

FM120-MST-Q1 THRU FM1200-MST-Q1

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

FM120-MST-Q1 THRU FM1200-MST-Q1

1.0A Surface Mount Schottky Barrier Rectifiers - 20-200V

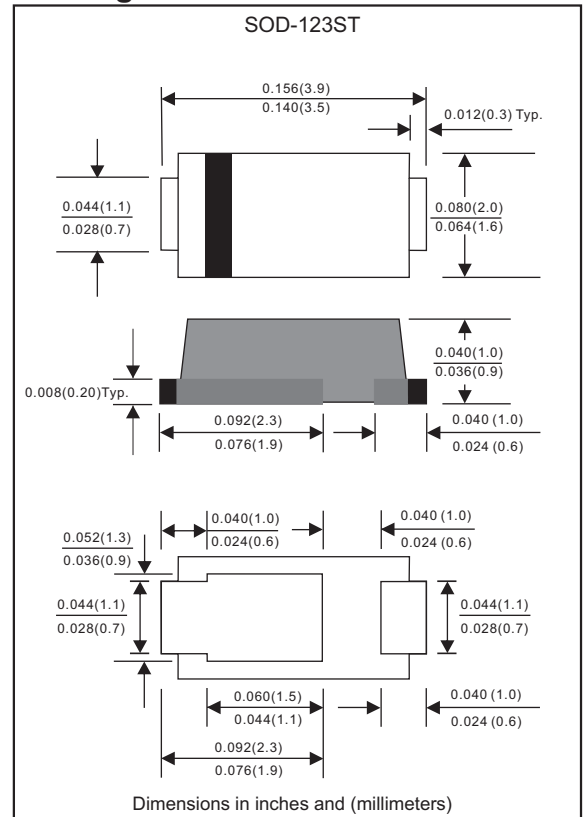
Features

- 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 part, ex. FM120-MST-Q1-H

Mechanical data

- Epoxy : UL94-V0 rated flame retardant
- Case : Molded plastic, SOD-123ST / MINI SMA
- Terminals :Plated terminals, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any
- Weight : Approximated 0.0155 gram

Package outline

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

PARAMETER	SYMBOLS	FM120-MST-Q1	FM130-MST-Q1	FM140-MST-Q1	FM150-MST-Q1	FM160-MST-Q1	FM180-MST-Q1	FM1100-MST-Q1	FM1150-MST-Q1	FM1200-MST-Q1	UNIT
Maximum repetitive peak reverse voltage	VRRM	20	30	40	50	60	80	100	150	200	V
Maximum RMS voltage	VRMS	14	21	28	35	42	56	70	105	140	V
Maximum continuous reverse voltage	VR	20	30	40	50	60	80	100	150	200	V
Maximum average forward rectified current	Io	1.0									A
Non-repetitive peak forward surge current 8.3ms single half sine-wave	IFSM	30									A
Typical junction capacitance (Note 1)	CJ	120									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	FM120-MST-Q1	FM130-MST-Q1	FM140-MST-Q1	FM150-MST-Q1	FM160-MST-Q1	FM180-MST-Q1	FM1100-MST-Q1	FM1150-MST-Q1	FM1200-MST-Q1	UNIT
Maximum instantaneous forward voltage at If=1.0A	VF	0.50			0.70		0.85		0.90	0.92	V
Maximum reverse leakage current at rated VR	IR				0.5 10						mA mA

Thermal characteristics

PARAMETER	SYMBOLS	FM120-MST-Q1	FM130-MST-Q1	FM140-MST-Q1	FM150-MST-Q1	FM160-MST-Q1	FM180-MST-Q1	FM1100-MST-Q1	FM1150-MST-Q1	FM1200-MST-Q1	UNIT
Typical thermal resistance junction to ambient (Note 2)	$R_{\theta JA}$	80									$^{\circ}\text{C/W}$
Typical thermal resistance junction to case (Note 2)	$R_{\theta JC}$	40									$^{\circ}\text{C/W}$

Note1: 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 (FM120-MST-Q1 THRU FM1200-MST-Q1)

