# SuperESD – ESDALC6V1-1U2-ES

## 1. Description

The ESDALC6V1-1U2-ES is an low capacitance TVS designed to protect high speed data interface. It has been specifically designed to protect sensitive electronic components which are connected to data and transmission lines from over-stress caused by ESD. The ESDALC6V1-1U2-ES incorporates one pair of low capacitance steering diodes plus a TVS diode.

## 2. Features

- IEC 61000-4-2 Level 4 ESD Protection
  - ±20kV Contact Discharge
  - ±20kV Air Discharge
- 60W Peak pulse Power (8/20us)
- Low clamping voltage
- Working voltage: 5V
- Low leakage current
- RoHS compliant
- Protecting one Uni-directional line
- Junction capacitance: 0.5pF Typ.

## 3. Applications

- USB 2.0/3.0
- 10/100/1000 Ethernet
- Monitors and Flat Panel Displays
- Notebook Computers
- SIM ports
- ATM interface

## 4. Ordering Information

| Part Number | Package | Marking | Material | Packing | Quantity per reel | Flammability Rating | Reel Size |
|---|---|---|---|---|---|---|---|
| ESDALC6V1-1U2-ES | DFN0603-2L | \|L5 | Halogen free | Tape & Reel | 10,000 PCS | UL 94V-0 | 7 inches |

Table-1 Ordering information

## 5. Pin Configuration and Functions

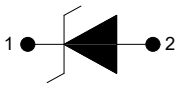
| Pin | Name | Description | Outline | Circuit Diagram |
|---|---|---|---|---|
| 1 | IO | Connect to IO |   |   |
| 2 | GND | Connect to GND | | |

Table-2 Pin configuration

## 6. Specification

### 6.1. Absolute Maximum rating

Over operating free-air temperature range (unless otherwise noted)

| Parameters | Symbol | Min. | Max. | Unit |
|---|---|---|---|---|
| Peak pulse power (tp=8/20us)@25℃ | $P_{pk}$ | - | 60 | W |
| Peak pulse current (tp=8/20us)@25℃ | $I_{PP}$ | | 4.0 | A |
| ESD (IEC61000-4-2 air discharge) @25℃ | $V_{ESD}$ | - | ±20 | kV |
| ESD (IEC61000-4-2 contact discharge) @25℃ | $V_{ESD}$ | - | ±20 | kV |
| Junction temperature | $T_J$ | - | 150 | ℃ |
| Operating temperature | $T_{OP}$ | -40 | 125 | ℃ |
| Storage temperature | $T_{STG}$ | -55 | 150 | ℃ |
| Lead temperature | $T_L$ | - | 260 | ℃ |

Table-3 Absolute Maximum rating

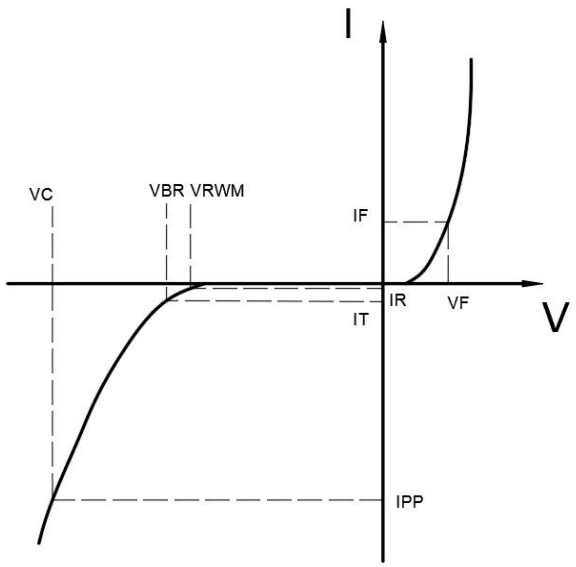
## 6.2. Electrical Characteristics

At TA = 25℃ unless otherwise noted

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| Reverse Stand-off Voltage | $V_{RWM}$ | | | | 5.0 | V |
| Reverse Breakdown Voltage | $V_{BR}$ | IT=1mA | 6.0 | | | V |
| Reverse Leakage Current | $I_R$ | $V_{RWM}$=5V | | | 1.0 | uA |
| Clamping Voltage | $V_C$ | $I_{PP}$=1A; tp=8/20us | | 8.0 | 9.5 | V |
| Clamping Voltage | $V_C$ | $I_{PP}$=4A; tp=8/20us | | 10.5 | 13.0 | V |
| Junction Capacitance | $C_J$ | I/O to GND; VR=0V; f=1MHz | | 0.5 | 0.6 | pF |

Table-4 Electrical Characteristics

| Symbol | Parameters |
|---|---|
| $V_{RWM}$ | Peak Reverse Working Voltage |
| $I_R$ | Reverse Leakage Current @ $V_{RWM}$ |
| $V_{BR}$ | Breakdown Voltage @ $I_T$ |
| $I_T$ | Test Current |
| $I_{PP}$ | Maximum Reverse Peak Pulse Current |
| $V_C$ | Clamping Voltage @ $I_{PP}$ |
| $I_F$ | Forward Current |
| $V_F$ | Forward Voltage @ $I_F$ |



