



**Working Voltage: 11 to 440 V**

**Peak Pulse Power: 5000 W**

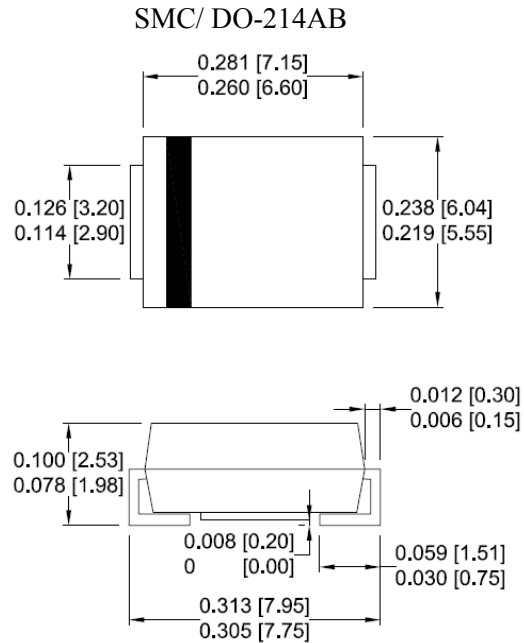
## Surface Mount Transient Voltage Suppressors

### Features

- Glass passivated chip
- 5000 W peak pulse power capability with a 10/1000  $\mu$ s waveform, repetitive rate (duty cycle):0.01 %
- Low leakage
- Uni and Bidirectional unit
- Excellent clamping capability
- Very fast response time
- RoHS compliant

### Mechanical Data

- Case: Molded plastic
- Epoxy: UL 94V-0 rate flame retardant
- Lead: Solderable per MIL-STD-750, method 2026
- Polarity: Color band denotes cathode end except Bipolar
- Mounting position: Any



Dimensions: inch[mm]

### Maximum Ratings( $T_A=25^\circ\text{C}$ unless otherwise noted)

| Parameter   | Symbol         | Value          | Unit             |
|---|----------------|----------------|------------------|
| Peak power dissipation with a 10/1000 $\mu$ s waveform <sup>(1)</sup>                       | $P_{PP}$       | 5000           | W                |
| Peak pulse current with a 10/1000 $\mu$ s waveform <sup>(1)</sup>                           | $I_{PP}$       | See Next Table | A                |
| Power dissipation on infinite heatsink at $T_L = 75^\circ\text{C}$                          | $P_D$          | 6.5            | W                |
| Peak forward surge current, 8.3 ms single half sine-wave unidirectional only <sup>(2)</sup> | $I_{FSM}$      | 300            | A                |
| Maximum instantaneous forward voltage at 100 A for unidirectional only <sup>(3)</sup>       | $V_F$          | 3.5/5.0        | V                |
| Operating junction and storage temperature range  | $T_J, T_{STG}$ | - 55 to +150   | $^\circ\text{C}$ |

**Note:**

(1)Non-repetitive current pulse per Fig.5 and derated above  $T_A=25^\circ\text{C}$  per Fig.1

(2)Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum

(3) $V_F < 3.5\text{V}$  for devices of  $V_{BR} < 200\text{V}$  and  $V_F < 5.0\text{V}$  for devices of  $V_{BR} > 201\text{V}$



Ratings and Characteristics Curves ( $T_A=25^\circ\text{C}$  unless otherwise noted)

