

## Surface Mount Transient Voltage Suppressors

High temperature stability and high reliability conditions



DO-218AB



Bi-directional

Symbol

### 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 bi-directional polarity.
- Low leakage current.
- Low forward voltage drop.
- High surge capability.
- Meets ISO16750-2 surge specification (varied by test condition).
- Meets MSL-1, per J-STD-020, LF maximum peak of  $260^\circ\text{C}$ .
- AEC-Q101 qualified.

PRIMARY CHARACTERISTICS	
$V_R$	24V
$P_{PP}$ (10/1000 $\mu\text{s}$ )	7700W
$P_{PP}$ (10/10000 $\mu\text{s}$ )	4600W
$P_D$	8W
$T_{Jmax}$	$175^\circ\text{C}$
Polarity	Bi-directional
Package	DO-218AB

### 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 94V-0 flammability rating

AEC-Q101 qualified

**Terminals:** Matte tin plated leads, solderable per J-STD-002

MAXIMUM RATINGS( $T_A=25^\circ\text{C}$ , unless otherwise noted)			
Parameter	Symbol	Value	Unit
Peak pulse power dissipation at 10/1000 $\mu\text{s}$ waveform	$P_{PP}$	7700	W
Peak pulse power dissipation at 10/10000 $\mu\text{s}$ waveform		4600	W
Power dissipation on infinite heat sink at $T_C=25^\circ\text{C}$	$P_D$	8.0	W
Peak pulse current with 10/1000 $\mu\text{s}$ waveform	$I_{PP}^{(1)}$	200	A
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	$^\circ\text{C}/\text{W}$
Typical thermal resistance, junction to ambient	$R_{\theta JA}$	12	$^\circ\text{C}/\text{W}$

### Note

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

**ELECTRICAL CHARACTERISTICS** (T<sub>A</sub>=25°C, unless otherwise noted)

Part Number	V <sub>R</sub>	I <sub>R</sub> @ V <sub>R</sub>	V <sub>BR</sub> @ I <sub>T</sub>		I <sub>T</sub>	V <sub>C</sub> @ I <sub>PP</sub>		I <sub>PP</sub>
Bi-polar	V	Max (μA)	Min (V)	Max (V)	mA	Typ (V)	Max (V)	A
☆SM8S24CAP-AL	24.0	1	26.7	29.5	5	28.0	38.5	200

**Note:**

①.Surge waveform: 10/1000μs

V<sub>R</sub>: Stand-off voltage -- Maximum voltage that can be applied

V<sub>BR</sub>: Breakdown voltage

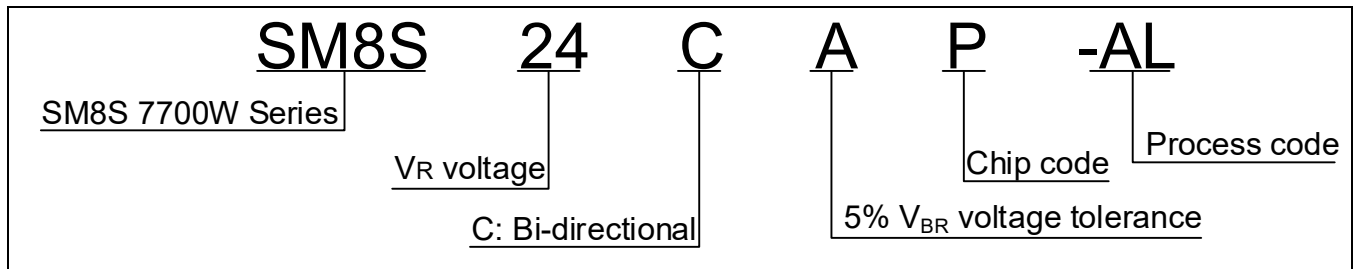
V<sub>C</sub>: Clamping voltage -- Peak voltage measured across the suppressor at a specified I<sub>PP</sub>

