

5.0 VOLT ESD DIODE FOR GENERAL INTERFACES

DESCRIPTION:



The ALPES05VHD0603-2 is a 5.0 Volt ESD diode for General Interfaces is designed to protect voltage sensitive components from ESD and transient voltage events. Excellent clamping capability, low leakage, and fast response time.

The ALPES05VHD0603-2 is suited for using in cellular phones, portable devices, digital cameras, power supplies and many other portable applications.

FEATURES:

- IEC 61000-4-2 (ESD)
 - $\pm 25\text{kV}$ Contact Discharge
 - $\pm 25\text{kV}$ Air Discharge
- IEC 61000-4-5(Lightning)
 - 8A (8/20 μs)
- IEC 61000-4-4 EFT Protection
 - 40A (5/50ns)
- Halogen free and RoHS compliant
- Protects one directional I/O line
- Transient protection for high-speed data lines
- Low clamping voltage
- Low leakage current

APPLICATIONS:

- Cell Phone Handsets and Accessories
- Microprocessor based equipment
- Personal Digital Assistants
- Notebooks / Desktops / Servers
- Portable Instrumentation
- Peripherals & Pagers
- Switch Systems
- 10/100/1000 Ethernet
- WAN/LAN Equipment

MECHANICAL CHARACTERISTICS

- Epoxy: UL94-V0 rated flame retardant.
- Case: Molded plastic, DFN0603-2L
- Terminals: Solder plated, solderable per MIL-STD-750, Method 2026
- Mounting Position: Any.

ABSOLUTE MAXIMUM RATINGS

MAXIMUM RATINGS @ $T_A = 25^\circ\text{C}$ unless otherwise specified			
PARAMETER	SYMBOL	VALUE	UNIT
Peak pulse power ($t_p=8/20\mu\text{s}$) @25°C	P_{pk}	80	W
Peak pulse current ($t_p=8/20\mu\text{s}$) @25°C	I_{pp}	8	A
ESD (IEC61000-4-2 air discharge) @25°C	V_{ESD}	± 25	kV
ESD (IEC61000-4-2 contact discharge) @25°C	V_{ESD}	± 25	kV
Junction Temperature	T_J	+125	°C
Operating Temperature Range	T_{OP}	-40 to +125	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C
Lead Temperature	T_L	260	°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}	5.6			V
Reverse Leakage Current	$V_{RWM} = 5\text{V}$	I_R			1	μA
Clamping Voltage	$I_{PP} = 1\text{A}; t_p = 8/20\mu\text{s}$	V_C		8.0		V
	$I_{PP} = 8\text{A}; t_p = 8/20\mu\text{s}$			10.0		V
Junction Capacitance	I/O to GND; $V_R = 0\text{V}$; $f = 1\text{MHz}$	C_J		12		pF

