

# SM8S14CA-Q1-H Thru SM8S43CA-Q1-H

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# SM8S14CA-Q1-H Thru SM8S43CA-Q1-H

## 6600W Bi-directional Automotive Load Dump Protection TVS : 14V ~ 36V

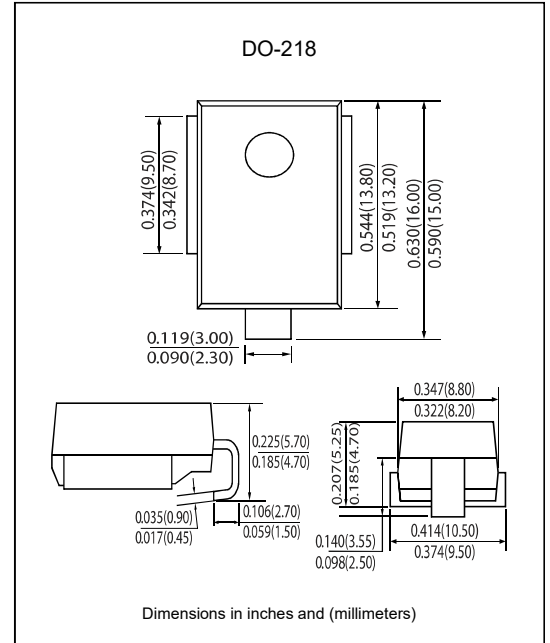
### Features

- 6600W peak pulse power capability with a 10/1000µs waveform, repetitive rate (duty cycle) : 0.01%.
- Meets ISO7637-2 5a surge specification .
- Qualified to AEC-Q101 standards for high reliability.
- Low leakage current.
- Bidirectional unit.
- Excellent clamping capability .
- Very fast response time.
- Lead-free parts meet RoHS requirements.

### Mechanical data

- Molding compound flammability rating : UL 94V-0
- Case : JEDEC DO-218 Molded plastic
- Mounting Position : Any
- Weight : Approximated 2.98 grams

### Package outline



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

Parameter	Symbol	Value	Unit
Peak pulse power dissipation at 10/1000µs waveform (Note 1)	$P_{PPM}$	6600	W
Peak pulse power dissipation at 10/10000µs waveform		5200	
Power dissipation on infinite heat sink at $T_c=25^\circ\text{C}$	$P_{M(AV)}$	8.0	W
Peak pulse current with 10/1000µs waveform	$I_{PP}$	See next table	A
Operating junction temperature range	$T_J$	+175	$^\circ\text{C}$
Storage temperature range	$T_{STG}$	-55 to +175	$^\circ\text{C}$

Note : 1. Non-repetitive current pulse per Fig.2 and derated above  $T_A=25^\circ\text{C}$  per Fig.1.

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

Part No.	Reverse stand-off voltage	Breakdown voltage @ $I_T$		Test current	Maximum clamping voltage @ $I_{PP}$ (Note 1)		Maximum reverse leakage current @ $V_{RWM}$	Maximum leakage current @ $V_{RWM}$ , $T_J=150^\circ\text{C}$
	$V_{RWM}$	$V_{BR\_Min.}$	$V_{BR\_Max.}$	$I_T$	$V_C$	$I_{PP}$	$I_R$	$I_R$
	Volts	Volts	Volts	mA	Volts	A	$\mu\text{A}$	$\mu\text{A}$
SM8S14CA-Q1-H	14	15.6	17.2	5.0	23.2	284	10	150
SM8S15CA-Q1-H	15	16.7	18.5	5.0	24.4	270	10	150
SM8S16CA-Q1-H	16	17.8	19.7	5.0	26.0	254	10	150
SM8S17CA-Q1-H	17	18.9	20.9	5.0	27.6	239	10	150
SM8S18CA-Q1-H	18	20.0	22.1	5.0	29.2	226	10	150
SM8S20CA-Q1-H	20	22.2	24.5	5.0	32.4	204	10	150
SM8S22CA-Q1-H	22	24.4	26.9	5.0	35.5	186	10	150
SM8S24CA-Q1-H	24	26.7	29.5	5.0	38.9	170	10	150
SM8S26CA-Q1-H	26	28.9	31.9	5.0	42.1	157	10	150
SM8S28CA-Q1-H	28	31.1	34.4	5.0	45.4	145	10	150
SM8S30CA-Q1-H	30	33.3	36.8	5.0	48.4	136	10	150
SM8S33CA-Q1-H	33	36.7	40.6	5.0	53.3	124	10	150
SM8S36CA-Q1-H	36	40.0	44.2	5.0	58.1	114	10	150
SM8S40CA-Q1-H	40	44.4	49.1	5.0	64.5	102	10	150
SM8S43CA-Q1-H	43	47.8	52.8	5.0	69.4	95.1	10	150

