

## 6600W, 10V – 43V Surface Mount Transient Voltage Suppressor

### FEATURES

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

| KEY PARAMETERS                          |             |                  |
|-----------------------------------------|-------------|------------------|
| PARAMETER                               | VALUE       | UNIT             |
| $V_{WM}$                                | 10 - 43     | V                |
| $V_{BR}$                                | 11.1 - 52.8 | V                |
| $P_{PPM}$<br>(10x1,000 $\mu\text{s}$ )  | 6600        | W                |
| $P_{PPM}$<br>(10x10,000 $\mu\text{s}$ ) | 5200        | W                |
| $T_{J\text{ MAX}}$                      | 175         | $^\circ\text{C}$ |
| Package                                 | DO-218AB    |                  |

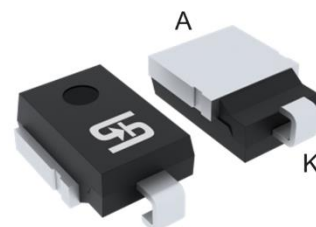


### APPLICATIONS

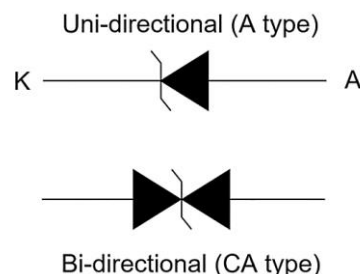
- Transient Surge Protection
- Automotive Load Dump Surge Protection

### 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: As marked
- Weight: 2.691g (approximately)



**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 $\mu\text{s}$ waveform <sup>(1)</sup> | $P_{PPM}$          | 6600        | W                |
| Non-repetitive peak impulse power dissipation with 10/10000 $\mu\text{s}$ waveform               | $P_{PPM}$          | 5200        | W                |
| Steady state power dissipation <sup>(Fig.1)</sup>                                                | $P_D$              | 8           | W                |
| Forward Voltage at $I_F = 100\text{A}$ <sup>(2)</sup> for uni-directional only                   | $V_{F\text{ MAX}}$ | 1.8         | V                |
| Peak forward surge current, 8.3ms single half sinewave for uni-directional only                  | $I_{FSM}$          | 700         | 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  $PW = 0.3\text{ms}$

**THERMAL PERFORMANCE**

| PARAMETER                           | SYMBOL          | TYP | UNIT |
|-------------------------------------|-----------------|-----|------|
| Junction-to-case thermal resistance | $R_{\theta JC}$ | 0.8 | °C/W |

