




Features

- RoHS compliant* and halogen free**
- Surface mount SMC package
- Standoff voltage: 5 to 170 volts
- Peak Pulse Power: 5000 watts
- AEC-Q101 compliant***
- UL Recognized 

Applications

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

5.0SMDJ-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-214AB (SMC) size format. The Transient Voltage Suppressor series offers a choice of Working Peak Reverse Voltage from 5 V up to 170 V and Breakdown Voltage up to 189 V. Typical fast response times are less than 1.0 ps 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.

Additional Information

Click these links for more information:



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Agency Recognition

| Description | |
|-------------|--------------------------------------|
| UL | File Number: E153537 |

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} | 5000 | Watts |
| Peak Forward Surge Current 8.3 ms Single Half Sine Wave Superimposed on Rated Load (JEDEC Method) (Note 3,4) | I _{FSM} | 300 | Amps |
| Steady State Power Dissipation @ TL = 50 °C | P _{M(AV)} | 6.5 | Watts |
| Maximum Instantaneous Forward Voltage @ I _{PP} = 100 A (For Unidirectional Units Only) | V _F | 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. Thermal Resistance Junction to Lead.
3. 8.3 ms Single Sine Wave duty cycle = 4 pulses maximum per minute (unidirectional units only).
4. Mounted on 8.0 mm x 8.0 mm copper pad area to each terminal.

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How to Order

5.0SMDJ 12 CA - Q

Package _____
5.0SMDJ = SMC/DO-214AB

Working Peak Reverse Voltage _____
12 = 12 V_{RWM} (Volts)

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

AEC-Q101 Compliant Suffix _____
Q = AEC-Q101 Compliant, 3000 pcs. per 13-inch Reel
QH = AEC-Q101 Compliant, 500 pcs. per 7-inch Reel



WARNING Cancer and Reproductive Harm - www.P65Warnings.ca.gov

* RoHS Directive 2015/863, Mar 31, 2015 and Annex.

** 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.

*** Q suffix for automotive and other applications requiring appropriate AEC-Q101 compliance for electronic limiters.

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5.0SMDJ-Q Transient Voltage Suppressor Diode Series

