P6SMB SERIES

SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSORS

康比電子
HORNBY ELECTRONIC

REVERSE VOLTAGE:	**6.8 to 440 VOLTS**
PEAK PULSE POWER:	**600 WATTS**

FEATURES

· Plastic package has Underwriters Laboratory
  Flammability Classification 94V-0
· 600W peak pulse power capability on 10/1000μs
  waveform, repetition rate (duty cycle): 0.01%
· Excellent clamping capability
· Low incremental surge resistance
· Very fast response time

## *MECHANICAL DATA*

Case: Molded plastic, DO-214AA(SMB)

Terminals: Axial leads, solderable per MIL-STD-750,
method 2026 guaranteed

Polarity: Color band denotes cathode except bipolar

Packaging: 12mm tape per EIA STD RS-481

Weight: 0.003 ounce, 0.093 gram

DO-214AA(SMB)

0.083 (2.11) / 0.077 (1.96)
0.155 (3.94) / 0.130 (3.30)
0.180 (4.57) / 0.160 (4.06)

0.012 (0.305) / 0.006 (0.152)
0.096 (2.44) / 0.084 (2.13)
0.060 (1.52) / 0.030 (0.76)
0.008 (0.203) / 0.004 (0.102)
0.220 (5.59) / 0.205 (5.21)
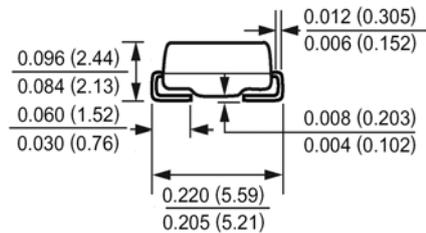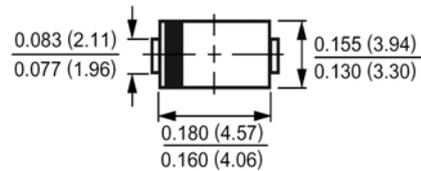
Dimensions in inches and (millimeters)

Maximum Ratings and Electrical Characteristics

Ratings at 25℃ ambient temperature unless otherwise specified.

Single phase, half wave, 60H_Z, resistive or inductive load.

For capacitive load, derate current by 20%.

	Symbols	Limit	Units
Peak power dissipation with a 10/1000μs waveform (Note 1 , 2) (Fig. 1)	P_{PPM}	Minimum 600	**Watts**
Peak pulse current with a 10/1000μs waveform (Note 1) (Fig. 3)	I_{PPM}	See Next Table	**Amp**
Power dissipation on infinite heatsink, $T_A = 50°C$	$P_{M(AV)}$	5.0	**Watts**
Peak forward surge current, 8.3ms single half sine-wave unidirectional only (Note 2)	I_{FSM}	100	**Amp**
Maximum instantaneous forward voltage at 50A for unidirectional only (Note 4)	V_F	3.5/5.0	**Volts**
Thermal resistance junction to leads	R_{0JL}	20	**℃/W**
Thermal resistance junction to ambient air (Note 3)	R_{0JA}	100	**℃/W**
Operating junction and storage temperature range	T_J，Tstg	−55 to +150	**℃**

NOTES:

1- Non-repetitive current pulse, per Fig.3 and derated above $T_A = 25°C$ per Fig. 2.

2- Mounted on 0.2 x 0.2" (5.0 x 5.0mm) copper pads to each terminal

3- Mounted on minimum recommended pad layout

4- $V_F = 3.5V$ for P6SMB200(A) & below; $V_F = 5.0V$ for P6SMB220(A) & above

Devices for Bidirectional Applications:

1- For bi-directional, use C or CA suffix for types P6SMB6.8 thru types P6SMB440A(e.g. P6SMB6.8C, P6SMB440CA).

2- Electrical characteristics apply in both directions.

P6KE SERIES
SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSORS

康比電子
HORNBY ELECTRONIC

Maximum Ratings and Electrical Characteristics

Ratings at 25℃ ambient temperature unless otherwise specified.

Single phase, half wave, 60H$_Z$, resistive or inductive load.

For capacitive load, derate current by 20%.