I<sub>R</sub>: Reverse leakage current

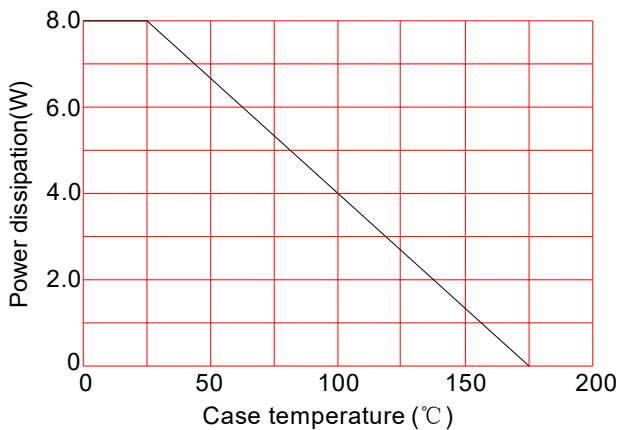
I<sub>T</sub>: Test current

☆: Products with negative resistance

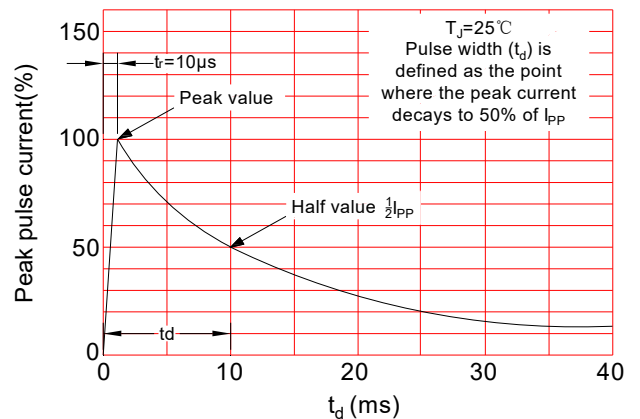
**ORDERING INFORMATION**



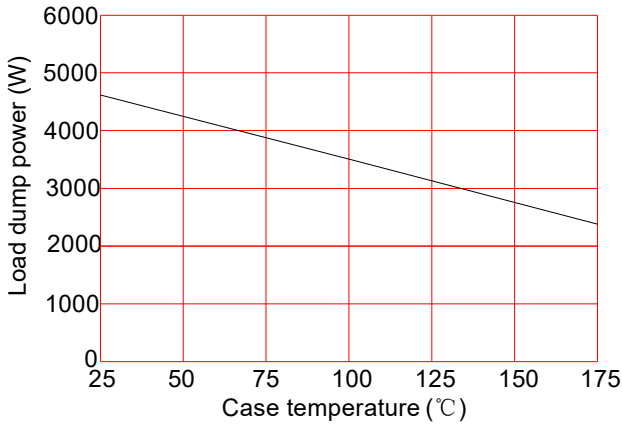
**RATINGS AND CHARACTERISTICS CURVES** (T<sub>A</sub>=25°C, unless otherwise noted)



