

ULTRA LOW CAPACITANCE ESD/TRANSIENT PROTECTION DIODE

DESCRIPTION:



The ALPESU5VD882 is an Ultra Low Capacitance ($C_j=0.3\text{pF}$ typ.) ESD / Transient Protection Diode with R2R + Zener technology and it has Low clamping voltage and low leakage current.

The ALPESU5VD882 is suited for USB3.0, DVI, HDMI DP and mobile link applications.

Uni-directional



FEATURES:

- 30Watts peak pulse power ($t_p = 8/20\mu\text{s}$)
- SOD-882 package
- Unidirectional configurations
- R2R + Zener technology
- Low clamping voltage
- Low leakage current
- Ultra-low capacitance ($C_j = 0.3\text{pF}$ typ.)
- IEC 61000-4-2 (ESD)
 - $\pm 10\text{kV}$ Contact Discharge
 - $\pm 18\text{kV}$ Air Discharge
- IEC 61000-4-4 (EFT)
 - 40A (5/50ns)
- IEC 61000-4-5 (Lightning)
 - 3A (8/20 μs)
- RoHS compliant

APPLICATIONS:

- USB3.0, Firewire, DVI, HDMI, S-ATA
- Thunderbolt, Display Port
- Mobile HDMI Link, MDDI, MIPI, SWP / NFC

MECHANICAL CHARACTERISTICS

- Epoxy: UL94-V0 rated flame retardant.
- Case: Molded plastic, SOD-882
- Terminals: Solder plated, solderable per MIL-STD-750, Method 2026

ABSOLUTE MAXIMUM RATINGS

MAXIMUM RATINGS @ $T_A = 25^\circ\text{C}$ unless otherwise specified			
PARAMETER	SYMBOL	VALUE	UNIT
Peak pulse power ($t_p=8/20\mu\text{s}$)	P_{PP}	30	W
Peak Pulse Current ($t_p=8/20\mu\text{s}$)	I_{PP}	3	A
ESD (IEC61000-4-2 air discharge)	V_{ESD}	± 18	kV
ESD (IEC61000-4-2 contact discharge)		± 10	
Operating Junction Temperature Range	T_J	-55 to +125	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ\text{C}$
Maximum Lead Solder Temperature (10 second duration)	T_L	260	$^\circ\text{C}$

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}			5.0	V
Reverse Breakdown Voltage	$I_T = 1\text{mA}$	V_{BR}	6.0		10.5	V
Reverse Leakage Current	$V_R = 5.0\text{V}$	I_R		<1	100	nA
Clamping Voltage (IEC 61000-4-5)	$I_{PP} = 3\text{A}$	V_C		10		V
Clamping Voltage (IEC 61000-4-2)	$V_{ESD} = 8\text{kV}$	V_C		15		V
Junction Capacitance	$V_R = 0\text{V}$, $f = 1\text{MHz}$	C_J		0.3		pF

