

1N4148WS-FL

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1N4148WS-FL

200mW Surface Mount Switching Diode-100V

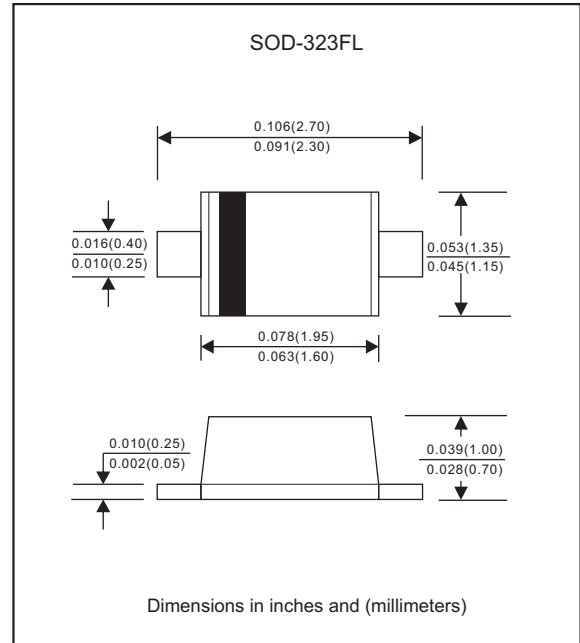
Features

- Fast switching speed.
- Electrically identical to standard JEDEC.
- Surface mount package ideally suited for automatic insertion.
- Tiny plastic SMD package.
- High Conductance.
- Silicon epitaxial planar chip.
- Lead-free parts for green partner, exceeds environmental standards of MIL-STD-19500 /228
- Suffix "-H" indicates Halogen-free parts, ex. 1N4148WS-FL-H

Mechanical data

- Epoxy : UL94-V0 rated flame retardant
- Case : Molded plastic, SOD-323FL
- Terminals :Plated terminals, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any
- Weight : Approximated 0.004 gram

Package Outline



Maximum ratings and Electrical Characteristics (AT $T_A=25^\circ\text{C}$ unless otherwise noted)

| PARAMETER | Symbol | 1N4148WS-FL | UNIT |
|--|-----------------|--|--------------------|
| Maximum reverse voltage | V_R | 75 | V |
| Maximum peak reverse voltage | V_{RM} | 100 | V |
| Maximum RMS voltage | V_{RMS} | 50 | V |
| Maximum DC blocking voltage | V_{DC} | 75 | V |
| Maximum average forward current at $T_A = 25^\circ\text{C}$ | I_O | 150 | mA |
| Maximum peak forward surge current, 1.0us | I_{FSM} | 2.0 | A |
| Maximum power dissipation derate above 25°C | P_D | 200 | mW |
| Maximum forward voltage | V_F | 0.715@ $I_F=0.001A$ 0.855@ $I_F=0.01A$ 1.0@ $I_F=0.05A$ 1.25@ $I_F=0.15A$ | V |
| Maximum DC reverse current at rated DC blocking voltage $T_J = 25^\circ\text{C}$ | I_R | 0.025@ $V_R=20V$ 1.0@ $V_R=75V$ | μA |
| Typical junction capacitance (Notes 1) | C_J | 2.0 | pF |
| Maximum reverse recovery time (Notes 2) | t_{rr} | 4.0 | ns |
| Typical thermal resistance junction to ambient | $R_{\theta JA}$ | 500 | $^\circ\text{C/W}$ |
| Operating junction and Storage Temperature Range | T_J, T_{STG} | -55 to +150 | $^\circ\text{C}$ |

Notes :

1. C_J at $V_R = 0V$, $f = 1\text{MHz}$
2. From $I_F = 10\text{mA}$ to $I_R = 1\text{mA}$, $V_R = 6V$, $R_L = 100\text{ohm}$

Rating and characteristic curves (1N4148WS-FL)

