

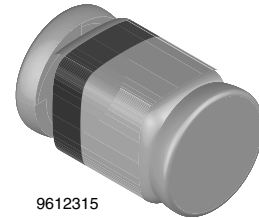
## Small Signal Fast Switching Diodes

### Features

- Silicon Epitaxial Planar Diodes
- 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
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21 definition



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**



9612315

### Applications

- Extreme fast switches

### Mechanical Data

**Case:** MicroMELF

**Weight:** approx. 12 mg

**Cathode band color:** black

**Packaging codes/options:**

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

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

### Parts Table

Part	Type differentiation	Ordering code	Remarks
MCL4148	$V_{RRM} = 100\text{ V}$ , $V_F$ at $I_F 50\text{ mA} = 1\text{ V}$	MCL4148-TR3 or MCL4148-TR	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	Tape and Reel

### Absolute Maximum Ratings

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

Parameter	Test condition	Symbol	Value	Unit
Repetitive peak reverse voltage		$V_{RRM}$	100	V
Reverse voltage		$V_R$	75	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	$V_R = 0$	$I_{FAV}$	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
Junction to ambient air	Mounted on epoxy-glass hard tissue, Fig. 5, 35 $\mu\text{m}$ copper clad, 0.9 $\text{mm}^2$ 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	Part	Symbol	Min.	Typ.	Max.	Unit
Forward voltage	$I_F = 5\text{ mA}$	MCL4448	$V_F$	620		720	mV
	$I_F = 50\text{ mA}$	MCL4148	$V_F$		860	1000	mV
	$I_F = 100\text{ mA}$	MCL4448	$V_F$		930	1000	mV
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	$\mu\text{A}$
	$V_R = 75\text{ V}$		$I_R$			5	$\mu\text{A}$
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	$V_R = 0$ , $f = 1\text{ MHz}$ , $V_{HF} = 50\text{ mV}$		$C_D$			4	pF
Rectification efficiency	$V_{HF} = 2\text{ V}$ , $f = 100\text{ MHz}$		$\eta_r$	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	ns

### Typical Characteristics

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

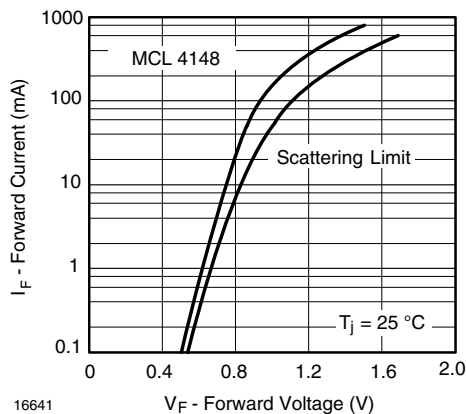


Figure 1. Forward Current vs. Forward Voltage

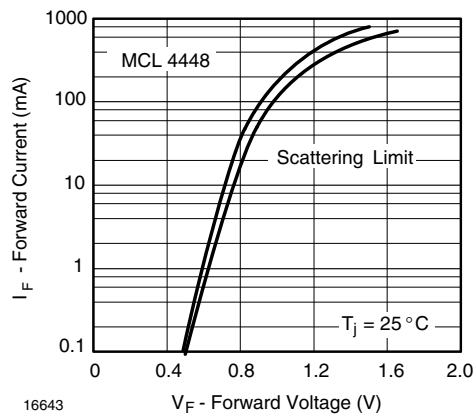


Figure 2. Forward Current vs. Forward Voltage

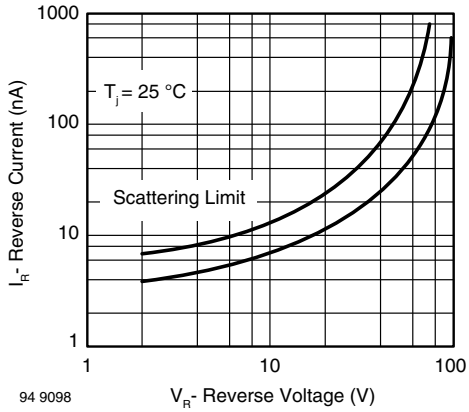


Figure 3. Reverse Current vs. Reverse Voltage

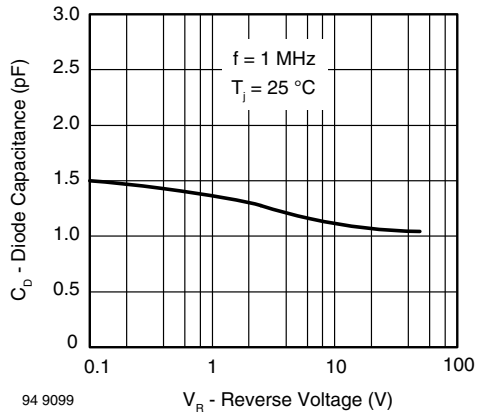


Figure 4. Diode Capacitance vs. Reverse Voltage

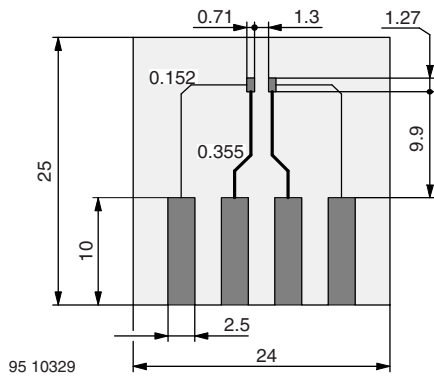
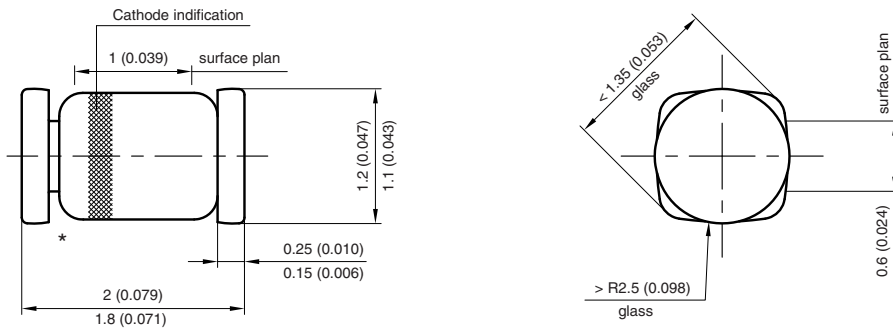


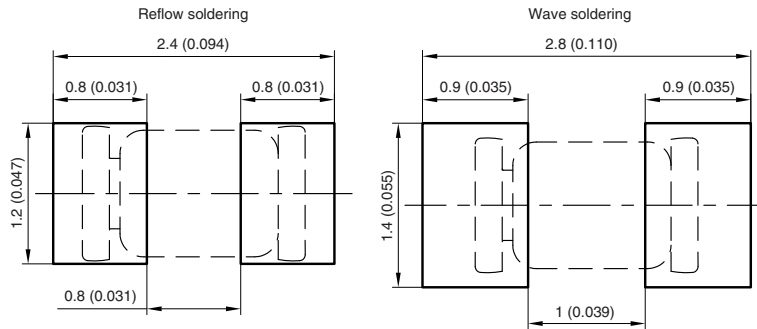
Figure 5. Board for  $R_{thJA}$  definition (in mm)

## Package Dimensions in millimeter (inches): MicroMELF



\* The gap between plug and glass can be either on cathode or anode side

Foot print recommendation:



Created - Date: 26.July.1996  
 Rev. 13 - Date: 07.June.2006  
 Document no.:6.560-5007.01-4  
 96 12072



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