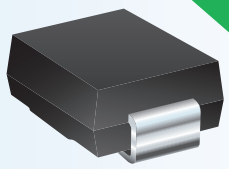
BOURNS®

# SMLJ-R SERIES

## Transient Voltage Suppressor Diodes



*RoHS COMPLIANT

### Features

- Surface mount SMC package
- Standoff voltage: 12 to 30 volts
- Peak pulse power: 3000 watts
- Typical temperature coefficient: $\Delta V_{BR} = 0.1\ \% \times V_{BR} @ 25\ °C \times \Delta T$
- RoHS compliant*

### Applications

- Portable communications
- Computing and video equipment

### Sustainability

- Recyclable ESD-safe packaging
- ISO 14001, low-impact energy
- Responsibly sourced and produced

## Product Overview

Manufacturers of portable communications, computing and video equipment are challenging the semiconductor industry to develop increasingly smaller electronic components.

Bourns offers Transient Voltage Suppressor Diodes for surge and ESD protection applications in compact chip package DO-214AB (SMC) size format. This Transient Voltage Suppressor series offers a choice of Working Peak Reverse Voltage from 12 to 30 V and Breakdown Voltage up to 36.8 V. Typical fast response times are less than 1.0 ps for unidirectional devices and less than 5.0 ps for bidirectional devices from 0 V to Minimum Breakdown Voltage.

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

## Maximum Ratings (@ $T_A$ = 25 °C Unless Otherwise Noted)

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Peak Pulse Power Dissipation ($T_P$ = 1 ms) (Note 1) | $P_{PK}$ | 3000 | Watts |
| Peak Pulse Current with a 10/1000 µs Waveform | $I_{PPM}$ | See Electrical Characteristics Chart | Amps |
| Peak Forward Surge Current (Note 2)<br>8.3 ms Single Half Sine Wave Superimposed on Rated Load (JEDEC Method) (Note 3) | $I_{FSM}$ | 300 | Amps |
| Steady State Power Dissipation @ $T_L$ = 75 °C | $P_{M(AV)}$ | 5.0 | Watts |
| Maximum Instantaneous Forward Voltage @ $I_{PP}$ = 100 A (Note 2) | $V_F$ | 3.5 | Volts |
| 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. Forward surge current and forward voltage are only applicable to unidirectional models.
3. 8.3 ms Single Sine Wave duty cycle = 4 pulses maximum per minute.

## Contact Information

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|---|---|---|
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## How to Order

**SMLJ 12 CA - R**

Package
SMLJ = SMC/DO-214AB

Working Peak Reverse Voltage
12 = 12 $V_{RWM}$ (Volts)
⋮
30 = 30 $V_{RWM}$ (Volts)

Suffix
A = 5 % Tolerance Unidirectional Device
CA = 5 % Tolerance Bidirectional Device

Reel
-R = 3,000 pcs. per 13-inch reel

* RoHS Directive 2015/863, Mar 31, 2015 and Annex.
Specifications are subject to change without notice.
Users should verify actual device performance in their specific applications.

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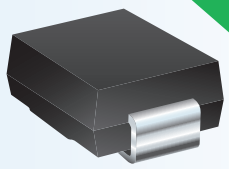

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### Electrical Characteristics (@ $T_A$ = 25 °C Unless Otherwise Noted)

