



Features

- Surface Mount SMA package
- Standoff Voltage: 12 to 58 volts
- Power Dissipation: 400 watts
- RoHS compliant*
- AEC-Q101 compliant**

Applications

- Protection of power buses
- Protection of I/O interfaces
- Overvoltage transient protection
- Automotive
 - Entertainment applications
 - Comfort applications
- Telecom, computer, industrial and consumer electronics applications

SMAJ-Q Transient Voltage Suppressor Diode Series

General Information

Bourns offers Transient Voltage Suppressor Diodes for surge and ESD protection applications, in compact chip package DO-214AC (SMA) size format. The Transient Voltage Suppressor series offers a choice of Working Peak Reverse Voltage from 12 V up to 58 V. Typical fast response times are less than 1.0 picosecond from 0 V to Breakdown Voltage.

Bourns® Chip Diodes conform to JEDEC standards, are easy to handle with standard pick and place equipment and the flat configuration minimizes roll away.

Electrical Characteristics (@ T_A = 25 °C Unless Otherwise Noted)

Parameter	Symbol	Value	Unit
Minimum Peak Pulse Power Dissipation (T _P = 1 ms) (Note 1,2)	P _{PK}	400	Watts
Peak Forward Surge Current 8.3 ms Single Half Sine Wave Superimposed on Rated Load (JEDEC Method) (Note 3)	I _{FSM}	40	Amps
Operating Temperature Range	T _J	-55 to +150	°C
Storage Temperature Range	T _{STG}	-55 to +150	°C

1. Non-repetitive current pulse, per Pulse Waveform graph and derated above T_A = 25 °C per Pulse Derating Curve.
2. Mounted on 5.0 mm² (0.03 mm thick) copper pads to each terminal.
3. 8.3 ms Single Half-Sine Wave duty cycle = 4 pulses maximum per minute (unidirectional units only).

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*RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.

**"Q" part number suffix indicates AEC-Q101 compliance.

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Electrical Characteristics (@ T_A = 25 °C Unless Otherwise Noted)

Unidirectional Device		Bidirectional Device		Breakdown Voltage V _{BR} (Volts)			Working Peak Reverse Voltage	Maximum Reverse Leakage @ V _{RWM}	Maximum Reverse Voltage @ I _{RSM}	Maximum Reverse Surge Current
Part No.	Marking	Part No.	Marking	Min.	Max.	@ I _T (mA)	V _{RWM} (V)	I _R (μA)	V _{RSM} (V)	I _{RSM} (A)
SMAJ12A-Q	IEQ	SMAJ12CA-Q	UEQ	13.3	14.7	1.0	12	1.0	19.9	20.1
SMAJ13A-Q	IGQ	SMAJ13CA-Q	UGQ	14.4	15.9	1.0	13	1.0	21.5	18.6
SMAJ14A-Q	IKQ	SMAJ14CA-Q	UKQ	15.6	17.2	1.0	14	1.0	23.2	17.2
SMAJ15A-Q	IMQ	SMAJ15CA-Q	UMQ	16.7	18.5	1.0	15	1.0	24.4	16.4
SMAJ16A-Q	IPQ	SMAJ16CA-Q	UPQ	17.8	19.7	1.0	16	1.0	26.0	15.3
SMAJ17A-Q	IRQ	SMAJ17CA-Q	URQ	18.9	20.9	1.0	17	1.0	27.6	14.5
SMAJ18A-Q	ITQ	SMAJ18CA-Q	UTQ	20.0	22.1	1.0	18	1.0	29.2	13.7
SMAJ20A-Q	IVQ	SMAJ20CA-Q	UVQ	22.2	24.5	1.0	20	1.0	32.4	12.3
SMAJ22A-Q	IXQ	SMAJ22CA-Q	UXQ	24.4	26.9	1.0	22	1.0	35.5	11.3
SMAJ24A-Q	IZQ	SMAJ24CA-Q	UZQ	26.7	29.5	1.0	24	1.0	38.9	10.3
SMAJ26A-Q	JEQ	SMAJ26CA-Q	VEQ	28.9	31.9	1.0	26	1.0	42.1	9.5
SMAJ28A-Q	JGQ	SMAJ28CA-Q	VGQ	31.1	34.4	1.0	28	1.0	45.4	8.8
SMAJ30A-Q	JKQ	SMAJ30CA-Q	VKQ	33.3	36.8	1.0	30	1.0	48.4	8.3
SMAJ33A-Q	JMQ	SMAJ33CA-Q	VMQ	36.7	40.6	1.0	33	1.0	53.3	7.5
SMAJ36A-Q	JPQ	SMAJ36CA-Q	VPQ	40.0	44.2	1.0	36	1.0	58.1	6.9
SMAJ40A-Q	JRQ	SMAJ40CA-Q	VRQ	44.4	49.1	1.0	40	1.0	64.5	6.2
SMAJ43A-Q	JTQ	SMAJ43CA-Q	VTQ	47.8	52.8	1.0	43	1.0	69.4	5.8
SMAJ45A-Q	JVQ	SMAJ45CA-Q	VVQ	50.0	55.3	1.0	45	1.0	72.7	5.5
SMAJ48A-Q	JXQ	SMAJ48CA-Q	VXQ	53.3	58.9	1.0	48	1.0	77.4	5.2
SMAJ51A-Q	JZQ	SMAJ51CA-Q	VZQ	56.7	62.7	1.0	51	1.0	82.4	4.9
SMAJ54A-Q	REQ	SMAJ54CA-Q	WEQ	60.0	66.3	1.0	54	1.0	87.1	4.6
SMAJ58A-Q	RGQ	SMAJ58CA-Q	WGQ	64.4	71.2	1.0	58	1.0	93.6	4.3

