

Formosa MS

FM101-MFL-Q1 Thru FM107-MFL-Q1

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FM101-MFL-Q1 Thru FM107-MFL-Q1

1.0A Surface Mount General Purpose Rectifiers : 50V ~ 1000V

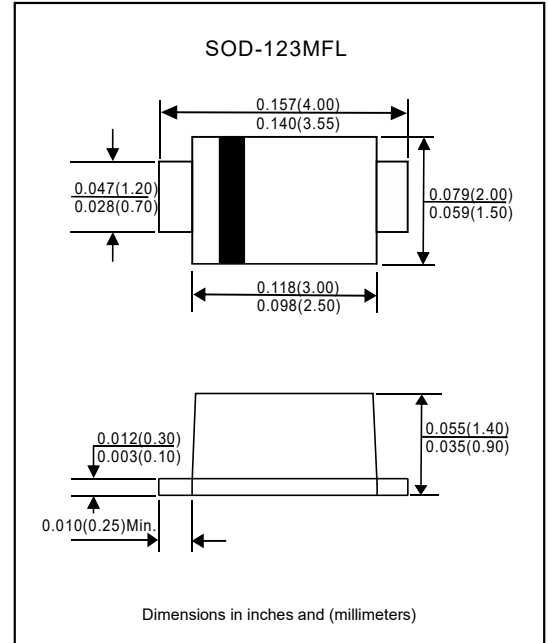
Features

- Idea for printed circuit board.
- Low reverse leakage.
- High forward surge current capability.
- Glass passivated junction chip.
- Qualified to AEC-Q101 standards for high reliability.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen free parts, ex. FM101-MFL-Q1-H.

Mechanical data

- Epoxy:UL94-V0 rated flame retardant.
- Case : Molded plastic, SOD-123MFL.
- Terminals : Solder plated, solderable per MIL-STD-750,Method 2026.
- Polarity : Color band denotes cathode end.
- Mounting Position : Any.

Package outline



Maximum ratings and electrical characteristics (At $T_A=25^\circ\text{C}$ unless otherwise noted)