## 7. Typical Characteristic

Figure1: Clamping Voltage vs. Peak Pulse Current

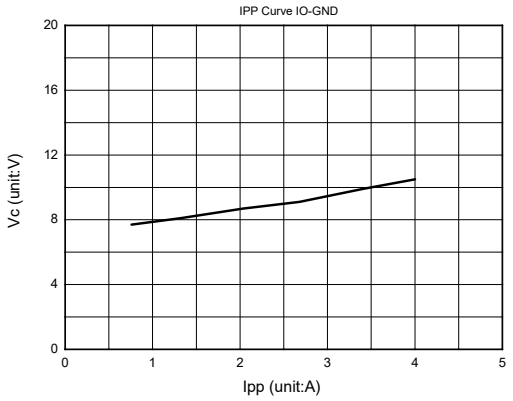



Figure2: Junction Capacitance vs, Reverse Voltage

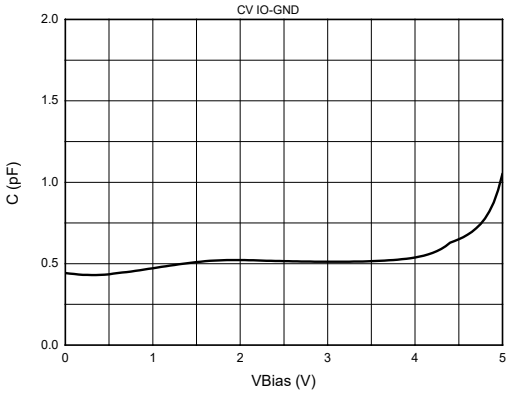
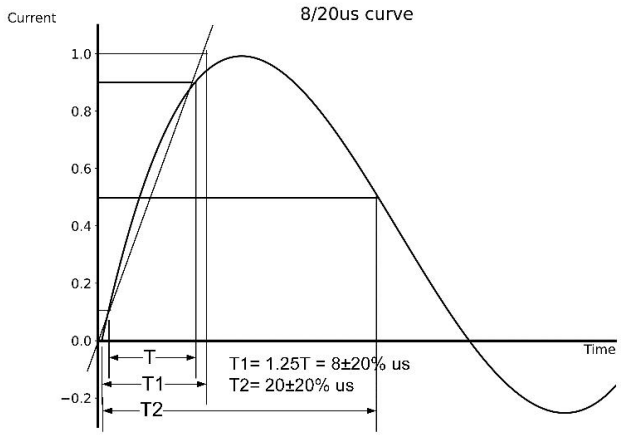
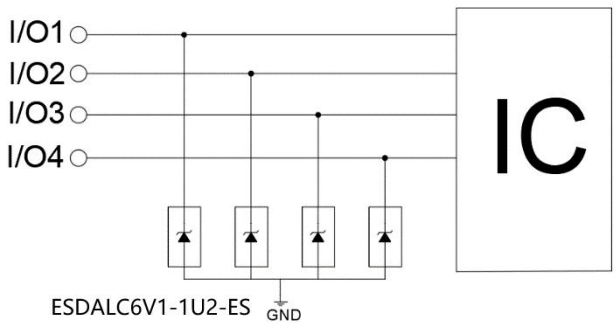



