

»Features

- Excellent clamping capability
- Low leakage current
- Low capacitance
- High surge capability
- Glass passivated chip
- Epoxy resin package
- Built-in strain relief
- Will not fatigue
- RoHS Compliant
- Fast response time:
typically less than 1.0ps from 0 Volts to V_{BR} min



SMC (DO-214AB)

»Mechanical Characteristics

- Package: SMC plastic package.
- Lead Finish: Matte Tin
- Case Material: Epoxy Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020

»Applications

- Telecom
- Computer
- Industrial electronic
- Consumer electronic

»Electrical Parameters

| Parameter | Definition |
|-----------|--|
| C_J | Junction Capacitance - typical capacitance measured with 0V or V_R bias |
| I_{PP} | Peak Pulse Current - maximum rated peak impulse current |
| V_C | Clamping Voltage - Peak voltage measured across the suppressor at a specified I_{ppm} (peak impulse current) |
| V_{BR} | Breakdown Voltage - Maximum voltage that flows through the TVS at a specified test current (I_T) |
| I_R | Leakage Current - maximum peak off-state current measured at V_R |
| V_R | Peak Off-state Voltage - maximum voltage that can be applied while maintaining off state |



»Summary of Packing Options

| Package | Packing Description | Packing Quantity | Industry Standard |
|---------|---------------------|------------------|-------------------|
| SMC | Tape/Reel, 13" reel | 3000 | EIA-481-1 |
| | Tape/Reel, 7" reel | 500 | EIA-481-1 |

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

| Parameter | Symbol | Value | Units | Remarks |
|--|-----------------|------------|-----------------------------|----------------|
| Peak Pulse Power Dissipation | P_{PPM} | 5000 | W | (Note1)(Note2) |
| Steady State Power Dissipation | P_D | 6.5 | W | (Note3) |
| Peak Forward Surge Current | I_{FSM} | 300 | A | (Note4) |
| Maximum Instantaneous Forward Voltage at 100A | V_{FM} | 5 | V | (Note5) |
| Typical Thermal Resistance Junction to Lead | $R_{\theta JL}$ | 15 | $^{\circ}\text{C}/\text{W}$ | |
| Typical Thermal Resistance Junction to Ambient | $R_{\theta JA}$ | 75 | $^{\circ}\text{C}/\text{W}$ | |
| Operating Temperature Range | T_J | -55 to 150 | $^{\circ}\text{C}$ | |
| Storage Temperature Range | T_{STG} | -55 to 150 | $^{\circ}\text{C}$ | |

Notes1: Non-repetitive current pulse , 10/1000us Waveform.

Notes2: Mounted on copper pad area of 8x8mm to each terminal.

Notes3: Infinite HeatSink at $T_A=50^{\circ}\text{C}$

Notes4: Measured on 8.3ms single half sine wave or equivalent square wave, duty cycle=4 perminute maximum.

Notes5: For UnidirectionalOnly.

