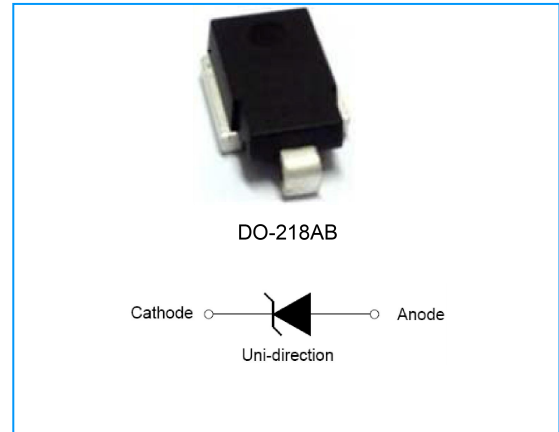


# Surface Mount Transient Voltage Suppressors

## SM8E Series

### 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-directional polarity only
- ◆ 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  $245^{\circ}\text{C}$
- ◆ 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-218B

Molding compound meets UL 94V-0 flammability rating

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

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

### PRIMARY CHARACTERISTICS

$V_R$	20V to 43V
$P_{PPM} (10/1000) \mu\text{s}$	8000W
$P_{PPM} (10/10000) \mu\text{s}$	6000W
$P_D$	8.5W
$I_{FSM}$	750A
$T_{Jmax}$	$175^{\circ}\text{C}$
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 on 10/1000 $\mu\text{s}$ waveform	$P_{PPM}$	8000	Watts
Peak pulse power dissipation on 10/10000 $\mu\text{s}$ 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 $\mu\text{s}$ 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	$^{\circ}\text{C}/\text{W}$

Note

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

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## SM8E Series

### Electrical Characteristics

Part Number	$V_R$	$I_T$	$I_R@V_R$		$V_{BR}@I_T$		$V_C@I_{PP}$	$I_{PP}$
	V	mA	$\mu A@25^\circ C$	$\mu A@175^\circ C$	Min(V)	Max (V)	V	A
SM8E20A	20.0	5	5	150	22.2	24.5	32.4	247
SM8E22A	22.0	5	5	150	24.4	26.9	35.5	225
SM8E24A	24.0	5	5	150	26.7	29.5	38.9	205
SM8E26A	26.0	5	5	150	28.9	31.9	42.1	190
SM8E28A	28.0	5	5	150	31.1	34.4	45.4	176
SM8E30A	30.0	5	5	150	33.3	36.8	48.4	165
SM8E32A	32.0	5	5	150	35.5	39.4	51.4	156
SM8E33A	33.0	5	5	150	36.7	40.6	53.3	150
SM8E36A	36.0	5	5	150	40.0	44.2	58.1	138
SM8E40A	40.0	5	5	150	44.4	49.1	64.5	124
SM8E43A	43.0	5	5	150	47.8	52.8	69.4	115

Note:

1. For all types maximum  $V_F=1.8V$  at  $I_F=100A$  measured on 8.3ms single half sine-wave or equivalent square wave, duty cycle=4 pulses per minute maximum.

