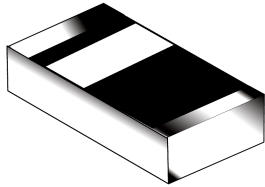




## Switching Diode

### CD4148WTN



#### FEATURES

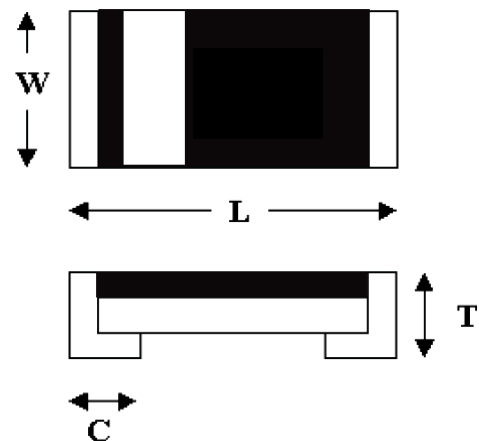
- Silicon epitaxial planar diode
- SMD chip pattern, suit for all kinds of SMT process
- Small size for PCB space saving
- 0603 size as SOD-523 equivalent
- Leadfree and RoHS compliance components

#### MECHANICAL CHARACTERISTICS

- Size: 0603
- Weight: approx. 2.8 mg
- Marking: Cathode terminal

#### DIMENSIONS

| Dimension/mm | 0603     |
|--------------|----------|
| L            | 1.55±0.1 |
| W            | 0.80±0.1 |
| T            | 0.65±0.1 |
| C            | 0.35±0.1 |



#### THERMAL CHARACTERISTICS<sup>1)</sup>

| Parameter at $T_{amb}=25^{\circ}C$ <sup>1)</sup>       | Symbol          | Value      | Unit  |
|--|-----------------|------------|-------|
| Forward Power Dissipation<br>Power derating above 25°C | $P_{tot}$       | 200        | mW    |
|  |                 | 1.6        | mW/°C |
| Junction Temperature                                   | $T_j$           | 150        | °C    |
| Thermal Resistance Junction to Ambient air             | $R_{\theta JA}$ | 375        | °C/W  |
| Operating & Storage Temperature range                  | $T_{stg}$       | -55 to 150 | °C    |

1) Valid provided that electrodes are kept at ambient temperature.



**MAXIMUM RATING<sup>1)</sup>**

| Parameter at T <sub>amb</sub> =25°C <sup>1)</sup>  | Symbol             | Value | Unit |
|--|--------------------|-------|------|
| Repetitive Peak Reverse Voltage  | V <sub>RRM</sub>   | 90    | V    |
| DC Reverse Voltage   | V <sub>R</sub>     | 80    | V    |
| Average rectified current sin half wave rectification with resistive load                                    | I <sub>F(AV)</sub> | 100   | mA   |
| Repetitive Peak Forward Current at T <sub>amb</sub> =25°C  | I <sub>FRM</sub>   | 225   | mA   |
| Non-Repetitive Surge Forward Current at t<1s and T <sub>j</sub> =25°C<br>at t≤8.3ms and T <sub>j</sub> =25°C | I <sub>FSM</sub>   | 500   | mA   |
|  |                    | 1500  | mA   |

1) Valid provided that electrodes are kept at ambient temperature.

**ELECTRICAL CHARACTERISTICS<sup>1)</sup>**

| Parameter at T <sub>amb</sub> =25°C <sup>1)</sup>                                   | Symbol           | Value                | Unit |
|---|------------------|----------------------|------|
| Forward Voltage at I <sub>F</sub> =10mA<br>at I <sub>F</sub> =100mA                 | V <sub>F</sub>   | 1.0 <sub>MAX</sub>   | V    |
|   |                  | 1.2 <sub>MAX</sub>   | V    |
| Leakage Current at V <sub>R</sub> =20V  | I <sub>R</sub>   | 0.025 <sub>MAX</sub> | uA   |
| Leakage Current at V <sub>R</sub> =80V  |                  | 0.1 <sub>MAX</sub>   | uA   |
| Capacitance at V <sub>R</sub> =0V, f=1MHz   | C <sub>tot</sub> | 3 <sub>MAX</sub>     | pF   |
| Reverse Recovery Time at I <sub>F</sub> =I <sub>R</sub> =10mA, R <sub>L</sub> =100Ω | t <sub>rr</sub>  | 4 <sub>MAX</sub>     | ns   |

1) Valid provided that electrodes are kept at ambient temperature.