Device Type	Breakdown Voltage		Test Current	Reverse Stand off Voltage	Maximum Reverse Leakage at V$_{WM}$	Maximum Peak Pulse Current	Maximum Clamping Voltage at I$_{PPM}$	Maximum Temperature Coefficient of V$_{BR}$
	V$_{BR}$ at I$_T$ (Note 1)		I$_T$	V$_{WM}$	I$_D$ (Note 3)	I$_{PPM}$ (Note 2)	V$_C$	/
	Volts $_{(min.)}$	Volts $_{(max.)}$	mAmps	Volts	uAmps	Amps	Volts	% / °C
P6SMB6.8	6.12	7.48	10	5.50	1000	55.6	10.8	0.057
P6SMB6.8A	6.45	7.14	10	5.80	1000	57.1	10.5	0.057
P6SMB7.5	6.75	8.25	10	6.05	500	51.3	11.7	0.061
P6SMB7.5A	7.13	7.88	10	6.40	500	53.1	11.3	0.061
P6SMB8.2	7.38	9.02	10	6.63	200	48.0	12.5	0.065
P6SMB8.2A	7.79	8.61	10	7.02	200	49.6	12.1	0.065
P6SMB9.1	8.19	10.0	1.0	7.37	50	43.5	13.8	0.068
P6SMB9.1A	8.65	9.55	1.0	7.78	50	44.8	13.4	0.068
P6SMB10	9.00	11.0	1.0	8.10	10	40.0	15.0	0.073
P6SMB10A	9.50	10.5	1.0	8.55	10	41.4	14.5	0.073
P6SMB11	9.90	12.1	1.0	8.92	5.0	37.0	16.2	0.075
P6SMB11A	10.5	11.6	1.0	9.40	5.0	38.5	15.6	0.075
P6SMB12	10.8	13.2	1.0	9.72	5.0	34.7	17.3	0.078
P6SMB12A	11.4	12.6	1.0	10.2	5.0	35.9	16.7	0.078
P6SMB13	11.7	14.3	1.0	10.5	5.0	31.6	19.0	0.081
P6SMB13A	12.4	13.7	1.0	11.1	5.0	33.0	18.2	0.081
P6SMB15	13.5	16.5	1.0	12.1	5.0	27.3	22.0	0.084
P6SMB15A	14.3	15.8	1.0	12.8	5.0	28.3	21.2	0.084
P6SMB16	14.4	17.6	1.0	12.9	5.0	25.5	23.5	0.086
P6SMB16A	15.2	16.8	1.0	13.6	5.0	26.7	22.5	0.086
P6SMB18	16.2	19.8	1.0	14.5	5.0	22.6	26.5	0.088
P6SMB18A	17.1	18.9	1.0	15.3	5.0	23.8	25.2	0.088
P6SMB20A	18.0	22.0	1.0	16.2	5.0	20.6	29.1	0.090
P6SMB20A	19.0	21.0	1.0	17.1	5.0	21.7	27.7	0.090
P6SMB22	19.8	24.2	1.0	17.8	5.0	18.8	31.9	0.092
P6SMB22A	20.9	23.1	1.0	18.8	5.0	19.6	30.6	0.092
P6SMB24	21.6	26.4	1.0	19.4	5.0	17.3	34.7	0.094
P6SMB24A	22.8	25.2	1.0	20.5	5.0	18.1	33.2	0.094
P6SMB27	24.3	29.7	1.0	21.8	5.0	15.3	39.1	0.096
P6SMB27A	25.7	28.4	1.0	23.1	5.0	16.0	37.5	0.096
P6SMB30	27.0	33.0	1.0	24.3	5.0	13.8	43.5	0.097
P6SMB30A	28.5	31.5	1.0	25.6	5.0	14.5	41.4	0.097
P6SMB33	29.7	36.3	1.0	26.8	5.0	12.6	47.7	0.098
P6SMB33A	31.4	34.7	1.0	28.2	5.0	13.1	45.7	0.098
P6SMB36	32.4	39.6	1.0	29.1	5.0	11.5	52.0	0.099
P6SMB36A	34.2	37.8	1.0	30.8	5.0	12.0	49.9	0.099
P6SMB39	35.1	42.9	1.0	31.6	5.0	10.6	56.4	0.100
P6SMB39A	37.1	41.0	1.0	33.3	5.0	11.1	53.9	0.100
P6SMB43	38.7	47.3	1.0	34.8	5.0	9.7	61.9	0.101
P6SMB43A	40.9	45.2	1.0	36.8	5.0	10.1	59.3	0.101
P6SMB47	42.3	51.7	1.0	38.1	5.0	8.8	67.8	0.101
P6SMB47A	44.7	49.4	1.0	40.2	5.0	9.3	64.8	0.101
P6SMB51	45.9	56.1	1.0	41.3	5.0	8.2	73.5	0.102
P6SMB51A	48.5	53.6	1.0	43.6	5.0	8.6	70.1	0.102
P6SMB56	50.4	61.6	1.0	45.4	5.0	7.5	80.5	0.103
P6SMB56A	53.2	58.8	1.0	47.8	5.0	7.8	77.0	0.103