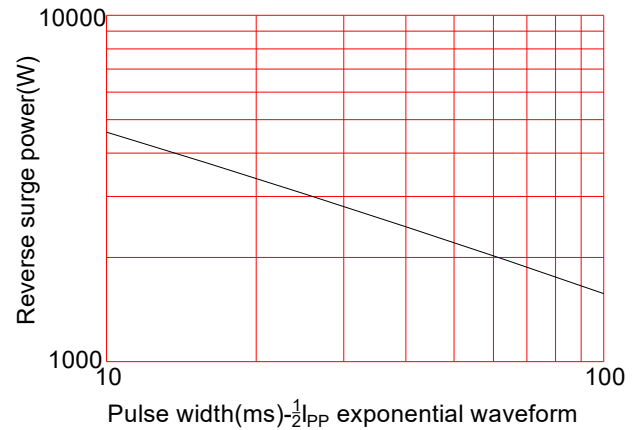
**FIG.1:** Power derating curve



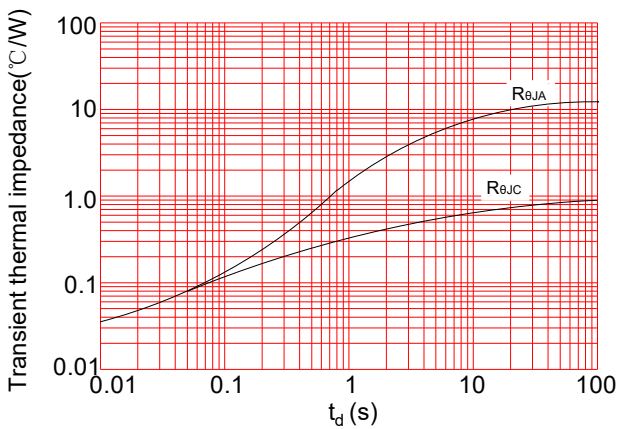
**FIG.2:** Pulse waveform



**FIG.3:** Load dump power characteristics (10ms exponential waveform)

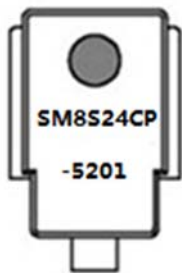


**FIG.4:** Reverse power capability



**FIG.5:** Typical transient thermal impedance

**MARKING**



SM	Surface Mount
8S	$P_D=8W$
24	$V_R: 24V$
C	Bi-directional
P	Chip code

**x201:**

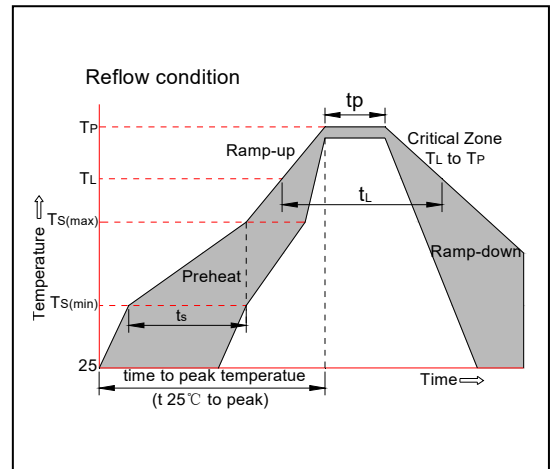
2015	2016	2017	2018	2019	2020
5	6	7	8	9	0
2021	2022	2023	2024	...	
1	2	3	4	...	

