FM320-ASF-Q1 THRU FM3200-ASF-Q1

List

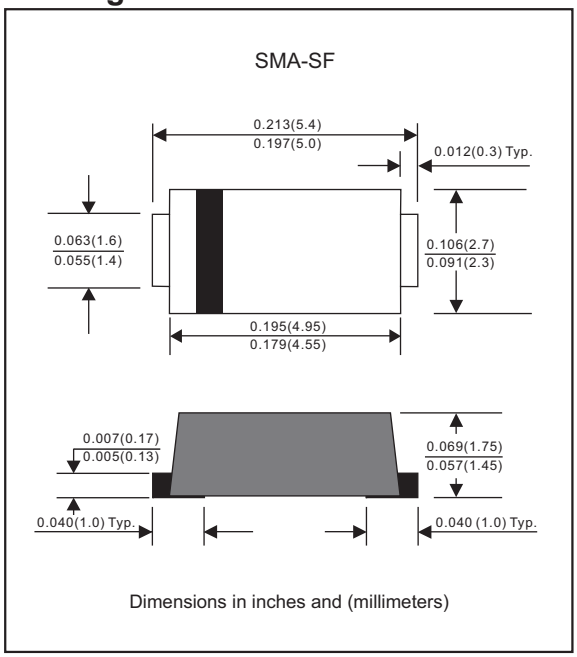
FM320-ASF-Q1 THRU FM3200-ASF-Q1

3.0A Surface Mount Schottky Barrier Rectifiers 20V-200V

Features

- 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
- Low power loss, high efficiency
- High current capability, low forward voltage drop
- High surge capability
- Guardring for overvoltage protection
- Ultra high-speed switching
- Silicon epitaxial planar chip, metal silicon junction
- Lead-free parts meet RoHS requirements
- Qualified to AEC-Q101 standards for high reliability
- Suffix "-H" indicates Halogen free parts, ex. FM320-ASF-Q1-H

Package outline



Dimensions in inches and (millimeters)

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, SMA-SF
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any
- Weight : Approximated 0.04 gram

Maximum ratings (AT T_A=25°C unless otherwise noted)

PARAMETER	SYMBOLS	FM320-ASF-Q1	FM330-ASF-Q1	FM340-ASF-Q1	FM345-ASF-Q1	FM350-ASF-Q1	FM360-ASF-Q1	FM380-ASF-Q1	FM3100-ASF-Q1	FM3150-ASF-Q1	FM3200-ASF-Q1	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	20	30	40	45	50	60	80	100	150	200	V
Maximum RMS voltage	V_{RMS}	14	21	28	31.5	35	42	56	70	105	140	V
Maximum continuous reverse voltage	V_R	20	30	40	45	50	60	80	100	150	200	V
Maximum average forward rectified current	I_O	3.0										A
Non-repetitive peak forward surge current 8.3ms single half sine-wave	I_{FSM}	80										A
Typical junction capacitance (Note 1)	C_J	250										pF
Operating junction temperature range	T_J	-55 to +125				-55 to +150						°C
Storage temperature range	T_{STG}	-65 to +175										°C

Electrical characteristics (AT T_A=25°C unless otherwise noted)

PARAMETER	SYMBOLS	FM320-ASF-Q1	FM330-ASF-Q1	FM340-ASF-Q1	FM345-ASF-Q1	FM350-ASF-Q1	FM360-ASF-Q1	FM380-ASF-Q1	FM3100-ASF-Q1	FM3150-ASF-Q1	FM3200-ASF-Q1	UNIT
Maximum instantaneous forward voltage at I_F=3.0A	V_F	0.475	0.50			0.70		0.85		0.90	0.92	V
Maximum reverse leakage current T_J=25°C at rated V_R T_J=100°C	I_R	0.1 20						0.05 10		0.01 5		mA mA

