

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

FEATURES

- AEC-Q101 qualified
- Junction passivation optimized design technology
- $T_J = 175\text{ °C}$ 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)

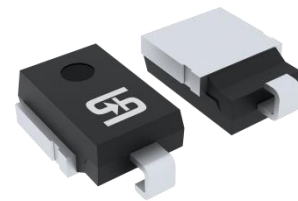
APPLICATIONS

- 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} (10x1,000 μ s)	3600	W
P_{PPM} (10x10,000 μ s)	2800	W
$T_{J\text{ MAX}}$	175	°C
Package	DO-218AB	
Configuration	Single die	



DO-218AB



ABSOLUTE MAXIMUM RATINGS ($T_A = 25\text{ °C}$ unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNIT
Non-repetitive peak impulse power dissipation with 10/1000 μ s waveform	P_{PPM}	3600	W
Non-repetitive peak impulse power dissipation with 10/10000 μ s waveform ⁽¹⁾	P_{PPM}	2800	W
Steady state power dissipation ^(Fig.1)	P_D	5	W
Forward Voltage at $I_F = 100\text{ A}$ ⁽²⁾	$V_{F, \text{ MAX}}$	2	V
Peak forward surge current, 8.3ms single half sine-wave	I_{FSM}	500	A
Junction temperature	T_J	-55 to +175	°C
Storage temperature	T_{STG}	-55 to +175	°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	$R_{\theta JC}$	0.9	°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							
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:

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
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

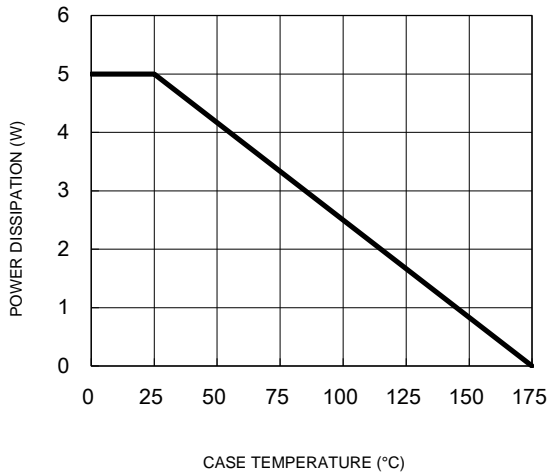


Fig.2 Load Dump Power Characteristics (10ms Exponential Waveform)

