

Surface Mount Transient Voltage Suppressors



DO-218AB

Features

- $T_J = 175\text{ }^\circ\text{C}$ capability suitable for high reliability and automotive requirement
- 8000 W peak pulse power capability with a 10/1000 μs waveform, repetitive rate (duty cycle):0.01 %
- Meet ISO 7637-2 5a/5b and ISO 16750 load dump test (varied by test condition)
- Part no. with suffix "Q" means AEC-Q101 qualified
- Low leakage current
- Low forward voltage drop
- Excellent clamping capability
- Very fast response time
- RoHS compliant

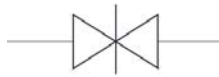
Applications

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

Uni-directional



Bi-directional



Mechanical Data

- Case: DO-218AB
- Molding compound: UL94V-0 flammability
- Polarity: Heatsink is anode

■Maximum Ratings ($T_A=25\text{ }^\circ\text{C}$ Unless otherwise specified)

PARAMETER	SYMBOL	UNIT	Value
Peak power dissipation with a 10/1000 μs waveform	P_{PPM}	W	8000
Peak power dissipation with a 10/10000 μs waveform			6000
Peak pulse current with a 10/1000 μs waveform (1)	I_{PPM}	A	See Next Table
Power dissipation on infinite heatsink at $T_L = 25\text{ }^\circ\text{C}$ (Fig 1)	P_D	W	8.5
Typical thermal resistance, junction to case	$R_{\theta JC}$	$^\circ\text{C/W}$	0.9
Peak forward surge current 8.3 ms single half sine-wave	I_{FSM}	A	750
Operating junction and storage temperature range	T_J, T_{STG}	$^\circ\text{C}$	- 55 to +175

Note:

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



SM8Z10AQ THRU SM8Z43CAQ

■ Thermal Characteristics (T_a=25°C Unless otherwise specified)

Part Number		Breakdown Voltage V _{BR} @IT			Maximum Reverse Leakage IR @V _{RWM} (uA)	Maximum IR @VRWM T _J =175 (uA)	Working Peak Reverse Voltage V _{RWM} (V)	Maximum Reverse Surge Current I _{PP} (A) (Fig.2)	Maximum Clamping Voltage VC @I _{PP} (V)
		Min (V)	Max (V)	IT (mA)					
Uni	Bi								
SM8Z10AQ	-	11.10	12.30	5.0	15	250	10	470.6	17.0
SM8Z11AQ	-	12.20	13.50	5.0	10	150	11	439.6	18.2
SM8Z12AQ	-	13.30	14.70	5.0	10	150	12	402.0	19.9
SM8Z13AQ	-	14.40	15.90	5.0	10	150	13	372.1	21.5
SM8Z14AQ	SM8Z14CAQ	15.60	17.20	5.0	10	150	14	344.8	23.2
SM8Z15AQ	SM8Z15CAQ	16.70	18.50	5.0	10	150	15	327.9	24.4
SM8Z16AQ	SM8Z16CAQ	17.80	19.70	5.0	10	150	16	307.7	26.0
SM8Z17AQ	SM8Z17CAQ	18.90	20.90	5.0	10	150	17	289.9	27.6
SM8Z18AQ	SM8Z18CAQ	20.00	22.10	5.0	10	150	18	274.0	29.2
SM8Z20AQ	SM8Z20CAQ	22.20	24.50	5.0	10	150	20	246.9	32.4
SM8Z22AQ	SM8Z22CAQ	24.40	26.90	5.0	10	150	22	225.4	35.5
SM8Z24AQ	SM8Z24CAQ	26.70	29.50	5.0	10	150	24	205.7	38.9
SM8Z26AQ	SM8Z26CAQ	28.90	31.90	5.0	10	150	26	190.0	42.1
SM8Z28AQ	SM8Z28CAQ	31.10	34.40	5.0	10	150	28	176.2	45.4
SM8Z30AQ	SM8Z30CAQ	33.30	36.80	5.0	10	150	30	165.3	48.4
SM8Z33AQ	SM8Z33CAQ	36.70	40.60	5.0	10	150	33	150.1	53.3
SM8Z36AQ	SM8Z36CAQ	40.00	44.20	5.0	10	150	36	137.7	58.1
SM8Z40AQ	SM8Z40CAQ	44.40	49.10	5.0	10	150	40	124.0	64.5
SM8Z43AQ	SM8Z43CAQ	47.80	52.80	5.0	10	150	43	115.3	69.4

Note:

1. Surge current waveform is defined at 10/1000us waveform
2. 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



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■ Characteristics (Typical)

