

Transient Voltage Suppressors (TVS) Data Sheet

Features

- For surface mounted applications in order to optimize board space
- Low profile package
- Built-in strain relief
- Glass passivated junction
- Low inductance
- Excellent clamping capability
- 8000W peak pulse power capability at 10/1000 μ s waveform, repetition rate (duty cycle): 0.01%
- Fast response time
- Typical I_R less than 1 μ A above 15V
- High Temperature soldering: 260 $^{\circ}$ C/10 seconds at terminals
- Plastic package has underwriters laboratory flammability 94V-0
- Meets MSL level 1, per J-STD-020
- AEC-Q101 qualified (Automotive grade with suffix "Q".)
- Expsemi electronics
- UL Certification:E492977



Mechanical Data

- Case: JEDEC DO-214AB. Molded plastic over glass passivated junction
- Terminal: Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity: Color band denotes cathode except bi-directional models

Applications

- AC/DC power supply
- I/O interface
- Low frequency signal transmission line

Maximum Ratings and Characteristics

Ratings at 25 $^{\circ}$ C ambient temperature unless otherwise specified.

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation by 10/1000 μ s Waveform (note1 note 2)	PPK	8000	Watts
Peak Forward Surge Current 8.3ms Single Half Sine Wave Superimposed on Rated Load (JEDEC Method) (Note 3)	IFSM	300	Amps
Steady State Power Dissipation @ $T_L = 50^{\circ}$ C	PM(AV)	6.5	Watts
Maximum Instantaneous Forward Voltage @ $I_{PP} = 50$ A (For Unidirectional Units Only)	VF	5	Volts
Operating Temperature Range	TJ	-55 to +150	$^{\circ}$ C
Storage Temperature Range	TSTG	-55 to +150	$^{\circ}$ C

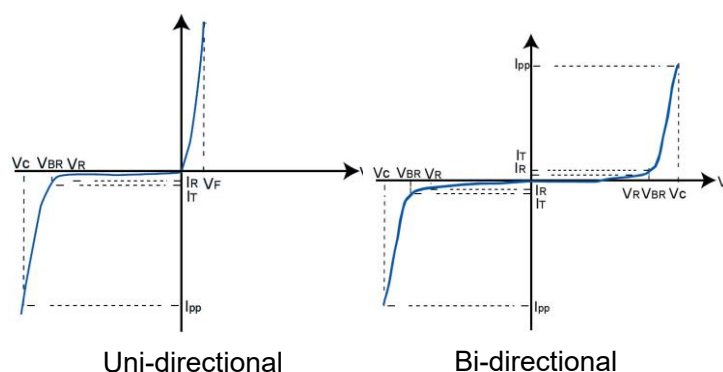
NOTES:

1. Non-repetitive current pulse, per Pulse Waveform graph and derated above $T_A = 25^{\circ}$ C per Pulse Derating Curve.
2. Thermal Resistance Junction to Lead.
3. 8.3 ms Single Half-Sine Wave duty cycle = 4 pulses maximum per minute (unidirectional units only).

Electrical Characteristics (TA = 25 °C unless otherwise noted)

