

FM501-BF THRU FM507-BF

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FM501-BF THRU FM507-BF

5.0A Surface Mount General Purpose Rectifiers 50V-1000V

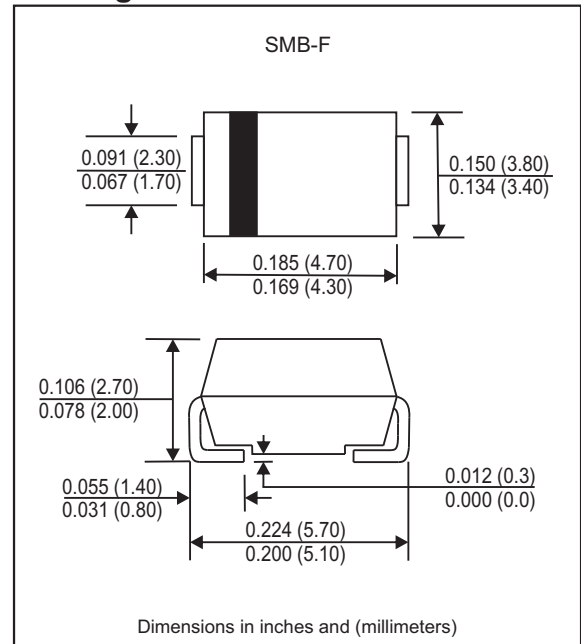
Features

- Glass passivated chip junction.
- Ideal for automated placement.
- High current capability.
- High surge capability.
- Lead free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free parts, ex. FM501-BF-H

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, DO-214AA / SMB-F
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any
- Weight : Approximated 0.088 gram

Package outline



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

Parameter	Symbols	FM501-BF	FM502-BF	FM503-BF	FM504-BF	FM505-BF	FM506-BF	FM507-BF	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	70	V
DC blocking voltage	V_{DC}	50	100	200	400	600	800	1000	V
Average forward rectified current at $T_A=75^{\circ}\text{C}$	I_O	5.0							A
Peak forward surge current, 8.3ms single half-sine-wave (JEDEC method)	I_{FSM}	120.0							A
Typical junction capacitance (Note 1)	C_J	40.0							pF
Operating junction temperature range	T_J	-55 to +150							$^{\circ}\text{C}$
Storage temperature range	T_{STG}	-55 to +150							$^{\circ}\text{C}$

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

Parameter	Symbols	FM501-BF	FM502-BF	FM503-BF	FM504-BF	FM505-BF	FM506-BF	FM507-BF	Units
Forward voltage at $I_F=5.0\text{A}$	V_F	1.15							V
Reverse current at $T_A=25^{\circ}\text{C}$ at rated DC blocking voltage $T_A=100^{\circ}\text{C}$	I_R	5.0 50.0							μA

Thermal characteristics

Parameter	Symbols	FM501-BF	FM502-BF	FM503-BF	FM504-BF	FM505-BF	FM506-BF	FM507-BF	Units
Typical thermal resistance junction to ambient (Note 2)	$R_{\theta JA}$	47.0							$^{\circ}\text{C/W}$

Note:

1. Measured at 1MHz and applied reverse voltage of 4.0V D.C.
2. Mounted on 0.31" x 0.31" (8.0 mm x 8.0 mm) copper pad areas.

Rating and characteristic curves (FM501-BF THRU FM507-BF)

