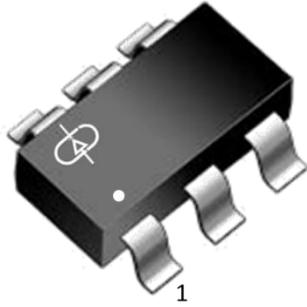


LOW CAPACITANCE ESD TVS ARRAY

DESCRIPTION:



The ALPSRV05-4-P-SM devices are low-capacitance transient voltage suppressors designed to protect components which are connected to data and transmission lines from over voltages caused by electrostatic discharge (ESD), electrical fast transients (EFT), and induced lightning.

FEATURES

- 400Watts peak pulse power ($t_p = 8/20\mu s$)
- SOT23-6 package
- Solid-state silicon-avalanche technology
- Low clamping voltage
- Low leakage current
- Low capacitance (1.5pF typical I/O to I/O)
- ESD Protection for high-speed data lines to:
 - IEC 61000-4-2 (ESD) ± 30 kV (contact), ± 30 kV (air),
 - IEC 61000-4-4 (EFT) 40A (5/50ns)
 - IEC 61000-4-5 (Lightning) 25A (8/20us)
- RoHS compliant

APPLICATIONS

- USB 2.0
- 10/100/1000 Ethernet
- Unified Display Interface (UDI)
- Digital Visual Interface (DVI)
- High speed serial interfaces

MECHANICAL DATA

- Epoxy: UL94-V0 rated flame retardant
- Case: Molded plastic, SOT-23-6
- Terminals: Plated terminals, solderable per MIL-STD-750, Method 2026
- Mounting Position: Any
- Weight: Approximated 0.013 gram

ORDERING PART NUMBER

PART NUMBER	ORDERING PART NUMBER
ALPSRV05-4-P-SM	ALPSRV05-4-P-SM

ELECTRICAL CHARACTERISTICS

ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)						
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Reverse Stand-Off Voltage		V_{RWM}			5	V
Reverse Breakdown Voltage	$I_T=1\text{mA}$	V_{BR}	6	6.8	10	V
Reverse Leakage Current	$V_R=5\text{V}$, $T = 25^{\circ}\text{C}$	I_R		0.1	0.5	μA
Clamping Voltage	$I_{PP}=25\text{A}$, $t_p=8/20\mu\text{s}$	V_C		14	16	V
Junction Capacitance	$V_R=0\text{V}$, $f=1\text{MHz}$, I/O pin to GND	C_J		3.5	5.0	pF
	$V_R=0\text{V}$, $f=1\text{MHz}$, Between I/O pins			1.5	2.5	pF

ABSOLUTE MAXIMUM RATINGS

ABSOLUTE MAXIMUM RATINGS ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)			
Parameter	Symbol	Value	Unit
Peak pulse power ($t_p=8/20\text{ }\mu\text{s}$)	P_{PP}	400	W
Peak pulse current ($t_p=8/20\mu\text{s}$)	I_{PP}	25	A
IEC 61000-4-2 (ESD) Air Contact	V_{ESD}	± 30 ± 30	kV
Operating Junction Temperature Range	T_J	-55 to +125	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 to +150	$^{\circ}\text{C}$