P6SMB SERIES
SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSORS

康比電子
HORNBY ELECTRONIC

Maximum Ratings and Electrical Characteristics

Ratings at 25℃ ambient temperature unless otherwise specified.

Single phase, half wave, 60H$_Z$, resistive or inductive load.

For capacitive load, derate current by 20%.

Device Type	Breakdown Voltage		Test Current	Reverse Stand off Voltage	Maximum Reverse Leakage at V$_{WM}$	Maximum Peak Pulse Current	Maximum Clamping Voltage at I$_{PPM}$	Maximum Temperature Coefficient of V$_{BR}$
	V$_{BR}$ at I$_T$ (Note 1)		I$_T$	V$_{WM}$	I$_D$ (Note 3)	I$_{PPM}$ (Note 2)	V$_C$	/
	Volts (min.)	Volts (max.)	mAmps	Volts	uAmps	Amps	Volts	% / °C
P6SMB62	55.8	68.2	1.0	50.2	5.0	6.7	89.0	0.104
P6SMB62A	58.9	65.1	1.0	53.0	5.0	7.1	85.0	0.104
P6SMB68	61.2	74.8	1.0	55.1	5.0	6.1	98.0	0.104
P6SMB68A	64.6	71.4	1.0	58.1	5.0	6.5	92.0	0.104
P6SMB75	67.5	82.5	1.0	60.7	5.0	5.6	108	0.105
P6SMB75A	71.3	78.8	1.0	64.1	5.0	5.8	103	0.105
P6SMB82	73.8	90.2	1.0	66.4	5.0	5.1	118	0.105
P6SMB82A	77.9	86.1	1.0	70.1	5.0	5.3	113	0.105
P6SMB91	81.9	100	1.0	73.7	5.0	4.6	131	0.106
P6SMB91A	86.5	95.5	1.0	77.8	5.0	4.8	125	0.106
P6SMB100	90.0	110	1.0	81.0	5.0	4.2	144	0.106
P6SMB100A	95.0	105	1.0	85.5	5.0	4.4	137	0.106
P6SMB110	99.0	121	1.0	89.2	5.0	3.8	158	0.107
P6SMB110A	105	116	1.0	94.0	5.0	3.9	152	0.107
P6SMB120	108	132	1.0	97.2	5.0	3.5	173	0.107
P6SMB120A	114	126	1.0	102	5.0	3.6	165	0.107
P6SMB130	117	143	1.0	105	5.0	3.2	187	0.107
P6SMB130A	124	137	1.0	111	5.0	3.4	179	0.107
P6SMB150	135	165	1.0	121	5.0	2.8	215	0.108
P6SMB150A	143	158	1.0	128	5.0	2.9	207	0.108
P6SMB160	144	176	1.0	130	5.0	2.6	230	0.108
P6SMB160A	152	168	1.0	136	5.0	2.7	219	0.108
P6SMB170	153	187	1.0	138	5.0	2.5	244	0.108
P6SMB170A	162	179	1.0	145	5.0	2.6	234	0.108
P6SMB180	162	198	1.0	146	5.0	2.3	258	0.108
P6SMB180A	171	189	1.0	154	5.0	2.4	246	0.108
P6SMB200	180	220	1.0	162	5.0	2.1	287	0.108
P6SMB200A	190	210	1.0	171	5.0	2.2	274	0.108
P6SMB220	198	242	1.0	175	5.0	1.7	344	0.108
P6SMB220A	209	231	1.0	185	5.0	1.8	328	0.108
P6SMB250	225	275	1.0	202	5.0	1.7	360	0.110
P6SMB250A	237	263	1.0	214	5.0	1.7	344	0.110
P6SMB300	270	330	1.0	243	5.0	1.4	430	0.110
P6SMB300A	285	315	1.0	256	5.0	1.4	414	0.110
P6SMB350	315	385	1.0	284	5.0	1.2	504	0.110
P6SMB350A	332	368	1.0	300	5.0	1.2	482	0.110
P6SMB400	360	440	1.0	324	5.0	1.0	574	0.110
P6SMB400A	380	420	1.0	342	5.0	1.1	548	0.110
P6SMB440	396	484	1.0	356	5.0	0.95	631	0.110
P6SMB440A	418	462	1.0	376	5.0	1.00	602	0.110