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

| Part Number (Uni) | Part Number (Bi) | Marking Code | | Reverse Stand off Voltage V_R (V) | Breakdown Voltage $V_{BR} @ I_T$ (V) | | Test Current I_T (mA) | Maximum Clamping Voltage $V_C @ I_{PP}$ (V) | Maximum Peak Pulse Current I_{PP} (A) | Maximun Reverse Leakage $I_R @ V_R$ (μA) |
|-------------------|------------------|--------------|------|-------------------------------------|--------------------------------------|------|-------------------------|---|---|---|
| | | Uni | Bi | | Min | Max | | | | |
| - | 5.0SMDJ5.0CA | 5.0SMDJ5.0CA | | 5 | 6.4 | 7 | 10 | 9.2 | 543 | 800 |
| 5.0SMDJ12A | 5.0SMDJ12CA | 5PEP | 5BEP | 12 | 13.3 | 14.7 | 10 | 19.9 | 252 | 800 |
| 5.0SMDJ13A | 5.0SMDJ13CA | 5PEQ | 5BEQ | 13 | 14.4 | 15.9 | 10 | 21.5 | 233 | 500 |
| 5.0SMDJ14A | 5.0SMDJ14CA | 5PER | 5BER | 14 | 15.6 | 17.2 | 10 | 23.2 | 216 | 200 |
| 5.0SMDJ15A | 5.0SMDJ15CA | 5PES | 5BES | 15 | 16.7 | 18.5 | 1 | 24.4 | 205 | 100 |
| 5.0SMDJ16A | 5.0SMDJ16CA | 5PET | 5BET | 16 | 17.8 | 19.7 | 1 | 26 | 193 | 50 |
| 5.0SMDJ17A | 5.0SMDJ17CA | 5PEU | 5BEU | 17 | 18.9 | 20.9 | 1 | 27.6 | 181 | 20 |
| 5.0SMDJ18A | 5.0SMDJ18CA | 5PEV | 5BEV | 18 | 20 | 22.1 | 1 | 29.2 | 172 | 10 |
| 5.0SMDJ20A | 5.0SMDJ20CA | 5PEW | 5BEW | 20 | 22.2 | 24.5 | 1 | 32.4 | 155 | 5 |
| 5.0SMDJ22A | 5.0SMDJ22CA | 5PEX | 5BEX | 22 | 24.4 | 26.9 | 1 | 35.5 | 141 | 5 |
| 5.0SMDJ24A | 5.0SMDJ24CA | 5PEZ | 5BEZ | 24 | 26.7 | 29.5 | 1 | 38.9 | 129 | 5 |
| 5.0SMDJ26A | 5.0SMDJ26CA | 5PFE | 5BFE | 26 | 28.9 | 31.9 | 1 | 42.1 | 119 | 5 |
| 5.0SMDJ28A | 5.0SMDJ28CA | 5PFG | 5BFG | 28 | 31.1 | 34.4 | 1 | 45.4 | 110 | 5 |
| 5.0SMDJ30A | 5.0SMDJ30CA | 5PFK | 5BFK | 30 | 33.3 | 36.8 | 1 | 48.4 | 103 | 5 |
| 5.0SMDJ33A | 5.0SMDJ33CA | 5PFM | 5BFM | 33 | 36.7 | 40.6 | 1 | 53.3 | 93.9 | 5 |
| 5.0SMDJ36A | 5.0SMDJ36CA | 5PFP | 5BFP | 36 | 40 | 44.2 | 1 | 58.1 | 86.1 | 5 |
| 5.0SMDJ40A | 5.0SMDJ40CA | 5PFR | 5BFR | 40 | 44.4 | 49.1 | 1 | 64.5 | 77.6 | 5 |
| 5.0SMDJ43A | 5.0SMDJ43CA | 5PFT | 5BFT | 43 | 47.8 | 52.8 | 1 | 69.4 | 72.1 | 5 |
| 5.0SMDJ45A | 5.0SMDJ45CA | 5PFV | 5BFV | 45 | 50 | 55.3 | 1 | 72.7 | 68.8 | 5 |
| 5.0SMDJ48A | 5.0SMDJ48CA | 5PFX | 5BFX | 48 | 53.3 | 58.9 | 1 | 77.4 | 64.7 | 5 |

