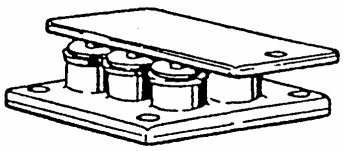
Microsemi
SCOTTSDALE DIVISION

High Power Transient Voltage Suppressor and Zener

DESCRIPTION

This high power Transient Voltage Suppressor and Zener is designed for applications requiring protection of voltage-sensitive electronic devices that may be damaged by high power or high energy voltage transients including lightning per IEC61000-4-5 and classes 1-4 with various source impedances described herein. Individual cells are matched to ensure current-sharing under high current pulse conditions and for continuous operation as a Zener when required.

APPEARANCE



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

FEATURES

- Peak surge power capacity given from 0.1 ms to 10 seconds.
- Low clamping factor
- Negligible power loss
- Small size and weight for 350 W dc rating
- Low thermal resistance junction to base plate
- Working Standoff Voltages 14 to 165 Volts
- Following variations are also available:
  - Non-Standard Voltages
  - Higher Power Capacity
  - Other Package Configurations

APPLICATIONS / BENEFITS

- High Power Voltage Regulation
- High Power Transient Voltage Protection from Lightning per IEC61000-4-5 for class 1,2,3,4, and 5 with source impedance of 42 Ohms
- High Power Transient Voltage Protection from Lightning per IEC61000-4-5 for class 1,2,3, and 4 with source impedance of 12 Ohms for MPZ5-16 and MPZ5-32 device types
- High Power Transient Voltage Protection from Lightning per IEC61000-4-5 for class 2 and 3 with source impedance of 2 Ohms for MPZ5-16 and MPZ-32 as well as class 4 for MPZ5-16

MAXIMUM RATINGS

- Transient Peak Pulse Power: 40 kW at 0.1 ms and 8 kW at 1.0 ms (sq. wave) or 12 kW @ 10/1000 us
- DC Power Dissipation: 350 Watts @ T_C = 25°C (Derate 2.33 W/°C above 25°C)
- Operating junction & storage temperature range: -65°C to +175°C.

MECHANICAL AND PACKAGING

- Robust copper heat-sink mounting plates and cells
- Finish: Nickel-Solder Plated
- Polarity: Anode-to-Case is standard. Cathode-to-Case available upon request.
- Weight: 61 grams (approximate)

ELECTRICAL CHARACTERISTICS (T_A = 25°C, V_F = 1.5 V max @ 10 A for all types)

Type	Rated Standoff Voltage (Note 1) V_{WM} Vdc	Rated Standoff Voltage (Note 1) V_{WM} Vrms	Maximum Device Clamping Factor CF= $\frac{V_Z @ I_Z(pulse)}{V_Z @ I_{ZT}}$ (Note 2)	Minimum Zener Voltage V_Z (min) @ I_{ZT} Vdc	Minimum Zener Voltage V_Z (min) @ I_{ZT} Adc	Maximum Zener Voltage Pulse Width = 1.0 ms V_Z (max) @ I_Z (pulse) Vdc	Maximum Zener Voltage Pulse Width = 1.0 ms V_Z (max) @ I_Z (pulse) Adc	Maximum Standby Current I_D @ V_{WM} µAdc	Typical Capacitance C (typ) @ V_{WM} µF
MPZ5-16A	14	10	1.25	16	0.4	24	200	50	0.025
MPZ5-16B	14	10	1.25	16	0.4	20	200	50	0.025
MPZ5-32A	28	20	1.25	32	0.2	50	100	50	0.011
MPZ5-32B	28	20	1.25	32	0.2	45	100	50	0.011
MPZ5-32C	28	20	1.25	32	0.2	40	100	50	0.011
MPZ5-180A	165	117	1.14	180	0.03	250	20	50	0.0012
MPZ5-180B	165	117	1.14	180	0.03	225	20	50	0.0012
MPZ5-180C	165	117	1.14	180	0.03	205	20	50	0.0012

NOTE 1: Rated Standoff Voltage (V_{WM}) is defined as normal input voltage to device for non-operating condition. If non-sinusoidal wave or dc input is present, the peak operating voltage input values for V_{WM} should be used to select device type.

NOTE 2: The maximum device clamping factor C_F is a ratio of V_Z measured at I_Z (pulse) given in the Electrical Characteristics Table divided by V_Z measured at I_{ZT} under steady state conditions. This value guarantees the sharpness of the voltage breakdown of individual devices. Figure 2 demonstrates the typical sharpness of the breakdown, and indicates the voltage regulation over a wide range of currents where the change in voltage ΔV_Z is as follows: $\Delta V_Z = V_Z @ I_Z$ (pulse) – $V_Z @ I_{ZT}$

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OUTLINE AND CIRCUIT

FIGURE 1 – MAXIMUM NON-REPETITIVE SURGE POWER
(RECTANGULAR WAVEFORM)

