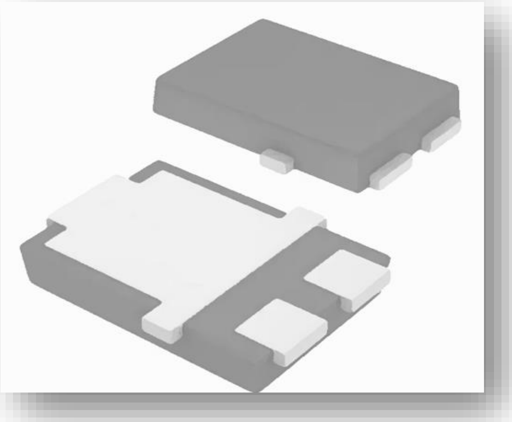
20.0A SURFACE MOUNT TRENCH MOS SCHOTTKY BARRIER RECTIFIERS 40V-100V

DESCRIPTION:



The ALP20L40-T7B thru ALP20L100-T7B is 20.0A Surface Mount Trench MOS Schottky Barrier Rectifiers 40V-100V are low profile package, Ideal for use in low voltage high frequency inverters, freewheeling, DC/DC converters, and polarity protection applications.

FEATURES:

- High current density Schottky
- Low forward voltage drop
- Excellent high temperature stability
- High forward surge current capability
- Lead Free finish, RoHS compliant
- Suffix "-H" indicates Halogen free parts, ex. ALP20L40-T7B-H

APPLICATIONS:

- Low voltage high frequency inverters
- Freewheeling
- DC/DC converters
- Polarity protection

MECHANICAL CHARACTERISTICS

- Epoxy: UL94-V0 rated flame retardant.
- Case: Molded plastic, TO-277B
- Terminals: Plated terminals, Solderable per MIL-STD-750, Method 2026
- Polarity: Color band denotes cathode except bi-directional models
- Mounting Position: Any.
- Approximate Weight: 0.092 grams.

TYPICAL DEVICE CHARACTERISTICS

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	**SYMBOL**	**ALP20L40-T7B**	**ALP20L45-T7B**	**ALP20L50-T7B**	**ALP20L60-T7B**	**ALP20L80-T7B**	**ALP20L100-T7B**	**UNITS**
Maximum repetitive peak reverse voltage	V_{RRM}	40	45	50	60	80	100	Volts
Maximum RMS voltage	V_{RMS}	28	31.5	35	42	56	70	Volts
Maximum continuous reverse voltage	V_R	40	45	50	60	80	100	Volts
Maximum average forward rectified current	Io	20						Amps
Non-repetitive Peak forward surge current 8.3 ms single half sine-wave (JEDEC Method)	I_{FSM}	250						Amps
Operating junction temperature range	T_J	-55 to +150						°C
Storage temperature range	T_{STG}	-55 to +150						°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

PARAMETER	**TEST CONDITIONS**	**SYMBOL**	**ALP20L40-T7B**	**ALP20L45-T7B**	**ALP20L50-T7B**	**ALP20L60-T7B**	**ALP20L80-T7B**	**ALP20L100-T7B**	**UNIT**
Maximum instantaneous forward voltage	I_F = 2.0A	V_F	0.35	0.35	0.35	0.40	0.45	0.45	Volts
	I_F = 20.0A	V_F	0.48	0.48	0.48	0.55	0.70	0.70	Volts
Maximum reverse leakage current at rated V_R	T_J = 25 °C	I_R	0.5	0.5	0.5	0.5	0.2	0.2	mA
	T_J = 125 °C		50	50	50	50	20	20	mA

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)								
PARAMETER	**SYMBOL**	**ALP20L40-T7B**	**ALP20L45-T7B**	**ALP20L50-T7B**	**ALP20L60-T7B**	**ALP20L80-T7B**	**ALP20L100-T7B**	**UNIT**
Typical thermal resistance junction to ambient (Note 1)	$R_{\theta JA}$	60.0						°C/W

Note:

