

FM220-AF THRU FM2200-AF**List**

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FM220-AF THRU FM2200-AF

2.0A Surface Mount Schottky Barrier Rectifiers 20-200V

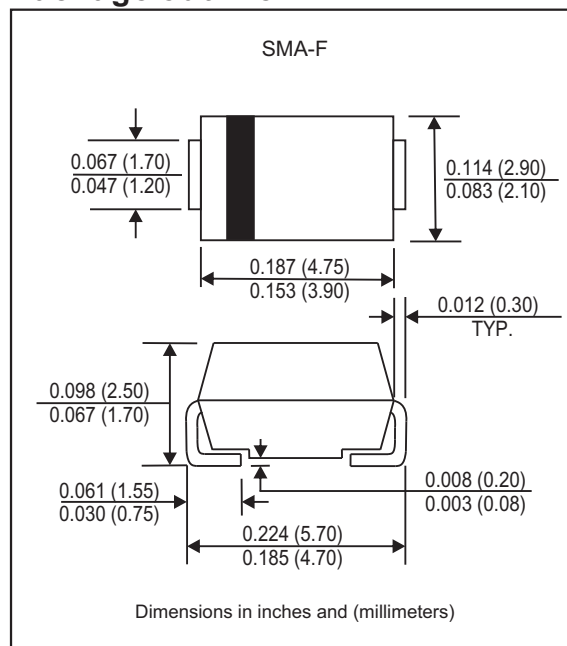
Features

- Low power loss, high efficiency
- High current capability, low forward voltage drop.
- Ultra high-speed switching.
- Silicon epitaxial planar chip, metal silicon junction.
- Lead-free parts meet RoHS requirements
- Suffix "-H" indicates Halogen free parts, ex. FM220-AF-H

Mechanical data

- Epoxy: UL94-V0 rated flame retardant
- Case : Molded plastic, DO-214AC / SMA-F
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any
- Weight : Approximated 0.055 gram

Package outline



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

Parameter	Symbols	FM220-AF	FM240-AF	FM260-AF	FM2100-AF	FM2150-MAF	FM2200-AF	Units
Maximum repetitive peak reverse voltage	VRRM	20	40	60	100	150	200	V
Maximum RMS voltage	VRMS	14	28	42	70	105	140	V
Maximum DC blocking voltage	VDC	20	40	60	100	150	200	V
Maximum average forward rectified current at TL (see fig. 1)	Io	2.0						A
Peak forward surge current, 8.3ms single half-sine-wave (JEDEC method)	IFSM	50						A
Operating junction temperature range	TJ	-55 to +125		-55 to +150				°C
Storage temperature range	TSTG	-55 to +175						°C

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

Parameter	Symbols	FM220-AF	FM240-AF	FM260-AF	FM2100-AF	FM2150-MAF	FM2200-AF	Units
Maximum instantaneous forward voltage at $I_F = 2.0\text{A}$ $T_J = 25^{\circ}\text{C}$	V_F	0.50		0.70	0.85	0.90	0.92	V
Maximum reverse current $T_J = 25^{\circ}\text{C}$ at rated DC blocking voltage $T_J = 100^{\circ}\text{C}$	I_R	0.5 20						mA

Thermal characteristics

Parameter	Symbols	FM220-AF	FM240-AF	FM260-AF	FM2100-AF	FM2150-MAF	FM2200-AF	Units
Typical thermal resistance junction to ambient (note 2)	$R_{\theta JA}$	55						$^{\circ}\text{C/W}$

Notes1: Measured at 1MHz and applied reverse voltage of 4.0V D.C.
2: P.C.B. mounted with 0.2x0.2"(5.0x5.0mm) copper pad areas

Rating and characteristic curves (FM220-AF THRU FM2200-AF)

