

FEATURES

- Junction passivation optimized design passivated anisotropic rectifier technology
- $T_J = 175^\circ\text{C}$ capability suitable for high reliability and automotive requirement.
- Available in uni/bi-directional polarity only
- Low leakage current
- Low forward voltage drop
- High surge capability
- Meets ISO7637-2 surge specification (varied by test condition)
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245°C
- AEC-Q101 qualified
- Compliant to ROHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC



TYPICAL APPLICATIONS

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting, especially for automotive load dump protection application.

MECHANICAL DATA

Case: DO-218AB

Molding compound meets UL 94 V-0 flammability rating

Base P/NHE3 - RoHS-compliant, AEC-Q101 qualified

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

PRIMARY CHARACTERISTICS	
V_R	10 V to 43 V
P_{PPM} (10/1000 μs)	8000W
P_{PPM} (10/10000 μs)	6000W
P_D	8.5 W
I_{FSM}	750A
T_{Jmax}	175°C
Polarity	Uni -directional
Package	DO-218AB

MAXIMUM RATINGS ($T_C=25^\circ\text{C}$, RH=45%-75%, unless otherwise noted)			
Parameter	Symbol	Value	Unit
Peak pulse power dissipation with 10/1000 μs waveform	P_{PPM}	8000	Watts
Peak pulse power dissipation with 10/10000 μs waveform		6000	Watts
Power dissipation on infinite heat Sink at $T_C=25^\circ\text{C}$	P_D	8.5	Watts
Peak pulse current with 10/1000 μs waveform	$I_{PPM}^{(1)}$	See next table	Amps
Peak forward surge current, 8.3ms single half sine-wave	I_{FSM}	750	Amps
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to +175	$^\circ\text{C}$
Typical thermal resistance, junction to case	$R_{\theta JC}$	0.9	$^\circ\text{C/W}$

Note

¹⁾ Non-repetitive current pulse derated above $T_A=25^\circ\text{C}$

ELECTRICAL CHARACTERISTICS								
Part Number	V_R	I_T	$I_R @ V_R$		$V_{BR} @ I_T$		$V_C @ I_{PP}$	I_{PP}
Uni-polar	V	mA	$\mu A @ 25^\circ C$	$\mu A @ T_J = 175^\circ C$	min(V)	max (V)	V	A
SM10S24A	24.0	5	5	150	26.7	29.5	38.9	170
SM10S28A	28.0	5	5	150	31.0	34.6	45.4	176
SM10S30A	30.0	5	5	150	33.3	36.8	48.4	165
SM10S32A	32.0	5	5	150	35.5	39.4	51.4	156
* SM10S33A	33.0	5	5	150	36.7	40.6	53.3	150
* SM10S36A	36.0	5	5	150	40.0	44.5	58.1	138
SM10S40A	40.0	5	5	150	44.4	49.1	64.5	124
SM10S43A	43.0	5	5	150	47.8	52.8	69.4	115

Note:

* Common used type

- ①. For all types maximum $V_F = 1.8$ V at $I_F = 100$ A measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum.
- ②. Surge waveform: 10/1000 μ s

V_R : Stand-off Voltage -- Maximum voltage that can be applied

V_{BR} : Breakdown Voltage

V_C : Clamping Voltage -- Peak voltage measured across the suppressor at a specified I_{pp}

I_R : Reverse Leakage Current

I_T : Test current

ORDERING INFORMATION

SM10S	XX	A
SM10S 8000W Series	V_R voltage	5% V_{BR} Voltage tolerance

LOADDUMP RATINGS

SYSTEM	TEST LEVEL	TEST VOLTAGE	U_s (V)	T_d (ms)	R_i (Ω)	NUMBER OF PULSE
24V	IV	27	174	350	2	10 pulse

* Load dump ratings test according with ISO7637-2 P5A and ISO16750-2 pulse A.

RATINGS AND CHARACTERISTICS CURVES ($T_A=25^{\circ}\text{C}$, unless otherwise noted)

