

MCL4148

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MCL4148

150mA Surface Mount Switching Diode 100V

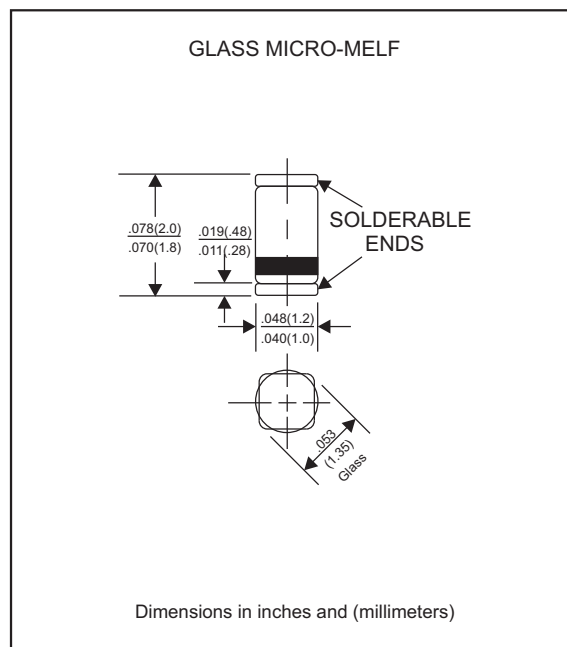
Features

- Fast speed switching.
- For general purpose switching application.
- High conductance.
- Hermetically sealed glass
- Silicon epitaxial planar chip.
- Lead-free parts meet RoHS requirements.

Mechanical data

- Case : GLASS MICRO-MELF
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any
- Weight : Approximated 0.013 gram

Package outline



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

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Repetitive peak reverse voltage		V_{RRM}			100	V
Reverse voltage		V_R			75	V
Peak forward surge current	$t_p = 1 \text{ s}$	I_{FSM}			500	mA
Forward current		I_F			300	mA
Average forward current		I_{FAV}			150	mA
Power dissipation		P_V			500	mW
Junction temperature		T_J	-55		+150	$^{\circ}\text{C}$
Storage temperature		T_{STG}	-65		+150	$^{\circ}\text{C}$
Forward voltage	$I_F = 10 \text{ mA}$	V_F		0.86	1.00	V
Reverse current	$V_R = 20 \text{ V}$	I_R			25	nA
	$V_R = 20 \text{ V}, T_J = 150^{\circ}\text{C}$	I_R			50	μA
	$V_R = 75 \text{ V}$	I_R			5.0	μA
Diode capacitance	$V_R = 0 \text{ V}, f = 1 \text{ MHz}$	C_D			4.0	pF
Reverse recovery time	$I_F = 10 \text{ mA}, V_R = 6 \text{ V}, I_{RR} = 0.1 \times I_R, R_L = 100 \Omega$	t_{rr}			4.0	ns

Rating and characteristic curves (MCL4148)

