



## Features

- RoHS compliant\* and halogen free\*\*
- Surface Mount SMC package
- Breakdown Voltage: 6.8 to 550 volts
- Peak Pulse Power: 1500 watts
- Typical temperature coefficient:  
 $\Delta V_{BR} = 0.1 \% \times V_{BR} @ 25^{\circ}C \times \Delta T$

## Applications

- IEC 61000-4-2 ESD (Min. Level 4)
- IEC 61000-4-4 EFT
- IEC 61000-4-5 Surge

# 1.5SMC Transient Voltage Suppressor Diode Series

## General Information

The markets 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. The Transient Voltage Suppressor series offers a choice of Breakdown Voltages from 6.8 V up to 550 V. Typical fast response times are less than 1.0 picosecond for unidirectional devices and less than 5.0 picoseconds 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.

## Electrical Characteristics (@ $T_A = 25^{\circ}C$ Unless Otherwise Noted)

| Parameter                                                                                                        | Symbol    | Value                                                            | Unit        |
|------------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------------------------------|-------------|
| Minimum Peak Pulse Power Dissipation ( $T_P = 1$ ms) (Note 1,2)                                                  | $P_{PK}$  | 1500                                                             | Watts       |
| Peak Forward Surge Current<br>8.3 ms Single Half Sine Wave Superimposed on Rated Load<br>(JEDEC Method) (Note 3) | $I_{FSM}$ | 200                                                              | Amps        |
| Maximum Instantaneous Forward Voltage @ $I_{PP} = 100$ A<br>(For Unidirectional Units Only)                      | $V_F$     | 1.5SMC6.8A ~ 1.5SMC200A<br>1.5SMC220A ~ 1.5SMC550A<br>3.5<br>5.0 | Volts       |
| Operating Temperature Range                                                                                      | $T_J$     | -55 to +150                                                      | $^{\circ}C$ |
| Storage Temperature Range                                                                                        | $T_{STG}$ | -55 to +150                                                      | $^{\circ}C$ |

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).

# BOURNS®

### Asia-Pacific:

Tel: +886-2 2562-4117

Email: asiacus@bourns.com

### Europe:

Tel: +36 88 520 390

Email: eurocus@bourns.com

### The Americas:

Tel: +1-951 781-5500

Email: americus@bourns.com

[www.bourns.com](http://www.bourns.com)

## How to Order

Series \_\_\_\_\_ 1.5SMC 6.8 CA - H

1.5SMC = SMC/DO-214AB

Breakdown Voltage \_\_\_\_\_  
 6.8 to 550 = 6.8 to 550  $V_{BD}$

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

Reel \_\_\_\_\_  
 (blank) = 13 inch reel  
 -H = 7 inch reel

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

\*\*Bourns considers a product to be "halogen free" if (a) the Bromine (Br) content is 900 ppm or less; (b) the Chlorine (Cl) content is 900 ppm or less; and (c) the total Bromine (Br) and Chlorine (Cl) content is 1500 ppm or less.

Specifications are subject to change without notice.

The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time. Users should verify actual device performance in their specific applications.

