

## Transient Voltage Suppressors (TVS) Data Sheet

### Features

- For surface mounted applications in order to optimize board space
- Low profile package
- Built-in strain relief
- Planar Junction
- Low inductance
- Excellent clamping capability
- 600W peak pulse power capability at 10/1000 $\mu$ s waveform, repetition rate (duty cycle): 0.01%
- Fast response time
- Typical  $I_R$  less than 1 $\mu$ A above 10V
- High Temperature soldering: 260 $^{\circ}$ C/10 seconds at terminals
- Plastic package has underwriters laboratory flammability 94V-0
- Meets MSL level 1, per J-STD-020
- Safety certification: UL: E244458



### Mechanical Data

- Case: JEDEC DO-214AC. Molded plastic over Planar Junction
- Terminal: Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity: Color band denotes cathode except bi-directional models
- Standard Packaging: 12mm tape (EIA STD RS-481)
- Weight: 0.07g

### Applications

- I/O interface
- AC/DC power supply
- Low frequency signal transmission line (RS232, RS485, etc.)

### Maximum Ratings and Characteristics

Ratings at 25 $^{\circ}$ C ambient temperature unless otherwise specified.

Rating	Symbol	Value	Units
Peak pulse power dissipation at 10/1000 $\mu$ s waveform (Note1, Note2, Fig.1)	$P_{PPM}$	Minimum 600	Watts
Peak pulse current of at 10/1000 $\mu$ s waveform (Note 1, Fig.3)	$I_{PPM}$	See Table	Amps
Steady state power dissipation at $T_A=50^{\circ}$ C (Fig.5)	$P_{M(AV)}$	3.3	Watts
Operating junction and Storage Temperature Range.	$T_J, T_{STG}$	-55 to +150	$^{\circ}$ C
Typical thermal resistance junction to lead	$R_{\theta JL}$	20	$^{\circ}$ C/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	100	$^{\circ}$ C/W

- Notes: 1. Non-repetitive current pulse, per Fig.3 and derated above  $T_A=25^{\circ}$ C per Fig.2.  
2. Mounted on 5.0mm $\times$ 5.0mm (0.03mm thick) copper pads to each terminal.

**Dimensions (SMA/DO-214AC)**

	Symbol	Millimeters		Inches	
		Min.	Max.	Min.	Max.
	L	3.99	4.50	0.157	0.177
	D	2.54	2.79	0.100	0.110
	D1	1.25	1.65	0.049	0.065
	T	4.93	5.28	0.194	0.208
	T1	0.76	1.52	0.030	0.060
	d	-	0.203	-	0.008
	H	2.00	2.50	0.079	0.098
	H1	1.98	2.29	0.078	0.090

**Electrical Characteristics (T<sub>A</sub>=25°C)**

Part Number	Type ①	Device Marking Code	Reverse Stand-Off Voltage	Breakdown Voltage @I <sub>T</sub>	Test Current	Maximum Clamping Voltage @I <sub>PP</sub>	Peak Pulse Current	Reverse Leakage @V <sub>RWM</sub>
			V <sub>RWM</sub> (V)	V <sub>BR</sub> (V)	I <sub>T</sub> (mA)	V <sub>C</sub> (V)	I <sub>PP</sub> (A)	I <sub>R</sub> (μA)
SMAJ18CA	HP6	XT	18.0	20.00~22.10	1	29.2	20.6	1

Notes: ① Specific code by request.

**Part Number Code and Marking**

<p><b>SMAJ 18 C A — HP6</b></p> <ul style="list-style-type: none"> <li>— Series Code</li> <li>— V<sub>RWM</sub> Voltage</li> <li>— Bidirectional</li> <li>— 5% V<sub>BR</sub> Voltage Tolerance</li> <li>— Internal Control Code</li> </ul>	<p>Logo: <b>B</b>          YXXX          XT          Date Code</p> <p>Marking Code</p>
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Ratings and Characteristic Curves ( $T_A=25^\circ\text{C}$  unless otherwise noted)

