



## JLE05URD2-3

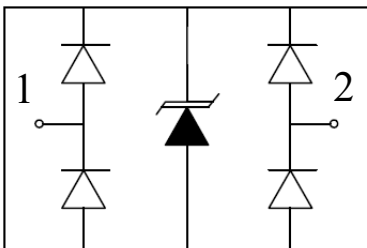
### 2-Line Uni-directional TVS Diode

Jialan-Microelectronics

## Description

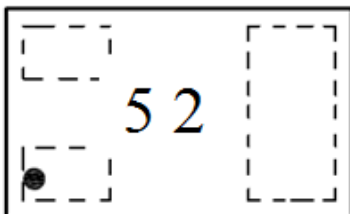
The JLE05URD2-3 is a uni-directional TVS diode, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive high-speed data lines. The JLE05URD2-3 has an ultra-low capacitance with a typical value at 0.6pF, and complies with the IEC 61000-4-2 (ESD) standard with  $\pm 20\text{kV}$  air and  $\pm 15\text{kV}$  contact discharge. It is assembled into an ultra-small 1.0x0.6x0.5mm lead-free DFN package. The small size, ultra-low capacitance and high ESD surge protection make JLE05URD2-3 an ideal choice to protect cell phone, digital video interfaces and other high speed ports.

## Circuit Diagram



Circuit Diagram

## Marking Diagram



Transparent top view

52:Device Marking Code

Dot denotes Pin1

## Features

- \* Ultra low capacitance: 0.6pF typical
- \* Ultra low leakage:  $\mu\text{A}$  level
- \* Operating voltage: 5V
- \* Low clamping voltage
- \* 3-pin leadless package
- \* Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
    - Air discharge:  $\pm 20\text{kV}$
    - Contact discharge:  $\pm 15\text{kV}$
  - IEC61000-4-5 (Lightning) 4A (8/20 $\mu\text{s}$ )
- \* RoHS Compliant
- \* Lead Finish: NiPdAu
- \* Package: 1.0x0.6x0.5mm

## Applications

- \* Smart phones
- \* Display Ports
- \* MDDI Ports
- \* USB Ports
- \* Digital Video Interface (DVI)
- \* PCI Express and Serial SATA Ports

## Ordering Information

| Part Number | Packaging         | Reel Size |
|-------------|-------------------|-----------|
| JLE05URD2-3 | 10000/Tape & Reel | 7 inch    |



## JLE05URD2-3

### Absolute Maximum Ratings ( $T_A=25^{\circ}\text{C}$ unless otherwise specified)

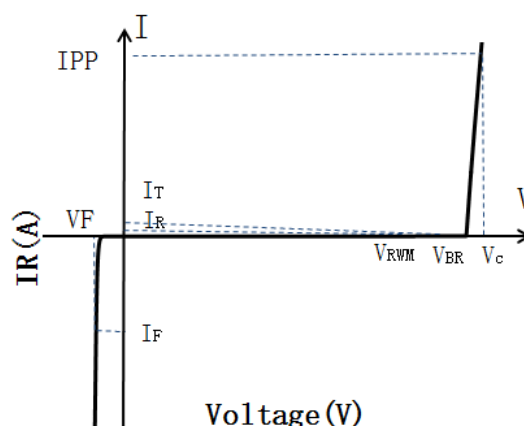
| Parameter                                | Symbol | Value       | Unit               |
|------------------------------------------|--------|-------------|--------------------|
| Peak Pulse Power (8/20 $\mu\text{s}$ )   | Ppk    | 80          | W                  |
| Peak Pulse Current (8/20 $\mu\text{s}$ ) | IPP    | 4           | A                  |
| ESD per IEC 61000-4-2 (Air)              | VESD   | $\pm 20$    | kV                 |
| ESD per IEC 61000-4-2 (Contact)          |        | $\pm 15$    |                    |
| Operating Temperature Range              | TJ     | -55 to +125 | $^{\circ}\text{C}$ |
| Storage Temperature Range                | Tstg   | -55 to +150 | $^{\circ}\text{C}$ |

### Electrical Characteristics ( $T_A=25^{\circ}\text{C}$ unless otherwise specified)

| Parameter               | Symbol           | Test Condition                                           | Min | Typ | Max | Unit          |
|-------------------------|------------------|----------------------------------------------------------|-----|-----|-----|---------------|
| Reverse Working Voltage | $V_{\text{RWM}}$ |                                                          |     |     | 5.0 | V             |
| Breakdown Voltage       | $V_{\text{BR}}$  | $I_{\text{T}} = 1\text{mA}$                              | 6.0 | 7.5 | 8.5 | V             |
| Reverse Leakage Current | $I_{\text{R}}$   | $V_{\text{RWM}} = 5.0\text{V}$                           |     |     | 0.5 | $\mu\text{A}$ |
| Clamping Voltage        | $V_{\text{C}}$   | $I_{\text{PP}} = 1\text{A}$ (8 x 20 $\mu\text{s}$ pulse) |     |     | 10  | V             |
| Clamping Voltage        | $V_{\text{C}}$   | $I_{\text{PP}} = 4\text{A}$ (8 x 20 $\mu\text{s}$ pulse) |     |     | 16  | V             |
| Junction Capacitance    | $C_{\text{J}}$   | $V_{\text{R}} = 0\text{V}$ , $f = 1\text{MHz}$           |     | 0.6 | 0.8 | pF            |