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

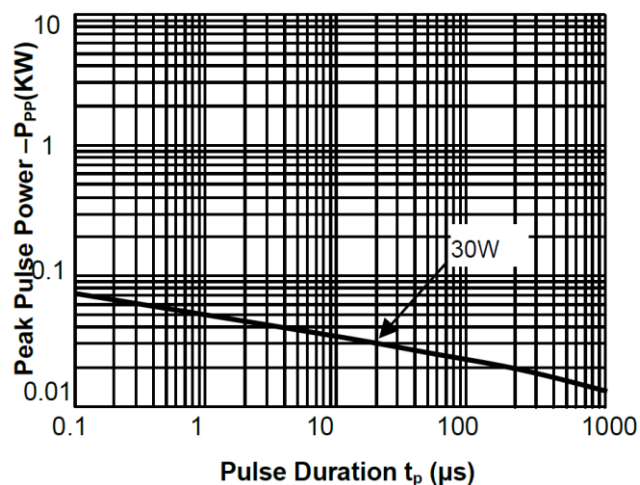


Fig.1 PEAK PULSE POWER RATING CURVE

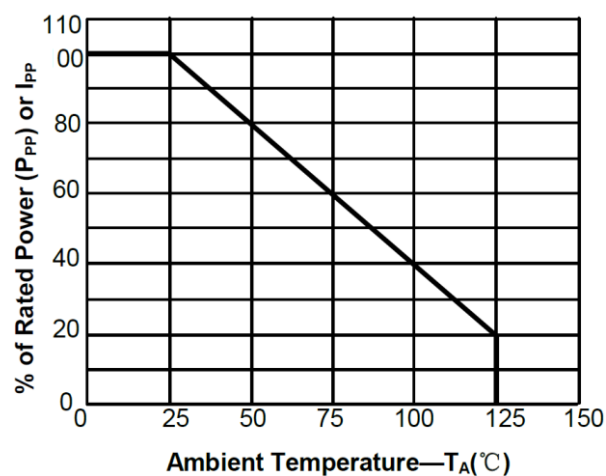


Fig.2 PULSE DERATING CURVE

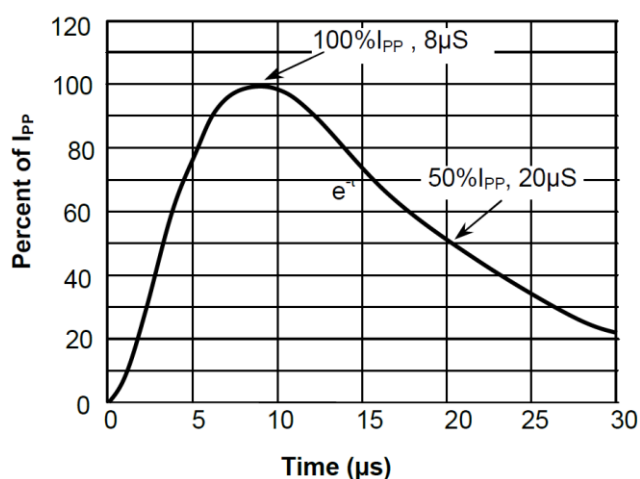


Fig.3 PULSE WAVEFORM-8/20μs

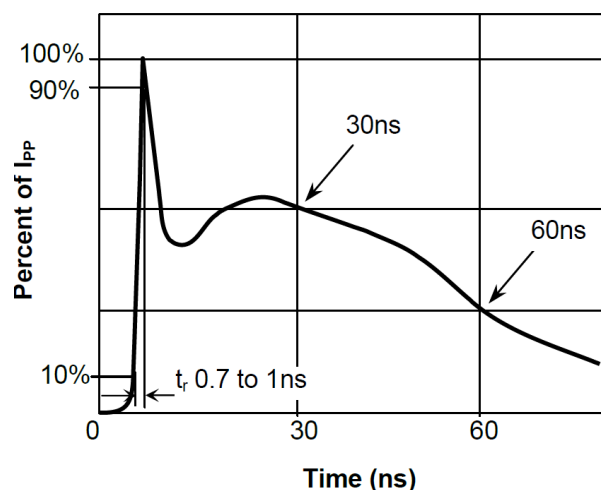


Fig.4 PULSE WAVEFORM-ESD(IEC61000-4-2)

