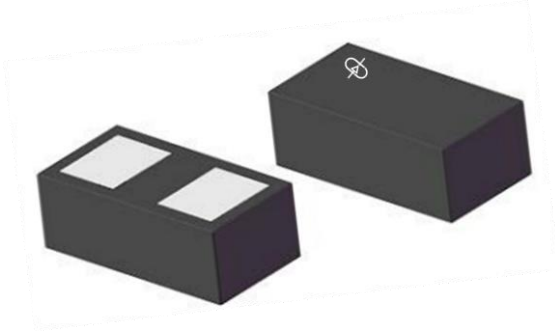


ULTRA-LOW CAPACITANCE TVS DIODE

DESCRIPTION:



The ALPESU5VE0201SNC is an Ultra Low Capacitance TVS Diode with Snap-Back technology. It has Low clamping voltage and Ultra-low capacitance (0.30pF typical).

The ALPESU5VE0201SNC is suited for using in USB, HDMI, UDI & DVI interfaces and Ethernet.

FEATURES:

- 60Watts peak pulse power ($t_p = 8/20\mu s$)
- Snap-Back technology
- Low clamping voltage
- Low leakage current
- Ultra-low capacitance (0.30pF typical)
- IEC 61000-4-2 (ESD)
 - $\pm 16kV$ Contact Discharge
 - $\pm 20kV$ Air Discharge
- IEC 61000-4-4 EFT Protection
 - 40A (5/50ns)
- IEC 61000-4-5 (Lightning)
 - 10A (8/20 μs)
- RoHS compliant

APPLICATIONS:

- USB 3.0, USB 2.0, MHL
- HDMI 2.0, Display Port 1.3, eSATA
- Unified Display Interface (UDI)
- Digital Visual Interface (DVI)
- 1G/2.5G/5G/10G Ethernet

MECHANICAL CHARACTERISTICS

- Epoxy: UL94-V0 rated flame retardant.
- Case: Molded plastic, ECP0201
- Terminals: Solder plated, solderable per MIL-STD-750, Method 2026

ABSOLUTE MAXIMUM RATINGS

MAXIMUM RATINGS @ T _A = 25 °C unless otherwise specified			
PARAMETER	SYMBOL	VALUE	UNIT
Peak pulse power (t _p =8/20μs)	P _{PP}	60	W
Peak Pulse Current (t _p =8/20μs)	I _{PP}	10	A
ESD (IEC61000-4-2 air discharge)	V _{ESD}	±20	kV
ESD (IEC61000-4-2 contact discharge)		±16	
Operating Junction Temperature Range	T _J	-55 to +125	°C
Storage Temperature Range	T _{STG}	-55 to +150	°C

ELECTRICAL CHARACTERISTICS
ELECTRICAL CHARACTERISTICS @ $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise specified

PARAMETER	CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Reverse Stand-off Voltage		V_{RWM}			5	V
Reverse Breakdown Voltage	$I_T = 1\text{mA}$	V_{BR}	5.5	6.5	8.6	V
Reverse Leakage Current	$V_R = 5.0\text{V}$	I_R		0.01	0.05	μA
Trigger Voltage	$I_{PP} = 10\text{A}$, $t_p = 8/20\mu\text{s}$	V_T		9.0		V
Clamping Voltage	$I_{PP} = 10\text{A}$, $t_p = 8/20\mu\text{s}$	V_C		6.0		V
Dynamic Resistance	$I_T = 0 \sim 30\text{A}$, $t_p = \text{TLP}$	R_{dyn}		0.25		Ω
Junction Capacitance	$V_R = 0\text{V}$, $f = 1\text{MHz}$ (I/O to GND)	C_J		0.30	0.50	pF

TYPICAL DEVICE RATING AND CHARACTERISTICS CURVES ($T_A = 25^\circ\text{C}$ unless otherwise noted)

