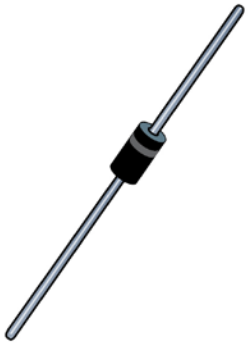
RoHS Available

600 Watt Transient Voltage Suppressor

Screening in reference to MIL-PRF-19500 available

DESCRIPTION

This screened MP6KE6.8A – MP6KE200CA series provides a variety of enhanced reliability choices. Uni- and bi- directional options, as well RoHS compliant versions, are available. These devices have the ability to clamp dangerous high voltage transients such as secondary effects of lightning strikes, providing circuit protection to several class levels in the IEC61000-4-5 specification. Clamping time is virtually instantaneous. It also provides protection from transients caused by inductive load dumps, RFI, and ESD, providing protection to IEC61000-4-2 and -4-4.



T-18 Package

Important: For the latest information, visit our website http://www.microsemi.com.

FEATURES

- Available in both unidirectional and bidirectional configurations
- 3σ lot norm screening performed on standby current I_D
- 100% surge tested devices
- Optional 100% **screening for avionics grade** is available
- Various screenings in reference to MIL-PRF-19500 are available. Refer to Hirel Non-Hermetic Product Portfolio for more details on the screening options.
  (See part nomenclature for all options.)
- High reliability controlled devices have wafer fabrication and assembly lot traceability
- Moisture classification is level 1 with no dry pack required per IPC/JEDEC J-STD-020B
- RoHS compliant versions are available

APPLICATIONS / BENEFITS

- Selections from 6.8 to 200 volts breakdown (V_{BR})
- Economical TVS series for thru-hole mounting
- Protects sensitive components such as IC's, CMOS, Bipolar, BiCMOS, ECL, DTL, T^2L, etc
- Protection from switching transients & induced RFI
- Compliant to IEC 61000-4-2 and IEC 61000-4-4 for ESD and EFT protection respectively.
- Secondary lightning protection per IEC61000-4-5 with 42 ohms source impedance:
  - Class 1: MP6KE6.8A to MP6KE130A or CA
  - Class 2: MP6KE6.8A to MP6KE68A or CA
  - Class 3: MP6KE6.8A to MP6KE36A or CA
  - Class 4: MP6KE6.8A to MP6KE18A or CA
- Secondary lightning protection per IEC61000-4-5 with 12 ohms source impedance:
  - Class 1: MP6KE6.8A to MP6KE43A or CA
  - Class 2: MP6KE6.8A to MP6KE22A or CA

Also available in:

DO-214AA package
(J-bend surface mount)
MSMBJ5.0A thru MSMBJ170CA

DO-215AA package
(Gull-wing surface mount)
MSMBG5.0A thru MSMBG170CA

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MAXIMUM RATINGS @ 25 ºC unless otherwise stated