TYPICAL DEVICE CHARACTERISTICS CURVES

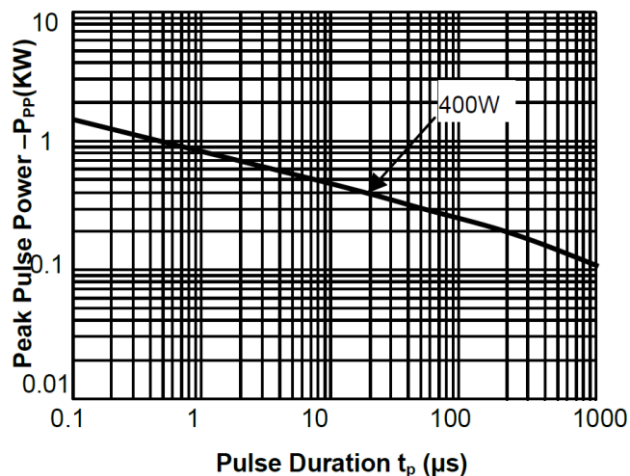


Fig1. Peak Pulse Power Rating Curve

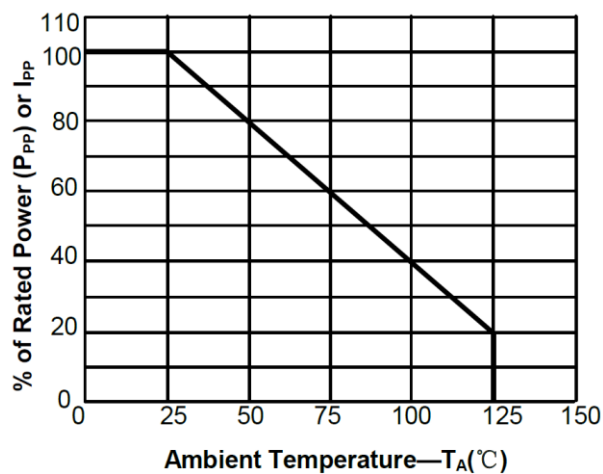


Fig2. Power Derating Curve

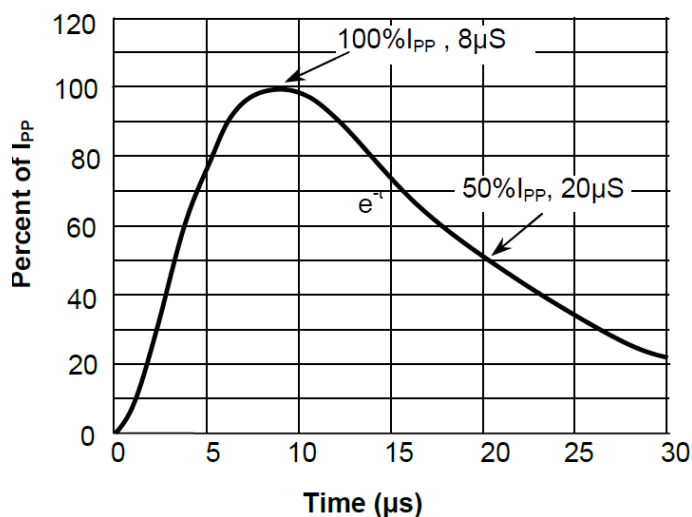


Fig3. Pulse Waveform-8/20 μ s

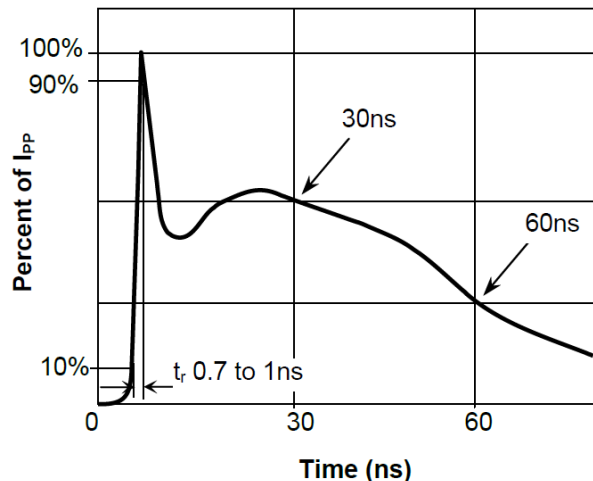


Fig4. Pulse Waveform-ESD(IEC61000-4-2)

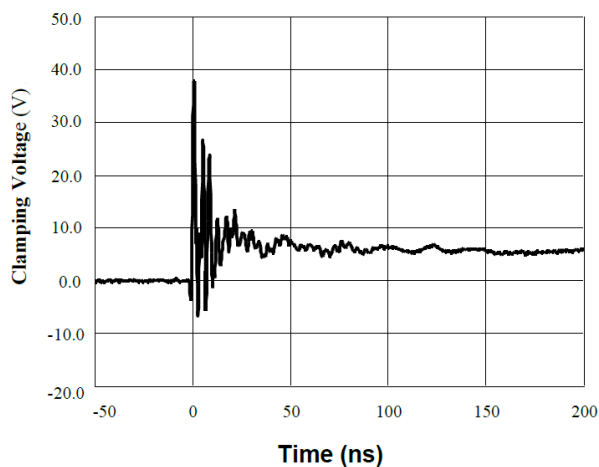


Fig 5. ESD Clamping of I/O to GND
(+8kV Contact per IEC 61000-4-2)

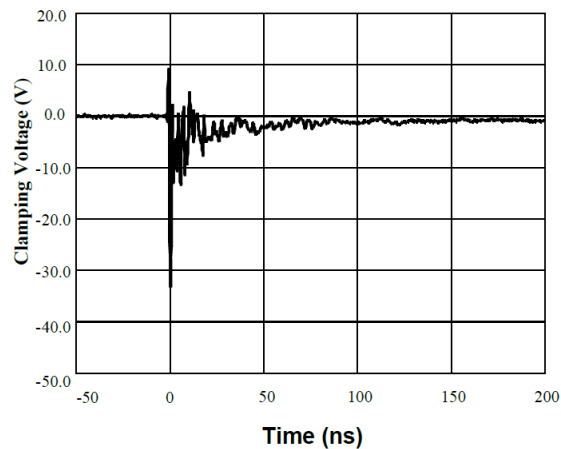
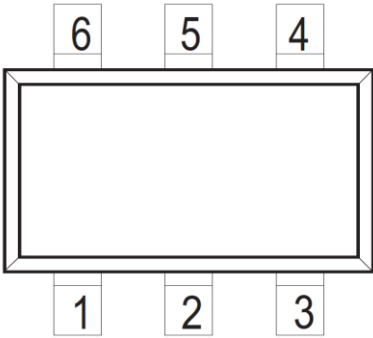
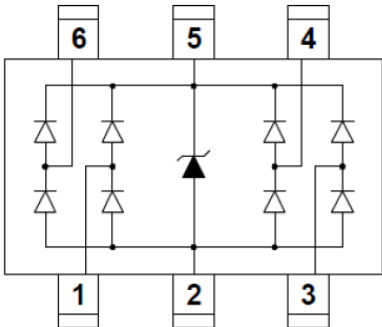