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

| Part Number (Uni) | Part Number (Bi) | Marking Code | | Reverse Stand off Voltage V_R (V) | Breakdown Voltage $V_{BR} @ I_T$ (V) | | Test Current I_T (mA) | Maximum Clamping Voltage $V_C @ I_{PP}$ (V) | Maximum Peak Pulse Current I_{PP} (A) | Maximun Reverse Leakage $I_R @ V_R$ (μA) |
|-------------------|------------------|--------------|------|-------------------------------------|--------------------------------------|------|-------------------------|---|---|---|
| | | Uni | Bi | | Min | Max | | | | |
| 5.0SMDJ51A | 5.0SMDJ51CA | 5PFZ | 5BFZ | 51 | 56.7 | 62.7 | 1 | 82.4 | 60.7 | 5 |
| 5.0SMDJ54A | 5.0SMDJ54CA | 5PGE | 5BGE | 54 | 60 | 66.3 | 1 | 87.1 | 57.5 | 5 |
| 5.0SMDJ58A | 5.0SMDJ58CA | 5PGG | 5BGG | 58 | 64.4 | 71.2 | 1 | 93.6 | 53.5 | 5 |
| 5.0SMDJ60A | 5.0SMDJ60CA | 5PGK | 5BGK | 60 | 66.7 | 73.7 | 1 | 96.8 | 51.7 | 5 |
| 5.0SMDJ64A | 5.0SMDJ64CA | 5PGM | 5BGM | 64 | 71.1 | 78.6 | 1 | 103 | 48.6 | 5 |
| 5.0SMDJ70A | 5.0SMDJ70CA | 5PGP | 5BGP | 70 | 77.8 | 86 | 1 | 113 | 44.3 | 5 |
| 5.0SMDJ75A | 5.0SMDJ75CA | 5PGR | 5BGR | 75 | 83.3 | 92.1 | 1 | 121 | 41.4 | 5 |
| 5.0SMDJ78A | 5.0SMDJ78CA | 5PGT | 5BGT | 78 | 86.7 | 95.8 | 1 | 126 | 39.7 | 5 |
| 5.0SMDJ85A | 5.0SMDJ85CA | 5PGV | 5BGV | 85 | 94.4 | 104 | 1 | 137 | 36.5 | 5 |
| 5.0SMDJ90A | 5.0SMDJ90CA | 5PGX | 5BGX | 90 | 100 | 111 | 1 | 146 | 34.3 | 5 |
| 5.0SMDJ100A | 5.0SMDJ100CA | 5PGZ | 5BGZ | 100 | 111 | 123 | 1 | 162 | 30.9 | 5 |
| 5.0SMDJ110A | 5.0SMDJ110CA | 5PHE | 5BHE | 110 | 122 | 135 | 1 | 177 | 28.3 | 5 |
| 5.0SMDJ120A | 5.0SMDJ120CA | 5PHG | 5BHG | 120 | 133 | 147 | 1 | 193 | 26 | 5 |
| 5.0SMDJ130A | 5.0SMDJ130CA | 5PHK | 5BHK | 130 | 144 | 159 | 1 | 209 | 24 | 5 |
| 5.0SMDJ150A | 5.0SMDJ150CA | 5PHM | 5BHM | 150 | 167 | 185 | 1 | 243 | 20.6 | 5 |
| 5.0SMDJ160A | 5.0SMDJ160CA | 5PHP | 5BHP | 160 | 178 | 197 | 1 | 259 | 19.3 | 5 |
| 5.0SMDJ170A | 5.0SMDJ170CA | 5PHR | 5BHR | 170 | 189 | 209 | 1 | 275 | 18.2 | 5 |

»Rating And Characteristic Curves ($T_A=25^\circ\text{C}$ unless otherwise noted)

