

2.0 LOW VF SURFACE MOUNT SCHOTTKY BARRIER RECTIFIER 40V-100V

DESCRIPTION:



The ALP2L40-MS thru ALP2L100-MS is 2.0A Low VF Surface Mount Schottky Barrier Rectifier – 40V - 100V are low profile package, Ideal for automated placement and guarding for overvoltage protection. Use in low voltage high frequency inverters, freewheeling, converters, and Telecommunication applications.

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 drops
- High surge capability
- Lead-free parts meet RoHS requirements
- Suffix "-H" indicates Halogen free parts, ex. ALP2L40-MS-H

APPLICATIONS:

- General purpose rectification of lighting
- Power supplies
- Inverters & Converters
- Freewheeling diodes for consumer
- Automotive
- Telecommunication

MECHANICAL CHARACTERISTICS

- Epoxy: UL94-V0 rated flame retardant.
- Case: Molded plastic, SOD-123S/MINI SMA.
- Terminals: Plated terminals, Solderable per MIL-STD-750, Method 2026
- Polarity: Color band denotes cathode except bi-directional models
- Mounting Position: Any.
- Approximate Weight: 0.0155 grams.

TYPICAL DEVICE CHARACTERISTICS

MAXIMUM RATINGS (T _A = 25 °C unless otherwise noted)						
PARAMETER	SYMBOL	ALP2L40-MS	ALP2L45-MS	ALP2L60-MS	ALP2L100-MS	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	2.0				Amps
Non-repetitive Peak forward surge current 8.3 ms single half sine-wave (JEDEC Method)	I _{FSM}	50				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 ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)							
PARAMETER	TEST CONDITIONS	SYMBOL	ALP2L40-MS	ALP2L45-MS	ALP2L60-MS	ALP2L100-MS	UNIT
Maximum instantaneous forward voltage	$I_F = 2.0\text{A}$	V_F	0.45	0.45	0.55	0.75	Volts
Maximum reverse leakage current at rated V_R	$T_J = 25\text{ }^{\circ}\text{C}$	I_R	0.5				mA
	$T_J = 100\text{ }^{\circ}\text{C}$		10				mA

THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)						
PARAMETER	SYMBOL	ALP2L40-MS	ALP2L45-MS	ALP2L60-MS	ALP2L100-MS	UNIT
Typical thermal resistance ⁽¹⁾ junction to ambient	R _{θJA}	75				°C/W
Typical thermal resistance ⁽¹⁾ junction to case	R _{θJC}	35				°C/W
Note: ⁽¹⁾ Mounted on FR-4 PCB Copper, minimum recommended pad layout.						

