FM1L40-NS THRU FM1L60-NS

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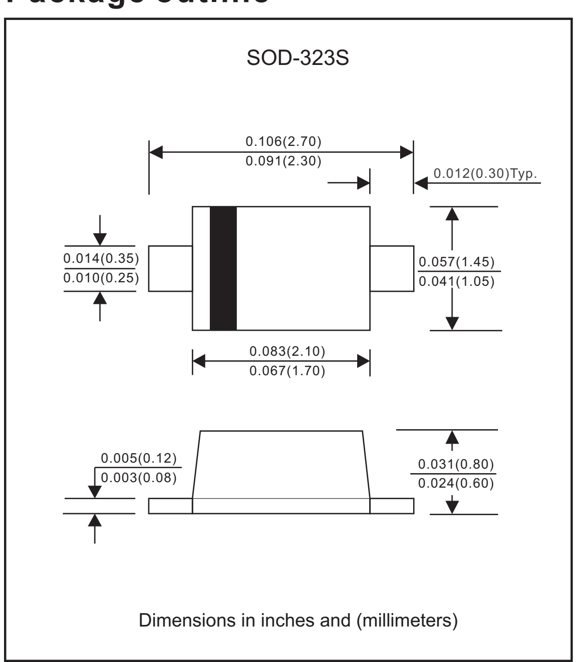
FM1L40-NS THRU FM1L60-NS

1.0A Low VF Surface Mount Schottky Barrier Rectifiers - 40V-60V

Package outline



Features

- High current density schottky.
- Low profile surface mounted application in order to optimize board space.
- Tiny plastic SMD package.
- Low power loss, high efficiency.
- High current capability, low forward voltage drop.
- High surge capability.
- Lead-free parts meet RoHS requirments.
- Suffix "-H" indicates Halogen free parts, ex. FM1L40-NS-H.

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, SOD-323S
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any
- Weight : Approximated 0.004 gram

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

PARAMETER	SYMBOLS	FM1L40-NS	FM1L45-NS	FM1L60-NS	UNITS
Maximum repetitive peak reverse voltage	V_{RRM}	40	45	60	Volts
Maximum RMS voltage	V_{RMS}	28	31.5	42	Volts
Maximum continuous reverse voltage	V_R	40	45	60	Volts
Maximum average forward rectified current	I_O	1.0			Amps
Non-repetitive peak forward surge current 1.0ms square-wave	I_{FSM}	30			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°C unless otherwise noted)

PARAMETER	SYMBOLS	FM1L40-NS	FM1L45-NS	FM1L60-NS	UNITS
Maximum instantaneous forward voltage at I_F=1.0A	V_F	0.45	0.45	0.55	Volts
Maximum reverse leakage current at rated V_R — T_J=25°C	I_R	0.5			mA
Maximum reverse leakage current at rated V_R — T_J=100°C	I_R	10			mA

Thermal characteristics

PARAMETER	SYMBOLS	FM1L40-NS	FM1L45-NS	FM1L60-NS	UNITS
Typical thermal resistance junction to ambient (note 1)	$R_{\theta JA}$	90			°C / W
Typical thermal resistance junction to case (note 1)	$R_{\theta JC}$	50			°C / W

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

Rating and characteristic curves (FM1L40-NS THRU FM1L60-NS)