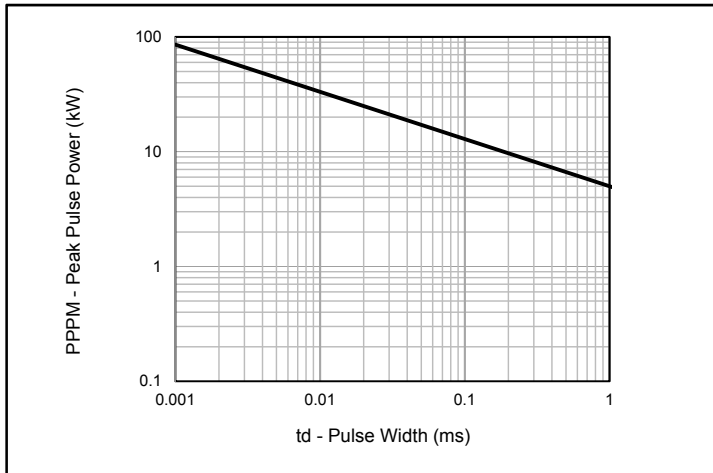


Fig.1 - Peak Pulse Power Rating

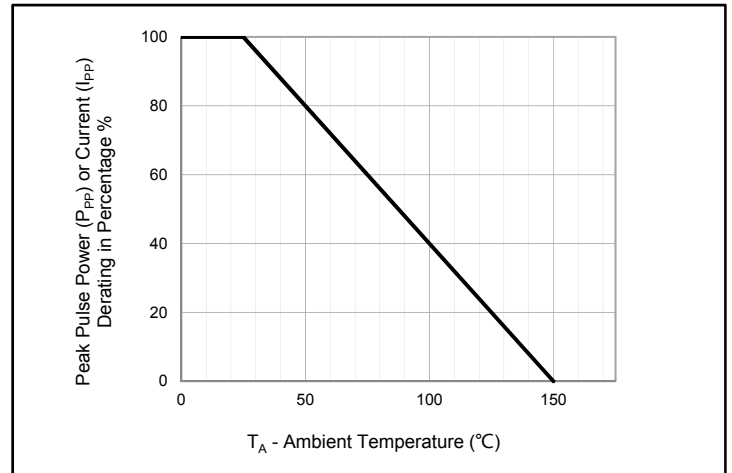


Fig.2 - Pulse Derating Curve

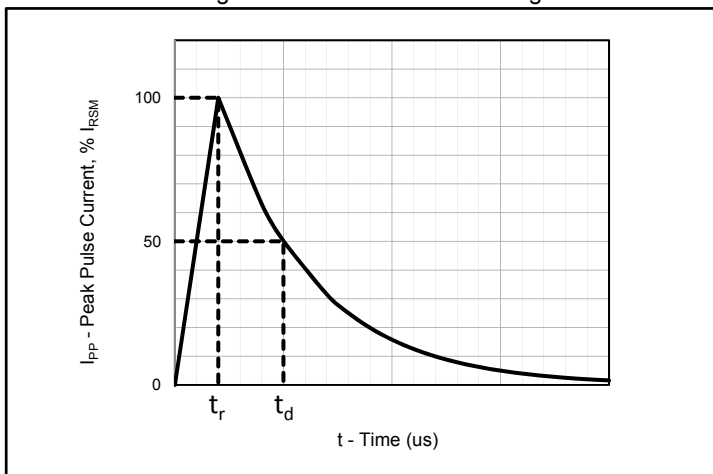


Fig.3 - Pulse Waveform

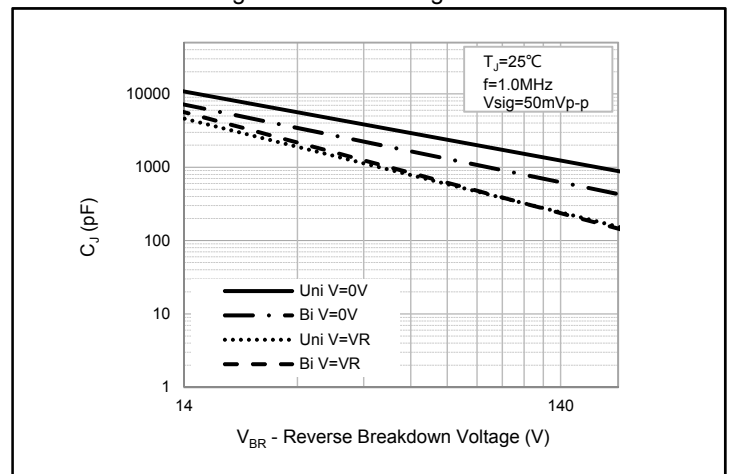


Fig.4 - Typical Junction Capacitance