TYPICAL DEVICE CHARACTERISTICS CURVES

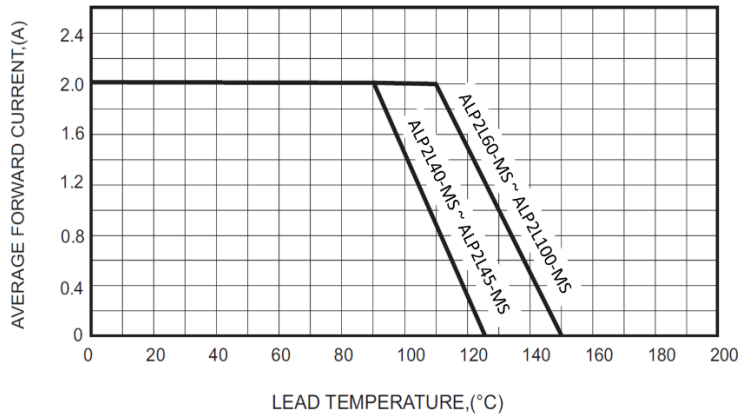


Fig1. TYPICAL FORWARD CURRENT DERATING CURVE

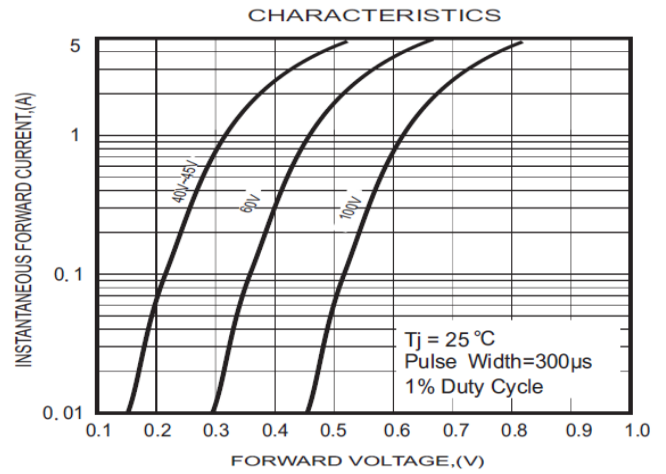


Fig2. TYPICAL FORWARD CHARACTERISTICS

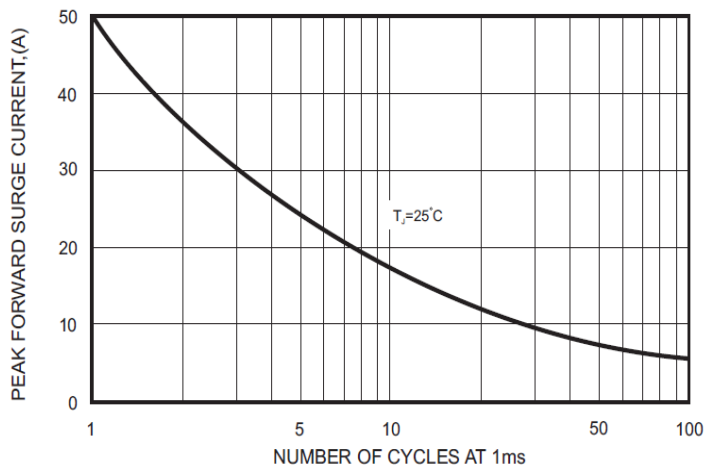


Fig3. MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT

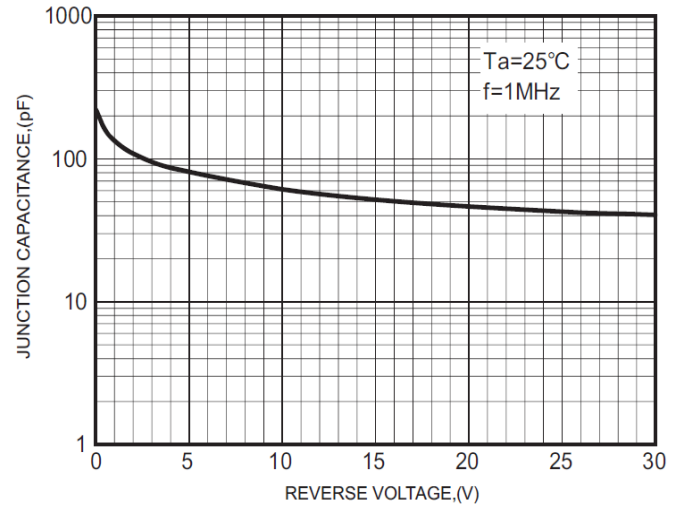


Fig4. TYPICAL JUNCTION CAPACITANCE

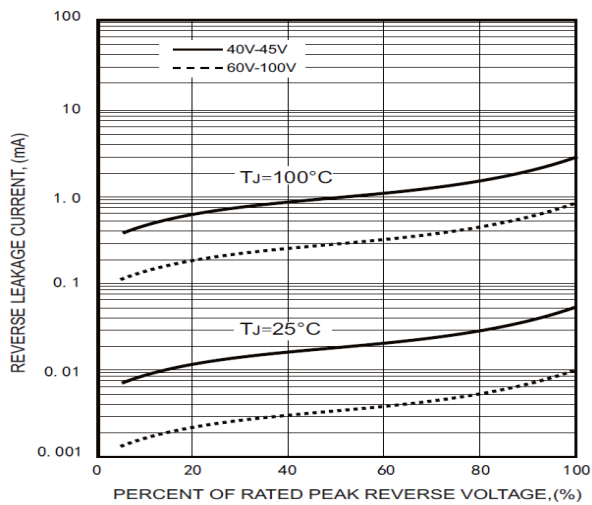
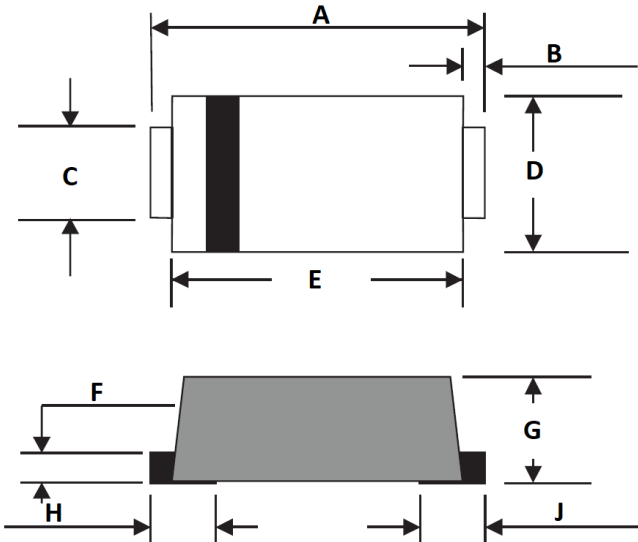


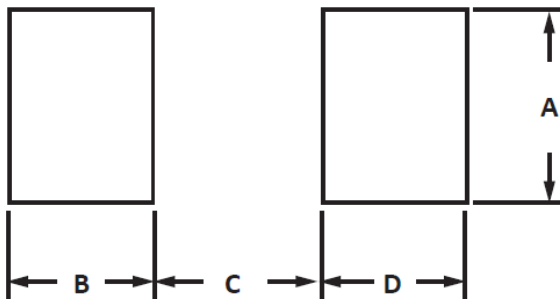
Fig5. TYPICAL REVERSE CHARACTERISTICS

PACKAGE INFORMATION

SOD-123S (MINI SMA)



OUTLINE DIMENSIONS				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	3.50	3.90	0.138	0.154
B	0.45		0.018	
C	0.70	1.10	0.028	0.044
D	1.60	2.00	0.063	0.079
E	2.60	3.00	0.103	0.119
F	0.18	0.22	0.007	0.009
G	0.90	1.00	0.036	0.040
H	0.80		0.032	
J	0.80		0.032	
NOTES 1. Dimensions are exclusive of mold flash and metal burrs.				