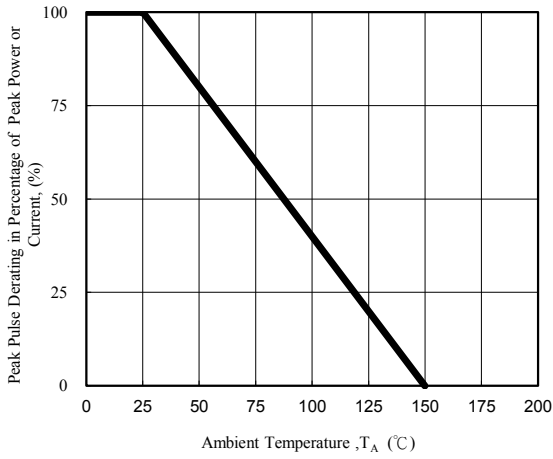


Fig. 1 - Pulse Derating Curve

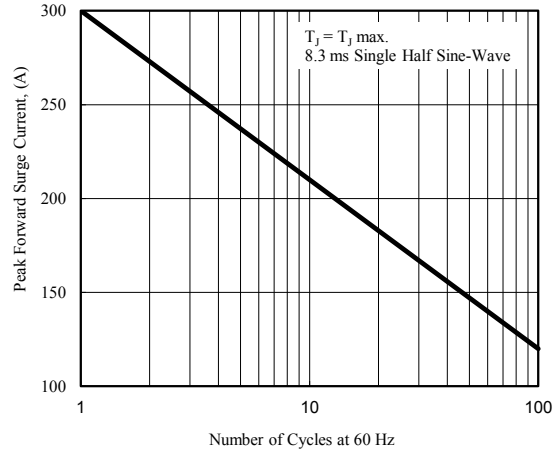


Fig. 2 - Maximum Non-Repetitive Surge Current

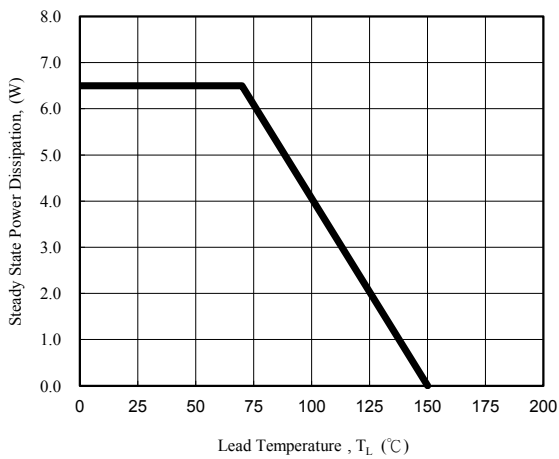


Fig. 3 - Steady State Power Derating Curve

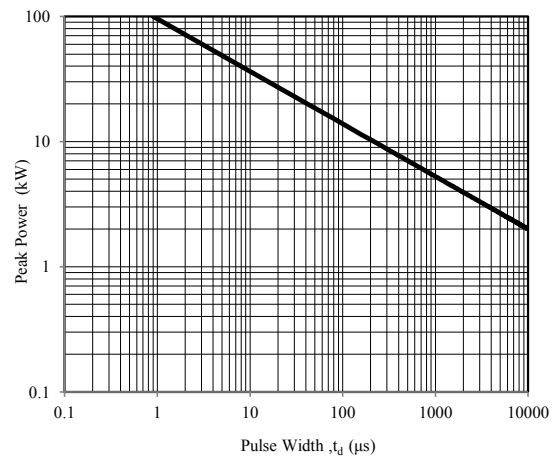


Fig. 4 - Peak Pulse Power Rating Curve

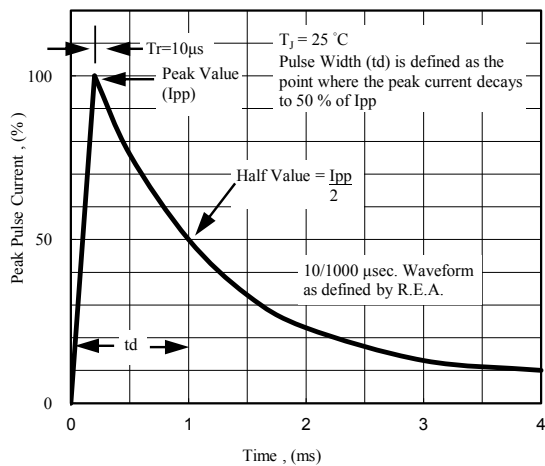


Fig. 5 - Pulse Waveform

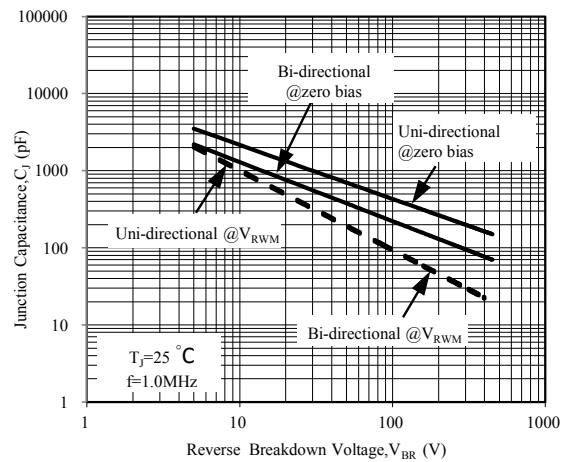


Fig. 6 - Typical Junction Capacitance

**Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)**

| Part Number (Uni) | Part Number (Bi) | Device Marking Code |      | Breakdown Voltage V <sub>BR</sub> @ I <sub>T</sub> |         |                     | Maximum Reverse Leakage I <sub>R</sub> @V <sub>RWM</sub> (uA) | Working Peak Reverse Voltage V <sub>RWM</sub> (V) | Maximum Reverse Surge Current I <sub>PP</sub> (A) | Maximum Clamping Voltage V <sub>C</sub> @I <sub>PP</sub> (V) |
|-------------------|------------------|---------------------|------|--|---------|---------------------|---|---|---|--|
|                   |                  | Uni                 | Bi   | Min (V)  | Max (V) | I <sub>T</sub> (mA) |   |   |   |  |
| 5.0SMDJ11         | 5.0SMDJ11C       | SPDW                | 5BDW | 12.20  | 14.90   | 10                  | 800   | 11.0  | 248.76  | 20.1   |
| 5.0SMDJ11A        | 5.0SMDJ11CA      | SPDX                | 5BDX | 12.20  | 13.50   | 10                  | 800   | 11.0  | 274.73  | 18.2   |
| 5.0SMDJ12         | 5.0SMDJ12C       | SPDY                | 5BDY | 13.30  | 16.30   | 10                  | 800   | 12.0  | 227.27  | 22.0   |
| 5.0SMDJ12A        | 5.0SMDJ12CA      | SPDZ                | 5BDZ | 13.30  | 14.70   | 10                  | 800   | 12.0  | 251.26  | 19.9   |
| 5.0SMDJ13         | 5.0SMDJ13C       | 5PED                | 5BED | 14.40  | 17.60   | 10                  | 500   | 13.0  | 210.08  | 23.8   |
| 5.0SMDJ13A        | 5.0SMDJ13CA      | 5PEE                | 5BEE | 14.40  | 15.90   | 10                  | 500   | 13.0  | 232.56  | 21.5   |
| 5.0SMDJ14         | 5.0SMDJ14C       | 5PEF                | 5BEF | 15.60  | 19.10   | 10                  | 200   | 14.0  | 193.80  | 25.8   |
