

SFM31-CF THRU SFM38-CF**List**

List.....	1
Package outline.....	2
Features.....	2
Mechanical data.....	2
Maximum ratings	2
Electrical 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

SFM31-CF THRU SFM38-CF

3.0A Surface Mount Super Fast Rectifiers 50-600V

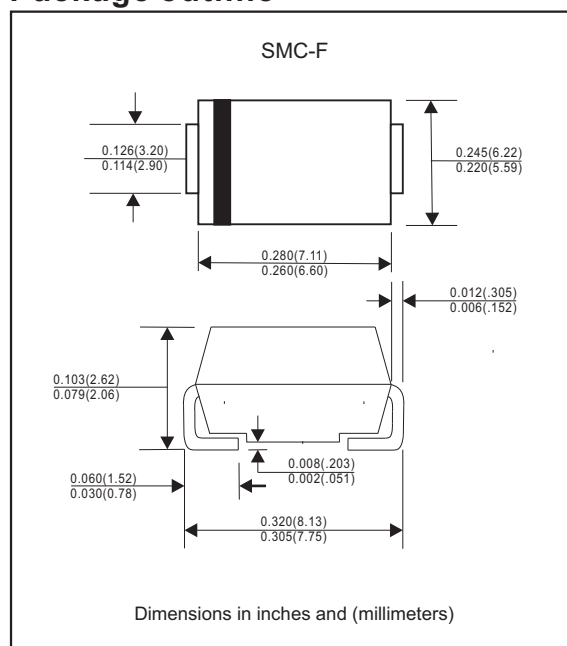
Features

- Super fast switching for high efficiency.
- Low leakage current.
- High surge current capability.
- Glass passivated chip junction.
- Lead free parts, RoHS requirements.
- Suffix "-H" indicates Halogen free parts, ex. SFM31-CF-H.

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, DO-214AB / SMC-F
- Terminals: Plated terminals, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any
- Weight:0.23 grams(approx.)

Package outline



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

PARAMETER	SYMBOLS	SFM31-CF	SFM32-CF	SFM33-CF	SFM34-CF	SFM35-CF	SFM36-CF	SFM38-CF	UNIT
Repetitive peak reverse voltage	V_{RRM}	50	100	150	200	300	400	600	V
RMS voltage	V_{RMS}	35	70	105	140	210	280	420	V
Continuous reverse voltage	V_R	50	100	150	200	300	400	600	V
Average forward rectified current	I_o	3							A
Peak forward surge current 8.3ms single half sine-wave(JEDEC method)	I_{FSM}	100							A
Typical Junction capacitance (Note 1)	C_J	65.0							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	SFM31-CF	SFM32-CF	SFM33-CF	SFM34-CF	SFM35-CF	SFM36-CF	SFM38-CF	UNIT
Forward voltage at $I_F = 3.0A$	V_F	0.95				1.25		1.7	V
Reverse current at rated V_R $T_A = 25^{\circ}C$ $T_A = 100^{\circ}C$	I_R	5.0 500							μA
Reverse recovery time (Note 2)	T_{rr}	35							ns

Thermal characteristics

PARAMETER	SYMBOLS	SFM31-CF	SFM32-CF	SFM33-CF	SFM34-CF	SFM35-CF	SFM36-CF	SFM38-CF	UNIT
Typical thermal resistance junction to ambient	$R_{\theta JA}$	47.0							$^{\circ}\text{C/W}$

Note : 1. Measured at 1MHz and applied reverse voltage of 4.0V D.C.
2. Reverse recovery time test condition $I_F = 0.5\text{A}$, $I_R = 1.0\text{A}$, $I_{rr} = 0.25\text{A}$

Rating and characteristic curves (SFM31-CF THRU SFM38-CF)

