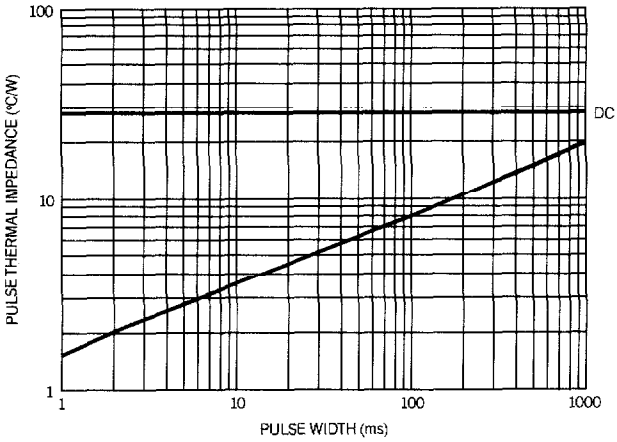
POWER RATING STUD MOUNTED DIODES



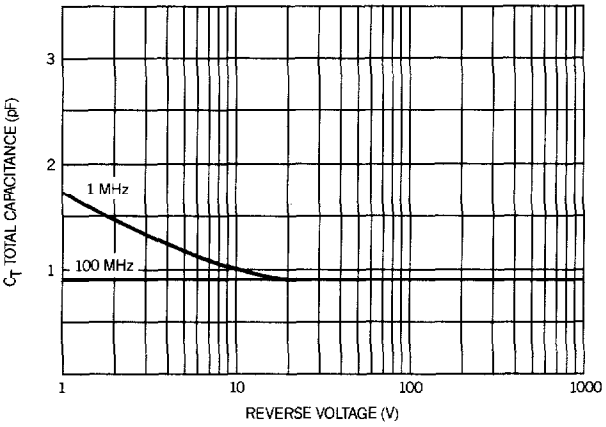
POWER RATING — AXIAL LEADED DIODES



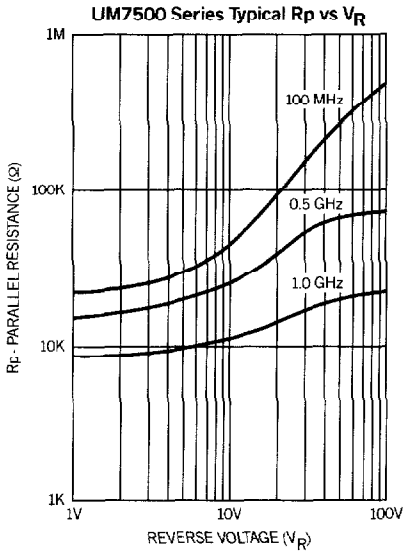
UM7500 Series Thermal Impedance vs Pulse Width



UM7500 Series Typical C_T vs V_R



UM7500 Series Typical Rp vs V_R



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