

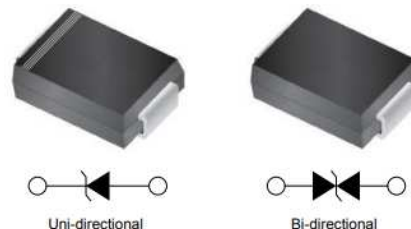
Transient Voltage Suppression Diodes: SMA6J Series

SMD Type 600 W



■ Features

1. Glass passivated chip
2. 600W peak pulse power capability at 10/1000µs waveform, repetition rate (duty cycle): 0.01%
3. Excellent clamping capability
4. Very fast response time
5. Low clamping voltage
6. Low leakage current
7. Meets MSL level 1, per J-STD-020, LF maximum peak of 260°C
8. JESD22-A114-B ESD Voltage: HBM 15KV
9. JEDEC EIA/JESD22-C101F ESD Voltage: CDM 500V
10. JEDEC EIA/JESD22-A115 ESD Voltage: MM 400V
11. ESD-immunity acc. IEC 61000-4-2 ±30kV(contact), ±30kV(air)
12. Halogen free and RoHS compliant



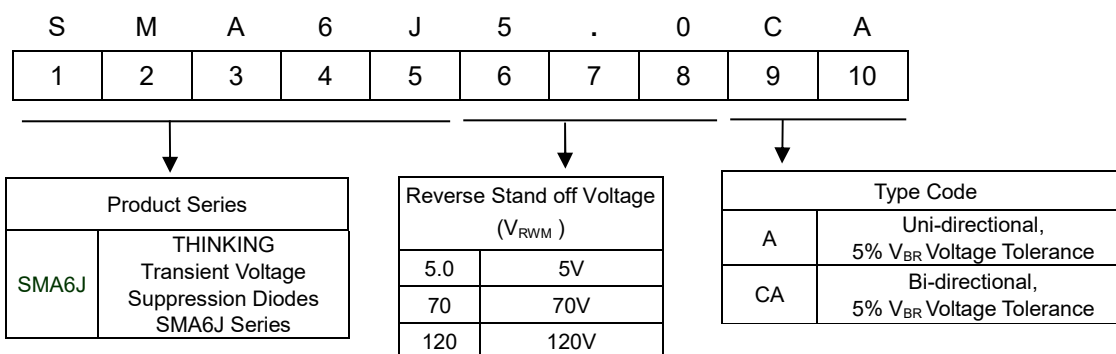
■ Recommended Applications

1. Computers
2. Telecom system
3. Industrial equipment
4. Consumer electronic applications
5. Other VCC bus and I/O interfaces

■ Mechanical Data

1. Case: Molded plastic, SMA / DO-214AC
2. Epoxy: UL 94V-0 rate flame retardant
3. Terminals: Solderable per MIL-STD-750, method 2026
4. Polarity: Color band denotes cathode end
5. Mounting Position: Any

■ Part Number Code

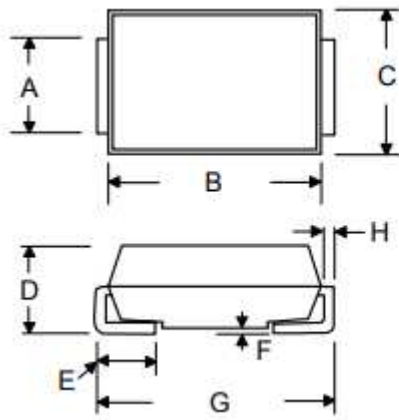


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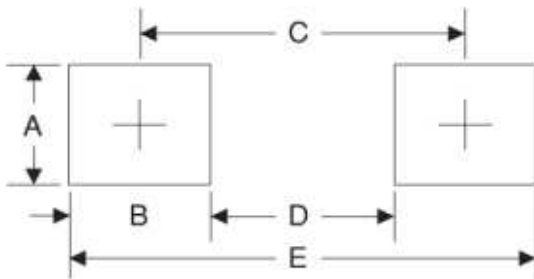
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Structures and Dimensions