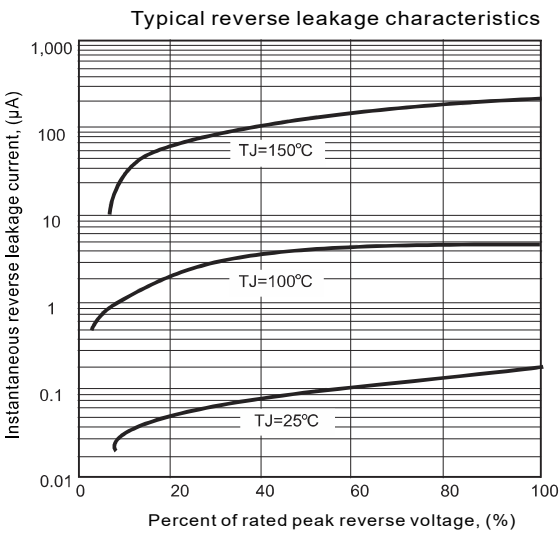
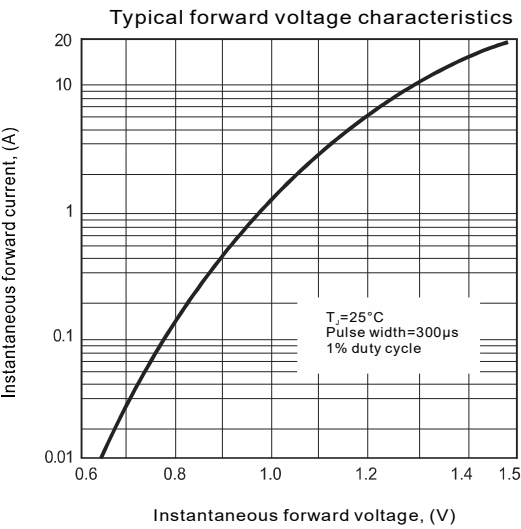
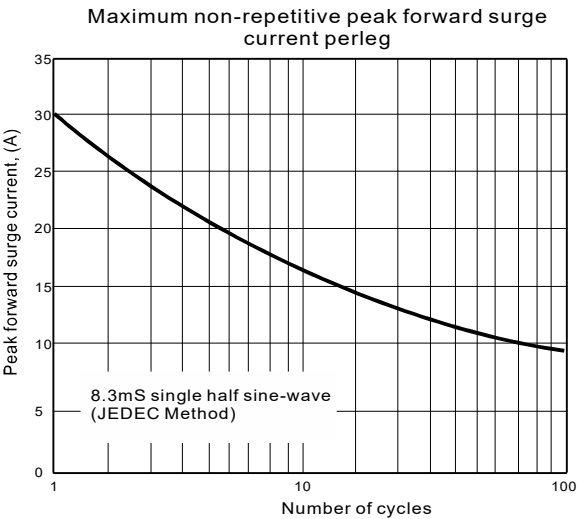
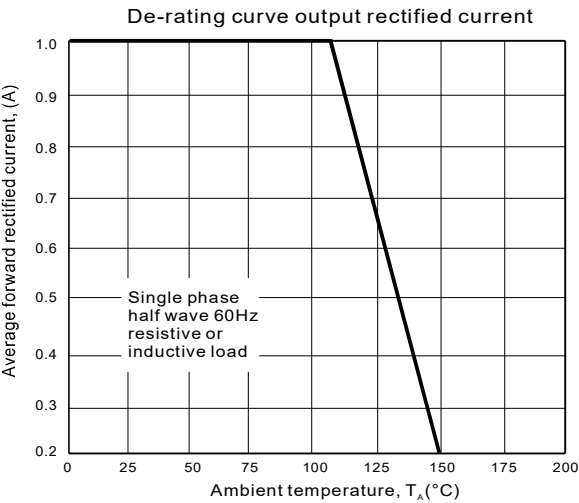
Parameter	Symbol	FM101- MFL-Q1	FM102- MFL-Q1	FM103- MFL-Q1	FM104- MFL-Q1	FM105- MFL-Q1	FM106- MFL-Q1	FM107- MFL-Q1	Units
Repetitive peak reverse voltage	V _{RRM}	50	100	200	400	600	800	1000	V
RMS voltage	V _{RMS}	35	70	140	280	420	560	700	V
DC blocking voltage	V _{DC}	50	100	200	400	600	800	1000	V
Average forward rectified current at T _A =75°C	I _O	1.0							A
Peak forward surge current, 8.3ms single half-sine-wave superimposed on rated load	I _{FSM}	30.0							A
Instantaneous forward voltage at 1.0A	V _F	1.1							V
DC reverse current T _A =25°C	I _R	5.0							μA
at rated DC blocking voltage T _A =125°C		200							
Typical junction capacitance (Note1)	C _J	18							pF
Thermal resistance, junction to ambient	R _{θJA}	120							°C/W
Operating junction temperature	T _J	+150							°C
Storage temperature range	T _{STG}	-55 to 150							°C

Note:1. Measured at 1MHz and applied reverse voltage of 4.0V D.C.

2. Single phase half-wave 60Hz, resistive or inductive load, for capacitive load current derate by 20%.

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Rating and characteristic curves

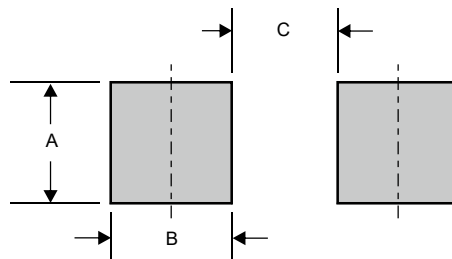


FM101-MFL-Q1 Thru FM107-MFL-Q1**Pinning information**

Pin	Simplified outline	Symbol
Pin1 Cathode Pin2 Anode		

Marking

Type number	Marking code
FM101-MFL-Q1	A1V
FM102-MFL-Q1	A2V
FM103-MFL-Q1	A3V
FM104-MFL-Q1	A4V
FM105-MFL-Q1	A5V
FM106-MFL-Q1	A6V
FM107-MFL-Q1	A7V