Fig.1 FORWARD CURRENT DERATING CURVE

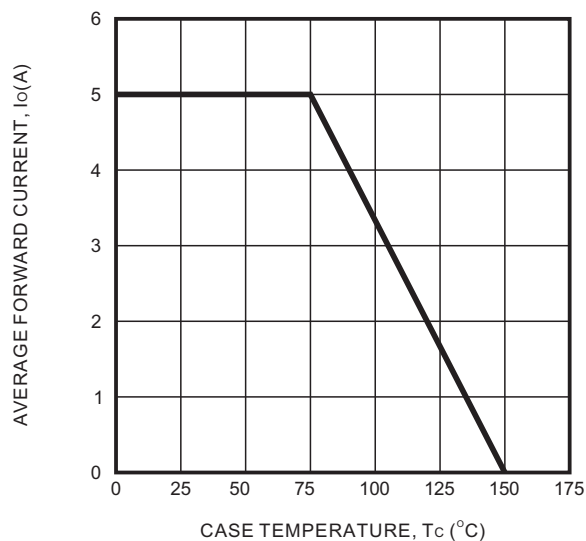


Fig.2 TYPICAL FORWARD CHARACTERISTICS

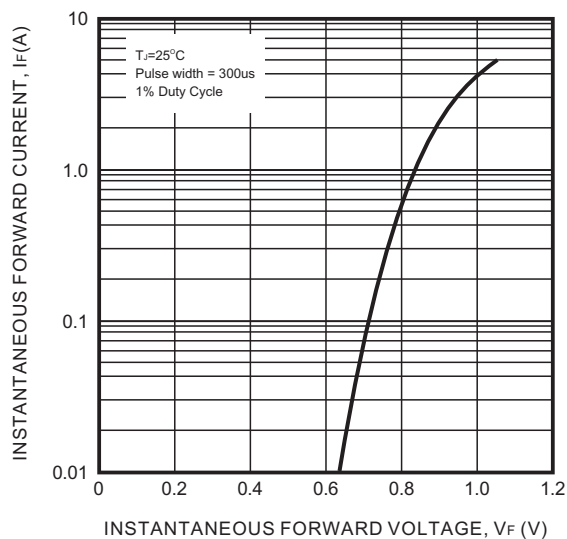


Fig.3 MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

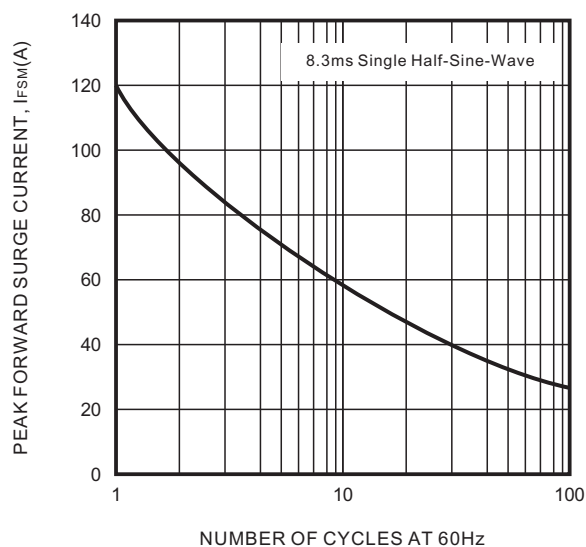
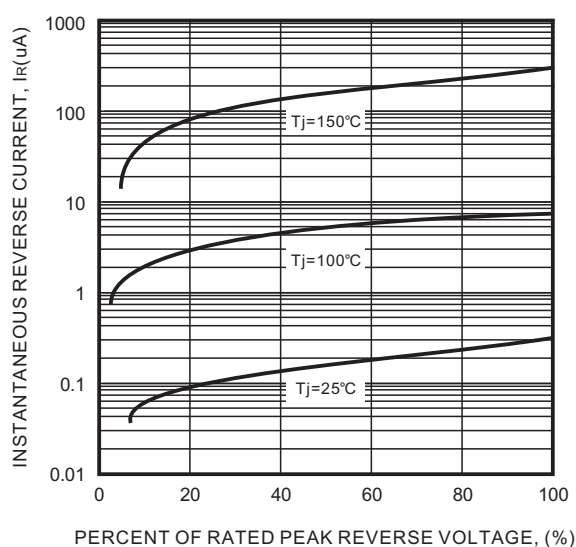
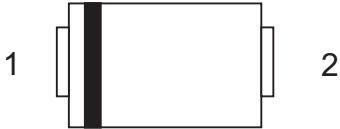