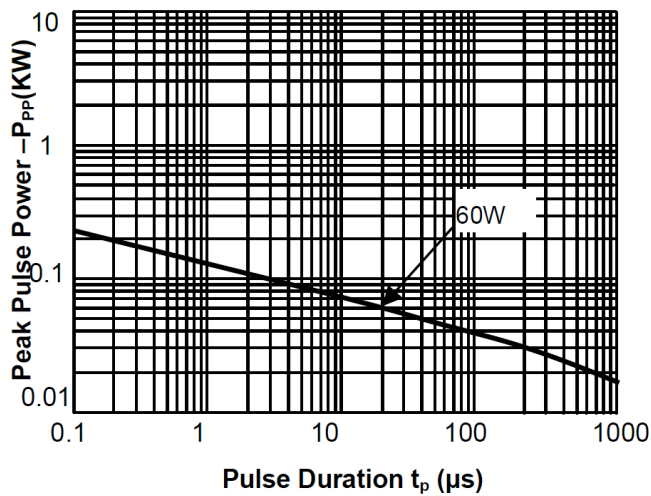


Fig.1 PEAK PULSE POWER RATING CURVE

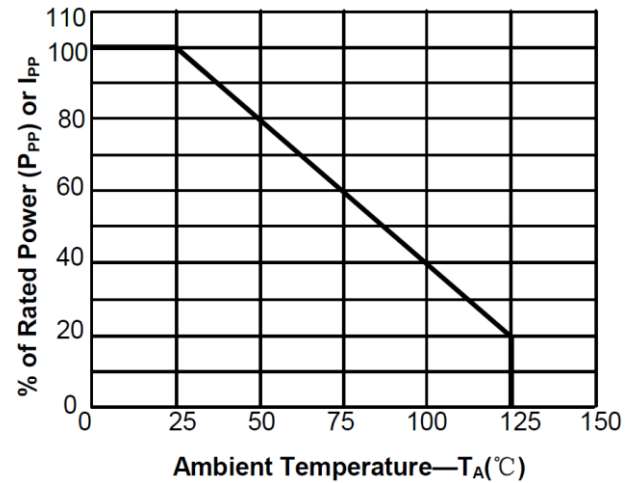


Fig.2 PULSE DERATING CURVE

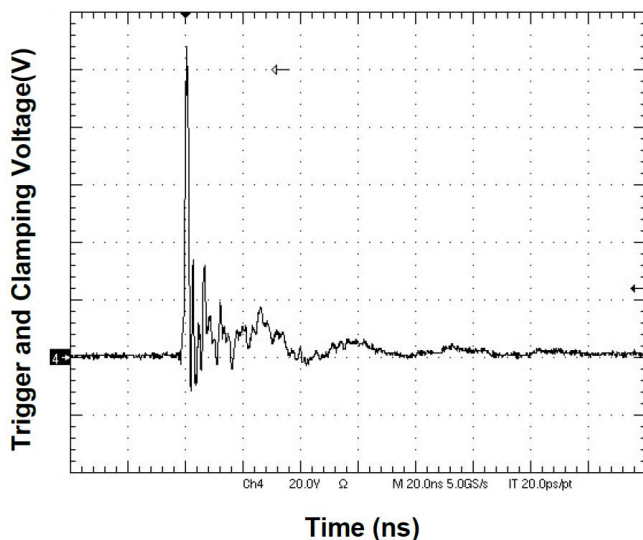


Fig.3 IEC61000-4-2 +8kV Contact Discharge

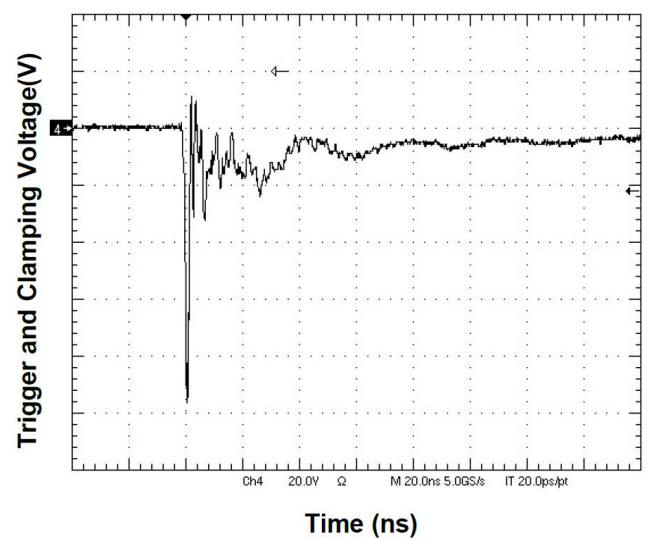


Fig.4 IEC61000-4-2 -8kV Contact Discharge

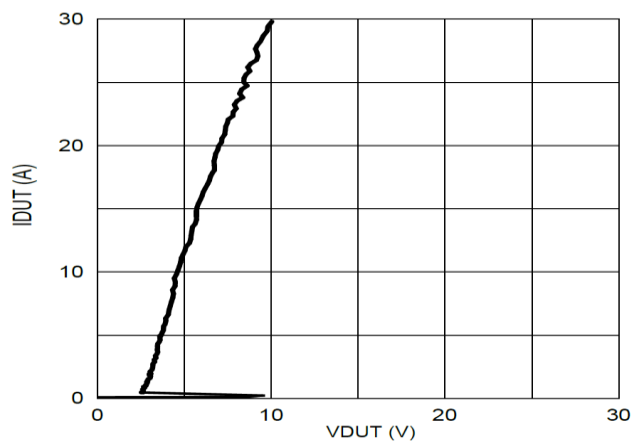


Fig.5 TRANSMISSION LINE PULSE ($t_p=100\text{ns}$)