Thermal characteristics

PARAMETER	SYMBOLS	FM320-ASF-Q1	FM330-ASF-Q1	FM340-ASF-Q1	FM345-ASF-Q1	FM350-ASF-Q1	FM360-ASF-Q1	FM380-ASF-Q1	FM3100-ASF-Q1	FM3150-ASF-Q1	FM3200-ASF-Q1	UNIT
Typical thermal resistance junction to ambient (Note2)	$R_{\theta JA}$	60										°C/W
Typical thermal resistance junction to case (Note 2)	$R_{\theta JC}$	30										°C/W

Notes1: Measured at 1MHz and applied reverse voltage of 4.0V D.C

2: Mounted on FR-4 PCB copper, minimum recommended pad layout

Rating and characteristic curves (FM320-ASF-Q1 THRU FM3200-ASF-Q1)

FIG.1-TYPICAL FORWARD CURRENT DERATING CURVE

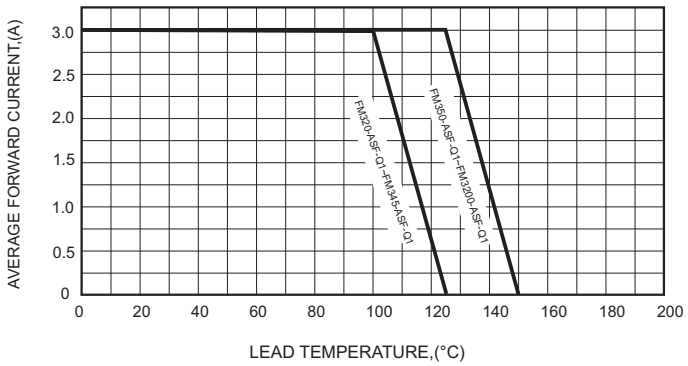


FIG.2-TYPICAL FORWARD CHARACTERISTICS

