



# 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](http://www.vishay.com/doc?99912)



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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 $\mu\text{m}$ 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 <sub>amb</sub> = 25 °C, unless otherwise specified)							
PARAMETER	TEST CONDITION	SYMBOL	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	I <sub>F</sub> = 5 mA	MCL4448	V <sub>F</sub>	0.620		0.720	V
	I <sub>F</sub> = 50 mA	MCL4148	V <sub>F</sub>		0.860	1	V
	I <sub>F</sub> = 100 mA	MCL4448	V <sub>F</sub>		0.930	1	V
Reverse current	V <sub>R</sub> = 20 V		I <sub>R</sub>			25	nA
	V <sub>R</sub> = 20 V, T <sub>j</sub> = 150 °C		I <sub>R</sub>			50	μA
	V <sub>R</sub> = 75 V		I <sub>R</sub>			5	μA
Breakdown voltage	I <sub>R</sub> = 100 μA, t <sub>p</sub> /T = 0.01, t <sub>p</sub> = 0.3 ms		V <sub>(BR)</sub>	100			V
Diode capacitance	V <sub>R</sub> = 0 V, f = 1 MHz, V <sub>HF</sub> = 50 mV		C <sub>D</sub>			4	pF
Rectification efficiency	V <sub>HF</sub> = 2 V, f = 100 MHz		η <sub>r</sub>	45			%
Reverse recovery time	I <sub>F</sub> = I <sub>R</sub> = 10 mA, i <sub>R</sub> = 1 mA		t <sub>rr</sub>			8	ns
	I <sub>F</sub> = 10 mA, V <sub>R</sub> = 6 V, i <sub>R</sub> = 0.1 x I <sub>R</sub> , R <sub>L</sub> = 100 Ω		t <sub>rr</sub>			4	

**TYPICAL CHARACTERISTICS** (T<sub>amb</sub> = 25 °C, unless otherwise specified)

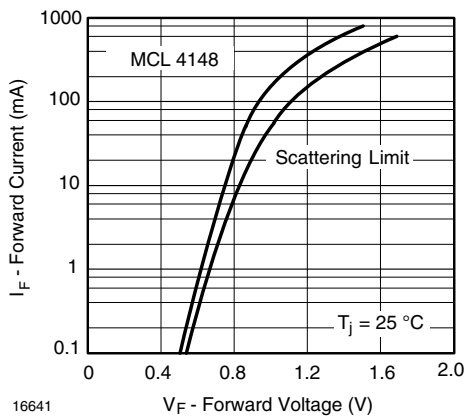


Fig. 1 - Reverse Current vs. Junction Temperature

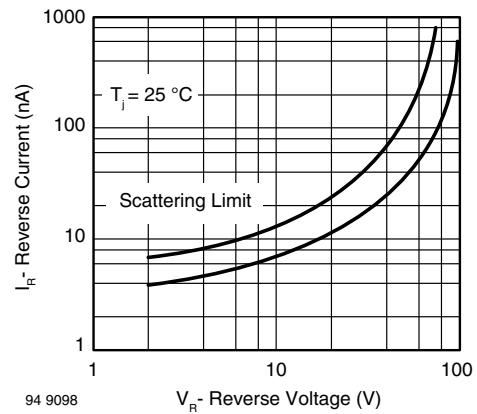


Fig. 3 - Reverse Current vs. Reverse Voltage

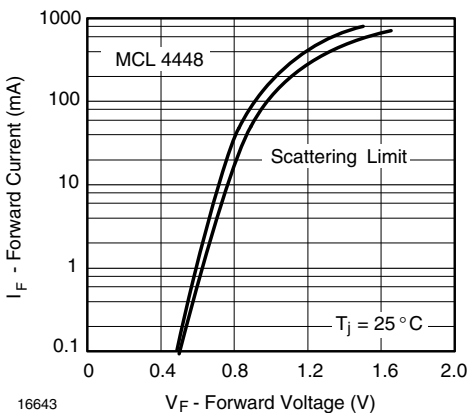


Fig. 2 - Forward Current vs. Forward Voltage

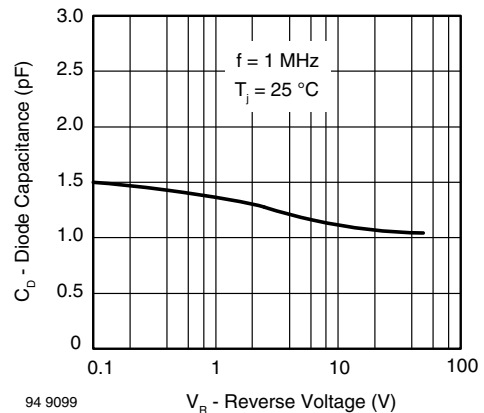


Fig. 4 - Diode Capacitance vs. Reverse Voltage

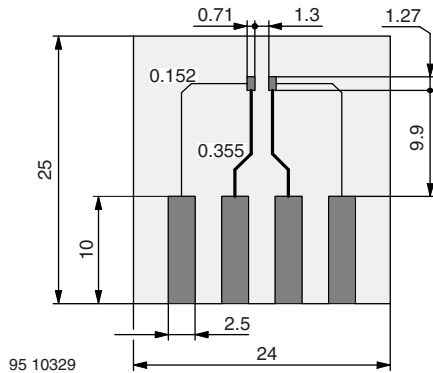
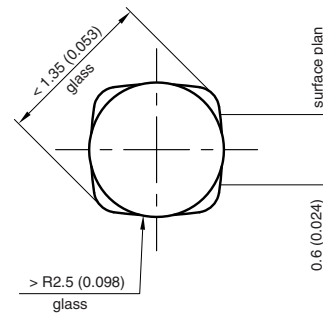
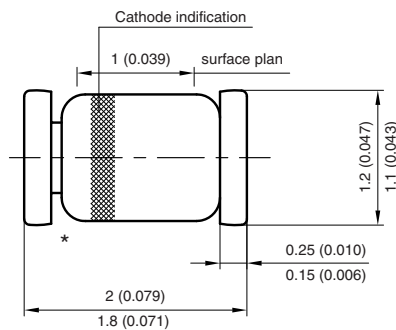


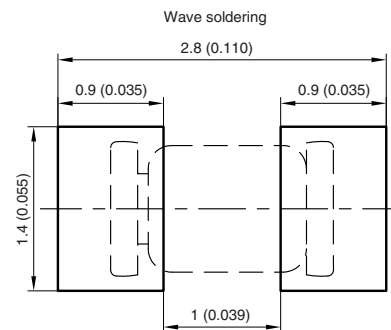
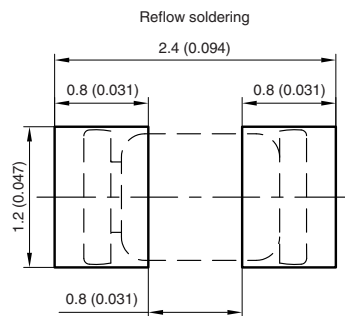
Fig. 5 - Board for  $R_{thJA}$  definition (in mm)

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



\* 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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