Fig. 1 TYPICAL FORWARD CHARACTERISTICS

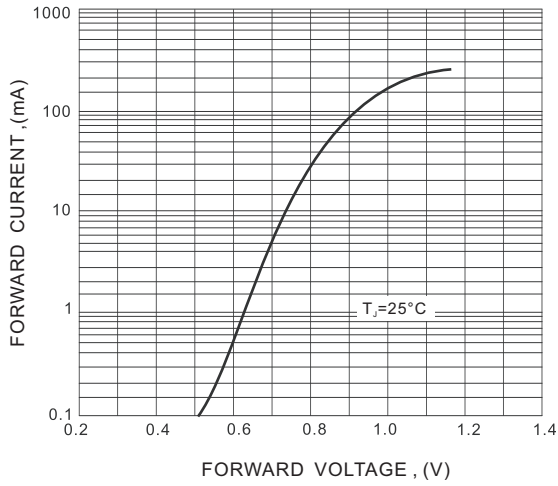


Fig. 2 TYPICAL REVERSE CHARACTERISTICS

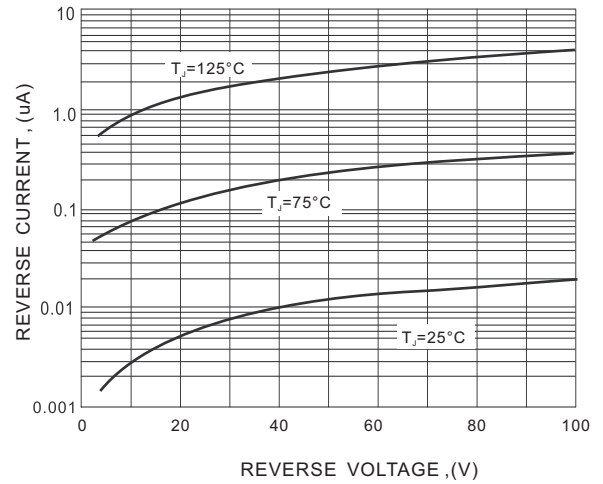
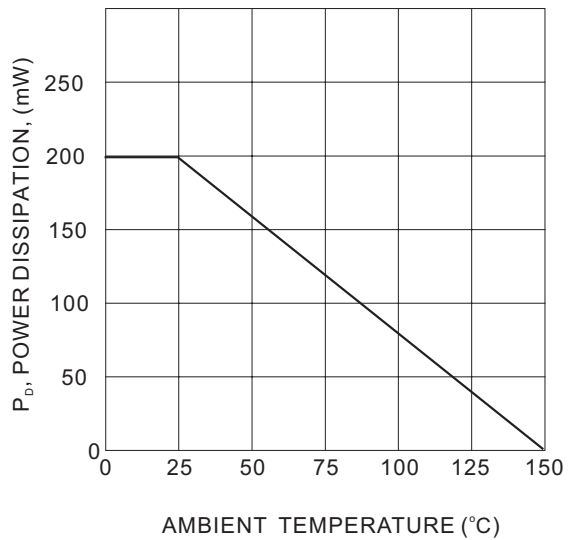




Fig. 3 POWER DERATING CURVE



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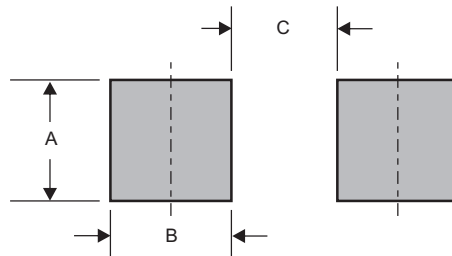
Pinning information

| Pin | Simplified outline | Symbol |
|----------------------------|--|---|
| Pin1 cathode Pin2 anode |  |  |

Marking

| Type number | Marking code |
|-------------|--------------|
| 1N4148WS-FL | S1 |

