

4600W, 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)

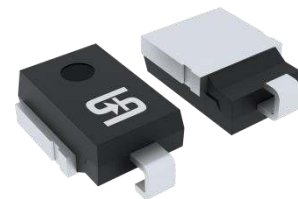
APPLICATIONS

- 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: 2.682g (approximately)

| KEY PARAMETERS | | |
|----------------------------------|-------------|------------------|
| PARAMETER | VALUE | UNIT |
| V_{WM} | 10 – 43 | V |
| V_{BR} | 11.1 – 52.8 | V |
| P_{PPM} (10x1,000 μ s) | 4600 | W |
| P_{PPM} (10x10,000 μ s) | 3600 | W |
| T_{JMAX} | 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 μ s waveform | P_{PPM} | 4600 | W |
| Non-repetitive peak impulse power dissipation with 10/10000 μ s waveform ⁽¹⁾ | P_{PPM} | 3600 | W |
| Steady state power dissipation ^(Fig.1) | P_D | 6 | W |
| Forward Voltage at $I_F = 100\text{ A}$ ⁽²⁾ | $V_{F, MAX}$ | 1.9 | V |
| Peak forward surge current, 8.3ms single half sine-wave | I_{FSM} | 600 | 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

| THERMAL PERFORMANCE | | | |
|-------------------------------------|-----------------|------------|-------------|
| PARAMETER | SYMBOL | TYP | UNIT |
| Junction-to-case thermal resistance | $R_{\theta JC}$ | 0.85 | °C/W |

Thermal Performance Note: With ideal heatsink

| ELECTRICAL SPECIFICATIONS ($T_A = 25^\circ\text{C}$ 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} (μA) (Note 1) | Maximum blocking leakage current I_R at V_{WM} $T_J = 175^\circ\text{C}$ (μA) (Note 1) | Maximum peak impulse current $I_{PPM(A)}$ $t_p = 10/1000$ (μs) | Maximum clamping voltage V_C at I_{PPM} (V) | Typical temp. coefficient of V_{BR} α_T ($\%/^\circ\text{C}$) (Note 2) |
| | | Min | Max | | | | | | | |
| TLD6S10AH | TLD6S10A | 11.1 | 12.3 | 5.0 | 10.0 | 15 | 250 | 271 | 17.0 | 0.069 |
| TLD6S11AH | TLD6S11A | 12.2 | 13.5 | 5.0 | 11.0 | 10 | 150 | 253 | 18.2 | 0.072 |
| TLD6S12AH | TLD6S12A | 13.3 | 14.7 | 5.0 | 12.0 | 10 | 150 | 231 | 19.9 | 0.074 |
| TLD6S13AH | TLD6S13A | 14.4 | 15.9 | 5.0 | 13.0 | 10 | 150 | 214 | 21.5 | 0.076 |
| TLD6S14AH | TLD6S14A | 15.6 | 17.2 | 5.0 | 14.0 | 10 | 150 | 198 | 23.2 | 0.078 |
| TLD6S15AH | TLD6S15A | 16.7 | 18.5 | 5.0 | 15.0 | 10 | 150 | 189 | 24.4 | 0.080 |
| TLD6S16AH | TLD6S16A | 17.8 | 19.7 | 5.0 | 16.0 | 10 | 150 | 177 | 26.0 | 0.081 |
| TLD6S17AH | TLD6S17A | 18.9 | 20.9 | 5.0 | 17.0 | 10 | 150 | 167 | 27.6 | 0.082 |
| TLD6S18AH | TLD6S18A | 20.0 | 22.1 | 5.0 | 18.0 | 10 | 150 | 158 | 29.2 | 0.083 |
| TLD6S20AH | TLD6S20A | 22.2 | 24.5 | 5.0 | 20.0 | 10 | 150 | 142 | 32.4 | 0.085 |
| TLD6S22AH | TLD6S22A | 24.4 | 26.9 | 5.0 | 22.0 | 10 | 150 | 130 | 35.5 | 0.086 |
| TLD6S24AH | TLD6S24A | 26.7 | 29.5 | 5.0 | 24.0 | 10 | 150 | 118 | 38.9 | 0.087 |
| TLD6S26AH | TLD6S26A | 28.9 | 31.9 | 5.0 | 26.0 | 10 | 150 | 106 | 42.1 | 0.088 |
| TLD6S28AH | TLD6S28A | 31.1 | 34.4 | 5.0 | 28.0 | 10 | 150 | 101 | 45.4 | 0.089 |
| TLD6S30AH | TLD6S30A | 33.3 | 36.8 | 5.0 | 30.0 | 10 | 150 | 95 | 48.4 | 0.090 |
| TLD6S33AH | TLD6S33A | 36.7 | 40.6 | 5.0 | 33.0 | 10 | 150 | 86 | 53.3 | 0.091 |
| TLD6S36AH | TLD6S36A | 40.0 | 44.2 | 5.0 | 36.0 | 10 | 150 | 79 | 58.1 | 0.091 |
| TLD6S40AH | TLD6S40A | 44.4 | 49.1 | 5.0 | 40.0 | 10 | 150 | 71 | 64.5 | 0.092 |
| TLD6S43AH | TLD6S43A | 47.8 | 52.8 | 5.0 | 43.0 | 10 | 150 | 66 | 69.4 | 0.093 |