Note: 1 Surge current waveform is defined at 10/1000  $\mu\text{s}$  waveform.

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## Rating and characteristic curves

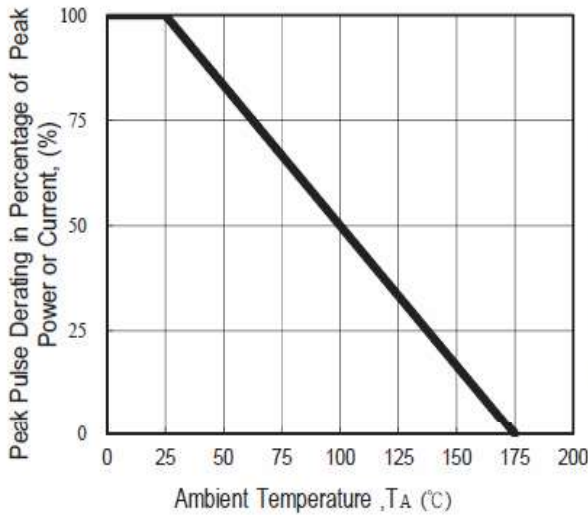


Fig. 1 - Pulse Derating Curve

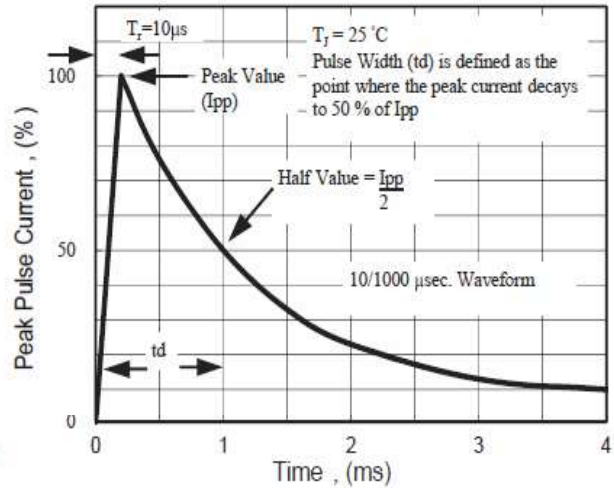


Fig. 2 - Pulse Waveform

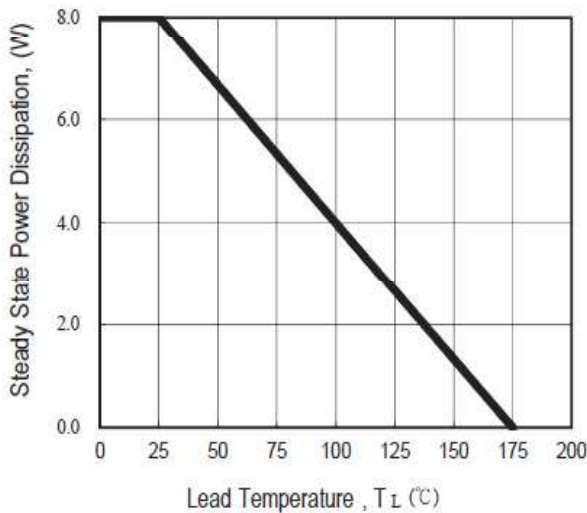


Fig. 3 - Steady State Power Derating Curve

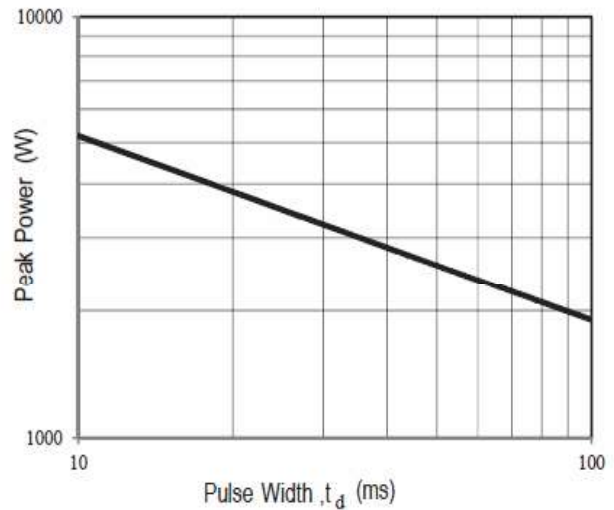
