200mW SURFACE MOUNT – ZENER DIODES - 2.4V- 75V

DESCRIPTION:

The ALPBZT52-S-FL-Q1 Series is 200mW Surface Mount Zener Diodes - 2.4V- 75V, which designed to protect voltage sensitive components from high voltage, high energy transients. It is supplied in cost-effective, highly reliable package and is ideally suited for many industrial/consumer applications.

FEATURES:

- Wide Zener Voltage Range Selection, 2.4V to 75V.
- 5% tolerance of Zener voltage for suffix "C"
  ex: ALPBZT52C2V4S-FL-Q1
- 2% tolerance of Zener voltage for suffix "B"
  ex: ALPBZT52B2V4S-FL-Q1
- Flat Lead SOD-323FL Plastic Package.
- Surface Device Type Mounting.
- RoHS Compliant.
- Green EMC.
- Matte Tin (Sn) Lead Finish.
- Qualified to AEC-Q101 standards for high reliability.
- Suffix "-H" indicates Halogen free parts,
  ex. ALPBZT52C2V4S-FL-Q1-H.

APPLICATIONS:

- Communication Systems
- Numerical and Process controls
- Medical equipment
- Business machines
- Power supplies
- Industrial/consumer applications.

MECHANICAL CHARACTERISTICS

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

ORDERING PART NUMBER

PART NUMBER	ORDERING PART NUMBER
ALPBZT52-S-FL-Q1 Series	**ALPBZT52-S-FL-Q1 – FM Series**

TYPICAL DEVICE CHARACTERISTICS

MAXIMUM RATINGS @ T_A = 25°C Unless Otherwise Specified			
PARAMETER	**SYMBOL**	**VALUE**	**UNIT**
Maximum Forward Voltage @ I_F = 10 mA	V_F	1.0	V
Maximum Power Dissipation @T_A =25 °C	P_D	200	mW
Operating junction temperature range	T_J	−65 ~ +150	°C
Storage Temperature Range	T_{STG}	−65 ~ +150	°C

These ratings are limiting values above which the serviceability of the diode may be impaired.