| Symbol | Dimensions in millimeters | |
|--------|---------------------------|------|
| | Min | Max |
| A | 1.30 | 1.70 |
| B | 3.90 | 4.50 |
| C | 2.40 | 2.80 |
| D | 2.00 | 2.50 |
| E | 0.76 | 1.52 |
| F | 0.10 | 0.20 |
| G | 4.80 | 5.30 |
| H | 0.15 | 0.31 |



| Symbol | Unit (mm) | Unit (inch) |
|--------|-----------|-------------|
| A | 1.68 | 0.066 |
| B | 1.52 | 0.060 |
| C | 3.90 | 0.154 |
| D | 2.41 | 0.095 |
| E | 5.45 | 0.215 |

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

| Parameter | Symbol | Value | Unit |
|---|-----------------|----------------|--------------------|
| Peak power dissipation with a 10/1000 μs waveform (Note 1,2) | P_{PPM} | 600 | W |
| Peak pulse current with 10/1000 μs waveform (Note 1) | I_{PPM} | See next table | A |
| Peak forward surge current, 8.3 ms single half sine-wave (Note 3) | I_{FSM} | 100 | A |
| Power dissipation on infinite heatsink at $T_L=75^\circ\text{C}$ | P_D | 5 | W |
| Typical thermal resistance junction to ambient | $R_{\theta JA}$ | 100 | $^\circ\text{C/W}$ |
| Typical thermal resistance junction to lead | $R_{\theta JL}$ | 20 | $^\circ\text{C/W}$ |
| Operating junction and storage temperature range | T_J, T_{STG} | -55 to +150 | $^\circ\text{C}$ |

Note:

1. Non-repetitive current pulse, per Fig. 3 and derated above $T_A=25^\circ\text{C}$ per Fig. 2.
2. Mounted on 5.0 x 5.0mm copper pad to each terminal.
3. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum.

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■ Electrical Characteristics (T_A=25°C unless otherwise noted)