FIG.1-TYPICAL FORWARD CURRENT DERATING CURVE

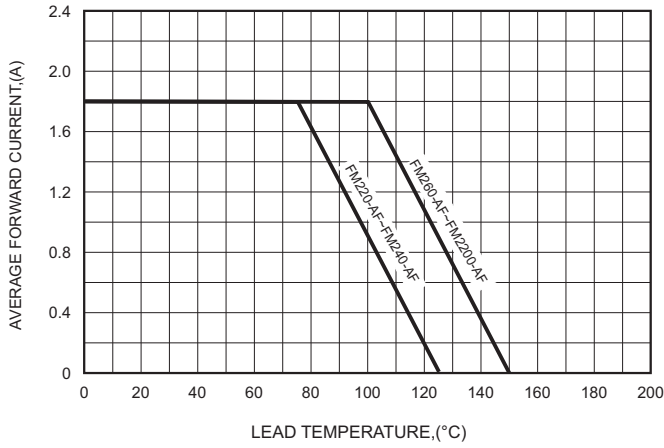


FIG.3-MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT

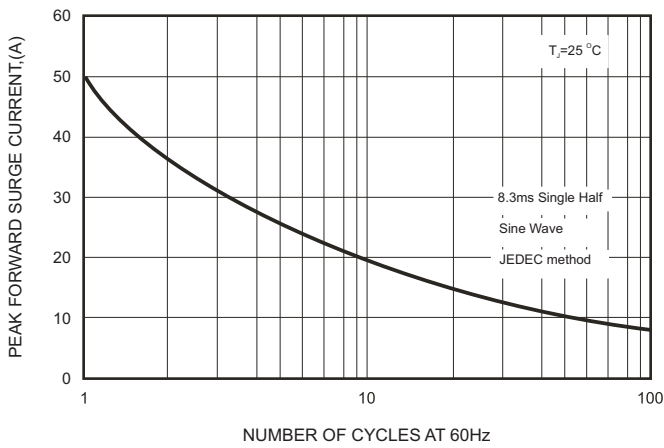


FIG.4-TYPICAL JUNCTION CAPACITANCE

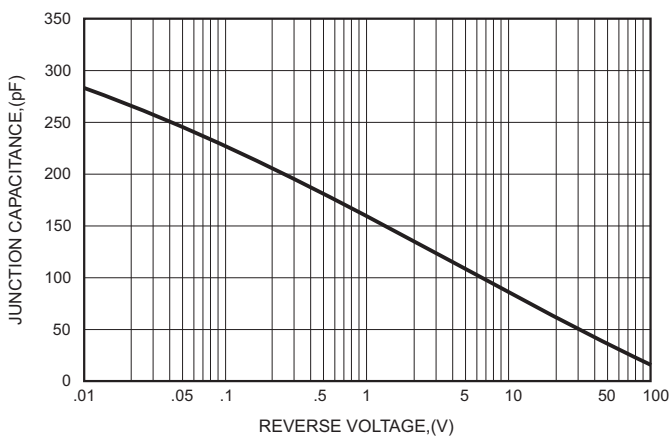


FIG.2-TYPICAL FORWARD CHARACTERISTICS

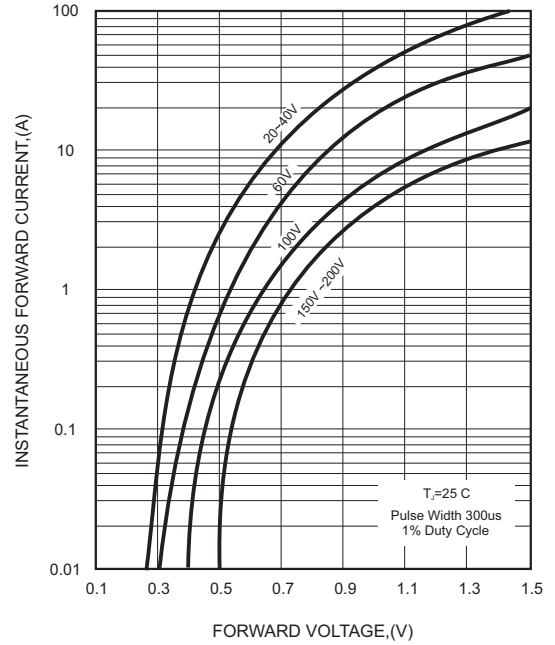
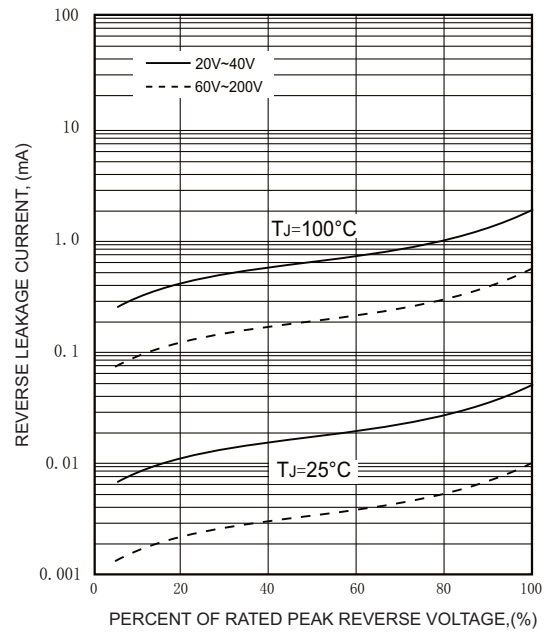