| 5.0SMDJ14A        | 5.0SMDJ14CA      | 5PEG                | 5BEG | 15.60  | 17.20   | 10                  | 200   | 14.0  | 215.52  | 23.2   |
| 5.0SMDJ15         | 5.0SMDJ15C       | 5PEH                | 5BEH | 16.70  | 20.40   | 1                   | 100   | 15.0  | 185.87  | 26.9   |
| 5.0SMDJ15A        | 5.0SMDJ15CA      | 5PEK                | 5BEK | 16.70  | 18.50   | 1                   | 100   | 15.0  | 204.92  | 24.4   |
| 5.0SMDJ16         | 5.0SMDJ16C       | 5PEL                | 5BEL | 17.80  | 21.80   | 1                   | 50  | 16.0  | 173.61  | 28.8   |
| 5.0SMDJ16A        | 5.0SMDJ16CA      | 5PEM                | 5BEM | 17.80  | 19.70   | 1                   | 50  | 16.0  | 192.31  | 26.0   |
| 5.0SMDJ17         | 5.0SMDJ17C       | 5PEN                | 5BEN | 18.90  | 23.10   | 1                   | 20  | 17.0  | 163.93  | 30.5   |
| 5.0SMDJ17A        | 5.0SMDJ17CA      | 5PEP                | 5BEP | 18.90  | 20.90   | 1                   | 20  | 17.0  | 181.16  | 27.6   |
| 5.0SMDJ18         | 5.0SMDJ18C       | 5PEQ                | 5BEQ | 20.00  | 24.40   | 1                   | 10  | 18.0  | 155.28  | 32.2   |
| 5.0SMDJ18A        | 5.0SMDJ18CA      | 5PER                | 5BER | 20.00  | 22.10   | 1                   | 10  | 18.0  | 171.23  | 29.2   |
| 5.0SMDJ19         | 5.0SMDJ19C       | 5PES                | 5BES | 21.13  | 25.76   | 1                   | 10  | 19.0  | 147.02  | 34.0   |
| 5.0SMDJ19A        | 5.0SMDJ19CA      | 5PET                | 5BET | 21.10  | 23.30   | 1                   | 10  | 19.0  | 162.44  | 30.8   |
| 5.0SMDJ20         | 5.0SMDJ20C       | 5PEU                | 5BEU | 22.20  | 27.10   | 1                   | 5   | 20.0  | 139.66  | 35.8   |
| 5.0SMDJ20A        | 5.0SMDJ20CA      | 5PEV                | 5BEV | 22.20  | 24.50   | 1                   | 5   | 20.0  | 154.32  | 32.4   |
| 5.0SMDJ22         | 5.0SMDJ22C       | 5PEW                | 5BEW | 24.40  | 29.80   | 1                   | 5   | 22.0  | 126.90  | 39.4   |
| 5.0SMDJ22A        | 5.0SMDJ22CA      | 5PEX                | 5BEX | 24.40  | 26.90   | 1                   | 5   | 22.0  | 140.85  | 35.5   |
