



Small Signal Fast Switching Diodes



FEATURES

- Silicon epitaxial planar diode
- Saving space
- Hermetic sealed parts
- Fits onto SOD-323 / SOT-23 footprints
- Electrical data identical with the devices 1N4148 and 1N4448 respectively
- MicroMELF package
- AEC-Q101 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

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MECHANICAL DATA

Case: MicroMELF

Weight: approx. 12 mg

Cathode band color: black

Packaging codes / options:

TR3/10K per 13" reel (8 mm tape), 10K/box

TR/2.5K per 7" reel (8 mm tape), 12.5K/box

APPLICATIONS

- Extreme fast switches

| PARTS TABLE | | | | |
|-------------|--|---------------------------|-----------------------|---------------|
| PART | TYPE DIFFERENTIATION | ORDERING CODE | CIRCUIT CONFIGURATION | REMARKS |
| MCL4148 | $V_{RRM} = 100\text{ V}$, V_F at $I_F 50\text{ mA} = 1\text{ V}$ | MCL4148-TR3 or MCL4148-TR | Single | Tape and reel |
| MCL4448 | $V_{RRM} = 100\text{ V}$, V_F at $I_F 100\text{ mA} = 1\text{ V}$ | MCL4448-TR3 or MCL4448-TR | Single | Tape and reel |

| ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25\text{ }^\circ\text{C}$, unless otherwise specified) | | | | | |
|---|------------------------------|-------------|-------|------|--|
| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT | |
| Reverse voltage | | V_R | 75 | V | |
| Repetitive peak reverse voltage | | V_{RRM} | 100 | V | |
| Peak forward surge current | $t_p = 1\text{ }\mu\text{s}$ | I_{FSM} | 2 | A | |
| Repetitive peak forward current | | I_{FRM} | 450 | mA | |
| Forward continuous current | | I_F | 200 | mA | |
| Average forward current | $V_R = 0\text{ V}$ | $I_{F(AV)}$ | 150 | mA | |
| Power dissipation | | P_{tot} | 500 | mW | |

| THERMAL CHARACTERISTICS ($T_{amb} = 25\text{ }^\circ\text{C}$, unless otherwise specified) | | | | | |
|--|---|------------|-------------|------------------|--|
| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT | |
| Thermal resistance junction to ambient air | Mounted on epoxy-glass hard tissue, Fig. 5, 35 μm copper clad, 0.9 mm^2 copper area per electrode | R_{thJA} | 500 | K/W | |
| Junction temperature | | T_j | 175 | $^\circ\text{C}$ | |
| Storage temperature range | | T_{stg} | -65 to +175 | $^\circ\text{C}$ | |



| ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | | | | |
|---|--|---------|------------|-------|-------|-------|---------------|
| PARAMETER | TEST CONDITION | SYMBOL | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Forward voltage | $I_F = 5\text{ mA}$ | MCL4448 | V_F | 0.620 | | 0.720 | V |
| | $I_F = 50\text{ mA}$ | MCL4148 | V_F | | 0.860 | 1 | V |
| | $I_F = 100\text{ mA}$ | MCL4448 | V_F | | 0.930 | 1 | V |
| Reverse current | $V_R = 20\text{ V}$ | | I_R | | | 25 | nA |
| | $V_R = 20\text{ V}, T_j = 150\text{ }^{\circ}\text{C}$ | | I_R | | | 50 | μA |
| | $V_R = 75\text{ V}$ | | I_R | | | 5 | μA |
| Breakdown voltage | $I_R = 100\text{ }\mu\text{A}, t_p/T = 0.01,$ $t_p = 0.3\text{ ms}$ | | $V_{(BR)}$ | 100 | | | V |
| Diode capacitance | $V_R = 0\text{ V}, f = 1\text{ MHz},$ $V_{HF} = 50\text{ mV}$ | | C_D | | | 4 | pF |
| Rectification efficiency | $V_{HF} = 2\text{ V}, f = 100\text{ MHz}$ | | η_r | 45 | | | % |
| Reverse recovery time | $I_F = I_R = 10\text{ mA},$ $i_R = 1\text{ mA}$ | | t_{rr} | | | 8 | ns |
| | $I_F = 10\text{ mA}, V_R = 6\text{ V},$ $i_R = 0.1 \times I_R, R_L = 100\text{ }\Omega$ | | t_{rr} | | | 4 | |

TYPICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

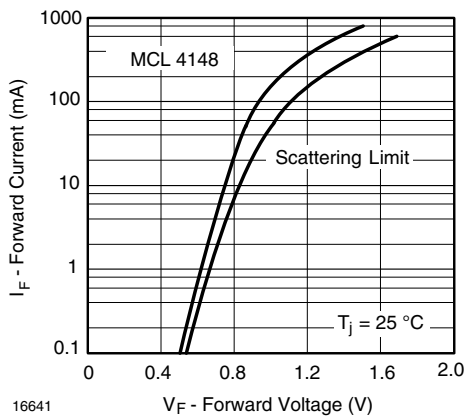


Fig. 1 - Reverse Current vs. Junction Temperature

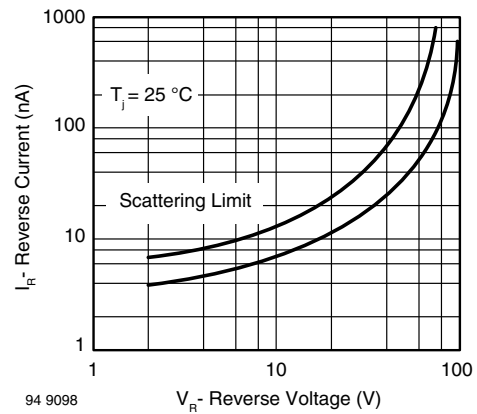


Fig. 3 - Reverse Current vs. Reverse Voltage

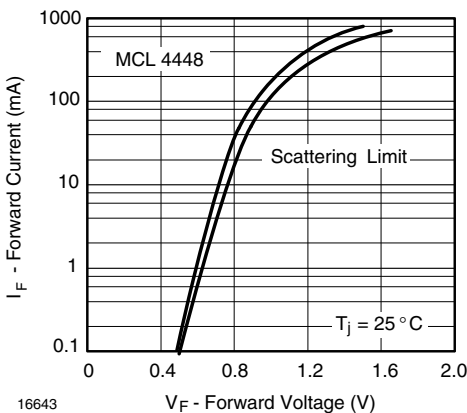


Fig. 2 - Forward Current vs. Forward Voltage

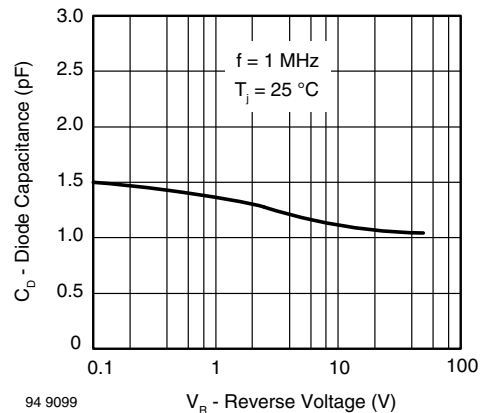


Fig. 4 - Diode Capacitance vs. Reverse Voltage

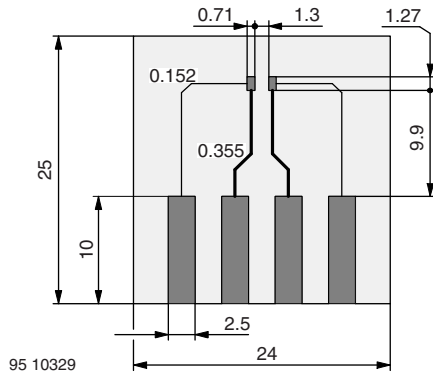
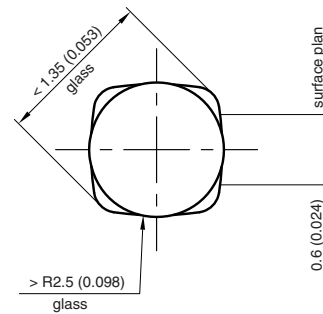
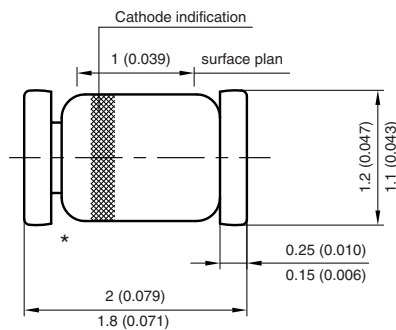
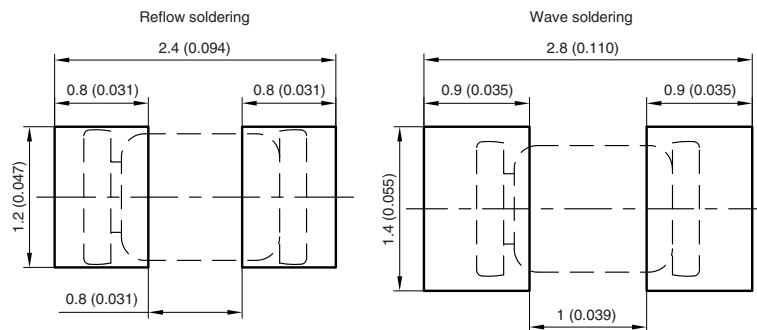


Fig. 5 - Board for R_{thJA} definition (in mm)

PACKAGE DIMENSIONS in millimeters (inches): **MicroMELF**



Foot print recommendation:



Created - Date: 26.July.1996
 Rev. 13 - Date: 07.June.2006
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 96 12072



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