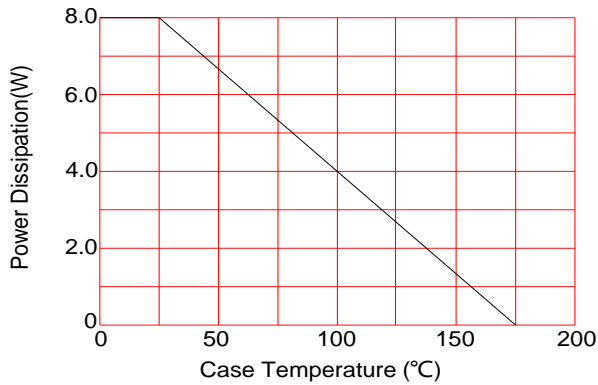


FIG.1: Power Derating Curve

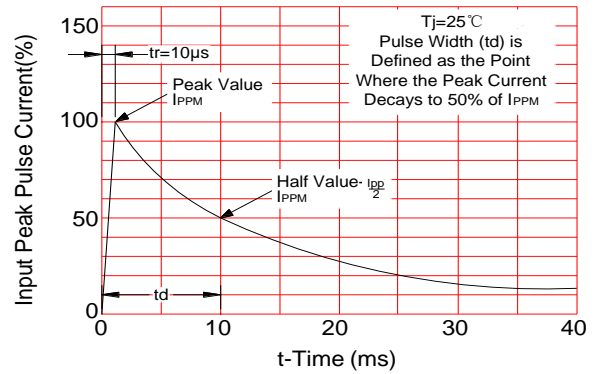


FIG.2: Pulse Waveform

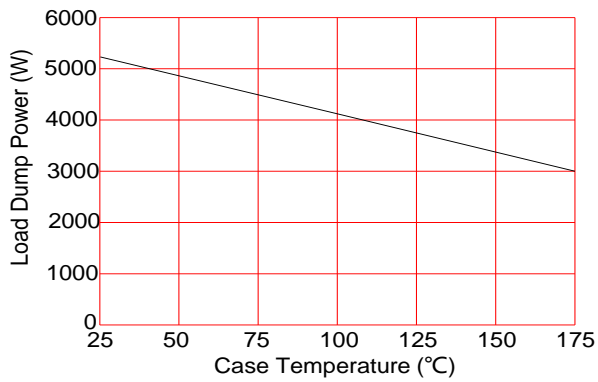


FIG.3: Load Dump Power Characteristics
(10ms Exponential Waveform)



FIG.4: Reverse Power Capability

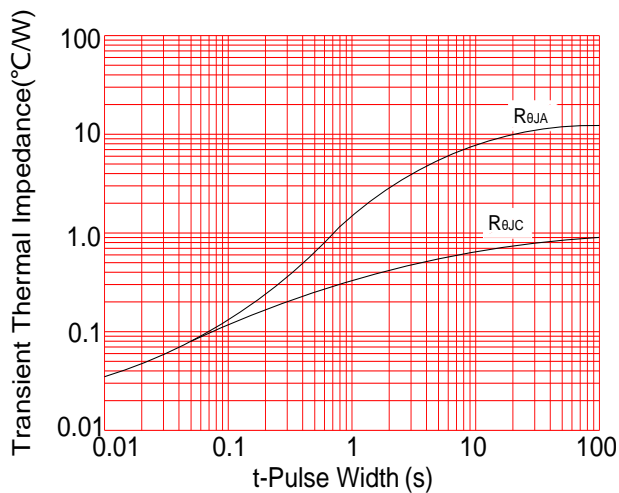
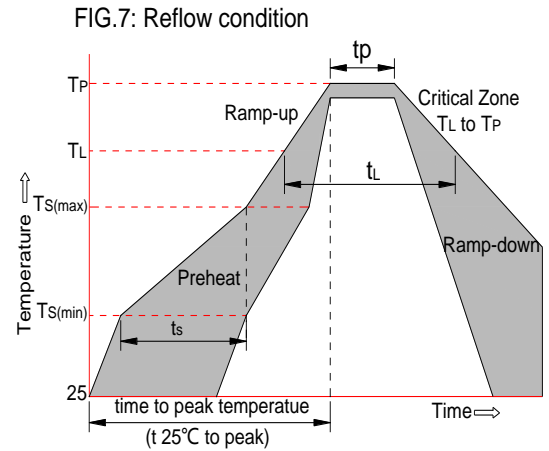


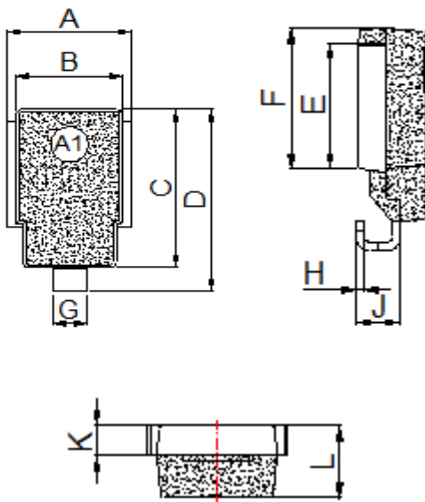
FIG.5: Typical Transient Thermal Impedance

