

ESD PROTECTION DIODE

DESCRIPTION:



Uni-directional



The ALPES5VD1006 is an Ultra small SMD package ESD Protection Diode with Low clamping voltage and low leakage current.

The ALPES5VD1006 is suited for using in Cellular phones audio, MP3 players and Portable applications.

FEATURES:

- 130Watts peak pulse power ($t_p = 8/20\mu s$)
- Unidirectional configurations
- Solid-state silicon-avalanche technology
- Low clamping voltage
- Low leakage current
- IEC 61000-4-2 (ESD)
 - $\pm 30kV$ Contact Discharge
 - $\pm 30kV$ Air Discharge
- IEC 61000-4-4 (EFT)
 - 40A (5/50ns)
- IEC 61000-4-5 (Lightning)
 - 8.7A (8/20 μs)
- RoHS compliant

APPLICATIONS:

- Audio Line, Speaker, Headset, Microphone Protection
- Human Interface Devices (Keyboard, Touchpad, Buttons)
- DC Power Line Protection

MECHANICAL CHARACTERISTICS

- Epoxy: UL94-V0 rated flame retardant.
- Case: Molded plastic, DFN1006
- Terminals: Solder plated, solderable per MIL-STD-750, Method 2026

ORDERING PART NUMBER

PART NUMBER	ORDERING PART NUMBER
ALPES5VD1006	ALPES5VD1006-SM

ABSOLUTE MAXIMUM RATINGS

MAXIMUM RATINGS @ $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise specified			
PARAMETER	SYMBOL	VALUE	UNIT
Peak pulse power ($t_p=8/20\mu\text{s}$)	P_{PP}	130	W
Peak Pulse Current ($t_p=8/20\mu\text{s}$)	I_{PP}	8.7	A
ESD (IEC61000-4-2 air discharge)	V_{ESD}	± 30	kV
ESD (IEC61000-4-2 contact discharge)		± 30	
Operating Junction Temperature Range	T_J	-55 to +125	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 to +150	$^{\circ}\text{C}$

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	6.8	8.5	V
Reverse Leakage Current	$V_R = 5.0\text{V}$	I_R	-	-	1	μA
Clamping Voltage (IEC 61000-4-5)	$I_{PP} = 8.7\text{A}$, $t_p = 8/20\mu\text{s}$	V_C	-	12.3	15	V
Trigger Voltage (IEC 61000-4-2)	$V_{ESD} = 8\text{kV}$	V_T	-	90	-	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	-	53	-	pF

