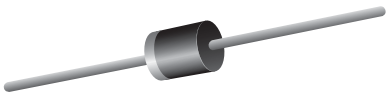
TRANSZORB® Transient Voltage Suppressors



P600

FEATURES

- P600 glass passivated chip junction
- Available in uni-directional polarity only
- 5000 W peak pulse power capability with a 10/1000 µs waveform, repetitive rate (duty cycle): 0.01 %
- Excellent clamping capability
- Very fast response time
- Low incremental surge resistance
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT

TYPICAL APPLICATIONS

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting on ICs, MOSFET, signal lines of sensor units for consumer, computer, industrial, automotive, and telecommunication.

MECHANICAL DATA

Case: Molded epoxy body over passivated junction
Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS compliant, commercial grade
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
V_{WM}	5.0 V to 188 V
V_{BR}	6.4 V to 231 V
P_{PPM}	5000 W
P_D	8.0 W
I_{FSM}	500 A
T_J max.	175 °C
Polarity	Uni-directional
Package	P600

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNIT
Peak pulse power dissipation with a 10/1000 µs waveform (1)	P_{PPM}	5000	W
Peak pulse current with a 10/1000 µs waveform (1)	I_{PPM}	See next table	A
Power dissipation on infinite heatsink at T_L = 75 °C (fig. 5)	P_D	8.0	W
Peak forward surge current 8.3 ms single half sine-wave (fig. 5)	I_{FSM}	600	A
Instantaneous forward voltage at 100 A (2)	V_F	3.5	V
Operating junction and storage temperature range	T_J, T_{STG}	- 55 to + 175	°C

Notes

(1) Non-repetitive current pulse, per fig. 3 and derated above T_A = 25 °C per fig. 2

(2) Measured 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum

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ELECTRICAL CHARACTERISTICS (JEDEC REGISTERED DATA) (T_A = 25 °C unless otherwise noted)

DEVICE TYPE	BREAKDOWN VOLTAGE V_{BR} AT I_T (1) (V)		TEST CURRENT I_T (mA)	STAND-OFF VOLTAGE V_{WM} (V)	MAXIMUM REVERSE LEAKAGE AT V_{WM} I_D (µA)	MAXIMUM PEAK PULSE CURRENT I_{PPM} (2) (A)	MAXIMUM CLAMPING VOLTAGE AT I_{PPM} V_C (V)	MAXIMUM TEMP. COEFFICIENT OF V_{BR} (%/°C)
	MIN.	MAX.						
5KP5.0A	6.4	7.00	50	5.0	2000	543	9.20	0.057
5KP6.0A	6.67	7.37	50	6.0	5000	485	10.3	0.061
5KP6.5A	7.22	7.98	50	6.5	2000	446	11.2	0.065
5KP7.0A	7.78	8.60	50	7.0	1000	417	12.0	0.068
5KP7.5A	8.33	9.21	5.0	7.5	250	388	12.9	0.073
5KP8.0A	8.89	9.83	5.0	8.0	150	368	13.6	0.075
5KP8.5A	9.44	10.4	5.0	8.5	50	347	14.4	0.078
5KP9.0A	10.0	11.1	5.0	9.0	20	325	15.4	0.081
5KP10A	11.1	12.3	5.0	10.0	15	294	17.0	0.084
5KP11A	12.2	13.5	5.0	11.0	10	275	18.2	0.086
5KP12A	13.3	14.7	5.0	12.0	5.0	251	19.9	0.088
5KP13A	14.4	15.9	5.0	13.0	2.0	233	21.5	0.090
5KP14A	15.6	17.2	5.0	14.0	2.0	216	23.2	0.092
5KP15A	16.7	18.5	5.0	15.0	2.0	205	24.4	0.094
5KP16A	17.8	19.7	5.0	16.0	2.0	192	26.0	0.096
5KP17A	18.9	20.9	5.0	17.0	2.0	181	27.6	0.097
5KP18A	20.0	22.1	5.0	18.0	2.0	171	29.2	0.098
5KP20A	22.2	24.5	5.0	20.0	2.0	154	32.4	0.099
5KP22A	24.4	26.9	5.0	22.0	2.0	141	35.5	0.100
5KP24A	26.7	29.5	5.0	24.0	2.0	129	38.9	0.101
5KP26A	28.9	31.9	5.0	26.0	2.0	119	42.1	0.101
5KP26A	28.9	31.9	5.0	26.0	2.0	119	42.1	0.101
5KP28A	31.1	34.4	5.0	28.0	2.0	110	45.4	0.102
5KP30A	33.3	36.8	5.0	30.0	2.0	103	48.4	0.103
5KP33A	36.7	40.6	5.0	33.0	2.0	93.8	53.3	0.104
5KP36A	40.0	44.2	5.0	36.0	2.0	86.1	58.1	0.104
5KP40A	44.4	49.1	5.0	40.0	2.0	77.5	64.5	0.105
5KP43A	47.8	52.8	5.0	43.0	2.0	72.0	69.4	0.105
5KP45A	50.0	55.3	5.0	45.0	2.0	68.8	72.7	0.106
5KP48A	53.3	58.9	5.0	48.0	2.0	64.6	77.4	0.106
5KP51A	56.7	62.7	5.0	51.0	2.0	60.7	82.4	0.107
5KP54A	60.0	66.3	5.0	54.0	2.0	57.4	87.1	0.107
5KP58A	64.4	71.2	5.0	58.0	2.0	53.4	94	0.107
5KP60A	66.7	73.7	5.0	60.0	2.0	51.7	97.0	0.108
5KP64A	71.1	78.6	5.0	64.0	2.0	48.5	103	0.108
5KP70A	77.8	86.0	5.0	70.0	2.0	44.2	113	0.108
5KP75A	83.3	92.1	5.0	75.0	2.0	41.3	121	0.108
5KP78A	86.7	95.8	5.0	78.0	2.0	39.7	126	0.108
5KP85A	94.4	104	5.0	85.0	2.0	36.5	137	0.110
5KP90A	100	111	5.0	90.0	2.0	34.2	146	0.110
5KP100A	111	123	5.0	100	2.0	30.9	162	0.110
5KP110A	122	135	5.0	110	2.0	28.2	177	0.112
5KP120A	133	147	5.0	120	2.0	25.9	193	0.112
5KP130A	144	159	5.0	130	2.0	23.9	209	0.112
5KP150A	167	185	5.0	150	2.0	20.6	243	0.112
5KP160A	178	197	5.0	160	2.0	19.3	259	0.112
5KP170A	189	209	5.0	170	2.0	18.2	275	0.112
5KP188A	209	231	5.0	188	2.0	15.2	328	0.112

