

FM301-BF-Q1 Thru FM307-BF-Q1**List**

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FM301-BF-Q1 Thru FM307-BF-Q1

3.0A General Purpose Plastic Rectifier Surface Mount 50-1000V

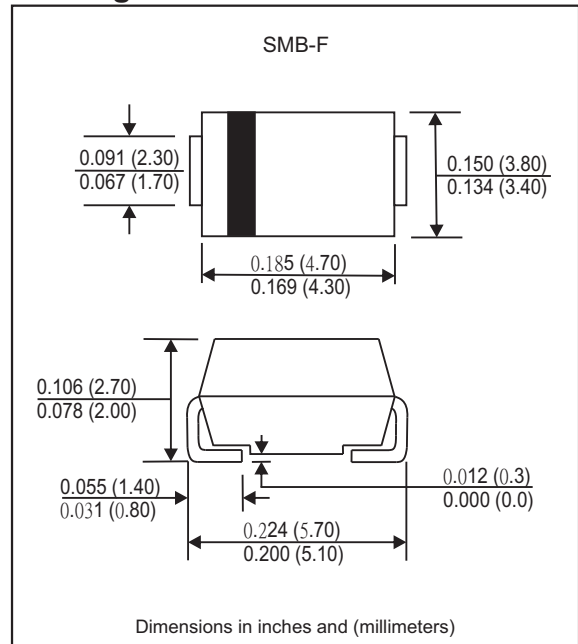
Features

- Low forward voltage drop.
- Low leakage current.
- High forward surge capability.
- Glass passivated junction chip
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC.
- Suffix "-H" indicates Halogen free parts, ex. FM301-BF-Q1-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 : Color band denotes cathode end.
- Mounting Position : Any
- Weight : Approximated 0.093 gram

Package outline



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

Parameter	Symbols	FM301-BF-Q1	FM302-BF-Q1	FM303-BF-Q1	FM304-BF-Q1	FM305-BF-Q1	FM306-BF-Q1	FM307-BF-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 $T_L=100^\circ\text{C}$	I_O	3.0							A
Peak forward surge current, 8.3ms single half-sine-wave (JEDEC method)	I_{FSM}	100.0							A
Typical junction capacitance (Note 1)	C_J	38.0							pF
Operating junction temperature range	T_J	-55 to +175							$^\circ\text{C}$
Storage temperature range	T_{STG}	-55 to +175							$^\circ\text{C}$

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

Parameter	Symbols	FM301-BF-Q1	FM302-BF-Q1	FM303-BF-Q1	FM304-BF-Q1	FM305-BF-Q1	FM306-BF-Q1	FM307-BF-Q1	Units
Forward voltage at $I_F=3.0\text{A}$	V_F	1.0							V
Reverse current $T_A=25^\circ\text{C}$ at rated DC blocking voltage $T_A=100^\circ\text{C}$	I_R	2.0 200.0							μA

Thermal characteristics

Parameter	Symbols	FM301-BF-Q1	FM302-BF-Q1	FM303-BF-Q1	FM304-BF-Q1	FM305-BF-Q1	FM306-BF-Q1	FM307-BF-Q1	Units
Typical thermal resistance junction to ambient (Note 2)	$R_{\theta JA}$	60.0							$^\circ\text{C/W}$

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 (FM301-BF-Q1 Thru FM307-BF-Q1)