TYPICAL DEVICE CHARACTERISTICS

ELECTRICAL CHARACTERISTICS @ T_A = 25°C Unless Otherwise Specified									
PART NUMBER	Zener Voltage			Test current	Maximum Zener Impedance			Leakage current	
	V_Z @ I_{ZT}			I_{ZT}	Z_{ZT} @ I_{ZT}	Z_{ZK} @ I_{ZK}	I_{ZK}	I_R	V_R
	Min. (V)	Nom. (V)	Max. (V)	mA	Max. (Ω)	Max. (Ω)	mA	Max. (µA)	Volts
The device numbers listed have a standard tolerance on the nominal zener voltage of ±5% tolerance									
ALPBZT52C2V4S-FL-Q1	2.28	2.4	2.52	5	100	564	1.0	45	1.0
ALPBZT52C2V7S-FL-Q1	2.57	2.7	2.84	5	100	564	1.0	18	1.0
ALPBZT52C3V0S-FL-Q1	2.85	3.0	3.15	5	100	564	1.0	9	1.0
ALPBZT52C3V3S-FL-Q1	3.14	3.3	3.47	5	95	564	1.0	4.5	1.0
ALPBZT52C3V6S-FL-Q1	3.42	3.6	3.78	5	90	564	1.0	4.5	1.0
ALPBZT52C3V9S-FL-Q1	3.71	3.9	4.10	5	90	564	1.0	2.7	1.0
ALPBZT52C4V3S-FL-Q1	4.09	4.3	4.52	5	90	564	1.0	2.7	1.0
ALPBZT52C4V7S-FL-Q1	4.47	4.7	4.94	5	80	470	1.0	2.7	2.0
ALPBZT52C5V1S-FL-Q1	4.85	5.1	5.36	5	60	451	1.0	1.8	2.0
ALPBZT52C5V6S-FL-Q1	5.32	5.6	5.88	5	40	376	1.0	0.9	2.0
ALPBZT52C6V2S-FL-Q1	5.89	6.2	6.51	5	10	141	1.0	2.7	4.0
ALPBZT52C6V8S-FL-Q1	6.46	6.8	7.14	5	15	75	1.0	1.8	4.0
ALPBZT52C7V5S-FL-Q1	7.11	7.5	7.86	5	15	75	1.0	0.9	5.0
ALPBZT52C8V2S-FL-Q1	7.79	8.2	8.61	5	15	75	1.0	0.63	5.0
ALPBZT52C9V1S-FL-Q1	8.65	9.1	9.56	5	15	94	1.0	0.45	6.0
ALPBZT52C10S-FL-Q1	9.50	10	10.50	5	20	141	1.0	0.18	7.0
ALPBZT52C11S-FL-Q1	10.45	11	11.55	5	20	141	1.0	0.09	8.0
ALPBZT52C12S-FL-Q1	11.40	12	12.60	5	25	141	1.0	0.09	8.0
ALPBZT52C13S-FL-Q1	12.35	13	13.65	5	30	160	1.0	0.09	8.0
ALPBZT52C15S-FL-Q1	14.25	15	15.57	5	30	188	1.0	0.045	10.5
ALPBZT52C16S-FL-Q1	15.20	16	16.80	5	40	188	1.0	0.045	11.2
ALPBZT52C18S-FL-Q1	17.10	18	18.90	5	45	212	1.0	0.045	12.6
ALPBZT52C20S-FL-Q1	19.00	20	21.00	5	55	212	1.0	0.045	14.0
ALPBZT52C22S-FL-Q1	20.90	22	23.10	5	55	235	1.0	0.045	15.4
ALPBZT52C24S-FL-Q1	22.80	24	25.20	5	70	235	1.0	0.045	16.8
ALPBZT52C27S-FL-Q1	25.65	27	28.35	2	80	282	0.5	0.045	18.9
ALPBZT52C30S-FL-Q1	28.50	30	31.50	2	80	282	0.5	0.045	21.0
ALPBZT52C33S-FL-Q1	31.35	33	34.65	2	80	306	0.5	0.045	23.0
ALPBZT52C36S-FL-Q1	34.20	36	37.80	2	90	329	0.5	0.045	25.2
ALPBZT52C39S-FL-Q1	37.05	39	40.95	2	130	329	0.5	0.045	27.3
ALPBZT52C43S-FL-Q1	40.85	43	45.15	2	150	353	0.5	0.045	30.1
ALPBZT52C47S-FL-Q1	44.65	47	49.35	2	170	353	0.5	0.045	33.0

