

FM240-BS-Q1 THRU FM2200-BS-Q1

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FM240-BS-Q1 THRU FM2200-BS-Q1

2.0A Surface Mount Schottky Barrier Rectifiers - 40V-200V

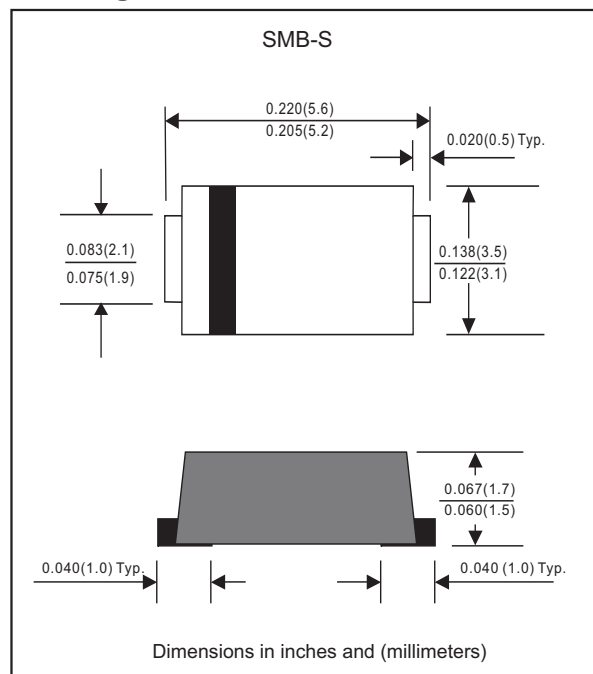
Features

- 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. FM240-BS-Q1-H

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, DO-214AA/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

Package outline



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

PARAMETER	SYMBOLS	FM240-BS-Q1	FM260-BS-Q1	FM2100-BS-Q1	FM2150-BS-Q1	FM2200-BS-Q1	UNITS
Maximum repetitive peak reverse voltage	VRRM	40	60	100	150	200	Volts
Maximum RMS voltage	VRMS	28	42	70	105	140	Volts
Maximum continuous reverse voltage	VR	40	60	100	150	200	Volts
Maximum average forward rectified current	Io	2.0					Amps
Non-repetitive peak forward surge current 8.3ms single half sine-wave	IFSM	50					Amps
Typical junction capacitance (Note 1)	CJ	160					pF
Operating junction temperature range	TJ	-55 to +125	-55 to +150				°C
Storage temperature range	TSTG	-65 to +175					°C

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

PARAMETER	SYMBOLS	FM240-BS-Q1	FM260-BS-Q1	FM2100-BS-Q1	FM2150-BS-Q1	FM2200-BS-Q1	UNITS
Maximum instantaneous forward voltage at $I_F=2.0\text{A}$	V_F	0.50	0.70	0.85	0.90	0.92	Volts
Maximum reverse leakage current at rated V_R $T_J=25^{\circ}\text{C}$ $T_J=100^{\circ}\text{C}$	I_R	0.5 10					mA mA

Thermal characteristics

PARAMETER	SYMBOLS	FM240-BS-Q1	FM260-BS-Q1	FM2100-BS-Q1	FM2150-BS-Q1	FM2200-BS-Q1	UNITS
Typical thermal resistance junction to ambient (Note 2)	$R_{\theta JA}$	60					$^{\circ}\text{C} / \text{W}$
Typical thermal resistance junction to case (Note 2)	$R_{\theta JC}$	30					$^{\circ}\text{C} / \text{W}$

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 (FM240-BS-Q1 THRU FM2200-BS-Q1)

