

FM5L40-BS-Q1 THRU FM5L100-BS-Q1

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FM5L40-BS-Q1 THRU FM5L100-BS-Q1

5.0A Low VF Surface Mount Schottky
Barrier Rectifiers - 40V-100V

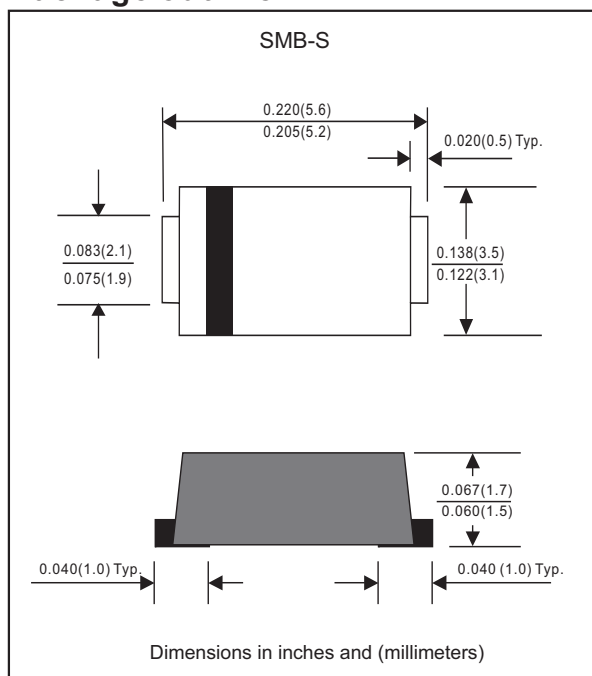
Features

- High current density schottky
- 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
- Lead-free parts meet RoHS requirements
- Qualified to AEC-Q101 standards for high reliability
- Suffix "-H" indicates Halogen free parts, ex. FM5L40-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	FM5L40-BS-Q1	FM5L45-BS-Q1	FM5L60-BS-Q1	FM5L100-BS-Q1	UNITS
Maximum repetitive peak reverse voltage	V _{RRM}	40	45	60	100	Volts
Maximum RMS voltage	V _{RMS}	28	31.5	42	70	Volts
Maximum continuous reverse voltage	V _R	40	45	60	100	Volts
Maximum average forward rectified current	I _O	5.0				Amps
Non-repetitive peak forward surge current 1.0ms square-wave	I _{FSM}	150				Amps
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 $T_A=25^\circ\text{C}$ unless otherwise noted)

PARAMETER	SYMBOLS	FM5L40-BS-Q1	FM5L45-BS-Q1	FM5L60-BS-Q1	FM5L100-BS-Q1	UNITS
Maximum instantaneous forward voltage at $I_F=5.0\text{A}$	V_F	0.45	0.45	0.55	0.75	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 20				mA mA

Thermal characteristics

PARAMETER	SYMBOLS	FM5L40-BS-Q1	FM5L45-BS-Q1	FM5L60-BS-Q1	FM5L100-BS-Q1	UNITS
Typical thermal resistance junction to ambient (note 1)	$R_{\theta JA}$	50				$^\circ\text{C} / \text{W}$
Typical thermal resistance junction to case (note 1)	$R_{\theta JC}$	26				$^\circ\text{C} / \text{W}$

Note 1: Mounted on FR-4 PCB Copper, minimum recommended pad layout.

Rating and characteristic curves (FM5L40-BS-Q1 THRU FM5L100-BS-Q1)