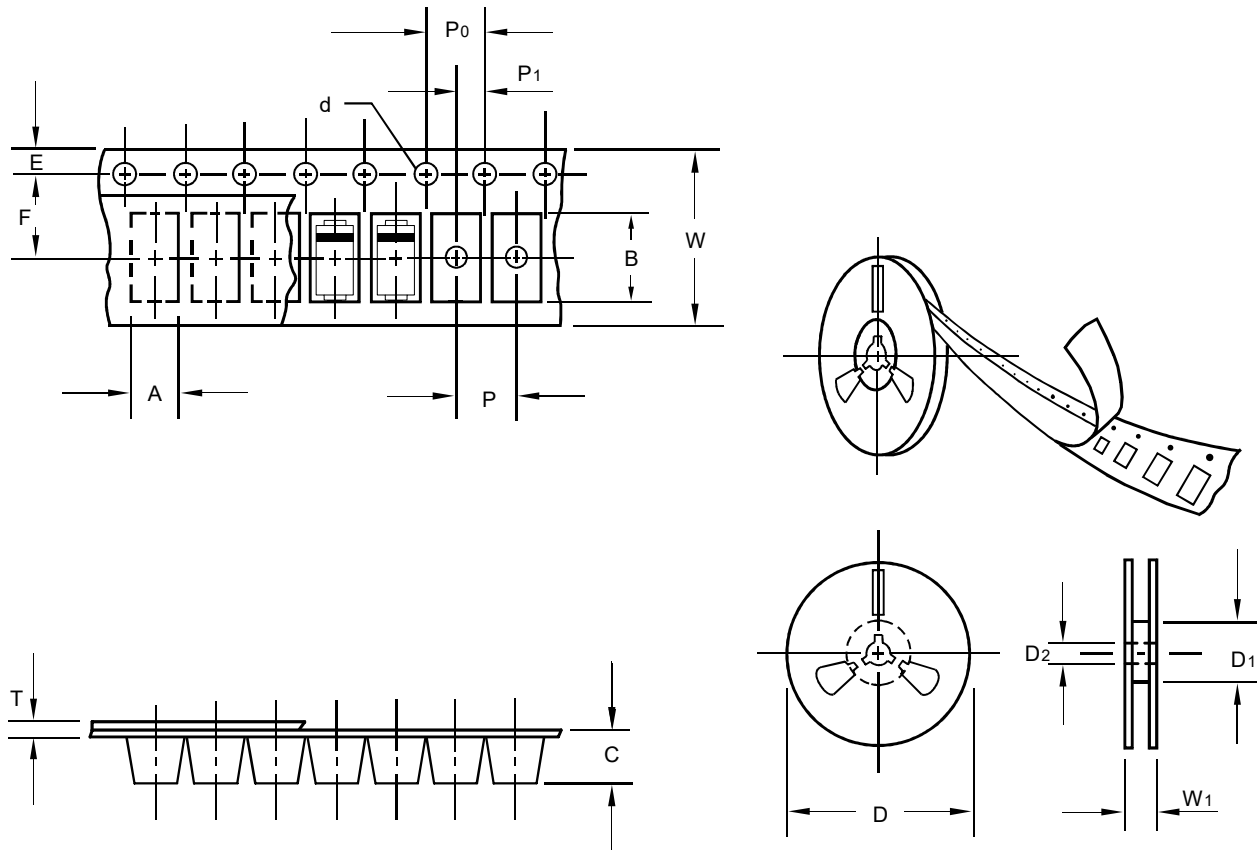
Suggested solder pad layout

Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SOD-123MFL	0.048 (1.20)	0.045 (1.15)	0.077 (1.95)

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Packing information



unit:mm

Item	Symbol	Tolerance	SOD-123MFL
Carrier width	A	0.1	2.15
Carrier length	B	0.1	3.95
Carrier depth	C	0.1	1.35
Sprocket hole	d	0.1	1.55
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D ₁	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D ₁	min	62.00
Feed hole diameter	D ₂	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	P ₀	0.1	4.00
Embossment center	P ₁	0.1	2.00
Overall tape thickness	T	0.1	0.22
Tape width	W	0.3	8.00
Reel width	W ₁	1.0	11.40