FIG.1-TYPICAL FORWARD CURRENT DERATING CURVE

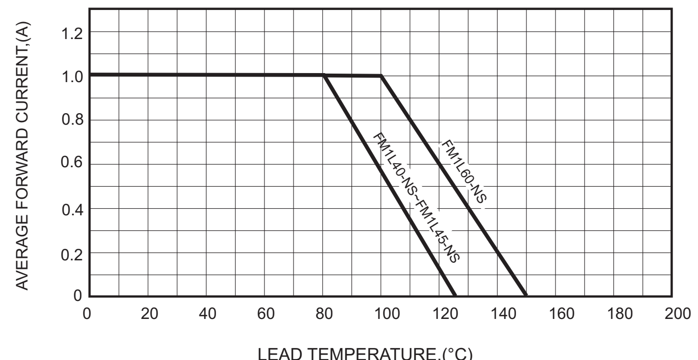


FIG.2-TYPICAL FORWARD CHARACTERISTICS

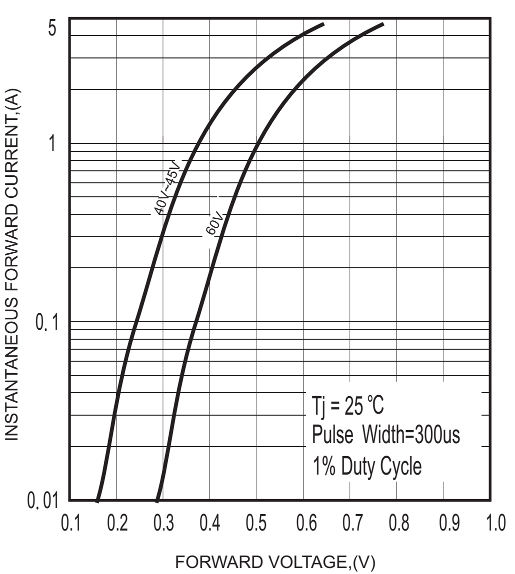


FIG.3-MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT

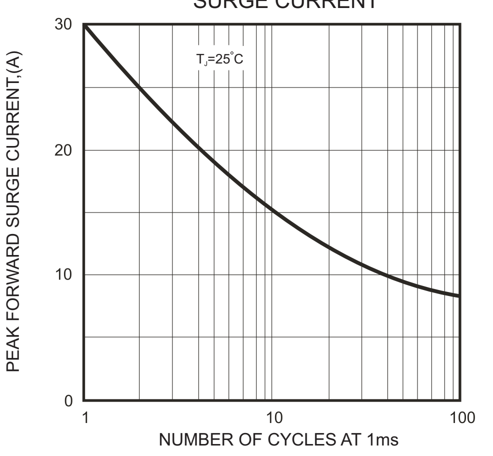
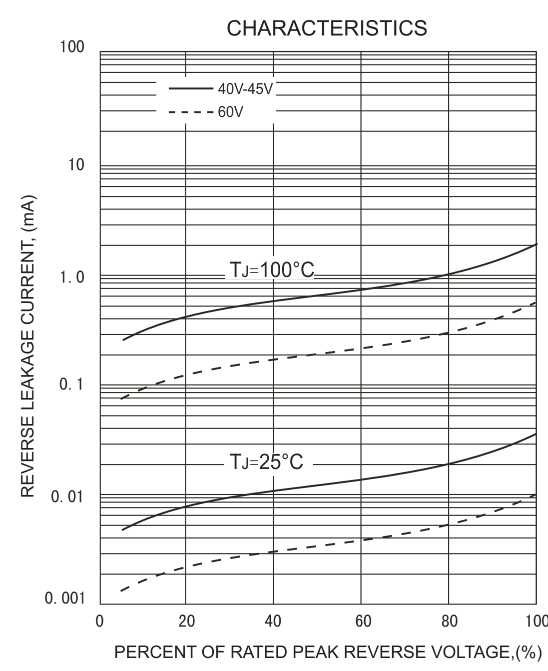


FIG.4 - TYPICAL REVERSE CHARACTERISTICS



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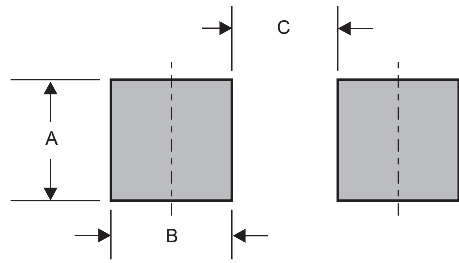
Pinning information

Pin	Simplified outline	Symbol
Pin1 cathode Pin2 anode	1 2	1 2

Marking

Type number	Marking code
FM1L40-NS	K
FM1L45-NS	L
FM1L60-NS	N

Suggested solder pad layout



Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SOD-323S	0.024 (0.60)	0.031 (0.80)	0.059 (1.50)

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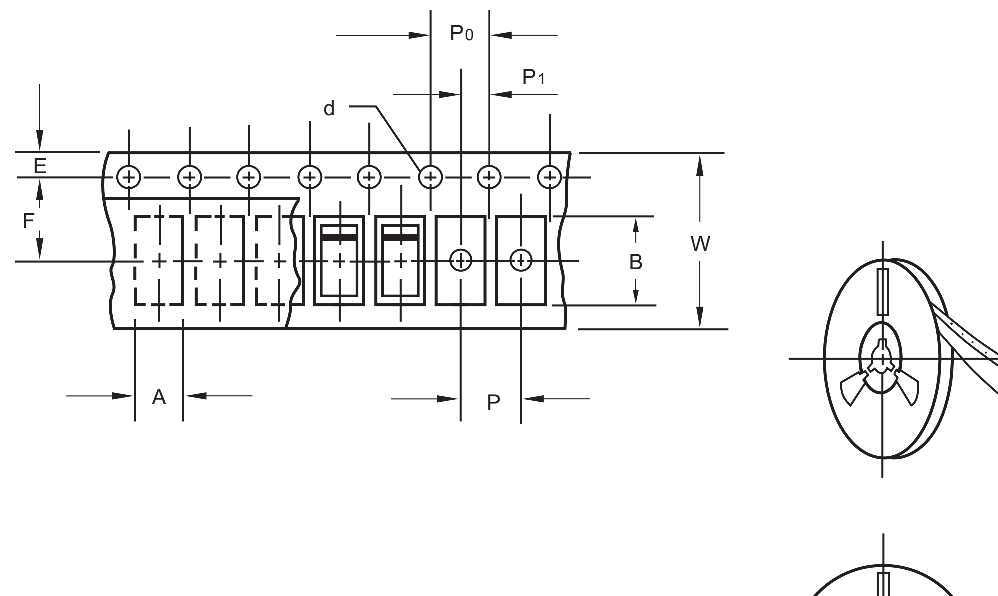
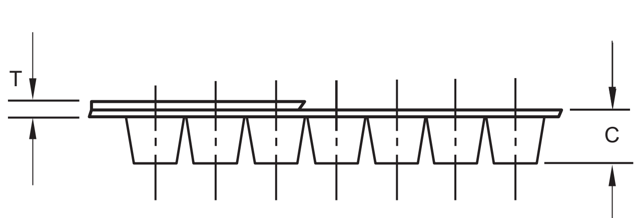
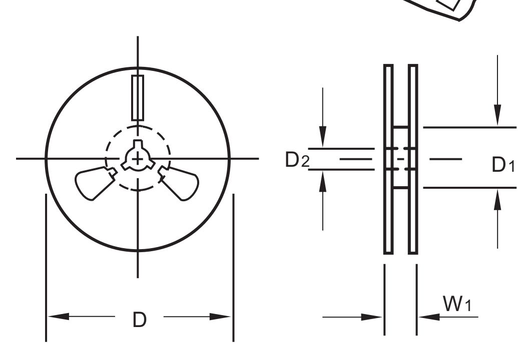
Packing information







