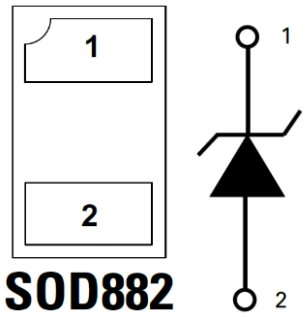
TVS Diode Arrays - 30pF 30kV Unidirectional Discrete TVS

DESCRIPTION:

The ALPAMSD821003A is **AEC-Q101 qualified** 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).

ALPAMSD821003A 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
- AEC-Q101 qualified
- 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 SOD882 package saves board space
- Fits solder footprint of industry standard 0402 (1005) devices
- Moisture Sensitivity Level (MSL Level-1)

APPLICATIONS:

- Automotive application

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_{op} = 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**
ALPAMSD821003A	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

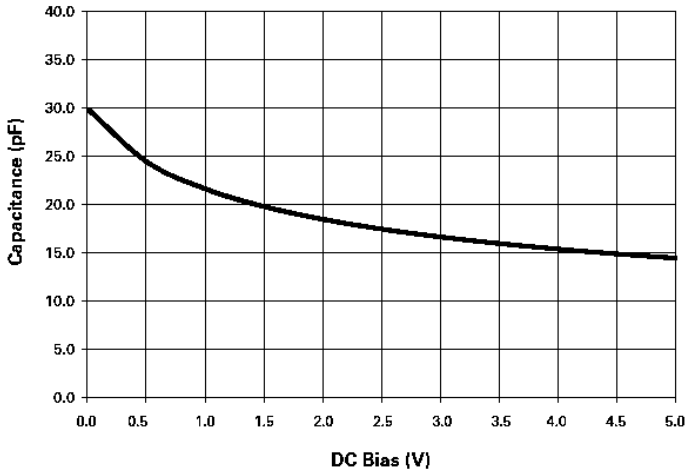


Fig.1 Capacitance vs. Reverse Bias

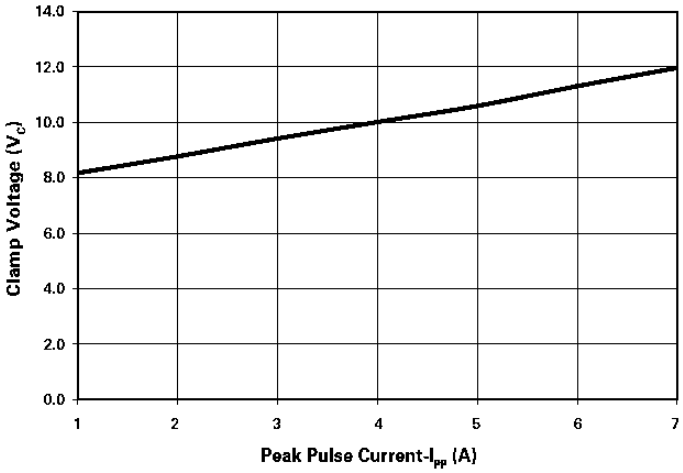


Fig.2 Clamping Voltage Vs. I_{PP}