Fig.4 TYPICAL REVERSE CHARACTERISTICS

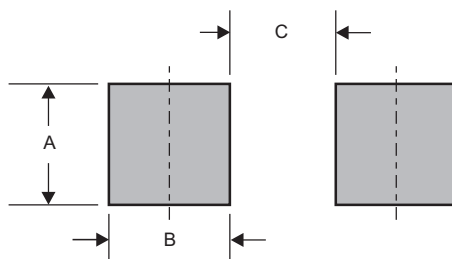


FM501-BF THRU FM507-BF**Pinning information**

Pin	Simplified outline	Symbol
Pin1 cathode Pin2 anode		

Marking

Type number	Marking code
FM501-BF	S5A
FM502-BF	S5B
FM503-BF	S5D
FM504-BF	S5G
FM505-BF	S5J
FM506-BF	S5K
FM507-BF	S5M

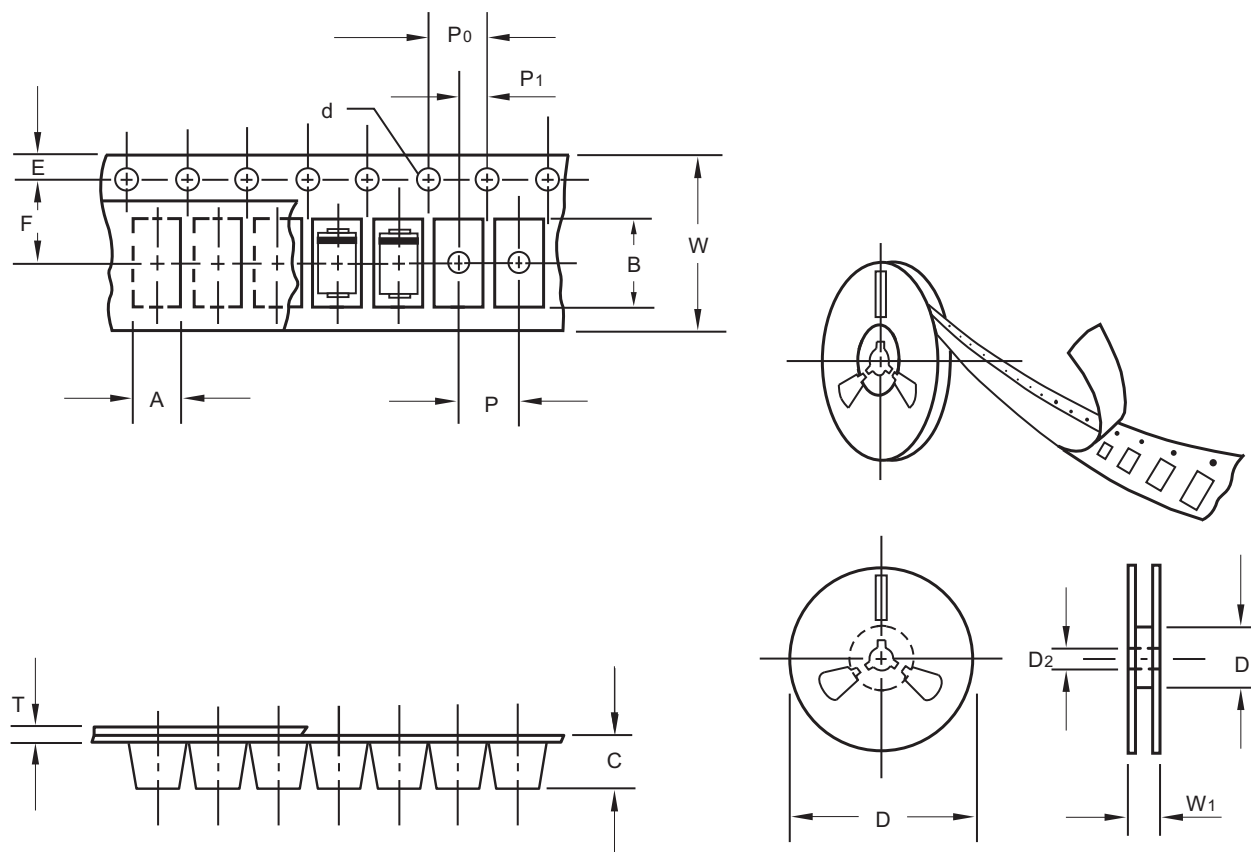
Suggested solder pad layout

Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SMB-F	0.091 (2.30)	0.098 (2.50)	0.071 (1.80)