| 5.0SMDJ24         | 5.0SMDJ24C       | 5PEY                | 5BEY | 26.70  | 32.60   | 1                   | 5   | 24.0  | 116.28  | 43.0   |
| 5.0SMDJ24A        | 5.0SMDJ24CA      | 5PEZ                | 5BEZ | 26.70  | 29.50   | 1                   | 5   | 24.0  | 128.53  | 38.9   |
| 5.0SMDJ26         | 5.0SMDJ26C       | 5PFD                | 5BFD | 28.90  | 35.30   | 1                   | 5   | 26.0  | 107.30  | 46.6   |
| 5.0SMDJ26A        | 5.0SMDJ26CA      | 5PFE                | 5BFE | 28.90  | 31.90   | 1                   | 5   | 26.0  | 118.76  | 42.1   |
| 5.0SMDJ28         | 5.0SMDJ28C       | 5PFF                | 5BFF | 31.10  | 38.00   | 1                   | 5   | 28.0  | 100.00  | 50.0   |
| 5.0SMDJ28A        | 5.0SMDJ28CA      | 5PFG                | 5BFG | 31.10  | 34.40   | 1                   | 5   | 28.0  | 110.13  | 45.4   |
| 5.0SMDJ30         | 5.0SMDJ30C       | 5PFH                | 5BFH | 33.30  | 40.70   | 1                   | 5   | 30.0  | 93.46   | 53.5   |
| 5.0SMDJ30A        | 5.0SMDJ30CA      | 5PFK                | 5BFK | 33.30  | 36.80   | 1                   | 5   | 30.0  | 103.31  | 48.4   |
| 5.0SMDJ33         | 5.0SMDJ33C       | 5PFL                | 5BFL | 36.70  | 44.90   | 1                   | 5   | 33.0  | 84.75   | 59.0   |
| 5.0SMDJ33A        | 5.0SMDJ33CA      | 5PFM                | 5BFM | 36.70  | 40.60   | 1                   | 5   | 33.0  | 93.81   | 53.3   |
| 5.0SMDJ36         | 5.0SMDJ36C       | 5PFN                | 5BFN | 40.00  | 48.90   | 1                   | 5   | 36.0  | 77.76   | 64.3   |
| 5.0SMDJ36A        | 5.0SMDJ36CA      | 5PFP                | 5BFP | 40.00  | 44.20   | 1                   | 5   | 36.0  | 86.06   | 58.1   |
| 5.0SMDJ40         | 5.0SMDJ40C       | 5PFQ                | 5BFQ | 44.40  | 54.30   | 1                   | 5   | 40.0  | 70.03   | 71.4   |
| 5.0SMDJ40A        | 5.0SMDJ40CA      | 5PFR                | 5BFR | 44.40  | 49.10   | 1                   | 5   | 40.0  | 77.52   | 64.5   |
| 5.0SMDJ43         | 5.0SMDJ43C       | 5PFS                | 5BFS | 47.80  | 58.40   | 1                   | 5   | 43.0  | 65.19   | 76.7   |
