

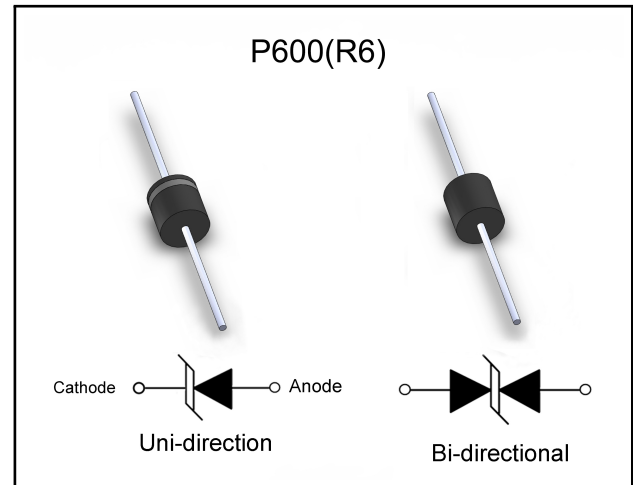
12KP Series

Transient Voltage Suppressor

Features

- Excellent clamping capability
- Low leakage current
- Low capacitance
- High surge capability
- Glass passivated chip
- Epoxy resin package
- Will not fatigue
- RoHS Compliant
- Meets ISO7637-2、16750-2 surge specification
- ISO 7637-2 P5a:
12V System (65-87V 0.5-4Ω 40-400ms)
24V System (123-174V 1-8Ω 100-350ms)

Package



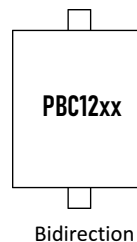
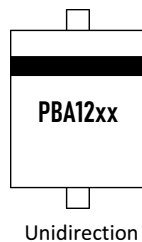
Mechanical Characteristics

- Package: P600 plastic package
- Lead Finish: Matte Tin
- Case Material: Epoxy Molding Compound
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020

Applications

- Auto powers system
- Can-bus
- ABS powers
- Automotive instrument
- Car GPS

Making Code



Summary of Packing Options

Package	Packing Description	Packing Quantity	Industry Standard
P600	Tape/Box,Box	300	EIA-481-1
	Tape/Reel,13" reel	800	EIA-481-1

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Specifications are subject to change without notice.

Please refer to <http://www.born-tw.com> for current information.

Revision: 2022-Jan-1-A

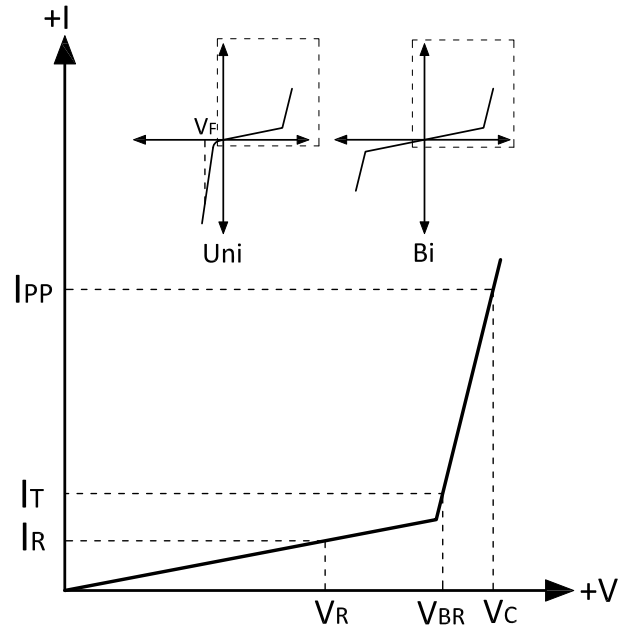


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Electrical Parameters

Parameter	Definition
C_J	Junction Capacitance - typical capacitance measured with 0V or V_R bias
I_{PP}	Peak Pulse Current - maximum rated peak impulse current
V_C	Clamping Voltage - Peak voltage measured across the suppressor at a specified I_{PPM}
V_{BR}	Breakdown Voltage - Maximum voltage that flows though the TVS at a specified test current (I_T)
I_R	Leakage Current - maximum peak off-state current measured at V_R
V_R	Peak Off-state Voltage - maximum voltage that can be applied while maintaining off state



