

4-LINE SMD LOW CAPACITANCE TVS FOR ESD PROTECTION 5.0V

DESCRIPTION:



The ALPSRV05-4-P-LF 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

- Low operating and clamping voltage
- Low leakage current
- Small package
- IEC 61000-4-2 (ESD) ± 30 kV (contact), ± 30 kV (air),
- IEC 61000-4-4 (EFT) 40A (5/50ns)
- IEC 61000-4-5 (Lightning) 24A (8/20us)
- Suffix "-H" indicates Halogen-free parts, ex. ALPSRV05-4-P-LF-H

APPLICATIONS

- Ethernet 10/100/1000
- Wireless data (WAN/LAN) system
- PC/Notebooks, USB2.0/IEEE 1394 ports
- Portable Instrumentation
- Video/Graphics Card

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

CIRCUIT DIAGRAM

Fig. 1A

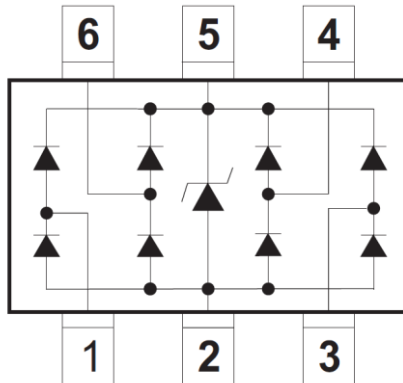
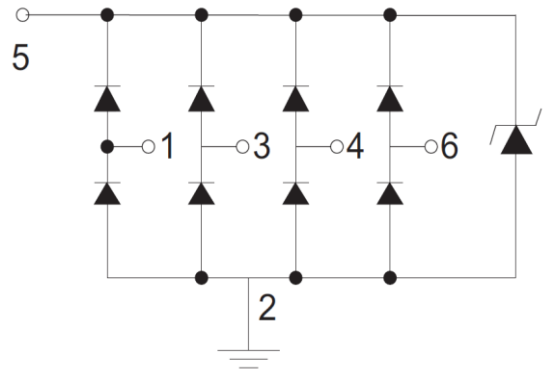


Fig. 1B

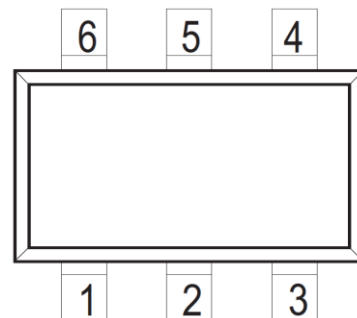


PIN DESCRIPTION

Pin Configuration

1, 3, 4, 6	I/O
5	VRWM
2	GND

Simplified outline



ELECTRICAL CHARACTERISTICS

ELECTRICAL CHARACTERISTICS (TA = 25 °C, VIN=12V unless otherwise noted)						
Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Reverse Stand-Off Voltage	V _{RWM}			5	V	
Reverse Breakdown Voltage	V _{BR}	6			V	I=1mA
Reverse Leakage Current	I _R			500	nA	V _{RWM} =5V, T = 25°C
Junction Capacitance	C _J		3	4	pF	V _R =0V, f=1MHz, I/O pin to GND
			1.5	2	pF	V _R =0V, f=1MHz, Between I/O pins
Clamping Voltage	V _C		17	20	V	I _{PP} =24A, tp=8/20us, Any I/O pin to GND

ABSOLUTE MAXIMUM RATINGS

ABSOLUTE MAXIMUM RATINGS			
Parameter	Symbol	Value	Unit
IEC 61000-4-2 (ESD) Air Contact	V _{ESD}	±30 ±30	kV
Peak pulse current (tp=8/20us)	I _{PP}	24	A
Peak pulse power (tp=8/20us)	P _{PP}	480	W
Operating Junction Temperature Range	T _J	-55 to +125	°C
Storage Temperature Range	T _{STG}	-55 to +150	°C