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

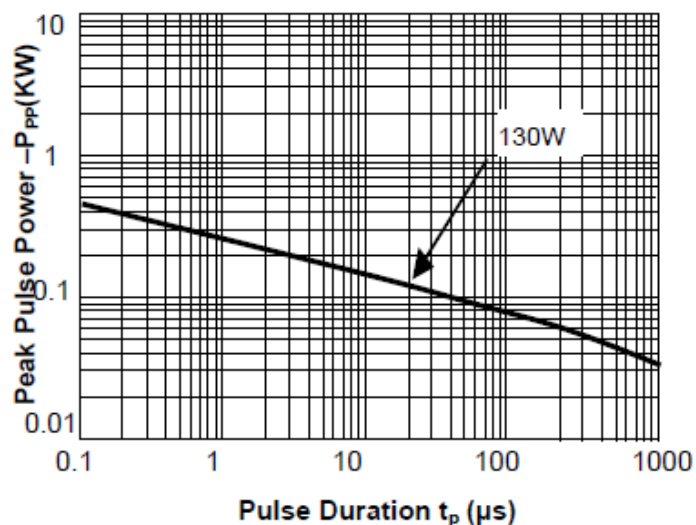


Fig.1 PEAK PULSE POWER RATING CURVE

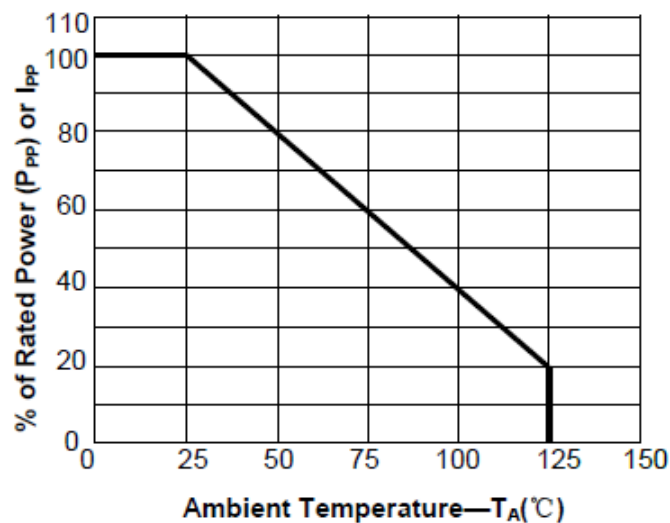


Fig.2 PULSE DERATING CURVE

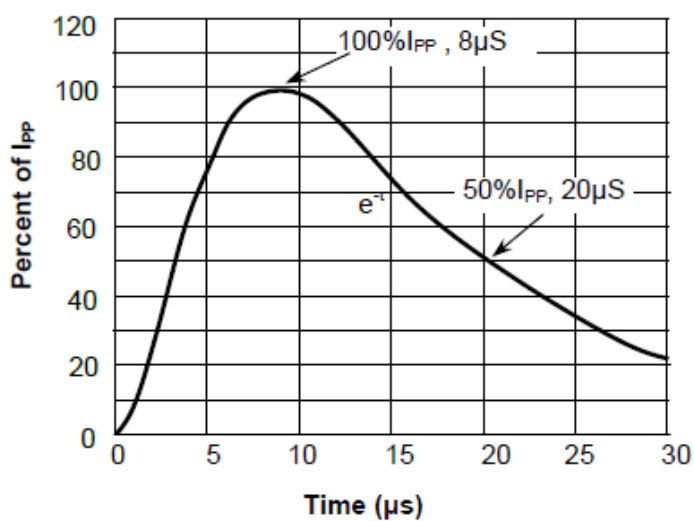


Fig.3 PULSE WAVEFORM-8/20 μs

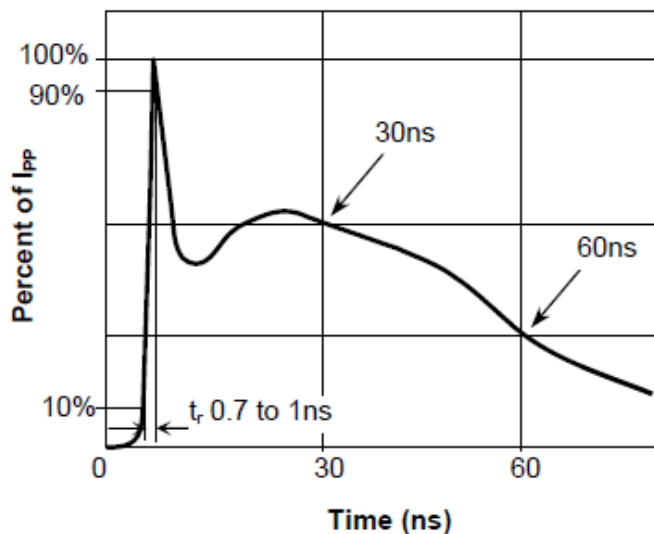


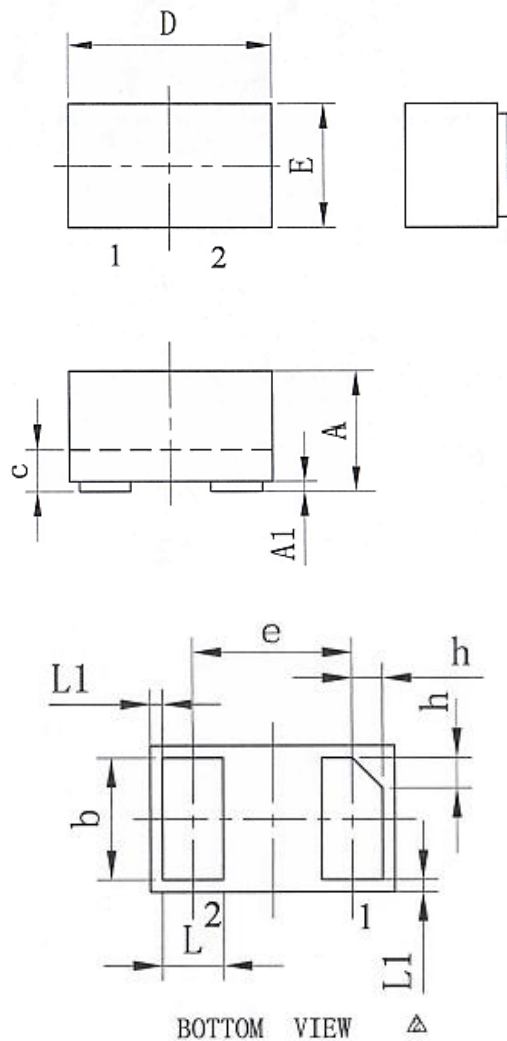
Fig.4 PULSE WAVEFORM-ESD(IEC61000-4-2)

PINNING INFORMATION

SCHEMATIC DIAGRAM

Uni-directional



PACKAGE INFORMATION
DFN1006

OUTLINE DIMENSIONS

SYMBOL	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.45	0.50	0.55	0.018	0.020	0.022