**TYPICAL CHARACTERISTICS**

Figure 1. Forward Characteristic

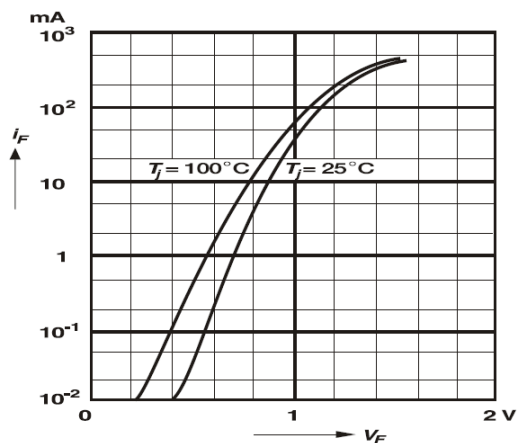


Figure 2. Power De-rating

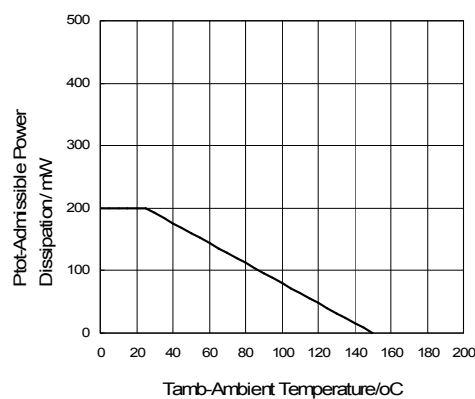




Figure 3. Forward Current De-rating

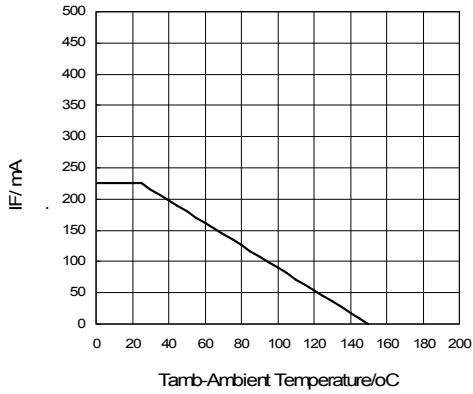
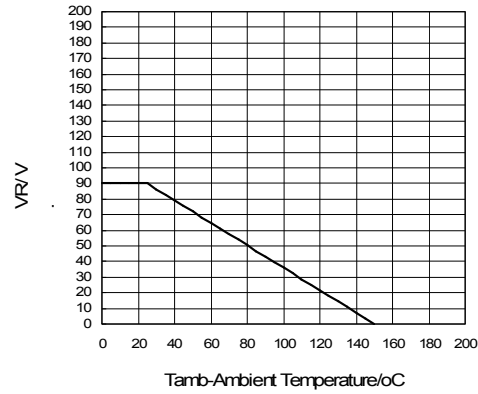


Figure 4. Reverse Voltage De-rating



**TEST CHARACTERISTICS**

| Test Item                       | Test Condition   | Requirement   |
|---------------------------------|--|---|
| Solderability                   | Sn bath at 245±5°C for 2±0.5s                          | >95% area tin covered   |
| Resistance to Soldering Heat    | Sn bath at 260±5°C for 10±2s                           | V <sub>F</sub> , V <sub>R</sub> & I <sub>R</sub> within spec;<br>no mechanical damage |
| Humidity Steady State           | At 85°C 85%RH for 168hrs                               | V <sub>F</sub> , V <sub>R</sub> & I <sub>R</sub> within spec                          |
| Continue Forward Operating Life | At 25°C I <sub>F</sub> = 1.1I <sub>F</sub> for 1000hrs | V <sub>F</sub> , V <sub>R</sub> & I <sub>R</sub> within spec                          |
| Thermal Shock                   | -55 ±5°C/5min to 150±5°C/5min<br>for 10cycles          | V <sub>F</sub> , V <sub>R</sub> & I <sub>R</sub> within spec                          |
| Bending Strength                | Bending up to 2mm for 1cycle                           | V <sub>F</sub> , V <sub>R</sub> & I <sub>R</sub> within spec;<br>no mechanical damage |