SOLDERING PARAMETERS

Reflow Condition		Pb-Free assembly (see FIG.7)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150°C
	-Temperature Max($T_{s(max)}$)	+200°C
	-Time (Min to Max) (t_s)	60-180 secs.
Average ramp up rate (Liquid us Temp(T_L) to peak)		3°C/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217°C
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_P)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (t_p)		30 secs. Max
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp (T_P)		8 min. Max
Do not exceed		+260°C

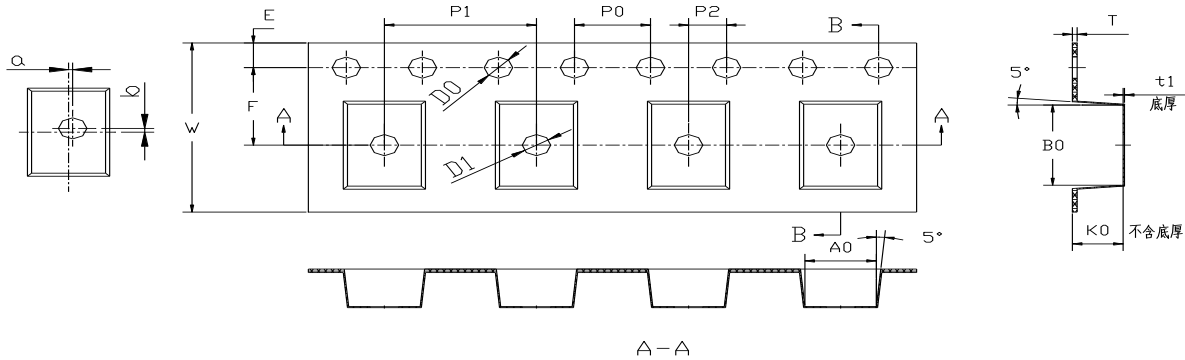


PACKAGE MECHANICAL DATA



Dimension	Inches		Millimeters	
	Min	Max	Min	Max
A	0.374	0.413	9.5	10.5
B	0.327	0.342	8.3	8.7
C	0.524	0.539	13.3	13.7
D	0.592	0.628	15.0	16.0
E	0.335	0.358	8.5	9.1
F	0.374	0.398	9.5	10.1
G	0.094	0.118	2.4	3.0
H	0.020	0.028	0.5	0.7
J	0.106	0.146	2.7	3.7
K	0.075	0.083	1.9	2.1
L	0.185	0.201	4.7	5.1

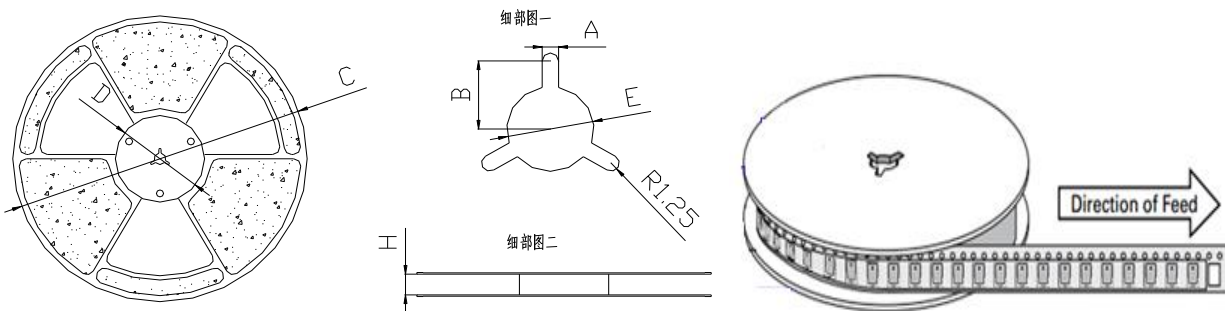
TAPE AND REEL SPECIFICATION-DO-218AB



ITEM	W	A0	B0	K0	P1	E	F	D0	D1	P0	P2	T
DIM	24	10.8	16.13	5.21	16	1.75	11.5	1.55	1.55	4.0	2.0	0.4
TOL	±0.15	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1

Note:

1. 10 pocket holes pitch cumulative tolerance $\pm 0.20\text{mm}$.
2. Carrier camber is 1mm in 100mm.
3. A0 and B0 are measured on a plane 0.30mm above the bottom of the pocket.
4. K0 is measured from a plane on the inside bottom of the pocket to the top surface of the pocket.
5. All dimensions meet EIA-481-2-A requirements.
6. Packing length per 22" Reel: 205Meters.



Dimensions	A	B	C	D	E	H
millimeters	2.5 ± 0.2	10.7 ± 0.2	330 ± 0.2	100 ± 0.2	13.3 ± 0.2	24 ± 0.2
inches	0.098 ± 0.008	0.42 ± 0.008	13.0 ± 0.008	3.94 ± 0.008	0.52 ± 0.008	0.94 ± 0.008