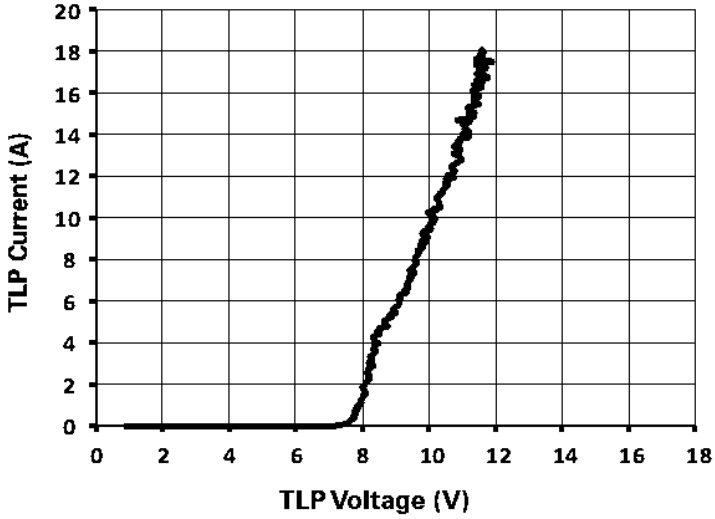


Fig.3 Transmission Line Pulsing (TLP) Plot

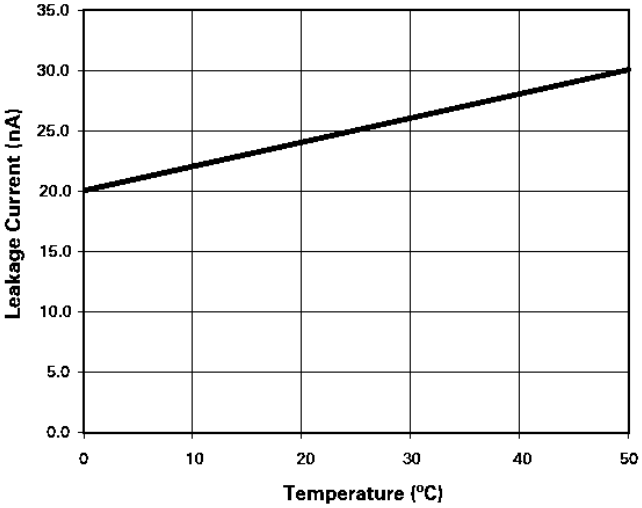


Fig.4 Leakage vs. Temperature

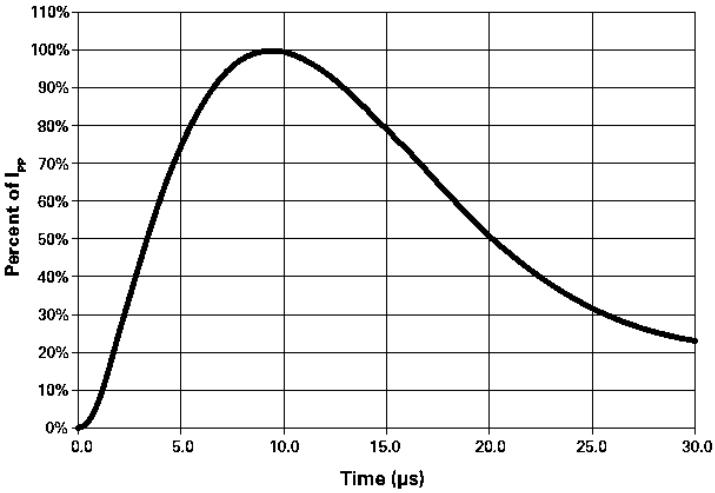
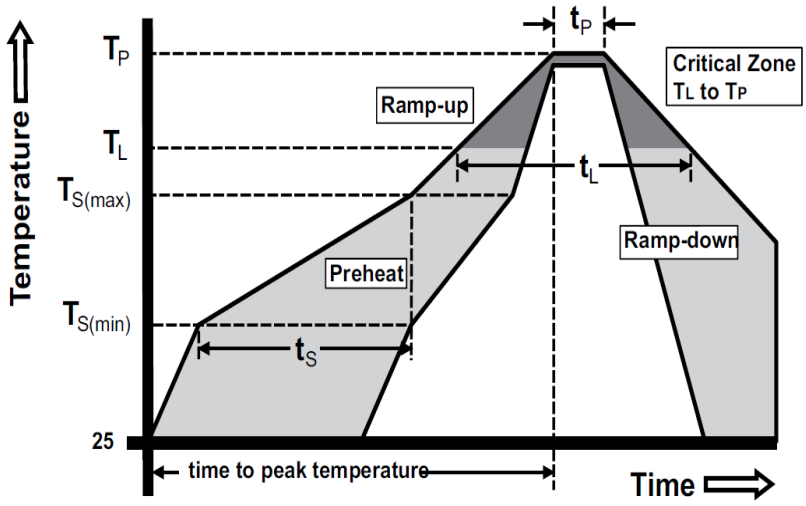


Fig.5 Pulse Waveform

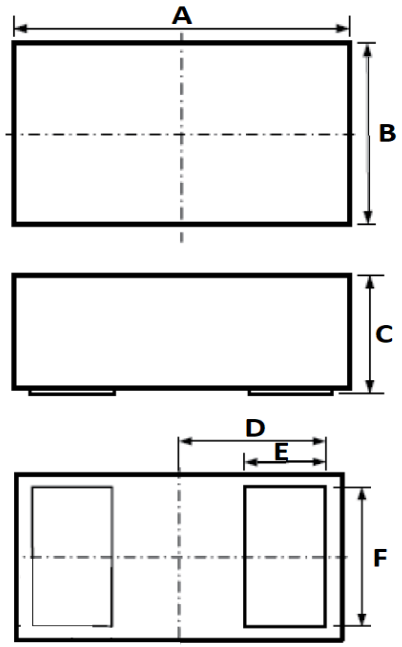
SOLDERING PARAMETERS

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



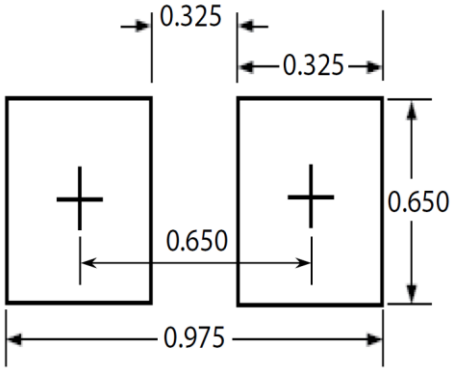
PACKAGE INFORMATION

SOD882



OUTLINE DIMENSIONS				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.90	1.10	0.035	0.043
B	0.50	0.70	0.020	0.028
C	0.40	0.60	0.016	0.024
D	0.45		0.018	
E	0.20	0.35	0.008	0.012
F	0.45	0.55	0.018	0.022

Recommended Soldering Pad Layout



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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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sales@alpinesemi.com
www.alpinesemi.com