

## 3600W, 10V – 43V Surface Mount Transient Voltage Suppressor

### FEATURES

- AEC-Q101 qualified
- Junction passivation optimized design technology
- $T_J = 175\text{ }^\circ\text{C}$  capability suitable for high reliability and automotive requirement
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21
- Meets ISO7637-2 and ISO16750-2 surge specifications (varied by test conditions)
- Meets IEC 61000-4-2 (Level: 4) / ISO 10605 (Level: L4)

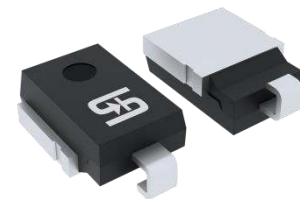
### APPLICATIONS

- Transient Surge Protection
- Automotive Load Dump Surge Protection

### MECHANICAL DATA

- Case: DO-218AB
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: Uni-directional
- Weight: 2.677g (approximately)

| KEY PARAMETERS                   |             |                  |
|----------------------------------|-------------|------------------|
| PARAMETER                        | VALUE       | UNIT             |
| $V_{WM}$                         | 10 – 43     | V                |
| $V_{BR}$                         | 11.1 – 52.8 | V                |
| $P_{PPM}$<br>(10x1,000 $\mu$ s)  | 3600        | W                |
| $P_{PPM}$<br>(10x10,000 $\mu$ s) | 2800        | W                |
| $T_{J\text{MAX}}$                | 175         | $^\circ\text{C}$ |
| Package                          | DO-218AB    |                  |
| Configuration                    | Single die  |                  |



DO-218AB



| ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)                 |             |             |                  |
|---|-------------|-------------|------------------|
| PARAMETER   | SYMBOL      | VALUE       | UNIT             |
| Non-repetitive peak impulse power dissipation with 10/1000 $\mu$ s waveform                 | $P_{PPM}$   | 3600        | W                |
| Non-repetitive peak impulse power dissipation with 10/10000 $\mu$ s waveform <sup>(1)</sup> | $P_{PPM}$   | 2800        | W                |
| Steady state power dissipation <sup>(Fig.1)</sup>   | $P_D$       | 5           | W                |
| Forward Voltage at $I_F = 100\text{ A}$ <sup>(2)</sup>                                      | $V_{F,MAX}$ | 2           | V                |
| Peak forward surge current, 8.3ms single half sine-wave                                     | $I_{FSM}$   | 500         | A                |
| Junction temperature  | $T_J$       | -55 to +175 | $^\circ\text{C}$ |
| Storage temperature   | $T_{STG}$   | -55 to +175 | $^\circ\text{C}$ |

#### Notes:

1. Non-repetitive current pulse per Fig.3
2. Pulse test with PW = 0.3ms

| <b>THERMAL PERFORMANCE</b>          |                 |            |             |
|-------------------------------------|-----------------|------------|-------------|
| <b>PARAMETER</b>                    | <b>SYMBOL</b>   | <b>TYP</b> | <b>UNIT</b> |
| Junction-to-case thermal resistance | $R_{\theta JC}$ | 0.9        | °C/W        |