### Portion Electronics Parameter

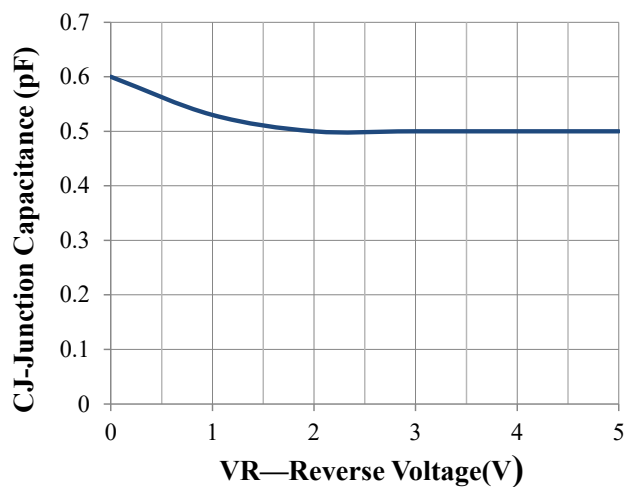
| Symbol          | Parameter                          |
|-----------------|------------------------------------|
| $I_{\text{T}}$  | Test Current                       |
| $I_{\text{PP}}$ | Maximum Reverse Peak Pulse Current |
| $V_{\text{C}}$  | Clamping Voltage @ $I_{\text{C}}$  |



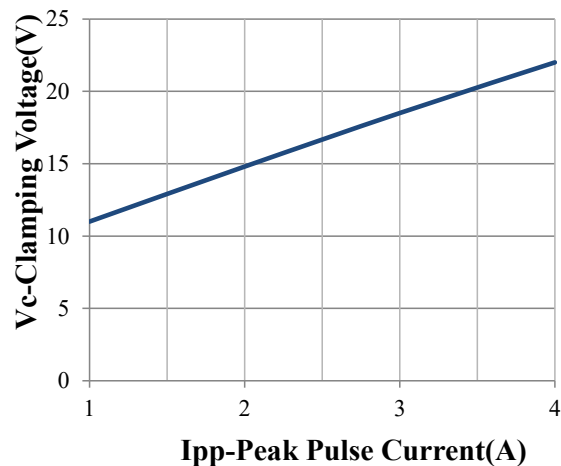


## JLE05URD2-3

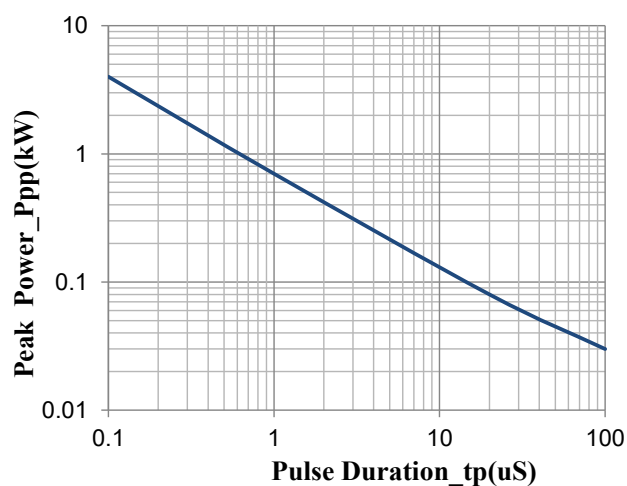
### Typical Performance Characteristics ( $T_A=25^{\circ}\text{C}$ unless otherwise Specified)



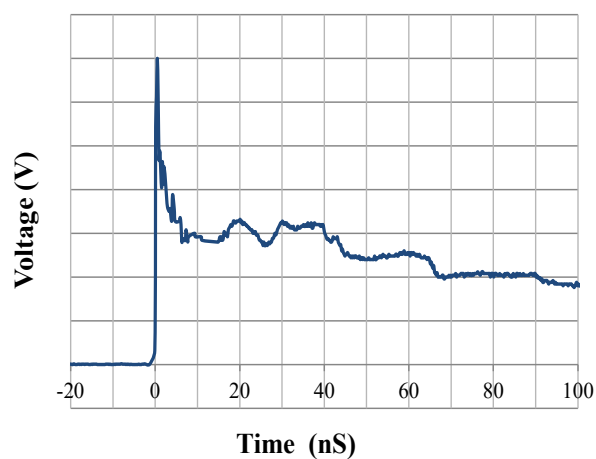
Junction Capacitance vs. Reverse Voltage