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Packing information



unit:mm

Item	Symbol	Tolerance	SMB-F
Carrier width	A	0.1	3.80
Carrier length	B	0.1	5.40
Carrier depth	C	0.1	2.45
Sprocket hole	d	0.1	1.55
13" Reel outside diameter	D	2.0	330.00
13" Reel inner diameter	D1	min	50.00
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D1	min	62.00
Feed hole diameter	D2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	5.50
Punch hole pitch	P	0.1	8.00
Sprocket hole pitch	P0	0.1	4.00
Embossment center	P1	0.1	2.00
Overall tape thickness	T	0.015	0.40
Tape width	W	0.3	12.00
Reel width	W1	1.0	18.00

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

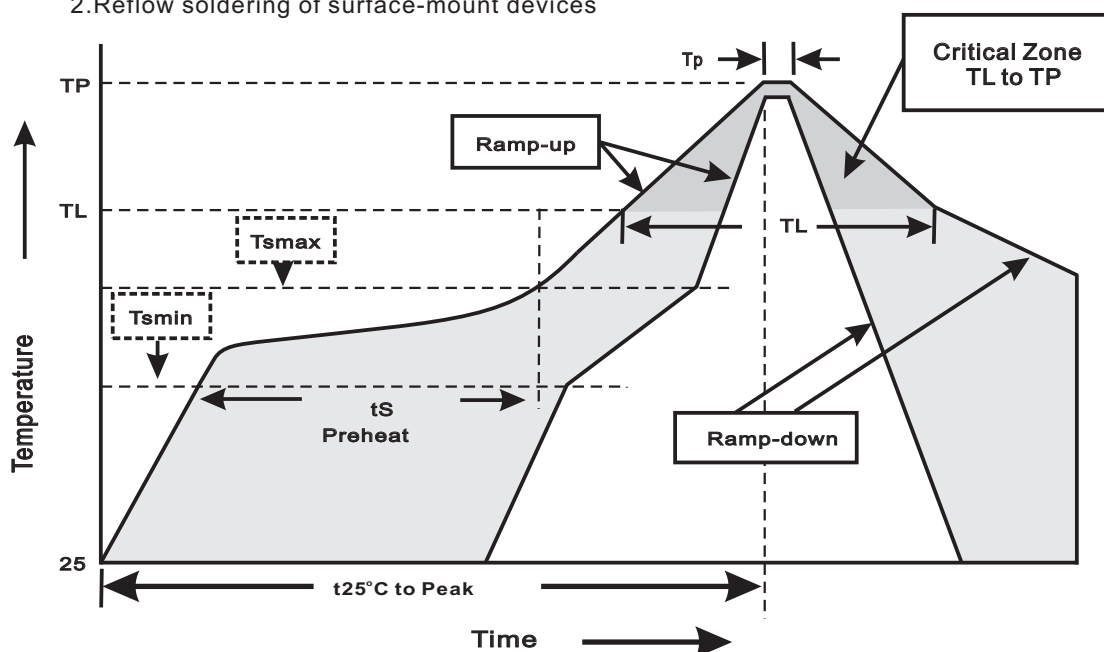
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Reel packing

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)
SMB-F	13"	3,000	8.0	6,000	337*337*37	330	350*330*360	48,000	12.40

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 _{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°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. Forward Surge	8.3ms single half sine-wave , one surge.	MIL-STD-750D METHOD-4066-2
9. Humidity	at $T_A = 85^\circ\text{C}$, RH=85% for 1000hrs.	MIL-STD-750D METHOD-1021
10. High Temperature Storage Life	at 150°C for 1000 hrs.	MIL-STD-750D METHOD-1031