FIG.1-TYPICAL FORWARD CURRENT DERATING CURVE

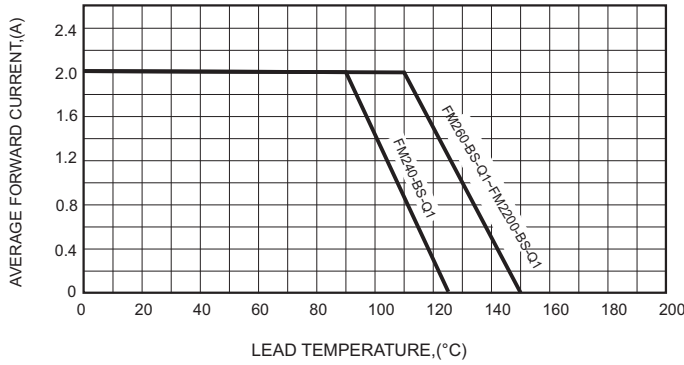


FIG.2-TYPICAL FORWARD CHARACTERISTICS

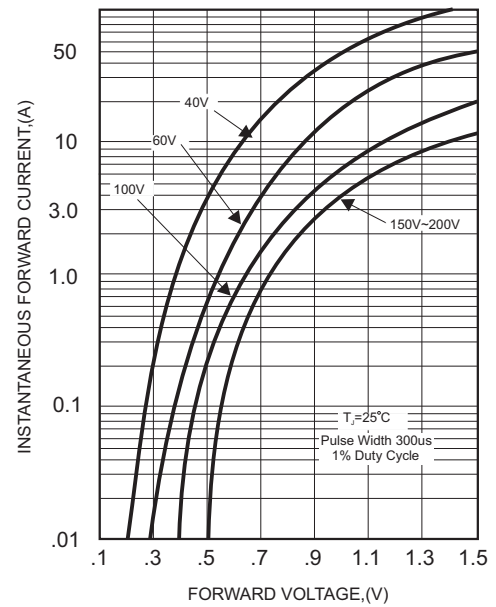


FIG.3-MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT

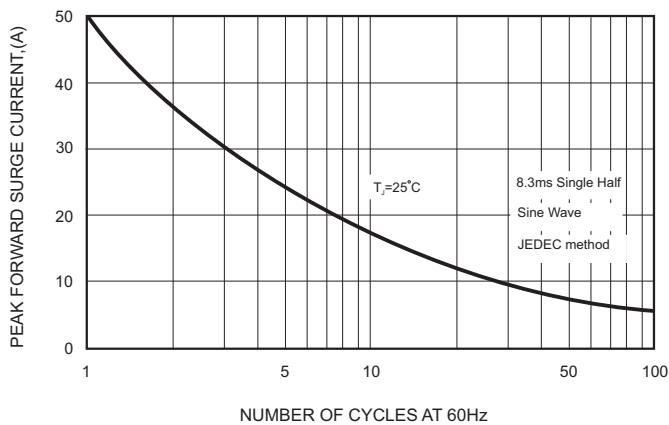


FIG.5 - TYPICAL REVERSE CHARACTERISTICS

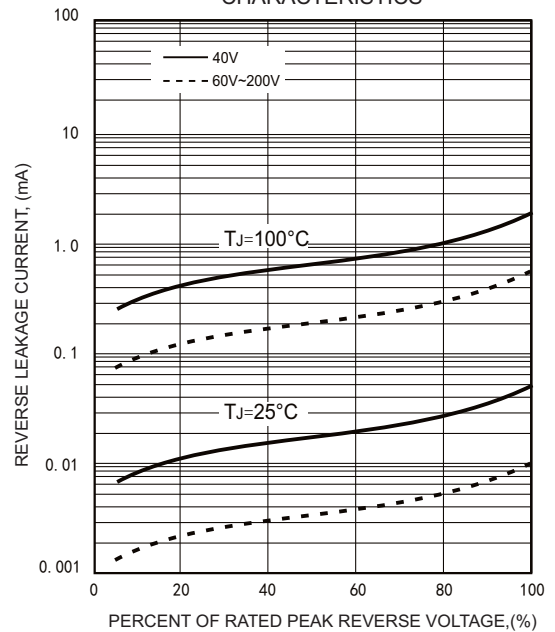
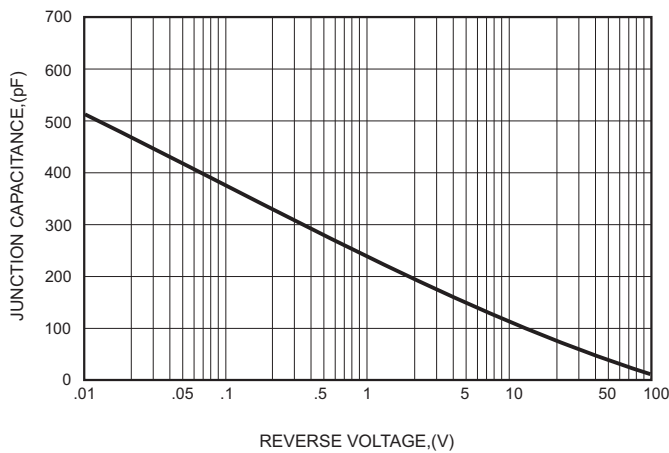


