

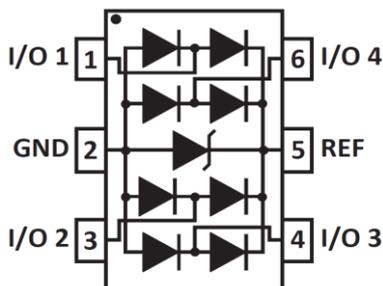
**ULTRA LOW CAPACITANCE STEERING DIODE/TVS ARRAY**

**DESCRIPTION:**



The ALPAMST3605A is a dual USB port protection array that features ultra-low capacitance. This device **AEC-Q101 approved** and designed for ESD protection, it can clamp the effects of electrical fast transients on the power bus.

The ALPAMST3605A combines 8 low capacitance steering diodes for up to four individual data or transmission lines and one TVS diode for power bus protection. This device is available in the space-saving SOT-23-6 package configuration, which minimizes lead inductance to prevent overshoot voltages during high ESD current events. This device meets the IEC 61000-4-2, IEC 61000-4-4 and IEC 61000-4-5 requirements.



**FEATURES:**

- **AEC-Q101 Qualified.**
- Compatible with IEC 61000-4-2 (ESD): Level 4 - Air 15kV, Contact 8kV
- Compatible with IEC 61000-4-4 (EFT): 40A, 5/50ns
- Compatible with IEC 61000-4-5 (Surge): 24A, 8/20μs - Level 2(Line- Ground) & Level 3 (Line-Line)
- 500 Watts Peak Pulse Power per Line (tp = 8/20μs)
- ESD Protection > 25 kilovolts
- Low Clamping Voltage
- Protection for 4 Lines
- Ultra Low Capacitance: 3.5pF Typical
- RoHS Compliant
- REACH Compliant

**APPLICATIONS:**

- Automotive application

**TYPICAL DEVICE CHARACTERISTICS**

MAXIMUM RATINGS @ 25°C Unless Otherwise Specified			
PARAMETER	SYMBOL	VALUE	UNITS
Peak Pulse Power (tp = 8/20µs) - See Figure 1	P <sub>PP</sub>	500	Watts
Operating Temperature	T <sub>L</sub>	-55 to 150	°C
Storage Temperature	T <sub>STG</sub>	-55 to 150	°C
Forward Surge Rating (5ms @ 25°C, I <sub>F</sub> = 10mA)	V <sub>F</sub>	0.5 Min. – 1.2 Max.	Volts
Peak Pulse Current (tp = 8/20µs) - Note 1	I <sub>PP</sub>	30	Amps
<b>NOTE</b> 1. Across TVS only - pin 2 to pin 5.			

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified						
PART NUMBER (Note 1)	RATED STAND-OFF VOLTAGE (Note 1)  V <sub>WM</sub> VOLTS	MINIMUM BREAKDOWN VOLTAGE  @ 1mA V <sub>(BR)</sub> VOLTS	MAXIMUM CLAMPING VOLTAGE (Fig. 2) (Note 1)  @ I <sub>p</sub> = 1A V <sub>c</sub> VOLTS	MAXIMUM CLAMPING VOLTAGE (Fig. 2) (Note 1)  @ 8/20µs V <sub>c</sub> @ I <sub>pp</sub>	MAXIMUM LEAKAGE CURRENT (Note 1)  @V <sub>WM</sub> I <sub>D</sub> µA	TYPICAL CAPACITANCE (Note 1)  @0V, 1MHz C <sub>J(SD)</sub> pF
ALPAMST3605A	5.0	6.0	12.0	15.0	5	3.5
<b>NOTES</b> 1. Measured from I/O pin to ground.						