FIG.1-TYPICAL FORWARD CURRENT DERATING CURVE

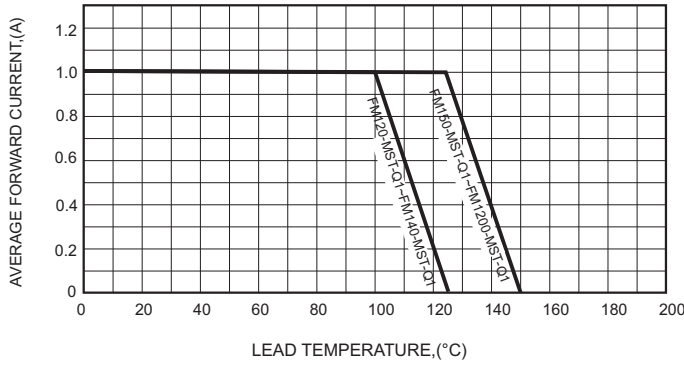


FIG.2-TYPICAL FORWARD CHARACTERISTICS

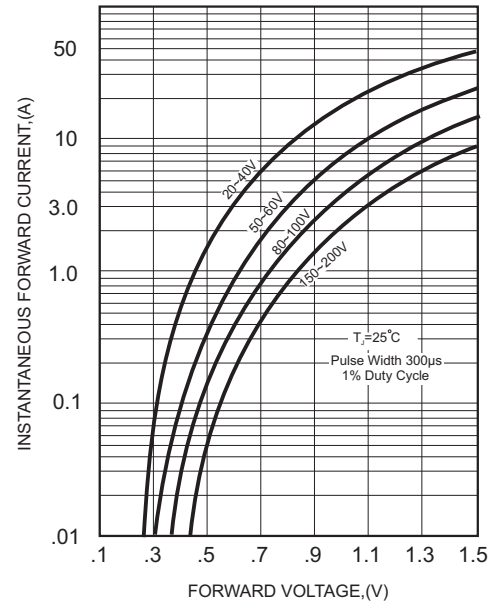


FIG.3-MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT

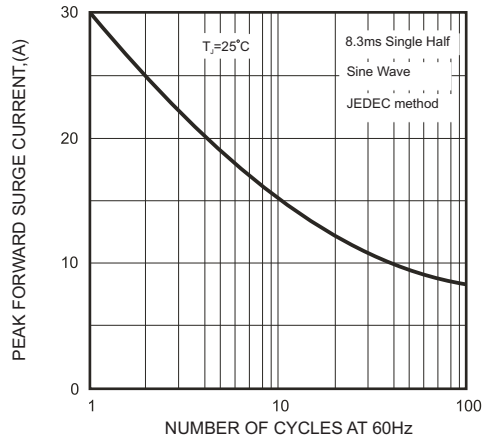


FIG.4-TYPICAL JUNCTION CAPACITANCE

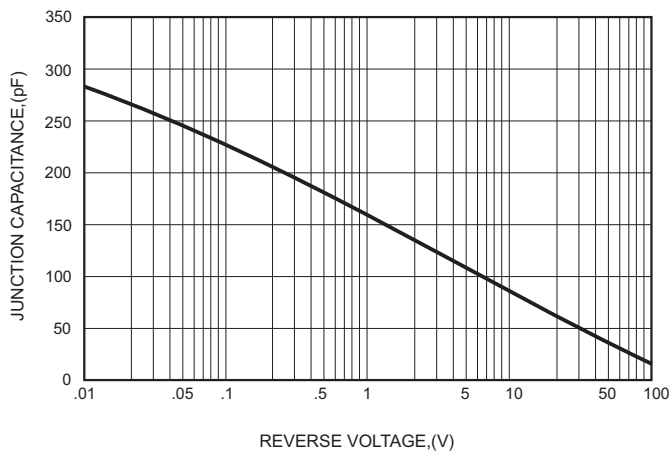
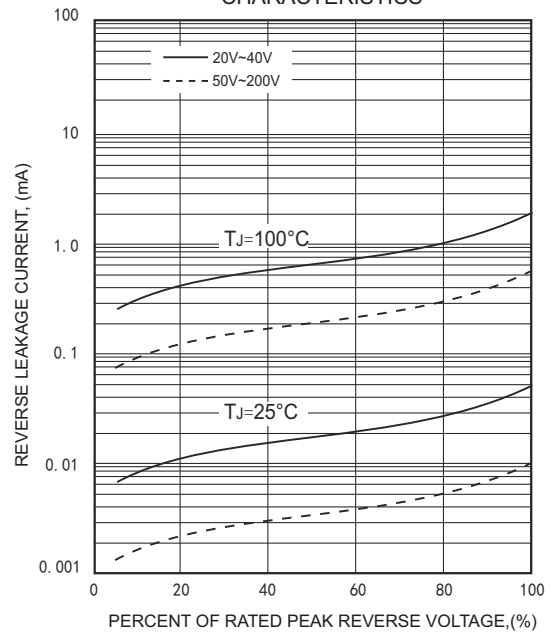