unit:mm

Item	Symbol	Tolerance	SOD-323S
Carrier width	A	0.1	1.40
Carrier length	B	0.1	2.95
Carrier depth	C	0.1	0.95
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D_1	min	-
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	3.50
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	8.00
Reel width	W_1	1.0	11.40

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

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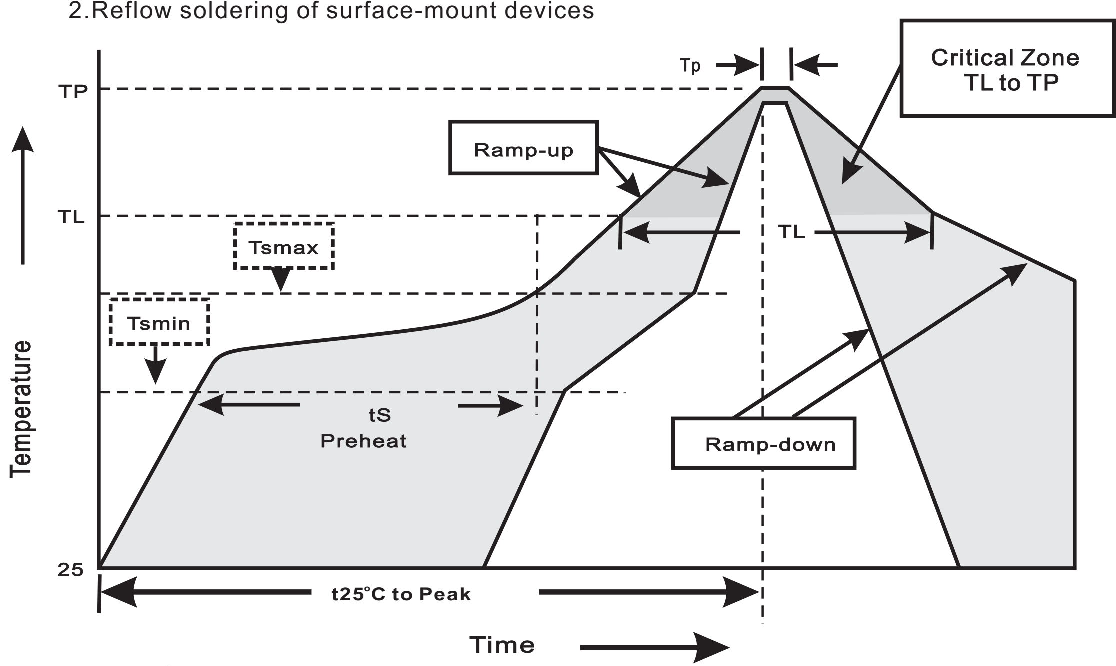
Reel packing

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)
SOD-323S	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(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

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High reliability test capabilities

Item Test	Conditions	Reference
1. Solder Resistance	at 260±5°C for 10±2sec.	MIL-STD-750D METHOD-2031
2. Solderability	at 245±5°C for 5 sec.	MIL-STD-202F METHOD-208
3. High Temperature Reverse Bias	V_R=80% rate at T_J=125°C for 168 hrs.	MIL-STD-750D METHOD-1038
4. Forward Operation Life	Rated average rectifier current at T_A=25°C for 500hrs.	MIL-STD-750D METHOD-1027
5. Intermittent Operation Life	T_A = 25°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°C for 4 hrs.	JESD22-A102
7. Temperature Cycling	-55°C to +125°C dwelled for 30 min. and transferred for 5min. total 10 cycles.	MIL-STD-750D METHOD-1051
8. Forward Surge	1.0ms square-wave , one surge.	MIL-STD-750D METHOD-4066-2
9. Humidity	at T_A=85°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