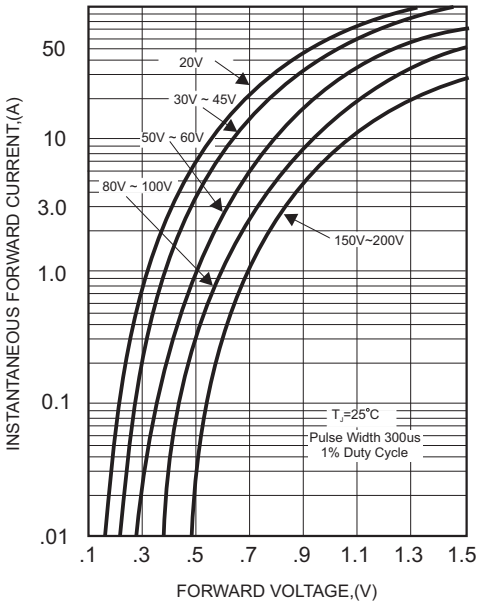


FIG.3-MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT

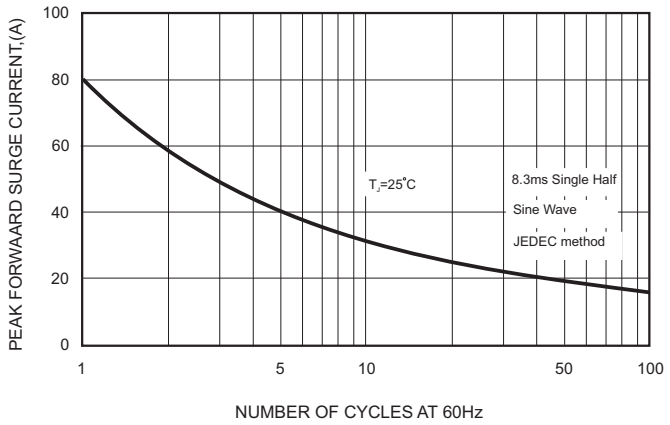


FIG.4-TYPICAL JUNCTION CAPACITANCE

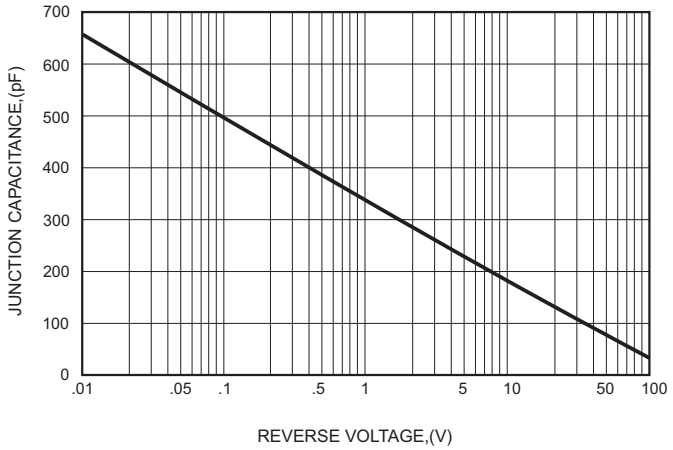
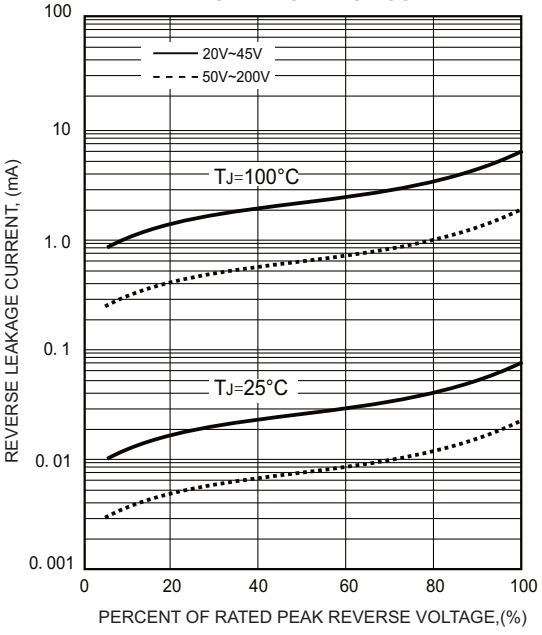


FIG.5 - TYPICAL REVERSE CHARACTERISTICS



FM320-ASF-Q1 THRU FM3200-ASF-Q1

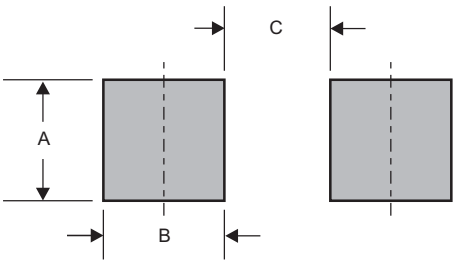
Pinning information

Pin	Simplified outline	Symbol
Pin1 cathode Pin2 anode		

Marking

Type number	Marking code
FM320-ASF-Q1	SK32
FM330-ASF-Q1	SK33
FM340-ASF-Q1	SK34
FM345-ASF-Q1	SK34
FM350-ASF-Q1	SK35
FM360-ASF-Q1	SK36
FM380-ASF-Q1	SK38
FM3100-ASF-Q1	S310
FM3150-ASF-Q1	S315
FM3200-ASF-Q1	S320

