

FM1201-CF-Q1 THRU FM1207-CF-Q1

List

List.....	1
Package outline.....	2
Features.....	2
Mechanical data.....	2
Maximum ratings	2
Maximum Electrical characteristics.....	2
Thermal characteristics	2
Rating and characteristic curves.....	3
Pinning information.....	4
Marking.....	4
Suggested solder pad layout.....	4
Packing information.....	5
Reel packing.....	6
Suggested thermal profiles for soldering processes.....	6
High reliability test capabilities.....	7

FM1201-CF-Q1 THRU FM1207-CF-Q1

12.0A Surface Mount General Purpose Rectifiers 50V-1000V

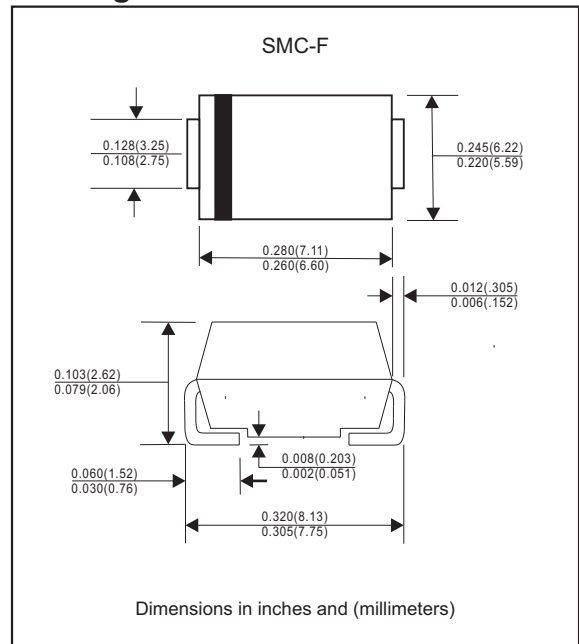
Features

- Glass passivated chip junction
- Ideal for automated placement
- High current capability
- High surge capability
- Lead free parts meet RoHS requirements
- Qualified to AEC-Q101 standards for high reliability
- Suffix "-H" indicates Halogen-free parts, ex. FM1201-CF-Q1-H

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, DO-214AB / SMC-F
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any
- Weight : Approximated 0.23 gram

Package outline



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

Parameter	Symbols	FM1201-CF-Q1	FM1202-CF-Q1	FM1203-CF-Q1	FM1204-CF-Q1	FM1205-CF-Q1	FM1206-CF-Q1	FM1207-CF-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 $T_L=75^\circ\text{C}$	I_O	12.0							A
Peak forward surge current, 8.3ms single half-sine-wave (JEDEC method)	I_{FSM}	350.0							A
Typical junction capacitance (Note 1)	C_J	114.0							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	FM1201-CF-Q1	FM1202-CF-Q1	FM1203-CF-Q1	FM1204-CF-Q1	FM1205-CF-Q1	FM1206-CF-Q1	FM1207-CF-Q1	Units
Forward voltage at $I_F=12.0\text{A}$	V_F	1.0							V
Reverse current at rated DC blocking voltage	I_R	2.0 200.0							μA

Thermal characteristics

Parameter	Symbols	FM1201-CF-Q1	FM1202-CF-Q1	FM1203-CF-Q1	FM1204-CF-Q1	FM1205-CF-Q1	FM1206-CF-Q1	FM1207-CF-Q1	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 (FM1201-CF-Q1 THRU FM1207-CF-Q1)