FIG.1-TYPICAL FORWARD CURRENT DERATING CURVE

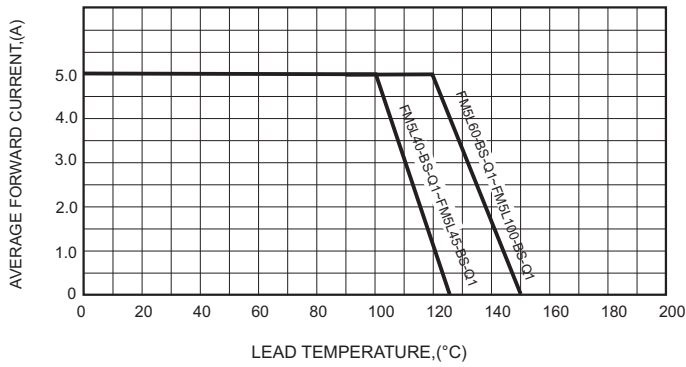


FIG.2-TYPICAL FORWARD CHARACTERISTICS

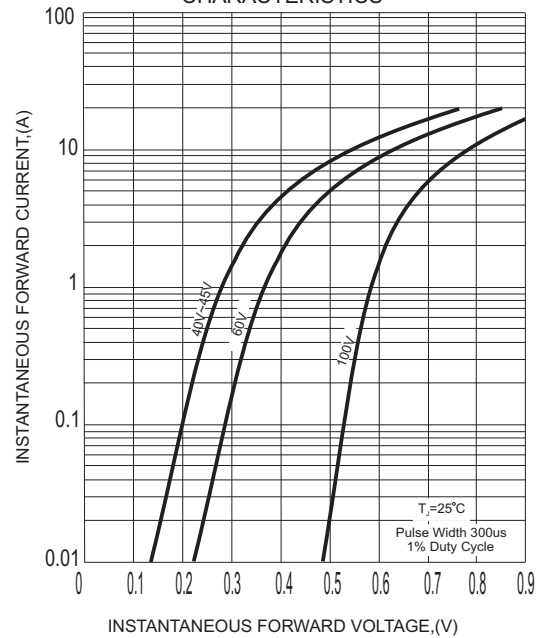


FIG.3-MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT

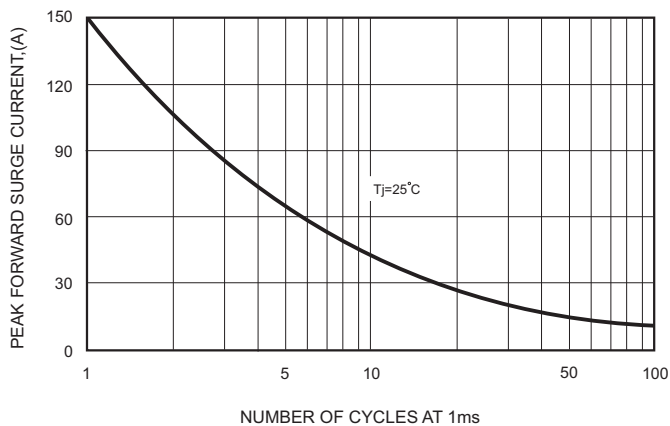
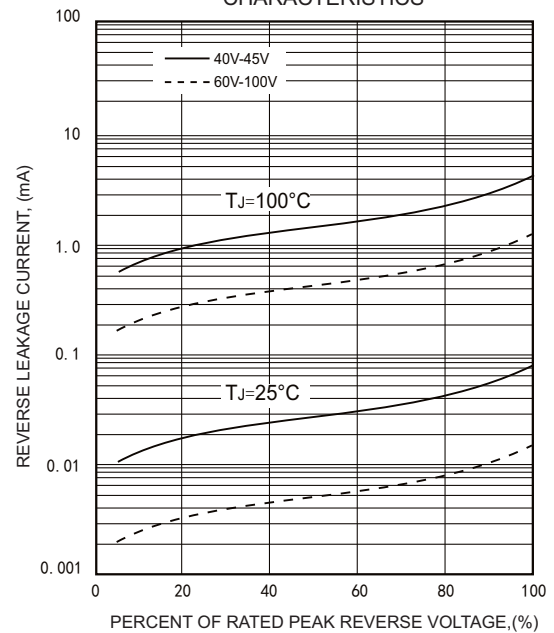


FIG.4 - TYPICAL REVERSE CHARACTERISTICS

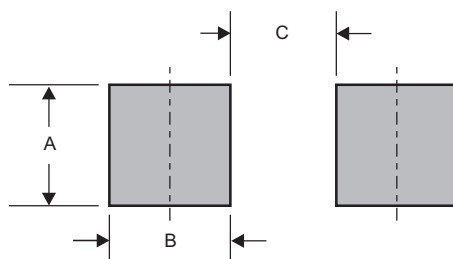


FM5L40-BS-Q1 THRU FM5L100-BS-Q1**Pinning information**

Pin	Simplified outline	Symbol
Pin1 cathode Pin2 anode		

Marking

Type number	Marking code
FM5L40-BS-Q1	5L40
FM5L45-BS-Q1	5L45
FM5L60-BS-Q1	5L60
FM5L100-BS-Q1	5L100