Fig.1 FORWARD CURRENT DERATING CURVE

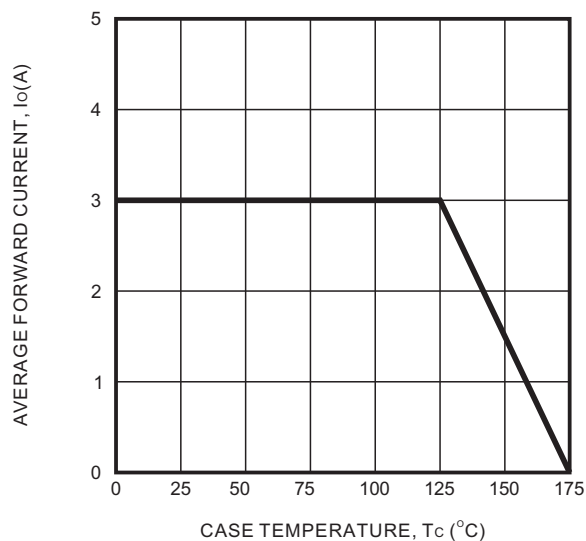


Fig.2 TYPICAL FORWARD CHARACTERISTICS

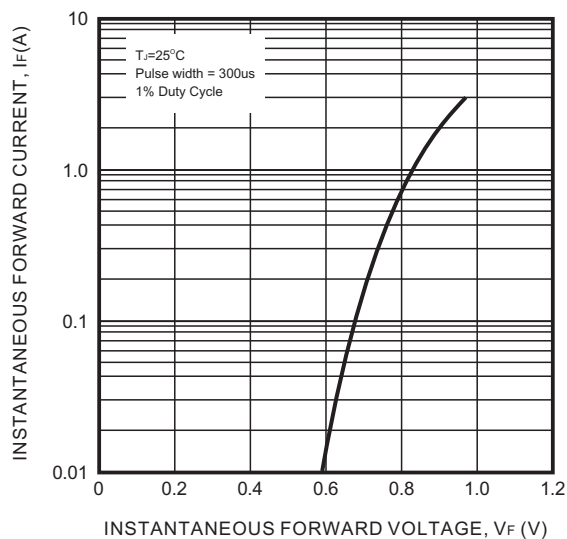


Fig.3 MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

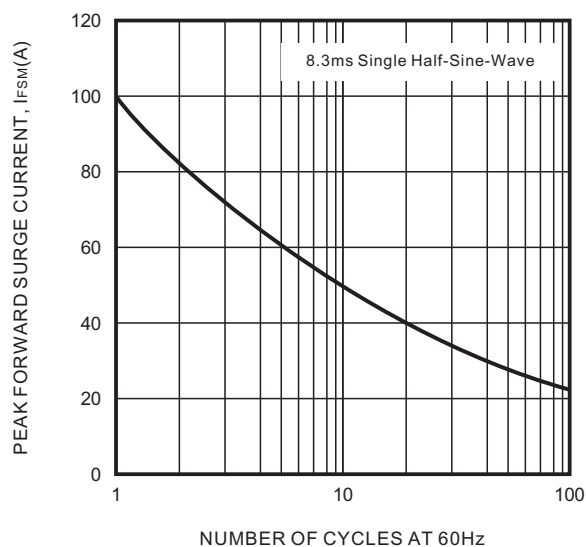
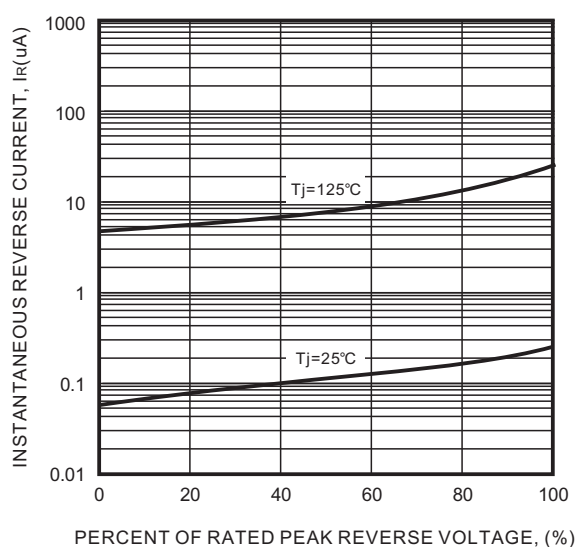


Fig.4 TYPICAL REVERSE CHARACTERISTICS



Formosa MS

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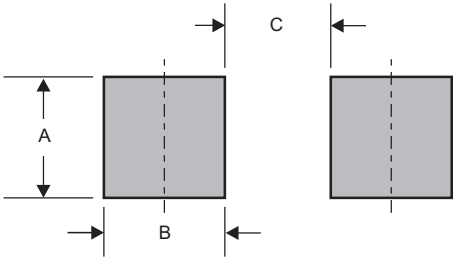
Pinning information

Pin	Simplified outline	Symbol
Pin1 cathode Pin2 anode		

Marking

Type number	Marking code
FM301-BF-Q1	GS3AV
FM302-BF-Q1	GS3BV
FM303-BF-Q1	GS3DV
FM304-BF-Q1	GS3GV
FM305-BF-Q1	GS3JV
FM306-BF-Q1	GS3KV
FM307-BF-Q1	GS3MV