| 5.0SMDJ43A        | 5.0SMDJ43CA      | 5PFT                | 5BFT | 47.80  | 52.80   | 1                   | 5   | 43.0  | 72.05   | 69.4   |
| 5.0SMDJ45         | 5.0SMDJ45C       | 5PFU                | 5BFU | 50.00  | 61.10   | 1                   | 5   | 45.0  | 62.27   | 80.3   |
| 5.0SMDJ45A        | 5.0SMDJ45CA      | 5PFV                | 5BFV | 50.00  | 55.30   | 1                   | 5   | 45.0  | 68.78   | 72.7   |
| 5.0SMDJ48         | 5.0SMDJ48C       | 5PFW                | 5BFW | 53.30  | 65.10   | 1                   | 5   | 48.0  | 58.48   | 85.5   |
| 5.0SMDJ48A        | 5.0SMDJ48CA      | 5PFX                | 5BFX | 53.30  | 58.90   | 1                   | 5   | 48.0  | 64.60   | 77.4   |
| 5.0SMDJ51         | 5.0SMDJ51C       | 5PFY                | 5BFY | 56.70  | 69.30   | 1                   | 5   | 51.0  | 54.88   | 91.1   |
| 5.0SMDJ51A        | 5.0SMDJ51CA      | 5PFZ                | 5BFZ | 56.70  | 62.70   | 1                   | 5   | 51.0  | 60.68   | 82.4   |
| 5.0SMDJ54         | 5.0SMDJ54C       | 5PGD                | 5BGD | 60.00  | 73.30   | 1                   | 5   | 54.0  | 51.92   | 96.3   |
| 5.0SMDJ54A        | 5.0SMDJ54CA      | 5PGE                | 5BGE | 60.00  | 66.30   | 1                   | 5   | 54.0  | 57.41   | 87.1   |
| 5.0SMDJ58         | 5.0SMDJ58C       | 5PGF                | 5BGF | 64.40  | 78.70   | 1                   | 5   | 58.0  | 48.54   | 103.0  |
| 5.0SMDJ58A        | 5.0SMDJ58CA      | 5PGG                | 5BGG | 64.40  | 71.20   | 1                   | 5   | 58.0  | 53.42   | 93.6   |
| 5.0SMDJ60         | 5.0SMDJ60C       | 5PGH                | 5BGH | 66.70  | 81.50   | 1                   | 5   | 60.0  | 46.73   | 107.0  |
| 5.0SMDJ60A        | 5.0SMDJ60CA      | 5PGK                | 5BGK | 66.70  | 73.70   | 1                   | 5   | 60.0  | 51.65   | 96.8   |
| 5.0SMDJ64         | 5.0SMDJ64C       | 5PGL                | 5BGL | 71.10  | 86.90   | 1                   | 5   | 64.0  | 43.86   | 114.0  |
| 5.0SMDJ64A        | 5.0SMDJ64CA      | 5PGM                | 5BGM | 71.10  | 78.60   | 1                   | 5   | 64.0  | 48.54   | 103.0  |