Part Number (Bi)	Part Number (Uni)	MARKING		Reverse Stand off Voltage V _R (Volts)	Breakdown Voltage V _{BR} (Volts)@I _T		Test Current I _T (mA)	Maximum Reverse Leakage I _R @ V _R (μA)	Maximum Peak Pulse Current I _{pp} (A)	Maximum Clamping Voltage V _C @ I _{pp} (V)
		BI	UNI		Min .V	Max .V				
8.0SMDJ12CA	8.0SMDJ12A	8BEP	8PEP	12.0	13.30	14.70	10	800	402.1	19.9
8.0SMDJ13CA	8.0SMDJ13A	8BEQ	8PEQ	13.0	14.40	15.90	10	500	372.1	21.5
8.0SMDJ14CA	8.0SMDJ14A	8BER	8PER	14.0	15.60	17.20	10	200	344.9	23.2
8.0SMDJ15CA	8.0SMDJ15A	8BES	8PES	15.0	16.70	18.50	1	100	327.9	24.4
8.0SMDJ16CA	8.0SMDJ16A	8BET	8PET	16.0	17.80	19.70	1	50	307.7	26.0
8.0SMDJ17CA	8.0SMDJ17A	8BEU	8PEU	17.0	18.90	20.90	1	20	290.0	27.6
8.0SMDJ18CA	8.0SMDJ18A	8BEV	8PEV	18.0	20.00	22.10	1	10	274.0	29.2
8.0SMDJ20CA	8.0SMDJ20A	8BEW	8PEW	20.0	22.20	24.50	1	5	247.0	32.4
8.0SMDJ22CA	8.0SMDJ22A	8BEX	8PEX	22.0	24.40	26.90	1	5	225.4	35.5
8.0SMDJ24CA	8.0SMDJ24A	8BEZ	8PEZ	24.0	26.70	29.50	1	5	205.7	38.9
8.0SMDJ26CA	8.0SMDJ26A	8BFE	8PFE	26.0	28.90	31.90	1	5	190.1	42.1
8.0SMDJ28CA	8.0SMDJ28A	8BFG	8PFG	28.0	31.10	34.40	1	5	176.2	45.4
8.0SMDJ30CA	8.0SMDJ30A	8BFK	8PFK	30.0	33.30	36.80	1	5	165.3	48.4
8.0SMDJ33CA	8.0SMDJ33A	8BFM	8PFM	33.0	36.70	40.60	1	5	150.1	53.3
8.0SMDJ36CA	8.0SMDJ36A	8BFP	8PFP	36.0	40.00	44.20	1	5	137.8	58.1
8.0SMDJ40CA	8.0SMDJ40A	8BFR	8PFR	40.0	44.40	49.10	1	5	124.1	64.5
8.0SMDJ43CA	8.0SMDJ43A	8BFT	8PFT	43.0	47.80	52.80	1	5	115.3	69.4
8.0SMDJ45CA	8.0SMDJ45A	8BFV	8PFV	45.0	50.00	55.30	1	5	110.1	72.7
8.0SMDJ48CA	8.0SMDJ48A	8BFX	8PFX	48.0	53.30	58.90	1	5	103.4	77.4
8.0SMDJ51CA	8.0SMDJ51A	8BFZ	8PFZ	51.0	56.70	62.70	1	5	97.2	82.4
8.0SMDJ54CA	8.0SMDJ54A	8BGE	8PGE	54.0	60.00	66.30	1	5	92.0	87.1
8.0SMDJ58CA	8.0SMDJ58A	8BGG	8PGG	58.0	64.40	71.20	1	5	85.5	93.6
8.0SMDJ60CA	8.0SMDJ60A	8BGK	8PGK	60.0	66.70	73.70	1	5	82.7	96.8
8.0SMDJ64CA	8.0SMDJ64A	8BGM	8PGM	64.0	71.10	78.60	1	5	77.7	103.0
8.0SMDJ70CA	8.0SMDJ70A	8BGP	8PGP	70.0	77.80	86.00	1	5	71.0	113.0
8.0SMDJ75CA	8.0SMDJ75A	8BGR	8PGR	75.0	83.30	92.10	1	5	66.2	121.0
8.0SMDJ78CA	8.0SMDJ78A	8BGT	8PGT	78.0	86.70	95.80	1	5	63.5	126.0
8.0SMDJ85CA	8.0SMDJ85A	8BGV	8PGV	85.0	94.40	104.00	1	5	58.4	137.0
8.0SMDJ90CA	8.0SMDJ90A	8BGX	8PGX	90.0	100.00	111.00	1	5	55.0	146.0
8.0SMDJ100CA	8.0SMDJ100A	8BGZ	8PGZ	100.0	111.00	123.00	1	5	49.4	162.0
8.0SMDJ110CA	8.0SMDJ110A	8BHE	8PHE	110.0	122.00	135.00	1	5	45.2	177.0