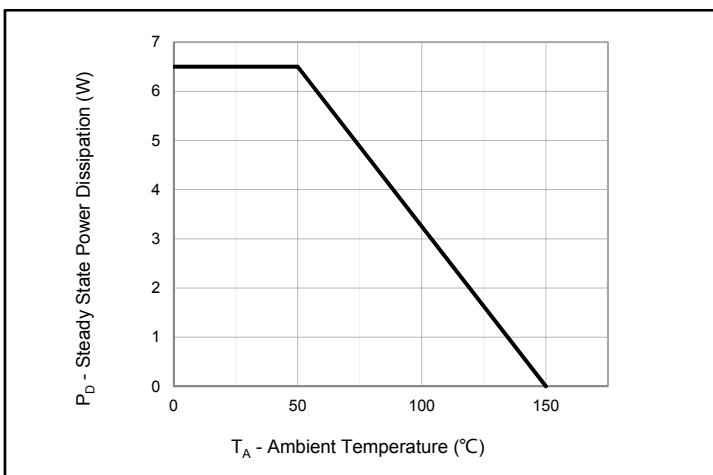


Fig.5 - Steady State Power Dissipation Derating Curve

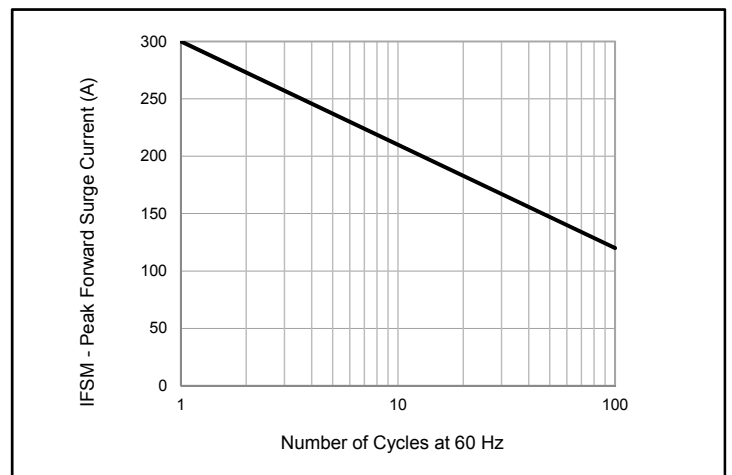
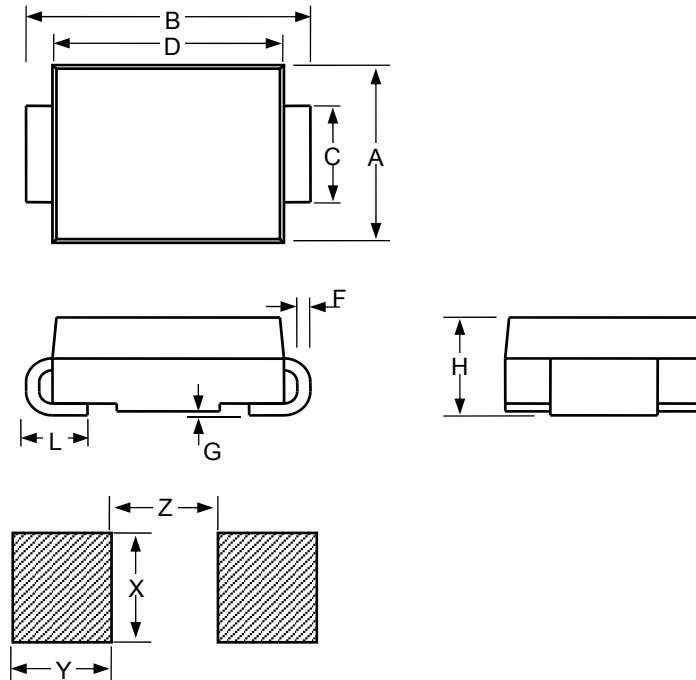


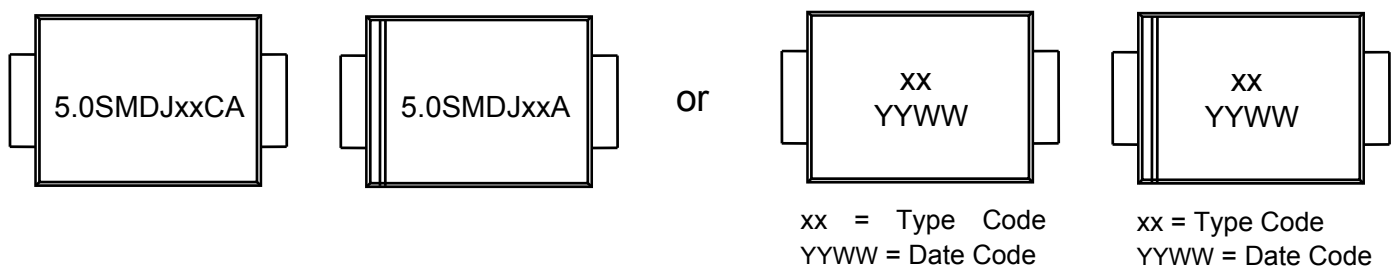
Fig.6 - Maximum Non-Repetitive Peak Forward Surge Current
Uni-Directional Only