Suggested solder pad layout

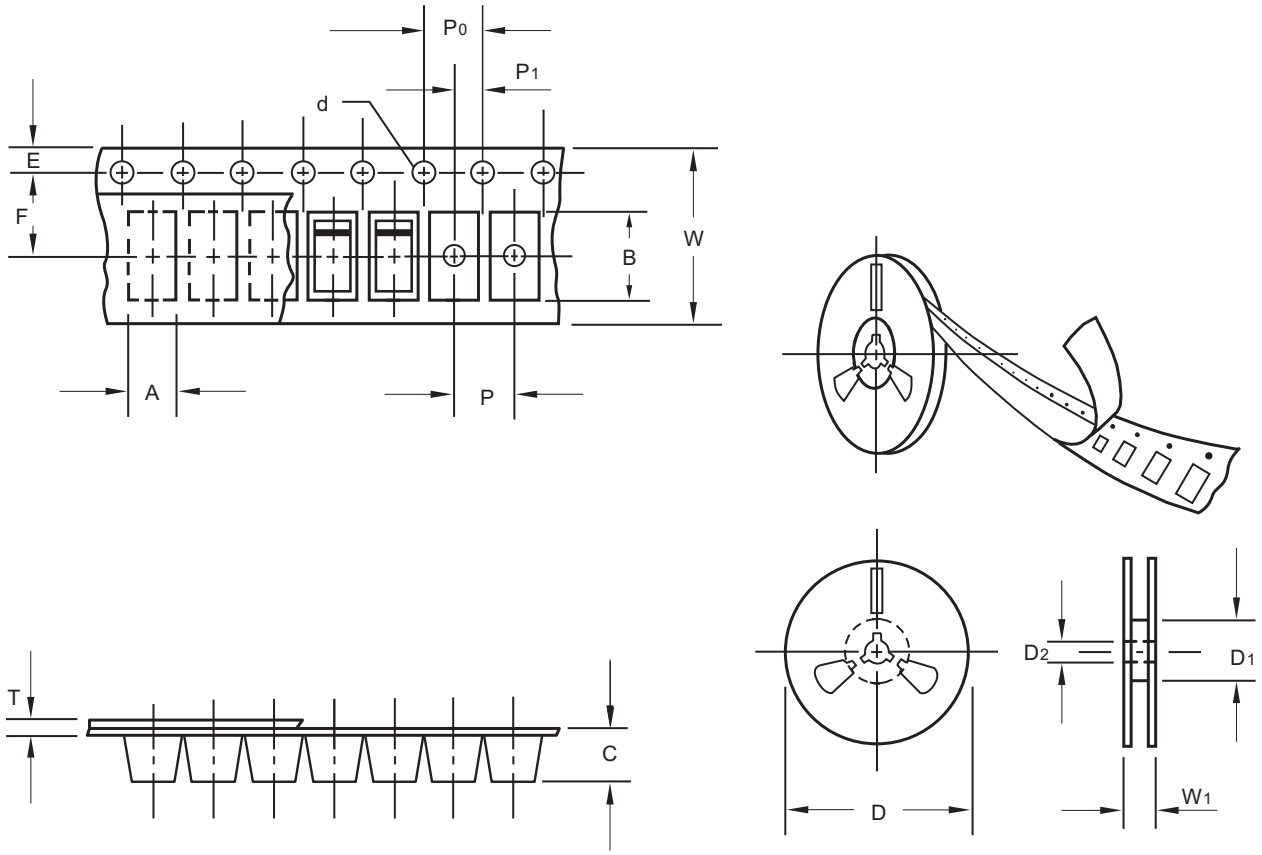


Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SMA-SF	0.063 (1.60)	0.059 (1.50)	0.110 (2.80)

FM320-ASF-Q1 THRU FM3200-ASF-Q1

Packing information



unit:mm

Item	Symbol	Tolerance	SMA-SF
Carrier width	A	0.1	2.90
Carrier length	B	0.1	5.50
Carrier depth	C	0.1	2.10
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	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	0.23
Tape width	W	0.3	12.00
Reel width	W_1	1.0	18.00

Note:Devices are packed in accor dance with EIA standar RS-481-A and specifications listed above.