# 1.5SMC Transient Voltage Suppressor Diode Series

**BOURNS®**

## Electrical Characteristics (@ $T_A = 25^\circ\text{C}$ 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)                | $I_R$ ( $\mu\text{A}$ )             | $V_{RSM}$ (V)                       | $I_{RSM}$ (A)                 |
| 1.5SMC6.8A            | 6V8A    | 1.5SMC6.8CA          | 6V8C    | 6.45                               | 7.14  | 10           | 5.8                          | 1000                                | 10.5                                | 144.8                         |
| 1.5SMC7.5A            | 7V5A    | 1.5SMC7.5CA          | 7V5C    | 7.13                               | 7.88  | 10           | 6.4                          | 500                                 | 11.3                                | 134.5                         |
| 1.5SMC8.2A            | 8V2A    | 1.5SMC8.2CA          | 8V2C    | 7.79                               | 8.61  | 10           | 7.02                         | 200                                 | 12.1                                | 125.6                         |
| 1.5SMC9.1A            | 9V1A    | 1.5SMC9.1CA          | 9V1C    | 8.65                               | 9.5   | 1            | 7.78                         | 50                                  | 13.4                                | 113.4                         |
| 1.5SMC10A             | 10A     | 1.5SMC10CA           | 10C     | 9.5                                | 10.5  | 1            | 8.55                         | 10                                  | 14.5                                | 104.8                         |
| 1.5SMC11A             | 11A     | 1.5SMC11CA           | 11C     | 10.5                               | 11.6  | 1            | 9.4                          | 5                                   | 15.6                                | 97.4                          |
| 1.5SMC12A             | 12A     | 1.5SMC12CA           | 12C     | 11.4                               | 12.6  | 1            | 10.2                         | 5                                   | 16.7                                | 91                            |
| 1.5SMC13A             | 13A     | 1.5SMC13CA           | 13C     | 12.4                               | 13.7  | 1            | 11.1                         | 1                                   | 18.2                                | 83.5                          |
| 1.5SMC15A             | 15A     | 1.5SMC15CA           | 15C     | 14.3                               | 15.8  | 1            | 12.8                         | 1                                   | 21.2                                | 71.7                          |
| 1.5SMC16A             | 16A     | 1.5SMC16CA           | 16C     | 15.2                               | 16.8  | 1            | 13.6                         | 1                                   | 22.5                                | 67.6                          |
| 1.5SMC18A             | 18A     | 1.5SMC18CA           | 18C     | 17.1                               | 18.9  | 1            | 15.3                         | 1                                   | 25.2                                | 60.3                          |
| 1.5SMC20A             | 20A     | 1.5SMC20CA           | 20C     | 19                                 | 21    | 1            | 17.1                         | 1                                   | 27.7                                | 54.9                          |
| 1.5SMC22A             | 22A     | 1.5SMC22CA           | 22C     | 20.9                               | 23.1  | 1            | 18.8                         | 1                                   | 30.6                                | 49.7                          |
| 1.5SMC24A             | 24A     | 1.5SMC24CA           | 24C     | 22.8                               | 25.2  | 1            | 20.5                         | 1                                   | 33.2                                | 45.8                          |
| 1.5SMC27A             | 27A     | 1.5SMC27CA           | 27C     | 25.7                               | 28.4  | 1            | 23.1                         | 1                                   | 37.5                                | 40.5                          |
| 1.5SMC30A             | 30A     | 1.5SMC30CA           | 30C     | 28.5                               | 31.5  | 1            | 25.6                         | 1                                   | 41.4                                | 36.7                          |
| 1.5SMC33A             | 33A     | 1.5SMC33CA           | 33C     | 31.4                               | 34.7  | 1            | 28.2                         | 1                                   | 45.7                                | 33.3                          |
| 1.5SMC36A             | 36A     | 1.5SMC36CA           | 36C     | 34.2                               | 37.8  | 1            | 30.8                         | 1                                   | 49.9                                | 30.5                          |
| 1.5SMC39A             | 39A     | 1.5SMC39CA           | 39C     | 37.1                               | 41    | 1            | 33.3                         | 1                                   | 53.9                                | 28.2                          |
| 1.5SMC43A             | 43A     | 1.5SMC43CA           | 43C     | 40.9                               | 45.2  | 1            | 36.8                         | 1                                   | 59.3                                | 25.6                          |
| 1.5SMC47A             | 47A     | 1.5SMC47CA           | 47C     | 44.7                               | 49.4  | 1            | 40.2                         | 1                                   | 64.8                                | 23.5                          |
| 1.5SMC51A             | 51A     | 1.5SMC51CA           | 51C     | 48.5                               | 53.6  | 1            | 43.6                         | 1                                   | 70.1                                | 21.7                          |
| 1.5SMC56A             | 56A     | 1.5SMC56CA           | 56C     | 53.2                               | 58.8  | 1            | 47.8                         | 1                                   | 77                                  | 19.7                          |