Notes

(1) Pulse test: $t_p \leq 50$ ms

(2) Surge current waveform per fig. 3 and derate per fig. 2

(3) All terms and symbols are consistent with ANSI/IEEE CA62.35

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ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
5KP5.0A-E3/54	2.776	54	800	13" diameter paper tape and reel
5KP5.0AHE3/54 (1)	2.776	54	800	13" diameter paper tape and reel

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

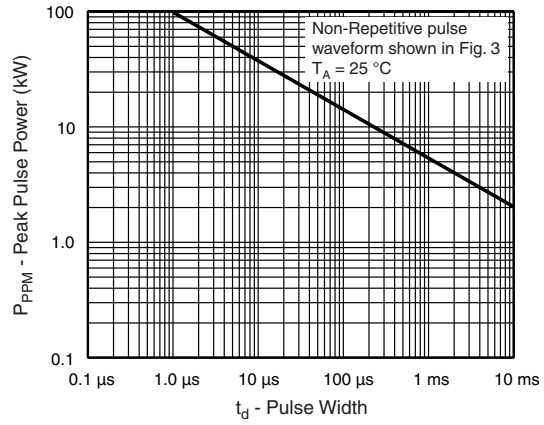

Fig. 1 - Peak Pulse Power Rating Curve

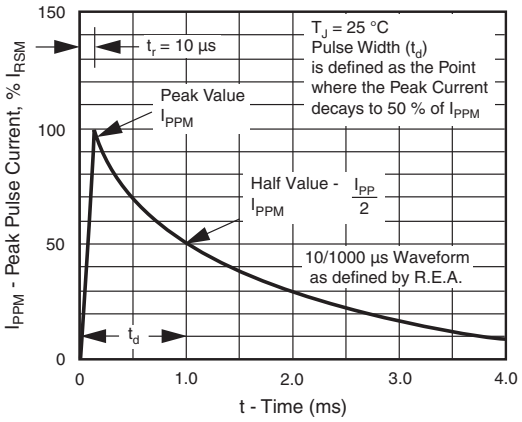

Fig. 3 - Pulse Waveform

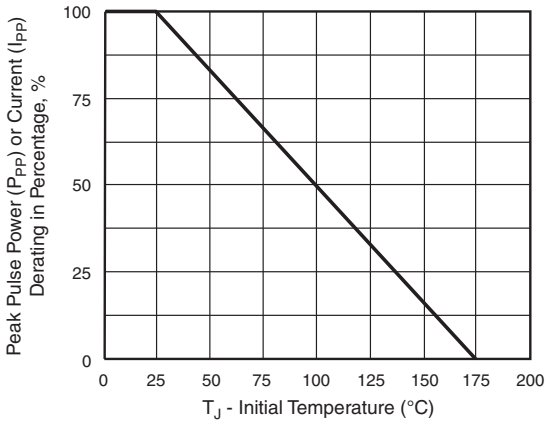

Fig. 2 - Pulse Power or Current vs. Initial Junction Temperature

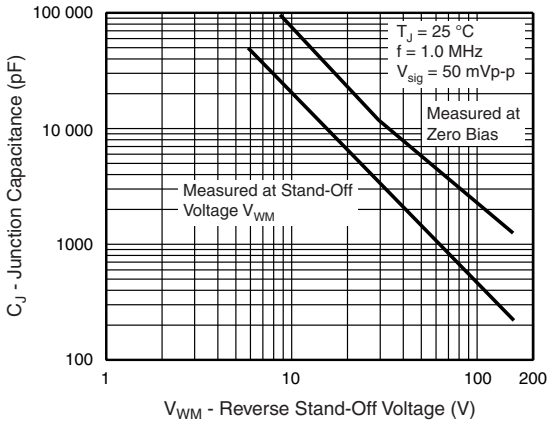

Fig. 4 - Typical Junction Capacitance

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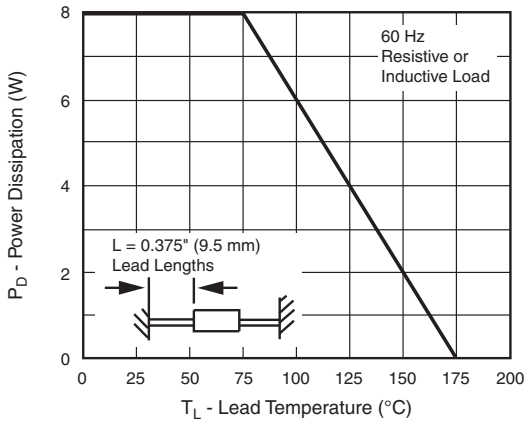


Fig. 5 - Power Derating Curve

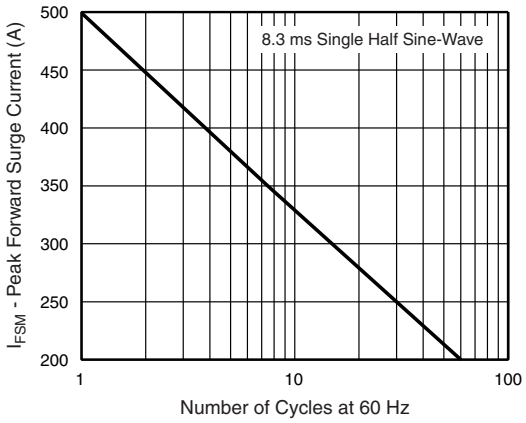