**Note:**

1. Suffix 'A' denotes 5% tolerance device. Without 'A' denotes 10% tolerance device
2. Add suffix 'C' or 'CA' after part number to specify Bi-directional devices
3. For Bi-Directional devices having V<sub>R</sub> of 20 volts and under, the I<sub>R</sub> limit is double

**Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)**

| Part Number<br>(Uni) | Part Number<br>(Bi) | Device<br>Marking<br>Code |      | Breakdown Voltage V <sub>BR</sub> @<br>I <sub>T</sub> |         |                     | Maximum<br>Reverse<br>Leakage I <sub>R</sub><br>@V <sub>RWM</sub><br>(uA) | Working<br>Peak<br>Reverse<br>Voltage<br>V <sub>RWM</sub> | Maximum<br>Reverse<br>Surge<br>Current I <sub>PP</sub><br>(A) | Maximum<br>Clamping<br>Voltage<br>V <sub>C</sub> @I <sub>PP</sub><br>(V) |
|----------------------|---------------------|---------------------------|------|---|---------|---------------------|---|---|---|--|
|                      |                     | Uni                       | Bi   | Min (V)   | Max (V) | I <sub>T</sub> (mA) |   |   |   |  |
| 5.0SMDJ70            | 5.0SMDJ70C          | 5PGN                      | 5BGN | 77.80   | 95.10   | 1                   | 5   | 70.0  | 40.00   | 125.0  |
| 5.0SMDJ70A           | 5.0SMDJ70CA         | 5PGP                      | 5BGP | 77.80   | 86.00   | 1                   | 5   | 70.0  | 44.25   | 113.0  |
| 5.0SMDJ75            | 5.0SMDJ75C          | 5PGQ                      | 5BGQ | 83.30   | 102.00  | 1                   | 5   | 75.0  | 37.31   | 134.0  |
| 5.0SMDJ75A           | 5.0SMDJ75CA         | 5PGR                      | 5BGR | 83.30   | 92.10   | 1                   | 5   | 75.0  | 41.32   | 121.0  |
| 5.0SMDJ78            | 5.0SMDJ78C          | 5PGS                      | 5BGS | 86.70   | 106.00  | 1                   | 5   | 78.0  | 35.97   | 139.0  |
| 5.0SMDJ78A           | 5.0SMDJ78CA         | 5PGT                      | 5BGT | 86.70   | 95.80   | 1                   | 5   | 78.0  | 39.68   | 126.0  |
| 5.0SMDJ80            | 5.0SMDJ80C          | 5PGA                      | 5BGA | 88.96   | 108.80  | 1                   | 5   | 80.0  | 34.92   | 143.2  |
| 5.0SMDJ80A           | 5.0SMDJ80CA         | 5PGB                      | 5BGB | 88.80   | 97.60   | 1                   | 5   | 80.0  | 38.58   | 129.6  |
| 5.0SMDJ85            | 5.0SMDJ85C          | 5PGU                      | 5BGU | 94.40   | 115.00  | 1                   | 5   | 85.0  | 33.11   | 151.0  |
| 5.0SMDJ85A           | 5.0SMDJ85CA         | 5PGV                      | 5BGV | 94.40   | 104.00  | 1                   | 5   | 85.0  | 36.50   | 137.0  |
| 5.0SMDJ90            | 5.0SMDJ90C          | 5PGW                      | 5BGW | 100.00  | 122.00  | 1                   | 5   | 90.0  | 31.25   | 160.0  |
| 5.0SMDJ90A           | 5.0SMDJ90CA         | 5PGX                      | 5BGX | 100.00  | 111.00  | 1                   | 5   | 90.0  | 34.25   | 146.0  |
| 5.0SMDJ100           | 5.0SMDJ100C         | 5PGY                      | 5BGY | 111.00  | 136.00  | 1                   | 5   | 100.0   | 27.93   | 179.0  |
| 5.0SMDJ100A          | 5.0SMDJ100CA        | 5PGZ                      | 5BGZ | 111.00  | 123.00  | 1                   | 5   | 100.0   | 30.86   | 162.0  |
| 5.0SMDJ110           | 5.0SMDJ110C         | 5PHD                      | 5BHD | 122.00  | 149.00  | 1                   | 5   | 110.0   | 25.51   | 196.0  |
| 5.0SMDJ110A          | 5.0SMDJ110CA        | 5PHE                      | 5BHE | 122.00  | 135.00  | 1                   | 5   | 110.0   | 28.25   | 177.0  |