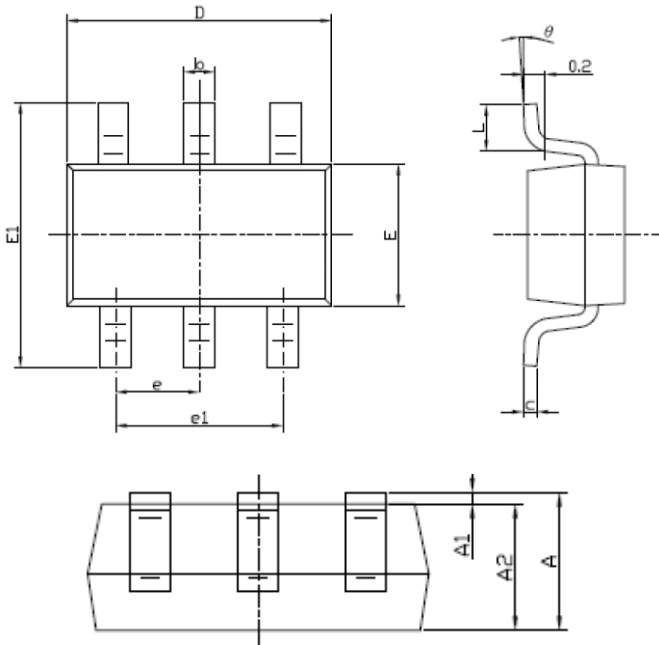
Fig.6 ESD Clamping of I/O to GND
(-8kV Contact per IEC 61000-4-2)

PIN INFORMATION

PIN	SIMPLIFIED OUTLINE	SCHEMATIC DIAGRAM
1, 3, 4, 6 - I/O 5 - V_{RWM} 2 - GND		

PACKAGE INFORMATION

SOT23-6

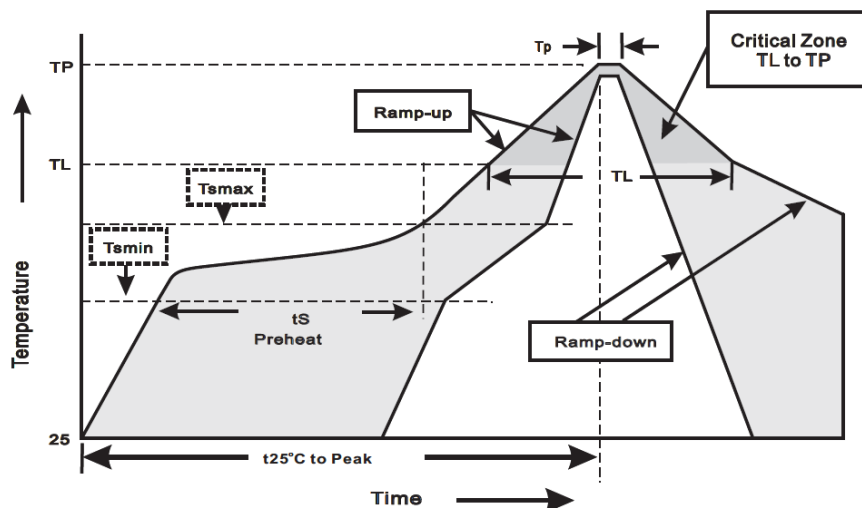


OUTLINE DIMENSIONS				
SYMBOL	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.05	1.25	0.041	0.049
A1	0.00	0.10	0.000	0.004
A2	1.05	1.15	0.041	0.045
b	0.30	0.50	0.012	0.020
c	0.10	0.20	0.004	0.008
D	2.85	3.05	0.112	0.120
E	1.50	1.70	0.059	0.067
E1	2.65	2.95	0.104	0.116
e	0.95 (BSC)		0.037 (BSC)	
e1	1.80	2.00	0.071	0.079
L	0.30	0.60	0.012	0.024
θ	0°	8°	0°	8°
Note: 1. Controlling dimension: in millimeters. 2. General tolerance: ±0.05mm				

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})	150 °C
- Temperature Max (T_{smax})	200 °C
- Time (min to max) (t_s)	60 ~ 120 sec
T_{smax} to T_L	
- Ramp-upRate	<3 °C/sec
Time maintained above:	
- Temperature (T_L)	217 °C
- Time(t_L)	60 ~ 260 sec
Peak Temperature (T_P)	255 °C-0/+5 °C
Time within 5 °C of actual Peak Temperature(t_P)	10 ~ 30 sec
Ramp-down Rate	<6 °C/sec
Time 25 °C to Peak Temperature	<6 minutes



beyond boundaries...

ALPSRV05-4-P-SM

SOT-23-6

CUSTOMER NOTE:

DISCLAIMER

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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).



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