I-V Curve Characteristics



Symbol	Parameter
I_{PP}	Maximum Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
V_{RWM}	Working Peak Reverse Voltage
I_R	Maximum Reverse Leakage Current @ V_{RWM}
V_{BR}	Breakdown Voltage @ I_T (Test Current)

Rating & Characteristic Curves

Figure 1- Peak pulse power derating curve

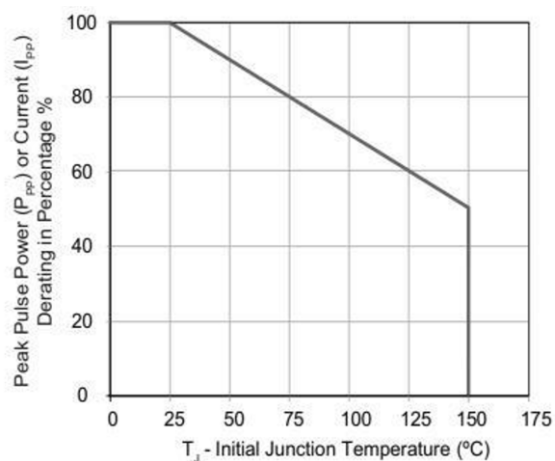


Figure 2- Pulse waveform

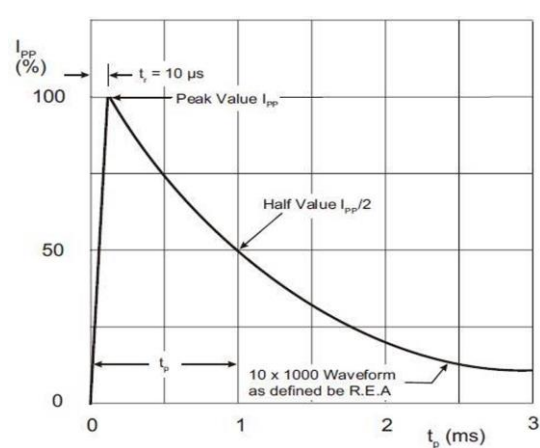


Figure 3- Peak pulse power rating curve

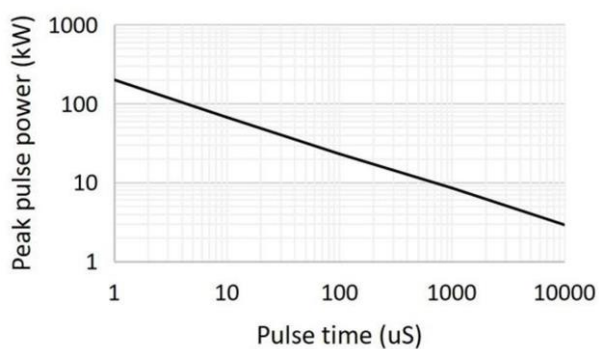
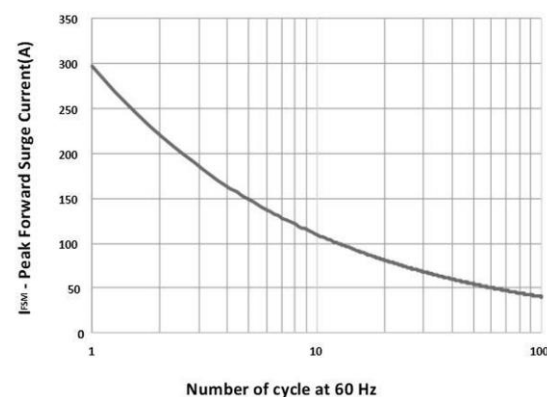