**Thermal Performance Note:** With ideal heatsink

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

| Part Number<br>(Uni-directional) | Marking code | Breakdown voltage<br>$V_{BR}$ at $I_T$<br>(V)<br>(Note 1) |      | Test current<br>$I_T$<br>(mA) | Working stand-off voltage<br>$V_{WM}$<br>(V) | Maximum blocking leakage current<br>$I_R$ at $V_{WM}$<br>( $\mu\text{A}$ )<br>(Note 1) | Maximum blocking leakage current<br>$I_R$ at $V_{WM}$<br>$T_J = 175^\circ\text{C}$<br>( $\mu\text{A}$ )<br>(Note 1) | Maximum peak impulse current<br>$I_{PPM}$<br>(A)<br>$t_p = 10/1000$<br>( $\mu\text{s}$ ) | Maximum clamping voltage<br>$V_C$ at $I_{PPM}$<br>(V) | Typical temp. coefficient of $V_{BR}$<br>$\alpha T$<br>(%/°C)<br>(Note 2) |
|----------------------------------|--------------|-----------------------------------------------------------|------|-------------------------------|----------------------------------------------|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-------------------------------------------------------|---------------------------------------------------------------------------|
|                                  |              | Min                                                       | Max  |                               |                                              |                                                                                        |                                                                                                                     |                                                                                          |                                                       |                                                                           |
| TLD8S10AH                        | TLD8S10A     | 11.1                                                      | 12.3 | 5.0                           | 10.0                                         | 15                                                                                     | 250                                                                                                                 | 388                                                                                      | 17.0                                                  | 0.069                                                                     |
| TLD8S11AH                        | TLD8S11A     | 12.2                                                      | 13.5 | 5.0                           | 11.0                                         | 10                                                                                     | 150                                                                                                                 | 363                                                                                      | 18.2                                                  | 0.072                                                                     |
| TLD8S12AH                        | TLD8S12A     | 13.3                                                      | 14.7 | 5.0                           | 12.0                                         | 10                                                                                     | 150                                                                                                                 | 332                                                                                      | 19.9                                                  | 0.074                                                                     |
| TLD8S13AH                        | TLD8S13A     | 14.4                                                      | 15.9 | 5.0                           | 13.0                                         | 10                                                                                     | 150                                                                                                                 | 307                                                                                      | 21.5                                                  | 0.076                                                                     |
| TLD8S14AH                        | TLD8S14A     | 15.6                                                      | 17.2 | 5.0                           | 14.0                                         | 10                                                                                     | 150                                                                                                                 | 284                                                                                      | 23.2                                                  | 0.078                                                                     |
| TLD8S15AH                        | TLD8S15A     | 16.7                                                      | 18.5 | 5.0                           | 15.0                                         | 10                                                                                     | 150                                                                                                                 | 270                                                                                      | 24.4                                                  | 0.080                                                                     |
| TLD8S16AH                        | TLD8S16A     | 17.8                                                      | 19.7 | 5.0                           | 16.0                                         | 10                                                                                     | 150                                                                                                                 | 254                                                                                      | 26.0                                                  | 0.081                                                                     |
| TLD8S17AH                        | TLD8S17A     | 18.9                                                      | 20.9 | 5.0                           | 17.0                                         | 10                                                                                     | 150                                                                                                                 | 239                                                                                      | 27.6                                                  | 0.082                                                                     |
| TLD8S18AH                        | TLD8S18A     | 20.0                                                      | 22.1 | 5.0                           | 18.0                                         | 10                                                                                     | 150                                                                                                                 | 226                                                                                      | 29.2                                                  | 0.083                                                                     |
| TLD8S20AH                        | TLD8S20A     | 22.2                                                      | 24.5 | 5.0                           | 20.0                                         | 10                                                                                     | 150                                                                                                                 | 204                                                                                      | 32.4                                                  | 0.085                                                                     |
| TLD8S22AH                        | TLD8S22A     | 24.4                                                      | 26.9 | 5.0                           | 22.0                                         | 10                                                                                     | 150                                                                                                                 | 186                                                                                      | 35.5                                                  | 0.086                                                                     |
| TLD8S24AH                        | TLD8S24A     | 26.7                                                      | 29.5 | 5.0                           | 24.0                                         | 10                                                                                     | 150                                                                                                                 | 170                                                                                      | 38.9                                                  | 0.087                                                                     |
| TLD8S26AH                        | TLD8S26A     | 28.9                                                      | 31.9 | 5.0                           | 26.0                                         | 10                                                                                     | 150                                                                                                                 | 157                                                                                      | 42.1                                                  | 0.088                                                                     |
| TLD8S28AH                        | TLD8S28A     | 31.1                                                      | 34.4 | 5.0                           | 28.0                                         | 10                                                                                     | 150                                                                                                                 | 145                                                                                      | 45.4                                                  | 0.089                                                                     |
| TLD8S30AH                        | TLD8S30A     | 33.3                                                      | 36.8 | 5.0                           | 30.0                                         | 10                                                                                     | 150                                                                                                                 | 136                                                                                      | 48.4                                                  | 0.090                                                                     |
| TLD8S33AH                        | TLD8S33A     | 36.7                                                      | 40.6 | 5.0                           | 33.0                                         | 10                                                                                     | 150                                                                                                                 | 124                                                                                      | 53.3                                                  | 0.091                                                                     |
| TLD8S36AH                        | TLD8S36A     | 40.0                                                      | 44.2 | 5.0                           | 36.0                                         | 10                                                                                     | 150                                                                                                                 | 114                                                                                      | 58.1                                                  | 0.091                                                                     |
| TLD8S40AH                        | TLD8S40A     | 44.4                                                      | 49.1 | 5.0                           | 40.0                                         | 10                                                                                     | 150                                                                                                                 | 102                                                                                      | 64.5                                                  | 0.092                                                                     |
| TLD8S43AH                        | TLD8S43A     | 47.8                                                      | 52.8 | 5.0                           | 43.0                                         | 10                                                                                     | 150                                                                                                                 | 95.1                                                                                     | 69.4                                                  | 0.093                                                                     |

