

SFM21-BS THRU SFM28-BS

List

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

2.0A Surface Mount Super Fast Rectifiers 50V-600V

- Batch process design, excellent power dissipation offers better reverse leakage current and thermal resistance
- Low profile surface mounted application in order to optimize board space
- High current capability
- Superfast recovery time for switching mode application
- High surge current capability
- Glass passivated chip junction
- Lead-free parts meet RoHS requirements
- Suffix "-H" indicates Halogen free parts. ex. SFM21-BS-H

- Epoxy: UL94-V0 rated flame retardant
- Case : Molded plastic, SMB-S
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any
- Weight : Approximated 0.072 gram

SMB-S

Top View Dimensions:

- Overall Width: 0.220(5.6)
- Inner Width: 0.205(5.2)
- Right Flange Width: 0.020(0.5) Typ.
- Left Flange Width: 0.083(2.1) / 0.075(1.9)
- Right Flange Height: 0.138(3.5) / 0.122(3.1)

Side View Dimensions:

- Top Surface Width: 0.067(1.7) / 0.060(1.5)
- Bottom Surface Width: 0.040(1.0) Typ.
- Right Flange Width: 0.040(1.0) Typ.

Dimensions in inches and (millimeters)

[illegible]

PARAMETER	SYMBOLS	SFM21-BS	SFM22-BS	SFM23-BS	SFM24-BS	SFM25-BS	SFM26-BS	SFM27-BS	SFM28-BS	UNIT
Maximum instantaneous forward voltage at $I_F=2.0A$	V_F	0.95				1.25		1.70		V
Maximum reverse leakage current $T_J=25^{\circ}C$ at rated V_R $T_J=125^{\circ}C$	I_R	5.0 100								μA μA
Maximum reverse recovery time (Note 2)	t_{rr}	35								ns

PARAMETER	SYMBOLS	SFM21-BS	SFM22-BS	SFM23-BS	SFM24-BS	SFM25-BS	SFM26-BS	SFM27-BS	SFM28-BS	UNIT
Typical thermal resistance junction to ambient (3)	R _{θJA}	37								°C/W
Typical thermal resistance junction to case(3)	R _{θJC}	22								°C/W



Formosa MS

Page 2

Document ID	Issued Date	Revised Date	Revision	Page.
DS-121442	2010/08/10	2011/07/22	B	7

Rating and characteristic curves (SFM21-BS THRU SFM28-BS)

FIG.1-TYPICAL FORWARD

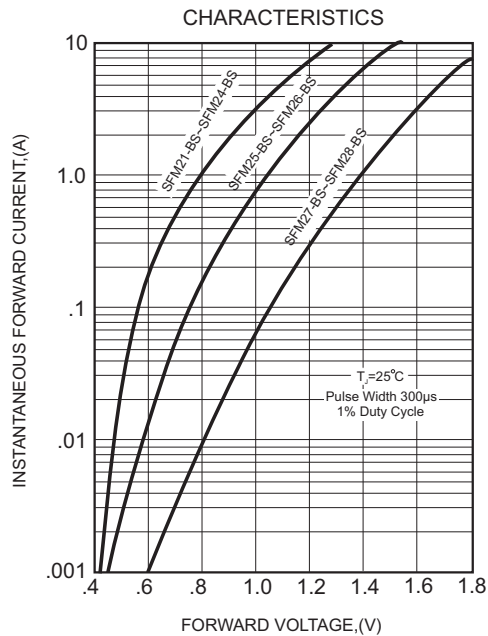


FIG.2-TYPICAL FORWARD CURRENT
DERATING CURVE

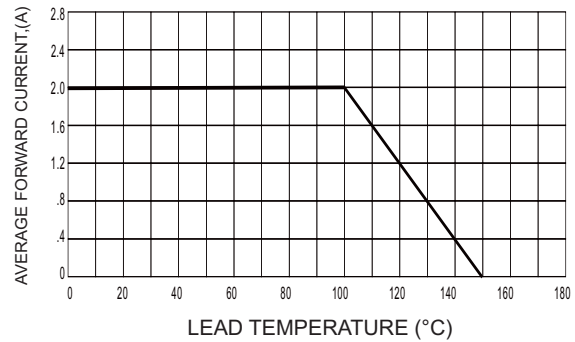


FIG.4-MAXIMUM NON-REPETITIVE FORWARD
SURGE CURRENT

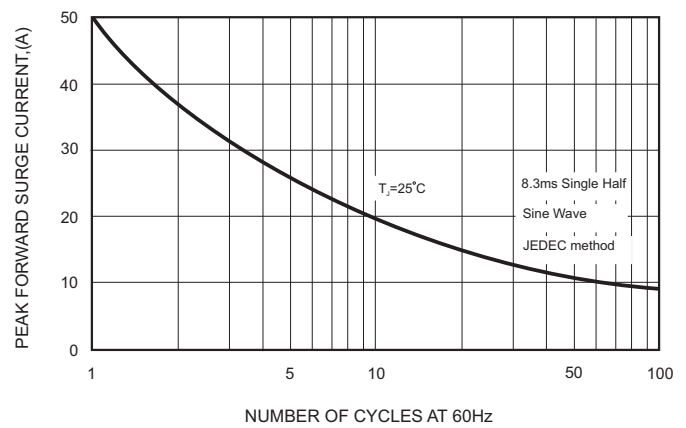
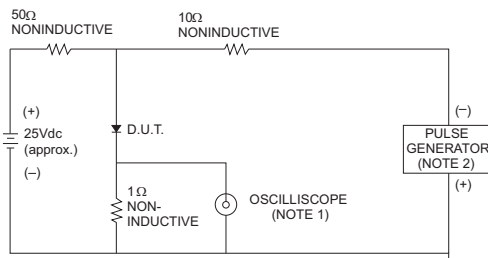


FIG.3- TEST CIRCUIT DIAGRAM AND REVERSE
RECOVERY TIME CHARACTERISTICS



NOTES: 1. Rise Time= 7ns max., Input Impedance= 1 megohm, 22pF.