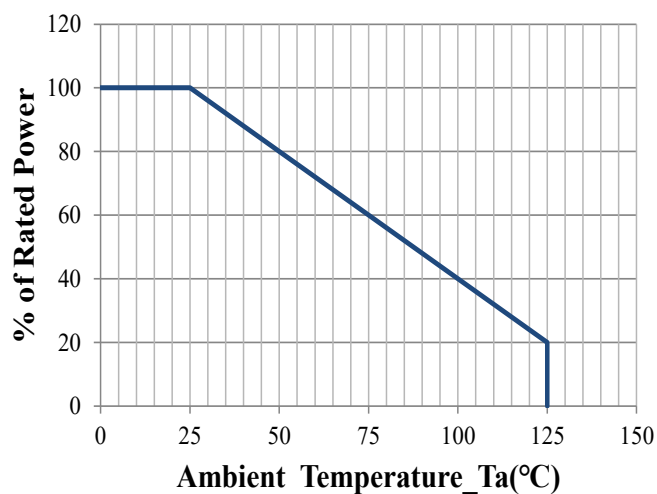
Clamping Voltage vs. Peak Pulse Current



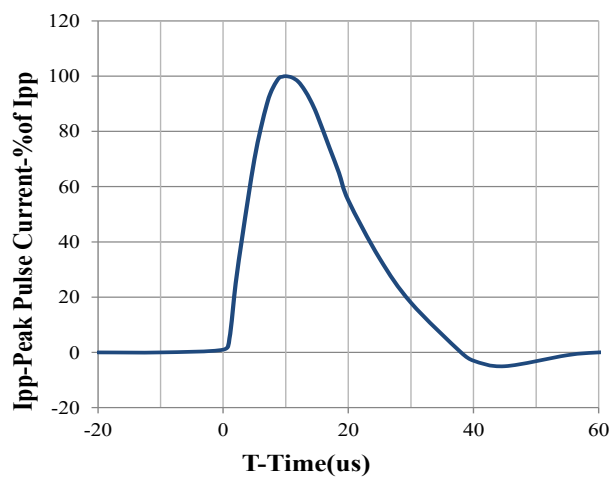
Peak Pulse Power vs. Pulse Time



IEC61000-4-2 Pulse Waveform



Power Derating Curve

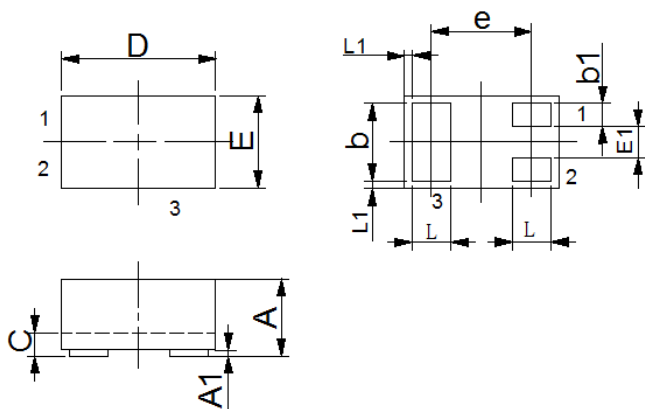


8 X 20us Pulse Waveform



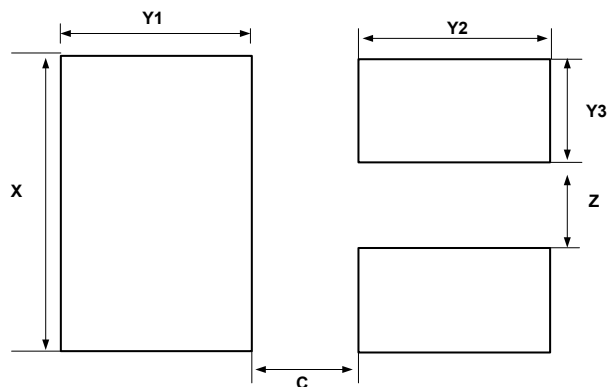
## JLE05URD2-3

### DFN1006-3 Package Outline Drawing



| SY | DIMENSIONS  |      |      |            |       |       |
|----|-------------|------|------|------------|-------|-------|
|    | 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 |
| b1 | 0.10        | 0.15 | 0.20 | 0.004      | 0.006 | 0.008 |
| 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 |
| E1 | 0.15        | 0.20 | 0.25 | 0.006      | 0.008 | 0.010 |
| L  | 0.20        | 0.25 | 0.30 | 0.008      | 0.010 | 0.012 |
| L1 | 0.05 REF    |      |      | 0.0002 REF |       |       |

### Suggested Land Pattern



| SYM | DIMENSIONS  |        |
|-----|-------------|--------|
|     | MILLIMETERS | INCHES |
| C   | 0.25        | 0.010  |
| X   | 0.65        | 0.024  |
| Y1  | 0.50        | 0.020  |
| Y2  | 0.50        | 0.020  |
| Y3  | 0.25        | 0.010  |
| Z   | 0.20        | 0.008  |

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