

## Transient Voltage Suppressors (TVS) Data Sheet

### Features

- Glass passivated junction
- Low inductance
- Excellent clamping capability
- 10000W peak pulse power capability at 10/1000µs waveform, repetition rate (duty cycle): 0.05%
- Fast response time
- High Temperature soldering guaranteed: 265°C/10 seconds/.375", (9.5mm) lead length, 5lbs (2.3kg) tension
- Plastic package has underwriters laboratory flammability 94V-0
- Meets MSL level 1, per J-STD-020
- IEC61000-4-2 ESD 30KV Air, 30KV contact compliance



### Mechanical Data

- Case: Moulded plastic over glass passivated junction
- Terminal: Plated Axial leads, solderable per MIL-STD-750, Method 2026
- Mounting Position: Any
- Weight: 2.75g

### Applications

- I/O interface
- AC/DC power supply
- Low frequency signal transmission line (RS232, RS485, etc.)
- Meets ISO7637-2 surge spec.

### Maximum Ratings and Characteristics

Ratings at 25°C ambient temperature unless otherwise specified.

| Rating  | Symbol                            | Value         | Units |
|---|-----------------------------------|---------------|-------|
| Peak pulse power dissipation at 10/1000µs waveform (Note1, Fig.2)   | P <sub>PPM</sub>                  | Minimum 10000 | Watts |
| Peak pulse current of at 10/1000µs waveform (Note 1, Fig.3)   | I <sub>PPM</sub>                  | See Table     | Amps  |
| Steady state power dissipation at T <sub>L</sub> =75°C (Fig.5)  | P <sub>M(AV)</sub>                | 8.0           | Watts |
| Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load, (JEDEC Method) (Note2, Fig.6) | I <sub>FSM</sub>                  | 300           | Amps  |
| Operating junction and Storage Temperature Range.   | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150   | °C    |
| Typical thermal resistance junction to lead   | R <sub>θJL</sub>                  | 8             | °C/W  |
| Typical thermal resistance junction to ambient  | R <sub>θJA</sub>                  | 40            | °C/W  |

Notes: 1. Non-repetitive current pulse, per Fig.3 and derated above T<sub>A</sub>=25°C per Fig.2.

2. 8.3ms single half sine-wave, or equivalent square wave, duty cycle=4 pulses per minutes maximum.

**Dimensions (P600)**

|   | Symbol | Millimeters |       | Inches |       |
|---|--------|-------------|-------|--------|-------|
|   |        | Min.        | Max.  | Min.   | Max.  |
|   | L      | 25.40       | -     | 1.000  | -     |
|   | T      | 8.60        | 9.10  | 0.340  | 0.360 |
|   | d      | 8.60        | 9.10  | 0.340  | 0.360 |
| s | 1.19   | 1.32        | 0.047 | 0.052  |       |

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

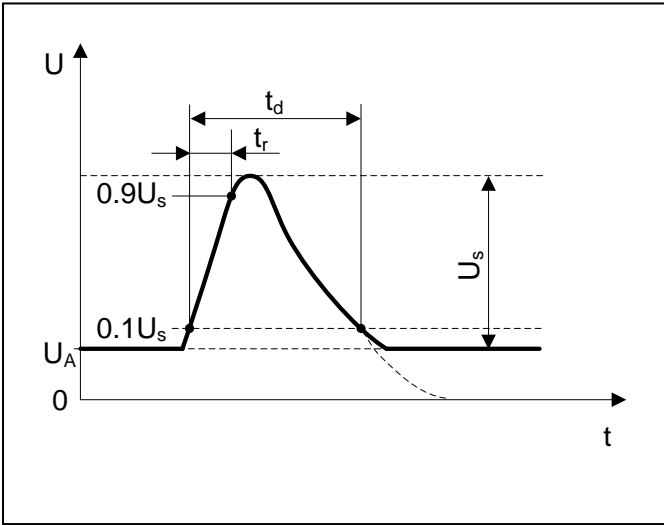
| Part Number    |               | Type<br>① | Breakdown Voltage @I <sub>T</sub> |                         | Test Current<br>I <sub>T</sub> (mA) | Reverse Stand-Off Voltage<br>V <sub>RWM</sub> (V) | Reverse Leakage @ V <sub>RWM</sub><br>I <sub>R</sub> (µA) | Maximum Clamping Voltage @I <sub>PP</sub><br>V <sub>C</sub> (V) | Peak Pulse Current<br>I <sub>PP</sub> (A) |
|----------------|---------------|-----------|-----------------------------------|-------------------------|-------------------------------------|---|---|---|---|
| Unidirectional | Bidirectional |           | V <sub>BR</sub> MIN.(V)           | V <sub>BR</sub> MAX.(V) |                                     |   |   |   |   |
| ATS22A         | ATS22C        | 2CF       | 24.2                              | 26.9                    | 5                                   | 22  | 1.8   | 35.5  | 287                                       |
| ATS24A         | ATS24C        | 2CF       | 26.7                              | 29.6                    | 5                                   | 24  | 1.8   | 39  | 257                                       |
| ATS26A         | ATS26C        | 2CF       | 28.9                              | 32                      | 5                                   | 26  | 1.8   | 42.1  | 237                                       |
| ATS28A         | ATS28C        | 2CF       | 31.1                              | 34.5                    | 5                                   | 28  | 1.8   | 45.4  | 220                                       |
| ATS30A         | ATS30C        | 2CF       | 33                                | 38                      | 5                                   | 30  | 1.8   | 50  | 250                                       |
| ATS33A         | ATS33C        | 2CF       | 36.7                              | 40.6                    | 5                                   | 33  | 1.8   | 53  | 190                                       |
| ATS36A         | ATS36C        | 2CF       | 40                                | 44.2                    | 5                                   | 36  | 1.8   | 58.1  | 174                                       |
| ATS40A         | ATS40C        | 2CF       | 44.4                              | 49.1                    | 5                                   | 40  | 1.8   | 64.5  | 155                                       |