Figure3: 8 X 20us Pulse Waveform



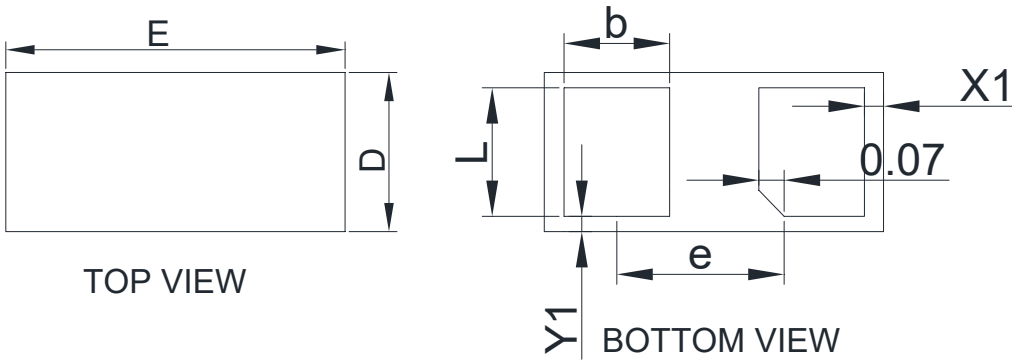

## 8. Typical Application



Typical Interface Application

## 9. Dimension (DFN0603-2L)

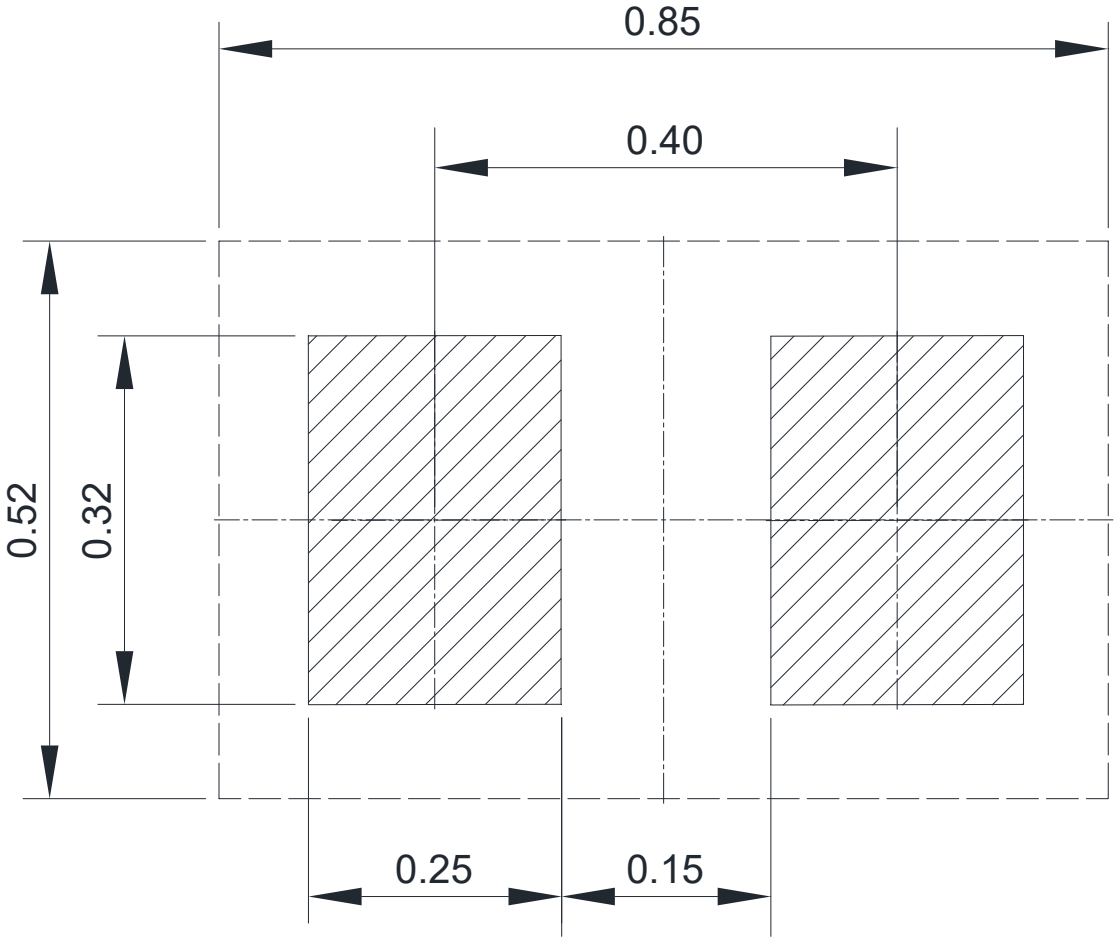
### POD(A)





| COMMON DIMENSIONS CUNITS MEASURE=MILLIMETER | | | | | | | |
|---|---|---|---|---|---|---|---|
| SYMBOL | MIN | MID | MAX | SYMBOL | MIN | MID | MAX |
| A | 0.280 | 0.300 | 0.320 | e | | 0.380 | |
| D | 0.250 | 0.300 | 0.350 | L | 0.210 | 0.230 | 0.250 |
| E | 0.550 | 0.600 | 0.650 | X1 | 0.02 | | 0.05 |
| b | 0.165 | 0.190 | 0.215 | Y1 | 0.02 | | 0.05 |

## 10. Recommended Soldering Footprint




DIMENSIONS: MILLIMETERS

## DISCLAIMER

ELECSUPER PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, SAFETY INFORMATION, AND OTHER RESOURCES “AS IS” AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with ElecSuper products. You are solely responsible for
(1) selecting the appropriate ElecSuper products for your application;
(2) designing, validating and testing your application;
(3) ensuring your application meets applicable standards, and any other safety, security, or other requirements.
These resources are subject to change without notice. ElecSuper grants you permission to use these resources only for development of an application that uses the ElecSuper products described in the resource. Other reproduction and display of these resources are prohibited. No license is granted to any other ElecSuper intellectual property right or to any third party intellectual property right. ElecSuper disclaims responsibility for, and you will fully indemnify ElecSuper and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources. ElecSuper’s products are provided subject to ElecSuper’s Terms of Sale or other applicable terms available either on www.elecsuper.com or provided in conjunction with such ElecSuper products. ElecSuper’s provision of these resources does not expand or otherwise alter ElecSuper’s applicable warranties or warranty disclaimers for ElecSuper products.