**Notes:**

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

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

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

| Part Number<br>(Bi-directional) | Marking code | Breakdown voltage<br>$V_{BR}$ at $I_T$<br>(V)<br>(Note 1) |      | Test current<br>$I_T$<br>(mA) | Working stand-off voltage<br>$V_{WM}$<br>(V) | Maximum blocking leakage current<br>$I_R$ at $V_{WM}$<br>( $\mu\text{A}$ )<br>(Note 1) | Maximum blocking leakage current<br>$I_R$ at $V_{WM}$<br>$T_J = 175^\circ\text{C}$<br>( $\mu\text{A}$ )<br>(Note 1) | Maximum peak impulse current<br>$I_{PPM}$<br>(A)<br>$t_p = 10/1000$<br>( $\mu\text{s}$ ) | Maximum clamping voltage<br>$V_C$ at $I_{PPM}$<br>(V) | Typical temp. coefficient of $V_{BR}$<br>$\alpha T$<br>(%/°C)<br>(Note 2) |
|---------------------------------|--------------|-----------------------------------------------------------|------|-------------------------------|----------------------------------------------|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-------------------------------------------------------|---------------------------------------------------------------------------|
|                                 |              | Min                                                       | Max  |                               |                                              |                                                                                        |                                                                                                                     |                                                                                          |                                                       |                                                                           |
| TLD8S10CAH                      | TLD8S10A     | 11.1                                                      | 12.3 | 5.0                           | 10.0                                         | 15                                                                                     | 250                                                                                                                 | 388                                                                                      | 17.0                                                  | 0.069                                                                     |
| TLD8S11CAH                      | TLD8S11A     | 12.2                                                      | 13.5 | 5.0                           | 11.0                                         | 10                                                                                     | 150                                                                                                                 | 363                                                                                      | 18.2                                                  | 0.072                                                                     |
| TLD8S12CAH                      | TLD8S12A     | 13.3                                                      | 14.7 | 5.0                           | 12.0                                         | 10                                                                                     | 150                                                                                                                 | 332                                                                                      | 19.9                                                  | 0.074                                                                     |
| TLD8S13CAH                      | TLD8S13A     | 14.4                                                      | 15.9 | 5.0                           | 13.0                                         | 10                                                                                     | 150                                                                                                                 | 307                                                                                      | 21.5                                                  | 0.076                                                                     |
| TLD8S14CAH                      | TLD8S14A     | 15.6                                                      | 17.2 | 5.0                           | 14.0                                         | 10                                                                                     | 150                                                                                                                 | 284                                                                                      | 23.2                                                  | 0.078                                                                     |
| TLD8S15CAH                      | TLD8S15A     | 16.7                                                      | 18.5 | 5.0                           | 15.0                                         | 10                                                                                     | 150                                                                                                                 | 270                                                                                      | 24.4                                                  | 0.080                                                                     |
| TLD8S16CAH                      | TLD8S16A     | 17.8                                                      | 19.7 | 5.0                           | 16.0                                         | 10                                                                                     | 150                                                                                                                 | 254                                                                                      | 26.0                                                  | 0.081                                                                     |
| TLD8S17CAH                      | TLD8S17A     | 18.9                                                      | 20.9 | 5.0                           | 17.0                                         | 10                                                                                     | 150                                                                                                                 | 239                                                                                      | 27.6                                                  | 0.082                                                                     |
| TLD8S18CAH                      | TLD8S18A     | 20.0                                                      | 22.1 | 5.0                           | 18.0                                         | 10                                                                                     | 150                                                                                                                 | 226                                                                                      | 29.2                                                  | 0.083                                                                     |
| TLD8S20CAH                      | TLD8S20A     | 22.2                                                      | 24.5 | 5.0                           | 20.0                                         | 10                                                                                     | 150                                                                                                                 | 204                                                                                      | 32.4                                                  | 0.085                                                                     |
| TLD8S22CAH                      | TLD8S22A     | 24.4                                                      | 26.9 | 5.0                           | 22.0                                         | 10                                                                                     | 150                                                                                                                 | 186                                                                                      | 35.5                                                  | 0.086                                                                     |
| TLD8S24CAH                      | TLD8S24A     | 26.7                                                      | 29.5 | 5.0                           | 24.0                                         | 10                                                                                     | 150                                                                                                                 | 170                                                                                      | 38.9                                                  | 0.087                                                                     |
| TLD8S26CAH                      | TLD8S26A     | 28.9                                                      | 31.9 | 5.0                           | 26.0                                         | 10                                                                                     | 150                                                                                                                 | 157                                                                                      | 42.1                                                  | 0.088                                                                     |
| TLD8S28CAH                      | TLD8S28A     | 31.1                                                      | 34.4 | 5.0                           | 28.0                                         | 10                                                                                     | 150                                                                                                                 | 145                                                                                      | 45.4                                                  | 0.089                                                                     |
| TLD8S30CAH                      | TLD8S30A     | 33.3                                                      | 36.8 | 5.0                           | 30.0                                         | 10                                                                                     | 150                                                                                                                 | 136                                                                                      | 48.4                                                  | 0.090                                                                     |
| TLD8S33CAH                      | TLD8S33A     | 36.7                                                      | 40.6 | 5.0                           | 33.0                                         | 10                                                                                     | 150                                                                                                                 | 124                                                                                      | 53.3                                                  | 0.091                                                                     |
| TLD8S36CAH                      | TLD8S36A     | 40.0                                                      | 44.2 | 5.0                           | 36.0                                         | 10                                                                                     | 150                                                                                                                 | 114                                                                                      | 58.1                                                  | 0.091                                                                     |
| TLD8S40CAH                      | TLD8S40A     | 44.4                                                      | 49.1 | 5.0                           | 40.0                                         | 10                                                                                     | 150                                                                                                                 | 102                                                                                      | 64.5                                                  | 0.092                                                                     |
| TLD8S43CAH                      | TLD8S43A     | 47.8                                                      | 52.8 | 5.0                           | 43.0                                         | 10                                                                                     | 150                                                                                                                 | 95.1                                                                                     | 69.4                                                  | 0.093                                                                     |