| Part No. (Uni) | Part No. (Bi) | Reverse Stand off Voltage V _{RWM} (V) | Breakage Voltage V _{BR} @ I _T | | Test Current I _T (mA) | Maximum Clamping Voltage V _C @ I _{pp} V _C (V) | Maximum Peak Pulse Current I _{pp} (A) | Maximum Reverse Leakage I _R @ V _{RWM} I _R (μA) | Marking Code | |
|-------------------|------------------|---|---|----------|--|--|--|---|-----------------|----|
| | | | Min(V) | Max(V) | | | | | Uni | Bi |
| SMA6J5.0A | SMA6J5.0CA | 5 | 6.4 | 7 | 10 | 9.2 | 65.2 | 800 | KE | AE |
| SMA6J6.0A | SMA6J6.0CA | 6 | 6.7 | 7.4 | 10 | 10.3 | 58.3 | 800 | KG | AG |
| SMA6J6.5A | SMA6J6.5CA | 6.5 | 7.2 | 8 | 10 | 11.2 | 53.57 | 500 | KK | AK |
| SMA6J7.0A | SMA6J7.0CA | 7 | 7.8 | 8.6 | 10 | 12 | 50 | 200 | KM | AM |
| SMA6J7.5A | SMA6J7.5CA | 7.5 | 8.3 | 9.2 | 1 | 12.9 | 46.5 | 100 | KP | AP |
| SMA6J8.0A | SMA6J8.0CA | 8 | 8.9 | 9.8 | 1 | 13.6 | 44.1 | 50 | KR | AR |
| SMA6J8.5A | SMA6J8.5CA | 8.5 | 9.4 | 10.4 | 1 | 14.4 | 41.7 | 10 | KT | AT |
| SMA6J9.0A | SMA6J9.0CA | 9 | 10 | 11 | 1 | 15.4 | 39 | 5 | KV | AV |
| SMA6J10A | SMA6J10CA | 10 | 11.1 | 12.3 | 1 | 17 | 35.3 | 5 | KX | AX |
| SMA6J11A | SMA6J11CA | 11 | 12.2 | 13.5 | 1 | 18.2 | 33 | 1 | KZ | AZ |
| SMA6J12A | SMA6J12CA | 12 | 13.3 | 14.7 | 1 | 19.9 | 30.2 | 1 | LE | BE |
| SMA6J13A | SMA6J13CA | 13 | 14.4 | 15.9 | 1 | 21.5 | 28 | 1 | LG | BG |
| SMA6J14A | SMA6J14CA | 14 | 15.6 | 17.2 | 1 | 23.2 | 25.9 | 1 | LK | BK |
| SMA6J15A | SMA6J15CA | 15 | 16.7 | 18.5 | 1 | 24.4 | 24.6 | 1 | LM | BM |
| SMA6J16A | SMA6J16CA | 16 | 17.8 | 19.7 | 1 | 26 | 23.1 | 1 | LP | BP |
| SMA6J17A | SMA6J17CA | 17 | 18.9 | 20.9 | 1 | 27.6 | 21.8 | 1 | LR | BR |
| SMA6J18A | SMA6J18CA | 18 | 20 | 22.1 | 1 | 29.2 | 20.6 | 1 | LT | BT |
| SMA6J19A | SMA6J19CA | 19 | 21.1 | 23.3 | 1 | 30.8 | 19.5 | 1 | LW | BW |
| SMA6J20A | SMA6J20CA | 20 | 22.2 | 24.5 | 1 | 32.4 | 18.6 | 1 | LV | BV |
| SMA6J22A | SMA6J22CA | 22 | 24.4 | 26.9 | 1 | 35.5 | 16.9 | 1 | LX | BX |
| SMA6J24A | SMA6J24CA | 24 | 26.7 | 29.5 | 1 | 38.9 | 15.5 | 1 | LZ | BZ |
| SMA6J26A | SMA6J26CA | 26 | 28.9 | 31.9 | 1 | 42.1 | 14.3 | 1 | ME | CE |
| SMA6J28A | SMA6J28CA | 28 | 31.1 | 34.4 | 1 | 45.4 | 13.3 | 1 | MG | CG |
| SMA6J30A | SMA6J30CA | 30 | 33.3 | 36.8 | 1 | 48.4 | 12.4 | 1 | MK | CK |
| SMA6J33A | SMA6J33CA | 33 | 36.7 | 40.6 | 1 | 53.3 | 11.3 | 1 | MM | CM |
| SMA6J36A | SMA6J36CA | 36 | 40 | 44.2 | 1 | 58.1 | 10.4 | 1 | MP | CP |
| SMA6J40A | SMA6J40CA | 40 | 44.4 | 49.1 | 1 | 64.5 | 9.3 | 1 | MR | CR |
| SMA6J43A | SMA6J43CA | 43 | 47.8 | 52.8 | 1 | 69.4 | 8.7 | 1 | MT | CT |
| SMA6J45A | SMA6J45CA | 45 | 50 | 55.3 | 1 | 72.7 | 8.3 | 1 | MV | CV |
| SMA6J48A | SMA6J48CA | 48 | 53.3 | 58.9 | 1 | 77.4 | 7.8 | 1 | MX | CX |