TYPICAL DEVICE CHARACTERISTICS CURVES

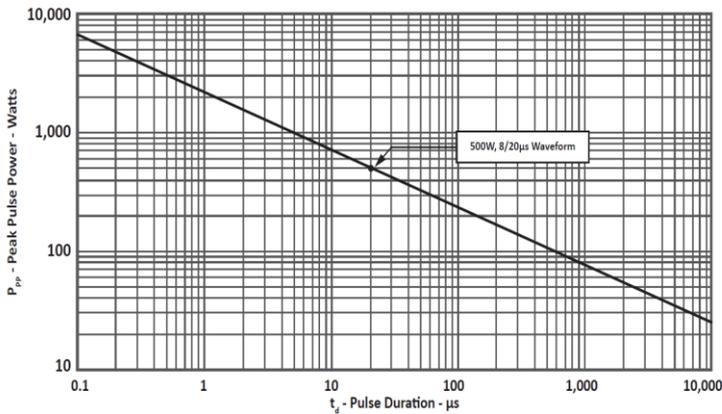


Fig1. PEAK PULSE POWER VS PULSE TIME

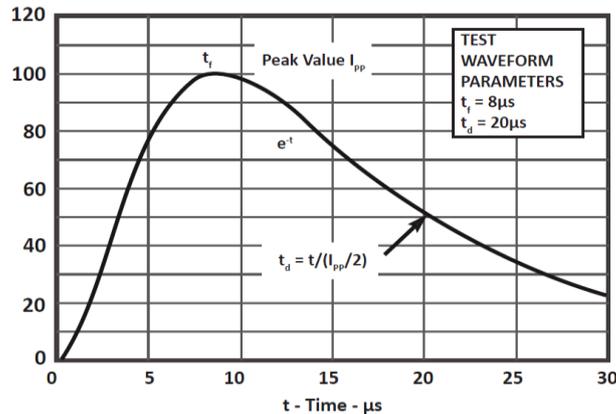


Fig2. PULSE WAVE FORM

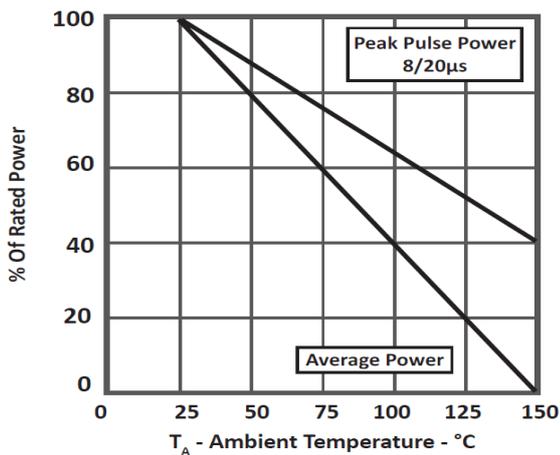


Fig3. POWER DERATING CURVE

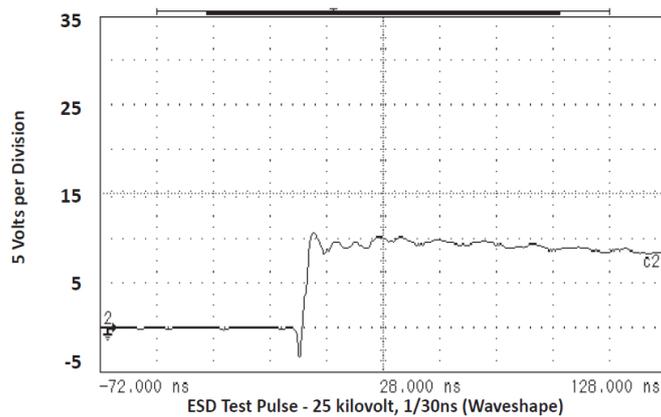
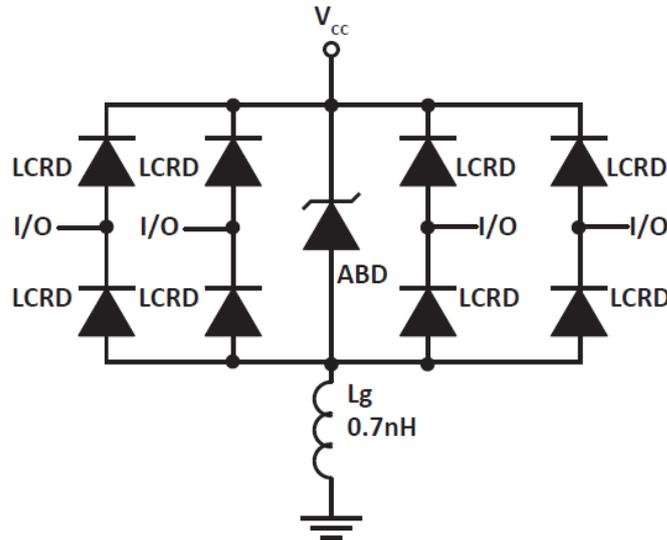