| Unidirectional Device | | Bidirectional Device | | Breakdown Voltage $V_{BR}$ (V) | | | Working Peak Reverse Voltage | Maximum Reverse Leakage @ $V_{RWM}$ | Maximum Clamping Voltage @ $I_{pp}$ (10/1000 µs) | Maximum Peak Pulse Current (10/1000 µs) | Maximum Clamping Voltage @ $I_{pp}$ (8/20 µs) | Maximum Peak Pulse Current (8/20 µs) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Part Number | Part Marking | Part Number | Part Marking | Min. | Max. | @ $I_T$ (mA) | $V_{RWM}$ (V) | $I_R$ (µA) | $V_C$ (V) | $I_{pp}$ (A) | $V_C$ (V) | $I_{pp}$ (A) |
| SMLJ12A-R | HEE | SMLJ12CA-R | IEE | 13.3 | 14.7 | 1 | 12 | 2 | 19.9 | 150.60 | 25.90 | 754.00 |
| SMLJ13A-R | HEG | SMLJ13CA-R | IEG | 14.4 | 15.9 | 1 | 13 | 2 | 21.5 | 139.40 | 28.00 | 697.50 |
| SMLJ14A-R | HEK | SMLJ14CA-R | IEK | 15.6 | 17.2 | 1 | 14 | 2 | 23.2 | 129.40 | 30.20 | 646.50 |
| SMLJ15A-R | HEM | SMLJ15CA-R | IEM | 16.7 | 18.5 | 1 | 15 | 2 | 24.4 | 123.00 | 31.70 | 615.00 |
| SMLJ16A-R | HEP | SMLJ16CA-R | IEP | 17.8 | 19.7 | 1 | 16 | 2 | 26 | 115.40 | 33.80 | 577.00 |
| SMLJ17A-R | HER | SMLJ17CA-R | IER | 18.9 | 20.9 | 1 | 17 | 2 | 27.6 | 106.60 | 35.90 | 543.50 |
| SMLJ18A-R | HET | SMLJ18CA-R | IET | 20.0 | 22.1 | 1 | 18 | 2 | 29.2 | 102.80 | 38.00 | 513.50 |
| SMLJ20A-R | HEV | SMLJ20CA-R | IEV | 22.2 | 24.5 | 1 | 20 | 2 | 32.4 | 92.60 | 42.10 | 463.00 |
| SMLJ22A-R | HEX | – | – | 24.4 | 26.9 | 1 | 22 | 2 | 35.5 | 84.40 | 46.20 | 422.50 |
| SMLJ24A-R | HEZ | – | – | 26.7 | 29.5 | 1 | 24 | 2 | 38.9 | 77.20 | 50.60 | 385.50 |
| SMLJ26A-R | HFE | – | – | 28.9 | 31.9 | 1 | 26 | 2 | 42.1 | 71.20 | 54.70 | 356.50 |
| SMLJ28A-R | HFG | – | – | 31.1 | 34.4 | 1 | 28 | 2 | 45.4 | 66.00 | 59.00 | 330.50 |
| SMLJ30A-R | HFK | – | – | 33.3 | 36.8 | 1 | 30 | 2 | 48.4 | 62.00 | 62.90 | 310.00 |

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

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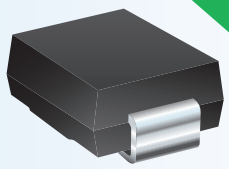

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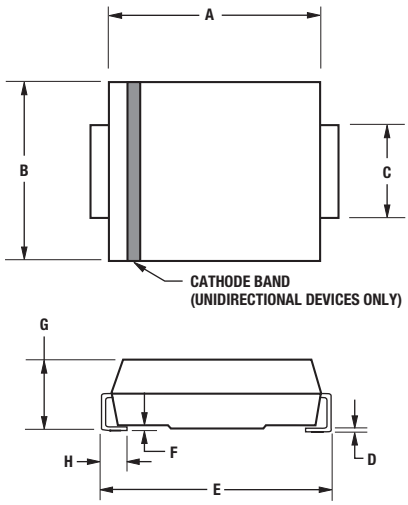
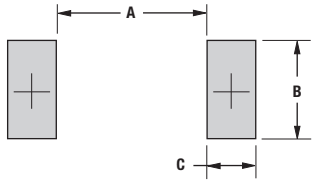
## Product Dimensions




| Dimension | SMC (DO-214AB) |
|---|---|
| A | 6.60 - 7.11<br>(0.260 - 0.280) |
| B | 5.59 - 6.22<br>(0.220 - 0.245) |
| C | 2.90 - 3.20<br>(0.114 - 0.126) |
| D | 0.15 - 0.31<br>(0.006 - 0.012) |
| E | 7.75 - 8.13<br>(0.305 - 0.320) |
| F | 0.05 - 0.20<br>(0.002 - 0.008) |
| G | 2.00 - 2.62<br>(0.079 - 0.103) |
| H | 0.76 - 1.52<br>(0.030 - 0.060) |

DIMENSIONS: MM / (INCHES)

## Recommended Footprint




| Dimension | SMC (DO-214AB) |
|---|---|
| A (Max.) | 4.69<br>(0.185) |
| B (Min.) | 3.07<br>(0.121) |
| C (Min.) | 1.52<br>(0.060) |

DIMENSIONS: MM / (INCHES)

## Physical Specifications

Case ..... Molded plastic per UL Class 94V-0

Polarity ..... Cathode band indicates unidirectional device
No cathode band indicates bidirectional device

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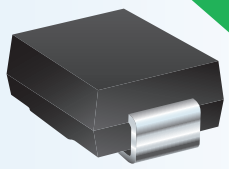