Note:

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

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

| ORDERING INFORMATION | | |
|------------------------------------|----------------|-------------------|
| ORDERING CODE⁽¹⁾ | PACKAGE | PACKING |
| TLD6SxAH | DO-218AB | 750 / Tape & Reel |

Note: "x" defines voltage from 10V (TLD6S10AH) to 43V (TLD6S43AH)

CHARACTERISTICS CURVES

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

Fig.1 Power Derating Curve

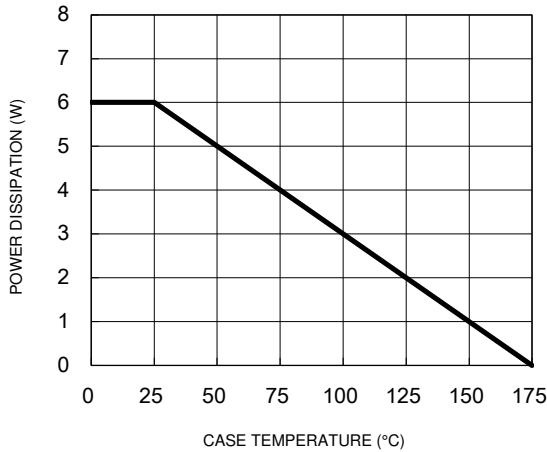


Fig.2 Load Dump Power Characteristics (10ms Exponential Waveform)