Fig4. OVERSHOOT & CLAMPING VOLTAGE

SPICE MODEL

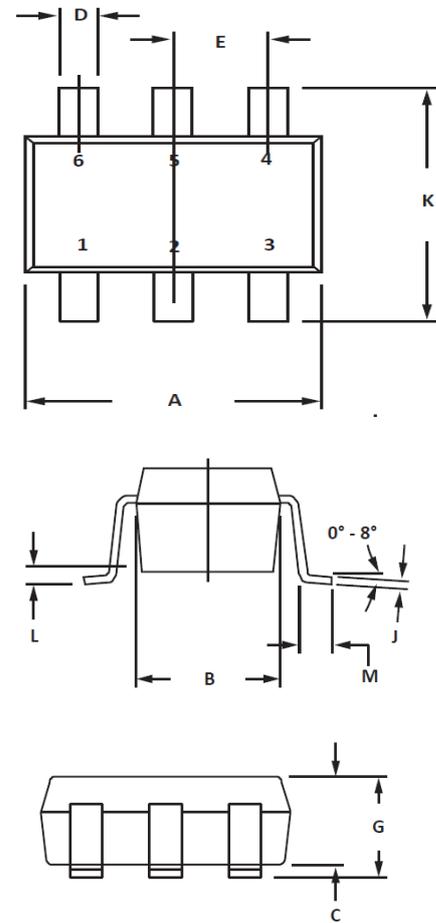
FIGURE 1  
SPICE MODEL



LCABD - Low Capacitance Avalanche Breakdown Diode (TVS)  
 LCRD: Low Capacitance Rectifier Diode  
 Lg - Lead Inductance

SPICE PARAMETERS			
PARAMETER	UNIT	ABD(TVS)	LCRD
BV	V	6.0	200
IBV	μA	1	0.01
C <sub>jo</sub>	pF	230	3
I <sub>s</sub>	A	1E-11	1E-13
V <sub>j</sub>	V	0.6	0.6
M	-	0.33	0.33
N	-	1	1
R <sub>s</sub>	Ohms	0.014	0.31
TT	s	1E-9	1E-9
EG	eV	1.11	1.11

PACKAGE INFORMATION



OUTLINE DIMENSIONS

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.80	3.05	0.110	0.120
B	1.50	1.75	0.059	0.070
C	0.90	1.30	0.036	0.051
D	0.30	0.40	0.012	0.016
E	0.85	1.05	0.033	0.040
G	0.90	1.45	0.036	0.057
J	0.09	0.20	0.003	0.008
K	2.60	3.00	0.102	0.118
L	0.0	0.15	0.0	0.006
M	0.30	0.60	0.012	0.024

NOTES

1. Controlling dimension: inches.
2. Dimensioning and tolerances per ANSI Y14.5M, 1985.
3. Dimensions are exclusive of mold flash and metal burrs.

PAD LAYOUT DIMENSIONS

DIM	MILLIMETERS	INCHES
	NOMINAL	NOMINAL
A	0.70	0.028
B	1.90	0.074
C	0.95	0.037
D	2.40	0.094
E	1.00	0.039

NOTES

1. Controlling dimension: inches.



*beyond boundaries...*

**ALPAMST3605A**

**SOT-23-6**

**CUSTOMER NOTE:**

**DISCLAIMER**

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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).



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