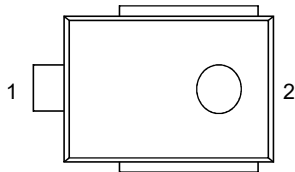
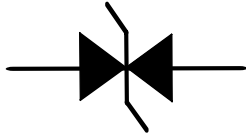


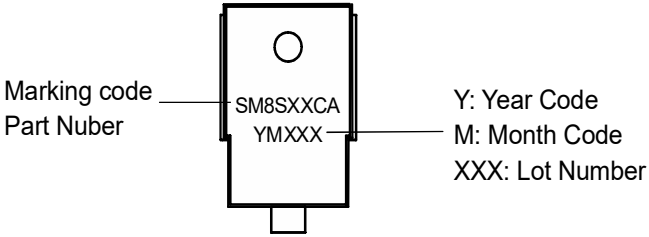
Fig. 4 - Peak Pulse Power Rating Curve

# SM8S14CA-Q1-H Thru SM8S43CA-Q1-H

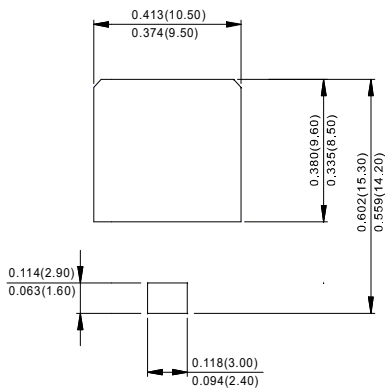
## Pinning information

Pin	Simplified outline	Symbol
Bi-Directional		

## Marking

Type number	Example
SM8S14CA-Q1-H Thru SM8S43CA-Q1-H	 <p>Y: Year Code M: Month Code XXX: Lot Number</p>