Fig.1 ADMISSIBLE REPETITIVE PEAK FORWARD CURRENT VERSUS PULSE DURATION

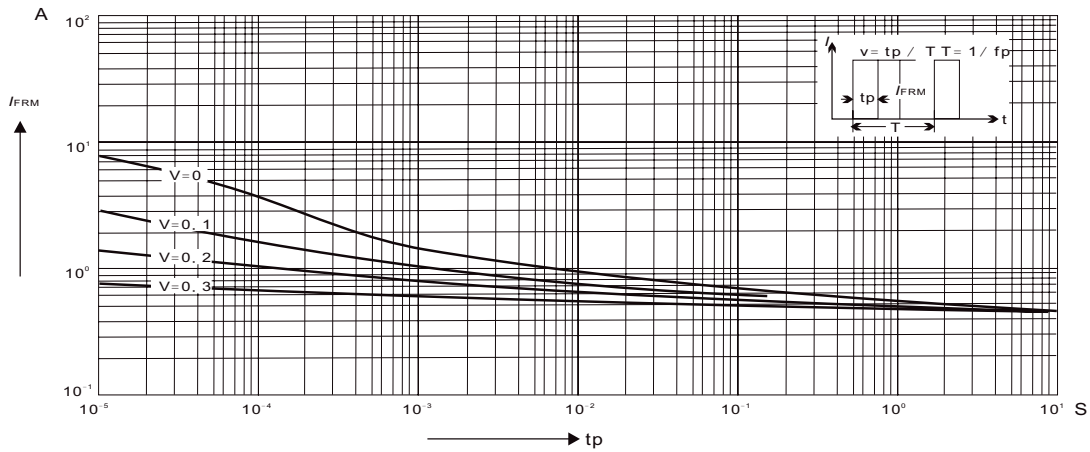


Fig.2-DYNAMIC FORWARD RESISTANCE VERSUS FORWARD CURRENT

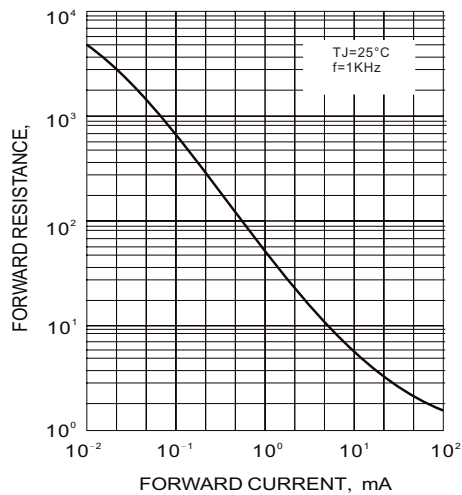


Fig.3 FORWARD CHARACTERISTICS

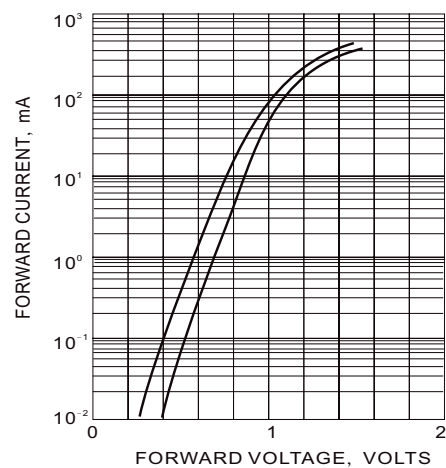


Fig.4 DERATING CURVE

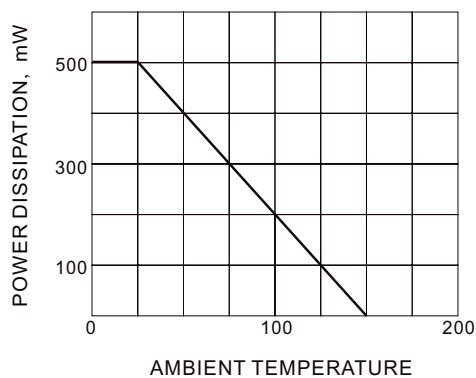
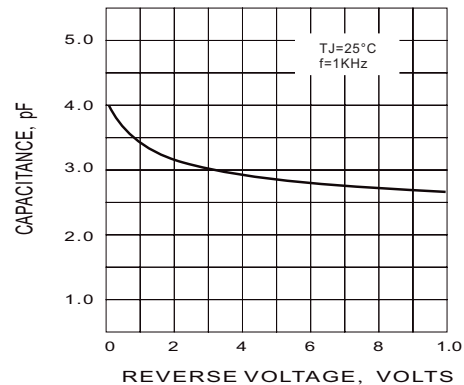


