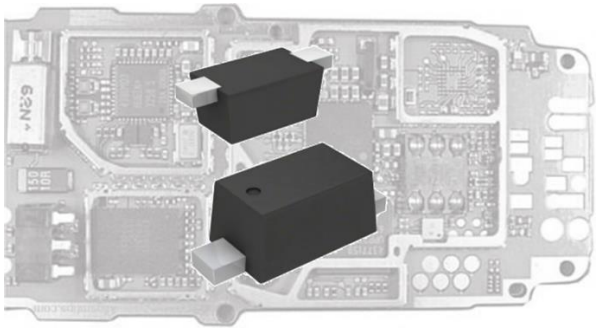
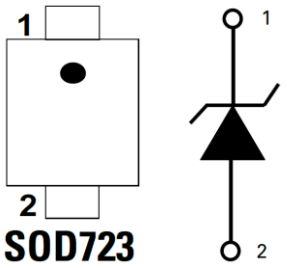
TVS Diode Arrays - 30pF 30kV Unidirectional Discrete TVS

DESCRIPTION:





The ALPSP1003 is Zener diodes fabricated in a proprietary silicon avalanche technology protect each I/O pin to provide a high level of protection for electronic equipment that may experience destructive electrostatic discharges (ESD).

ALPSP1003 robust diodes can safely absorb repetitive ESD strikes at ±30kV (contact discharge, IEC 61000-4-2) without performance degradation. Additionally, each diode can safely dissipate 7A of 8/20µs surge current (IEC61000-4-5) with very low clamping voltages.

FEATURES:

- RoHS compliant, Halogen-free and Lead- free
- ESD, IEC 61000-4-2, ±30kV contact, ±30kV air
- EFT, IEC 61000-4-4, 40A (5/50ns)
- Lightning, IEC 61000-4-5 2nd edition, 7A (8/20µs)
- Low leakage current of 100nA (MAX) at 5V
- Tiny SOD723 package saves board space
- Fits solder footprint of industry standard 0402 (1005) devices
- Moisture Sensitivity Level (MSL Level-1)

APPLICATIONS:

- Mobile phones
- Smart phones
- Tablets
- Portable navigation devices
- Digital cameras
- Portable medical devices
- Wearable Technology.

TYPICAL DEVICE CHARACTERISTICS

MAXIMUM RATINGS @ 25°C Unless Otherwise Specified			
PARAMETER	**SYMBOL**	**VALUE**	**UNITS**
Peak Pulse Current (tp=8/20µs)	I_{PP}	7.0	A
Operating Temperature	T_{OP}	–40 to 125	°C
Storage Temperature	T_{STOR}	–55 to 150	°C
CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.			

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)		
PARAMETER	**RATING**	**UNITS**
Storage Temperature Range	–55 to 150	°C
Maximum Junction Temperature	150	°C
Maximum Lead Temperature (Soldering 20-40s)	260	°C

ELECTRICAL CHARACTERISTICS (T_{OP} = 25 °C unless otherwise noted)								
PART NUMBER	**PARAMETER**	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MIN.**	**MAX.**	**UNIT**
ALPSP1003	Forward Voltage Drop	I_F = 10mA		V_F	0.8		1.2	V
	Reverse Voltage Drop	I_R = 1mA		V_R	7.8	6.0	8.5	V
	Reverse Standoff Voltage	$I_R \leq$ 1µA		V_{RWM}			5.0	V
	Reverse Leakage Current	V_R = 5V		I_{LEAK}			100	nA
	Clamp Voltage[1]	I_{PP} = 6A	t_p= 8/20µs	V_C	11.4			V
		I_{PP} = 7A	t_p= 8/20µs		12.0			V
	Dynamic Resistance	TLP, t_p = 100ns, 1/O to GND		R_{DYN}	0.25			Ω
	ESD Withstand Voltage[1]	IEC61000-4-2 (Contact Discharge)		V_{ESD}	±30			kV
		IEC61000-4-2 (Air Discharge)			±30			kV
	Diode Capacitance[1]	Reverse Bias = 0V		C_D	30			pF

NOTE
1. Parameter is guaranteed by design and/or device characterization.