FIG.5 - TYPICAL REVERSE CHARACTERISTICS

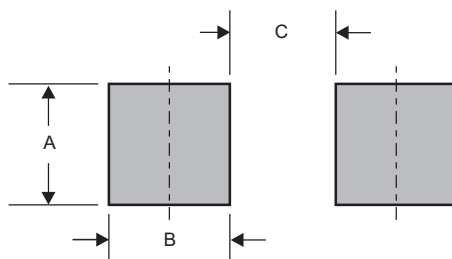


FM220-AF THRU FM2200-AF**Pinning information**

Pin	Simplified outline	Symbol
Pin1 cathode Pin2 anode		

Marking

Type number	Marking code
FM220-AF	SK22,SS22
FM240-AF	SK24,SS24
FM260-AF	SK26,SS26
FM2100-AF	SK210,SS210
FM2150-AF	SK215,SS215
FM2200-AF	SK220,SS220

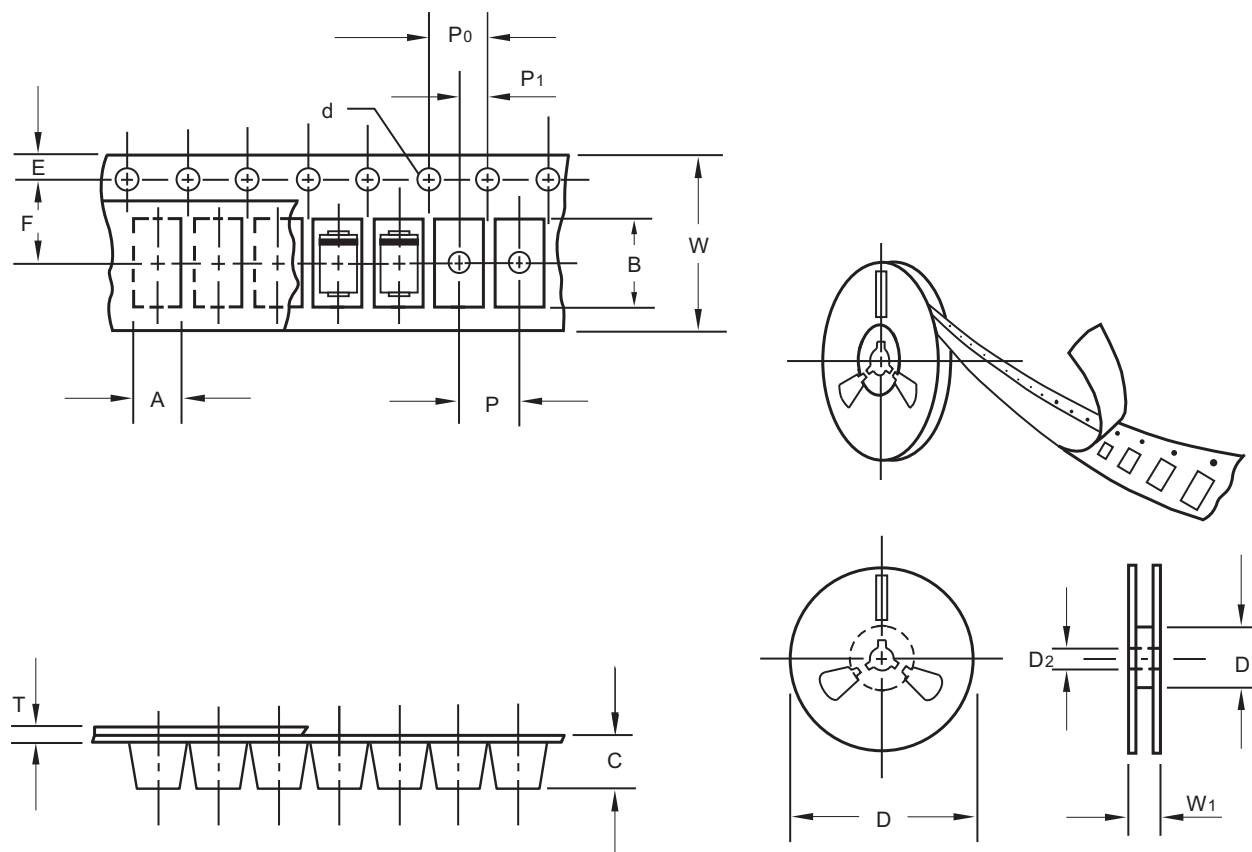
Suggested solder pad layout

Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SMA-F	0.068 (1.70)	0.104 (2.60)	0.060(1.50)

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Packing information



unit:mm

Item	Symbol	Tolerance	SMA-F
Carrier width	A	0.1	2.79
Carrier length	B	0.1	5.33
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	72.00
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	5.50
Punch hole pitch	P	0.1	4.00
Sprocket hole pitch	P ₀	0.1	4.00