PAD LAYOUT DIMENSIONS		
DIM	MILLIMETERS	INCHES
	Typ.	Typ.
A	1.10	0.044
B	1.00	0.040
C	2.00	0.079
D	1.00	0.040

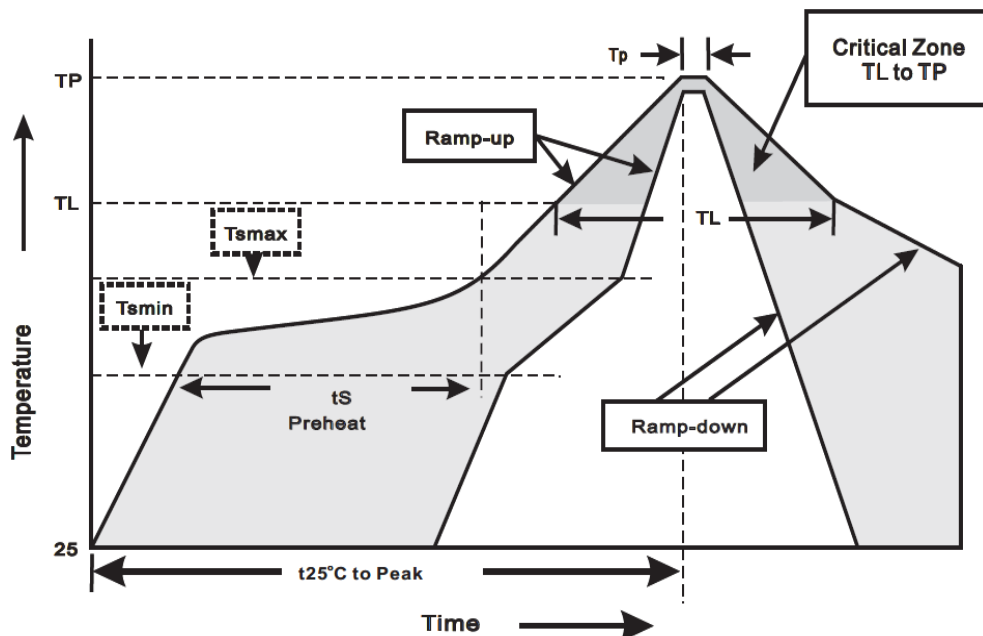
PINNING INFORMATION

PIN	SIMPLIFIED OUTLINE	SYMBOL
Pin1 Cathode Pin2 Anode		

SOLDERING PARAMETERS

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 ~ 120 sec
T_{smax} to T_L - Ramp-upRate	<3 °C/sec
Time maintained above: - Temperature (T_L) - Time(t_L)	217 °C 60 ~ 260 sec
Peak Temperature (T_P)	255 °C-0/+5 °C
Time within 5 °C of actual Peak Temperature(t_P)	10 ~ 30 sec
Ramp-down Rate	<6 °C/sec
Time 25 °C to Peak Temperature	<6 minutes



beyond boundaries...

ALP2L40-MS thru ALP2L100-MS SOD-123S (MINI SMA)

PRODUCT HIGH RELIABILITY TEST CAPABILITIES

ITEM	TEST CONDITIONS	STANDARD
Solder Resistance	At 260±5°C for 10±2Sec.	MIL-STD-750D METHOD-2031
Solderability	At 245±5°C for 5 sec.	MIL-STD-202F METHOD-208
High Temperature Reverse Bias	$V_R = 80\%$ rate at $T_J = 150^\circ$ for 168 hrs.	MIL-STD-750D METHOD-1038
Forward Operation Life	Rated average rectifier current at $T_A = 25^\circ\text{C}$ for 500hrs	MIL-STD-750D METHOD-1027
Intermittent Operation Life	$T_A = 25^\circ\text{C}$, $I_F = I_O$ 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
Pressure Cooker	15P _{SIG} at $T_A = 121^\circ\text{C}$ for 4Hrs	JESD22-A102
Temperature Cycling	-55°C to +125°C dwelled for 30min and transferred for 5min. total 10 cycles.	MIL-STD-750D METHOD-1051
Forward Surge	1.0ms square-wave, one surge.	MIL-STD-750D METHOD-4066-2
Humidity	At $T_A = 85^\circ\text{C}$, RH=85% for 1000hrs.	MIL-STD-750D METHOD-1021
High Temperature Storage Life	At 175°C for 1000hrs.	MIL-STD-750D METHOD-1031

CUSTOMER NOTE:

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2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).



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