FIG.1-TYPICAL FORWARD CURRENT DERATING CURVE

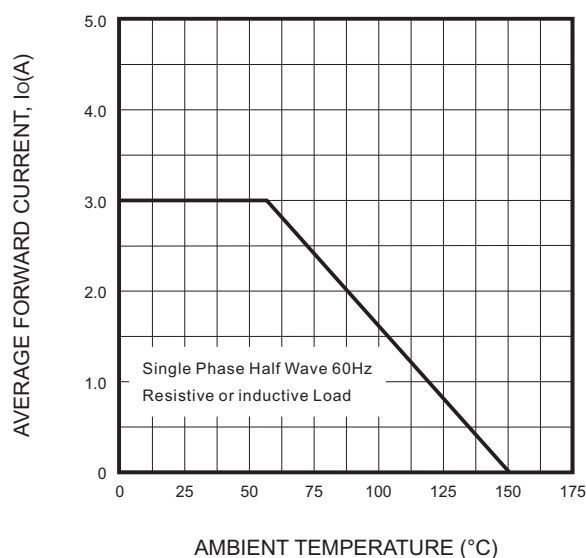


FIG.2-MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT

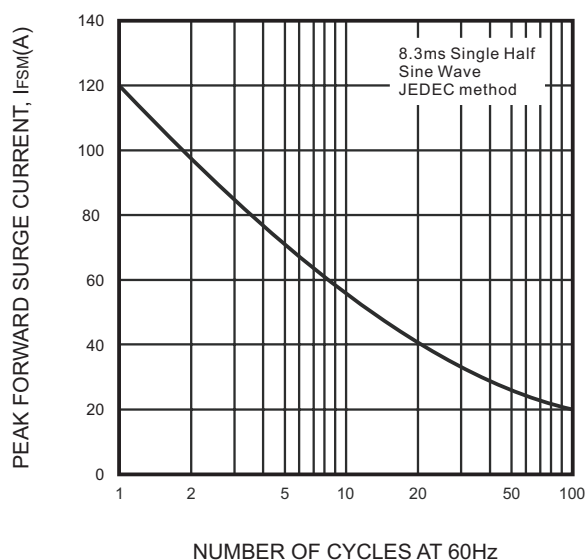


FIG.3-TYPICAL FORWARD CHARACTERISTICS

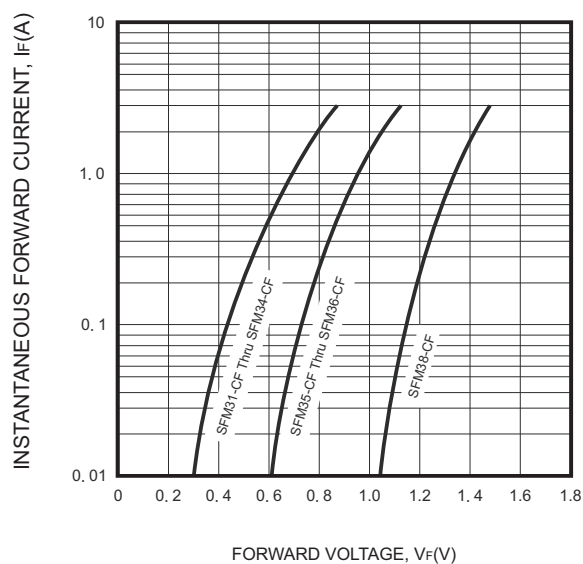
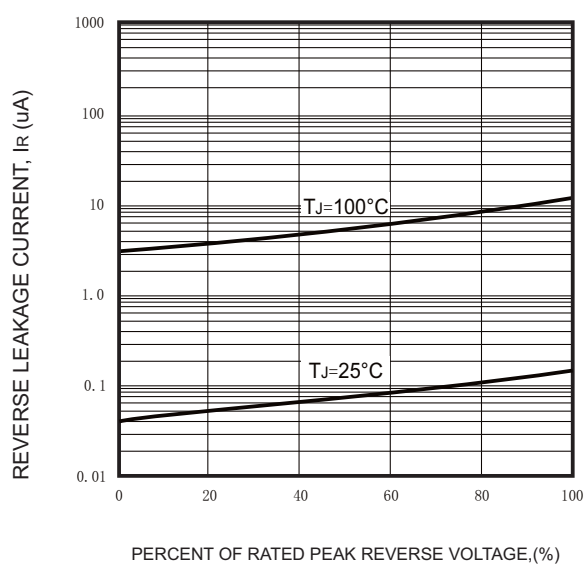