Fig.1 FORWARD CURRENT DERATING CURVE

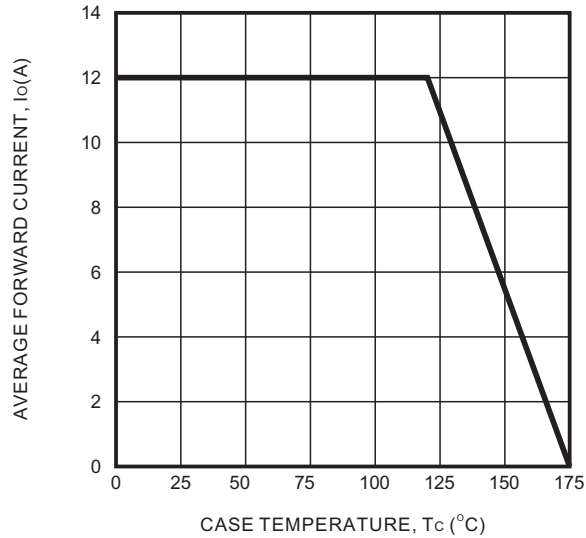


Fig.2 TYPICAL FORWARD CHARACTERISTICS

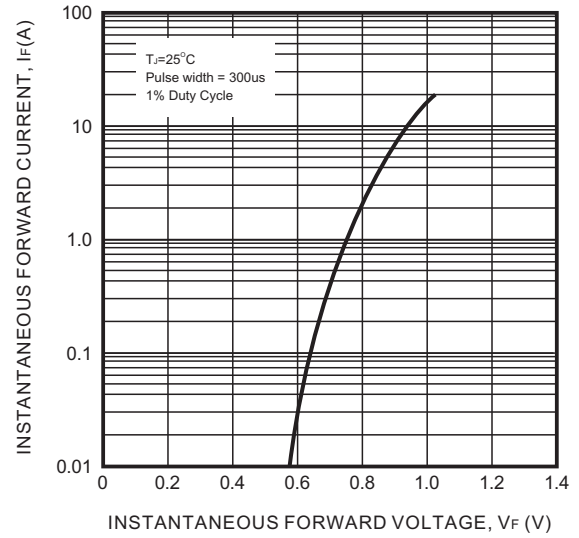


Fig.3 MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

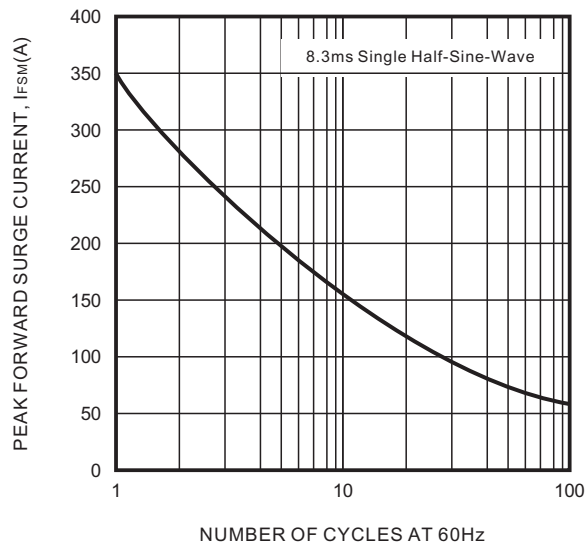
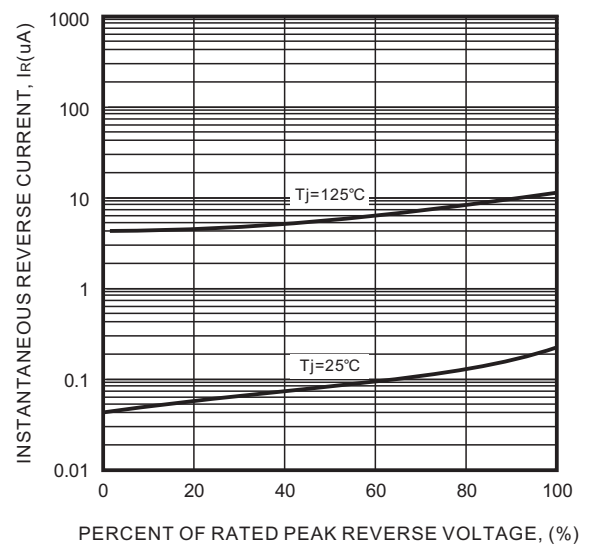