| 1.5SMC62A             | 62A     | 1.5SMC62CA           | 62C     | 58.9                               | 65.1  | 1            | 53                           | 1                                   | 85                                  | 17.9                          |
| 1.5SMC68A             | 68A     | 1.5SMC68CA           | 68C     | 64.6                               | 71.4  | 1            | 58.1                         | 1                                   | 92                                  | 16.5                          |
| 1.5SMC75A             | 75A     | 1.5SMC75CA           | 75C     | 71.3                               | 78.8  | 1            | 64.1                         | 1                                   | 103                                 | 14.8                          |
| 1.5SMC82A             | 82A     | 1.5SMC82CA           | 82C     | 77.9                               | 86.1  | 1            | 70.1                         | 1                                   | 113                                 | 13.5                          |
| 1.5SMC91A             | 91A     | 1.5SMC91CA           | 91C     | 86.5                               | 95.5  | 1            | 77.8                         | 1                                   | 125                                 | 12.2                          |
| 1.5SMC100A            | 100A    | 1.5SMC100CA          | 100C    | 95                                 | 105   | 1            | 85.5                         | 1                                   | 137                                 | 11.1                          |
| 1.5SMC110A            | 110A    | 1.5SMC110CA          | 110C    | 105                                | 116   | 1            | 94                           | 1                                   | 152                                 | 10                            |
| 1.5SMC120A            | 120A    | 1.5SMC120CA          | 120C    | 114                                | 126   | 1            | 102                          | 1                                   | 165                                 | 9.2                           |
| 1.5SMC130A            | 130A    | 1.5SMC130CA          | 130C    | 124                                | 137   | 1            | 111                          | 1                                   | 179                                 | 8.5                           |
| 1.5SMC150A            | 150A    | 1.5SMC150CA          | 150C    | 143                                | 158   | 1            | 128                          | 1                                   | 207                                 | 7.3                           |
| 1.5SMC160A            | 160A    | 1.5SMC160CA          | 160C    | 152                                | 168   | 1            | 136                          | 1                                   | 219                                 | 6.9                           |
| 1.5SMC170A            | 170A    | 1.5SMC170CA          | 170C    | 162                                | 179   | 1            | 145                          | 1                                   | 234                                 | 6.5                           |
| 1.5SMC180A            | 180A    | 1.5SMC180CA          | 180C    | 171                                | 189   | 1            | 154                          | 1                                   | 246                                 | 6.2                           |
| 1.5SMC200A            | 200A    | 1.5SMC200CA          | 200C    | 190                                | 210   | 1            | 171                          | 1                                   | 274                                 | 5.5                           |
| 1.5SMC220A            | 220A    | 1.5SMC220CA          | 220C    | 209                                | 231   | 1            | 185                          | 1                                   | 328                                 | 4.6                           |
| 1.5SMC250A            | 250A    | 1.5SMC250CA          | 250C    | 237                                | 263   | 1            | 214                          | 1                                   | 344                                 | 4.4                           |
| 1.5SMC300A            | 300A    | 1.5SMC300CA          | 300C    | 285                                | 315   | 1            | 256                          | 1                                   | 414                                 | 3.7                           |
| 1.5SMC350A            | 350A    | 1.5SMC350CA          | 350C    | 332                                | 368   | 1            | 300                          | 1                                   | 482                                 | 3.2                           |
| 1.5SMC400A            | 400A    | 1.5SMC400CA          | 400C    | 380                                | 420   | 1            | 342                          | 1                                   | 548                                 | 2.8                           |
| 1.5SMC440A            | 440A    | 1.5SMC440CA          | 440C    | 418                                | 462   | 1            | 376                          | 1                                   | 602                                 | 2.5                           |
| 1.5SMC480A            | 480A    | 1.5SMC480CA          | 480C    | 456                                | 504   | 1            | 408                          | 1                                   | 658                                 | 2.3                           |
| 1.5SMC510A            | 510A    | 1.5SMC510CA          | 510C    | 485                                | 535   | 1            | 434                          | 1                                   | 698                                 | 2.1                           |
| 1.5SMC530A            | 530A    | 1.5SMC530CA          | 530C    | 503.5                              | 556.5 | 1            | 477                          | 1                                   | 725                                 | 2.1                           |
| 1.5SMC540A            | 540A    | 1.5SMC540CA          | 540C    | 513                                | 567   | 1            | 486                          | 1                                   | 740                                 | 2                             |
| 1.5SMC550A            | 550A    | 1.5SMC550CA          | 550C    | 522.5                              | 577.5 | 1            | 495                          | 1                                   | 760                                 | 2                             |