FIG.5 - TYPICAL REVERSE CHARACTERISTICS



FM120-MST-Q1 THRU FM1200-MST-Q1

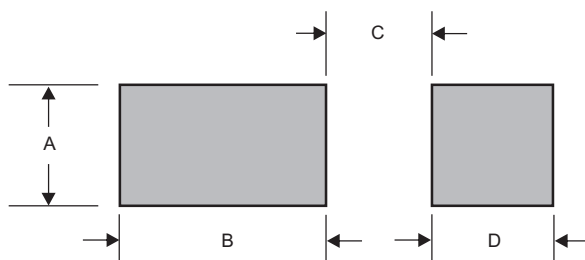
Pinning information

Pin	Simplified outline	Symbol
Pin1 cathode Pin2 anode		

Marking

Type number	Marking code
FM120-MST-Q1	12
FM130-MST-Q1	13
FM140-MST-Q1	14
FM150-MST-Q1	15
FM160-MST-Q1	16
FM180-MST-Q1	18
FM1100-MST-Q1	10
FM1150-MST-Q1	115
FM1200-MST-Q1	120

Suggested solder pad layout

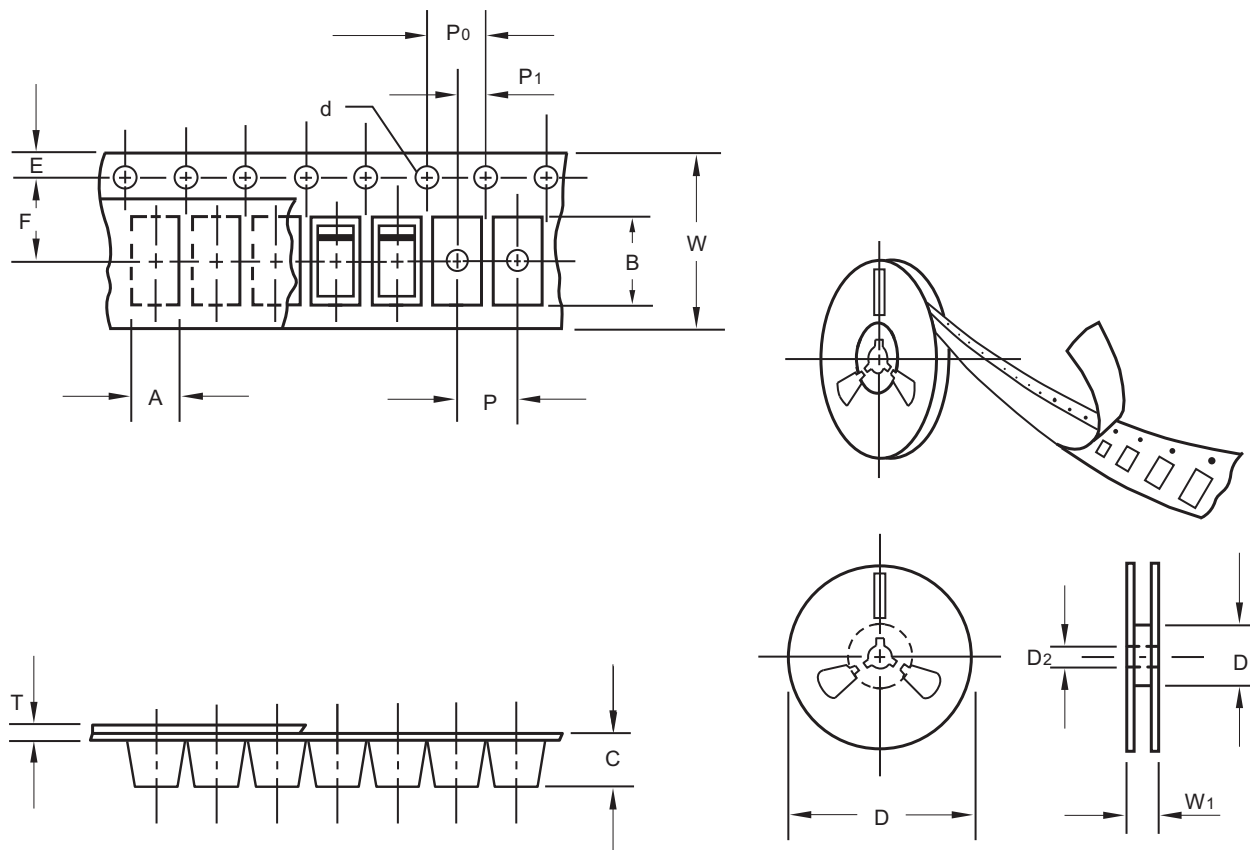


Dimensions in inches and (millimeters)

PACKAGE	A	B	C	D
SOD-123ST	0.036 (0.90)	0.084 (2.10)	0.032 (0.80)	0.032 (0.80)

FM120-MST-Q1 THRU FM1200-MST-Q1

Packing information



unit:mm

Item	Symbol	Tolerance	SOD-123ST
Carrier width	A	0.1	2.00
Carrier length	B	0.1	3.85
Carrier depth	C	0.1	1.10