TYPICAL DEVICE CHARACTERISTICS CURVES

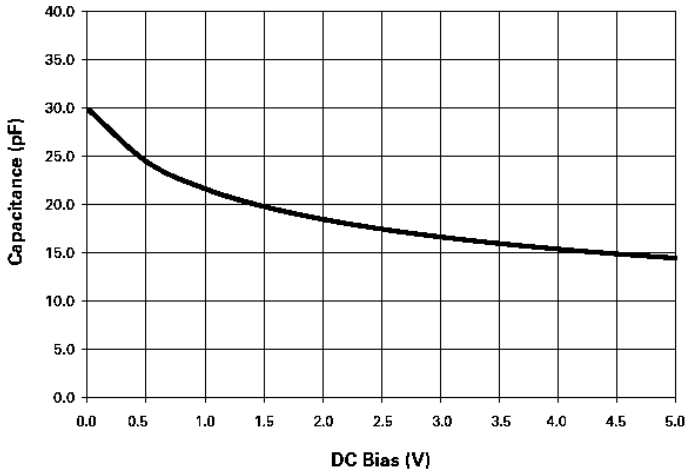


Fig.1 Capacitance vs. Reverse Bias

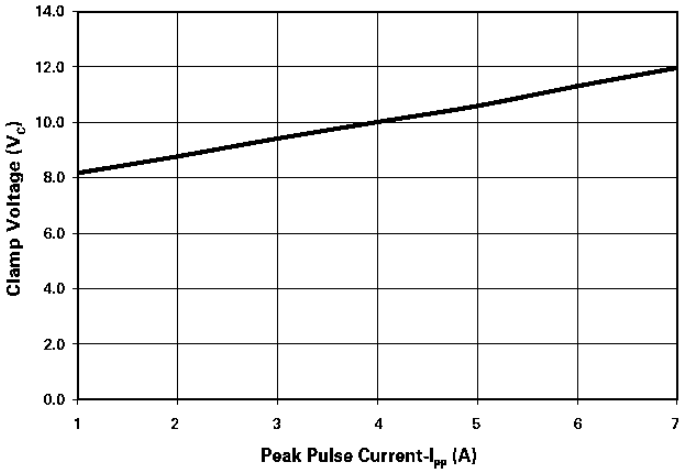


Fig.2 Clamping Voltage Vs. I_{PP}

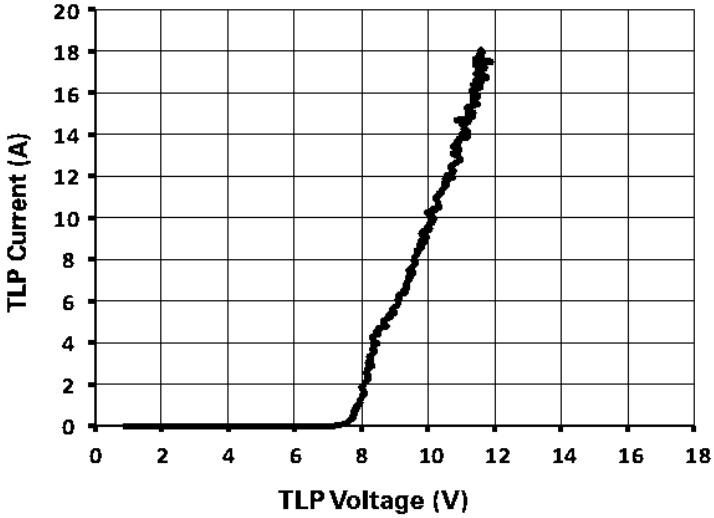


Fig.3 Transmission Line Pulsing (TLP) Plot

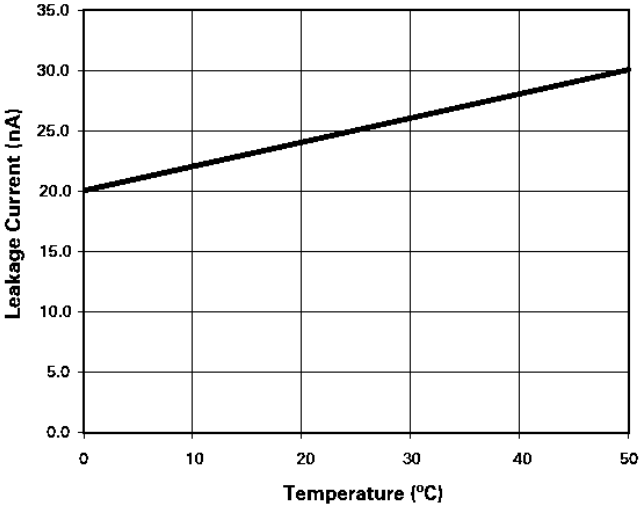


Fig.4 Leakage vs. Temperature

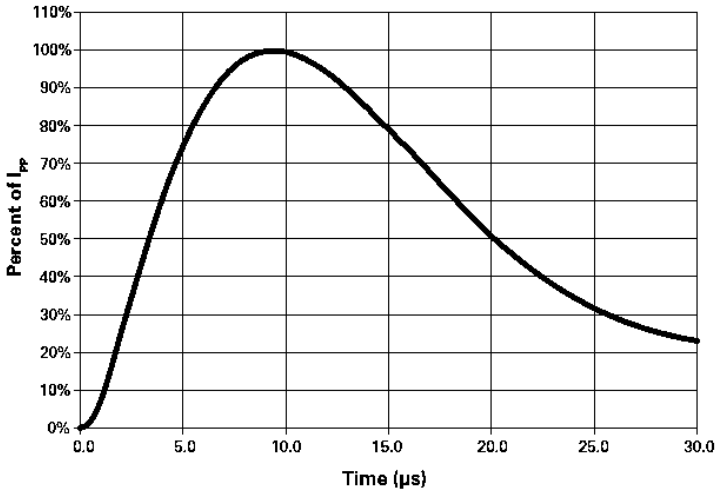
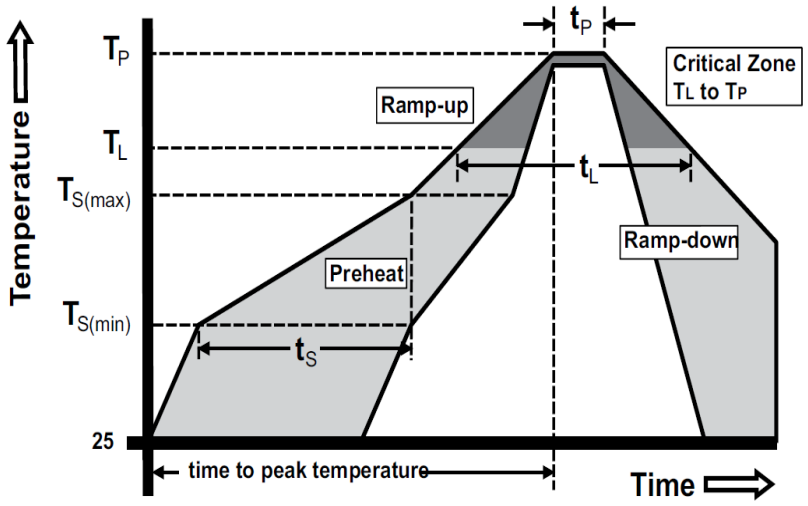


Fig.5 Pulse Waveform

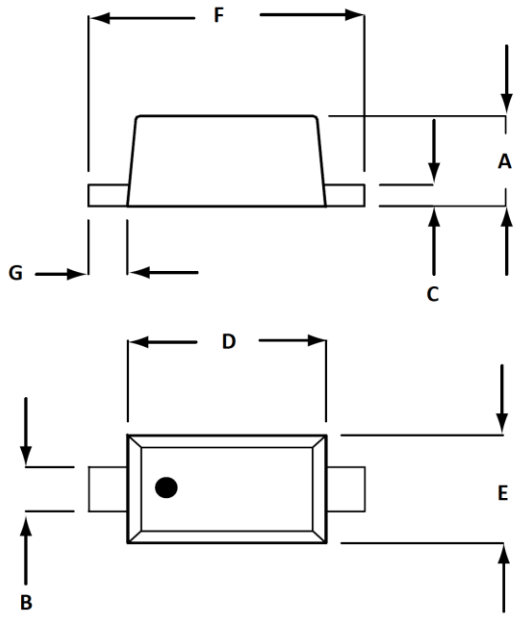
SOLDERING PARAMETERS

Reflow Condition		Pb – Free assembly
Pre Heat	**- Temperature Min ($T_{s(min)}$)**	150°C
	- Temperature Max ($T_{s(max)}$)	200°C
	- Time (min to max) (t_s)	60 – 180 secs
Average ramp up rate (Liquidus) Temp (T_L) to peak		3°C/second max