Fig.5 TYPICAL JUNCTION CAPACITANCE



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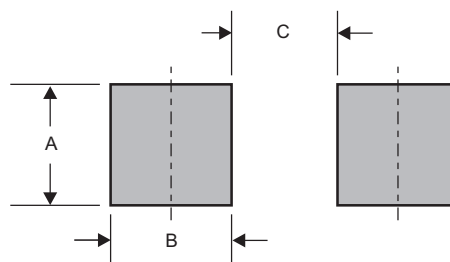
Pinning information

Pin	Simplified outline	Symbol
Pin1 cathode Pin2 anode		

Marking

Type number	Marking code
MCL4148	cathode band only

Suggested solder pad layout

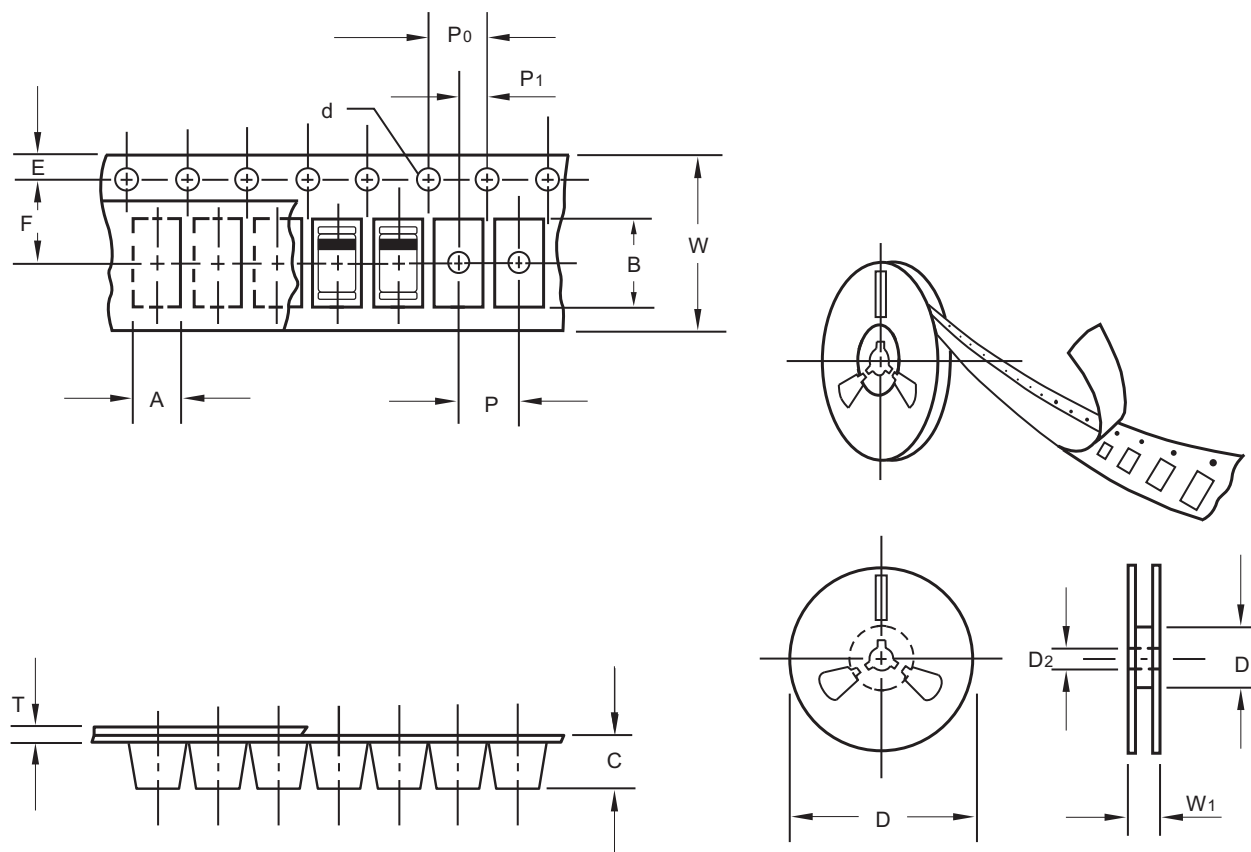


Dimensions in inches and (millimeters)