ELECTRICAL CHARACTERISTICS @ T_A = 25°C Unless Otherwise Specified									
PART NUMBER	Zener Voltage			Test current	Maximum Zener Impedance			Leakage current	
	V_Z @ I_{ZT}			I_{ZT}	Z_{ZT} @ I_{ZT}	Z_{ZK} @ I_{ZK}	I_{ZK}	I_R	V_R
	Min. (V)	Nom. (V)	Max. (V)	mA	Max. (Ω)	Max. (Ω)	mA	Max. (µA)	Volts
ALPBZT52C51S-FL-Q1	48.45	51	53.55	2	180	376	0.5	0.045	35.7
ALPBZT52C56S-FL-Q1	53.20	56	58.80	2	200	400	0.5	0.045	39.2
ALPBZT52C62S-FL-Q1	58.90	62	65.10	2	215	423	0.5	0.045	43.4
ALPBZT52C68S-FL-Q1	64.60	68	71.40	2	240	447	0.5	0.045	47.6
ALPBZT52C75S-FL-Q1	71.25	75	78.75	2	255	470	0.5	0.045	52.5
The device numbers listed have a standard tolerance on the nominal zener voltage of ±2% tolerance									
ALPBZT52B2V4S-FL-Q1	2.35	2.4	2.45	5	100	564	1.0	45	1.0
ALPBZT52B2V7S-FL-Q1	2.65	2.7	2.75	5	100	564	1.0	18	1.0
ALPBZT52B3V0S-FL-Q1	2.94	3.0	3.06	5	100	564	1.0	9	1.0
ALPBZT52B3V3S-FL-Q1	3.23	3.3	3.37	5	95	564	1.0	4.5	1.0
ALPBZT52B3V6S-FL-Q1	3.53	3.6	3.67	5	90	564	1.0	4.5	1.0
ALPBZT52B3V9S-FL-Q1	3.82	3.9	3.98	5	90	564	1.0	2.7	1.0
ALPBZT52B4V3S-FL-Q1	4.21	4.3	4.39	5	90	564	1.0	2.7	1.0
ALPBZT52B4V7S-FL-Q1	4.61	4.7	4.79	5	80	470	1.0	2.7	2.0
ALPBZT52B5V1S-FL-Q1	5.00	5.1	5.20	5	60	451	1.0	1.8	2.0
ALPBZT52B5V6S-FL-Q1	5.49	5.6	5.71	5	40	376	1.0	0.9	2.0
ALPBZT52B6V2S-FL-Q1	6.08	6.2	6.32	5	10	141	1.0	2.7	4.0
ALPBZT52B6V8S-FL-Q1	6.66	6.8	6.94	5	15	75	1.0	1.8	4.0
ALPBZT52B7V5S-FL-Q1	7.35	7.5	7.65	5	15	75	1.0	0.9	5.0
ALPBZT52B8V2S-FL-Q1	8.04	8.2	8.36	5	15	75	1.0	0.63	5.0
ALPBZT52B9V1S-FL-Q1	8.92	9.1	9.28	5	15	94	1.0	0.45	6.0
ALPBZT52B10S-FL-Q1	9.80	10	10.20	5	20	141	1.0	0.18	7.0
ALPBZT52B11S-FL-Q1	10.78	11	11.22	5	20	141	1.0	0.09	8.0
ALPBZT52B12S-FL-Q1	11.76	12	12.24	5	25	141	1.0	0.09	8.0
ALPBZT52B13S-FL-Q1	12.74	13	13.26	5	30	160	1.0	0.09	8.0
ALPBZT52B15S-FL-Q1	14.70	15	15.30	5	30	188	1.0	0.045	10.5
ALPBZT52B16S-FL-Q1	15.68	16	16.32	5	40	188	1.0	0.045	11.2
ALPBZT52B18S-FL-Q1	17.64	18	18.36	5	45	212	1.0	0.045	12.6
ALPBZT52B20S-FL-Q1	19.60	20	20.40	5	55	212	1.0	0.045	14.0
ALPBZT52B22S-FL-Q1	21.56	22	22.44	5	55	235	1.0	0.045	15.4
ALPBZT52B24S-FL-Q1	23.52	24	24.48	5	70	235	1.0	0.045	16.8
ALPBZT52B27S-FL-Q1	26.46	27	27.54	2	80	282	0.5	0.045	18.9
ALPBZT52B30S-FL-Q1	29.40	30	30.60	2	80	282	0.5	0.045	21.0