Absolute Maximum Ratings ($T_A=+25^{\circ}\text{C}$, unless otherwise noted)

Parameter	Symbol	Value	Units
Peak Pulse Power Dissipation (Note1)	P_{PPM}	12000	W
Steady State Power Dissipation (Note2)	P_D	8	W
Peak Forward Surge Current (Note3)	I_{FSM}	400	A
Maximum Instantaneous Forward Voltage at 100A (Note4)	V_{FM}	5	V
Typical Thermal Resistance Junction to Lead	$R_{\theta JL}$	8	$^{\circ}\text{C/W}$
Typical Thermal Resistance Junction to Ambient	$R_{\theta JA}$	40	$^{\circ}\text{C/W}$
Operating Temperature Range	T_J	-55 to 175	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 to 175	$^{\circ}\text{C}$

Notes:

- (1) Non-repetitive current pulse , 10/1000us Waveform.
- (2) Infinite HeatSink at $T_L = 75^{\circ}\text{C}$, at 0.375" (9.5mm) lead length, P.C.B. mounted.
- (3) Measured on 8.3ms single half sine wave or equivalent square wave, duty cycle=4 perminute maximum.
- (4) For Unidirectional Only, $V_{FW} < 3.5\text{V}$ for $V_{BR} \leq 200\text{V}$ and $V_{FM} < 5.0\text{V}$ for $V_{BR} \geq 201\text{V}$.



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Electrical Characteristics ($T_A=+25^{\circ}\text{C}$, unless otherwise noted)

Part Number	Part Number	Reverse Stand-Off Voltage V_R	Breakdown Voltage $V_{BR}@I_T$		Test Current I_T	Maximum Clamping Voltage $V_C @ I_{IPP}$	Maximum Peak Pulse Current I_{IPP}	Maximum Reverse Leakage $I_R @ V_R$
(Uni)	(Bi)	(V)	Min.(V)	Max.(V)	(mA)	(V)	(A)	(μA)
12KP30A	12KP30CA	30	33.3	36.8	5	48.4	247	5
12KP33A	12KP33CA	33	36.7	40.6	5	53.3	225	5
12KP36A	12KP36CA	36	40.0	44.2	5	58.1	206	5
12KP40A	12KP40CA	40	44.4	49.1	5	64.5	186	5
12KP43A	12KP43CA	43	47.8	52.8	5	69.4	172	5
12KP45A	12KP45CA	45	50.0	55.3	5	72.7	165	5
12KP48A	12KP48CA	48	53.3	58.9	5	77.4	155	5



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Ratings and Characteristic Curves ($T_A = +25^\circ\text{C}$, unless otherwise noted)