- Notes: 1. Suffix 'A' denotes a 5 % tolerance unidirectional device.
 2. Suffix 'CA' denotes a 5 % tolerance bidirectional device.

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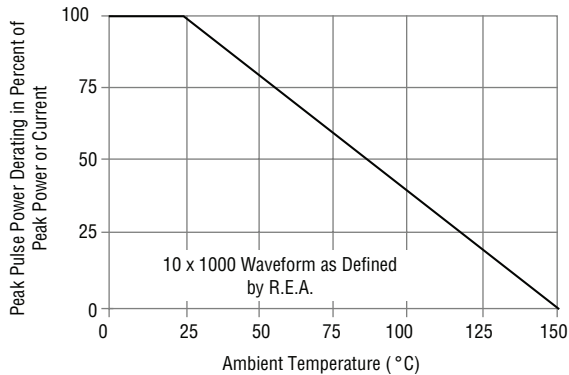
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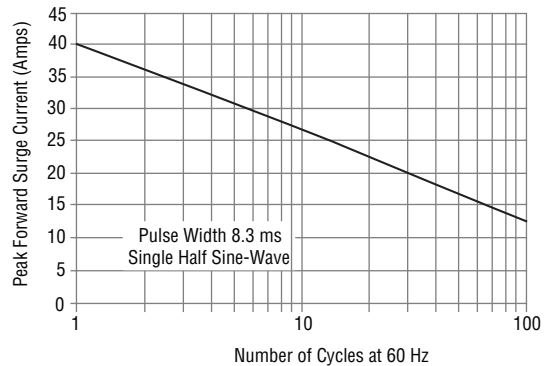