| Part Number    |               | Type<br>①    | Suitable ISO 7637-2 2004 5a test waveform |               |       |      |                  |    |    |    |    |   |
|----------------|---------------|--------------|---|---------------|-------|------|------------------|----|----|----|----|---|
| Unidirectional | Bidirectional |              | V <sub>C</sub> (V)                        | Voltage level |       |      | Resistance Level |    |    |    |    |   |
|                |               | 87V<br>400mS |   | 174V<br>350mS | DC(V) | 0.5Ω | 1Ω               | 2Ω | 3Ω | 4Ω | 8Ω |   |
| ATS22A         | ATS22C        | 2CF          | 35.5                                      | x             | --    | 13.5 | --               | x  | x  | x  | x  | x |
| ATS24A         | ATS24C        | 2CF          | 39  | x             | --    | 13.5 | --               | x  | x  | x  | x  | x |
| ATS26A         | ATS26C        | 2CF          | 42.1                                      | x             | --    | 27   | --               | -- | -- | -- | x  | x |
| ATS28A         | ATS28C        | 2CF          | 45.4                                      | x             | --    | 27   | --               | -- | -- | -- | x  | x |
| ATS30A         | ATS30C        | 2CF          | 50  | --            | x     | 28   | --               | -- | -- | -- | x  | x |
| ATS33A         | ATS33C        | 2CF          | 53  | --            | x     | 28   | --               | -- | -- | -- | x  | x |
| ATS36A         | ATS36C        | 2CF          | 58.1                                      | --            | x     | 28   | --               | -- | -- | -- | x  | x |
| ATS40A         | ATS40C        | 2CF          | 64.5                                      | --            | x     | 28   | --               | -- | -- | -- | x  | x |

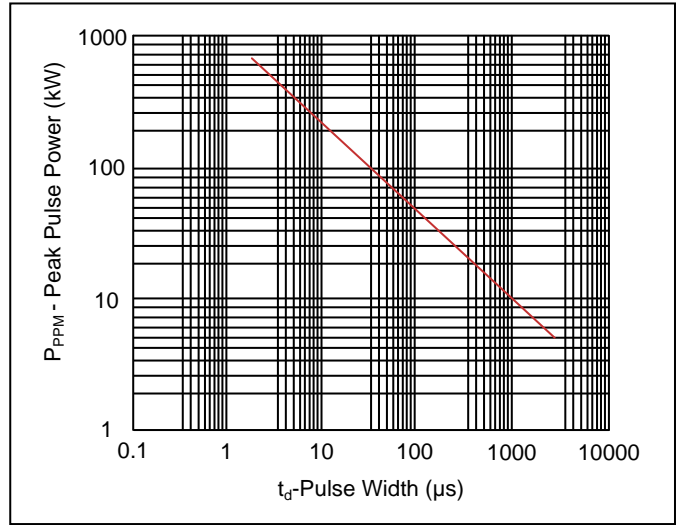
Note: 'x' representatives meets this test condition;