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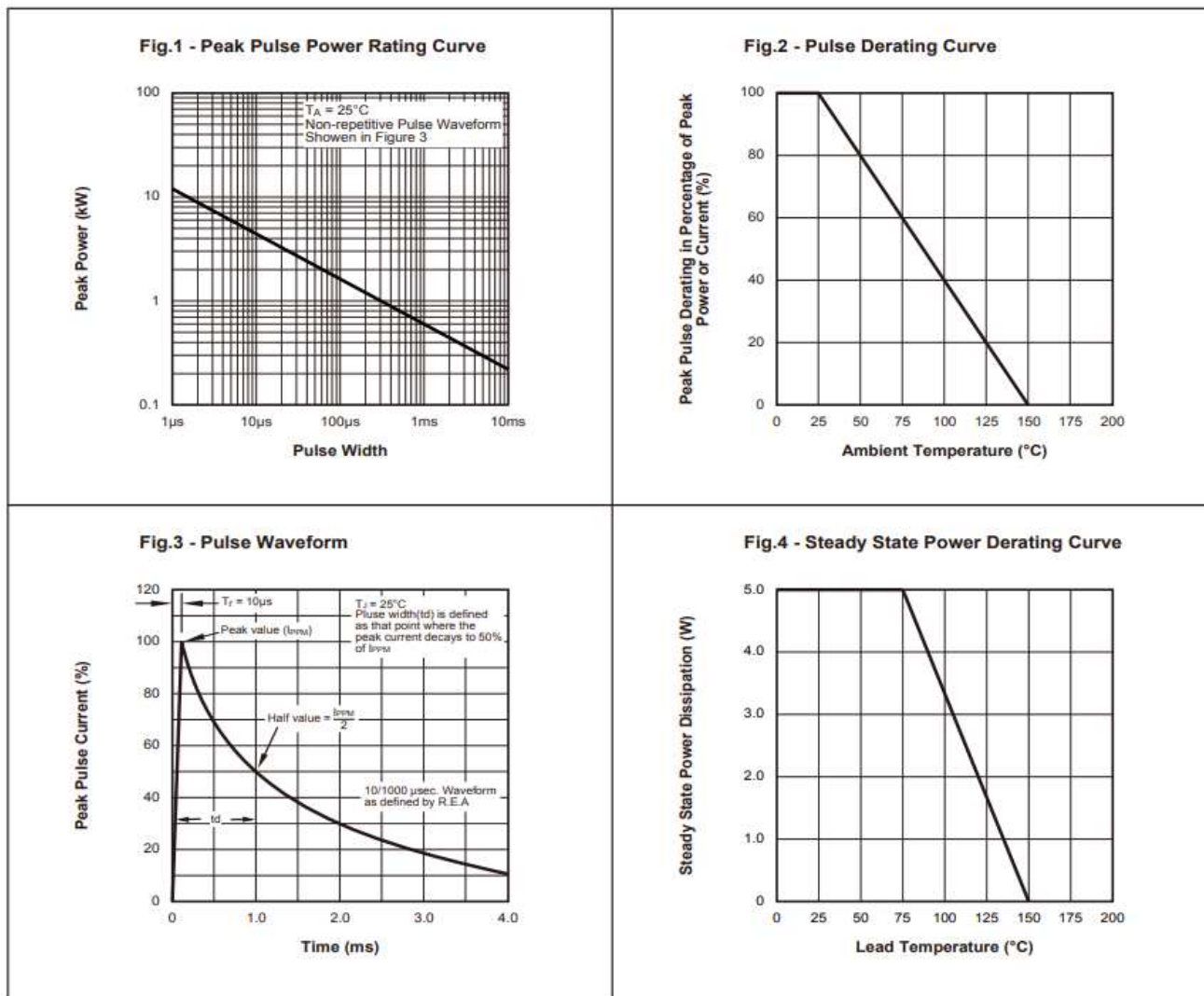
| Part No. (Uni) | Part No. (Bi) | Reverse Stand off Voltage V _{RWM} (V) | Breakage Voltage V _{BR} @ I _T | | Test Current I _T (mA) | Maximum Clamping Voltage V _C @ I _{pp} | Maximum Peak Pulse Current I _{pp} (A) | Maximum Reverse Leakage I _R @V _{RWM} | Marking Code | |
|-------------------|------------------|---|---|----------|--|--|--|---|-----------------|----|
| | | | Min(V) | Max(V) | | | | | Uni | Bi |
| SMA6J51A | SMA6J51CA | 51 | 56.7 | 62.7 | 1 | 82.4 | 7.3 | 1 | MZ | CZ |
| SMA6J54A | SMA6J54CA | 54 | 60 | 66.3 | 1 | 87.1 | 6.9 | 1 | NE | DE |
| SMA6J58A | SMA6J58CA | 58 | 64.4 | 71.2 | 1 | 93.6 | 6.5 | 1 | NG | DG |
| SMA6J60A | SMA6J60CA | 60 | 66.7 | 73.7 | 1 | 96.8 | 6.2 | 1 | NK | DK |
| SMA6J64A | SMA6J64CA | 64 | 71.1 | 78.6 | 1 | 103 | 5.9 | 1 | NM | DM |
| SMA6J70A | SMA6J70CA | 70 | 77.8 | 86 | 1 | 113 | 5.3 | 1 | NP | DP |
| SMA6J75A | SMA6J75CA | 75 | 83.3 | 92.1 | 1 | 121 | 5 | 1 | NR | DR |
| SMA6J78A | SMA6J78CA | 78 | 86.7 | 95.8 | 1 | 126 | 4.8 | 1 | NT | DT |