**Notes:**

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

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

**ORDERING INFORMATION**

| ORDERING CODE <sup>(1)(2)</sup> | PACKAGE  | PACKING           |
|---------------------------------|----------|-------------------|
| TLD8SxAH                        | DO-218AB | 750 / Tape & Reel |

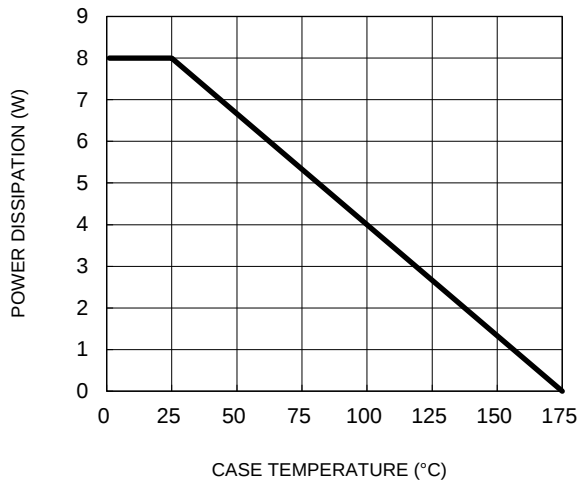
**Notes:**

- "x" defines voltage from 10V (TLD8S10AH) to 43V (TLD8S43AH)
- Bidirectional use of type CA suffix