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

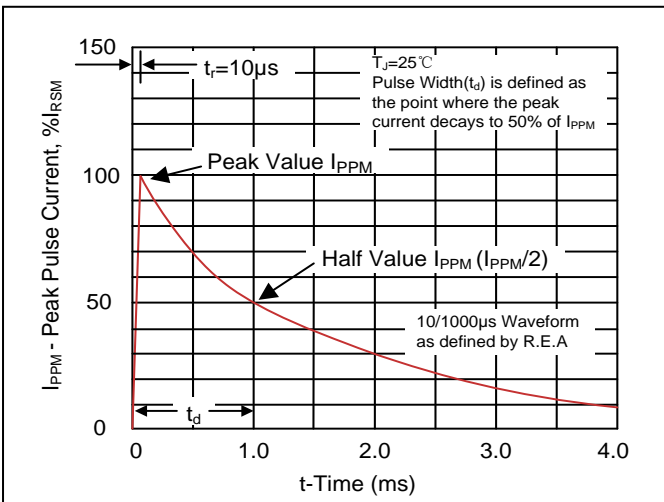
**Figure 1. ISO 7637-2 5a Test pulse**



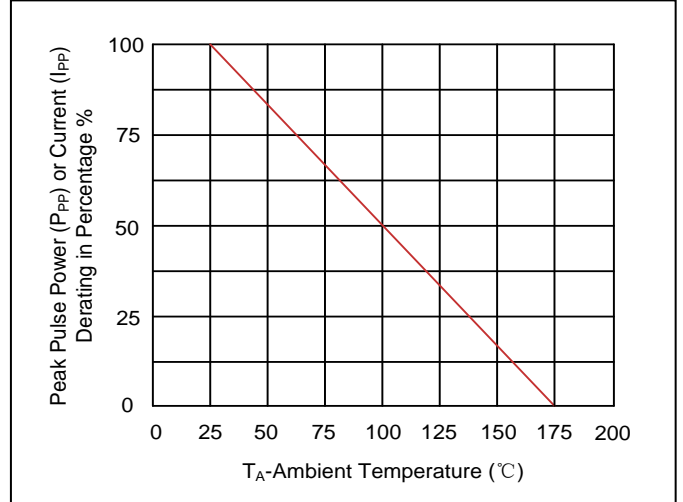
**Figure 2. Peak Pulse Power Rating Curve**