$T_{S(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	**- Temperature (T_L) (Liquidus)**	217°C
	- Temperature (t_L)	60 – 150 seconds
Peak Temperature (T_P)		$260^{+0/-5}$ °C
Time within 5°C of actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_P)		8 minutes Max.
Do not exceed		260°C

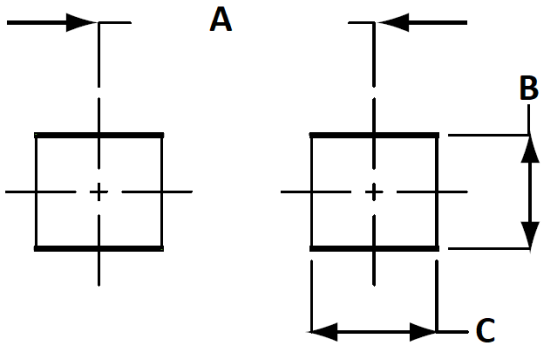


PACKAGE INFORMATION

SOD723



OUTLINE DIMENSIONS				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.46	0.65	0.018	0.026
B	0.23	0.35	0.009	0.014
C	0.08	0.13	0.003	0.005
D	0.90	1.10	0.035	0.043
E	0.58	0.64	0.023	0.025
F	1.37	1.47	0.054	0.058
G	0.15	0.25	0.006	0.010



SOLDER PAD LAYOUT DIMENSIONS				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	-	1.10	-	0.043
B	-	0.45	-	0.018
C	-	0.50	-	0.020

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 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