FIG.1 Pulse Derating Curve

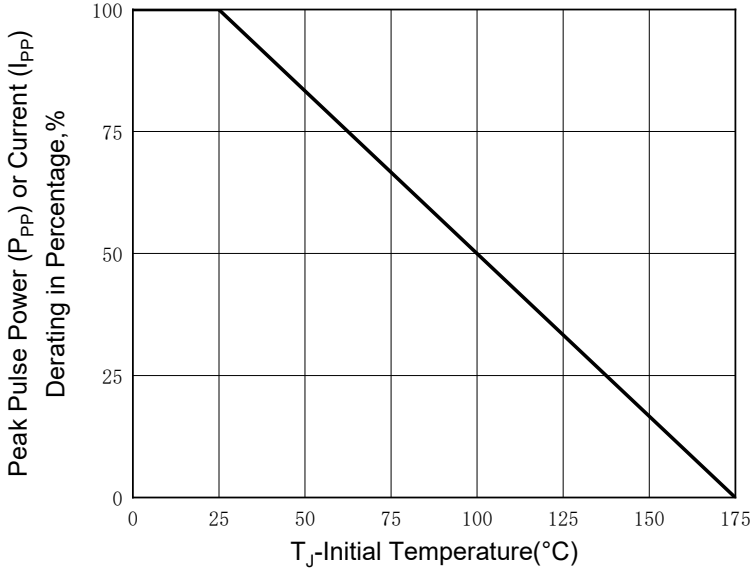


FIG.2 Pulse Waveform

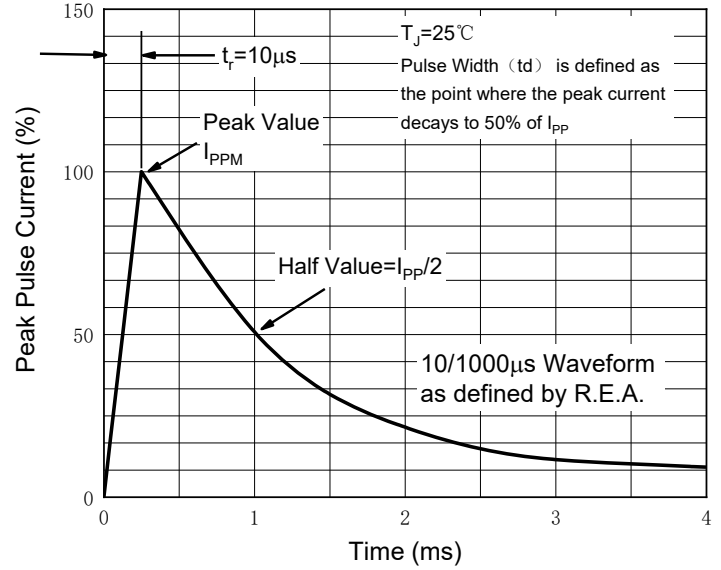


FIG.3 Steady State Power Derating Curve

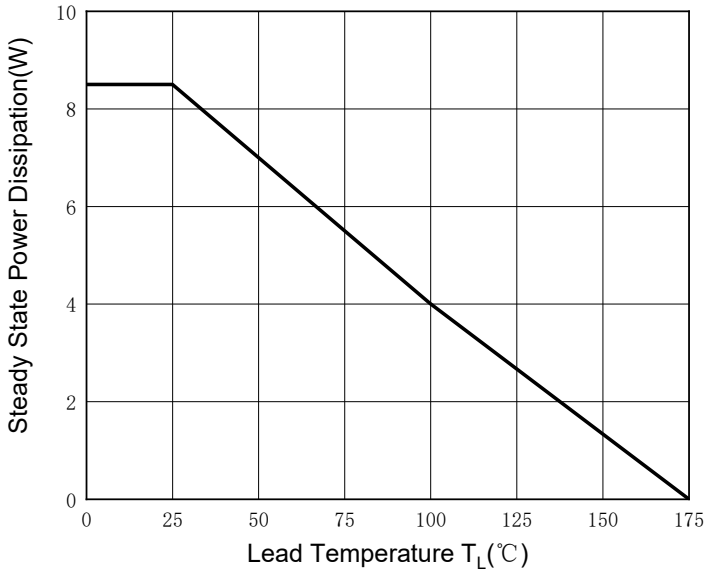
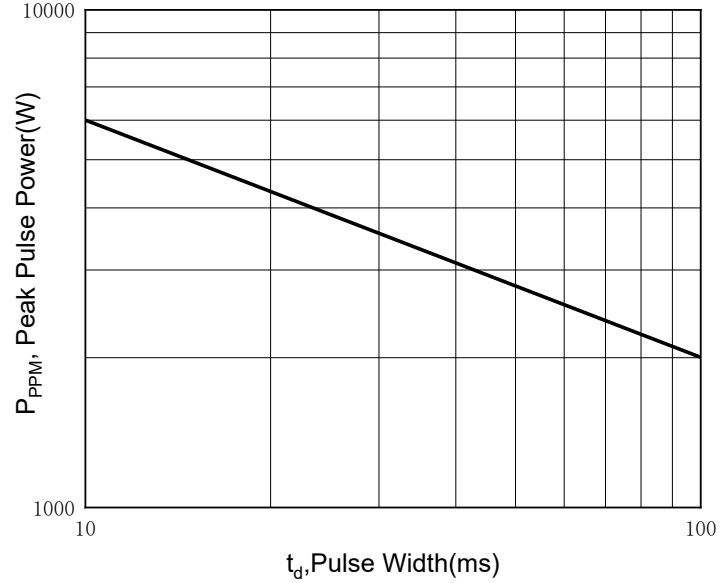