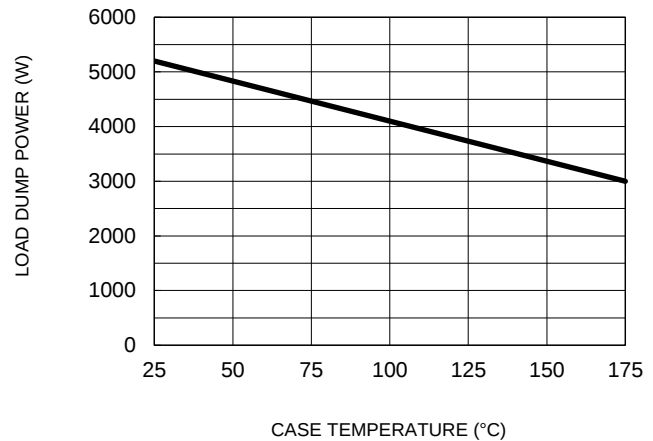
## CHARACTERISTICS CURVES

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

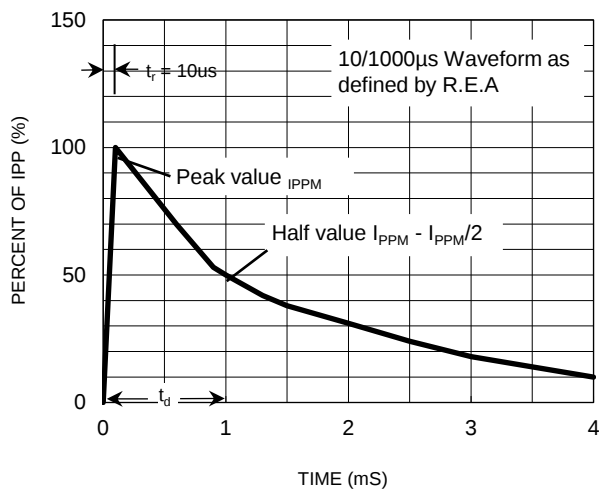
**Fig.1 Power Derating Curve**



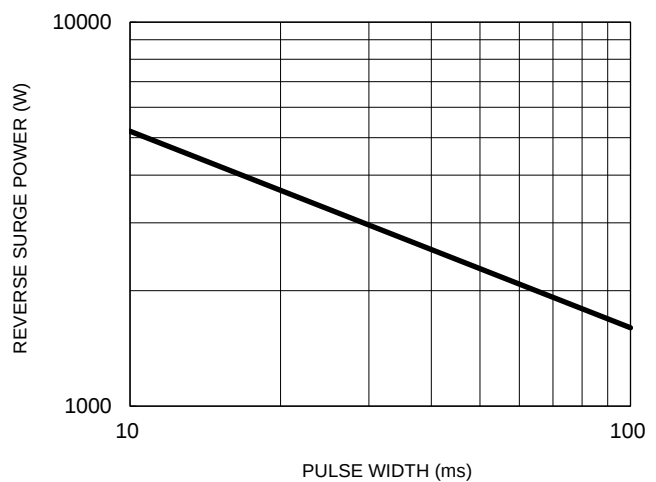
**Fig.2 Load Dump Power Characteristics  
(10ms Exponential Waveform)**