Figure 1. Peak Pulse Power Rating Curve

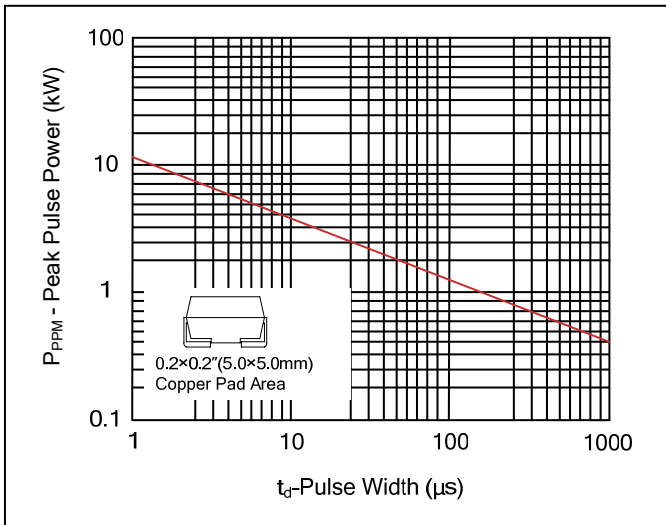


Figure 2. Pulse Derating Curve

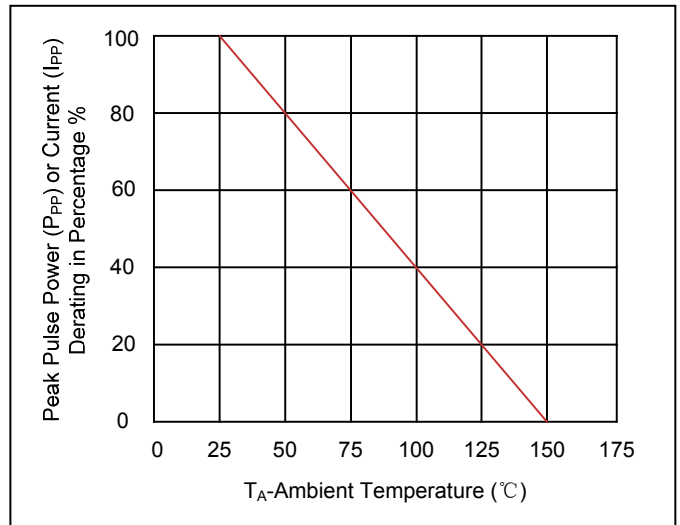


Figure 3. Pulse Waveform

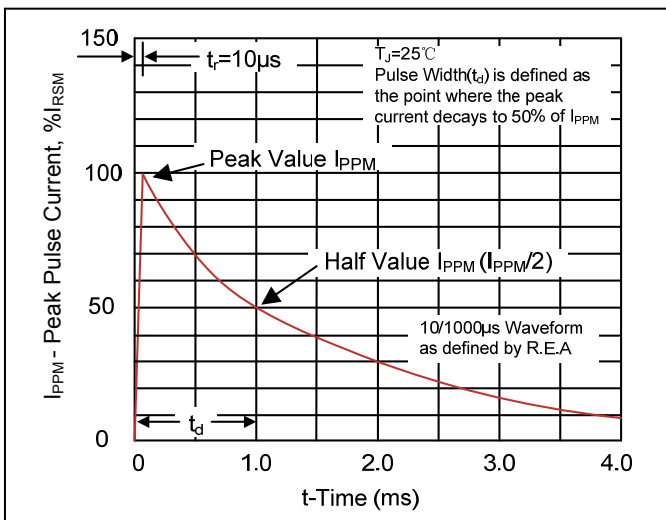


Figure 4. Typical Junction Capacitance

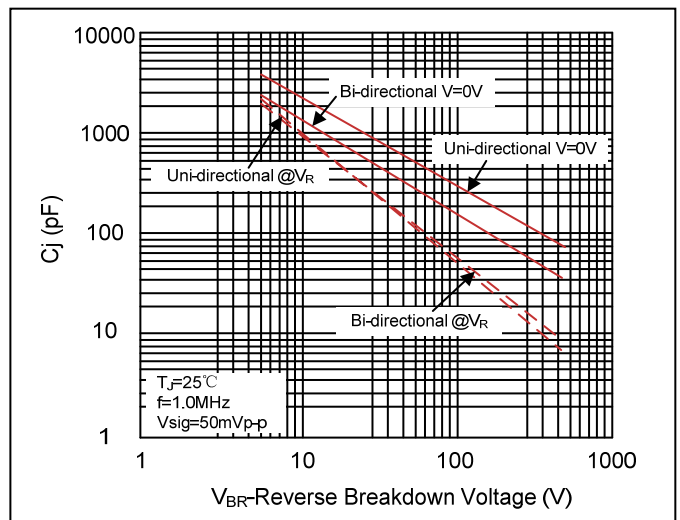
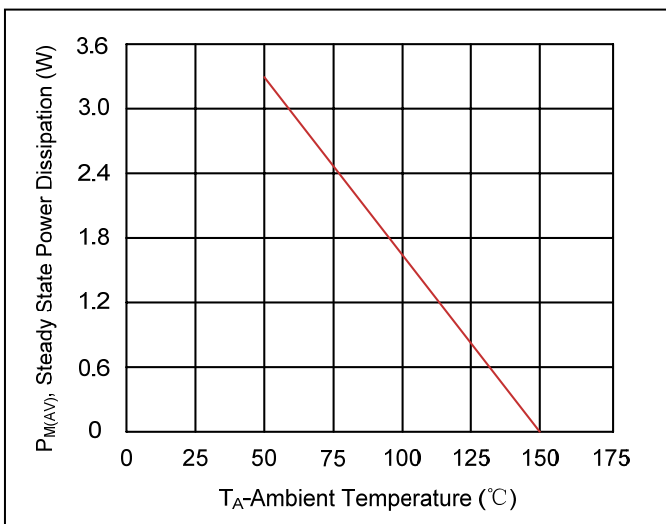
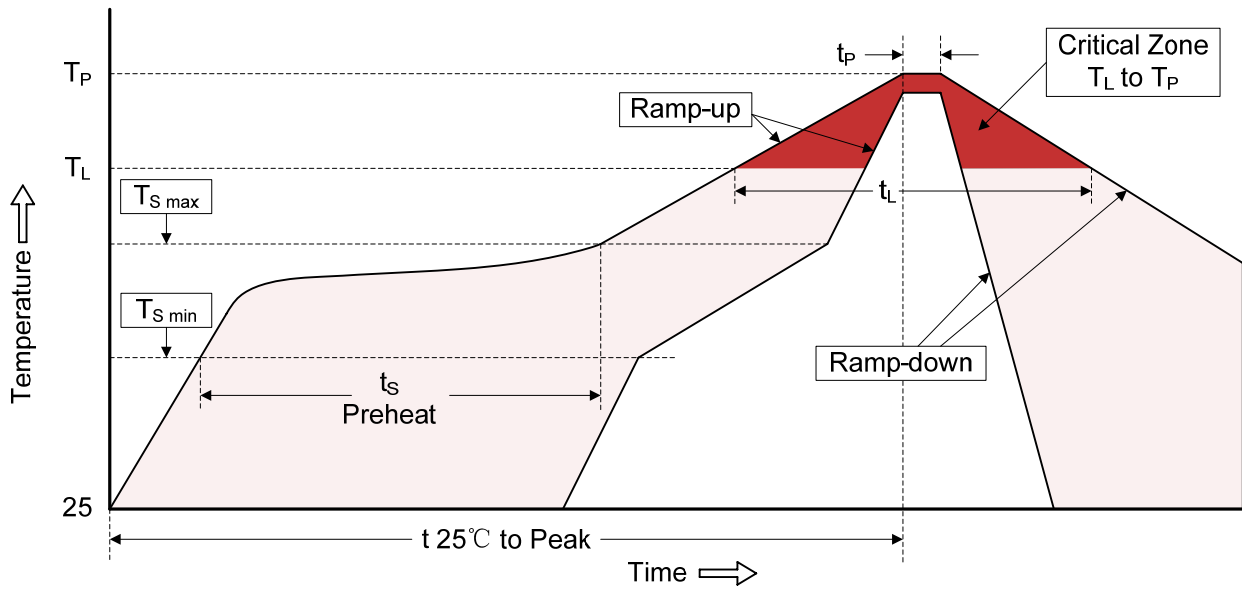


Figure 5. Steady State Power Dissipation Derating Curve



Recommended Soldering Conditions

Reflow Soldering



Recommended Conditions

Profile Feature	Pb-Free Assembly
Average ramp-up rate ( $T_L$ to $T_P$ )	3°C/second max.
Preheat	
-Temperature Min ( $T_{S\ min}$ )	150°C
-Temperature Max ( $T_{S\ max}$ )	200°C
-Time (min to max) ( $t_s$ )	60-180 seconds
$T_{S\ max}$ to $T_L$	
-Ramp-up Rate	3°C/second max.
Time maintained above:	
-Temperature ( $T_L$ )	217°C
-Time ( $t_L$ )	60-150 seconds
Peak Temperature ( $T_P$ )	260°C
Time within 5°C of actual Peak Temperature ( $t_p$ )	20-40 seconds
Ramp-down Rate	6°C/second max.
Time 25°C to Peak Temperature	8 minutes max.

**Packaging**

Tape		Symbol	Dimension (mm)
		W	12.00±0.20
		P0	4.00±0.10
		P1	4.00±0.10
		P2	2.00±0.10
		D0	Φ1.5±0.10
		D1	Φ1.5±0.10
		E	1.75±0.10
		F	5.50±0.05
		A0	2.79±0.10
		B0	5.33±0.10
		K0	2.55±0.15
		T	0.25±0.05
		<p>7" Reel</p>	
D3	Φ50.0Min.		
D4	Φ13.0±0.5		
W1	16.0±2.0		
Quantity: 1000PCS			
<p>13" Reel</p>		D5	Φ330.0±2.0
		D6	Φ13.5±0.5
		H	2.5±1.0
		W2	16.0±2.0
		Quantity: 5000PCS	