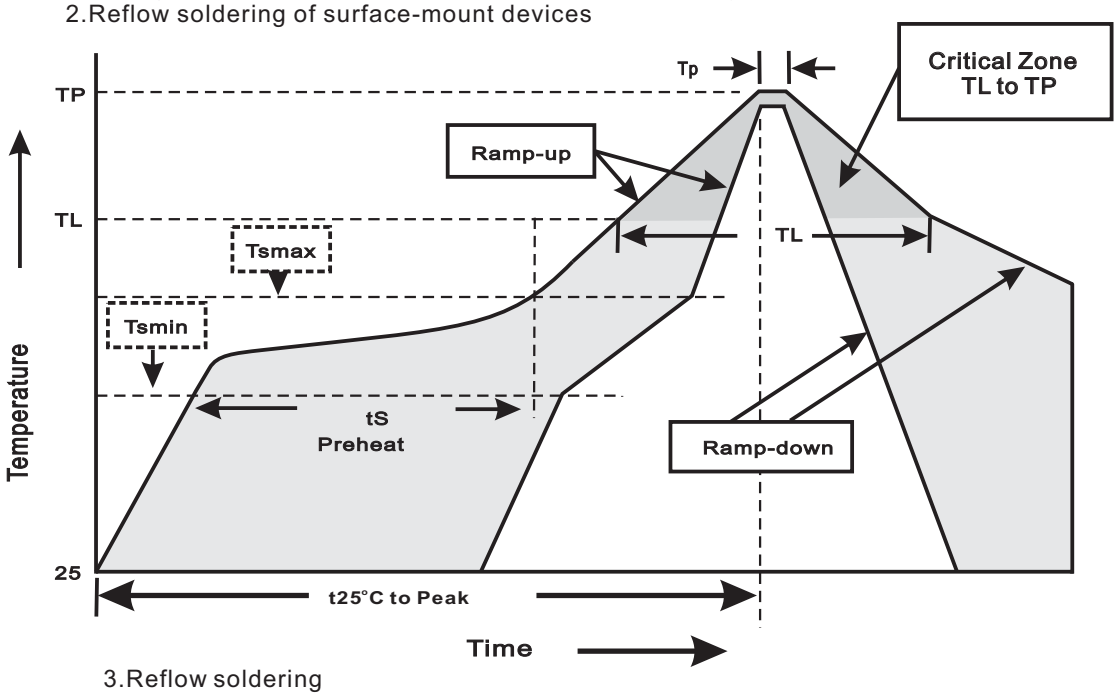
FM320-ASF-Q1 THRU FM3200-ASF-Q1

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)
SMA-SF	7"	2,000	4.0	20,000	183*155*183	178	382*356*392	160,000	12.0
	13"	7,500	4.0	15,000	335*335*38	330	350*330*360	120,000	11.5

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(Tsmin) -Temperature Max(Tsmax) -Time(min to max)(t_s)	 150°C 200°C 60~120sec
Tsmax 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

FM320-ASF-Q1 THRU FM3200-ASF-Q1

High reliability test capabilities

Item Test	Conditions	Reference
1. MSL Preconditioning	24hr bake@125℃+168hrs@85℃ /85%RH+3xIR@260℃+1flux immersion+alcohol+DI H2O rinse	JESD22-A113
2. Operation Life	Ta=25℃, Rated Current（Io=Io max.）Test Duration:1000hrs	MIL-STD-750E METHOD 1027.3
3. High Temperature Reverse Bias	80% Rated VR (Tj=Tj max.)Test Duration:1000hrs	JESD22-A108
4. High Temperature Storage Life	Ta=125℃ Test Duration：1000hrs	JESD22 A-103
5. Temperature Cycle	-55℃（15min） to 150℃（15min）Test Cycles：1000cycles	JESD22 A-104
6. Autoclave	P=2atm Ta=121℃ RH=100% Test Duration:96hrs	JESD22 A-102
7. Intermittent Operational Life	Ta=25℃,On/Io Max. 2min, Off/2min, Test Cycles:15000cycles	MIL-STD-750E METHOD 1037
8. Solderability	245±5℃ for 5sec	J-STD-002
9. Moisture Resistance	Ta=85℃/85% Relative humidity Test Duration:1000hrs	MIL-STD-750E METHOD 1021.2
10. Resistance To Solder Heat	260±5℃ for 10sec	JESD22 B-106
11. High Temperature High Humidity Reverse Bias	Ta=85℃, 85%RH, with device reverse biased at 80% of rated breakdown voltage up to a maximum of 100V or limit of chamber Test Duration:1000hrs	JESD22-A101