FIG.4 - TYPICAL REVERSE CHARACTERISTICS



SFM31-CF THRU SFM38-CF

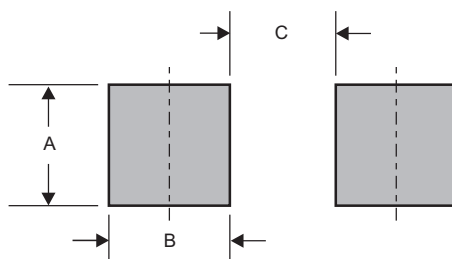
Pinning information

Pin	Simplified outline	Symbol
Pin1 cathode Pin2 anode		

Marking

Type number	Marking code
SFM31-CF	ES3A
SFM32-CF	ES3B
SFM33-CF	ES3C
SFM34-CF	ES3D
SFM35-CF	ES3E
SFM36-CF	ES3G
SFM38-CF	ES3J

Suggested solder pad layout

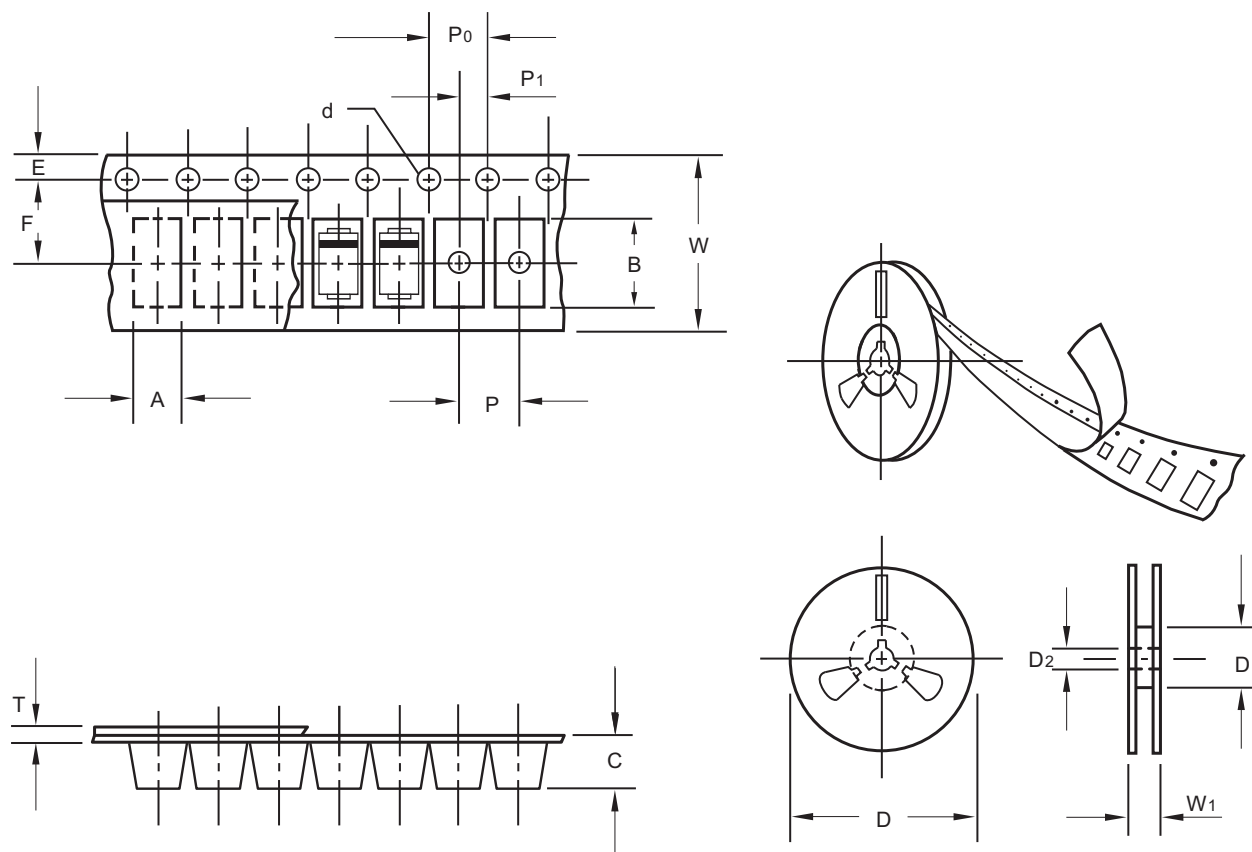


Dimensions in inches and (millimeters)

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

SFM31-CF THRU SFM38-CF

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.

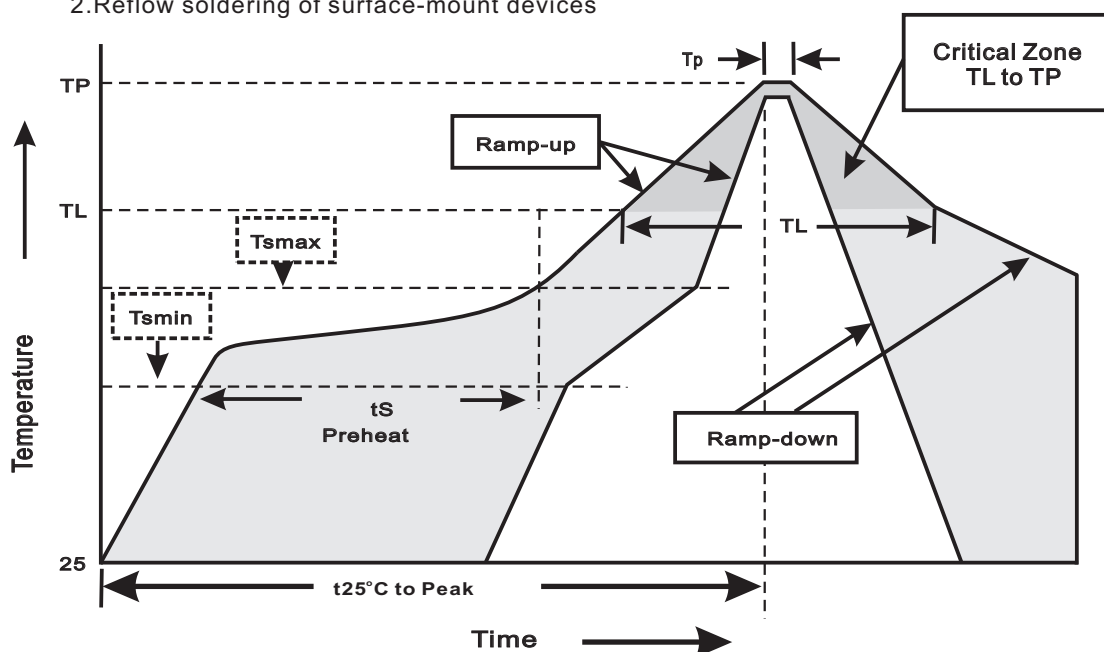
SFM31-CF THRU SFM38-CF

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°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

SFM31-CF THRU SFM38-CF

High reliability test capabilities

Item Test	Conditions	Reference
1. Solder Resistance	at $260\pm5^{\circ}\text{C}$ for $10\pm2\text{sec.}$ immerse body into solder $1/16''\pm1/32''$	MIL-STD-750D METHOD-2031
2. Solderability	at $245\pm5^{\circ}\text{C}$ for 5 sec.	MIL-STD-202F METHOD-208
3. High Temperature Reverse Bias	$V_R=80\%$ rate at $T_J=125^{\circ}\text{C}$ 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