TYPICAL DEVICE CHARACTERISTICS CURVES

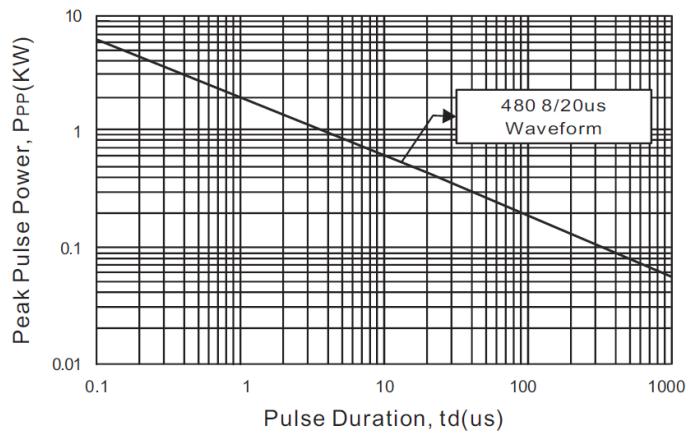


Figure 1. Peak Pulse Power vs. Pulse Time

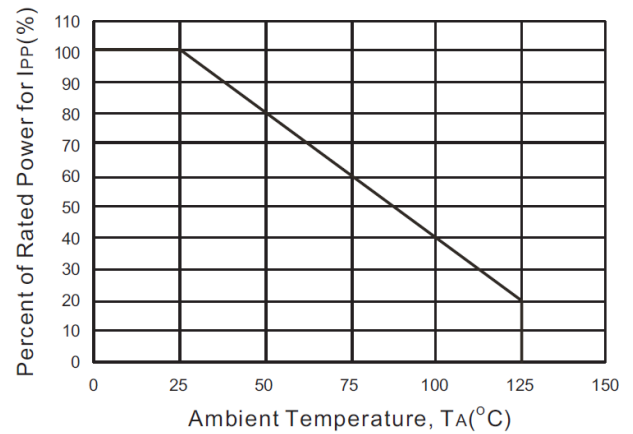


Figure 2. Power Derating Curve

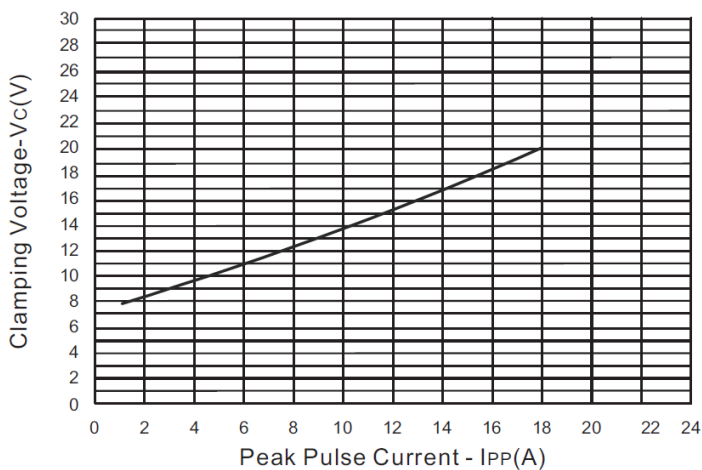


Figure 3. Clamping Voltage vs. Peak Pulse Current

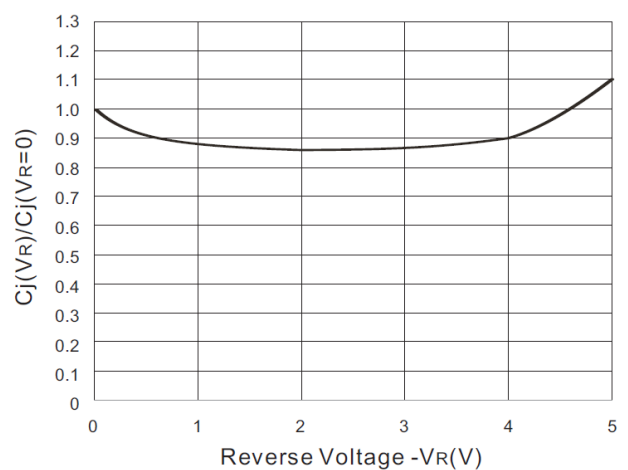


Figure 4. Normalized Junction Capacitance vs. Reverse Voltage(I/O-GND)