1. Mounted on FR-4 PCB Copper pad area. Cathode pad dimensions 4.95mm x 3.4mm.
   Anode pad dimensions 1.55mm x 5.0mm.

TYPICAL DEVICE CHARACTERISTICS CURVES

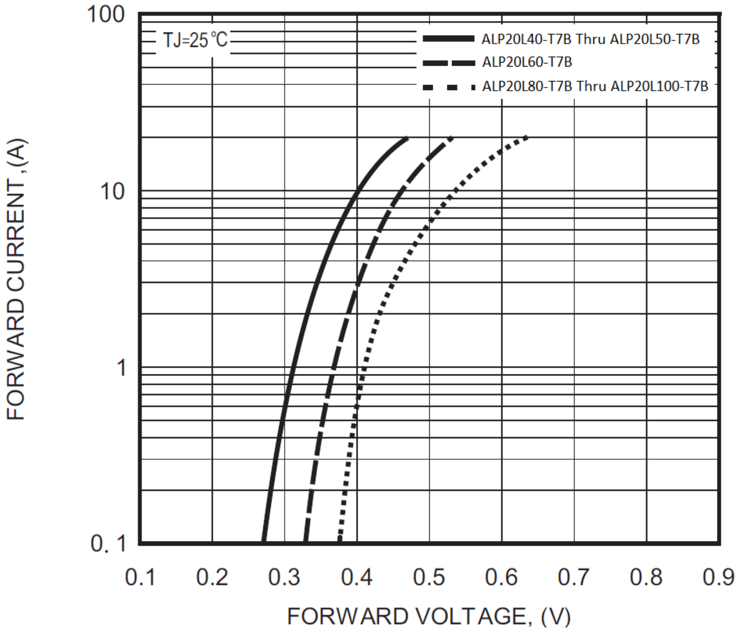


Fig1. TYPICAL FORWARD CHARACTERISTICS