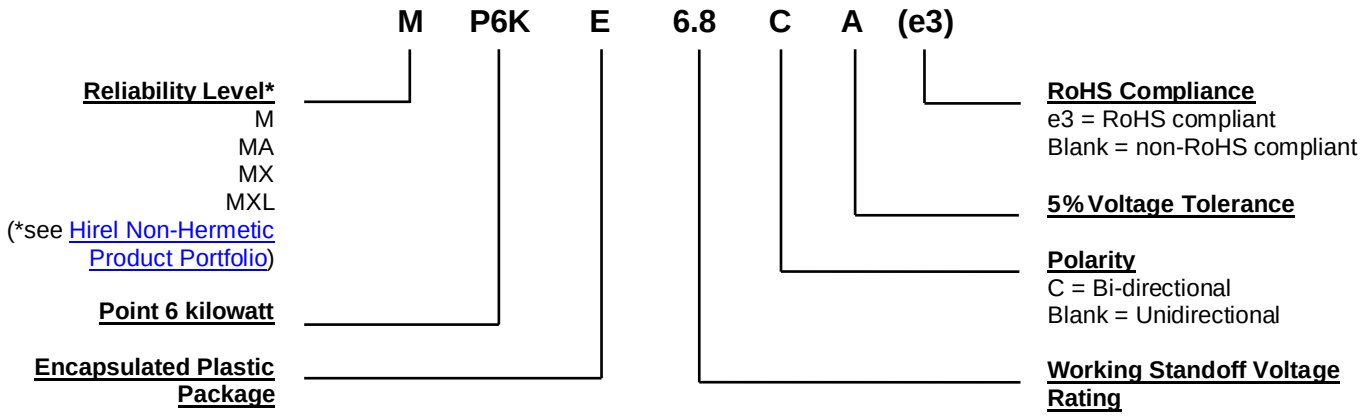
Parameters/Test Conditions	Symbol	Value	Unit
Junction and Storage Temperature	T_J and T_{STG}	-65 to +150	^oC
Thermal Resistance, Junction to Lead @ 3/8 inch (10 mm) lead length from body	$R_{\Theta JL}$	25	$^oC/W$
Thermal Resistance, Junction to Ambient (1)	$R_{\Theta JA}$	85	$^oC/W$
Peak Pulse Power Dissipation (2) 10/1000µs	P_{PP}	600	W
Steady-State Power Dissipation @ T_L = 25 ºC 3/8 inch (10 mm) from body	P_D	5 1.47 (1)	W
$T_{clamping}$ (0 volts to $V_{(BR)}$ min, theoretical) Unidirectional Bidirectional		< 100 < 5	ps ns
Forward Voltage (3)	V_F	3.5	V
Solder Temperature @ 10 s		260	^oC

Notes: 1. When mounted on FR4 PC board with 4 mm^2 copper pads (1 oz) and track width 1 mm, length 25 mm.
2. With impulse repetition rate (duty factor) of 0.01 % or less (also Figure 1 and 4).
3. At 100 amp peak impulse of 8.3 ms half-sine wave (unidirectional only).

MECHANICAL and PACKAGING

- CASE: Void-free transfer molded thermosetting epoxy body meeting UL94V-0
- TERMINALS: Tin-lead or RoHS compliant annealed matte-tin plating. Solderable per MIL-STD-750, method 2026.
- MARKING: Part number
- POLARITY: Cathode indicated by band. Bidirectional not marked.
- TAPE & REEL option: Standard per EIA-296 (add "TR" suffix to part number). Consult factory for quantities.
- WEIGHT: Approximately 0.7 grams
- See Package Dimensions on last page.

PART NOMENCLATURE



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SYMBOLS & DEFINITIONS	
Symbol	**Definition**
$\alpha_{V(BR)}$	Temperature Coefficient of Breakdown Voltage: The change in breakdown voltage divided by the change in temperature that caused it expressed in %/°C or mV/°C.
$I_{(BR)}$	Breakdown Current: The current used for measuring Breakdown Voltage $V_{(BR)}$.
I_D	Standby Current: The current through the device at rated stand-off voltage.
I_{PP}	Peak Impulse Current: The maximum rated random recurring peak impulse current or nonrepetitive peak impulse current that may be applied to a device. A random recurring or nonrepetitive transient current is usually due to an external cause, and it is assumed that its effect will have completely disappeared before the next transient arrives.
P_{PP}	Peak Pulse Power. The rated random recurring peak impulse power or rated nonrepetitive peak impulse power. The impulse power is the maximum-rated value of the product of I_{PP} and V_C.
$V_{(BR)}$	Breakdown Voltage: The voltage across the device at a specified current $I_{(BR)}$ in the breakdown region.
V_C	Clamping Voltage: The voltage across the device in a region of low differential resistance during the application of an impulse current (I_{PP}) for a specified waveform.
V_{WM}	Working Standoff Voltage: The maximum-rated value of dc or repetitive peak positive cathode-to-anode voltage that may be continuously applied over the standard operating temperature.