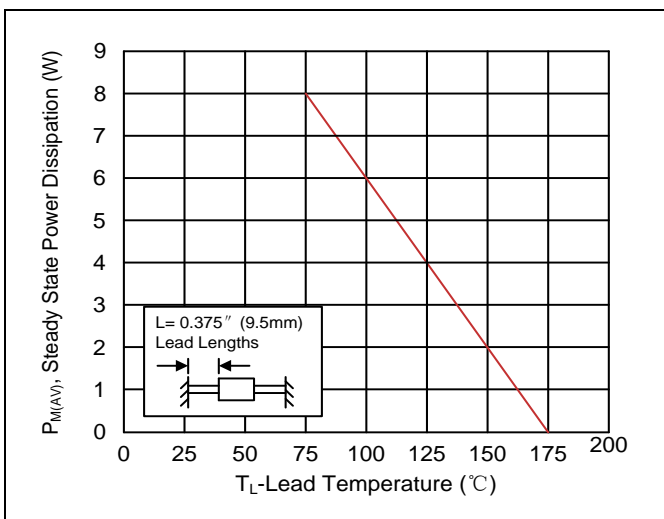
**Figure 3. Pulse Waveform**



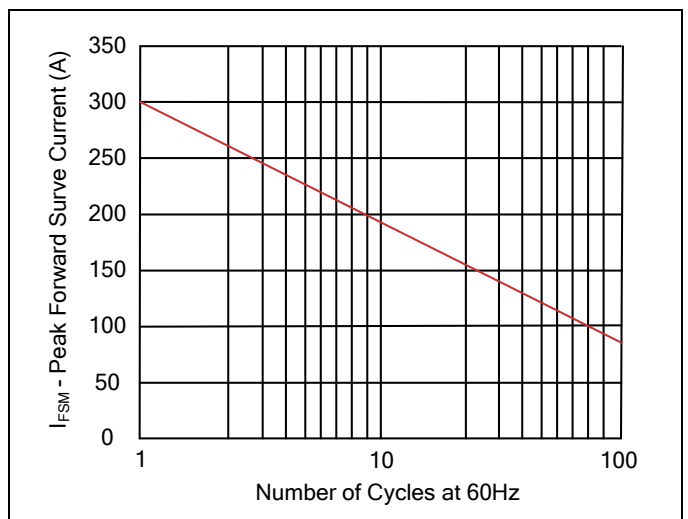
**Figure 4. Pulse Derating Curve**



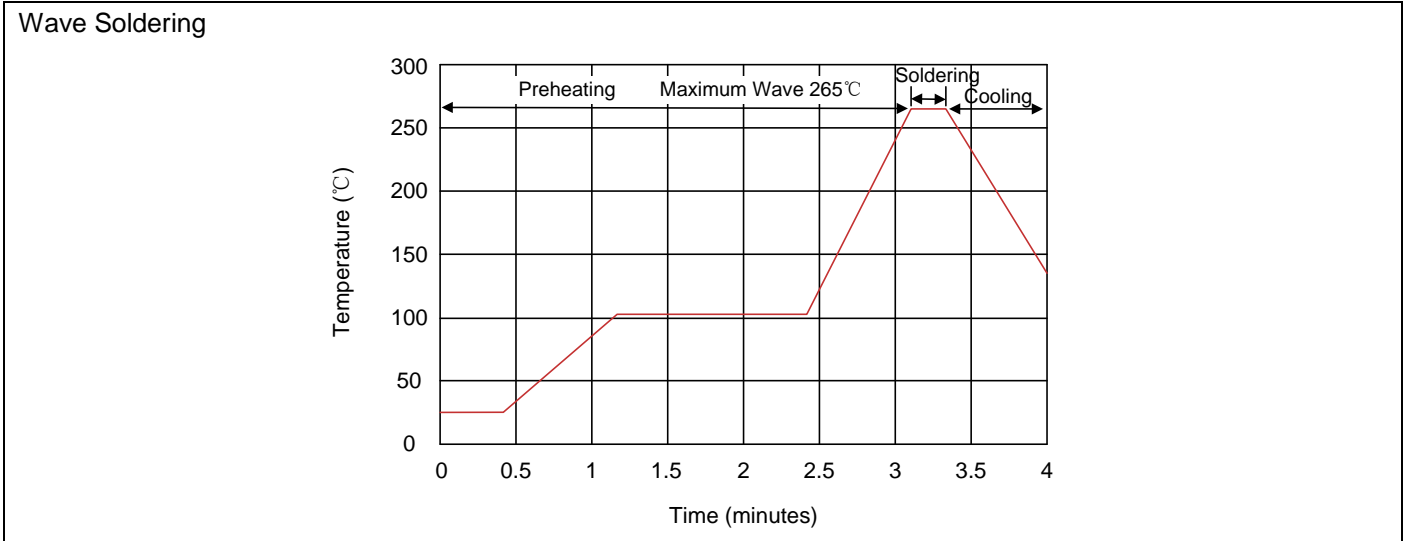
**Figure 5. Steady State Power Dissipation Derating Curve**