ELECTRICAL CHARACTERISTICS @ T_A = 25°C Unless Otherwise Specified									
PART NUMBER	Zener Voltage			Test current	Maximum Zener Impedance			Leakage current	
	V_Z @ I_{ZT}			I_{ZT}	Z_{ZT} @ I_{ZT}	Z_{ZK} @ I_{ZK}	I_{ZK}	I_R	V_R
	Min. (V)	Nom. (V)	Max. (V)	mA	Max. (Ω)	Max. (Ω)	mA	Max. (µA)	Volts
ALPBZT52B33S-FL-Q1	32.34	33	33.66	2	80	306	0.5	0.045	23.0
ALPBZT52B36S-FL-Q1	35.28	36	36.72	2	90	329	0.5	0.045	25.2
ALPBZT52B39S-FL-Q1	38.22	39	39.78	2	130	329	0.5	0.045	27.3
ALPBZT52B43S-FL-Q1	42.14	43	43.86	2	150	353	0.5	0.045	30.1
ALPBZT52B47S-FL-Q1	46.06	47	47.94	2	170	353	0.5	0.045	33.0
ALPBZT52B51S-FL-Q1	49.98	51	52.02	2	180	376	0.5	0.045	35.7
ALPBZT52B56S-FL-Q1	54.88	56	57.12	2	200	400	0.5	0.045	39.2
ALPBZT52B62S-FL-Q1	60.76	62	63.24	2	215	423	0.5	0.045	43.4
ALPBZT52B68S-FL-Q1	66.64	68	69.36	2	240	447	0.5	0.045	47.6
ALPBZT52B75S-FL-Q1	73.50	75	76.50	2	255	470	0.5	0.045	52.5

Notes:

1. The Zener Voltage (V_Z) is tested under pulse condition of 10ms.
2. The zener impedance is derived from the 60-cycle ac voltage, which results when an ac current having an rms value equal to 10% of the dc zener current (I_{ZT} or I_{ZK}) is superimposed to I_{ZT} or I_{ZK} .