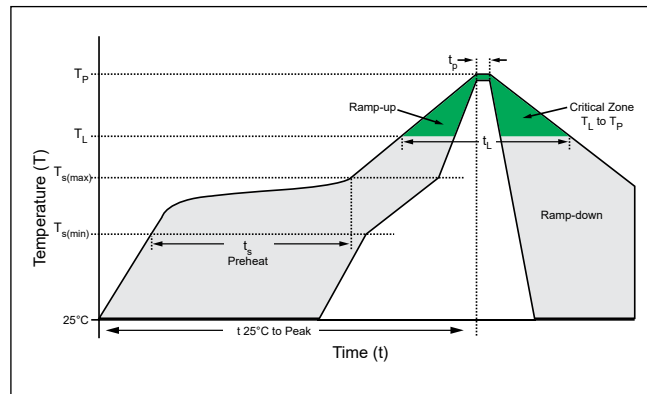
Figure 4- Maximum Non-Repetitive Forward Surge Current Uni-Directional Only



Recommended Soldering Conditions

Soldering Parameters

Reflow Condition		Lead-free assembly
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_A) to peak)		3°C/second max
$T_{s(max)}$ to T_A - Ramp-up Rate		3°C/second max
Reflow	- Temperature (T_A) (Liquidus)	217°C
	- Time (min to max) (t_s)	60 – 150 seconds
Peak Temperature (T_p)		260 ^{+0/-5} °C
Time within 5°C of actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_p)		8 minutes Max.
Do not exceed		260°C



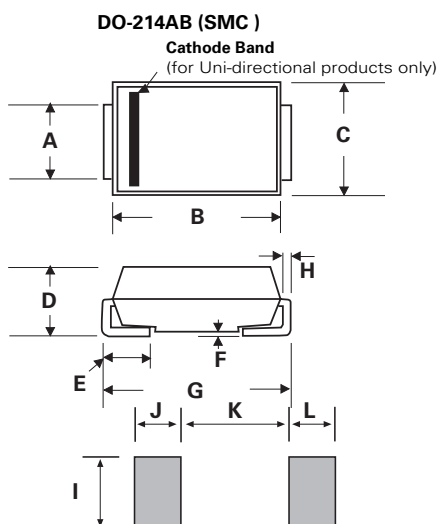
Physical Specifications

Case	JEDEC DO214AB. Molded plastic body over glass passivated junction
Polarity	Color band denotes positive end (cathode) except Bidirectional.
Terminal	Matte Tin-plated leads, Solderable per JESD22-B102

Environmental Specifications

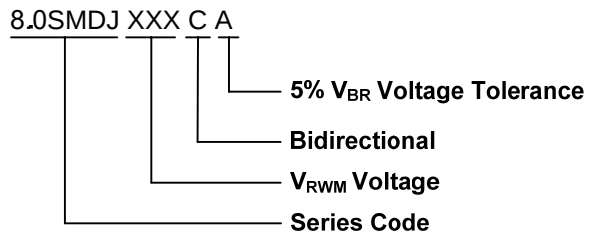
High Temp. Storage	JESD22-A103
HTRB	JESD22-A108
Temperature Cycling	JESD22-A104
MSL	JEDEC-J-STD-020, Level 1
H3TRB	JESD22-A101
RSH	JESD22-A111

Dimensions

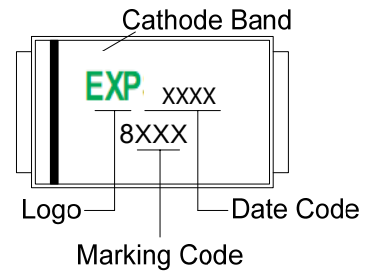


Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.108	0.128	2.750	3.250
B	0.260	0.291	6.600	7.400
C	0.220	0.246	5.590	6.250
D	0.078	0.108	1.980	2.750
E	0.030	0.060	0.760	1.520
F	0.002	0.008	0.051	0.203
G	0.303	0.323	7.700	8.200
H	0.006	0.012	0.152	0.305
I	0.129	-	3.300	-
J	0.094	-	2.400	-
K	-	0.165	-	4.200
L	0.094	-	2.400	-

Part Numbering System



Part Marking System



Packaging

Part number	Component Package	Quantity	Packaging Option	Packaging Specification
8.0SMDJxxXX	DO-214AB	3000	Tape & Reel - 16mm tape/13" reel	EIA STD RS-481

Tape and Reel Specification