»Package Dimensions



| SMC | | | | | | |
|-----------|--------|-------|-------|-------------|------|-------|
| Dimension | Inches | | | Millimeters | | |
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.22 | | 0.245 | 5.59 | | 6.22 |
| B | 0.305 | | 0.32 | 7.75 | | 8.13 |
| C | 0.114 | | 0.126 | 2.9 | | 3.2 |
| D | 0.26 | | 0.28 | 6.6 | | 7.11 |
| F | 0.006 | | 0.012 | 0.15 | | 0.305 |
| G | - | | 0.008 | - | | 0.203 |
| H | 0.087 | | 0.11 | 2.2 | | 2.8 |
| L | 0.03 | | 0.06 | 0.76 | | 1.52 |
| X | | 0.15 | | | 3.82 | |
| Y | | 0.119 | | | 3.03 | |
| Z | | 0.151 | | | 3.84 | |

»Marking Information

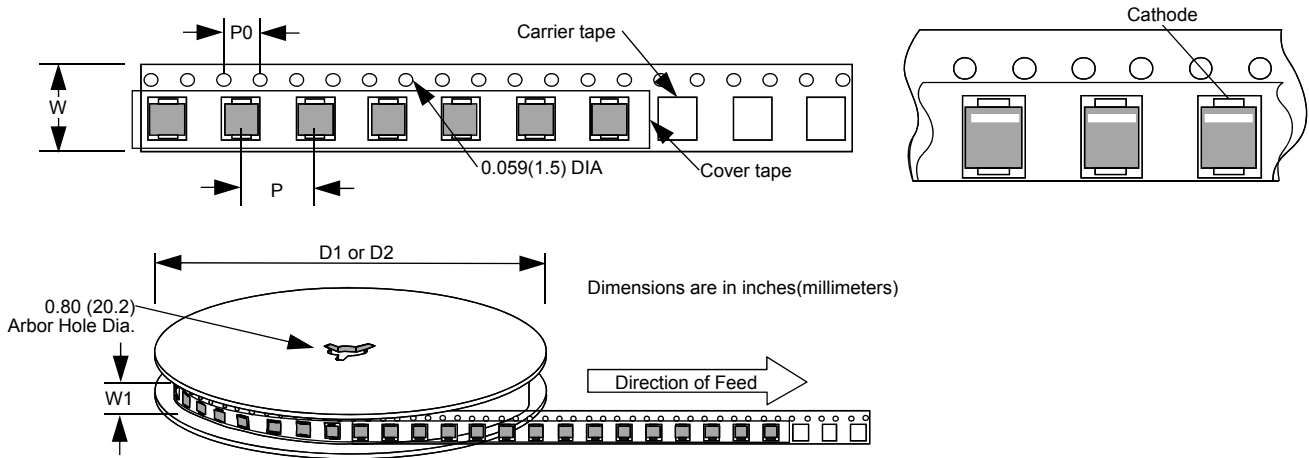


»Soldering Parameters



| Reflow Condition | | Lead-free assembly |
|--|------------------------------------|-------------------------|
| Pre Heat | - Temperature Min ($T_{s(min)}$) | 150°C |
| | - Temperature Max ($T_{s(max)}$) | 200°C |
| | - Time (min to max) (t_s) | 60 – 180 secs |
| Average ramp up rate (Liquidus Temp (T_L) to peak) | | 3°C/second max |
| $T_{s(max)}$ to T_L - Ramp-up Rate | | 3°C/second max |
| Reflow | - Temperature (T_L) (Liquidus) | 217°C |
| | - Time (t_L) | 60 – 150 secs |
| Peak Temperature (T_P) | | 260 ^{+0/-5} °C |
| Time within 5°C of actual peak Temperature (t_p) | | 20 – 40 secs |
| Ramp-down Rate | | 6°C/second max |
| Time 25°C to peak Temperature (t) | | 8 minutes Max. |
| Do not exceed | | 260°C |

»Tape and Reel Specification



| Dimension | Inches | | | Millimeters | | |
|-----------|--------|-------|-----|-------------|-------|-----|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| P | | 0.315 | | | 8 | |
| P0 | | 0.157 | | | 4 | |
| W | | 0.63 | | | 16 | |
| W1 | | 0.646 | | | 16.4 | |
| D1 | | 7 | | | 177.8 | |
| D2 | | 13 | | | 330.2 | |