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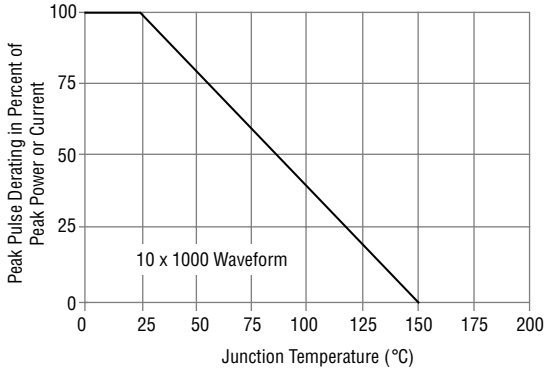
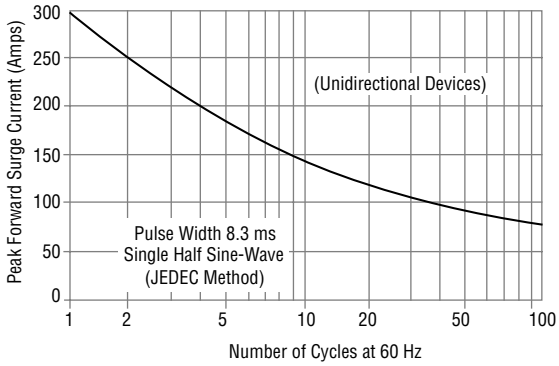
## Rating & Characteristic Curves