**Thermal Performance Note:** With ideal heatsink

| <b>ELECTRICAL SPECIFICATIONS</b> ( $T_A = 25^\circ\text{C}$ unless otherwise noted) |              |  |      |                         |  |   |   |   |   |   |
|---|--------------|--|------|-------------------------|--|---|---|---|---|---|
| Part number   | Marking code | Breakdown voltage $V_{BR}$ at $I_T$ (V) (Note 1) |      | Test current $I_T$ (mA) | Working stand-off voltage $V_{WM}$ (V) | Maximum blocking leakage current $I_R$ at $V_{WM}$ ( $\mu\text{A}$ ) (Note 1) | Maximum blocking leakage current $I_R$ at $V_{WM}$ $T_J = 175^\circ\text{C}$ ( $\mu\text{A}$ ) (Note 1) | Maximum peak impulse current $I_{PPM(A)}$ $t_p = 10/1000$ ( $\mu\text{s}$ ) | Maximum clamping voltage $V_C$ at $I_{PPM}$ (V) | Typical temp. coefficient of $V_{BR}$ $\alpha_T$ ( $\%/^\circ\text{C}$ ) (Note 2) |
|   |              | Min  | Max  |                         |  |   |   |   |   |   |
| TLD5S10AH   | TLD5S10A     | 11.1   | 12.3 | 5.0                     | 10.0                                   | 15  | 250   | 212   | 17.0  | 0.069   |
| TLD5S11AH   | TLD5S11A     | 12.2   | 13.5 | 5.0                     | 11.0                                   | 10  | 150   | 198   | 18.2  | 0.072   |
| TLD5S12AH   | TLD5S12A     | 13.3   | 14.7 | 5.0                     | 12.0                                   | 10  | 150   | 181   | 19.9  | 0.074   |
| TLD5S13AH   | TLD5S13A     | 14.4   | 15.9 | 5.0                     | 13.0                                   | 10  | 150   | 167   | 21.5  | 0.076   |
| TLD5S14AH   | TLD5S14A     | 15.6   | 17.2 | 5.0                     | 14.0                                   | 10  | 150   | 155   | 23.2  | 0.078   |
| TLD5S15AH   | TLD5S15A     | 16.7   | 18.5 | 5.0                     | 15.0                                   | 10  | 150   | 148   | 24.4  | 0.080   |
| TLD5S16AH   | TLD5S16A     | 17.8   | 19.7 | 5.0                     | 16.0                                   | 10  | 150   | 138   | 26.0  | 0.081   |
| TLD5S17AH   | TLD5S17A     | 18.9   | 20.9 | 5.0                     | 17.0                                   | 10  | 150   | 130   | 27.6  | 0.082   |
| TLD5S18AH   | TLD5S18A     | 20.0   | 22.1 | 5.0                     | 18.0                                   | 10  | 150   | 123   | 29.2  | 0.083   |
| TLD5S20AH   | TLD5S20A     | 22.2   | 24.5 | 5.0                     | 20.0                                   | 10  | 150   | 111   | 32.4  | 0.085   |
| TLD5S22AH   | TLD5S22A     | 24.4   | 26.9 | 5.0                     | 22.0                                   | 10  | 150   | 101   | 35.5  | 0.086   |
| TLD5S24AH   | TLD5S24A     | 26.7   | 29.5 | 5.0                     | 24.0                                   | 10  | 150   | 93  | 38.9  | 0.087   |
| TLD5S26AH   | TLD5S26A     | 28.9   | 31.9 | 5.0                     | 26.0                                   | 10  | 150   | 86  | 42.1  | 0.088   |
| TLD5S28AH   | TLD5S28A     | 31.1   | 34.4 | 5.0                     | 28.0                                   | 10  | 150   | 79  | 45.4  | 0.089   |
| TLD5S30AH   | TLD5S30A     | 33.3   | 36.8 | 5.0                     | 30.0                                   | 10  | 150   | 74  | 48.4  | 0.090   |
| TLD5S33AH   | TLD5S33A     | 36.7   | 40.6 | 5.0                     | 33.0                                   | 10  | 150   | 68  | 53.3  | 0.091   |
| TLD5S36AH   | TLD5S36A     | 40.0   | 44.2 | 5.0                     | 36.0                                   | 10  | 150   | 62  | 58.1  | 0.091   |
| TLD5S40AH   | TLD5S40A     | 44.4   | 49.1 | 5.0                     | 40.0                                   | 10  | 150   | 56  | 64.5  | 0.092   |
| TLD5S43AH   | TLD5S43A     | 47.8   | 52.8 | 5.0                     | 43.0                                   | 10  | 150   | 52  | 69.4  | 0.093   |

**Note:**

- Pulse test with  $PW = 30\text{ms}$
- To calculate  $V_{BR}$  vs. junction temperature, use the following formula:  

$$V_{BR} \text{ at } T_J = V_{BR} \text{ at } 25^\circ\text{C} \times (1 + \alpha_T \times (T_J - 25))$$

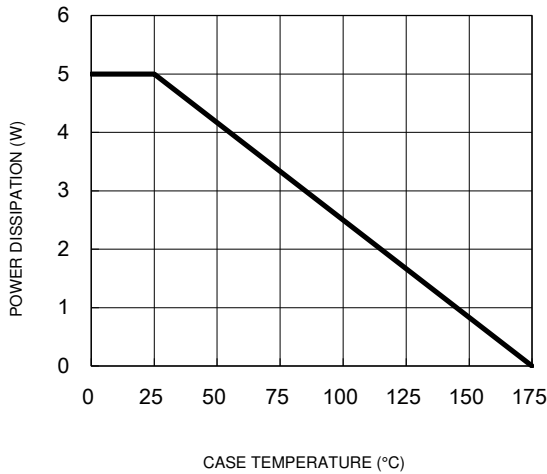
| <b>ORDERING INFORMATION</b>        |                |                   |
|------------------------------------|----------------|-------------------|
| <b>ORDERING CODE<sup>(1)</sup></b> | <b>PACKAGE</b> | <b>PACKING</b>    |
| TLD5SxAH                           | DO-218AB       | 750 / Tape & Reel |