Figure 1: Peak Pulse Power Rating

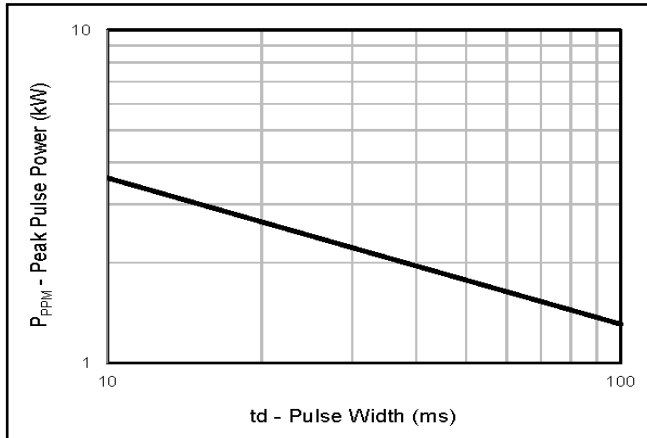


Figure 2: Pulse Derating Curve

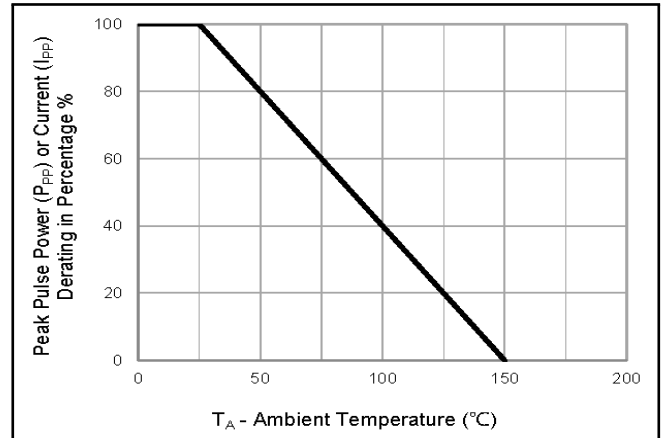


Figure 3: Pulse Waveform

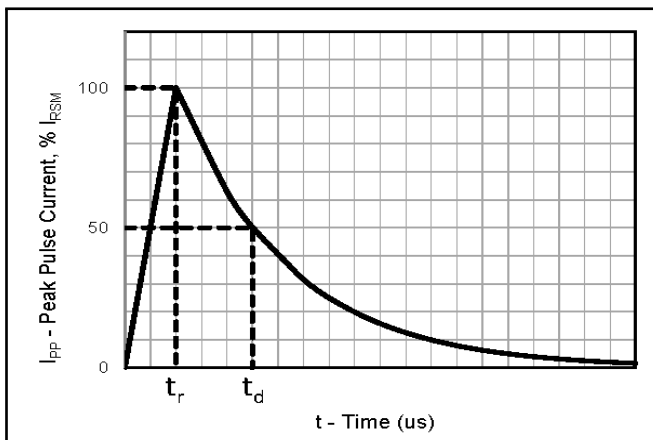


Figure 4: Typical Junction Capacitance

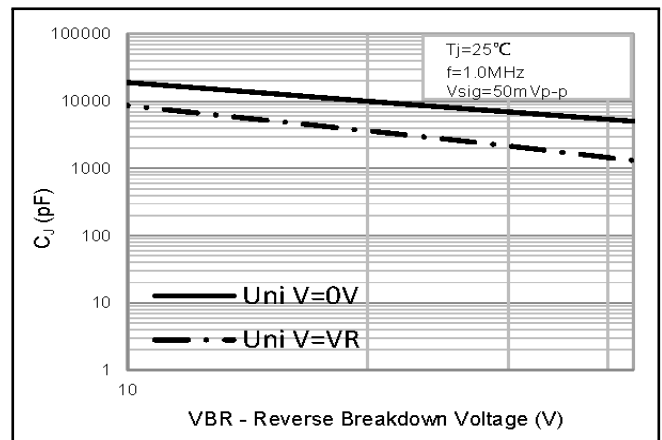


Figure 5: Steady State Power Dissipation Derating Curve

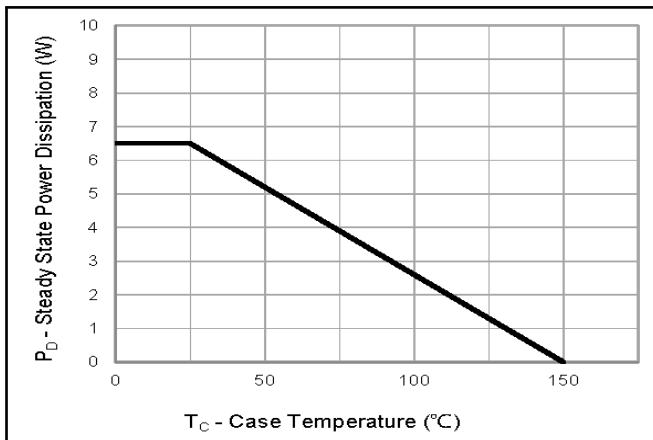
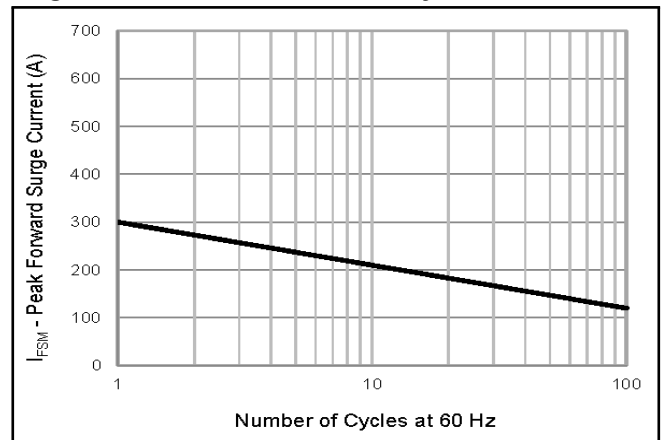