**APPLICATIONS**

- Function: Fast switching
- Soldering Condition:

**Soldering Condition & Caution**

- Recommended Soldering Condition  
(Refer to IPC/JEDEC J-STD-020D 4-1&5.2)

| Recommended Profile Condition       | Sn-Pb Soldering       | Leadfree Soldering    | Wave Soldering                 |
|-------------------------------------|-----------------------|-----------------------|--------------------------------|
| Ramp-up rate (from pre-heat stage)  | <3°C/s                | <3°C/s                | $\Delta T < 150^\circ\text{C}$ |
| Pre-heat Temperature & Time         | 100-150 °C<br>60-120s | 150-200 °C<br>60-120s | 100-150 °C<br>60-120s          |
| Soldering Temperature & Time        | 183 °C<br>60-150s     | 217 °C<br>60-150s     | 260±5°C<br>5±2s                |
| Peak Temperature                    | 230±5°C<br><260°C     | 245±5°C<br><260°C     | 260±5°C                        |
| Time within 5°C of peak temperature | 10-20s                | 20-30s                | -                              |
| Ramp-down rate                      | <6°C/s                | <6°C/s                | <6°C/s                         |
| Time 25°C to peak temperature       | <6min                 | <8min                 | -                              |

Manual Soldering: Approx. 350°C for 3s, avoid solder iron tip direct touch the components body

**Recommended Soldering Profile**

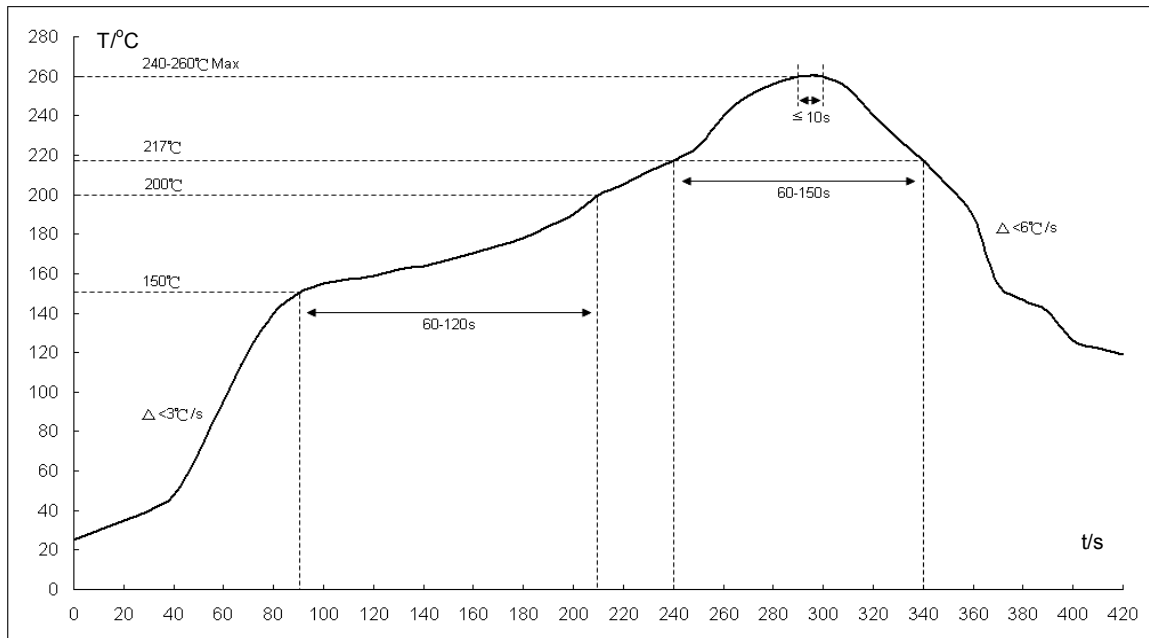


Fig1: Reflow soldering profile for lead-free solder (SnAgCu)