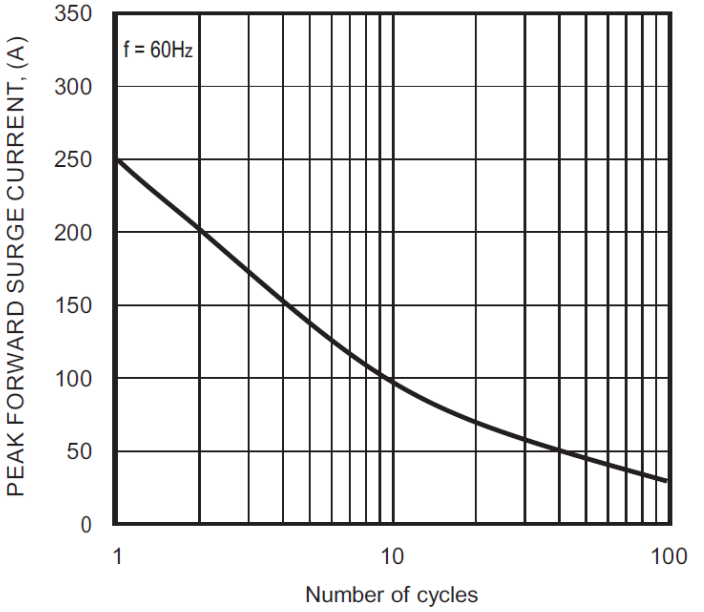


Fig2. MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT

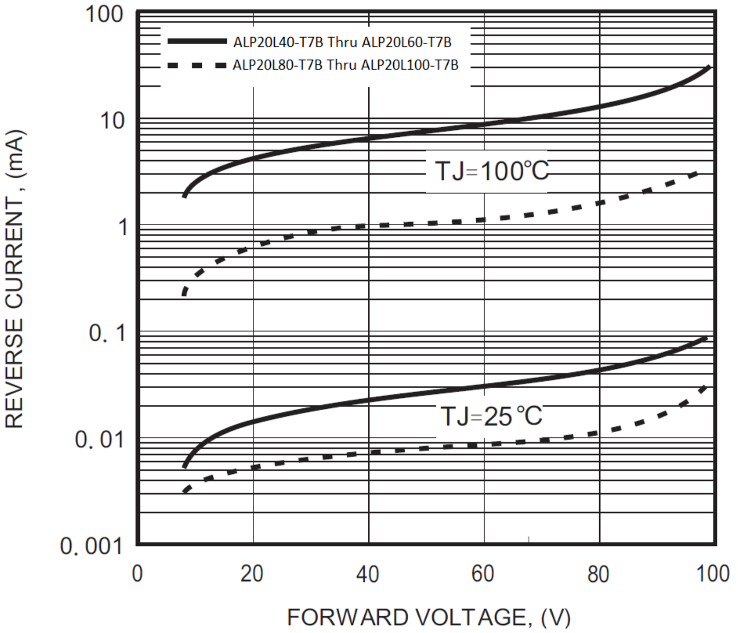


Fig3. TYPICAL REVERSE LEAKAGE CHARACTERISTICS

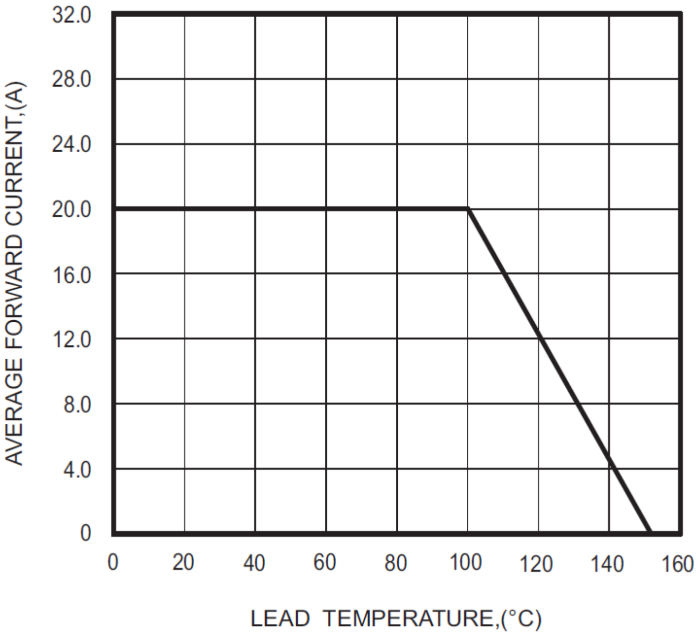
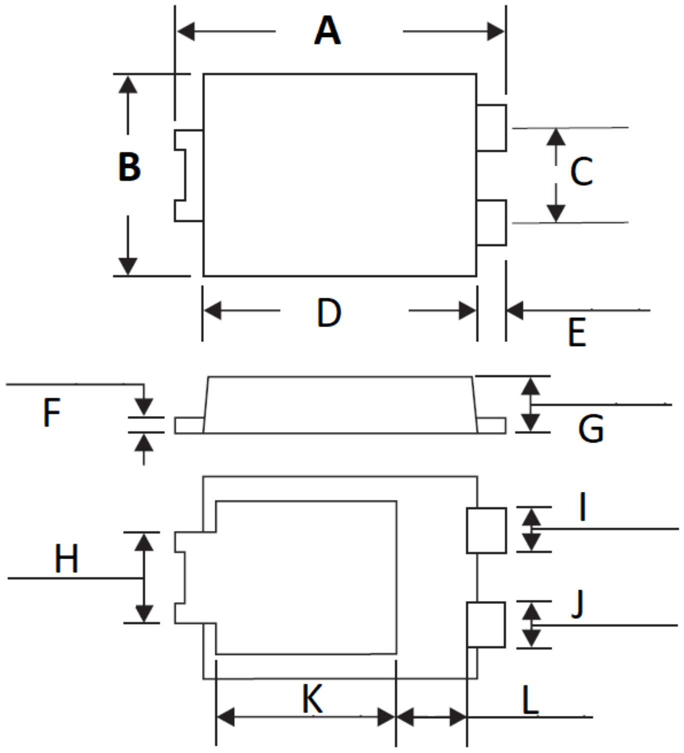