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

| Unidirectional Device | | Bidirectional Device | | Breakdown Voltage V _{BR} (Volts) | | | Reverse Standoff Voltage | Max. Reverse Leakage @ V _{RWM} | Max. Clamping Voltage @ I _{pp} (10/1000 μs) | Max. Peak Pulse Current (10/1000 μs) | Max. Clamping Voltage @ I _{pp} (8/20 μs) | Max. 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) |
| 5.0SMDJ5.0A-Q | 5RDEQ | 5.0SMDJ5.0CA-Q | 5DDEQ | 6.40 | 7.00 | 10 | 5.0 | 1050 | 9.2 | 543.6 | 12.0 | 4077.0 |
| 5.0SMDJ6.0A-Q | 5RDGQ | 5.0SMDJ6.0CA-Q | 5DDGQ | 6.67 | 7.37 | 10 | 6.0 | 1050 | 10.3 | 485.5 | 13.4 | 3641.3 |
| 5.0SMDJ6.5A-Q | 5RDKQ | 5.0SMDJ6.5CA-Q | 5DDKQ | 7.22 | 7.98 | 10 | 6.5 | 750 | 11.2 | 446.5 | 14.6 | 3348.8 |
| 5.0SMDJ7.0A-Q | 5PDMQ | 5.0SMDJ7.0CA-Q | 5DDMQ | 7.78 | 8.60 | 10 | 7.0 | 300 | 12.0 | 416.8 | 15.6 | 3126.0 |
| 5.0SMDJ7.5A-Q | 5PDPQ | 5.0SMDJ7.5CA-Q | 5DDPQ | 8.33 | 9.21 | 1 | 7.5 | 150 | 12.9 | 387.7 | 16.8 | 2907.8 |
| 5.0SMDJ8.0A-Q | 5PDRQ | 5.0SMDJ8.0CA-Q | 5DDRQ | 8.89 | 9.83 | 1 | 8.0 | 70 | 13.6 | 367.7 | 17.7 | 2757.8 |
| 5.0SMDJ8.5A-Q | 5PDTQ | 5.0SMDJ8.5CA-Q | 5DDTQ | 9.44 | 10.40 | 1 | 8.5 | 30 | 14.4 | 347.3 | 18.7 | 2604.8 |
| 5.0SMDJ9.0A-Q | 5PDVQ | 5.0SMDJ9.0CA-Q | 5DDVQ | 10.00 | 11.10 | 1 | 9.0 | 12 | 15.4 | 324.8 | 20.0 | 2436.0 |
| 5.0SMDJ10A-Q | 5PDXQ | 5.0SMDJ10CA-Q | 5DDXQ | 11.10 | 12.30 | 1 | 10.0 | 6 | 17.0 | 294.2 | 22.1 | 2206.5 |
| 5.0SMDJ11A-Q | 5PDZQ | 5.0SMDJ11CA-Q | 5DDZQ | 12.20 | 13.50 | 1 | 11.0 | 2 | 18.2 | 274.8 | 23.7 | 2061.0 |
| 5.0SMDJ12A-Q | 5PEPQ | 5.0SMDJ12CA-Q | 5BEPQ | 13.30 | 14.70 | 1 | 12.0 | 2 | 19.9 | 252.0 | 25.9 | 1890.0 |
| 5.0SMDJ13A-Q | 5PEQQ | 5.0SMDJ13CA-Q | 5BEQQ | 14.40 | 15.90 | 1 | 13.0 | 2 | 21.5 | 233.0 | 28.0 | 1747.5 |
| 5.0SMDJ14A-Q | 5PERQ | 5.0SMDJ14CA-Q | 5BERQ | 15.60 | 17.20 | 1 | 14.0 | 2 | 23.2 | 216.0 | 30.2 | 1620.0 |
| 5.0SMDJ15A-Q | 5PESQ | 5.0SMDJ15CA-Q | 5BESQ | 16.70 | 18.50 | 1 | 15.0 | 2 | 24.4 | 205.0 | 31.7 | 1537.5 |
| 5.0SMDJ16A-Q | 5PETQ | 5.0SMDJ16CA-Q | 5BETQ | 17.80 | 19.70 | 1 | 16.0 | 2 | 26.0 | 193.0 | 33.8 | 1447.5 |
| 5.0SMDJ17A-Q | 5PEUQ | 5.0SMDJ17CA-Q | 5BEUQ | 18.90 | 20.90 | 1 | 17.0 | 2 | 27.6 | 181.0 | 35.9 | 1357.5 |
| 5.0SMDJ18A-Q | 5PEVQ | 5.0SMDJ18CA-Q | 5BEVQ | 20.00 | 22.10 | 1 | 18.0 | 2 | 29.2 | 172.0 | 38.0 | 1290.0 |