Fig.4 TYPICAL REVERSE CHARACTERISTICS



FM1201-CF-Q1 THRU FM1207-CF-Q1

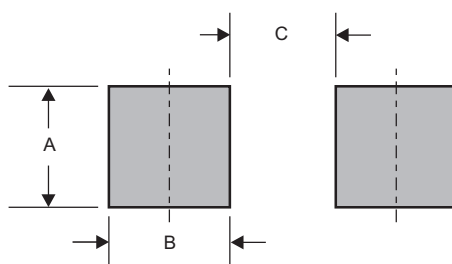
Pinning information

Pin	Simplified outline	Symbol
Pin1 cathode Pin2 anode		

Marking

Type number	Marking code
FM1201-CF-Q1	GS12AV
FM1202-CF-Q1	GS12BV
FM1203-CF-Q1	GS12DV
FM1204-CF-Q1	GS12GV
FM1205-CF-Q1	GS12JV
FM1206-CF-Q1	GS12KV
FM1207-CF-Q1	GS12MV

Suggested solder pad layout

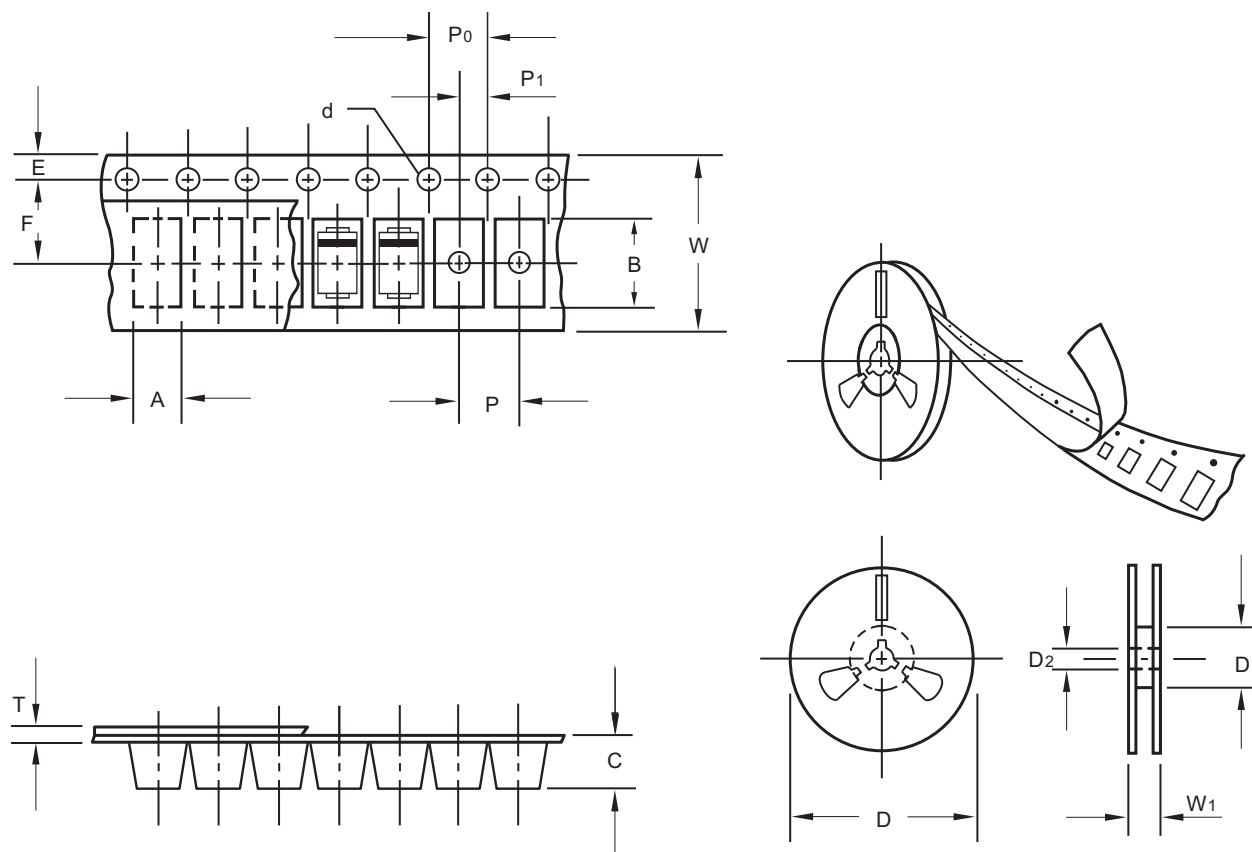


Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SMC-F	0.132 (3.30)	0.100 (2.50)	0.176 (4.40)