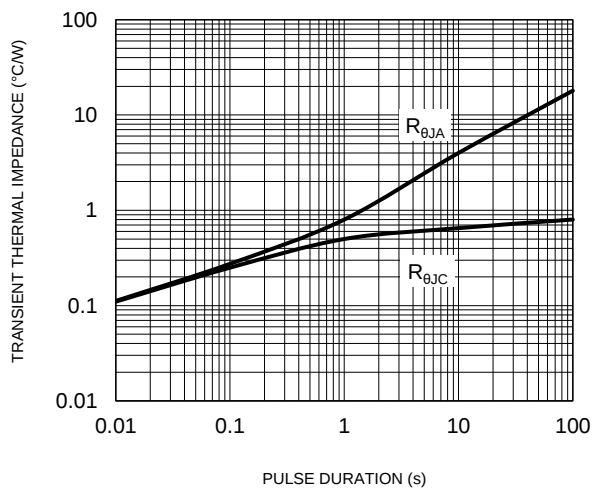
**Fig.3 10/1000μs Pulse Waveform**



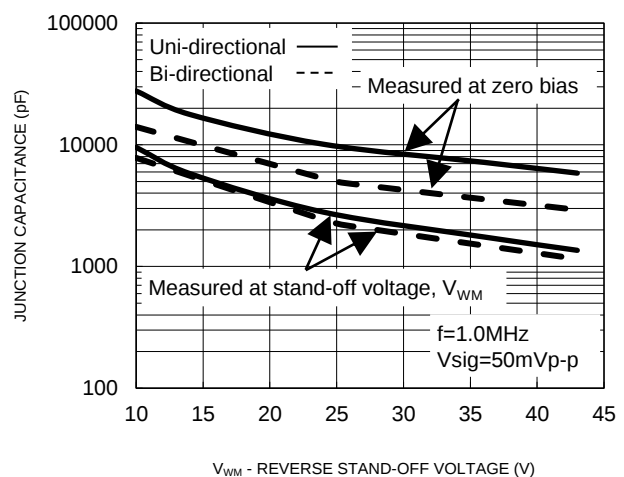
**Fig.4 Reverse Power Capability**



**Fig.5 Typical Transient Thermal Impedance**

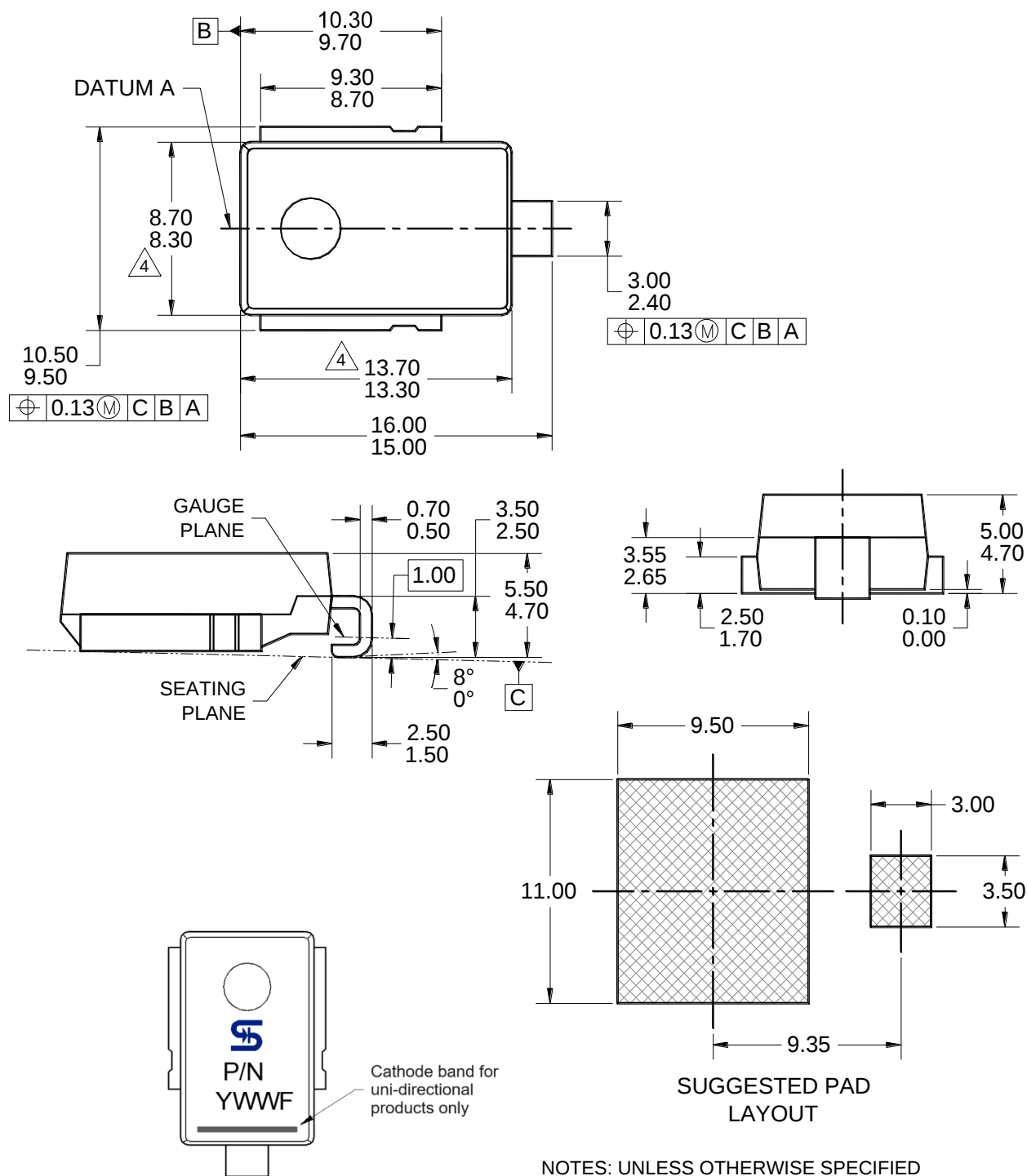


**Fig.6 Typical Junction Capacitance**



**PACKAGE OUTLINE DIMENSIONS**

**DO-218**



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