2. Surge waveform: 10/1000 $\mu S$

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

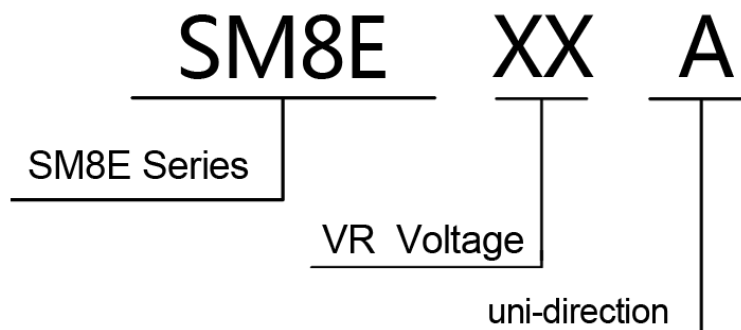
$V_{BR}$ : Breakdown voltage

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

$I_R$ : Reverse leakage current

$I_T$ : Test current

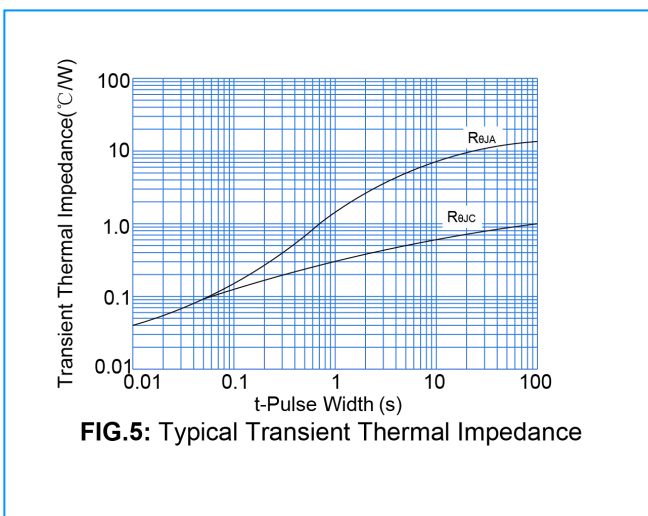
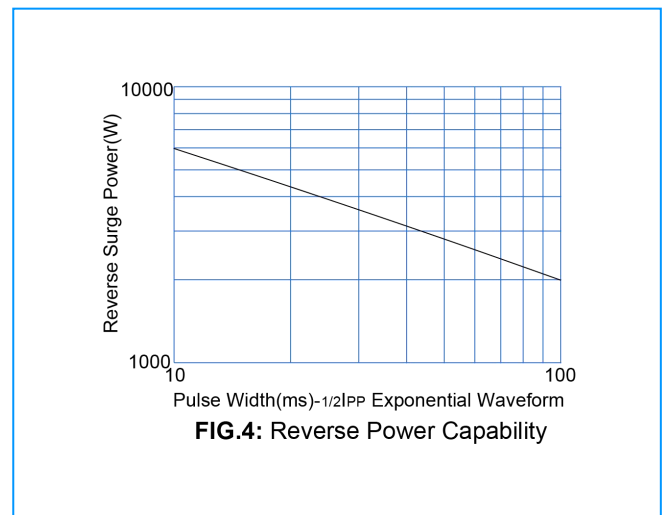
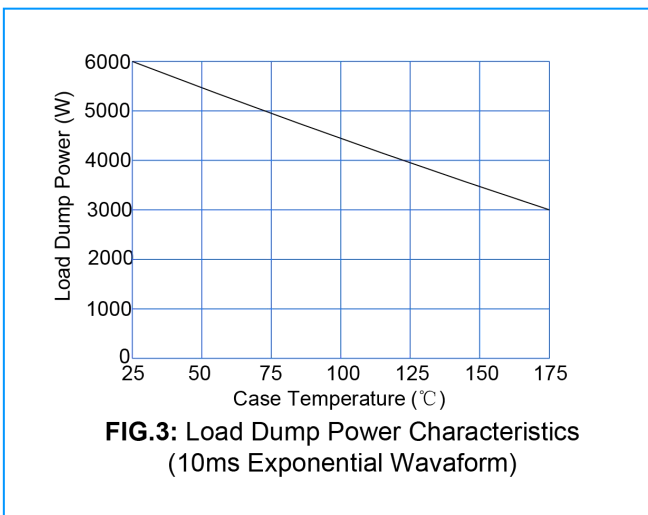
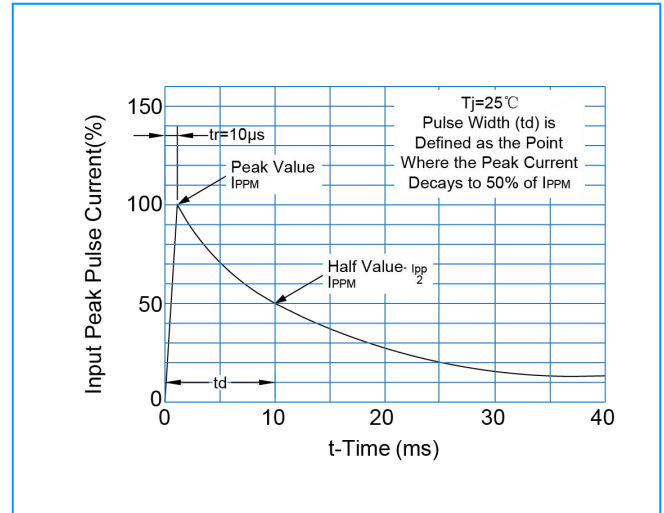
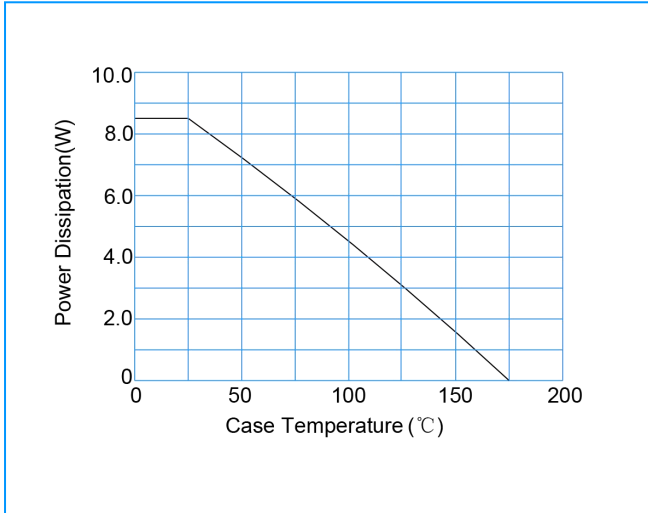
### Ordering Information