NOTES:

1- Pulse test: tp ≤ 50ms

2- Surge current waveform per Fig. 3 and derated per Fig. 2

3- For bidirectional types having V$_{WM}$ of 10 volts and less, the I$_D$ limit is doubled

4- All terms and symbols are consistent with ANSI/IEEE C62.35

P6SMB SERIES
SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSORS

RATINGS AND CHARACTERISTIC CURVES

Fig. 1 – Peak Pulse Power Rating Curve

P_{PPM} — Peak Pulse Power (kW) vs. t_d — Pulse Width (sec.)

0.2 x 0.2" (0.5 x 0.5mm) Copper Pad Areas
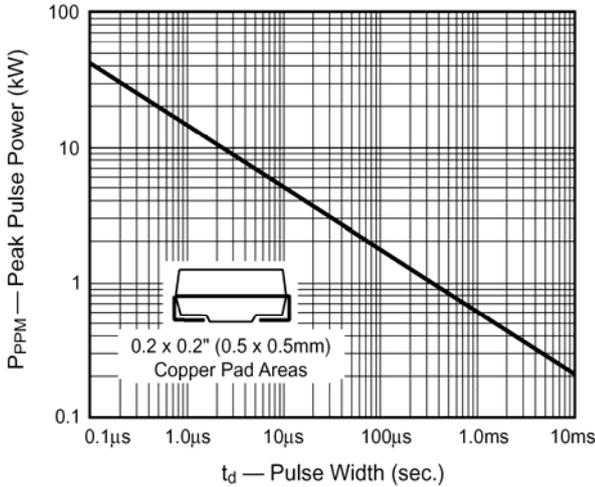
Fig. 2 – Pulse Derating Curve

Peak Pulse Power (P_{PP}) or Current (I_{PP}) Derating in Percentage, % vs. T_A — Ambient Temperature (°C)

Fig. 3 – Pulse Waveform

I_{PPM} — Peak Pulse Current, % I_{RSM} vs. t — Time (ms)

tr = 10μsec.

$T_J = 25°C$
Pulse Width (td) is defined as the point where the peak current decays to 50% of I_{PPM}

Peak Value I_{PPM}

Half Value — $\dfrac{IPP}{2}$
I_{PPM}

10/1000μsec. Waveform as defined by R.E.A.