ELECTRICAL CHARACTERISTICS @ 25 °C

PART NUMBER	BREAKDOWN VOLTAGE				RATED STANDOFF VOLTAGE	MAX STANDBY CURRENT	MAX CLAMPING VOLTAGE	PEAK PULSE CURRENT (see Fig. 2)	TEMPERATURE COEFFICIANT of $V_{(BR)}$
	$V_{(BR)}$ @			$I_{(BR)}$	V_{WM}	I_D @ V_{WM}	V_C @ I_{PP}	I_{PP}	$\alpha_{V(BR)}$
	V_{MIN}	V_{NOM}	V_{MAX}	mA	V	µA	V	A	% / °C
MP6KE6.8A	6.45	6.8	7.14	10	5.8	1000	10.5	57	0.057
MP6KE7.5A	7.13	7.5	7.88	10	6.4	500	11.3	53	0.061
MP6KE8.2A	7.79	8.2	8.61	10	7.02	200	12.1	50	0.065
MP6KE9.1A	8.65	9.1	9.55	1	7.78	50	13.4	45	0.068
MP6KE10A	9.5	10	10.5	1	8.55	10	14.5	41	0.073
MP6KE11A	10.5	11	11.6	1	9.4	5	15.6	38	0.075
MP6KE12A	11.4	12	12.6	1	10.2	5	16.7	36	0.078
MP6KE13A	12.4	13	13.7	1	11.1	5	18.2	33	0.081
MP6KE15A	14.3	15	15.8	1	12.8	1	21.2	28	0.084
MP6KE16A	15.2	16	16.8	1	13.6	1	22.5	27	0.086
MP6KE18A	17.1	18	18.9	1	15.3	1	25.2	24	0.088
MP6KE20A	19	20	21	1	17.1	1	27.7	22	0.090
MP6KE22A	20.9	22	23.1	1	18.8	1	30.6	20	0.092
MP6KE24A	22.8	24	25.2	1	20.5	1	33.2	18	0.094
MP6KE27A	25.7	27	28.4	1	23.1	1	37.5	16	0.096
MP6KE30A	28.5	30	31.5	1	25.6	1	41.4	14.4	0.097
MP6KE33A	31.4	33	34.7	1	28.2	1	45.7	13.2	0.098
MP6KE36A	34.2	36	37.8	1	30.8	1	49.9	12	0.099
MP6KE39A	37.1	39	41	1	33.3	1	53.9	11.2	0.100
MP6KE43A	40.9	43	45.2	1	36.8	1	59.3	10.1	0.101
MP6KE47A	44.7	47	49.4	1	40.2	1	64.8	9.3	0.101
MP6KE51A	48.5	51	53.6	1	43.6	1	70.1	8.6	0.102
MP6KE56A	53.2	56	58.8	1	47.8	1	77	7.8	0.103
MP6KE62A	58.9	62	65.1	1	53	1	85	7.1	0.104
MP6KE68A	64.6	68	71.4	1	58.1	1	92	6.5	0.104
MP6KE75A	71.3	75	78.8	1	64.1	1	103	5.8	0.105
MP6KE82A	77.9	82	86.1	1	70.1	1	113	5.3	0.105
MP6KE91A	86.5	91	95.5	1	77.8	1	125	4.8	0.106
MP6KE100A	95	100	105	1	85.5	1	137	4.4	0.106
MP6KE110A	105	110	116	1	94	1	152	3.4	0.107
MP6KE120A	114	120	126	1	102	1	165	3.6	0.107
MP6KE130A	124	130	137	1	111	1	179	3.3	0.107
MP6KE150A	143	150	158	1	128	1	207	2.9	0.108
MP6KE160A	152	160	168	1	136	1	219	2.7	0.108
MP6KE170A	161	170	179	1	145	1	234	2.6	0.108
MP6KE180A	171	180	189	1	154	1	246	2.4	0.108
MP6KE200A	190	200	210	1	171	1	274	2.2	0.108

Consult factory for higher voltages.

NOTE 1: For bidirectional construction, capacitance will be one-half that shown in Figure 4.