FM1201-CF-Q1 THRU FM1207-CF-Q1

Packing information



unit:mm

Item	Symbol	Tolerance	SMC-F
Carrier width	A	0.15	6.00
Carrier length	B	0.2	8.25
Carrier depth	C	0.1	2.36
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	330.00
13" Reel inner diameter	D ₁	min	50.00
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	7.50
Punch hole pitch	P	0.1	8.00
Sprocket hole pitch	P ₀	0.1	4.00
Embossment center	P ₁	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	16.00
Reel width	W ₁	1.0	18.00

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

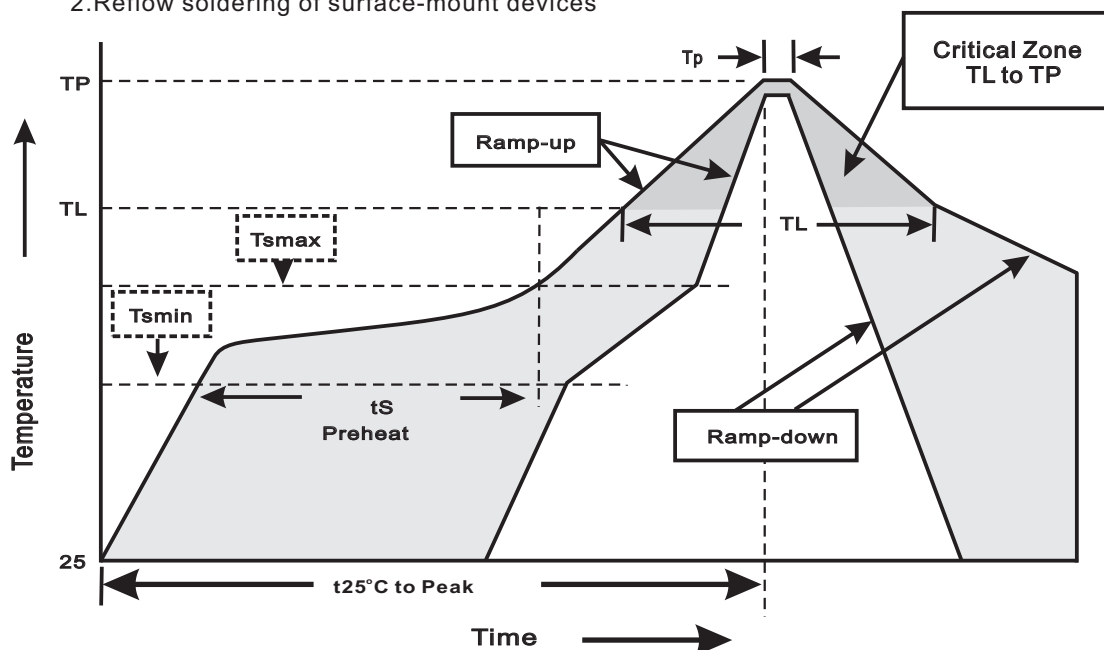
FM1201-CF-Q1 THRU FM1207-CF-Q1

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)
SMC-F	13"	3,000	8.0	6,000	338*338*38	330	365*365*360	48,000	18.8

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)	$<3^{\circ}\text{C}/\text{sec}$
Preheat -Temperature Min(T_{smmin}) -Temperature Max(T_{smmax}) -Time(min to max)(t_s)	150°C 200°C $60\sim 120\text{sec}$
T_{smmax} to T_L -Ramp-upRate	$<3^{\circ}\text{C}/\text{sec}$
Time maintained above: -Temperature(T_L) -Time(t_L)	217°C $60\sim 260\text{sec}$
Peak Temperature(T_P)	$255^{\circ}\text{C}-0/+5^{\circ}\text{C}$
Time within 5°C of actual Peak Temperature(t_P)	$10\sim 30\text{sec}$
Ramp-down Rate	$<6^{\circ}\text{C}/\text{sec}$
Time 25°C to Peak Temperature	$<6\text{minutes}$

FM1201-CF-Q1 THRU FM1207-CF-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 =175°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