Fig4. TYPICAL FORWARD CURRENT DERATING CURVE

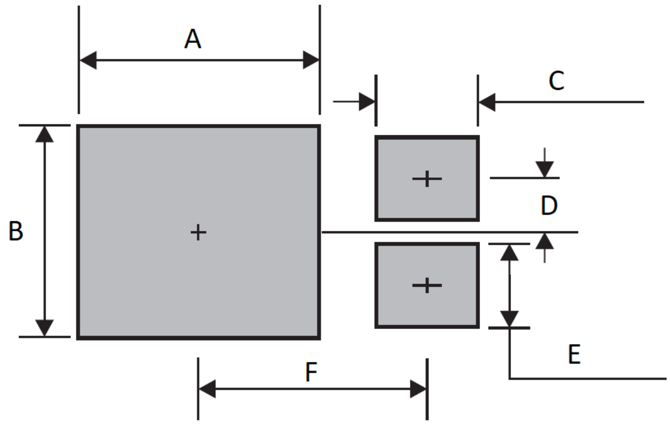
PACKAGE INFORMATION

TO-277B



OUTLINE DIMENSIONS				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	6.35	6.70	0.250	0.264
B	3.75	4.30	0.148	0.170
C	1.65	1.95	0.065	0.077
D	5.25	5.50	0.207	0.217
E	0.45	0.75	0.018	0.029
F	0.15	0.43	0.006	0.017
G	1.00	1.30	0.040	0.052
H	1.65	1.95	0.065	0.077
I	0.75	1.05	0.029	0.041
J	0.75	1.05	0.029	0.041
K	3.05	3.55	0.120	0.140
L	0.85	1.30	0.033	0.052

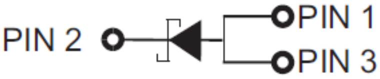
NOTES
1. Dimensions are exclusive of mold flash and metal burrs.



PAD LAYOUT DIMENSIONS		
DIM	MILLIMETERS	INCHES
	Typ.	Typ.
A	5.35	0.211
B	3.60	0.142
C	1.85	0.073
D	0.90	0.035
E	1.50	0.059
F	4.30	0.169

All ALPINESEMI™ parts are manufacturered at the facility approved ISO/TS 16949, ISO 9001 and ISO 14001