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GRAPHS

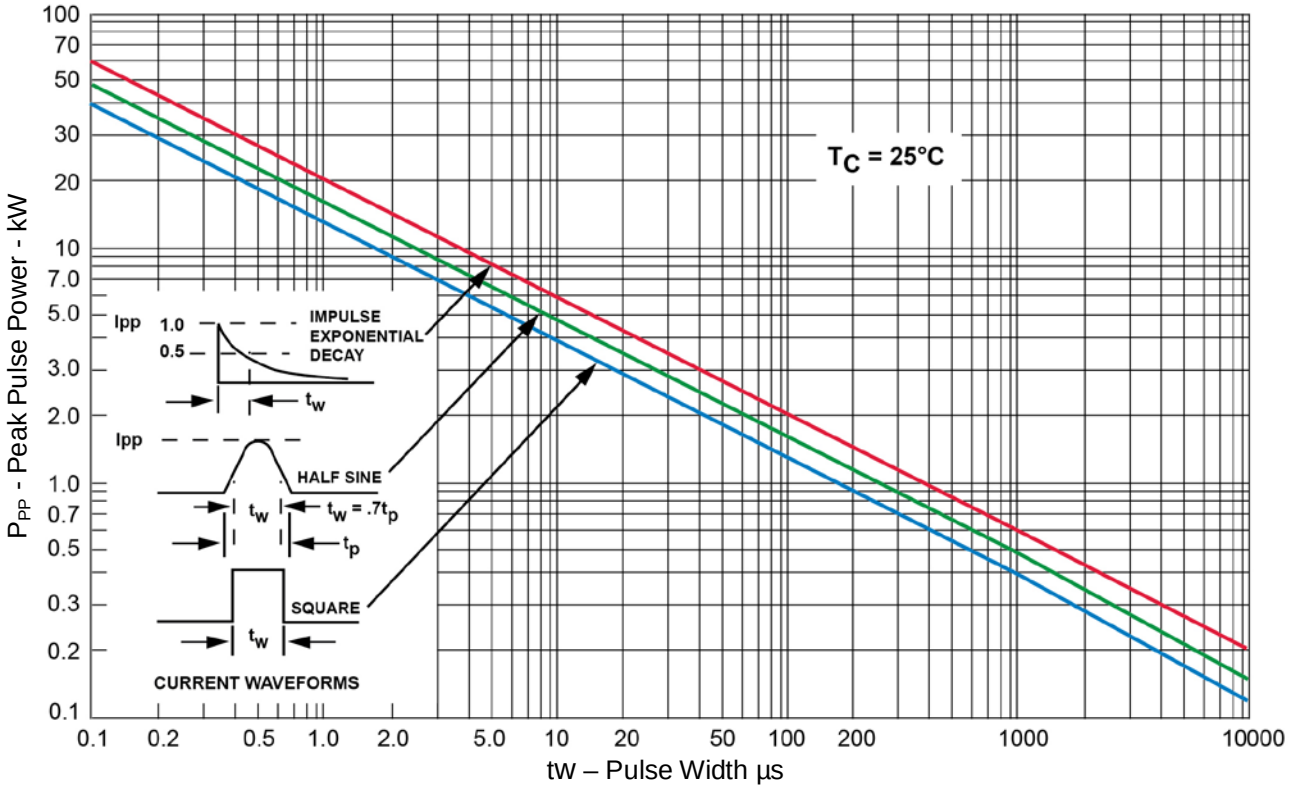
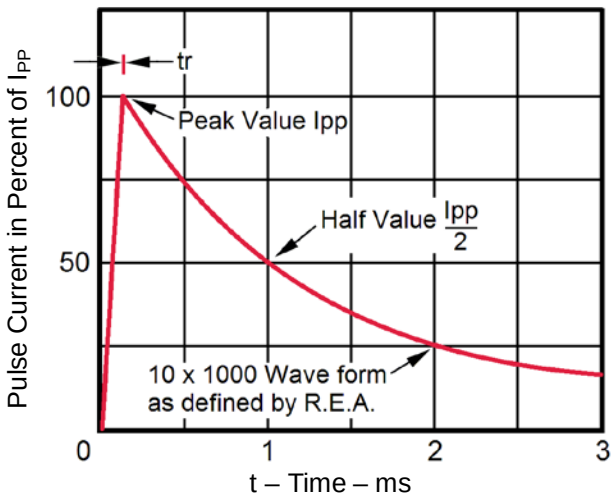


FIGURE 1
Peak Pulse Power vs Pulse Time



Test waveform parameters: tr=10 µs, tp=1000 µs

FIGURE 2
Pulse Waveform for 10/1000 µs Exponential Surge

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GRAPHS (continued)