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

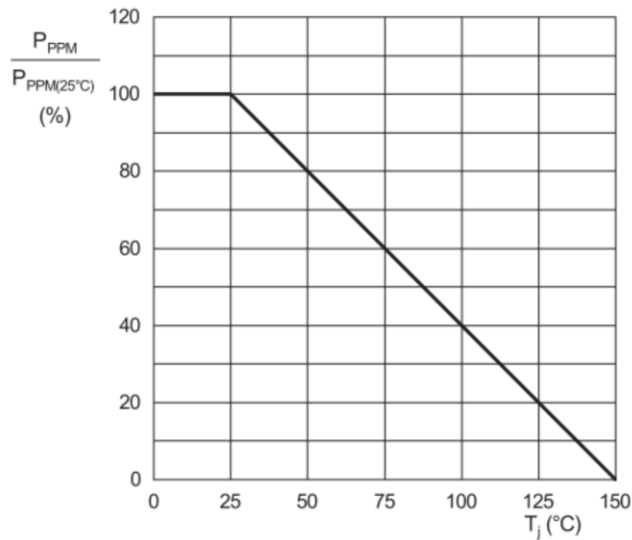


Fig.1 PEAK PULSE POWER DERATING CURVE

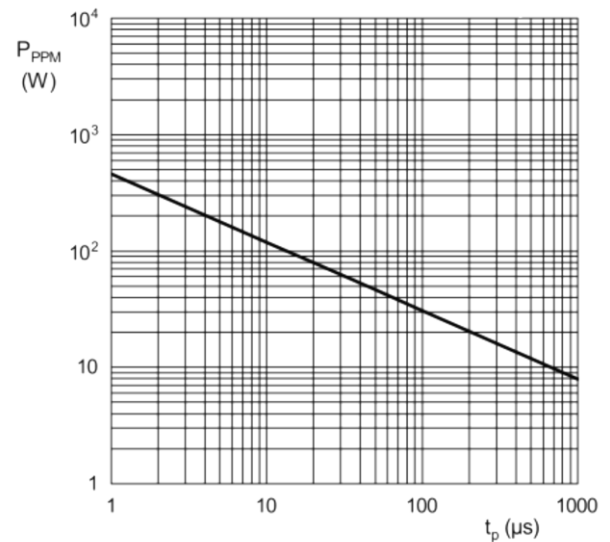


Fig.2 PEAK PULSE POWER VS. PULSE TIME

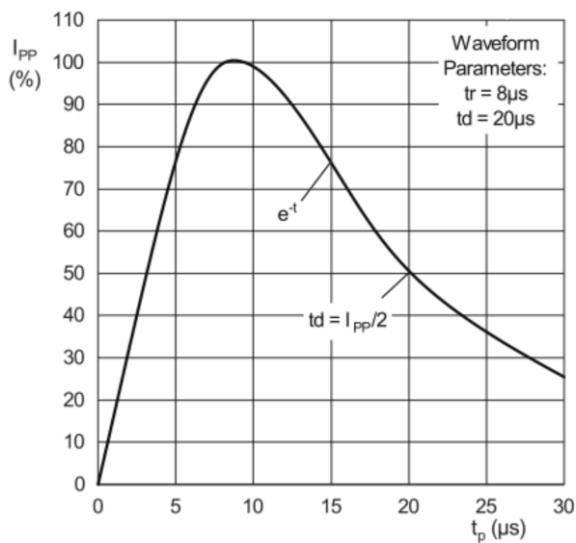


Fig.3 PULSE WAVEFORM

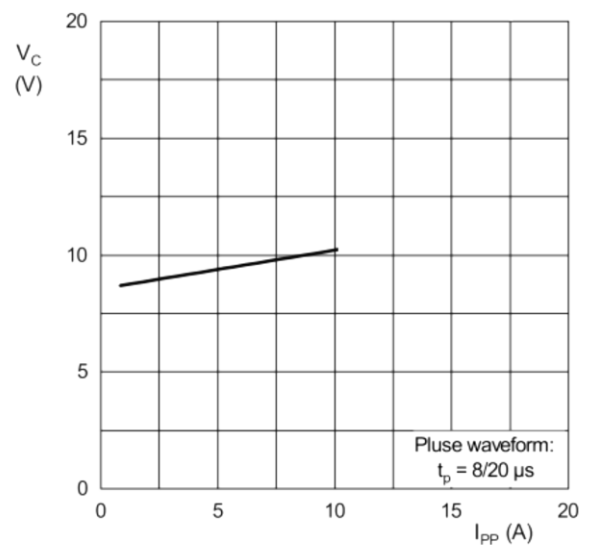
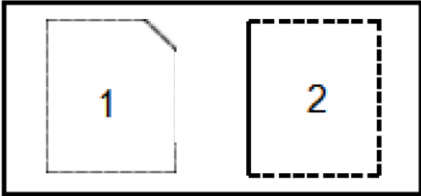
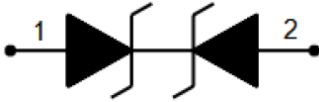