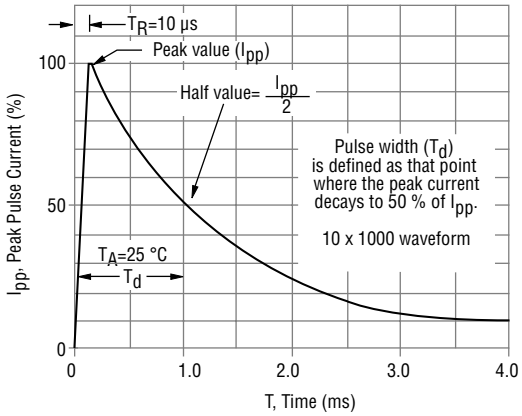
### Pulse Derating Curve



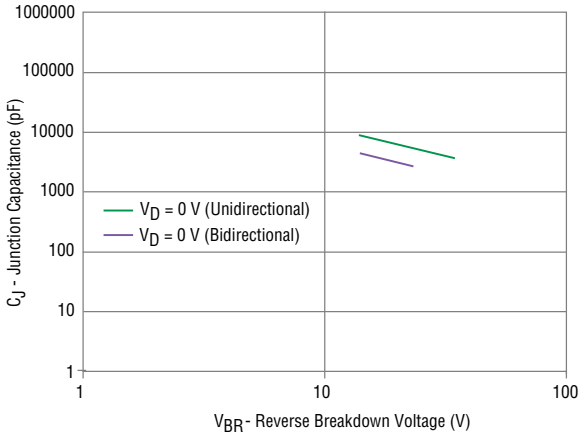

### Maximum Non-Repetitive Surge Current



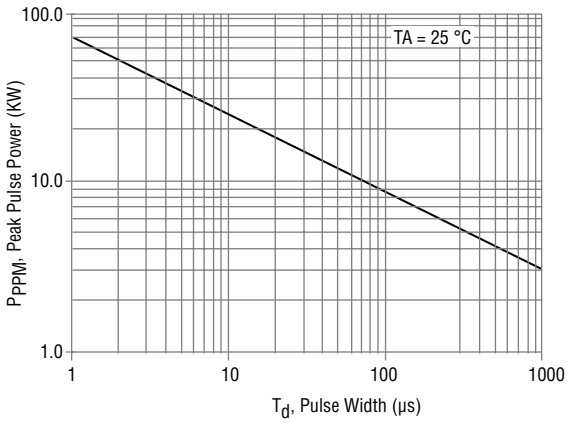

### Pulse Waveform



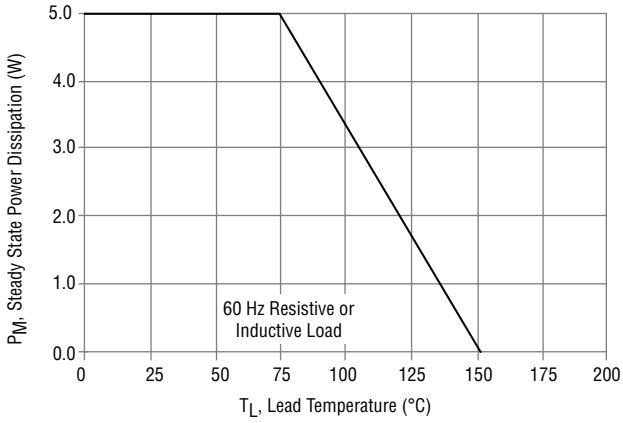

### Typical Junction Capacitance




### Pulse Derating Curve




### Steady State Power Derating Curve



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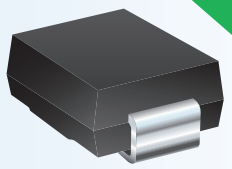

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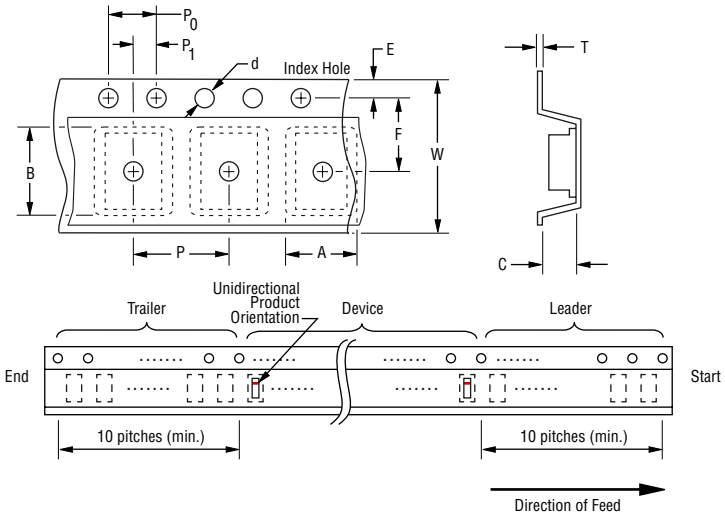
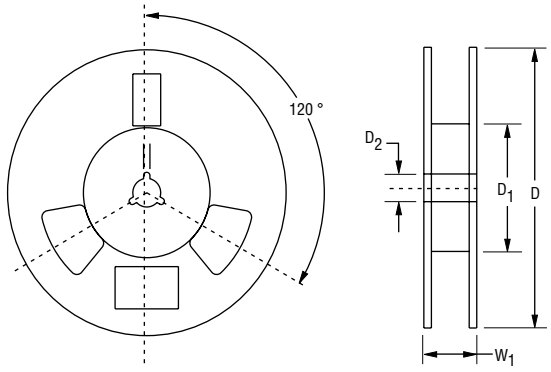
## Packaging Specifications

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




Devices are packed in accordance with EIA standard RS-481-A and specifications shown here.

| Item | Symbol | SMC (DO-214AB) 13-Inch Reel |
|---|---|---|
| Carrier Width | A | 6.0 ± 2.0 (0.236 - 0.079) |
| Carrier Length | B | 8.3 ± 0.20 (0.327 ± 0.008) |
| Carrier Depth | C | 2.5 ± 0.20 (0.098 ± 0.008) |
| Sprocket Hole | d | 1.50 ± 0.10 (0.059 ± 0.004) |
| Reel Outside Diameter | D | 330 (12.992) |
| Reel Inner Diameter | $D_1$ | 50.0 (1.969) MIN. |
| Feed Hole Diameter | $D_2$ | 13.0 +0.50/-0.20 (0.512 +0.020/-0.008) |
| Sprocket Hole Position | E | 1.75 ± 0.10 (0.069 ± 0.004) |
| Punch Hole Position | F | 7.50 ± 0.10 (0.295 ± 0.004) |
| Punch Hole Pitch | P | 8.00 ± 0.10 (0.315 ± 0.004) |
| Sprocket Hole Pitch | $P_0$ | 4.00 ± 0.10 (0.157 ± 0.004) |
| Embossment Center | $P_1$ | 2.00 ± 0.10 (0.079 ± 0.004) |
| Overall Tape Thickness | T | 0.30 ± 0.10 (0.012 ± 0.004) |
| Tape Width | W | 16.00 ± 0.30 (0.630 ± 0.012) |
| Reel Width | $W_1$ | 22.4 (0.882) MAX. |
| Quantity per Reel | -- | 3,000 |

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