| 5.0SMDJ20A-Q | 5PEWQ | 5.0SMDJ20CA-Q | 5BEWQ | 22.20 | 24.50 | 1 | 20.0 | 2 | 32.4 | 155.0 | 42.1 | 1162.5 |
| 5.0SMDJ22A-Q | 5PEXQ | 5.0SMDJ22CA-Q | 5BEXQ | 24.40 | 26.90 | 1 | 22.0 | 2 | 35.5 | 141.0 | 46.2 | 1057.5 |
| 5.0SMDJ24A-Q | 5PEZQ | 5.0SMDJ24CA-Q | 5BEZQ | 26.70 | 29.50 | 1 | 24.0 | 2 | 38.9 | 129.0 | 50.6 | 967.5 |
| 5.0SMDJ26A-Q | 5PFEQ | 5.0SMDJ26CA-Q | 5BFEQ | 28.90 | 31.90 | 1 | 26.0 | 2 | 42.1 | 119.0 | 54.7 | 892.5 |
| 5.0SMDJ28A-Q | 5PFGQ | 5.0SMDJ28CA-Q | 5BFGQ | 31.10 | 34.40 | 1 | 28.0 | 2 | 45.4 | 110.0 | 59.0 | 825.0 |
| 5.0SMDJ30A-Q | 5PFKQ | 5.0SMDJ30CA-Q | 5BFKQ | 33.30 | 36.80 | 1 | 30.0 | 2 | 48.4 | 103.0 | 62.9 | 772.5 |
| 5.0SMDJ33A-Q | 5PFMQ | 5.0SMDJ33CA-Q | 5BFMQ | 36.70 | 40.60 | 1 | 33.0 | 2 | 53.3 | 93.9 | 69.3 | 704.3 |
| 5.0SMDJ36A-Q | 5PFPQ | 5.0SMDJ36CA-Q | 5BFPPQ | 40.00 | 44.20 | 1 | 36.0 | 2 | 58.1 | 86.1 | 75.5 | 645.8 |
| 5.0SMDJ40A-Q | 5PFRQ | 5.0SMDJ40CA-Q | 5BFRQ | 44.40 | 49.10 | 1 | 40.0 | 2 | 64.5 | 77.6 | 83.9 | 582.0 |
| 5.0SMDJ43A-Q | 5PFTQ | 5.0SMDJ43CA-Q | 5BFTQ | 47.80 | 52.80 | 1 | 43.0 | 2 | 69.4 | 72.1 | 90.2 | 540.8 |
| 5.0SMDJ45A-Q | 5PFVQ | 5.0SMDJ45CA-Q | 5BFVQ | 50.00 | 55.30 | 1 | 45.0 | 2 | 72.7 | 68.8 | 94.5 | 516.0 |
| 5.0SMDJ48A-Q | 5PFXQ | 5.0SMDJ48CA-Q | 5BFXQ | 53.30 | 58.90 | 1 | 48.0 | 2 | 77.4 | 64.7 | 100.6 | 485.3 |
| 5.0SMDJ51A-Q | 5PFZQ | 5.0SMDJ51CA-Q | 5BFZQ | 56.70 | 62.70 | 1 | 51.0 | 2 | 82.4 | 60.7 | 107.1 | 455.3 |
| 5.0SMDJ54A-Q | 5RGEQ | 5.0SMDJ54CA-Q | 5BGEQ | 60.00 | 66.30 | 1 | 54.0 | 2 | 87.1 | 57.5 | 113.2 | 431.3 |
| 5.0SMDJ58A-Q | 5PGGQ | 5.0SMDJ58CA-Q | 5BGGQ | 64.40 | 71.20 | 1 | 58.0 | 2 | 93.6 | 53.5 | 121.7 | 401.3 |
| 5.0SMDJ60A-Q | 5PGKQ | 5.0SMDJ60CA-Q | 5BGKQ | 66.70 | 73.70 | 1 | 60.0 | 2 | 96.8 | 51.7 | 125.8 | 387.8 |
| 5.0SMDJ64A-Q | 5PGMQ | 5.0SMDJ64CA-Q | 5BGMQ | 71.10 | 78.60 | 1 | 64.0 | 2 | 103.0 | 48.6 | 133.9 | 364.5 |
| 5.0SMDJ70A-Q | 5PGPQ | 5.0SMDJ70CA-Q | 5BGPQ | 77.80 | 86.00 | 1 | 70.0 | 2 | 113.0 | 44.3 | 146.9 | 332.3 |
| 5.0SMDJ75A-Q | 5PGRQ | 5.0SMDJ75CA-Q | 5BGRQ | 83.30 | 92.10 | 1 | 75.0 | 2 | 121.0 | 41.4 | 157.3 | 310.5 |
| 5.0SMDJ78A-Q | 5PGTQ | 5.0SMDJ78CA-Q | 5BGTQ | 86.70 | 95.80 | 1 | 78.0 | 2 | 126.0 | 39.7 | 163.8 | 297.8 |
| 5.0SMDJ85A-Q | 5PGVQ | 5.0SMDJ85CA-Q | 5BGVQ | 94.40 | 104.00 | 1 | 85.0 | 2 | 137.0 | 36.5 | 178.1 | 273.8 |