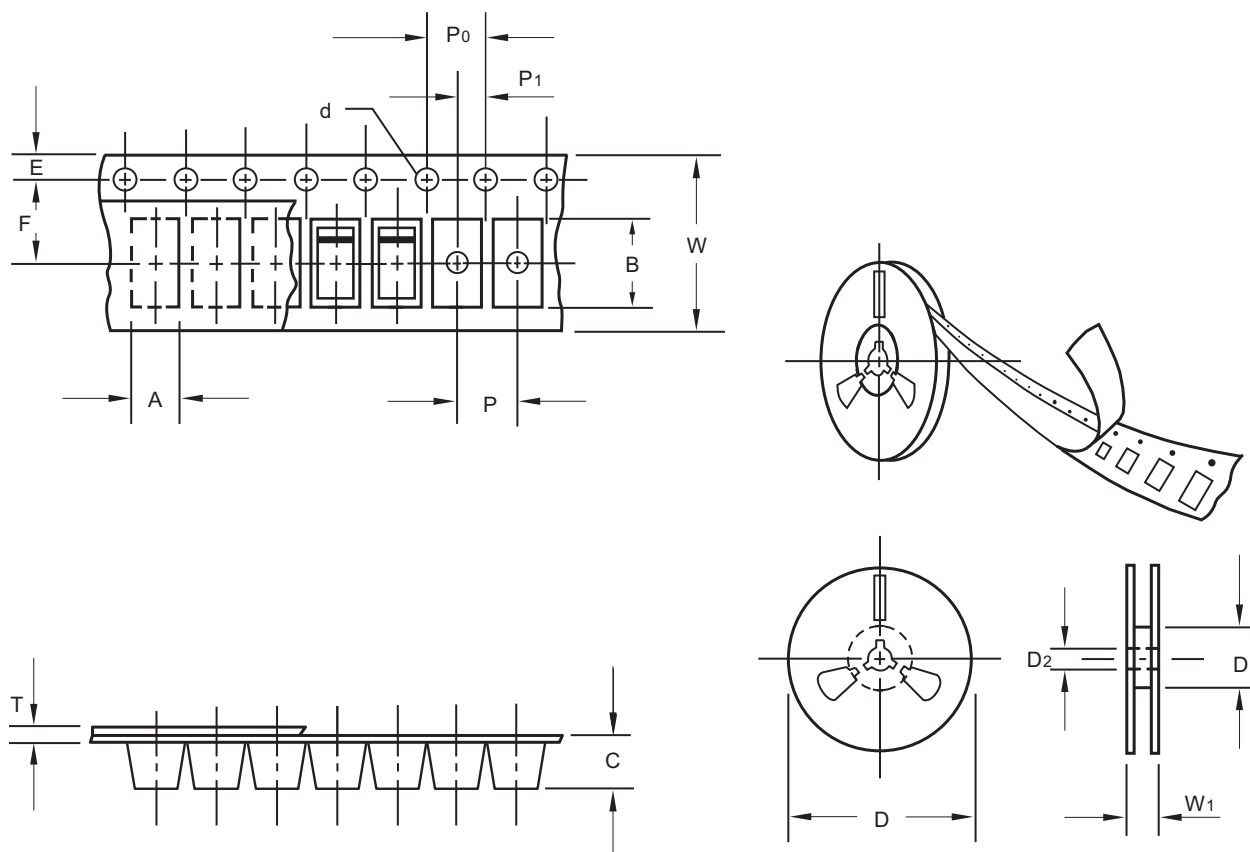
Suggested solder pad layout

Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SMB-S	0.078 (2.00)	0.059 (1.50)	0.110 (2.80)

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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.

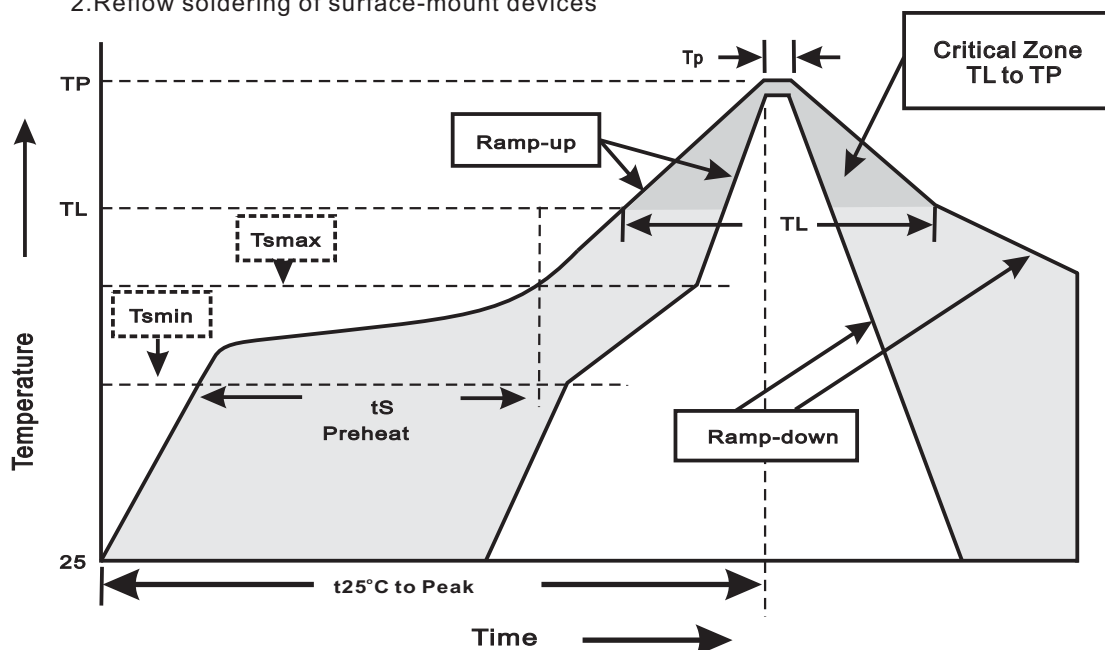
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Reel packing

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_{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

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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/lo 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