Suggested solder pad layout

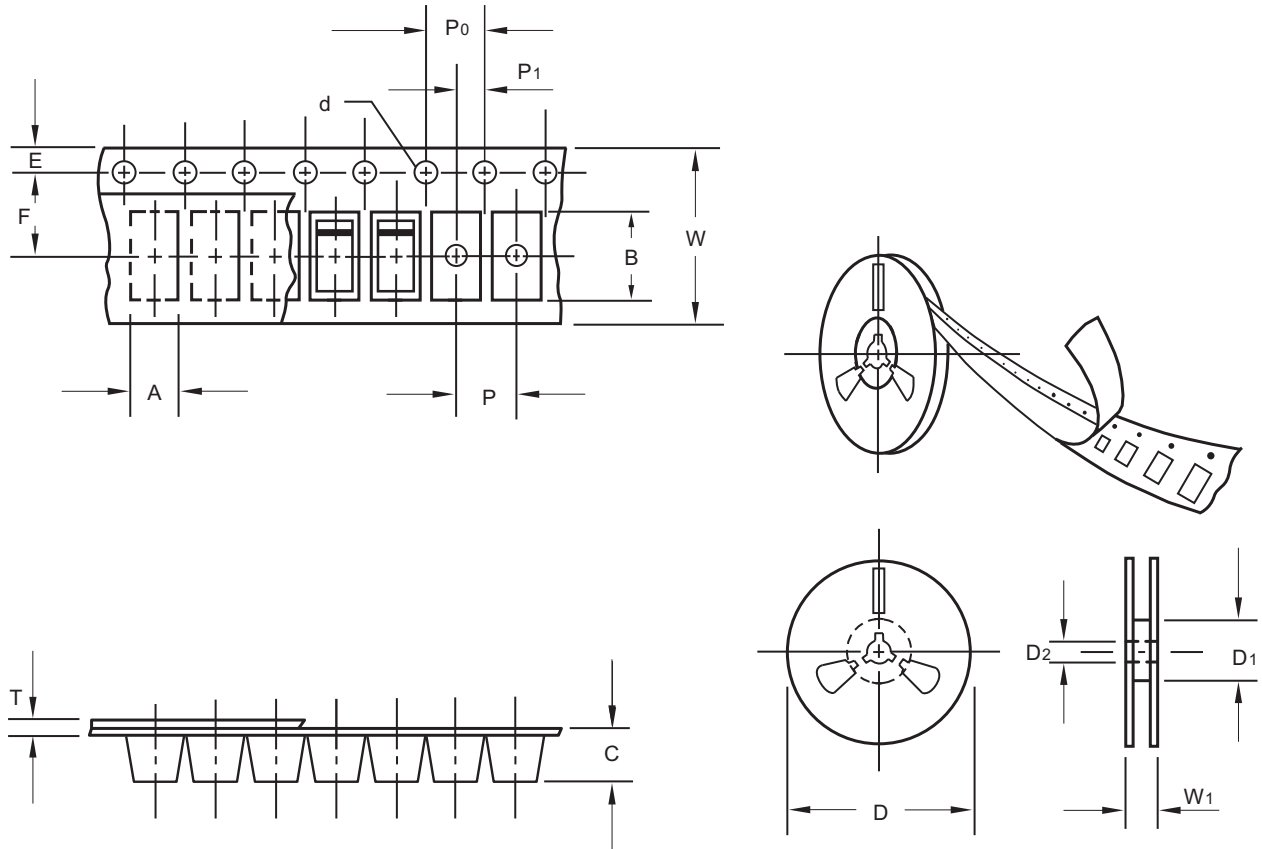


Dimensions in inches and (millimeters)

| PACKAGE | A | B | C |
|-----------|--------------|--------------|--------------|
| SOD-323FL | 0.032 (0.82) | 0.022 (0.56) | 0.069 (1.75) |

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Packing information



unit:mm

| Item | Symbol | Tolerance | SOD-323FL |
|---------------------------|--------|-----------|-----------|
| Carrier width | A | 0.1 | 1.46 |
| Carrier length | B | 0.1 | 2.95 |
| Carrier depth | C | 0.1 | 1.25 |
| Sprocket hole | d | 0.1 | 1.50 |
| 13" Reel outside diameter | D | 2.0 | - |
| 13" Reel inner diameter | D1 | min | - |
| 7" Reel outside diameter | D | 2.0 | 178.00 |
| 7" Reel inner diameter | D1 | min | 62.00 |
| Feed hole diameter | D2 | 0.5 | 13.00 |
| Sprocket hole position | E | 0.1 | 1.75 |
| Punch hole position | F | 0.1 | 3.50 |
| Punch hole pitch | P | 0.1 | 4.00 |
| Sprocket hole pitch | P0 | 0.1 | 4.00 |
| Embossment center | P1 | 0.1 | 2.00 |
| Overall tape thickness | T | 0.1 | 0.23 |
| Tape width | W | 0.3 | 8.00 |
| Reel width | W1 | 1.0 | 11.40 |

Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

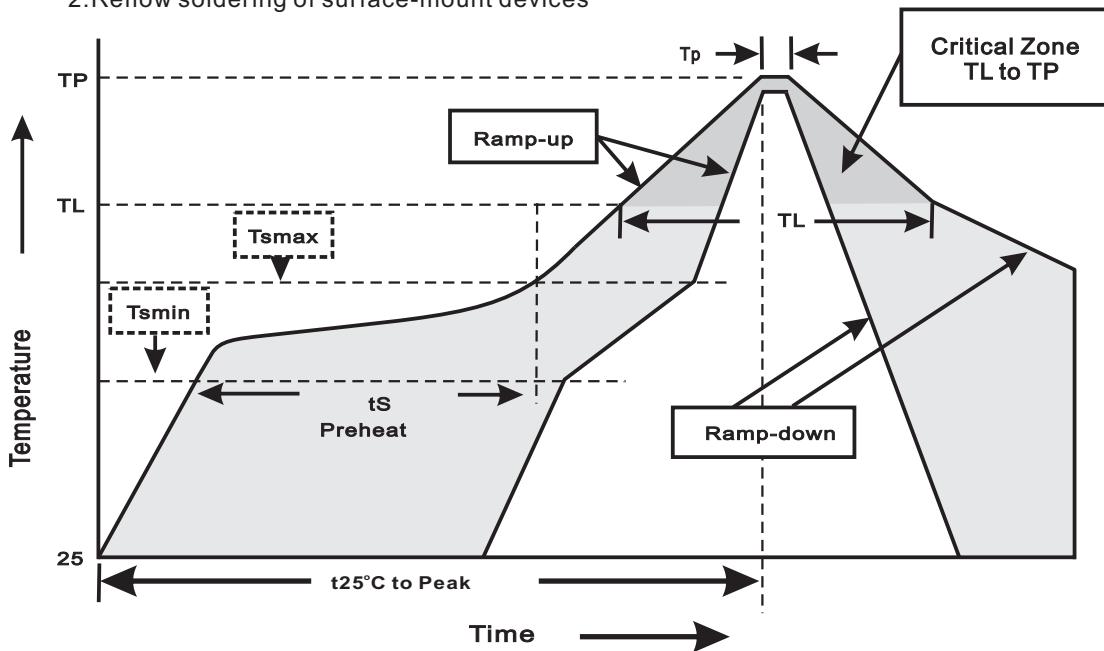
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Reel packing

| PACKAGE | REEL SIZE | REEL (pcs) | COMPONENT SPACING (m/m) | BOX (pcs) | INNER BOX (m/m) | REEL DIA, (m/m) | CARTON SIZE (m/m) | CARTON (pcs) | APPROX. GROSS WEIGHT (kg) |
|-----------|-----------|------------|-------------------------|-----------|-----------------|-----------------|-------------------|--------------|---------------------------|
| SOD-323FL | 7" | 3,000 | 4.0 | 30,000 | 183*183*123 | 178 | 382*262*387 | 240,000 | 9.5 |

Suggested thermal profiles for soldering processes

- 1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
- 2.Reflow soldering of surface-mount devices



3.Reflow soldering

| Profile Feature | Soldering Condition |
|---|-----------------------------|
| Average ramp-up rate(T _L to T _P) | <3°C/sec |
| Preheat -Temperature Min(T _{smin}) -Temperature Max(T _{smax}) -Time(min to max)(t _s) | 150°C 200°C 60~120sec |
| T _{smax} to T _L -Ramp-upRate | <3°C/sec |
| Time maintained above: -Temperature(T _L) -Time(t _L) | 217°C 60~260sec |
| Peak Temperature(T _P) | 255°C-0/+5°C |
| Time within 5°C of actual Peak Temperature(t _P) | 10~30sec |
| Ramp-down Rate | <6°C/sec |
| Time 25°C to Peak Temperature | <6minutes |

1N4148WS-FL**High reliability test capabilities**

| Item Test | Conditions | Reference |
|-----------------------------------|--|-------------------------------|
| 1. Solder Resistance | at $260\pm 5^{\circ}\text{C}$ for $10\pm 2\text{sec}$. immerse body into solder $1/16''\pm 1/32''$ | MIL-STD-750D METHOD-2031 |
| 2. Solderability | at $245\pm 5^{\circ}\text{C}$ for 5 sec. | MIL-STD-202F METHOD-208 |
| 3. High Temperature Reverse Bias | $V_R=80\%$ rate at $T_J=150^{\circ}\text{C}$ for 168 hrs. | MIL-STD-750D METHOD-1038 |
| 4. Forward Operation Life | Rated average rectifier current at $T_A=25^{\circ}\text{C}$ for 500hrs. | MIL-STD-750D METHOD-1027 |
| 5. Intermittent Operation Life | $T_A = 25^{\circ}\text{C}$, $I_F = I_o$ On state: power on for 5 min. off state: power off for 5 min. on and off for 500 cycles. | MIL-STD-750D METHOD-1036 |
| 6. Pressure Cooker | $15P_{SIG}$ at $T_A=121^{\circ}\text{C}$ for 4 hrs. | JESD22-A102 |
| 7. Temperature Cycling | -55°C to $+125^{\circ}\text{C}$ dwelled for 30 min. and transferred for 5min. total 10 cycles. | MIL-STD-750D METHOD-1051 |
| 8. Forward Surge | Peak forward surge current | MIL-STD-750D METHOD-4066-2 |
| 9. Humidity | at $T_A=85^{\circ}\text{C}$, RH=85% for 1000hrs. | MIL-STD-750D METHOD-1021 |
| 10. High Temperature Storage Life | at 175°C for 1000 hrs. | MIL-STD-750D METHOD-1031 |