Embossment center	P ₁	0.1	2.00
Overall tape thickness	T	0.1	0.30
Tape width	W	0.3	12.00
Reel width	W ₁	1.0	18.00

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

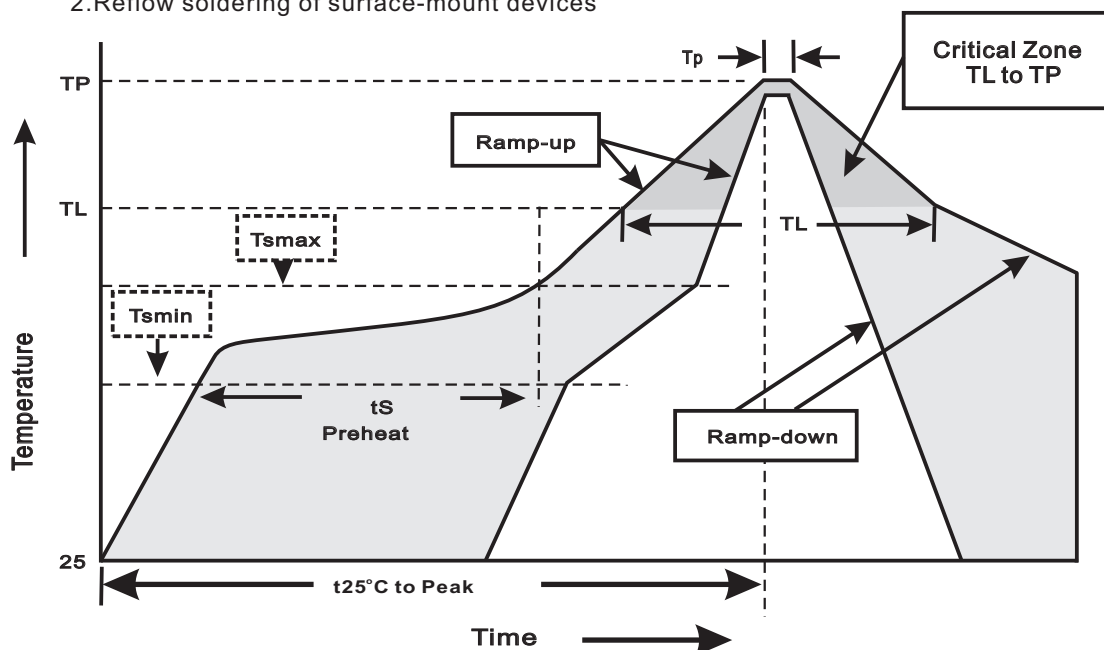
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Reel packing

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)
SMA-F	13"	5,000	4.0	10,000	335*335*38	330	350*330*360	80,000	13.50

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

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High reliability test capabilities

Item Test	Conditions	Reference
1. Solder Resistance	at $260 \pm 5^\circ\text{C}$ for $10 \pm 2\text{sec}$.	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 $T_J = 125^\circ\text{C}$ 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 175°C for 1000 hrs.	MIL-STD-750D METHOD-1031