TYPICAL DEVICE CHARACTERISTICS CURVES

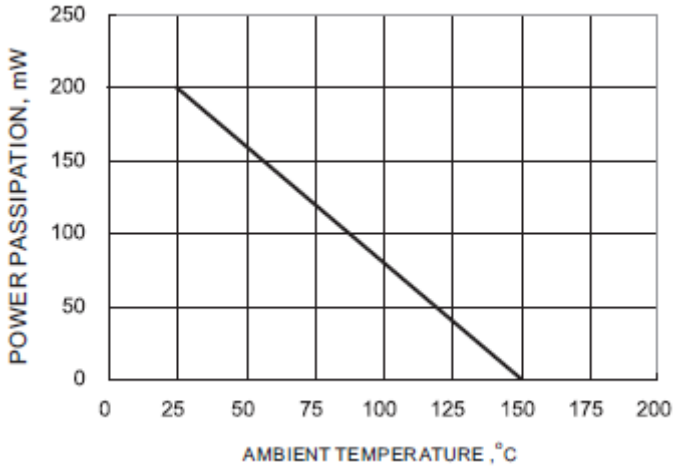


Fig1. POWER DISSIPATION VS. AMBIENT TEMP

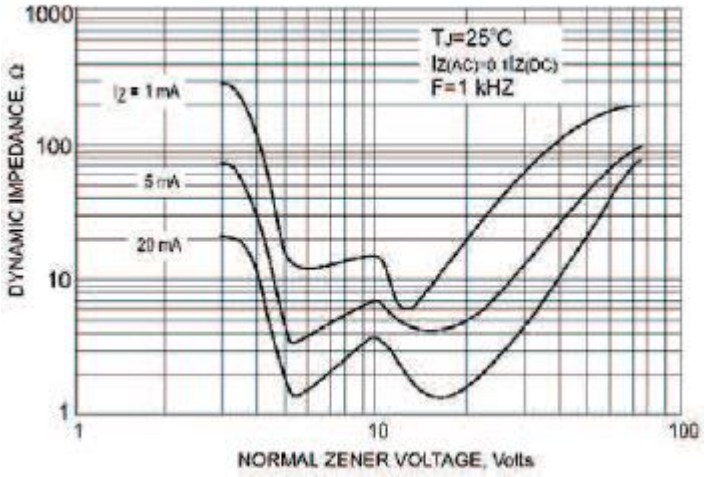


Fig2. EFFECT OF ZENER VOLTAGE ON ZENER IMPEDANCE

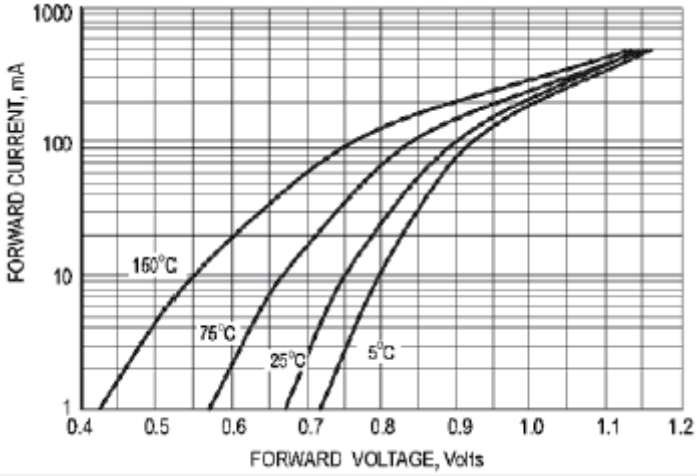


Fig3. TYPICAL FORWARD VOLTAGE

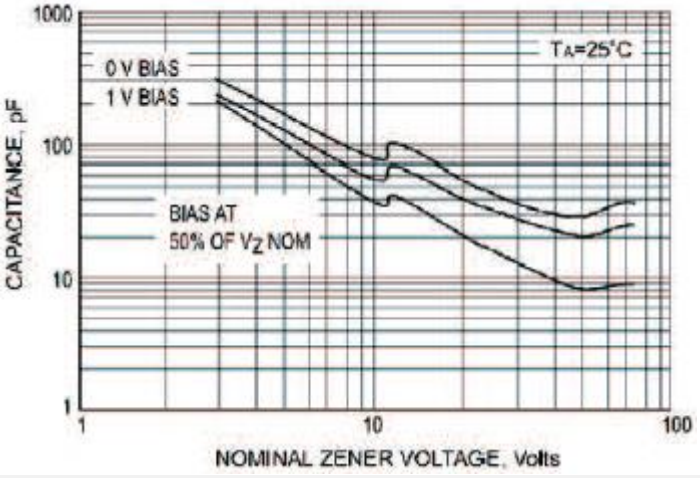


Fig3. 4-TYPICAL CAPACITANCE

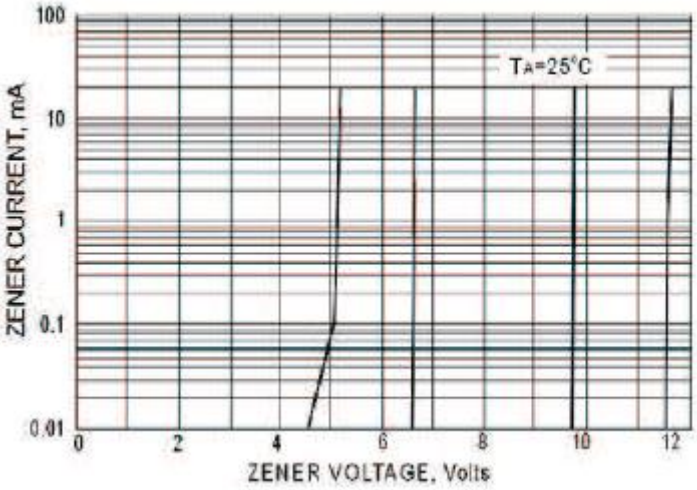


Fig5. ZENER BREAKDOWN CHARACTERISTICS

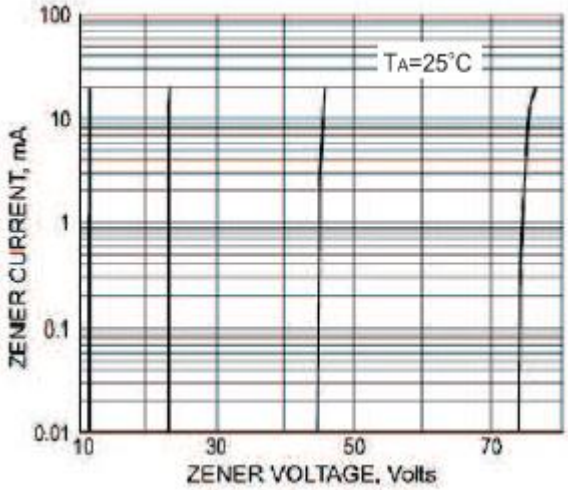


Fig6. ZENER BREAKDOWN CHARACTERISTICS

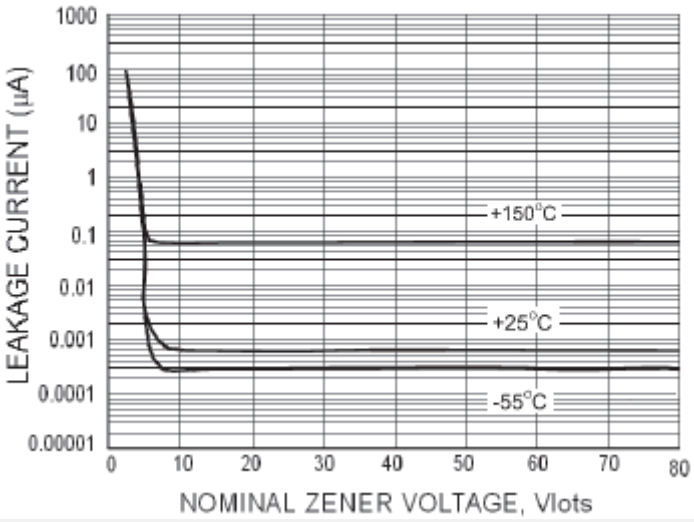


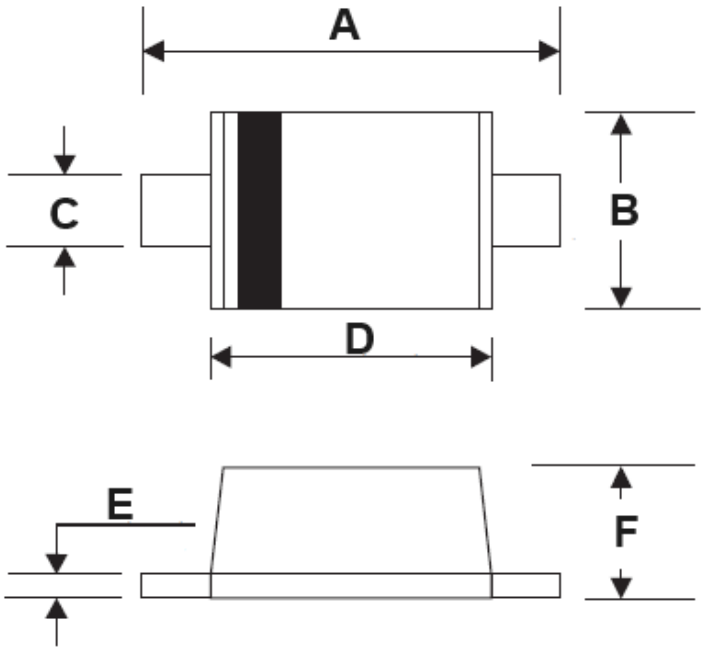
Fig7. TYPICAL LEAKGE CURRENT

PINNING INFORMATION

PIN	SIMPLIFIED OUTLINE	SCHEMATIC DIAGRAM
Pin1 cathode Pin2 anode		

PACKAGE INFORMATION

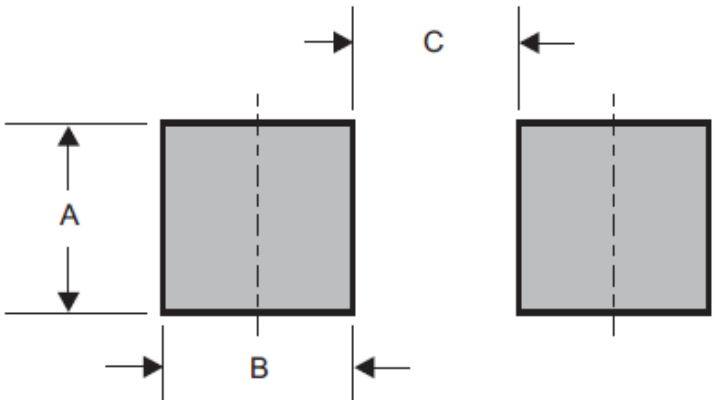
SOD-323FL