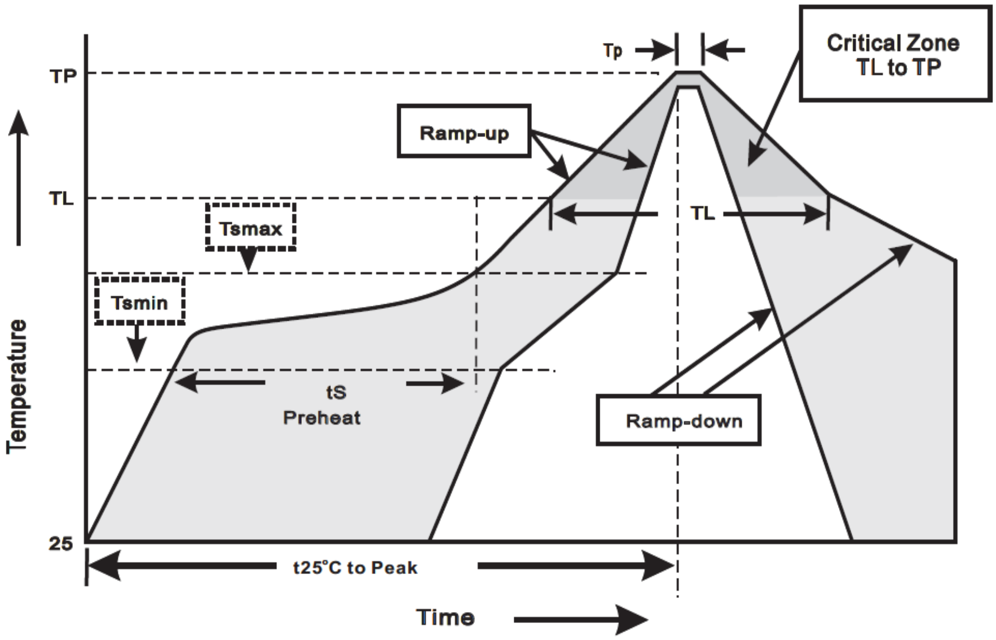
PINNING INFORMATION

PIN	SIMPLIFIED OUTLINE	SYMBOL
PIN 1 Anode PIN 3 Anode PIN 2 Cathode		

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(tL)	 217 °C 60 ~ 260 sec
Peak Temperature (T_P)	255 °C-0/+5 °C
Time within 5 °C of actual Peak Temperature(tP)	10 ~ 30 sec
Ramp-down Rate	<6 °C/sec
Time 25 °C to Peak Temperature	<6 minutes

PRODUCT HIGH RELIABLITY 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°C for 168 hrs.	MIL-STD-750D METHOD-1038
Forward Operation Life	Rated average rectifier current at T_A =25 °C for 500hrs	MIL-STD-750D METHOD-1027
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
Pressure Cooker	15P_{SIG} at T_A=121°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	8.3ms square-wave, one surge.	MIL-STD-750D METHOD-4066-2
Humidity	At T_A=85°C, RH=85% for 1000hrs.	MIL-STD-750D METHOD-1021
High Temperature Storage Life	At 150°C for 1000hrs.	MIL-STD-750D METHOD-1031

CUSTOMER NOTE:

DISCLAIMER

The product information and the selection guide facilitates the selection of the ALPINESEMI™'s Semiconductor Device(s) best suited for application in your product(s) as per your requirement. It is recommended that you completely review the Data sheet(s) so as to confirm that the Device(s) meets functionality parameters for your application. The information furnished on the Data Sheet and the ALPINESEMI™'s Web Site is believed to be accurate and reliable at the time of preparation of this document. ALPINESEMI™ however, does not assume any inaccuracies that may arise when the components are mounted and removed. Furthermore, ALPINESEMI™ does not assume liability whatsoever, arising out of the application or the use of any of ALPINESEMI™'s product(s). Neither, does it convey any license under its patent rights nor the rights of others. These products are not guaranteed for use in life saving/support appliances or systems. ALPINESEMI™'s customers using these products (either as individual Semiconductor Devices or incorporated in their end products), in any life saving/support appliances or systems or applications do so at their own risk and ALPINESEMI™ will not be responsible in any way(s) for any damage(s) resulting from such use.

Please check the website **www.alpinesemi.com** for continues updates and revision of datasheets.

DESIGN CHANGES: ALPINESEMI™ strives for continuous improvement and reserves the right to change the specifications of its products without prior notice. ALPINESEMI™ reserves the right to discontinue product lines without prior notice. Any product selection is a recommendation based on best understanding of such product(s) by our engineers. However, buyers are advised to rely on their own judgment for such selection of the products.

ALPINESEMI™ makes no warranty, representation or guarantee regarding the suitability of its products for any particular applications. Neither does ALPINESEMI™ assume any liability arising out of the applications nor the use of such products. ALPINESEMI™ specifically disclaims all liabilities either consequential or incidental.

All rights of the product and datasheet are reserved to ALPINESEMI™.

All logos and information provided in the datasheets are for reference only. Any registered and/or trademark/logos belonging to respective companies be the property of those companies. ALPINESEMI™ extends the courtesy to them, if any of the information found in its datasheet.

Component Disposal Instructions

1. ALPINESEMI™ Semiconductor Devices are RoHS compliant and hence customers are requested to dispose as per the prevailing Environmental Legislation put forth in their specific country.

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

ALPINESEMI

sales@alpinesemi.com
www.alpinesemi.com