| 5.0SMDJ120           | 5.0SMDJ120C         | 5PHF                      | 5BHF | 133.00  | 163.00  | 1                   | 5   | 120.0   | 23.36   | 214.0  |
| 5.0SMDJ120A          | 5.0SMDJ120CA        | 5PHG                      | 5BHG | 133.00  | 147.00  | 1                   | 5   | 120.0   | 25.91   | 193.0  |
| 5.0SMDJ130           | 5.0SMDJ130C         | 5PHH                      | 5BHH | 144.00  | 176.00  | 1                   | 5   | 130.0   | 21.65   | 231.0  |
| 5.0SMDJ130A          | 5.0SMDJ130CA        | 5PHK                      | 5BHK | 144.00  | 159.00  | 1                   | 5   | 130.0   | 23.92   | 209.0  |
| 5.0SMDJ140           | 5.0SMDJ140C         | 5PHA                      | 5BHA | 155.68  | 190.40  | 1                   | 5   | 140.0   | 19.95   | 250.6  |
| 5.0SMDJ140A          | 5.0SMDJ140CA        | 5PHB                      | 5BHB | 155.00  | 171.00  | 1                   | 5   | 140.0   | 22.05   | 226.8  |
| 5.0SMDJ150           | 5.0SMDJ150C         | 5PHL                      | 5BHL | 167.00  | 204.00  | 1                   | 5   | 150.0   | 18.66   | 268.0  |
| 5.0SMDJ150A          | 5.0SMDJ150CA        | 5PHM                      | 5BHM | 167.00  | 185.00  | 1                   | 5   | 150.0   | 20.58   | 243.0  |
| 5.0SMDJ160           | 5.0SMDJ160C         | 5PHN                      | 5BHN | 178.00  | 218.00  | 1                   | 5   | 160.0   | 17.42   | 287.0  |
| 5.0SMDJ160A          | 5.0SMDJ160CA        | 5PHP                      | 5BHP | 178.00  | 197.00  | 1                   | 5   | 160.0   | 19.31   | 259.0  |
| 5.0SMDJ170           | 5.0SMDJ170C         | 5PHQ                      | 5BHQ | 189.00  | 231.00  | 1                   | 5   | 170.0   | 16.45   | 304.0  |
| 5.0SMDJ170A          | 5.0SMDJ170CA        | 5PHR                      | 5BHR | 189.00  | 209.00  | 1                   | 5   | 170.0   | 18.18   | 275.0  |
| 5.0SMDJ180           | 5.0SMDJ180C         | 5PHS                      | 5BHS | 200.16  | 244.80  | 1                   | 5   | 180.0   | 15.52   | 322.2  |
| 5.0SMDJ180A          | 5.0SMDJ180CA        | 5PHT                      | 5BHT | 200.00  | 220.00  | 1                   | 5   | 180.0   | 17.15   | 291.6  |
| 5.0SMDJ190           | 5.0SMDJ190C         | 5PHU                      | 5BHU | 211.28  | 258.40  | 1                   | 5   | 190.0   | 14.70   | 340.1  |
| 5.0SMDJ190A          | 5.0SMDJ190CA        | 5PHV                      | 5BHV | 211.00  | 232.00  | 1                   | 5   | 190.0   | 16.24   | 307.8  |
| 5.0SMDJ200A          | 5.0SMDJ200CA        | 5PHW                      | 5BHW | 224.00  | 247.00  | 1                   | 5   | 200.0   | 15.43   | 324.0  |
| 5.0SMDJ220A          | 5.0SMDJ220CA        | 5PHX                      | 5BHX | 246.00  | 272.00  | 1                   | 5   | 220.0   | 14.04   | 356.0  |
| 5.0SMDJ250A          | 5.0SMDJ250CA        | 5PHZ                      | 5BHZ | 279.00  | 309.00  | 1                   | 5   | 250.0   | 12.35   | 405.0  |
| 5.0SMDJ300A          | 5.0SMDJ300CA        | 5PJE                      | 5BJE | 335.00  | 371.00  | 1                   | 5   | 300.0   | 10.29   | 486.0  |
| 5.0SMDJ350A          | 5.0SMDJ350CA        | 5PJG                      | 5BJG | 391.00  | 432.00  | 1                   | 5   | 350.0   | 8.82  | 567.0  |
| 5.0SMDJ400A          | 5.0SMDJ400CA        | 5PJK                      | 5BJK | 447.00  | 494.00  | 1                   | 5   | 400.0   | 7.72  | 648.0  |
| 5.0SMDJ440A          | 5.0SMDJ440CA        | 5PJM                      | 5BJM | 492.00  | 543.00  | 1                   | 5   | 440.0   | 7.01  | 713.0  |

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