FIG.4: Peak Pulse Power Rating Curve





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■ TYPICAL LOAD DUMP CAPABILITY AT ISO 16750-2 PULSE 5a WITH 12 V BATTERY SYSTEM (TA = 25 °C)

Condititon	Us(V)	Ri(Ω)	Td(ms)
Device type			
SM8Z18AQ/CAQ	101	1	400
SM8Z20AQ/CAQ			
SM8Z22AQ/CAQ			
SM8Z24AQ/CAQ			
SM8Z26AQ/CAQ			
SM8Z28AQ/CAQ			

■ TYPICAL LOAD DUMP CAPABILITY AT ISO 16750-2 PULSE 5a WITH 24 V BATTERY SYSTEM (TA = 25 °C)

Condititon	Us(V)	Ri(Ω)	Td(ms)
Device type			
SM8Z30AQ/CAQ	151	2	350
SM8Z33AQ/CAQ			
SM8Z36AQ/CAQ			
SM8Z40AQ/CAQ			

■ TYPICAL LOAD DUMP CAPABILITY AT ISO 16750-2 PULSE 5b WITH 12 V BATTERY SYSTEM (TA = 25 °C)

Condititon	Us(V)	Us*(V)	Ri(Ω)	Td(ms)
Device type				
SM8Z18AQ/CAQ	101	35	1	400
SM8Z20AQ/CAQ				
SM8Z22AQ/CAQ				
SM8Z24AQ/CAQ				
SM8Z26AQ/CAQ				
SM8Z28AQ/CAQ				

■ TYPICAL LOAD DUMP CAPABILITY AT ISO 16750-2 PULSE 5b WITH 24 V BATTERY SYSTEM (TA = 25 °C)

Condititon	Us(V)	Us*(V)	Ri(Ω)	Td(ms)
Device type				
SM8Z30AQ/CAQ	151	65	1	200
SM8Z33AQ/CAQ				
SM8Z36AQ/CAQ				
SM8Z40AQ/CAQ				



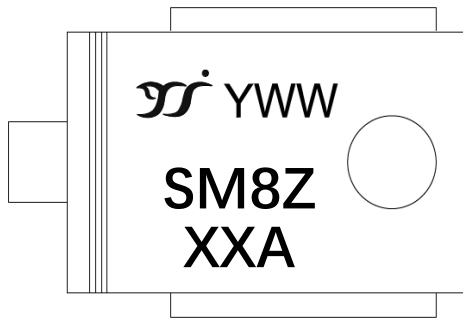
SM8Z10AQ THRU SM8Z43CAQ

■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	UNIT WEIGHT(g)	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
SM8Z10AQ-SM8Z43AQ SM8Z14CAQ-SM8Z43CAQ	F1	Approximate 2.86	750	750	3750	13"reel

■ Marking Information

Uni-directional



Bi-directional



Note:

1. All marking is at middle of the product body
2. All marking is in laser printing
3. XXA/XXCA is marking code, like SM8Z43AQ/43CAQ marking code is 43
4. Body color: Black
5. YWW is date code, "Y" is year. "WW" is week.

For instance:

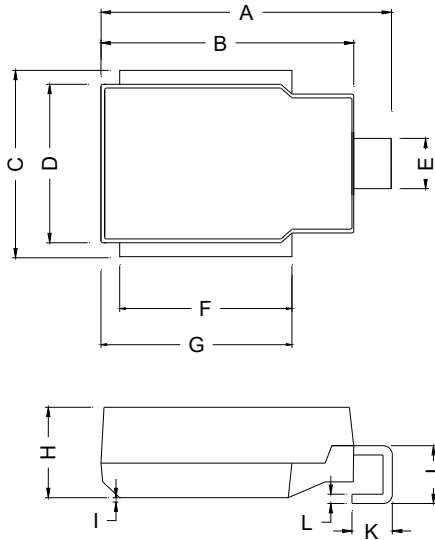
The 17th week of 2022, date code is 217

The 17th week of 2023, date code is 317



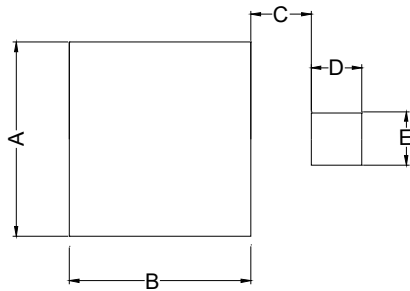
SM8Z10AQ THRU SM8Z43CAQ

■ Outline Dimensions



DO-218AB		
DIM	MIN (mm)	MAX(mm)
A	15.00	16.00
B	13.30	13.70
C	9.50	10.50
D	8.30	8.70
E	2.40	3.00
F	8.90	9.50
G	9.90	10.50
H	4.70	5.00
I	0.00	0.18
J	2.50	3.50
K	1.80	2.80
L	0.50	0.70

■ Suggested pad layout



DO-218AB		
DIM	MIN (mm)	MAX(mm)
A	9.50	10.50
B	9.00	9.60
C	2.80	3.40
D	2.30	2.90
E	2.40	3.00



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Disclaimer

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