Continued on next page

Note:

- 'Q' suffix denotes AEC-Q101 compliance.

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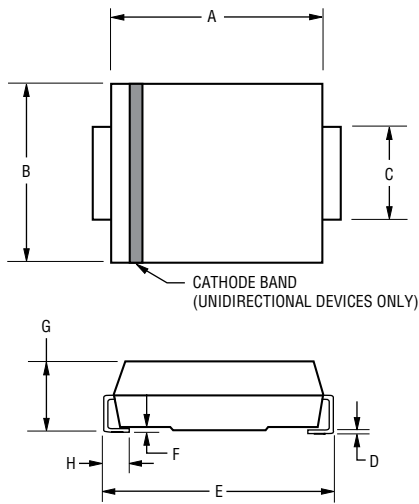
5.0SMDJ-Q Transient Voltage Suppressor Diode Series



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

| Unidirectional Device | | Bidirectional Device | | Breakdown Voltage V _{BR} (Volts) | | | Reverse Standoff Voltage | Maximum Reverse Leakage @ V _{RWM} | Max. Clamping Voltage @ I _{pp} (10/1000 μs) | Max. Peak Pulse Current (10/1000 μs) | Max. Clamping Voltage @ I _{pp} (8/20 μs) | Max. 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) |
| 5.0SMDJ90A-Q | 5PGXQ | | | 100.00 | 111.00 | 1 | 90.0 | 2 | 146.0 | 34.3 | 189.8 | 257.3 |
| 5.0SMDJ100A-Q | 5PGZQ | | | 111.00 | 123.00 | 1 | 100.0 | 2 | 162.0 | 30.9 | 210.6 | 231.8 |
| 5.0SMDJ110A-Q | 5PHEQ | | | 122.00 | 135.00 | 1 | 110.0 | 2 | 177.0 | 28.3 | 230.1 | 212.3 |
| 5.0SMDJ120A-Q | 5PHGQ | | | 133.00 | 147.00 | 1 | 120.0 | 2 | 193.0 | 26.0 | 250.9 | 195.0 |
| 5.0SMDJ130A-Q | 5PHKQ | | | 144.00 | 159.00 | 1 | 130.0 | 2 | 209.0 | 24.0 | 271.7 | 180.0 |
| 5.0SMDJ150A-Q | 5PHMQ | | | 167.00 | 185.00 | 1 | 150.0 | 2 | 243.0 | 20.6 | 315.9 | 154.5 |
| 5.0SMDJ160A-Q | 5PHPQ | | | 178.00 | 197.00 | 1 | 160.0 | 2 | 259.0 | 19.3 | 336.7 | 144.8 |
| 5.0SMDJ170A-Q | 5PHRQ | | | 189.00 | 209.00 | 1 | 170.0 | 2 | 275.0 | 18.2 | 357.5 | 136.5 |

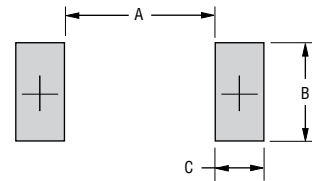
Product Dimensions



| 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 | $\frac{2.90 - 3.20}{(0.114 - 0.126)}$ |
| D | $\frac{0.15 - 0.31}{(0.006 - 0.012)}$ |
| E | $\frac{7.75 - 8.13}{(0.305 - 0.320)}$ |
| F | $\frac{0.20}{(0.008)}$ MAX. |
| G | $\frac{2.01 - 2.62}{(0.080 - 0.103)}$ |
| H | $\frac{0.76 - 1.52}{(0.030 - 0.060)}$ |

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.) | $\frac{1.53}{(0.060)}$ |

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

Physical Specifications

Encapsulation 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

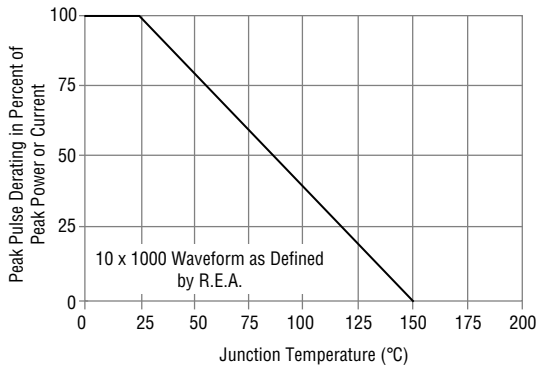
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5.0SMDJ-Q Transient Voltage Suppressor Diode Series