**Note:** "x" defines voltage from 10V (TLD5S10AH) to 43V (TLD5S43AH)

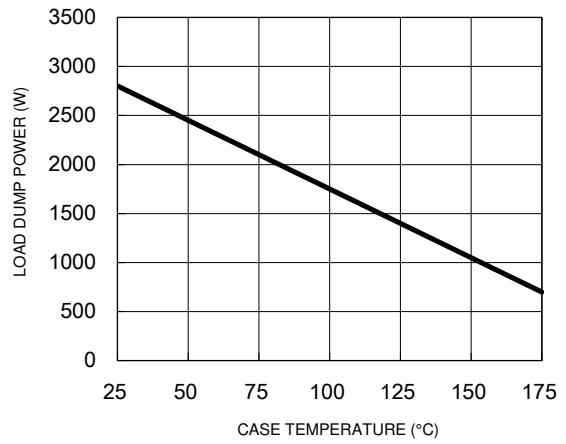
**CHARACTERISTICS CURVES**

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

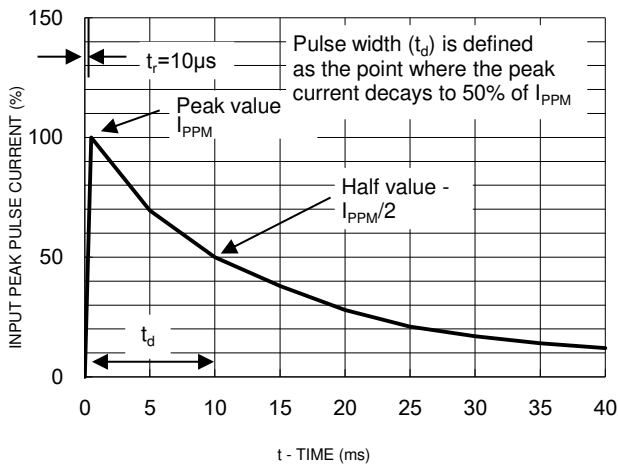
**Fig.1 Power Derating Curve**



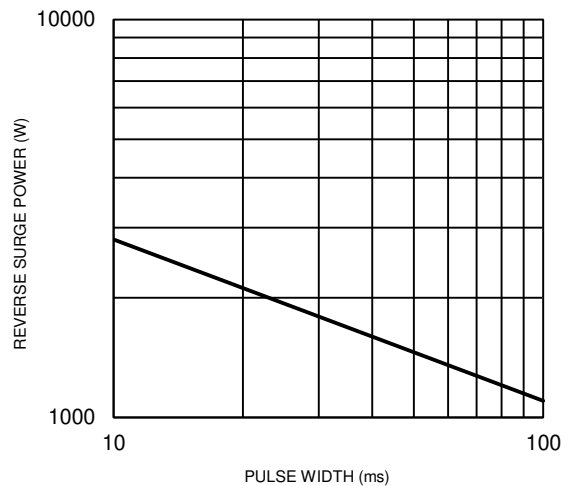
**Fig.2 Load Dump Power Characteristics (10ms Exponential Waveform)**