**5x01:** Month, 1/2/3~9/O/N/D

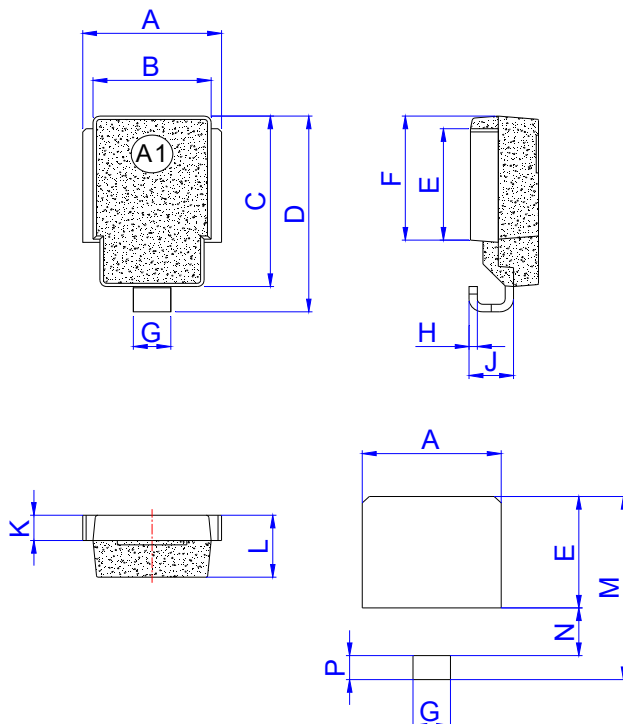
**52xx:** Lot number

**SOLDERING PARAMETERS**

Reflow Condition		Pb-Free assembly (see figure at right)
Pre Heat	-Temperature Min ( $T_{s(min)}$ )	+150°C
	-Temperature Max( $T_{s(max)}$ )	+200°C
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquidus Temp ( $T_L$ )to peak)		3°C/sec. Max
$T_{s(max)}$ to $T_L$ - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature( $T_L$ )(Liquidus)	+217°C
	-Temperature( $t_L$ )	60-150 secs.
Peak Temp ( $T_p$ )		+260(+0/-5)°C
Time within 5°C of actual Peak Temp ( $t_p$ )		20-40secs.
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp ( $T_p$ )		8 min. Max
Do not exceed		+260°C



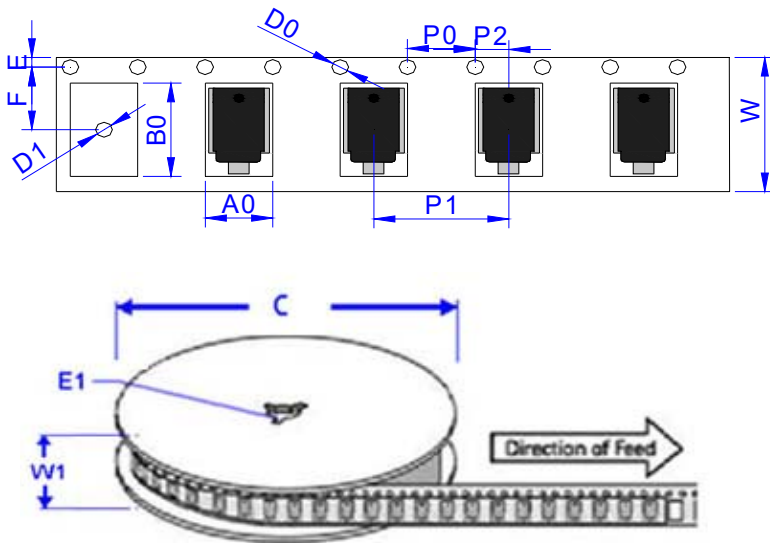
**PACKAGE MECHANICAL DATA**



DO-218AB

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	9.5	10.5	0.374	0.413
B	8.3	8.7	0.327	0.342
C	13.3	13.7	0.524	0.539
D	15.0	16.0	0.592	0.628
E	8.5	9.1	0.335	0.358
F	9.5	10.1	0.374	0.398
G	2.4	3.0	0.094	0.118
H	0.5	0.7	0.020	0.028
J	2.7	3.7	0.106	0.146
K	1.9	2.1	0.075	0.083
L	4.7	5.1	0.185	0.201
M	14.2	14.8	0.559	0.583
N	3.5	4.1	0.138	0.161
P	1.6	2.2	0.063	0.087

## TAPE AND REEL SPECIFICATION-DO-218AB



Ref.	Dimensions	
	Millimeters	Inches
A0	10.80 ± 0.3	0.425 ± 0.012
B0	16.13 ± 0.3	0.635 ± 0.012
C	330.0 ± 0.3	13.0 ± 0.012
D0	1.55 ± 0.2	0.061 ± 0.008
D1	1.55 ± 0.2	0.061 ± 0.008
E	1.75 ± 0.2	0.069 ± 0.008
E1	13.30 ± 0.2	0.524 ± 0.008
F	11.50 ± 0.2	0.453 ± 0.008
P0	4.00 ± 0.2	0.157 ± 0.008
P1	16.00 ± 0.2	0.630 ± 0.008
P2	2.00 ± 0.2	0.079 ± 0.008
W	24.00 ± 0.2	0.945 ± 0.008
W1	25.85 ± 0.2	1.018 ± 0.008

## ORDERING INFORMATION

PART No.	UNIT WEIGHT (g) TYP	REEL (PCS)	PER CARTON (PCS)	DESCRIPTION
SM8S24CAP-AL	2.985	750	3,000	13 inch reel pack

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