Suggested solder pad layout

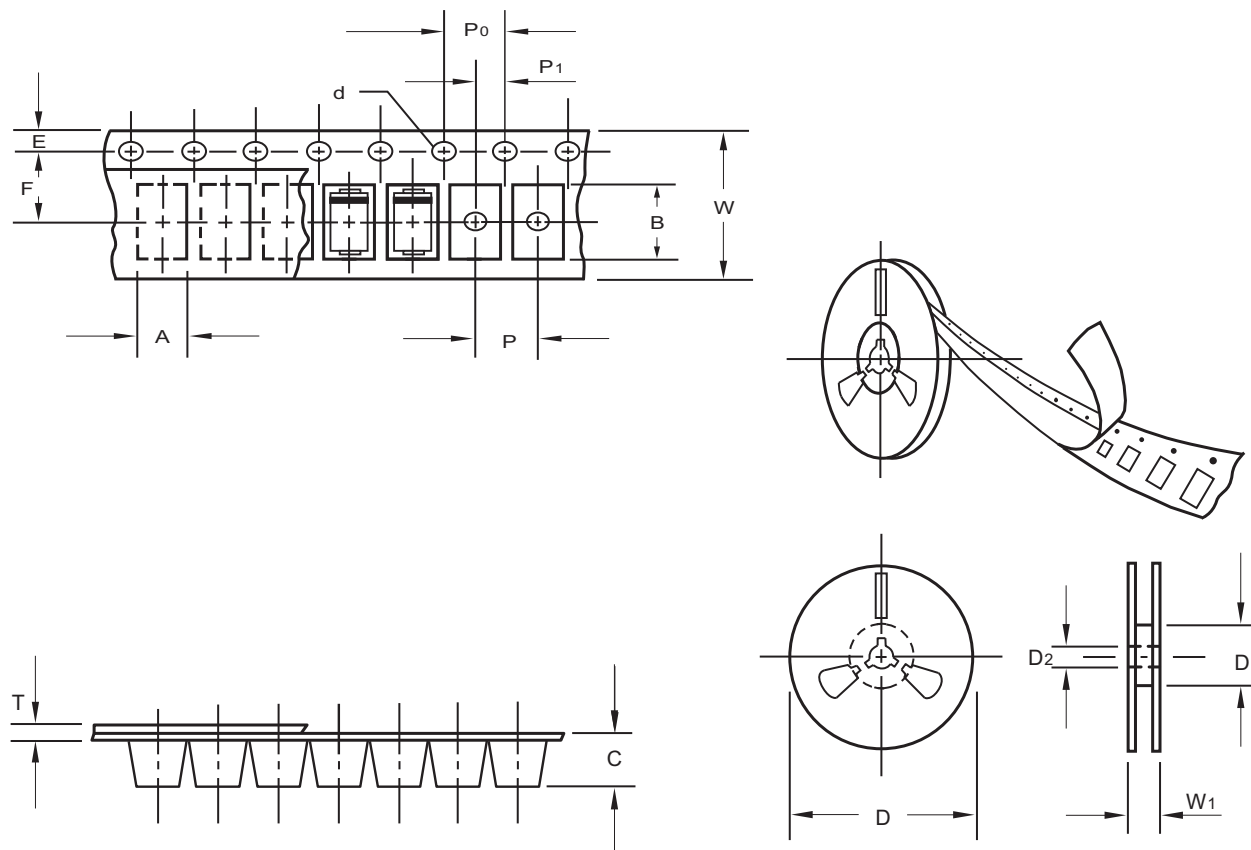


Dimensions in inches and (millimeters)

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	5.25
Carrier length	B	0.1	5.72
Carrier depth	C	0.1	2.50
Sprocket hole	d	0.1	1.50
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.

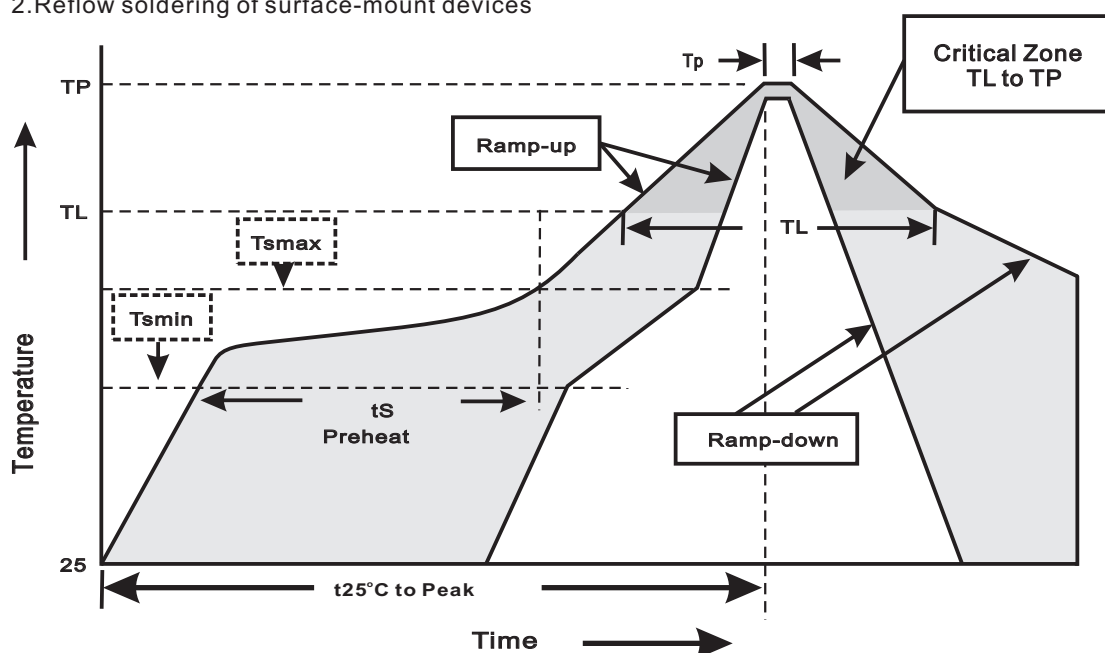
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Reel packing

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

FM301-BF-Q1 Thru FM307-BF-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