PACKAGE	A	B	C
MICRO-MELF	0.055(1.40)	0.024(0.60)	0.051(1.30)

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Packing information



unit:mm

Item	Symbol	Tolerance	MICRO-MELF
Carrier width	A	0.1	2.00
Carrier length	B	0.1	3.70
Carrier depth	C	0.1	1.80
Sprocket hole	d	0.1	1.50
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D1	min	50.00
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	0.1	11.40

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

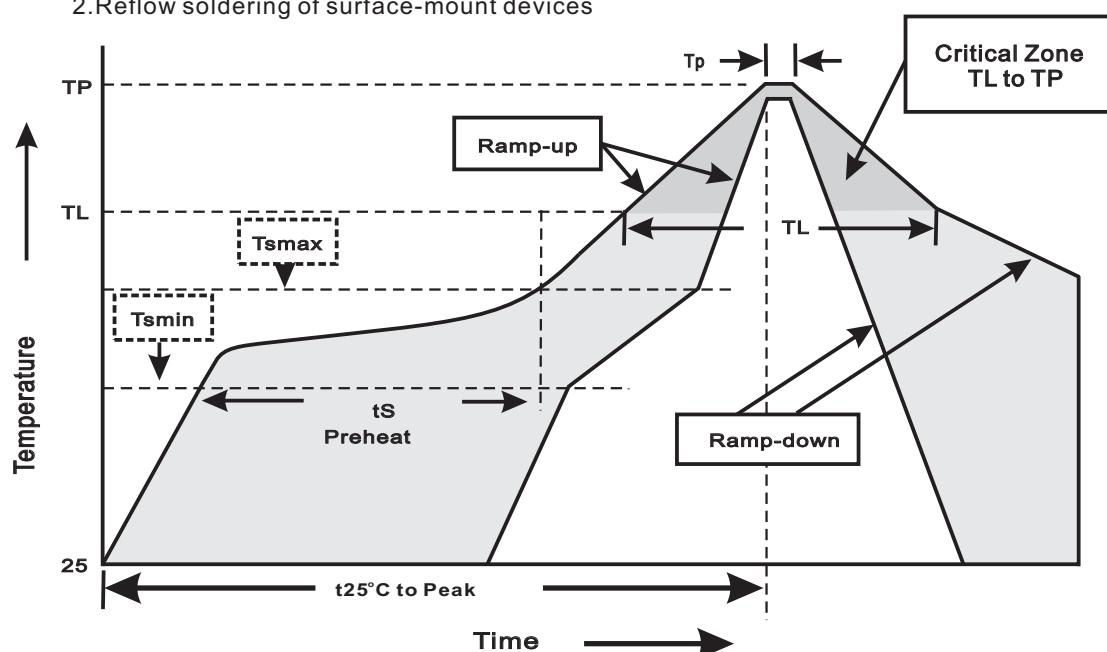
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Reel packing

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)
GLASS MICRO -MELF	7"	3,000	4,0	30,000	183*183*123	178	382*262*387	240,000	11.5

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 _{smmin}) -Temperature Max(T _{smmax}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{smmax} 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

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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. Thermal Shock	0°C for 5 min. rise to 100°C for 5 min. total 10 cycles.	MIL-STD-750D METHOD-1056
9. Forward Surge	Peak Forward Current $t_p = 1\text{s}$	MIL-STD-750D METHOD-4066-2
10. Humidity	at $T_A = 85^\circ\text{C}$, RH=85% for 1000hrs.	MIL-STD-750D METHOD-1021
11. High Temperature Storage Life	at 175°C for 1000 hrs.	MIL-STD-750D METHOD-1031