| SMA6J80A | SMA6J80CA | 80 | 88.8 | 97.6 | 1 | 129.6 | 4.6 | 1 | NW | DW |
| SMA6J85A | SMA6J85CA | 85 | 94.4 | 104 | 1 | 137 | 4.4 | 1 | NV | DV |
| SMA6J90A | SMA6J90CA | 90 | 100 | 111 | 1 | 146 | 4.1 | 1 | NX | DX |
| SMA6J100A | SMA6J100CA | 100 | 111 | 123 | 1 | 162 | 3.7 | 1 | NZ | DZ |
| SMA6J110A | SMA6J110CA | 110 | 122 | 135 | 1 | 177 | 3.4 | 1 | PE | FE |
| SMA6J120A | SMA6J120CA | 120 | 133 | 147 | 1 | 193 | 3.2 | 1 | PG | FG |
| SMA6J130A | SMA6J130CA | 130 | 144 | 159 | 1 | 209 | 2.9 | 1 | PK | FK |
| SMA6J140A | SMA6J140CA | 140 | 155 | 171 | 1 | 227 | 2.7 | 1 | PL | FL |
| SMA6J150A | SMA6J150CA | 150 | 167 | 185 | 1 | 243 | 2.5 | 1 | PM | FM |
| SMA6J160A | SMA6J160CA | 160 | 178 | 197 | 1 | 259 | 2.3 | 1 | PP | FP |
| SMA6J170A | SMA6J170CA | 170 | 189 | 209 | 1 | 275 | 2.2 | 1 | PR | FR |
| SMA6J180A | SMA6J180CA | 180 | 200 | 220 | 1 | 291 | 2.1 | 1 | PT | FT |
| SMA6J190A | SMA6J190CA | 190 | 211 | 232 | 1 | 308 | 2 | 1 | PU | FU |
| SMA6J200A | SMA6J200CA | 200 | 224 | 247 | 1 | 324 | 1.9 | 1 | PV | FV |
| SMA6J220A | SMA6J220CA | 220 | 246 | 272 | 1 | 356 | 1.7 | 1 | PX | FX |