### Notes:

- Suffix 'A' denotes a 5 % tolerance unidirectional device.
- Suffix 'CA' denotes a 5 % tolerance bidirectional device.
- For bidirectional devices with a  $V_R$  of 10 volts or less, the  $I_R$  limit is double.

Specifications are subject to change without notice.

The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time.

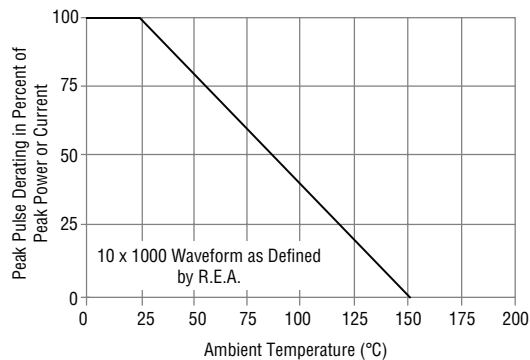
Users should verify actual device performance in their specific applications.

# 1.5SMC Transient Voltage Suppressor Diode Series

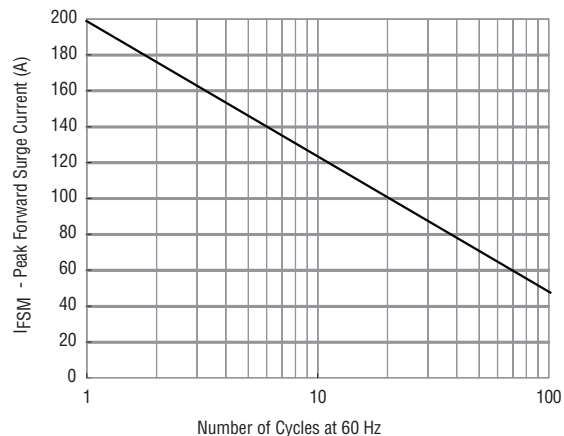
**BOURNS®**

## Rating & Characteristic Curves

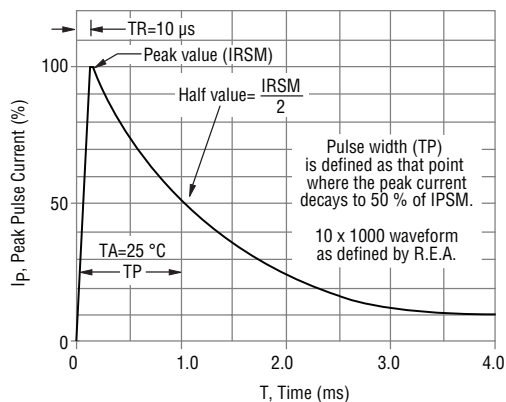
### Pulse Derating Curve



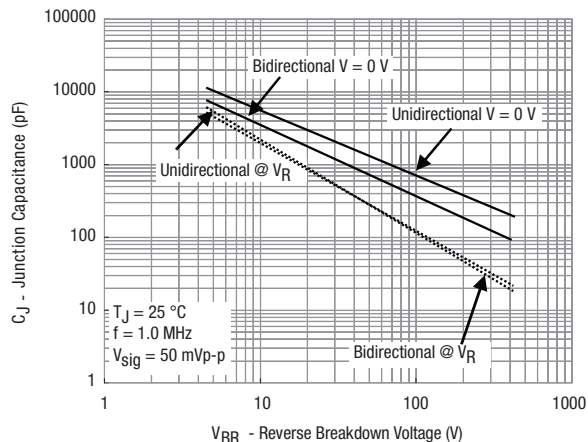
### Maximum Non-Repetitive Surge Current



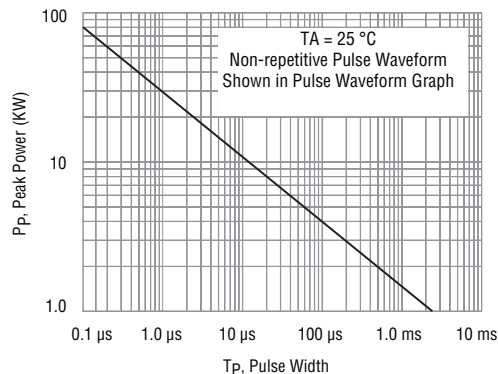
### Pulse Waveform



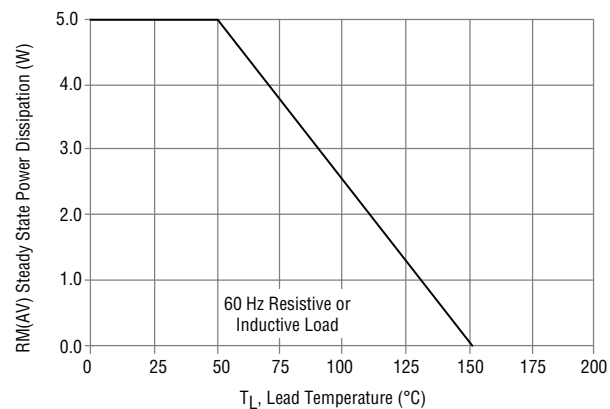
### Typical Junction Capacitance



### Pulse Rating Curve



### Steady State Power Derating Curve



Specifications are subject to change without notice.