# Surface Mount Transient Voltage Suppressors

## SM8E Series

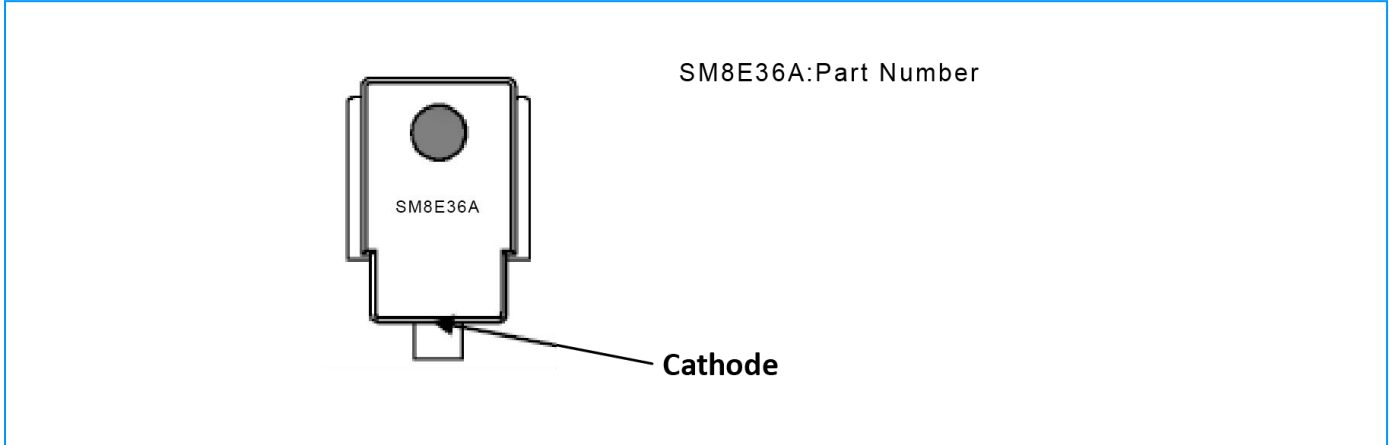
### Ratings And Characteristics Curves ( $T_A=25^{\circ}\text{C}$ , unless otherwise noted)