**Figure 6. Maximum Non-Repetitive Forward Surge Current Uni-Directional Only**



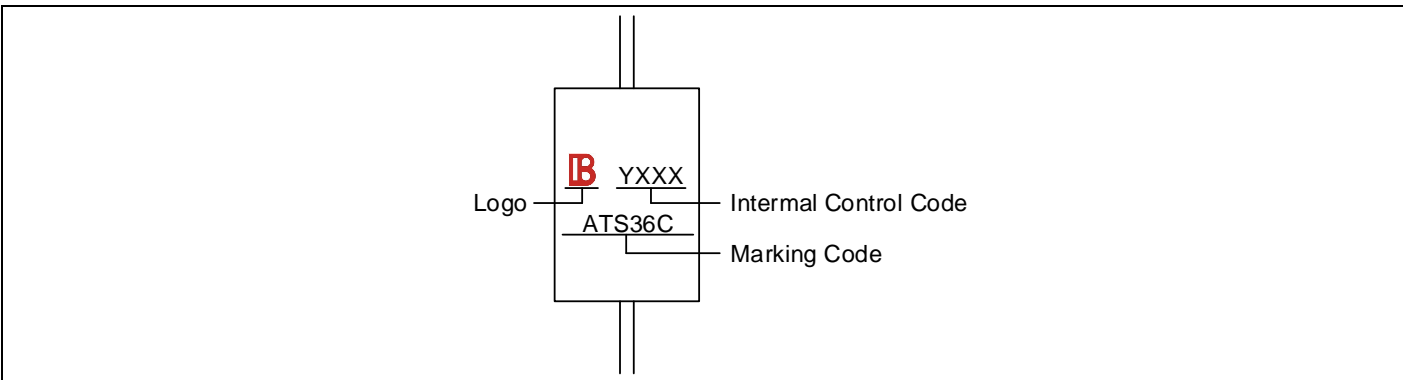
**Recommended Soldering Conditions**



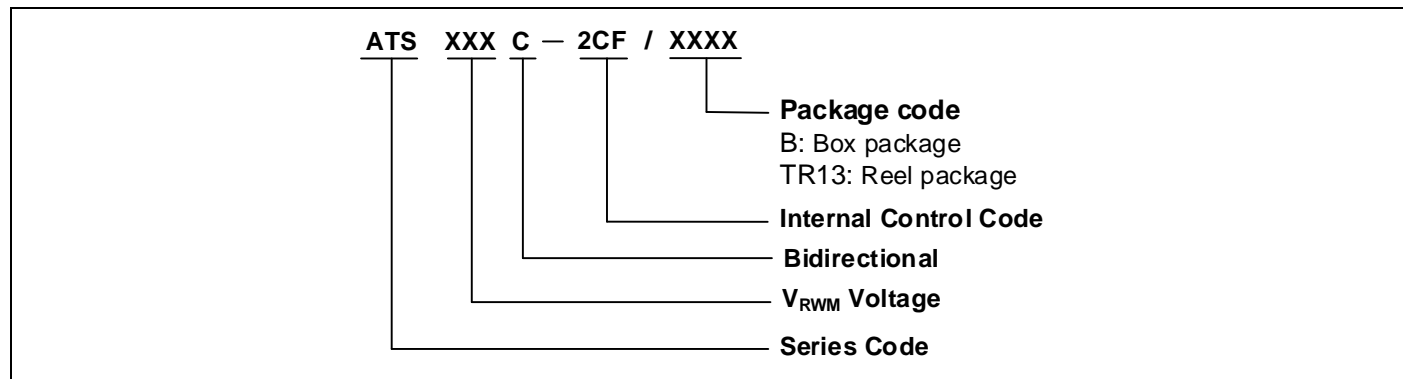
Recommended Conditions

| Item             | Conditions |
|------------------|------------|
| Peak Temperature | 265°C      |
| Dipping Time     | 10 seconds |
| Soldering        | 1 time     |

**Marking Code**



**Part Number Code**

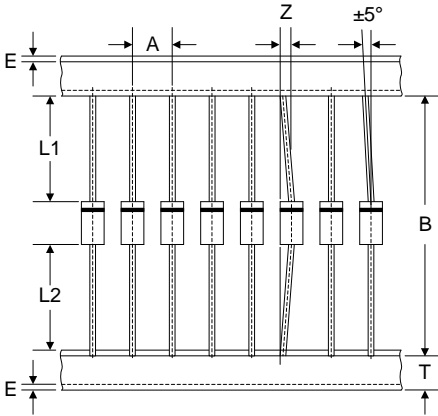
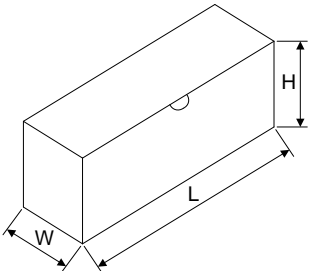
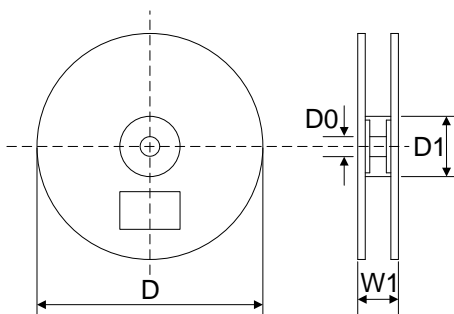


**Ordering Code for Different Package**

Box package: Add suffix "/B" at the end of the part number, such as ATSXXXC-2CF/B

Reel package: Add suffix "/TR13" at the end of the part number, such as ATSXXXC-2CF/TR13

**Packaging**

| Tape  | 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.        |                  |
|   |  | L              | 250.0±5.0        |
|   |   | W              | 75.0±5.0         |
|   |   | H              | 114.0±5.0        |
|   |   |                | Quantity: 300PCS |
|  | D   | 330.0±3.0      |                  |
|   | D0  | 16.4±2.0       |                  |
|   | D1  | 86.0±2.0       |                  |
|   | W1  | 76.0±3.0       |                  |
|   |   |                | Quantity: 800PCS |