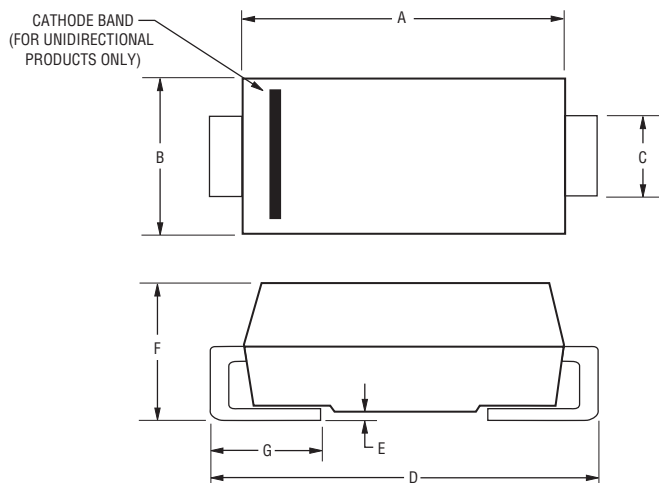
The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time.

Users should verify actual device performance in their specific applications.

# 1.5SMC Transient Voltage Suppressor Diode Series

**BOURNS®**

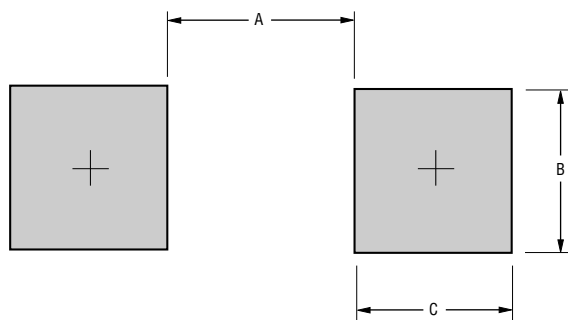
## Product Dimensions



| Dimension | SMC (DO-214AB)                         |
|-----------|----------------------------------------|
| A         | $\frac{6.60 - 7.11}{(0.260 - 0.280)}$  |
| B         | $\frac{5.59 - 6.22}{(0.220 - 0.245)}$  |
| C         | $\frac{2.90 - 3.20}{(0.115 - 0.125)}$  |
| D         | $\frac{7.75 - 8.13}{(0.305 - 0.320)}$  |
| E         | $\frac{0.05 - 0.202}{(0.002 - 0.008)}$ |
| F         | $\frac{2.00 - 2.62}{(0.079 - 0.103)}$  |
| G         | $\frac{0.76 - 1.52}{(0.030 - 0.060)}$  |

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

## Recommended Footprint



| Dimension | SMC (DO-214AB)         |
|-----------|------------------------|
| a (Max.)  | $\frac{4.69}{(0.185)}$ |
| b (Min.)  | $\frac{3.07}{(0.121)}$ |
| c (Min.)  | $\frac{1.52}{(0.060)}$ |

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

## Environmental Specifications

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

Specifications are subject to change without notice.

The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time.

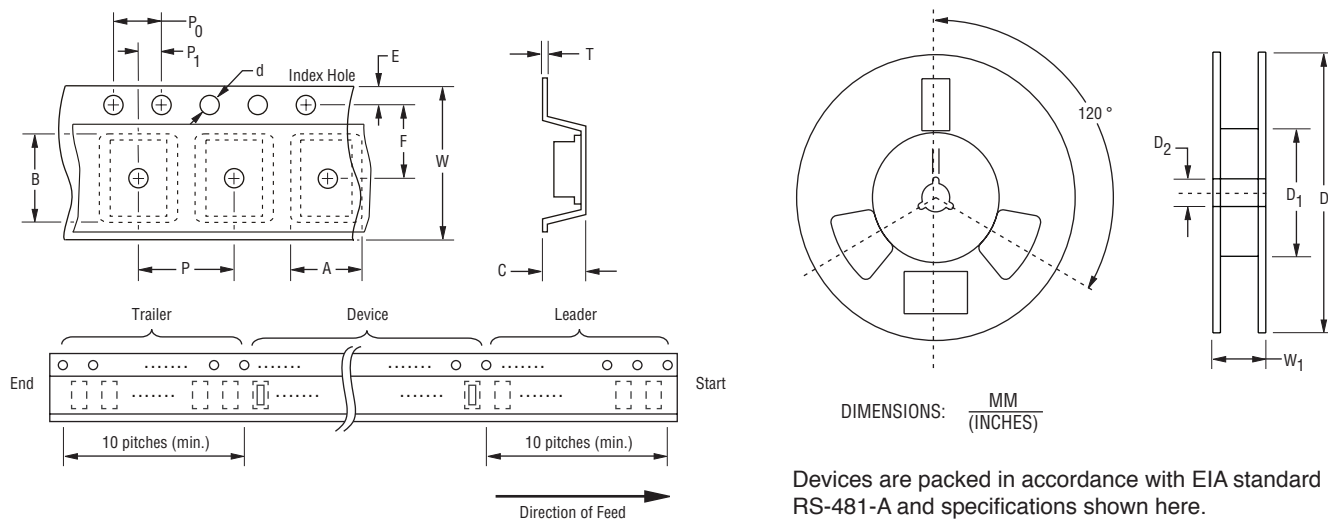
Users should verify actual device performance in their specific applications.