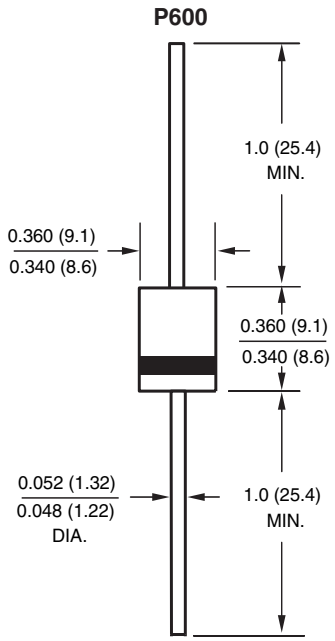


Fig. 6 - Maximum Non-Repetitive Forward Surge Current

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



APPLICATION NOTES

The 5KP series of high power transient voltage suppressors were designed to be used on the output of switching power supplies. These devices may be used to replace crowbar circuits. Both the 5 % and 10 % voltage tolerances are referenced to the power supply output voltage level.

They are able to withstand high levels of peak current while allowing a circuit breaker to trip or a fuse blow before shorting. This will enable the user to reset the breaker or replace the fuse and continue operation. For this type operation, it is recommended that a sufficient mounting surface be used for dissipating the heat generated by the Transient Voltage Suppressor during the transient or over-voltage condition.

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