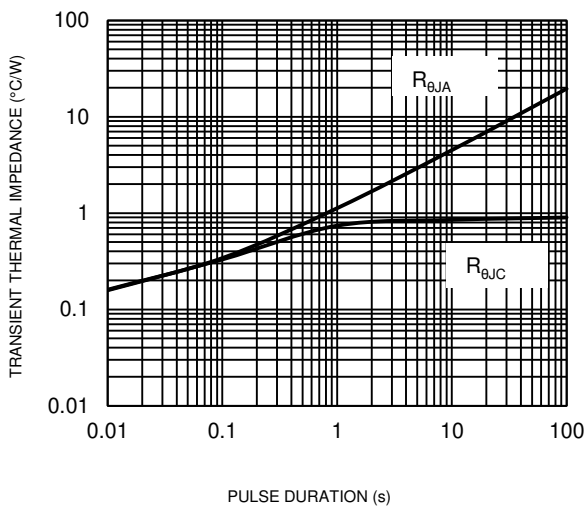
**Fig.3 Clamping Power Pulse Waveform**



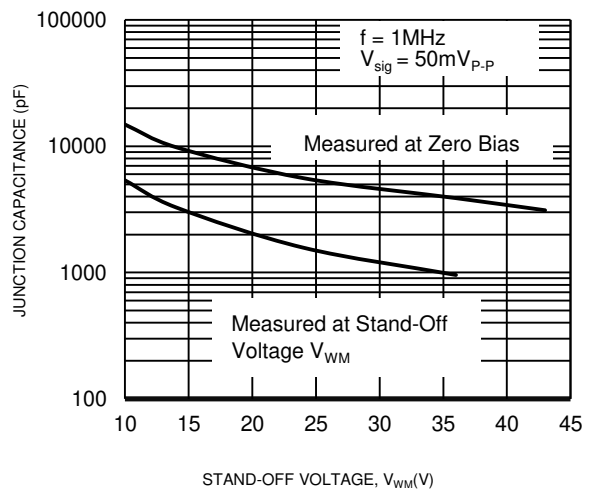
**Fig.4 Reverse Power Capability**



**Fig.5 Typical Transient Thermal Impedance**

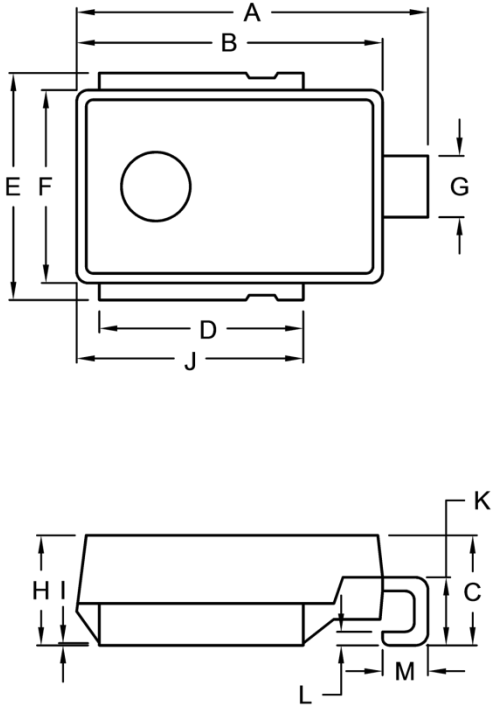


**Fig.6 Typical Junction Capacitance**



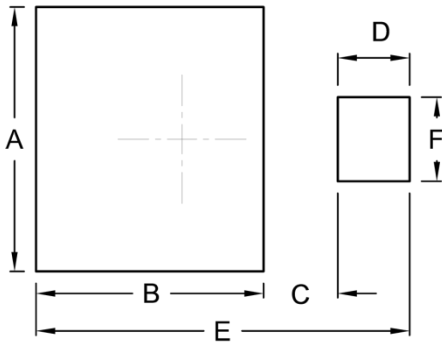
**PACKAGE OUTLINE DIMENSIONS**

DO-218AB



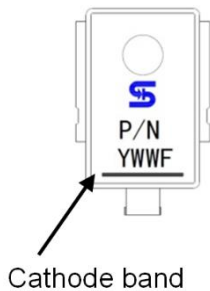
| DIM. | Unit (mm) |       | Unit (inch) |       |
|------|-----------|-------|-------------|-------|
|      | Min.      | Max.  | Min.        | Max.  |
| A    | 15.00     | 16.00 | 0.591       | 0.630 |
| B    | 13.30     | 13.70 | 0.524       | 0.539 |
| C    | 4.70      | 5.50  | 0.185       | 0.217 |
| D    | 8.70      | 9.30  | 0.343       | 0.366 |
| E    | 9.50      | 10.50 | 0.374       | 0.413 |
| F    | 8.30      | 8.70  | 0.327       | 0.343 |
| G    | 2.40      | 3.00  | 0.094       | 0.118 |
| H    | 4.70      | 5.00  | 0.185       | 0.197 |
| I    | 0.00      | 0.10  | 0.000       | 0.004 |
| J    | 9.70      | 10.30 | 0.382       | 0.406 |
| K    | 2.50      | 3.50  | 0.098       | 0.138 |
| L    | 0.50      | 0.70  | 0.020       | 0.028 |
| M    | 1.50      | 2.50  | 0.059       | 0.098 |

**SUGGESTED PAD LAYOUT**



| Symbol | Unit (mm) | Unit (inch) |
|--------|-----------|-------------|
| A      | 11.00     | 0.433       |
| B      | 9.50      | 0.374       |
| C      | 3.10      | 0.122       |
| D      | 3.00      | 0.118       |
| E      | 15.60     | 0.614       |
| F      | 3.50      | 0.138       |

**MARKING DIAGRAM**



P/N = Marking Code  
YWW = Date Code  
F = Factory Code

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