# 1.5SMC Transient Voltage Suppressor Diode Series

**BOURNS®**

## Packaging Information

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



| Item                   | Symbol         | SMC (DO-214AB)                                     |                        |
|------------------------|----------------|----------------------------------------------------|------------------------|
|                        |                | 7 Inch Reel                                        | 13 Inch Reel           |
| Carrier Width          | A              | $6.0 \pm 2.0$<br>(0.236 - 0.079)                   |                        |
| Carrier Length         | B              | $8.3 \pm 0.20$<br>(0.327 ± 0.008)                  |                        |
| Carrier Depth          | C              | $2.5 \pm 0.20$<br>(0.098 ± 0.008)                  |                        |
| Sprocket Hole          | d              | $1.50 \pm 0.10$<br>(0.059 ± 0.004)                 |                        |
| Reel Outside Diameter  | D              | $\frac{178}{(7.008)}$                              | $\frac{330}{(12.992)}$ |
| Reel Inner Diameter    | D <sub>1</sub> | $\frac{50.0}{(1.969)}$ MIN.                        |                        |
| Feed Hole Diameter     | D <sub>2</sub> | $\frac{13.0 + 0.50/-0.20}{(0.512 + 0.020/-0.008)}$ |                        |
| Sprocket Hole Position | E              | $1.75 \pm 0.10$<br>(0.069 ± 0.004)                 |                        |
| Punch Hole Position    | F              | $7.50 \pm 0.10$<br>(0.295 ± 0.004)                 |                        |
| Punch Hole Pitch       | P              | $8.00 \pm 0.10$<br>(0.315 ± 0.004)                 |                        |
| Sprocket Hole Pitch    | P <sub>0</sub> | $4.00 \pm 0.10$<br>(0.157 ± 0.004)                 |                        |
| Embossment Center      | P <sub>1</sub> | $2.00 \pm 0.10$<br>(0.079 ± 0.004)                 |                        |
| Overall Tape Thickness | T              | $0.30 \pm 0.10$<br>(0.012 ± 0.004)                 |                        |
| Tape Width             | W              | $16.00 \pm 0.30$<br>(0.630 ± 0.012)                |                        |
| Reel Width             | W <sub>1</sub> | $\frac{22.4}{(0.882)}$ MAX.                        |                        |
| Quantity per Reel      | --             | 500                                                | 3,000                  |

REV. 07/17

Specifications are subject to change without notice.

The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time.

Users should verify actual device performance in their specific applications.

Компания «Life Electronics» занимается поставками электронных компонентов импортного и отечественного производства от производителей и со складов крупных дистрибьюторов Европы, Америки и Азии.

С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

Мы предлагаем:

- Конкурентоспособные цены и скидки постоянным клиентам.
- Специальные условия для постоянных клиентов.
- Подбор аналогов.
- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
- Приемлемые сроки поставки, возможна ускоренная поставка.
- Доставку товара в любую точку России и стран СНГ.
- Комплексную поставку.
- Работу по проектам и поставку образцов.
- Формирование склада под заказчика.
- Сертификаты соответствия на поставляемую продукцию (по желанию клиента).
- Тестирование поставляемой продукции.
- Поставку компонентов, требующих военную и космическую приемку.
- Входной контроль качества.
- Наличие сертификата ISO.

В составе нашей компании организован Конструкторский отдел, призванный помогать разработчикам, и инженерам.

Конструкторский отдел помогает осуществить:

- Регистрацию проекта у производителя компонентов.
- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



Тел: +7 (812) 336 43 04 (многоканальный)

Email: [org@lifeelectronics.ru](mailto:org@lifeelectronics.ru)

[www.lifeelectronics.ru](http://www.lifeelectronics.ru)