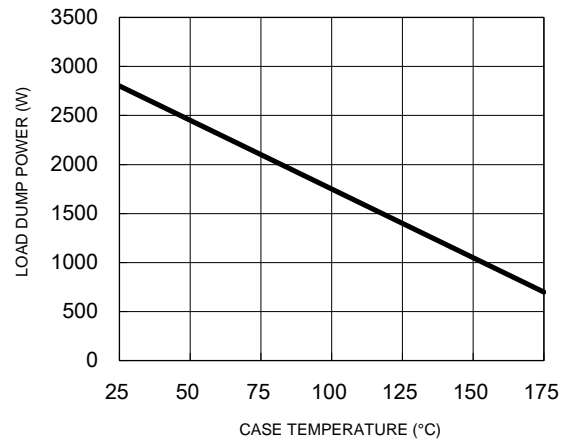


Fig.3 Clamping Power Pulse Waveform

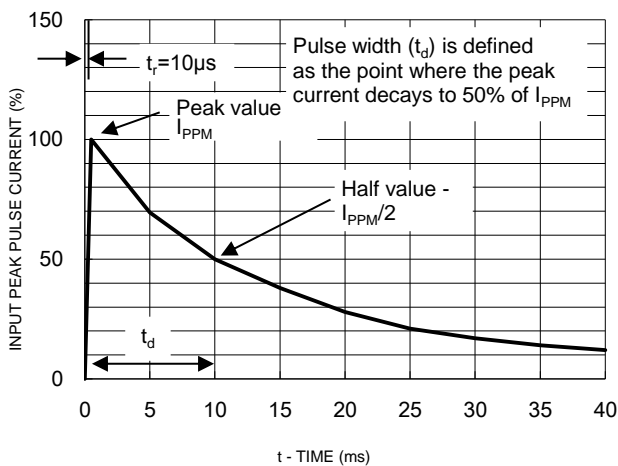


Fig.4 Reverse Power Capability

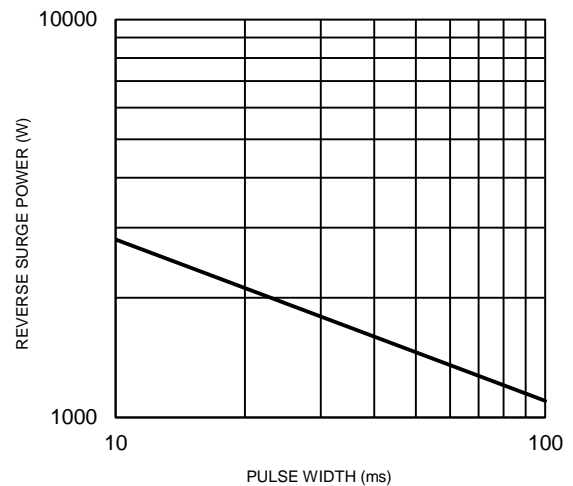


Fig.5 Typical Transient Thermal Impedance

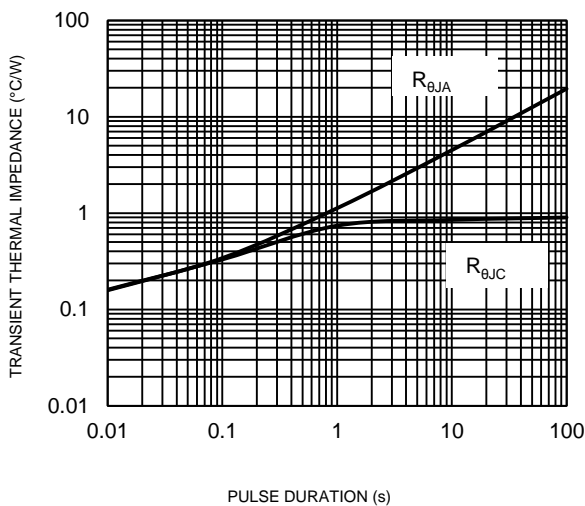
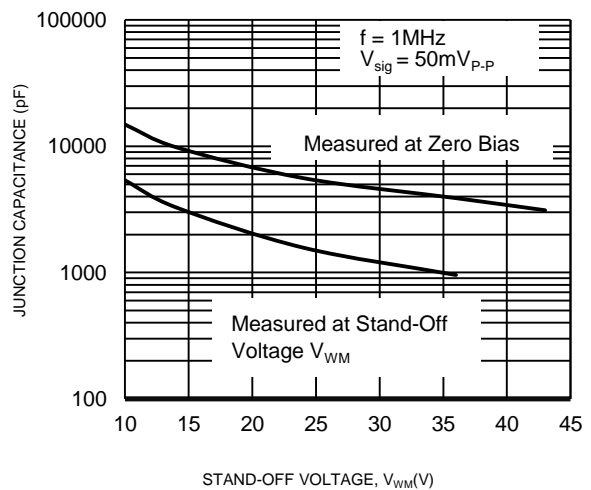
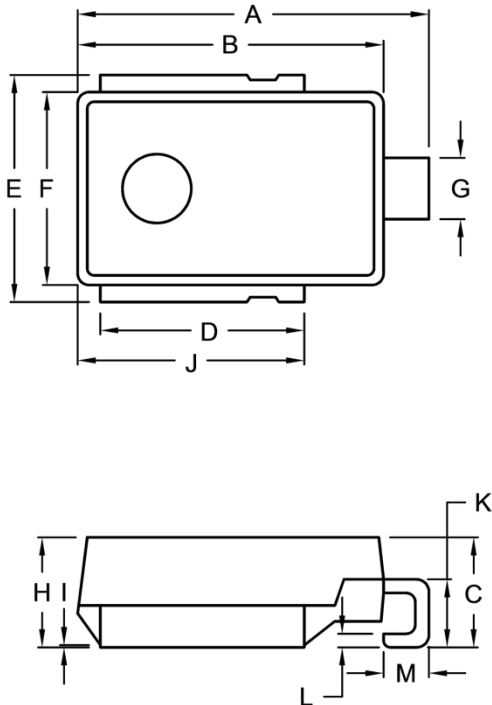


Fig.6 Typical Junction Capacitance



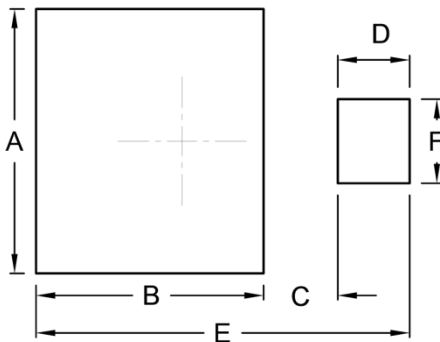
PACKAGE OUTLINE DIMENSIONS

DO-218AB



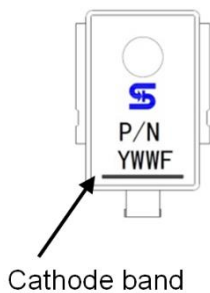
DIM.	Unit (mm)		Unit (inch)	
	Min.	Max.	Min.	Max.
A	15.00	16.00	0.591	0.630
B	13.30	13.70	0.524	0.539
C	4.70	5.50	0.185	0.217
D	8.70	9.30	0.343	0.366
E	9.50	10.50	0.374	0.413
F	8.30	8.70	0.327	0.343
G	2.40	3.00	0.094	0.118
H	4.70	5.00	0.185	0.197
I	0.00	0.10	0.000	0.004
J	9.70	10.30	0.382	0.406
K	2.50	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
YWWF = Date Code
F = Factory Code

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