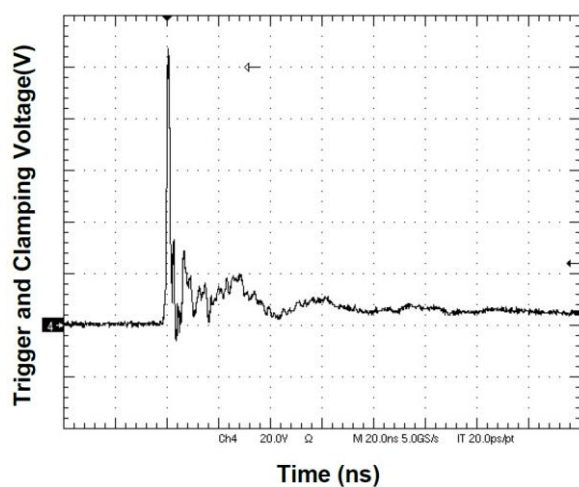


Fig.5 IEC61000-4-2 +8kV CONTACT DISCHARGE

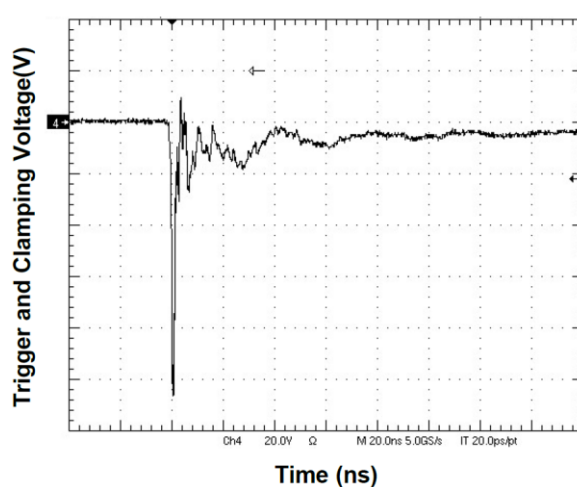


Fig.6 IEC61000-4-2 -8kV CONTACT DISCHARGE

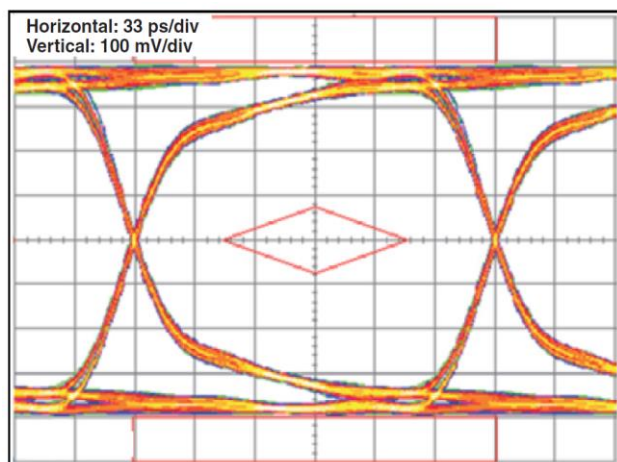


Fig.7 EYE DIAGRAM - USB3.0 MASK AT 5.0Gbps PER CHANNEL

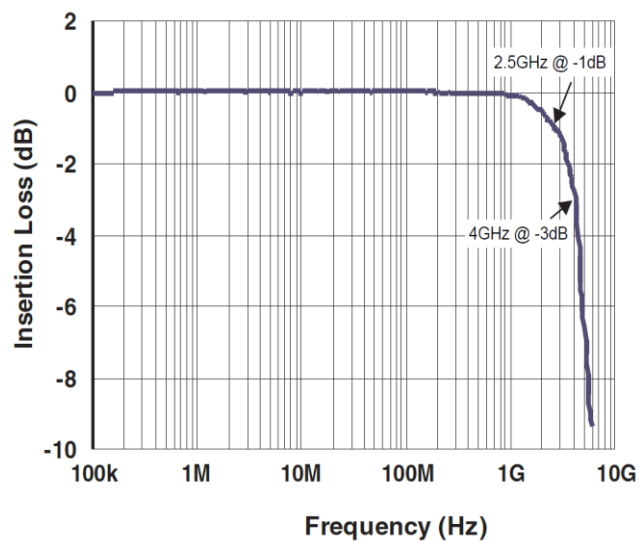


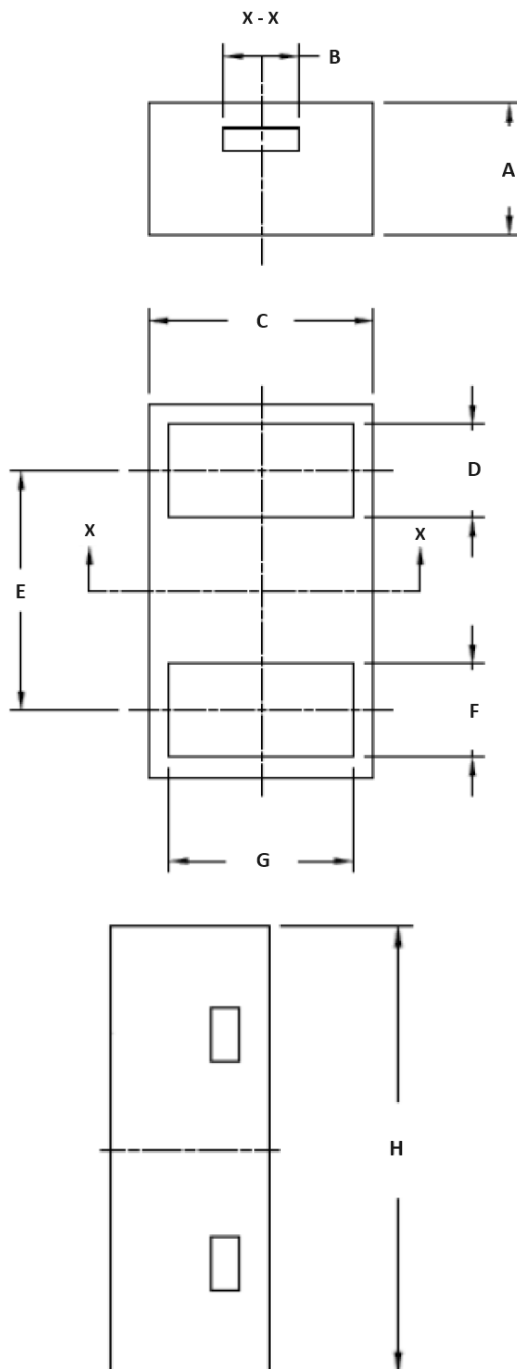
Fig.8 INSERTION LOSS S21 - I/O to GND

PINNING INFORMATION

SCHEMATIC DIAGRAM

Uni-directional



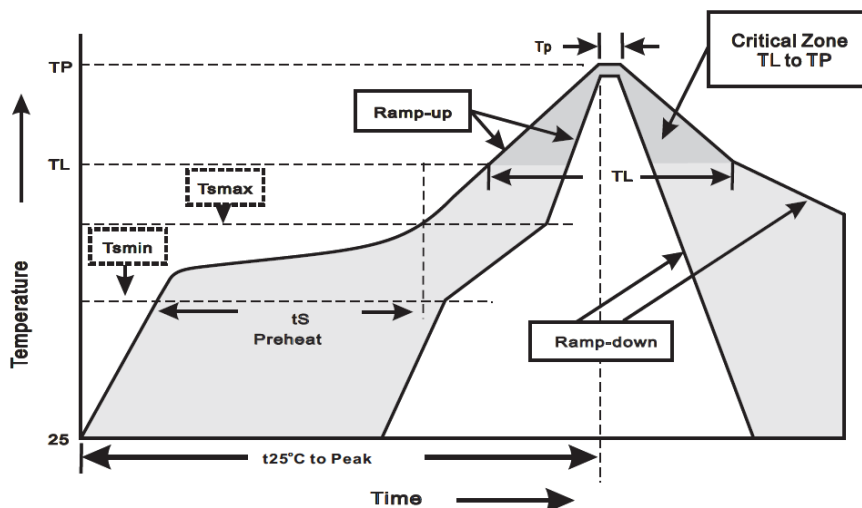
PACKAGE INFORMATION
SOD-882

OUTLINE DIMENSIONS

SYMBOL	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.45	0.50	0.018	0.020
B	0.20 Typ.		0.008 Typ.	
C	0.55	0.65	0.022	0.026
D	0.20	0.30	0.008	0.012
E	0.64 Typ.		0.025 Typ.	
F	0.20	0.30	0.008	0.012
G	0.44	0.54	0.017	0.021
H	0.95	1.05	0.037	0.041
Note: - Controlling dimension: in millimeters. - 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...

ALPESU5VD882

SOD-882

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).



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