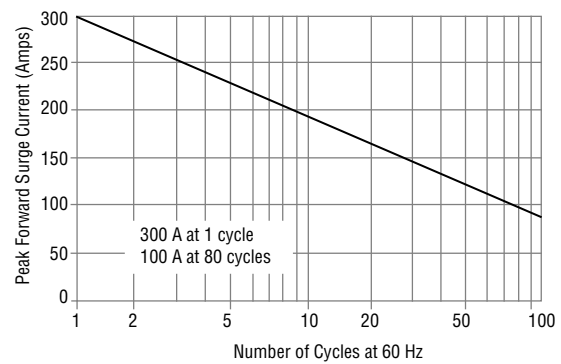


Rating & Characteristic Curves

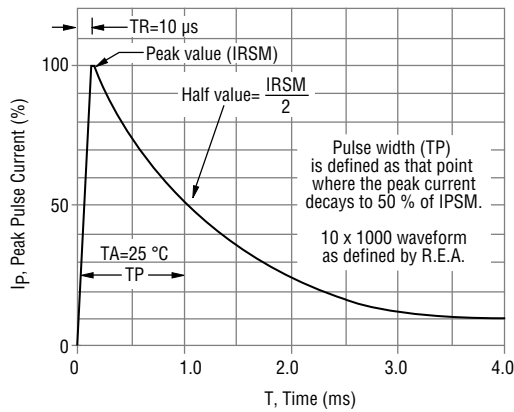
Pulse Derating Curve



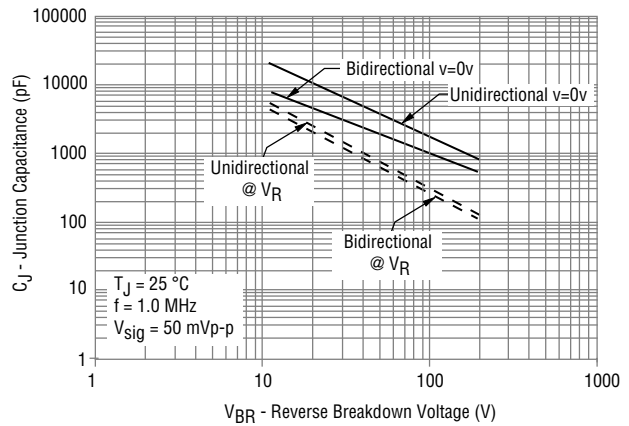
Maximum Non-Repetitive Surge Current



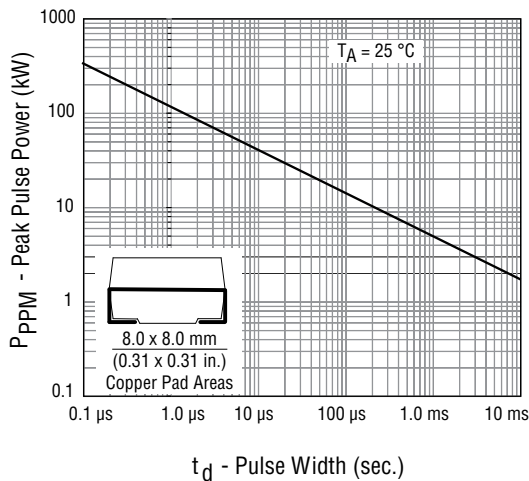
Pulse Waveform



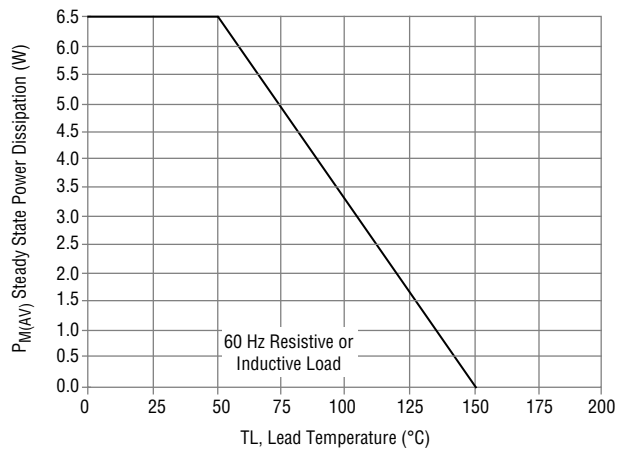
Typical Junction Capacitance



Pulse Rating Curve



Steady State Power Derating Curve



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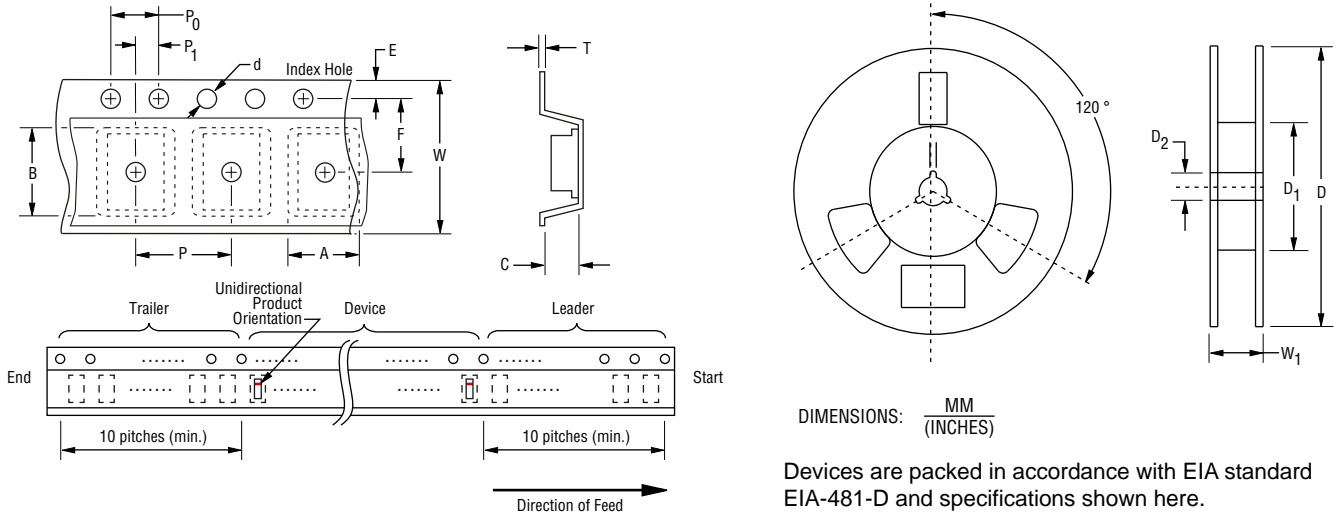
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5.0SMDJ-Q Transient Voltage Suppressor Diode Series

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 | $\frac{6.0 \pm 0.20}{(0.236 \pm 0.079)}$ | |
| Carrier Length | B | $\frac{8.3 \pm 0.20}{(0.327 \pm 0.008)}$ | |
| Carrier Depth | C | $\frac{2.5 \pm 0.20}{(0.098 \pm 0.008)}$ | |
| Sprocket Hole | d | $\frac{1.50 \pm 0.10}{(0.059 \pm 0.004)}$ | |
| 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 | $\frac{13.0 + 0.50/-0.20}{(0.512 + 0.020/-0.008)}$ | |
| Sprocket Hole Position | E | $\frac{1.75 \pm 0.10}{(0.069 \pm 0.004)}$ | |
| Punch Hole Position | F | $\frac{7.50 \pm 0.10}{(0.295 \pm 0.004)}$ | |
| Punch Hole Pitch | P | $\frac{8.00 \pm 0.10}{(0.315 \pm 0.004)}$ | |
| Sprocket Hole Pitch | P ₀ | $\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$ | |
| Embossment Center | P ₁ | $\frac{2.00 \pm 0.10}{(0.079 \pm 0.004)}$ | |
| Overall Tape Thickness | T | $\frac{0.30 \pm 0.10}{(0.012 \pm 0.004)}$ | |
| Tape Width | W | $\frac{16.00 \pm 0.30}{(0.630 \pm 0.012)}$ | |
| Reel Width | W ₁ | $\frac{22.4}{(0.882)}$ MAX. | |
| Quantity per Reel | -- | 500 | 3,000 |

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