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

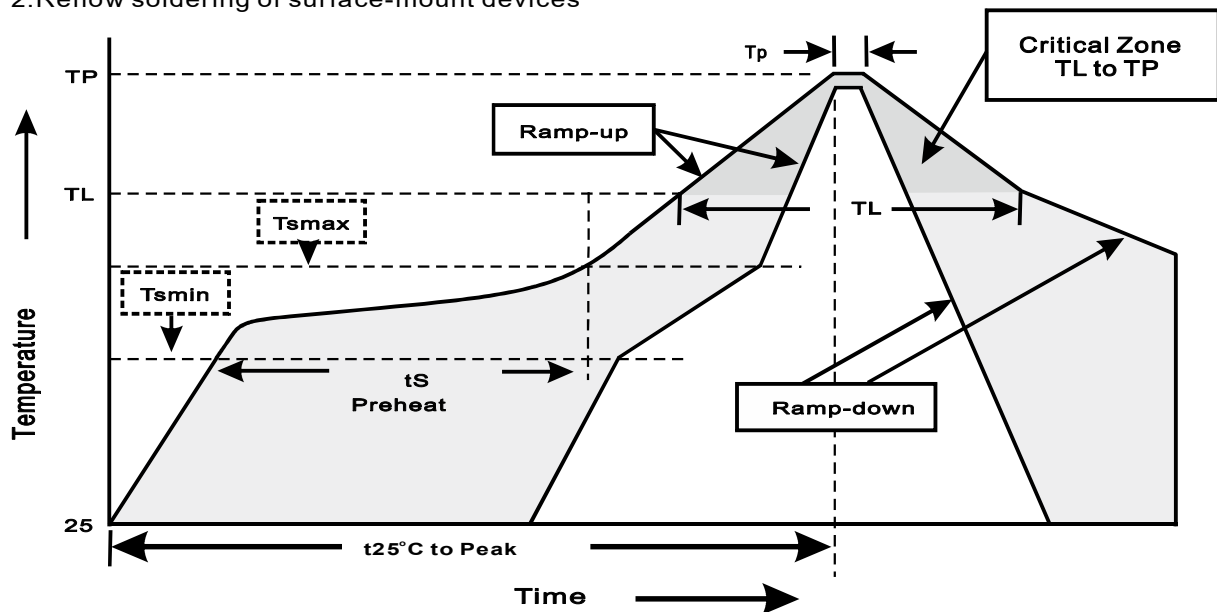
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Reel packing

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)
SOD-123MFL	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000

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)	$< 3^\circ\text{C/sec}$
Preheat -Temperature Min(T_{Smin}) -Temperature Max(T_{Smax}) -Time(min to max)(t_S)	150°C 200°C 60~120sec
T_{Smax} to T_L -Ramp-upRate	$< 3^\circ\text{C/sec}$
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	$< 6^\circ\text{C/sec}$
Time 25°C to Peak Temperature	< 6 minutes

FM101-MFL-Q1 Thru FM107-MFL-Q1**High reliability test capabilities**

Item Test	Conditions	Reference
1. MSL Preconditioning	24hr brake@125°C + 168hrs @ 85°C/85%R.H + 3x IR @260°C + 1flux immersion + alcohol + DI H ₂ O rinse	JESD22-A113
2. Operation Life	T _A =25°C, Rated Current (I _o = I _o max.) Test Duration:1000hrs	MIL-STD-750D METHOD 1027.3
3. High Temperature Reverse Bias	80% rated V _R (T _j =T _j max.) Test Duration: 1000hrs	JESD22-A108
4. High Temperature Storage Life	T _A =125°C Test Duration: 1000hrs	JESD22-A103
5. Temperature Cycling	55°C to +125°C dwelled for 30 min. and transferred for 5min. total 10 cycles.	JESD22-A104
6. Autoclave	P=2atm T _A =121°C RH=100% Test Duration 96 hrs.	JESD22-A102
7. Intermittent Operational Life	T _A = 25°C, On/IO Max. 2min, Off/2min, Test Cycles:15000 cycle	MIL-STD-750E METHOD 1037
8. Solderability	245±5°C for 5sec.	J-STD-002
9. Moisture Resistance	T _A =85°C/85% Relative humidity Test Duration: 1000hrs	MIL-STD-750E METHOD 1021.2
10. Resistance To Solder Heat	260±5°C for 10sec.	JESD22-B-106
11. High Temperature High Humidity Reverse Bias	T _A =85°C/85% with device reverse biased at 80% of rated breakdown voltage up to a maximum of 1000V or limit of chamber Test Duration: 1000hrs	JESD22-A101