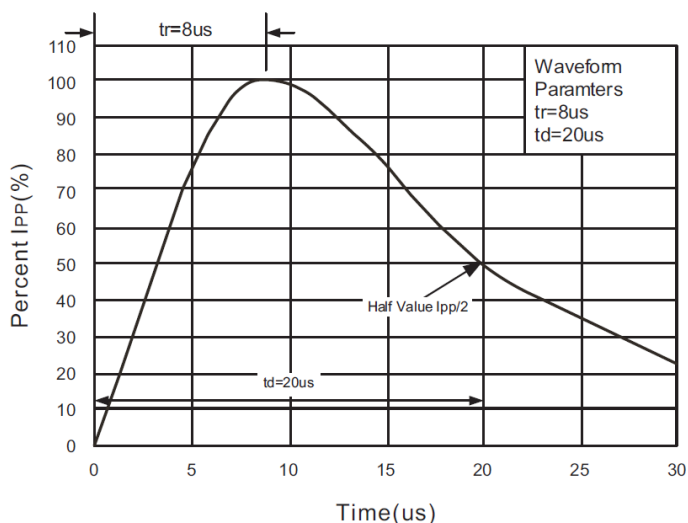
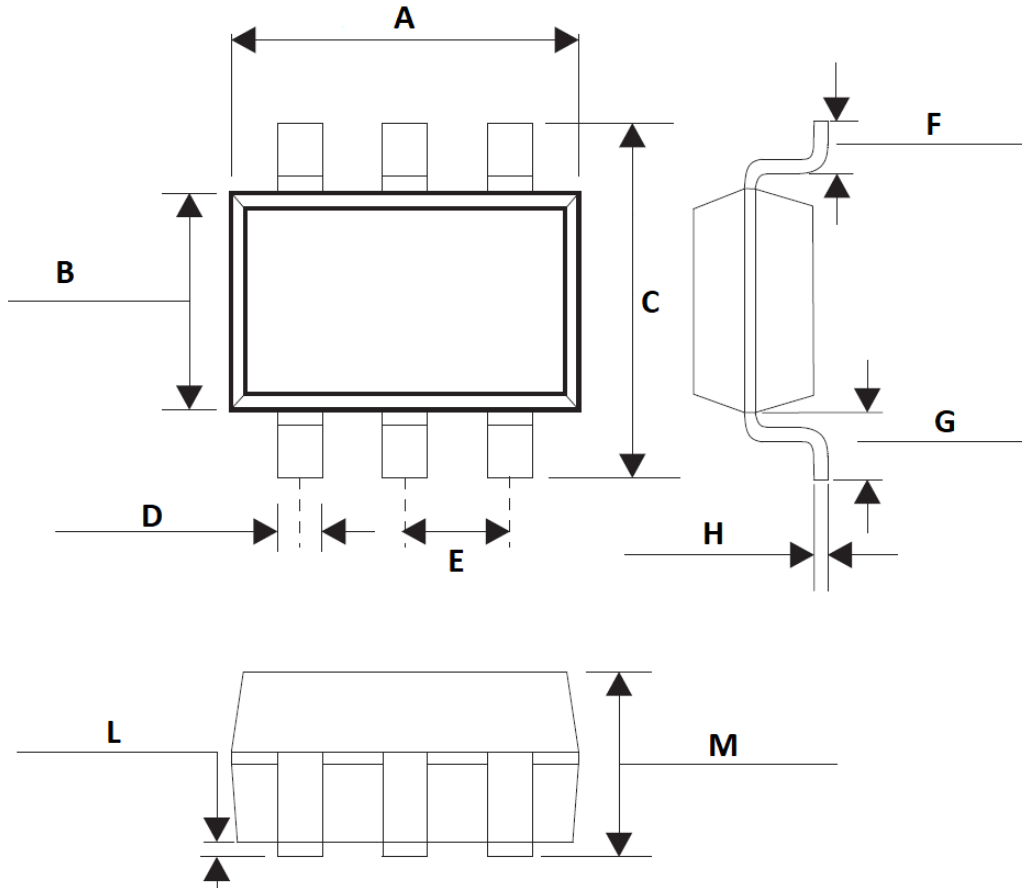
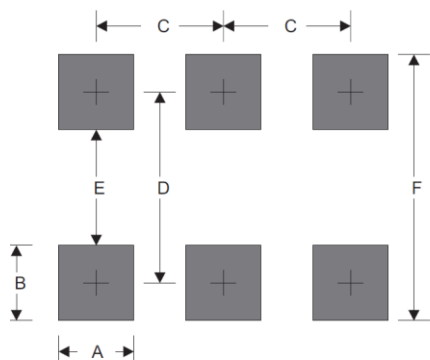


