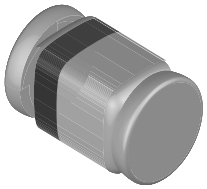
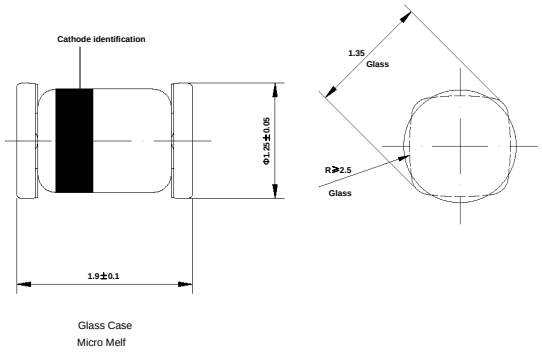
MCL4148/MCL4448

Small Signal Fast Switching Diode



Micro Melf



Dimension in millimeters

Features

- Silicon Epitaxial Planar Diodes
- Saving space
- Hermetic sealed parts
- Fits onto SOD323 / SOT23 footprints
- Electrical data identical with the devices 1N4148 and 1N4448 respectively
- Micro Melf package
- Lead (Pb)-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

Applications

- Extreme fast switches

Mechanical Data

Case: MicroMELF Glass case
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 V, V_F at I_F 50 mA = 1 V	MCL4148-TR3 or MCL4148-TR	Tape and Reel
MCL4448	V_{RRM} = 100 V, V_F at I_F 100 mA = 1 V	MCL4448-TR3 or MCL4448-TR	Tape and Reel

Absolute Maximum Ratings

T_{amb} = 25 °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 µs	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

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Thermal Characteristics

T_{amb} = 25 °C, unless otherwise specified

Parameter	Test condition	Symbol	Value	Unit
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	°C
Storage temperature range		T_{stg}	- 65 to + 175	°C

Electrical Characteristics

T_{amb} = 25 °C, unless otherwise specified

Parameter	Test condition	Part	Symbol	Min	Typ.	Max	Unit
Forward voltage	I_F = 5 mA	MCL4448	V_F	620		720	mV
	I_F = 50 mA	MCL4148	V_F		860	1000	mV
	I_F = 100 mA	MCL4448	V_F		930	1000	mV
Reverse current	V_R = 20 V		I_R			25	nA
	V_R = 20 V, T_j = 150 °C		I_R			50	µA
	V_R = 75 V		I_R			5	µA
Breakdown voltage	I_R = 100 µA, t_p/T = 0.01, t_p = 0.3 ms		$V_{(BR)}$	100			V
Diode capacitance	V_R = 0, f = 1 MHz, V_{HF} = 50 mV		C_D			4	pF
Rectification efficiency	V_{HF} = 2 V, f = 100 MHz		η_r	45			%
Reverse recovery time	I_F = I_R =10 mA, i_R = 1 mA		t_{rr}			8	ns
	I_F = 10 mA, V_R = 6 V, i_R = 0.1 x I_R, R_L = 100 Ω		t_{rr}			4	ns

Typical Characteristics

T_{amb} = 25 °C, unless otherwise specified

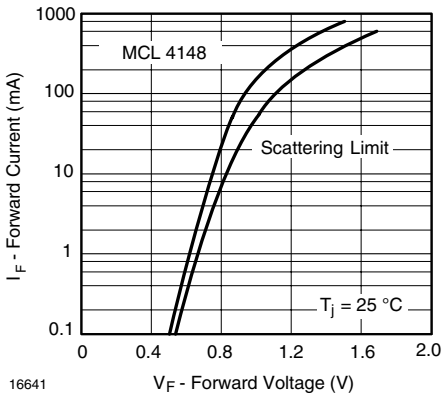

Figure 1. Forward Current vs. Forward Voltage

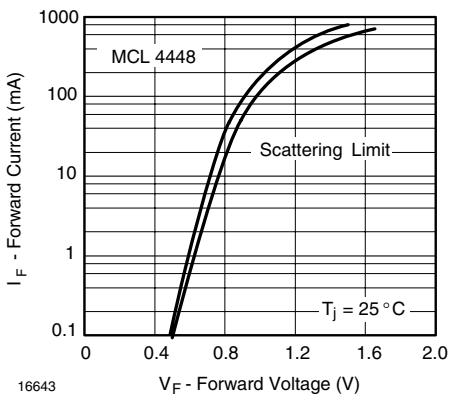

Figure 2. Forward Current vs. Forward Voltage

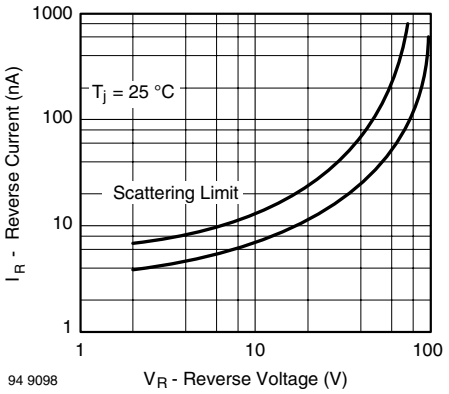

Figure 3. Reverse Current vs. Reverse Voltage

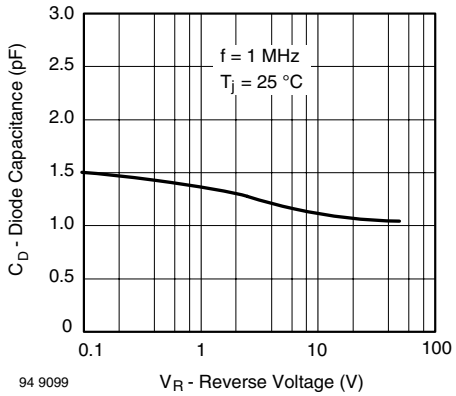

Figure 4. Diode Capacitance vs. Reverse Voltage

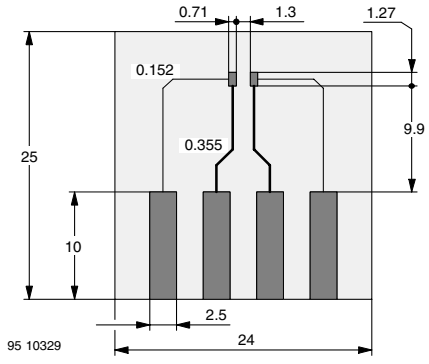

Figure 5. Board for R_{thJA} definition (in mm)