OUTLINE DIMENSIONS				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.30	2.70	0.091	0.106
B	1.15	1.35	0.045	0.053
C	0.25	0.40	0.010	0.016
D	1.60	1.95	0.063	0.077
E	0.05	0.25	0.002	0.010
F	0.70	1.00	0.028	0.039

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

SUGGESTED SOLDER PAD LAYOUT

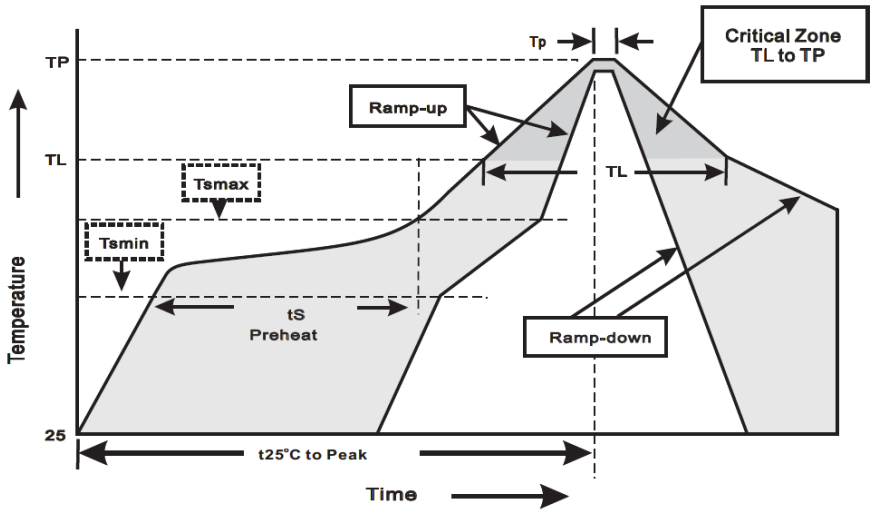


PAD LAYOUT DIMENSIONS		
DIM	MILLIMETERS	INCHES
	Typ.	Typ.
A	0.82	0.032
B	0.56	0.022
C	1.75	0.069

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
1. MSL Preconditioning	24hr bake@125℃+168hrs@85℃ /85%RH+3xI_R@260℃+1flux Immersion + alcohol + DI H2O rinse	JESD22-A113
2. Operation Life	T_a=25℃, Rated Current (I_o=I_o max.) Test Duration:1000hrs	MIL-STD-750E METHOD 1027.3
3. High Temperature Reverse Bias	80% Rated V_R (T_j=T_j max.) Test Duration:1000hrs	JESD22-A108
4. High Temperature Storage Life	T_a=125℃ Test Duration:1000hrs	JESD22 A-103
5. Temperature Cycle	-55℃(15min) to 150℃(15min) Test Cycles:1000cycles	JESD22 A-104
6. Autoclave	P=2atm T_a=121℃ RH=100% Test Duration:96hrs	JESD22 A-102
7. Intermittent Operational Life	T_a=25℃, On/Io Max. 2min, Off/2min, Test Cycles:15000cycles	MIL-STD-750E METHOD 1037
8. Solderability	245±5℃ for 5sec	J-STD-002
9. Moisture Resistance	T_a=85℃/85% Relative humidity Test Duration:1000hrs	MIL-STD-750E METHOD 1021.2
10. Resistance To Solder Heat	260±5℃ for 10sec	JESD22 B-106
11. High Temperature High Humidity Reverse Bias	T_a=85℃, 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

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.

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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®

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