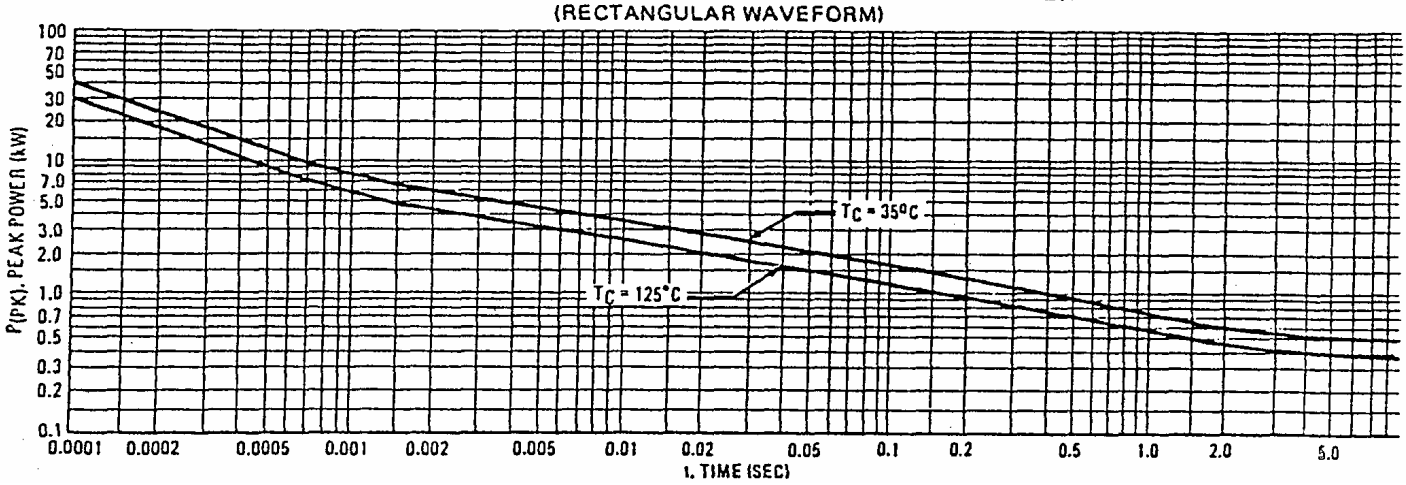
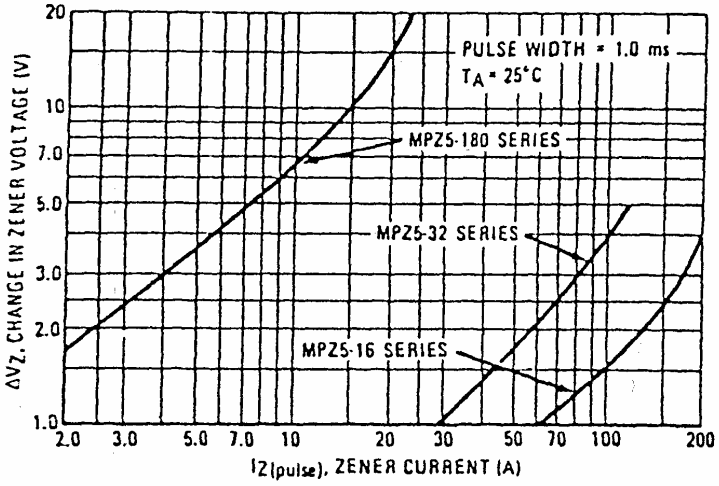
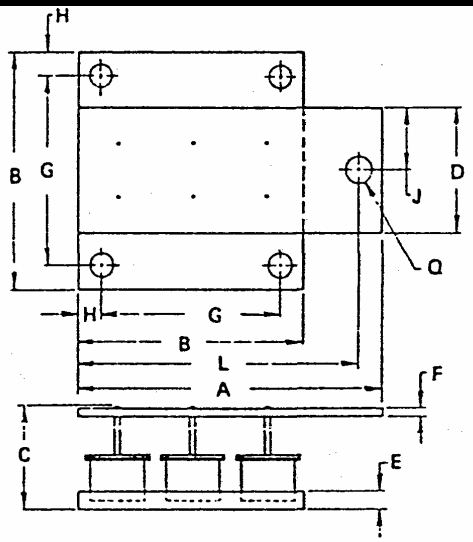


FIGURE 2 – TYPICAL DYNAMIC ZENER VOLTAGE CHARACTERISTICS (Note 2)



PACKAGE DIMENSIONS



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	50.29	51.31	1.980	2.020
B	37.59	38.61	1.480	1.520
C	-	16.51	-	0.650
D	20.24	21.01	0.797	0.827
E	2.92	3.43	0.115	0.135
F	1.32	1.83	0.052	0.072
G	29.97	30.99	1.180	1.220
H	3.56	4.06	0.140	0.160
J	10.06	10.57	0.396	0.416
L	46.74	47.74	1.840	1.860
Q	3.30	3.81	0.130	0.150

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