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■ Typical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

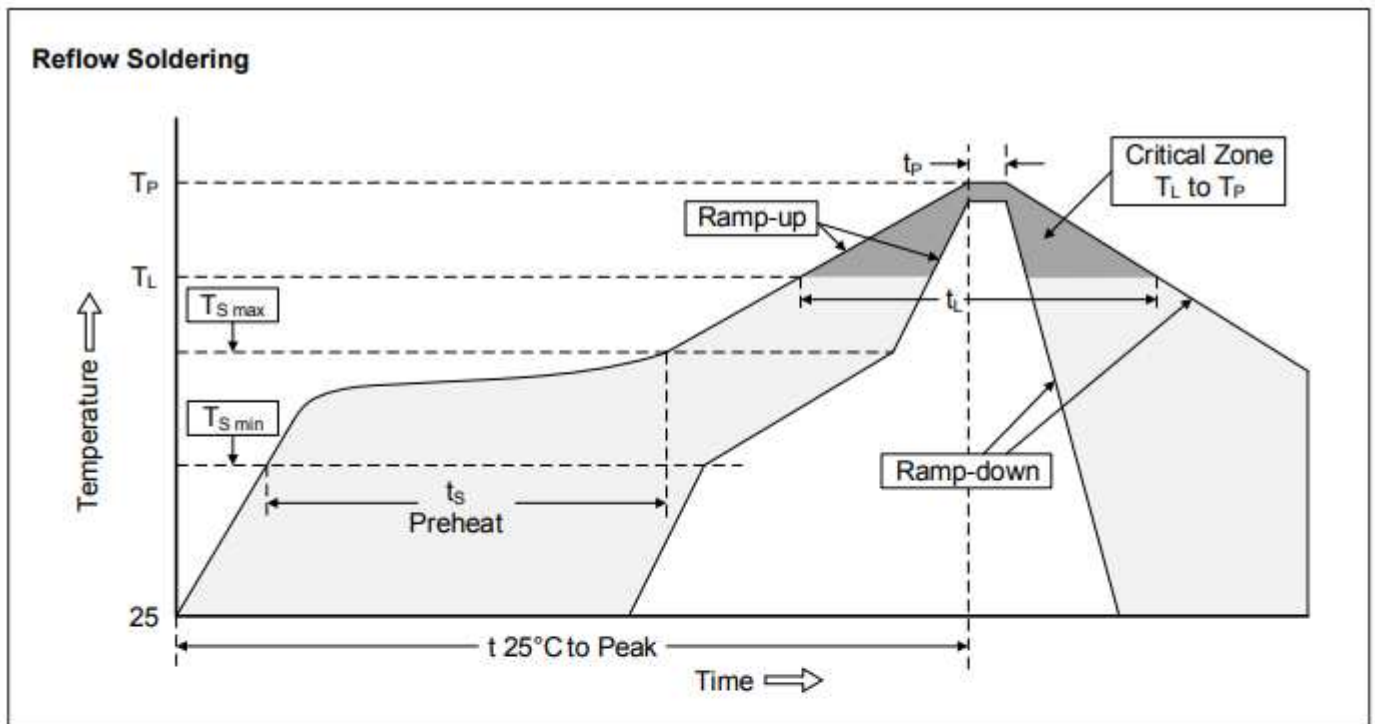


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■ Soldering Recommendation



Recommended Conditions

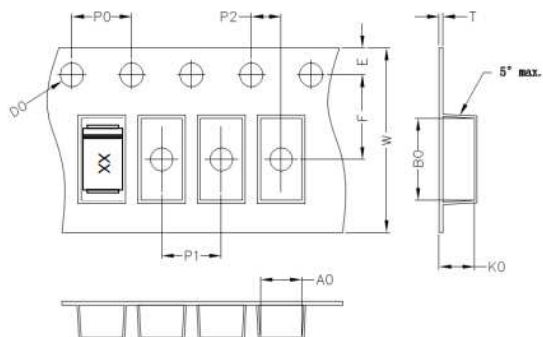
| Profile Feature | Pb-Free Assembly |
|--|------------------|
| Average ramp-up rate (T_L to T_P) | 3°C/second max. |
| Preheat | |
| -Temperature Min ($T_{S\ min}$) | 150°C |
| -Temperature Max ($T_{S\ max}$) | 200°C |
| -Time (min to max) (t_s) | 60-180 seconds |
| $T_{S\ max}$ to T_L | |
| -Ramp-up Rate | 3°C/second max. |
| Time maintained above: | |
| -Temperature (T_L) | 217°C |
| -Time (t_L) | 60-150 seconds |
| Peak Temperature (T_P) | 260°C |
| Time within 5°C of actual Peak Temperature (t_p) | 20-40 seconds |
| Ramp-down Rate | 6°C/second max. |
| Time 25°C to Peak Temperature | 8 minutes max. |

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■ Packaging



| | | | | | |
|------|------|------|------|------|-----------|
| A0 | B0 | K0 | D0 | E | F |
| 2.80 | 5.30 | 2.36 | 1.55 | 1.75 | 5.50 |
| P0 | P1 | P2 | T | W | Tolerance |
| 4.0 | 4.0 | 2.0 | 0.25 | 12 | 0.1 |

■ Quantity

| Series Type | Packaging option | Base quantity | Packaging specification |
|-------------|------------------|----------------|-------------------------|
| SMA6J | Tape and reel | 7500pcs / reel | EIA STD RS-481114 |

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■ Warehouse Storage Conditions of product

- Storage Condition:
 1. Storage Temperature: -10°C~+40°C
 2. Relative Humidity: $\leq 75\%RH$
 3. Keep away from corrosive atmosphere and sunlight.
- Period of Storage: 1 year.