Performance Graphs

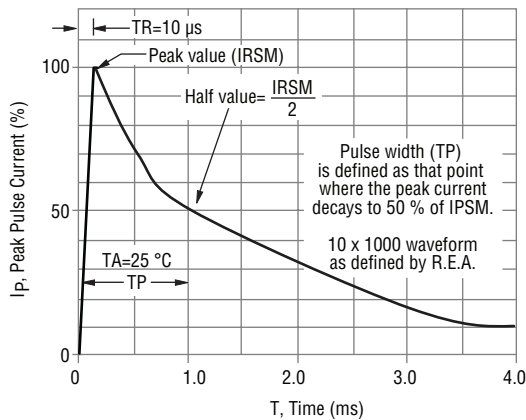
Peak Pulse Power Derating Curve



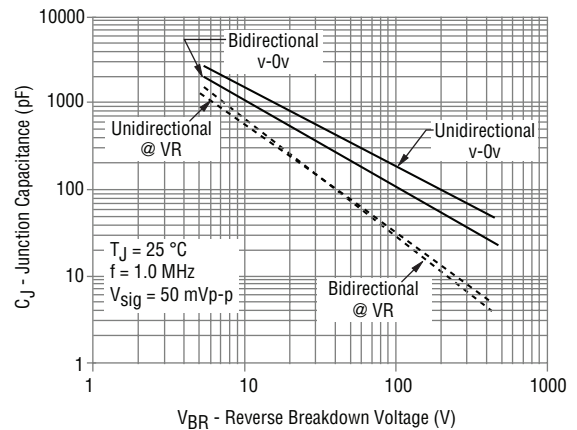
Maximum Non-Repetitive Surge Current



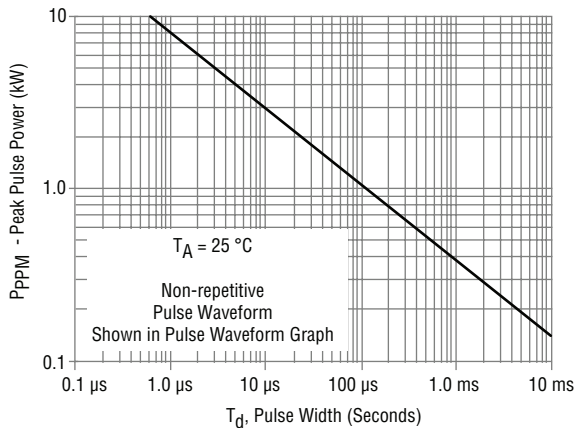
Pulse Waveform



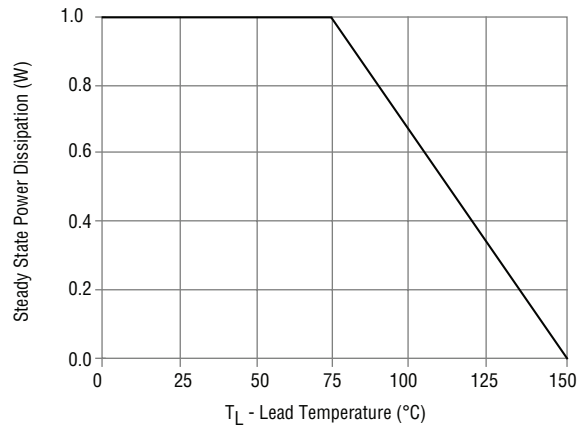
Typical Junction Capacitance



Pulse Rating Curve



Steady State Power Derating Curve

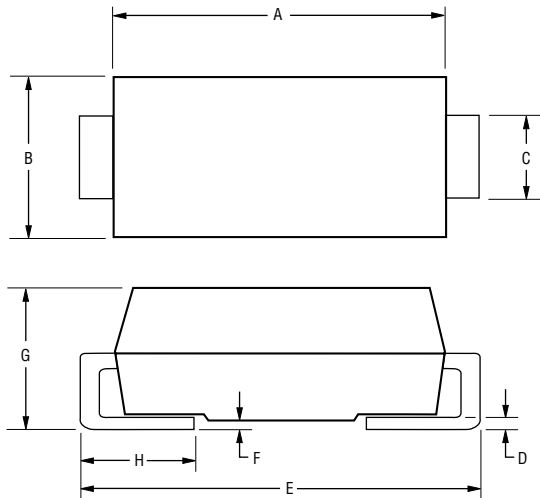


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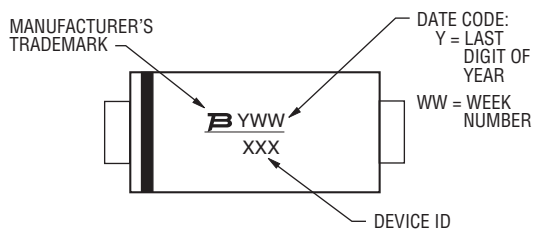
Product Dimensions



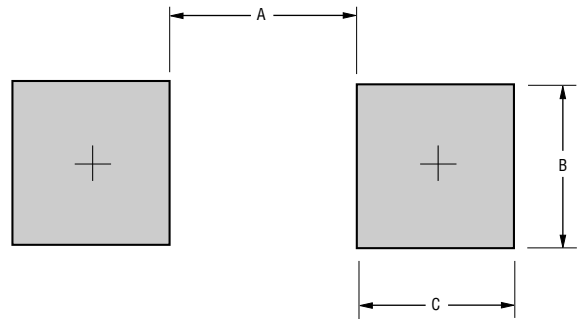
Dimension	SMA (DO-214AC)
A	$\frac{3.99 - 4.50}{(0.157 - 0.157)}$
B	$\frac{2.54 - 2.79}{(0.100 - 0.110)}$
C	$\frac{1.25 - 1.65}{(0.049 - 0.065)}$
D	$\frac{0.15 - 0.31}{(0.006 - 0.112)}$
E	$\frac{4.93 - 5.28}{(0.194 - 0.208)}$
F	$\frac{0.203}{(0.008)}$ MAX.
G	$\frac{1.98 - 2.29}{(0.078 - 0.090)}$
H	$\frac{0.76 - 1.52}{(0.030 - 0.060)}$

DIMENSIONS: $\frac{\text{MM}}{\text{(INCHES)}}$

Typical Part Marking



Recommended Footprint



Dimension	SMA (DO-214AC)
A (Max.)	$\frac{2.70}{(0.106)}$
B (Min.)	$\frac{2.10}{(0.083)}$
C (Min.)	$\frac{1.27}{(0.050)}$

DIMENSIONS: $\frac{\text{MM}}{\text{(INCHES)}}$

Physical Specifications

Case Molded plastic per UL Class 94V-0
 Polarity..... Cathode band indicates unidirectional device
 No cathode band indicates bidirectional device