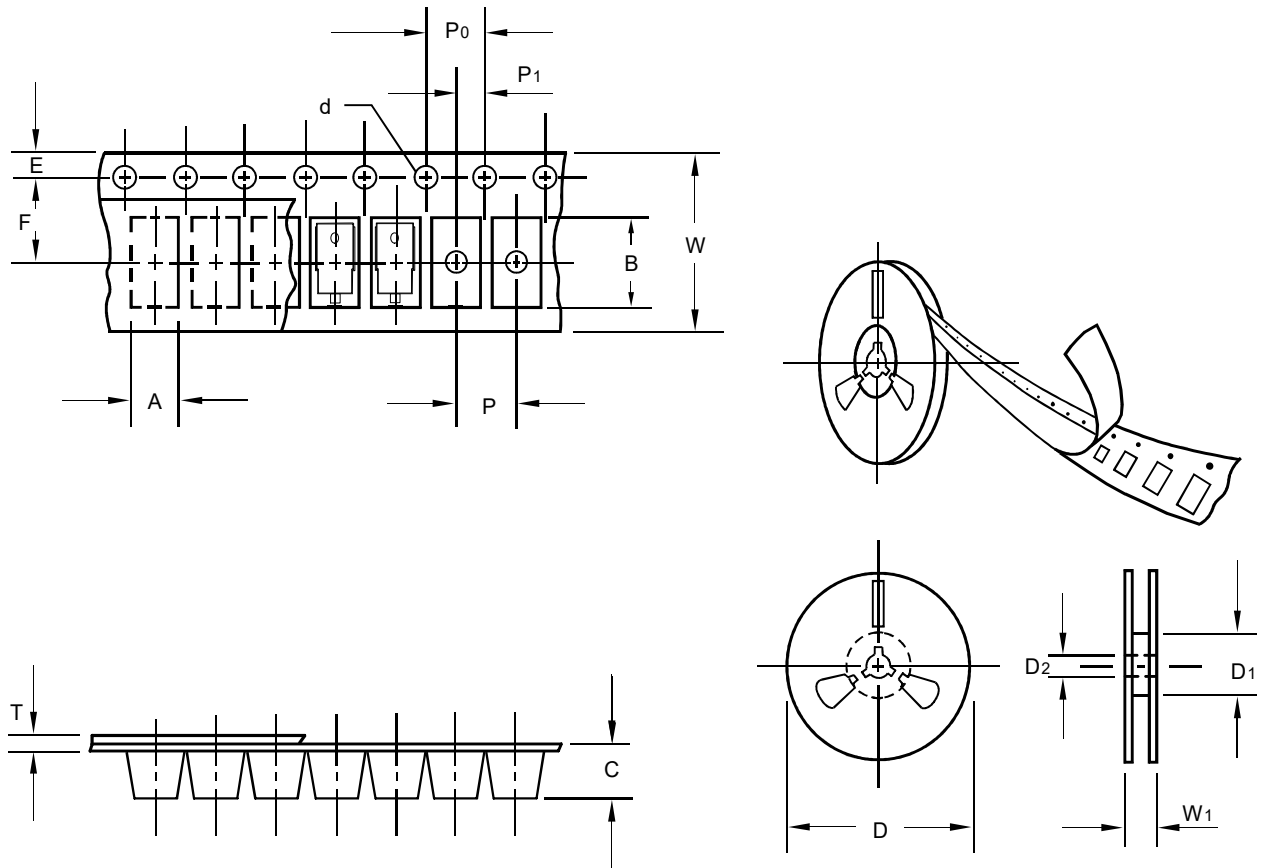
## Suggested solder pad layout



Dimensions in inches and (millimeters)

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## Packing information



unit:mm

Item	Symbol	Tolerance	DO-218
Carrier width	A	0.3	10.80
Carrier length	B	0.3	16.13
Carrier depth	C	0.3	5.210
Sprocket hole	d	0.2	1.55
13" Reel outside diameter	D	2.0	330.00
13" Reel inner diameter	D1	min	50.00
Feed hole diameter	D2	0.5	13.30
Sprocket hole position	E	0.2	1.75
Punch hole position	F	0.2	11.50
Punch hole pitch	P	0.2	16.00
Sprocket hole pitch	P0	0.2	4.00
Embossment center	P1	0.2	2.00
Overall tape thickness	T	0.2	0.40
Tape width	W	0.3	24.00
Reel width	W1	1.0	25.85

Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

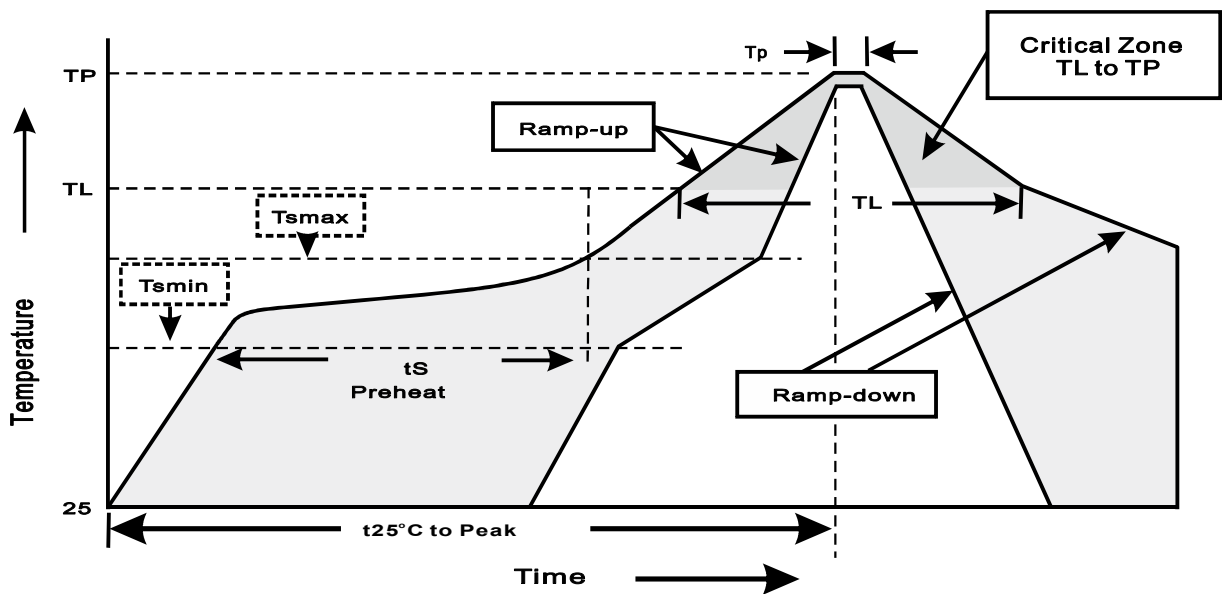
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## Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)
DO-218	13"	750	16.0	750	335*335*38	330	350*330*360	6,000

## Suggested thermal profiles for soldering processes

- 1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
- 2.Reflow soldering of surface-mount devices



### 3.Reflow soldering

Profile Feature	Soldering Condition
Average ramp-up rate(T <sub>L</sub> to T <sub>P</sub> )	<3°C/sec
Preheat -Temperature Min(T <sub>smmin</sub> ) -Temperature Max(T <sub>smmax</sub> ) -Time(min to max)(t <sub>s</sub> )	150°C 200°C 60~120sec
T <sub>smmax</sub> to T <sub>L</sub> -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(T <sub>L</sub> ) -Time(t <sub>L</sub> )	217°C 60~260sec
Peak Temperature(T <sub>P</sub> )	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t <sub>p</sub> )	10~30sec
Ramp-down Rate	<3°C/sec
Time 25°C to Peak Temperature	<6minutes

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## High reliability test capabilities

Item Test	Conditions	Reference
1. MSL Preconditioning	24hr bake@125°C+168hrs@85°C /85%RH+3xIR@260°C+1flux immersion+alcohol+DI H2O rinse	JESD22-A113
2. High Temperature Reverse Bias	VRWM=VRWM *100% (T <sub>Jmax</sub> =175°C)Test Duration:1000hrs	JESD22-A108
3. High Temperature Storage Life	Ta=Storage temperature range device specified maximum temperature) Test Duration:1000hrs	JESD22 A-103
4. Temperature Cycle	-55°C(15min) to 150°C(15min)Test Cycles:1000cycles	JESD22 A-104
5. Autoclave	P=2atm Ta=121°C RH=100% Test Duration:96hrs	JESD22 A-102
6. Solderability	245±5°C for 5sec	J-STD-002
7. Moisture Resistance	Ta=85°C/85% Relative humidity Test Duration:1000hrs	MIL-STD-750E METHOD 1021.2
8. Resistance To Solder Heat	260±5°C for 10sec	JESD22 B-106
9. High Temperature High Humidity Reverse Bias	Ta=85°C,85%RH, with device reverse biased at 80% of rated breakdown voltage up to a maximum of 100V or limit of chamber Test Duration:1000hrs	JESD22-A101