A1	0.00	0.02	0.05	0.000	0.001	0.002
b	0.45	0.50	0.55	0.018	0.020	0.022
c	0.12	0.15	0.18	0.005	0.006	0.007
D	0.95	1.00	1.05	0.037	0.039	0.041
e	0.65 BSC			0.026 BSC		
E	0.55	0.60	0.65	0.022	0.024	0.026
L	0.20	0.25	0.30	0.008	0.010	0.012
L1	0.05 REF			0.002 REF		
h	0.07	0.12	0.17	0.003	0.005	0.007

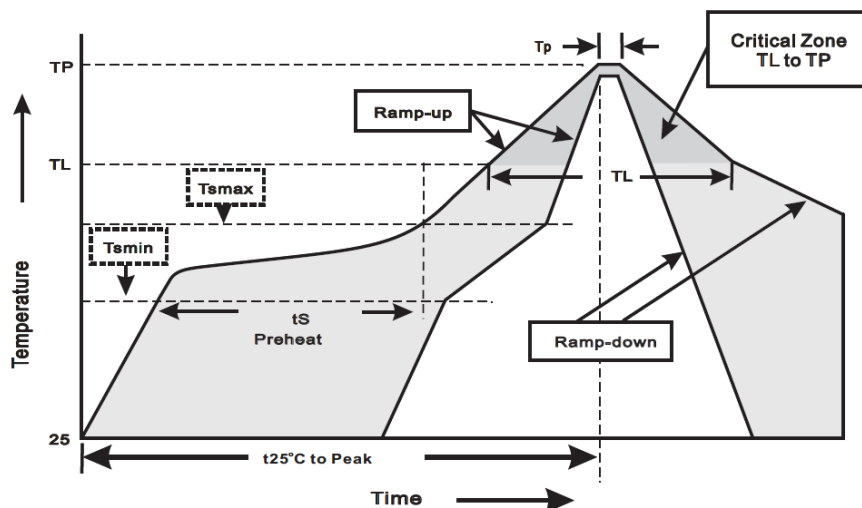
Note:

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...

ALPES5VD1006

DFN1006

CUSTOMER NOTE:

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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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