Figure 5. 8/20us Pulse Waveform

PACKAGE INFORMATION
SOT-23-6


OUTLINE DIMENSIONS		
SYMBOL	MILLIMETERS	
	MIN	MAX
A	2.80	3.02
B	1.50	1.75
C	2.60	3.00
D	0.35	0.50
E	0.95 (Typ.)	
F	0.35	0.60
G	0.55	0.75
H	0.08	0.20
L	0.00	0.15
M	0.90	1.45

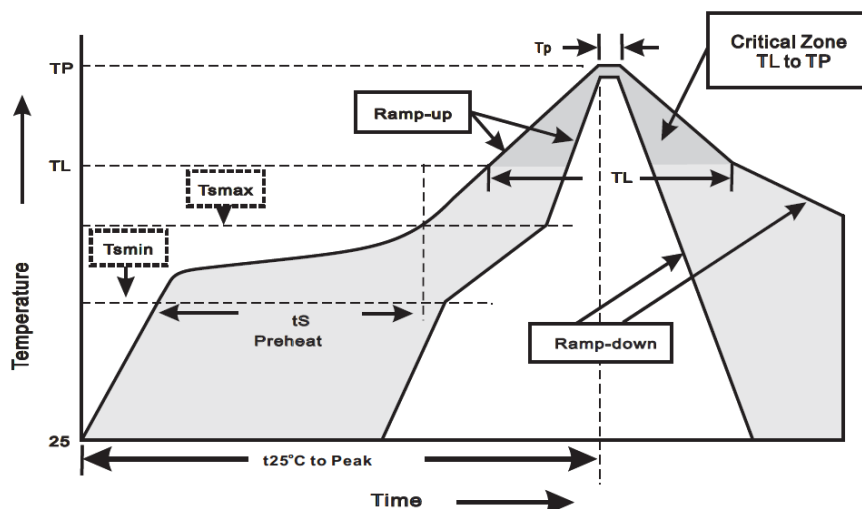
SUGGESTED SOLDER PAD LAYOUT



OUTLINE DIMENSIONS	
SYMBOL	MILLIMETERS
A	0.60
B	1.10
C	0.95
D	2.50
E	1.40
F	3.60

SUGGESTED THERMAL PROFILES FOR SOLDERING PROCESSES

- Storage environment: Temperature=5 °C~40 °C Humidity=55% ±25%
- Reflow soldering of surface-mount devices



- Reflow soldering

PROFILE FEATURE	SOLDERING CONDITION
Average ramp-up rate (TL to TP)	<3 °C/sec
Preheat	
- Temperature Min (Tsm)	150 °C
- Temperature Max (Tsmax)	200 °C
- Time (min to max) (ts)	60 ~ 120 sec
Tsmax to TL	
- Ramp-upRate	<3 °C/sec
Time maintained above:	
- Temperature (TL)	217 °C
- Time(tL)	60 ~ 260 sec
Peak Temperature (TP)	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



beyond boundaries...

ALPSRV05-4-P-LF

SOT-23-6

CUSTOMER NOTE:

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2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).



sales@alpinesemi.com

www.alpinesemi.com