How to Order

Package **SMAJ 12 CA - Q**
 SMAJ = SMA/DO-214AC
 Working Peak Reverse Voltage
 12 = 12 V_{RWM} (Volts)
 Suffix
 A = 5 % Tolerance Unidirectional Device
 CA = 5 % Tolerance Bidirectional Device
 AEC-Q101 Suffix
 Q = AEC-Q101 Compliant, 13-inch Reel
 QH = AEC-Q101 Compliant, 7-inch Reel

Environmental Specifications

Moisture Sensitivity Level 1
 ESD Classification (HBM)..... 3B

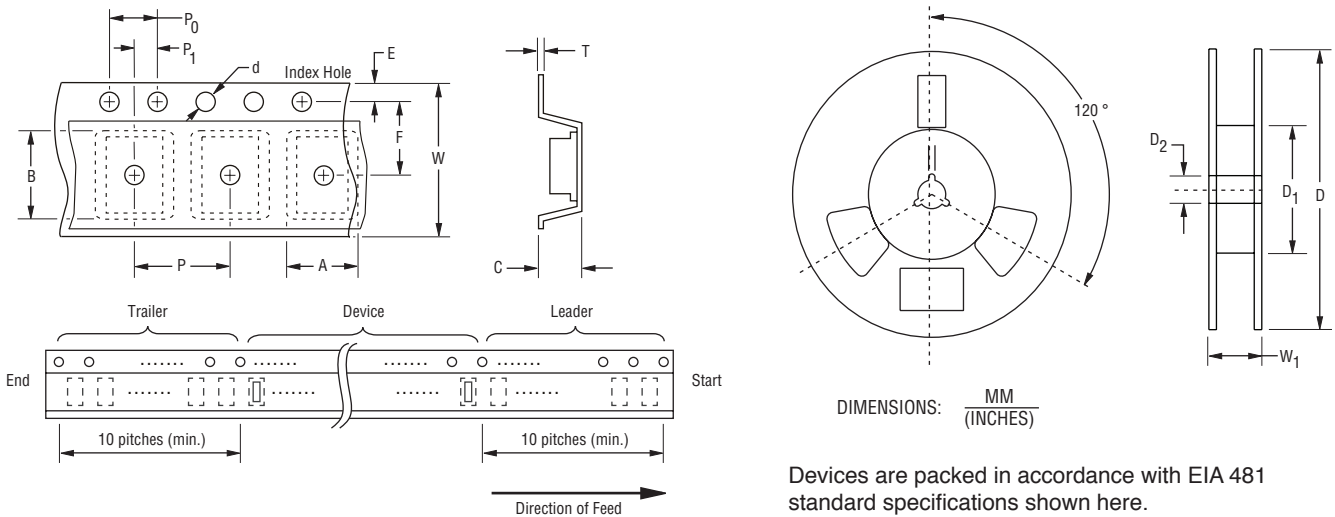
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Packaging Information

The product will be dispensed in tape and reel format (see diagram below).



Item	Symbol	SMA (DO-214AC)	
		7-Inch Reel	13-Inch Reel
Carrier Width	A	$\frac{2.90 \pm 0.20}{(0.114 \pm 0.008)}$	
Carrier Length	B	$\frac{5.50 \pm 0.20}{(0.217 \pm 0.008)}$	
Carrier Depth	C	$\frac{2.26 \pm 0.20}{(0.089 \pm 0.008)}$	
Sprocket Hole	d	$\frac{1.50 \pm 0.10}{(0.061 \pm 0.004)}$	
Reel Outside Diameter	D	$\frac{178}{(7.008)}$	$\frac{330}{(12.992)}$
Reel Inner Diameter	D ₁	$\frac{50.0}{(1.969)}$ MIN.	
Feed Hole Diameter	D ₂	$\frac{13.0 \pm 0.20}{(0.512 \pm 0.008)}$	
Sprocket Hole Position	E	$\frac{1.75 \pm 0.10}{(0.069 \pm 0.004)}$	
Punch Hole Position	F	$\frac{5.50 \pm 0.05}{(0.217 \pm 0.002)}$	
Punch Hole Pitch	P	$\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$	
Sprocket Hole Pitch	P ₀	$\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$	
Embossment Center	P ₁	$\frac{2.00 \pm 0.05}{(0.079 \pm 0.002)}$	
Overall Tape Thickness	T	$\frac{0.30 \pm 0.10}{(0.012 \pm 0.004)}$	
Tape Width	W	$\frac{12.00 \pm 0.30}{(0.472 \pm 0.012)}$	
Reel Width	W ₁	$\frac{18.4}{(0.724)}$ MAX.	
Quantity per Reel	--	1,000	5,000

REV. 02/18

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