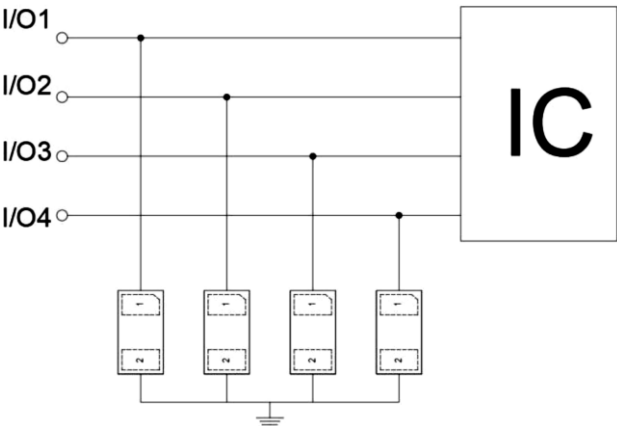
Fig.4 CLAMP VOLTAGE VS. CURRENT

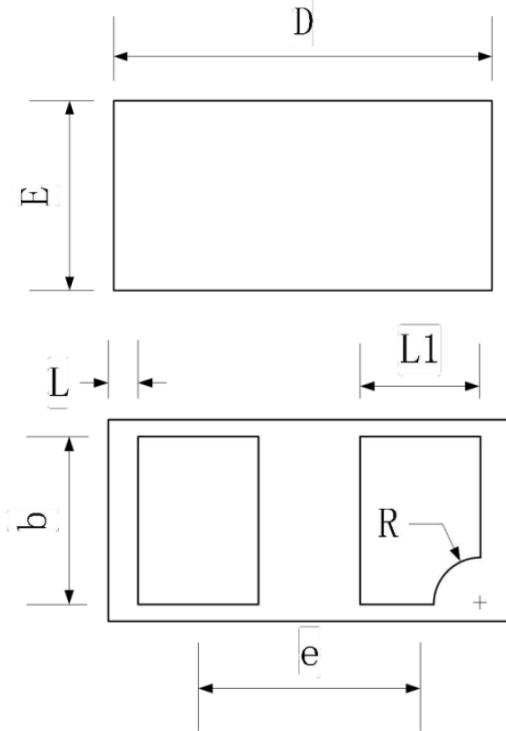
PINNING INFORMATION

PIN	NAME	DESCRIPTION	SIMPLIFIED OUTLINE	CIRCUIT DIAGRAM
1	IO1	Connect to IO		
2	IO2	Connect to IO		

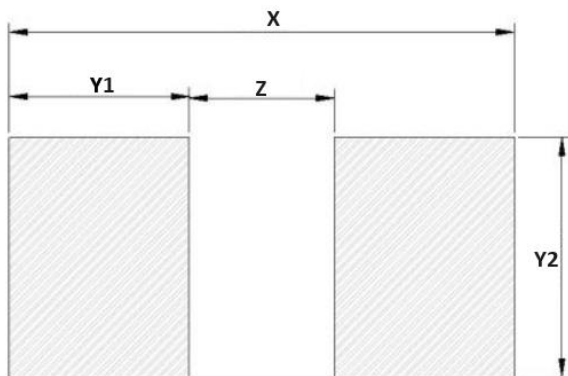
APPLICATIONS INFORMATION

Typical Interface Application



PACKAGE INFORMATION
DFN0603-2L


OUTLINE DIMENSIONS						
SYMBOL	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
D	0.570	0.600	0.635	0.022	0.024	0.025
E	0.270	0.300	0.330	0.011	0.012	0.013
b	0.210	0.250	0.280	0.008	0.010	0.011
e	0.350 BSC			0.014 BSC		
L	0.030	0.045	0.060	0.001	0.002	0.002
L1	0.180 BSC			0.007 BSC		
R	0.050	0.076	0.150	0.002	0.003	0.006
Note: 1. Controlling dimension: in millimeters. 2. General tolerance: $\pm 0.05\text{mm}$						

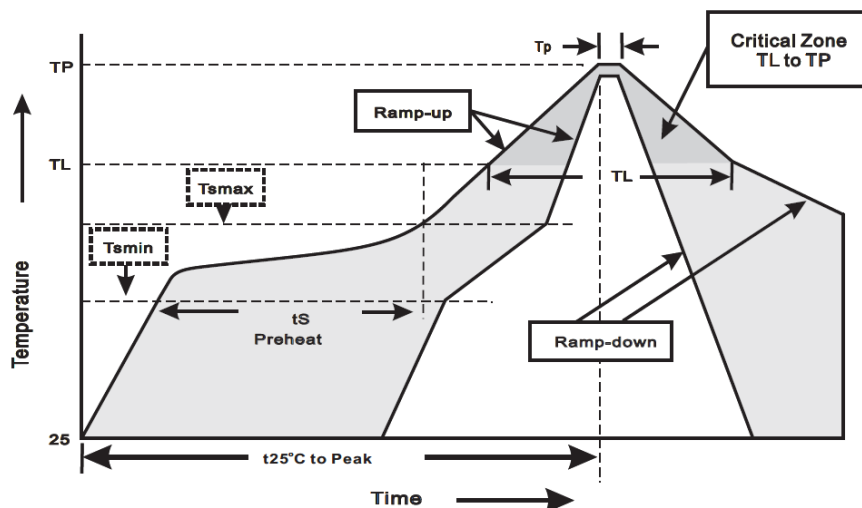
SUGGESTED SOLDER PAD LAYOUT


OUTLINE DIMENSIONS		
SYMBOL	MILLIMETERS	INCHES
X	0.380	0.015
Y1	0.230	0.009
Y2	0.300	0.012
Z	0.150	0.006

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...

ALPES05VHD0603-2

DFN0603-2L

CUSTOMER NOTE:

DISCLAIMER

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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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