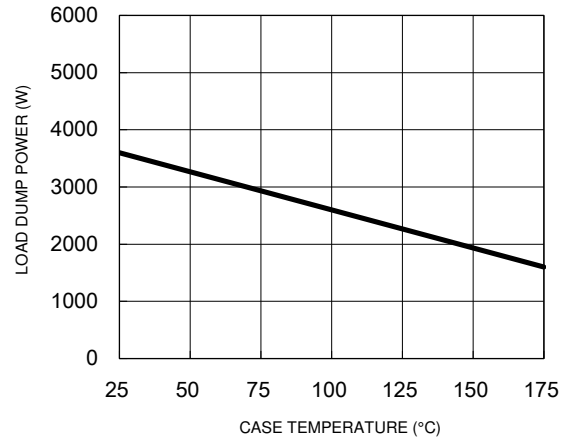


Fig.3 Clamping Power Pulse Waveform

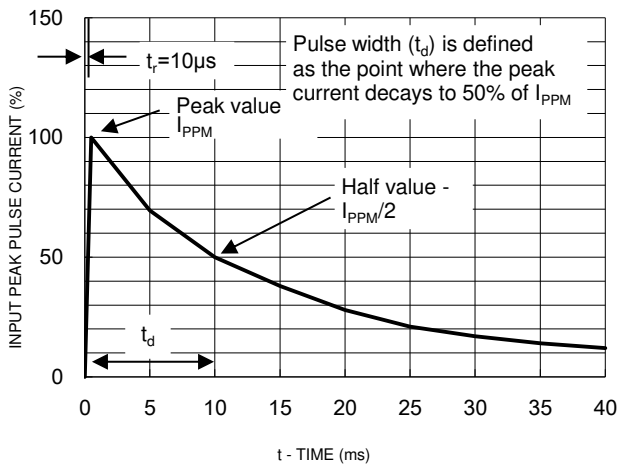


Fig.4 Reverse Power Capability

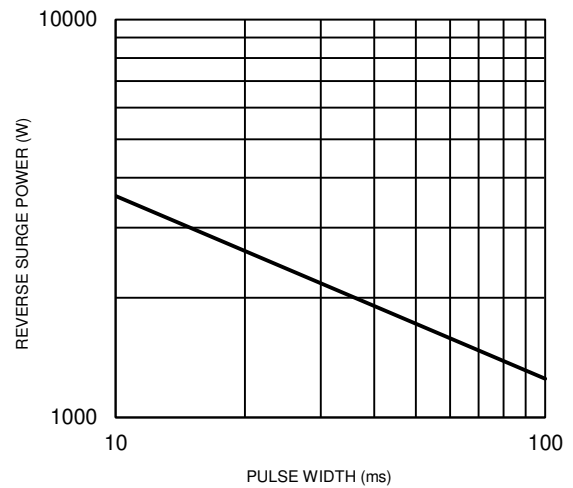


Fig.5 Typical Transient Thermal Impedance

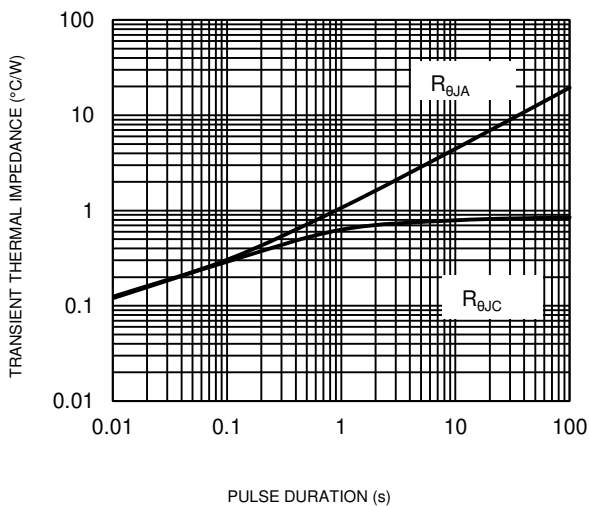
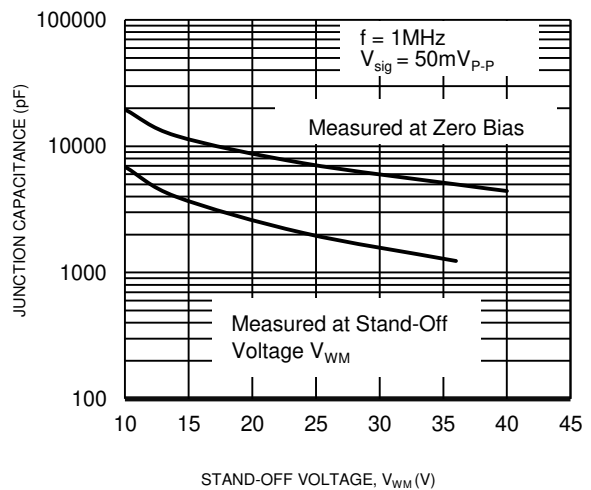
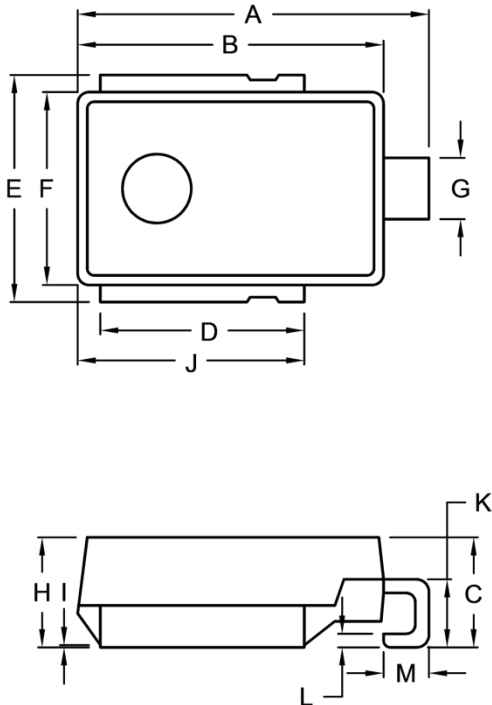


Fig.6 Typical Junction Capacitance



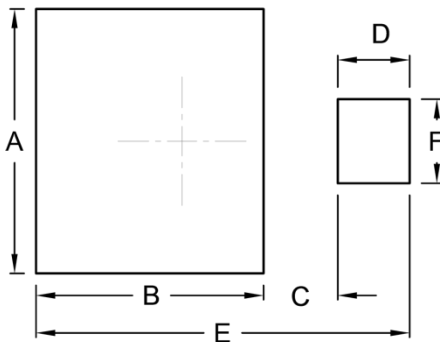
PACKAGE OUTLINE DIMENSIONS

DO-218AB



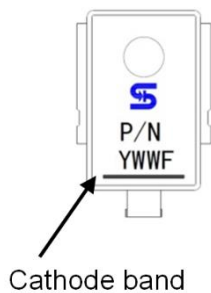
| DIM. | Unit (mm) | | Unit (inch) | |
|------|-----------|-------|-------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 15.00 | 16.00 | 0.591 | 0.630 |
| B | 13.30 | 13.70 | 0.524 | 0.539 |
| C | 4.70 | 5.50 | 0.185 | 0.217 |
| D | 8.70 | 9.30 | 0.343 | 0.366 |
| E | 9.50 | 10.50 | 0.374 | 0.413 |
| 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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