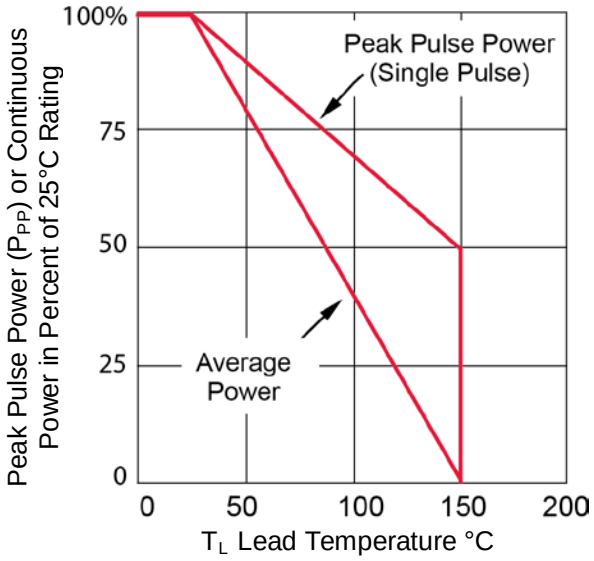

FIGURE 3
Derating Curve

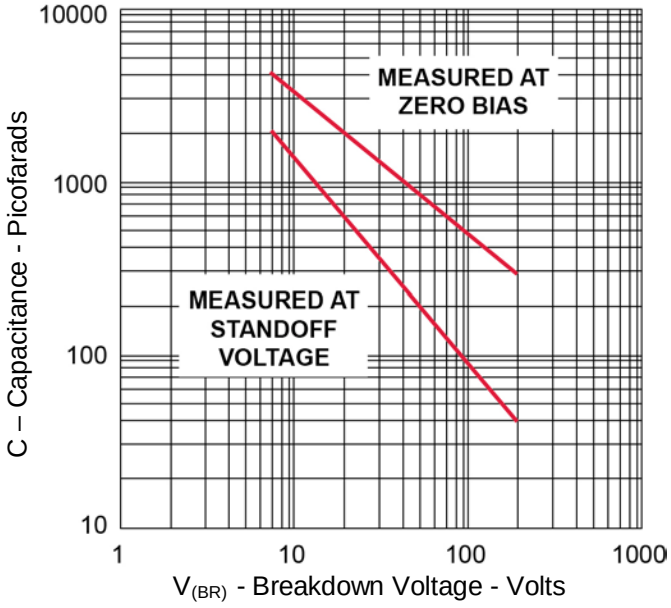

FIGURE 4
Typical Capacitance vs. Breakdown Voltage

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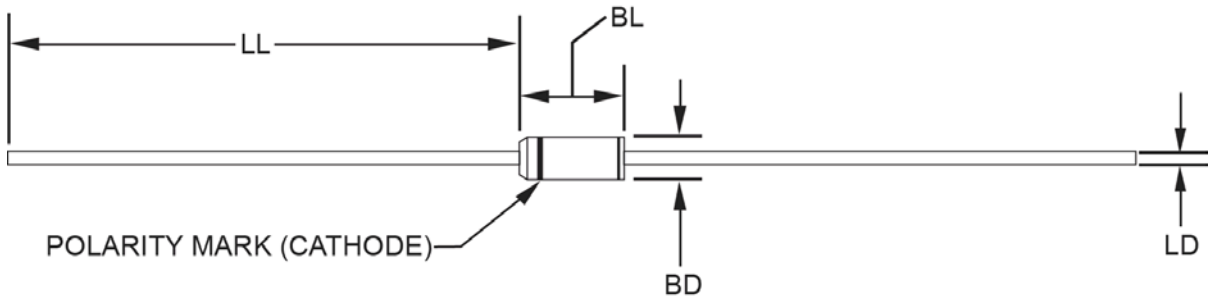
PACKAGE DIMENSIONS



NOTES: Cathode indicated by band.

Dim	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
LL	1.00	-	25.4	-
BL	0.330	0.350	8.39	8.89
BD	0.130	0.145	3.31	3.68
LD	0.038	0.042	0.97	1.06

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