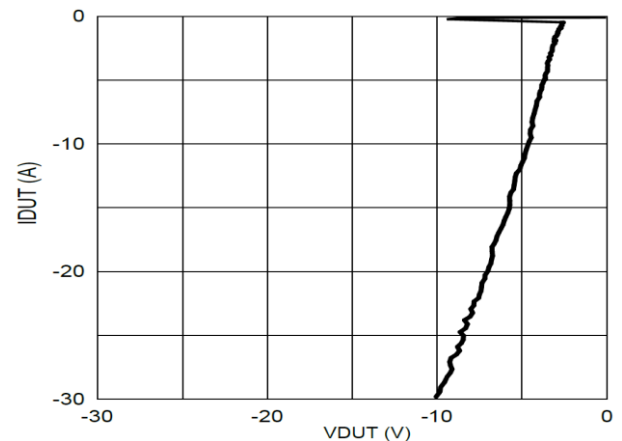


Fig.6 TRANSMISSION LINE PULSE ($t_p=100\text{ns}$)

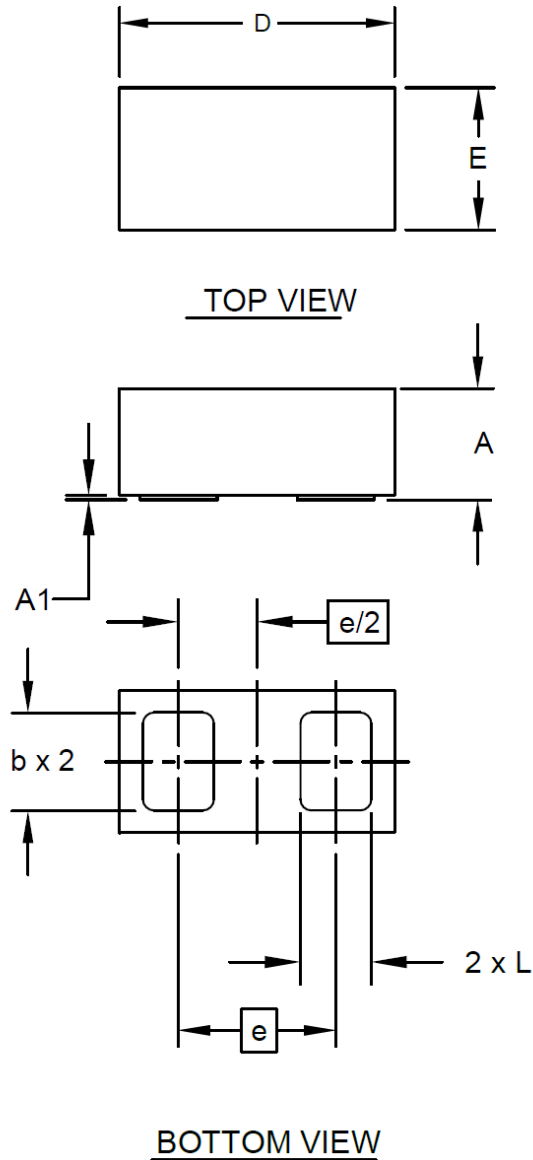
PINNING INFORMATION

SCHEMATIC DIAGRAM



PACKAGE INFORMATION

ECP0201



OUTLINE DIMENSIONS

SYMBOL	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.185	0.206	0.227	0.007	0.008	0.009
A1	0.000	0.010	0.050	0.000	0.000	0.002
b	0.200	0.220	0.240	0.008	0.009	0.009
D	0.590	0.615	0.640	0.023	0.024	0.025
E	0.290	0.315	0.340	0.011	0.012	0.013
e	0.355 BSC			0.014 BSC		
L	0.140	0.160	0.180	0.006	0.006	0.007

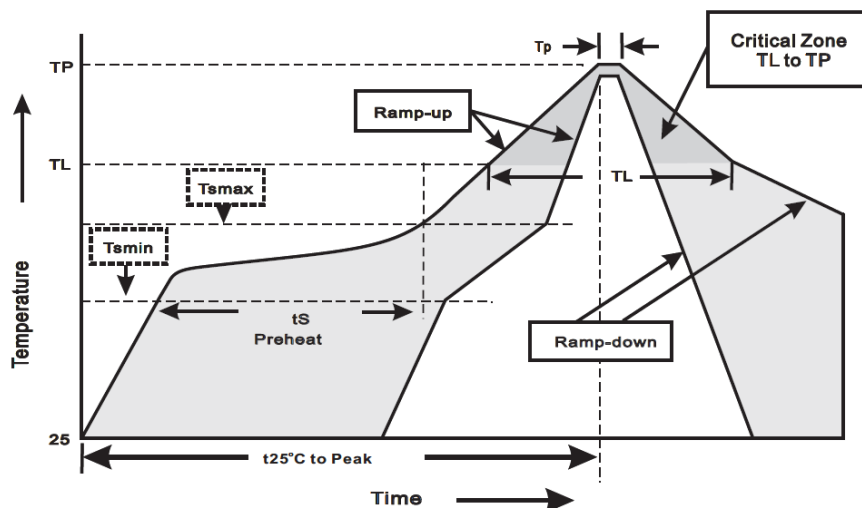
Note:

1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$

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...

ALPESU5VE0201SNC

ECP0201

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.

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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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