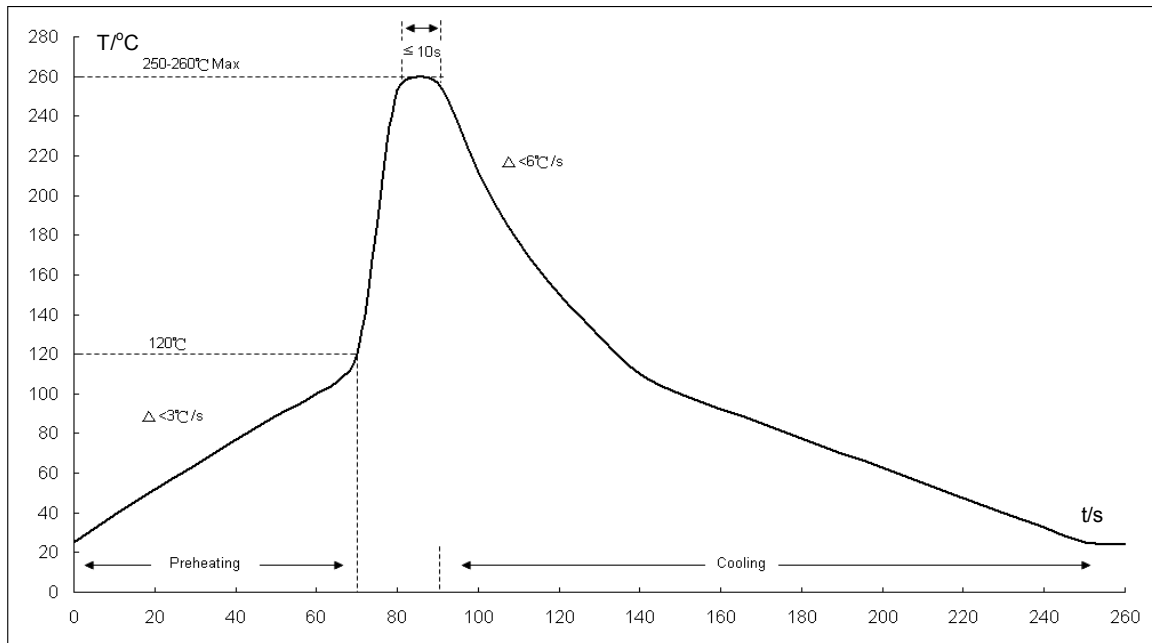
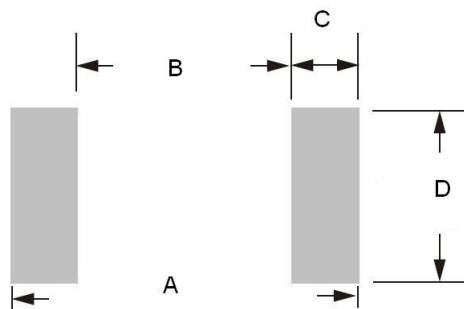


Fig2: Wave soldering profile

- \*1. The recommended profiles are referring to IPC/JEDEC J-STD-020D & IEC-60068-2-58
- \*2. Chip diodes are able to stand maximum soldering temperature up to 260°C max for 10s, and the soldering cycles with max 3 times, referring to IEC-60068-2-58

■ Recommended Soldering Footprint:



■ Reflow/Wave Soldering

| Product Size | Dimension/ mm |     |         |         |
|--------------|---------------|-----|---------|---------|
|              | A             | B   | C       | D       |
| 0603         | 1.8-2.6       | 0.8 | 0.5-0.9 | 0.8-1.0 |

- Storage Condition: Product termination solderability can degrade due to high temperature and



humidity or chemical environment. Storage condition must be in an ambient temperature of <40°C and ambient humidity of <75%RH, and free from chemical.

**ENVIRONMENTAL CHARACTERISTICS**

| Product | Hazardous Substance or Element/ppm |      |       |                  |       |       |
|---------|------------------------------------|------|-------|------------------|-------|-------|
|         | Pb                                 | Cd   | Hg    | Cr <sup>6+</sup> | PBB   | PBDE  |
|         | <1000                              | <100 | <1000 | <1000            | <1000 | <1000 |

| Product | Halogen Substance/ ppm |      |      |      |       |
|---------|------------------------|------|------|------|-------|
|         | F                      | Cl   | Br   | I    | Total |
|         | <900                   | <900 | <900 | <900 | <1500 |

**PACKING METHOD**

| Product | Quantity/Reel | Reel Size | Tape  |
|---------|---------------|-----------|-------|
|         | 5,000pcs      | 7"        | Paper |

**DISCLAIMERS**

These products are not designed for use in applications where any failure or malfunction may result in personal injury, death or severe property or environmental damage such as medical, military, aircraft, space or life support equipments.