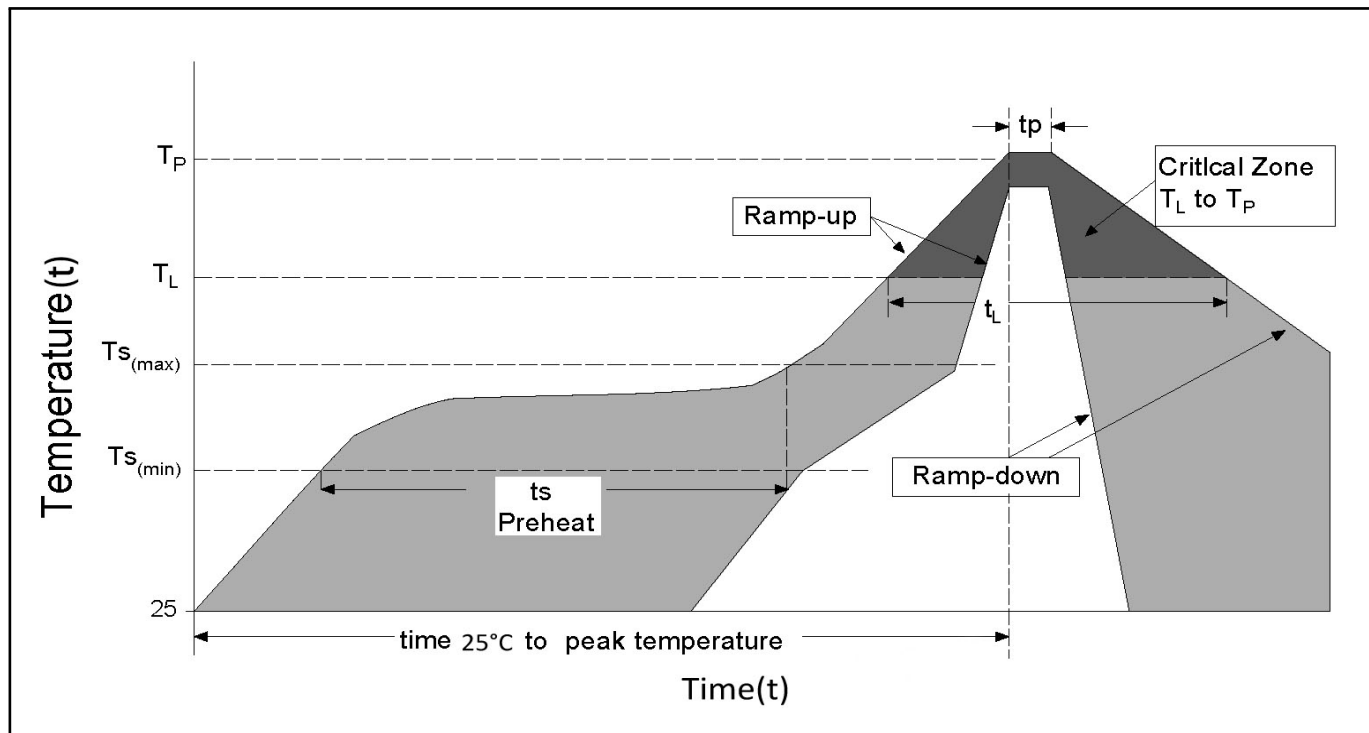
Figure 6: Maximum Non-Repetitive Peak Forward Surge Current Uni-Directional Only