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D1	min	-
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	3.50
Punch hole pitch	P	0.1	4.00
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	8.00
Reel width	W1	1.0	11.40

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

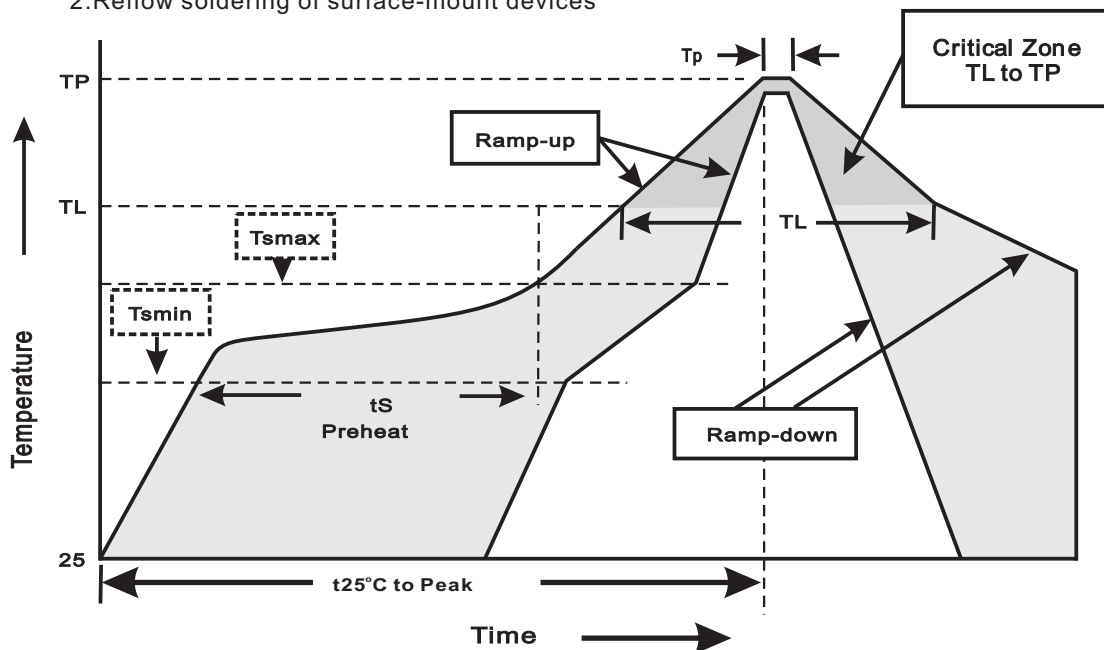
FM120-MST-Q1 THRU FM1200-MST-Q1

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)
SOD-123ST	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000	9.5

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(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	<3°C/sec
Time 25°C to Peak Temperature	<6minutes

FM120-MST-Q1 THRU FM1200-MST-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