FIG.4-TYPICAL JUNCTION CAPACITANCE

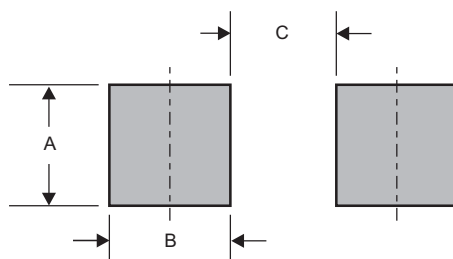


FM240-BS-Q1 THRU FM2200-BS-Q1**Pinning information**

Pin	Simplified outline	Symbol
Pin1 cathode Pin2 anode		

Marking

Type number	Marking code
FM240-BS-Q1	SK24
FM260-BS-Q1	SK26
FM2100-BS-Q1	S210
FM2150-BS-Q1	S215
FM2200-BS-Q1	S220

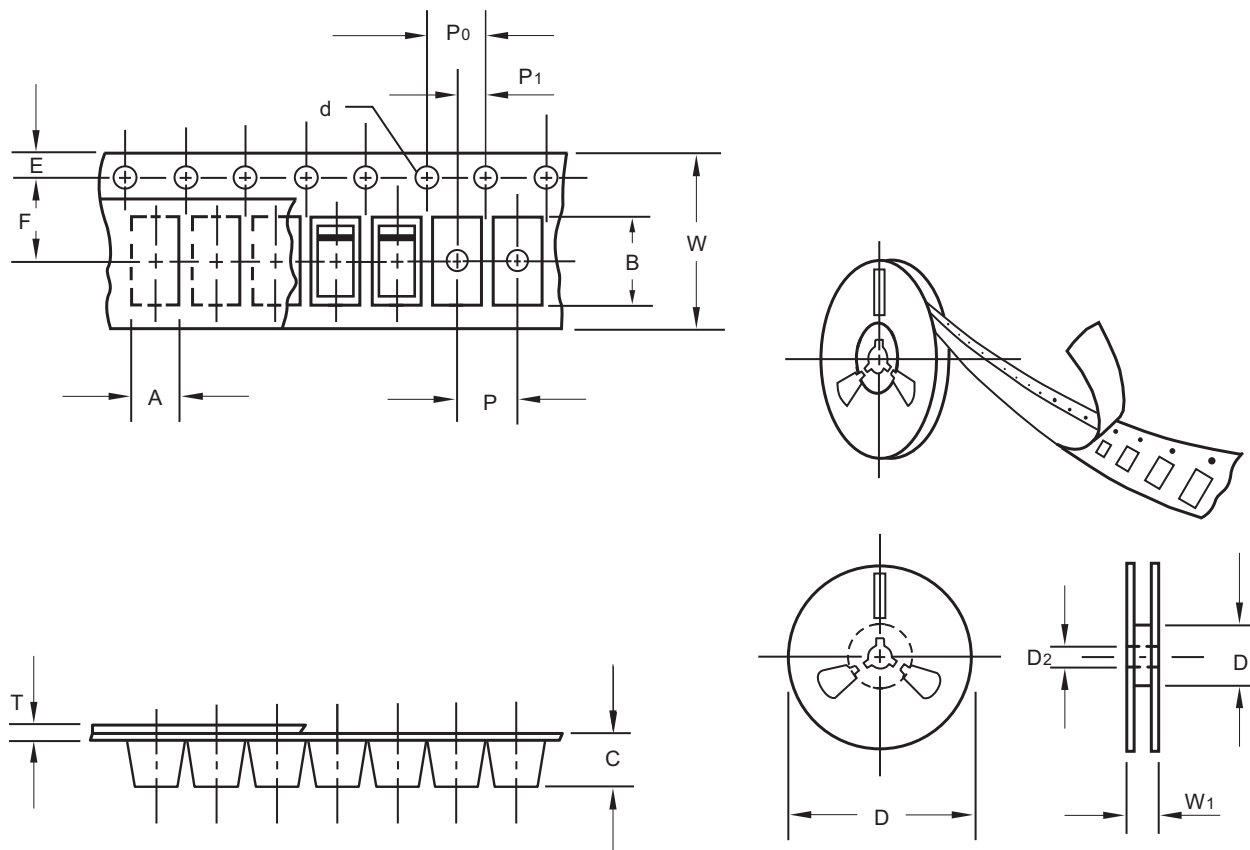
Suggested solder pad layout

Dimensions in inches and (millimeters)

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

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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.

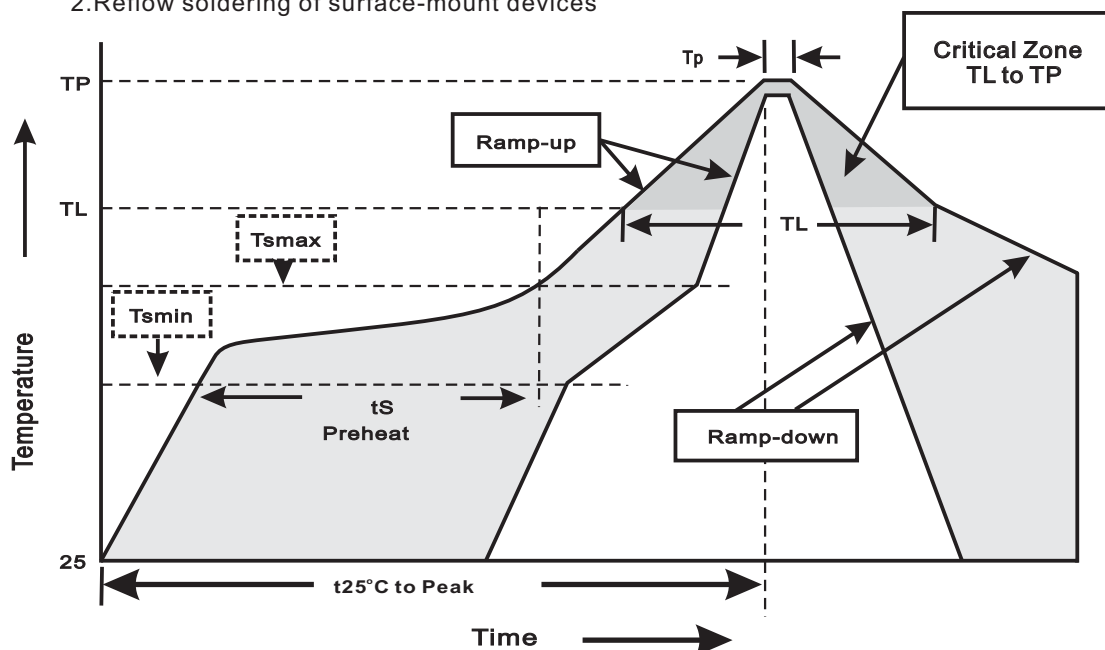
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Reel packing

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)
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

FM240-BS-Q1 THRU FM2200-BS-Q1**High reliability test capabilities**

Item Test	Conditions	Reference
1. MSL Preconditioning	24hr bake@125°C+168hrs@85°C /85%RH+3xIR@260°C+1flux immersion+alcohol+DI H2O rinse	JESD22-A113
2. Operation Life	Ta=25°C,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°C Test Duration:1000hrs	JESD22 A-103
5. Temperature Cycle	-55°C(15min) to 150°C(15min)Test Cycles:1000cycles	JESD22 A-104
6. Autoclave	P=2atm Ta=121°C RH=100% Test Duration:96hrs	JESD22 A-102
7. Intermittent Operational Life	Ta=25°C,On/Io Max. 2min, Off/2min, Test Cycles:15000cycles	MIL-STD-750E METHOD 1037
8. Solderability	245±5°C for 5sec	J-STD-002
9. Moisture Resistance	Ta=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	Ta=85°C, 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