td
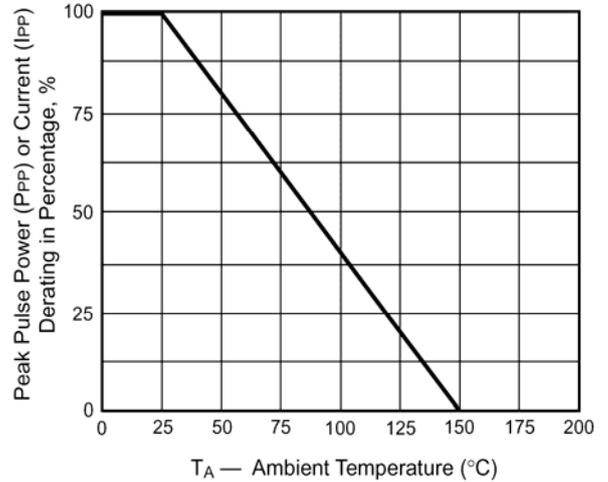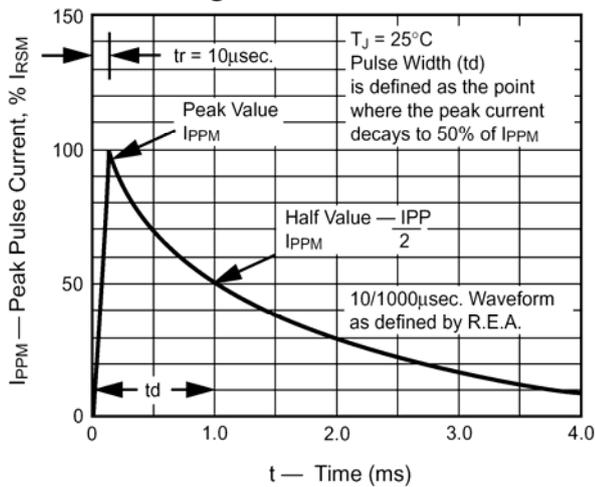
Fig. 4 – Typical Junction Capacitance

C_J — Junction Capacitance (pF) vs. V_{WM} — Reverse Stand-Off Voltage (V)

Measured at Zero Bias

V_R, Measured at Stand-Off Voltage, V_{WM}

Uni-Directional
Bi-Directional

$T_J = 25°C$
f = 1.0MHz
Vsig = 50mVp-p
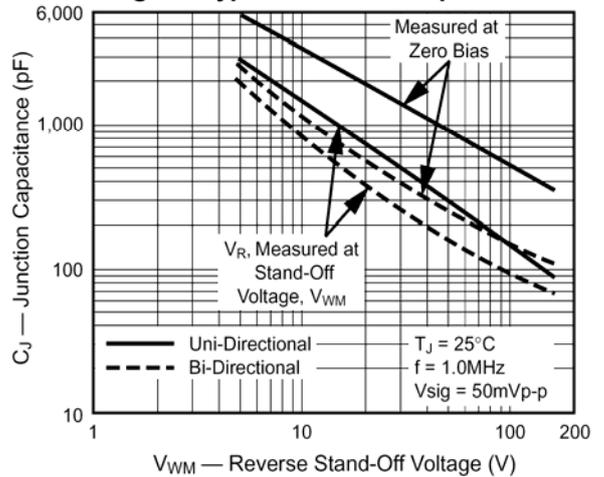
Fig. 5 – Typical Transient Thermal Impedance

Transient Thermal Impedance (°C/W) vs. t_p — Pulse Duration (sec)
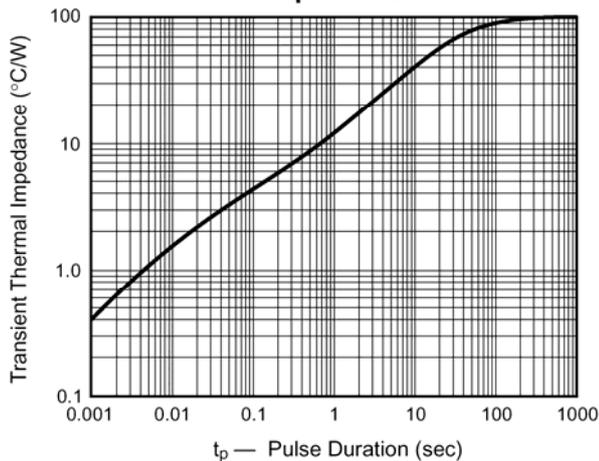
Fig. 6 – Maximum Non-Repetitive Peak Forward Surge Current

I_{FSM} — Peak Forward Surge Current (A) vs. Number of Cycles at 60H_Z

8.3ms Single Half Sine-Wave (JEDEC Method) Unidirectional Only