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Soldering Parameters



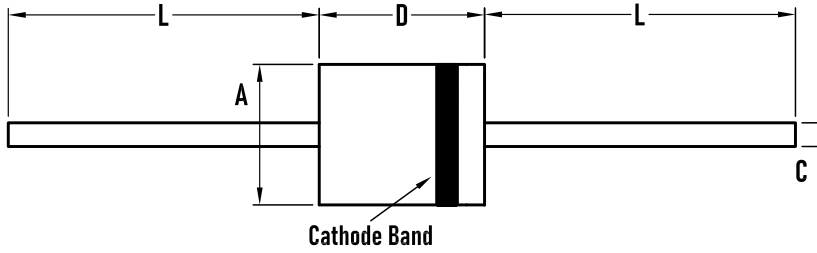
Reflow Condition		Lead-free assembly
Pre Heat	- Temperature Min ($T_{S(min)}$)	150°C
	- Temperature Max ($T_{S(max)}$)	200°C
	- Time (min to max) (t_s)	60 - 180 secs
Average ramp up rate (Liquidus Temp (T_L) to peak)		3°C/second max
$T_{S(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	- Temperature (T_L) (Liquidus)	217°C
	- Time (t_L)	60 - 150 secs
Peak Temperature (T_P)		260 ^{+0/-5} °C
Time within 5°C of actual peak Temperature (t_p)		20 - 40 secs
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (t)		8 minutes Max.
Do not exceed		260°C



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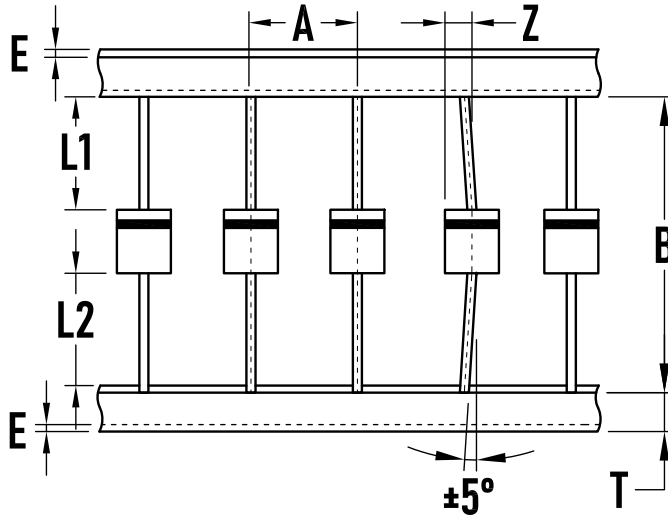
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Package Mechanical Data - P600



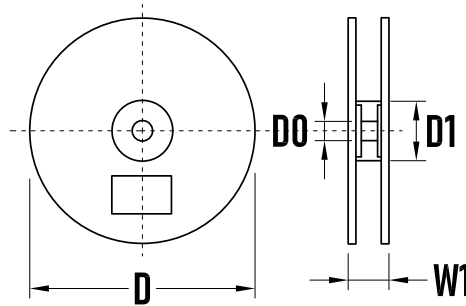
SYMBOL	Inches		MILLIMETER	
	MIN	MAX	MIN	MAX
A	0.339	0.358	8.6	9.1
C	0.048	0.052	1.22	1.32
D	0.339	0.358	8.6	9.1
L	1	—	25.4	—

Packaging Tape-P600



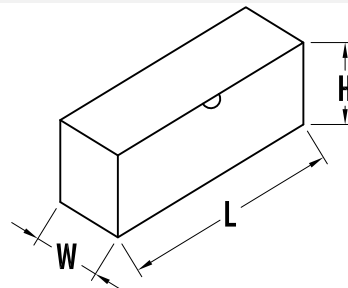
SYMBOL	Dimension(mm)
A	10.0±0.5
B	53.0±1.0
Z	1.2Max.
T	6.0±0.4
E	0.8Max.
L1-L2	1.0Max.

Packaging Reel



SYMBOL	Dimension(mm)
D	330.0±3.0
D0	16.4±2.0
D1	86.0±2.0
W1	76.0±3.0
Quantity	800PCS

Packaging BOX



SYMBOL	Dimension(mm)
L	250.0±5.0
W	75.0±5.0
H	114.0±5.0
Quantity	300PCS