# Surface Mount Transient Voltage Suppressors

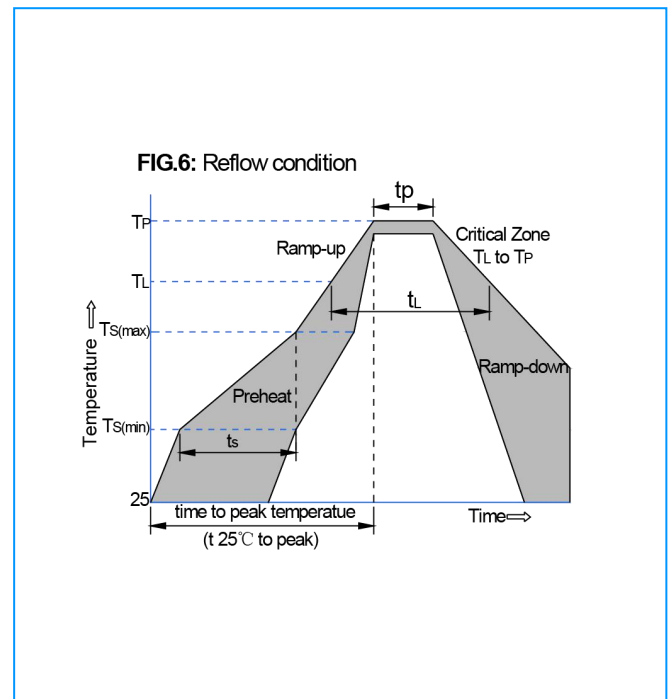
## SM8E Series

### Marking



### Soldering Parameters

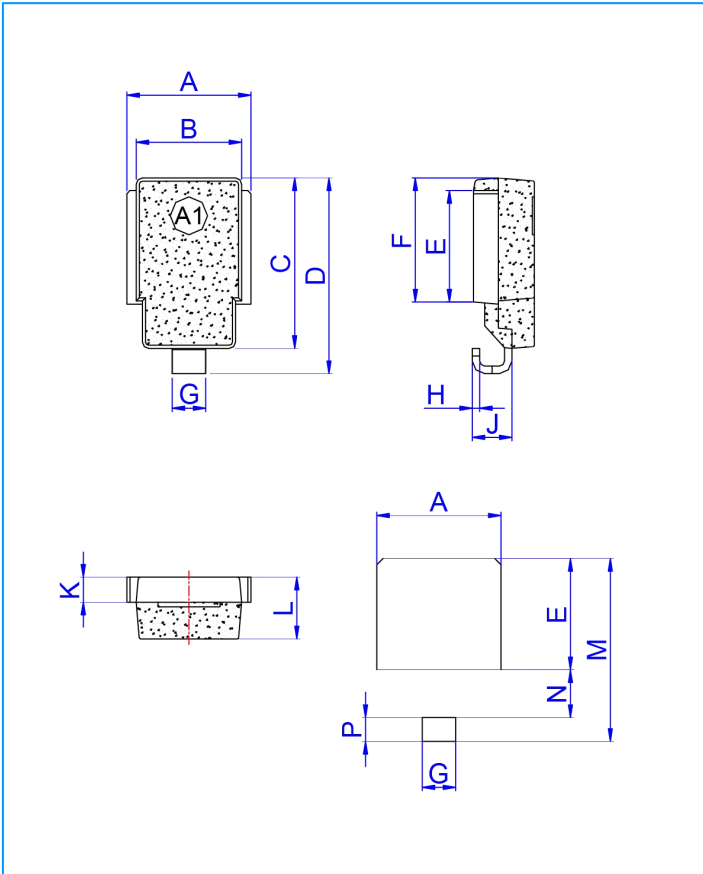
Reflow Condition		Pb-Free assembly (see FIG.6)
Pre Heat	-Temperature Min ( $T_{S (min)}$ )	+150°C
	-Temperature Max ( $T_{S (max)}$ )	+200°C
	-Time (Min to Max) ( $t_s$ )	60-180 secs.
Average ramp up rate (Liquidus Temp ( $T_L$ ) to peak)		3°C/sec. Max
$T_{S (max)}$ to $T_L$ - Ramp-up Rate		3°C/sec. 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 (TP)		8 min. Max
Do not exceed		+260°C



# Surface Mount Transient Voltage Suppressors

## SM8E Series

### Package Mechanical Data



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