2. Rise Time= 10ns max., Source Impedance= 50 ohms.

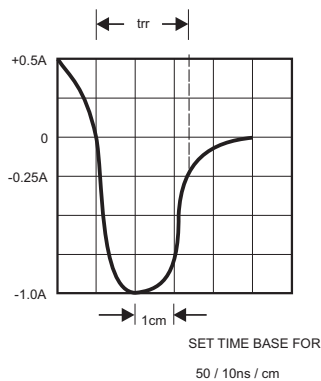
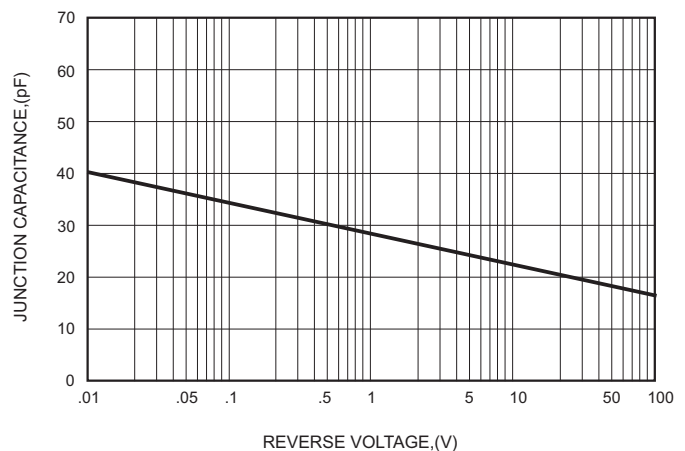


FIG.5-TYPICAL JUNCTION CAPACITANCE



SFM21-BS THRU SFM28-BS**Pinning information**

Pin	Simplified outline	Symbol
Pin1 cathode Pin2 anode		

Marking

Type number	Marking code
SFM21-BS	S21
SFM22-BS	S22
SFM23-BS	S23
SFM24-BS	S24
SFM25-BS	S25
SFM26-BS	S26
SFM27-BS	S27
SFM28-BS	S28

Suggested solder pad layout

Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SMB-S	0.096 (2.45)	0.063 (1.60)	0.130 (3.30)

SFM21-BS THRU SFM28-BS

Packing information



unit:mm

Item	Symbol	Tolerance	SMB-S
Carrier width	A	0.1	3.81
Carrier length	B	0.1	5.74
Carrier depth	C	0.1	2.24
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	0.1	0.23
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.

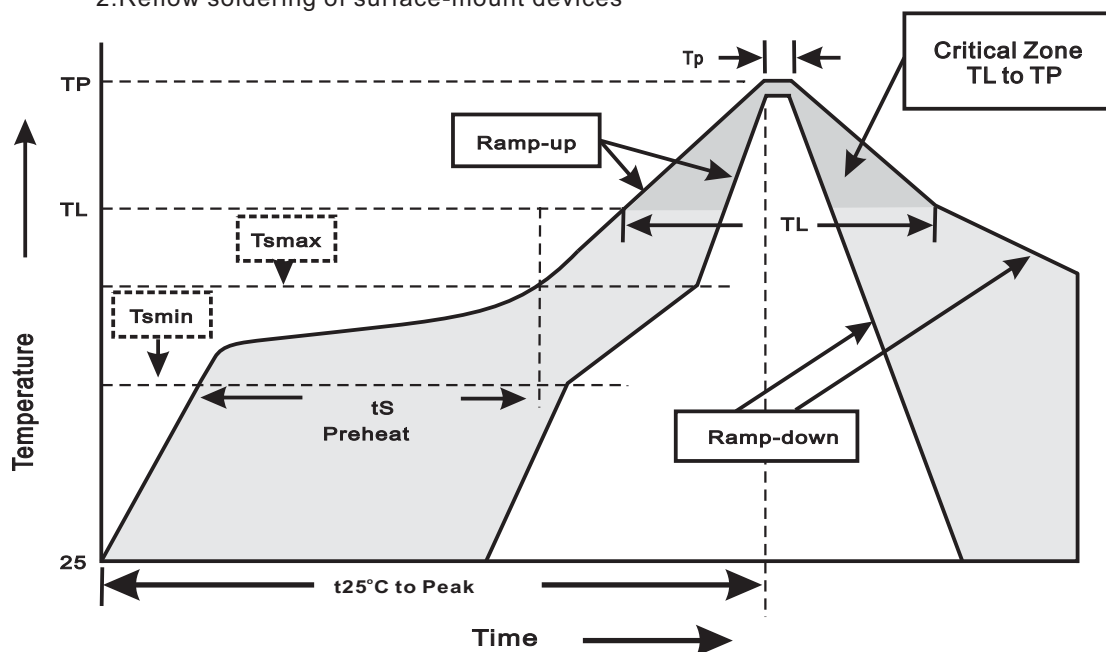
SFM21-BS THRU SFM28-BS

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-S	13"	4,000	8.0	8,000	335*335*38	330	350*330*360	64,000	13.0

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 _{smmin}) -Temperature Max(T _{smmax}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{smmax} 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

SFM21-BS THRU SFM28-BS

High reliability test capabilities

Item Test	Conditions	Reference
1. Solder Resistance	at $260 \pm 5^{\circ}\text{C}$ for $10 \pm 2\text{sec.}$	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 175°C for 1000 hrs.	MIL-STD-750D METHOD-1031