

# ESD11D5.0C

1-Line Bidirectional ESD Protection Diode

## General description

The ESD11D5.0C is a bi-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 data and power line. The ESD11D5.0C complies with the IEC 61000-4-2 (ESD) standard with  $\pm 30$  KV air and  $\pm 30$  KV contact discharge. It is assembled into an ultra-small 0.6x0.3x0.3mm lead-free 0201 package. The small size and high ESD surge protection make ESD11D5.0C an ideal choice to protect cell phone, digital cameras, audio players and many other portable applications.

## Features and benefits

- Ultra small SMD package
- Bidirectional ESD protection of one line
- Femtofarad capacitance:  $C_j = 15\text{pF}$  (Typ)
- Complies with following standards: IEC 61000-4-2 (ESD) immunity test Air discharge:  $\pm 30\text{KV}$ , Contact discharge:  $\pm 30\text{KV}$
- RoHS Compliant

## Application information

- Cellular Handsets and Accessories
- Personal Digital Assistants
- Notebooks and Handhelds
- Keypads, Side Keys, LCD Displays

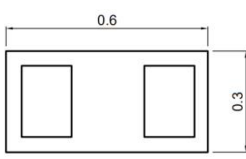
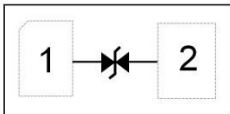
DFN0603-2L



## Ordering information

| Device     | Package    | Marking | Packaging         |
|------------|------------|---------|-------------------|
| ESD11D5.0C | DFN0603-2L | A       | 10000/Tape & Reel |

## Schematic & Pin configuration

| Mimensions                                                                                      | Circuit Diagram                                                                      |
|-------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|  <p>(mm)</p> |  |

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

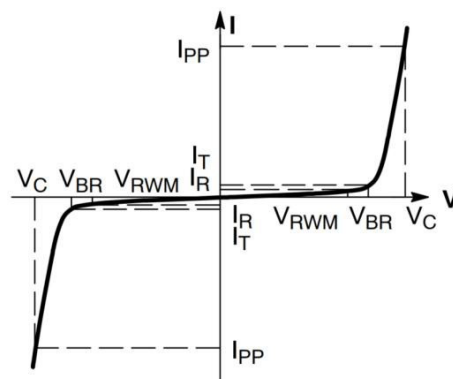
| Parameter                                              | Symbol    | Value       | Unit             |
|--------------------------------------------------------|-----------|-------------|------------------|
| Peak Pulse Power ( $T_p = 8/20\ \mu\text{s}$ )         | $P_{PK}$  | 90          | W                |
| Rated Peak Pulse Current ( $T_p = 8/20\ \mu\text{s}$ ) | $I_{PP}$  | 9.0         | A                |
| Maximum lead temperature for soldering during 10s      | $T_L$     | 260         | $^\circ\text{C}$ |
| Storage Temperature Range                              | $T_{stg}$ | -55 to +150 | $^\circ\text{C}$ |
| Operating Temperature Range                            | $T_{OP}$  | -40 to +125 | $^\circ\text{C}$ |
| ESD voltage IEC 61000-4-2 (air discharge)              | $V_{ESD}$ | 30          | kV               |
| ESD voltage IEC 61000-4-2 (contact discharge)          | $V_{ESD}$ | 30          | kV               |

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

| Parameter                  | Symbol    | Min | Typ  | Max  | Unit          | Condition                                       |
|----------------------------|-----------|-----|------|------|---------------|-------------------------------------------------|
| Reverse Working Voltage    | $V_{RWM}$ | --  | --   | 5.0  | V             |                                                 |
| Breakdown Voltage          | $V_{BR}$  | 6.0 | 6.5  | 8.5  | V             | $I_T = 1\text{mA}$                              |
| Leakage Current $I_{Leak}$ | $I_R$     | --  | --   | 0.1  | $\mu\text{A}$ | $V_{RWM} = 5\text{V}$                           |
| Clamping Voltage           | $V_C$     | --  | 6.5  | --   | V             | $I_{PP} = 1.0\text{A}, T_p = 8/20\ \mu\text{s}$ |
| Clamping Voltage           | $V_C$     | --  | 9.0  | 10.0 | V             | $I_{PP} = 9.0\text{A}, T_p = 8/20\ \mu\text{s}$ |
| Dynamic Resistance         | $R_{DYN}$ | --  | 0.2  | --   | $\Omega$      | $TLP = 0.2/100\text{ns}$                        |
| Junction Capacitance       | $C_J$     | --  | 15.0 | 20.0 | pF            | $V_R = 0\text{V}, f = 1\text{MHz}$              |

## Portion Electronics Parameter

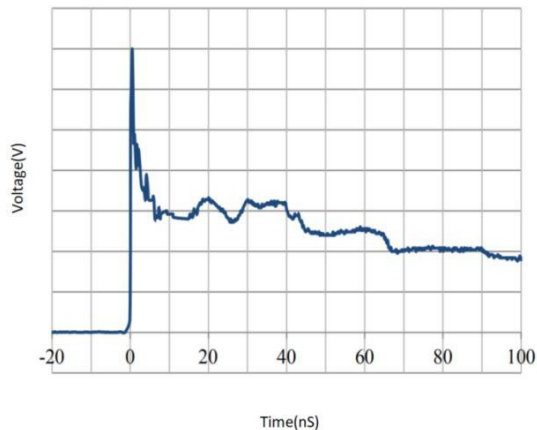
| Symbol    | Parameter                                   |
|-----------|---------------------------------------------|
| $I_{PP}$  | Maximum Reverse Peak Pulse Current          |
| $V_C$     | Clamping Voltage @ $I_{PP}$                 |
| $V_{RWM}$ | Working Peak Reverse Voltage                |
|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



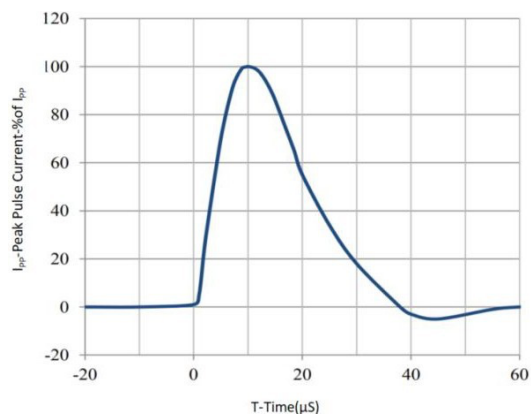
# ESD11D5.0C

1-Line Bidirectional ESD Protection Diode

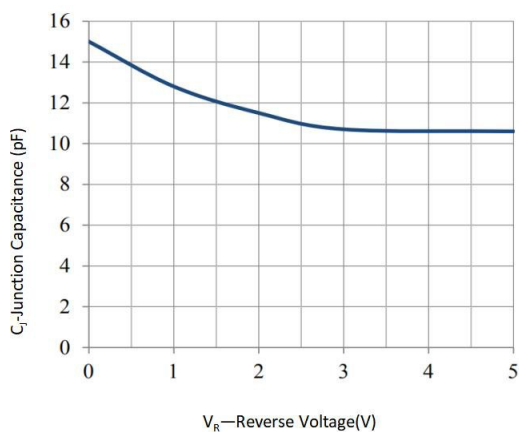
## Typical Performance Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise Specified)



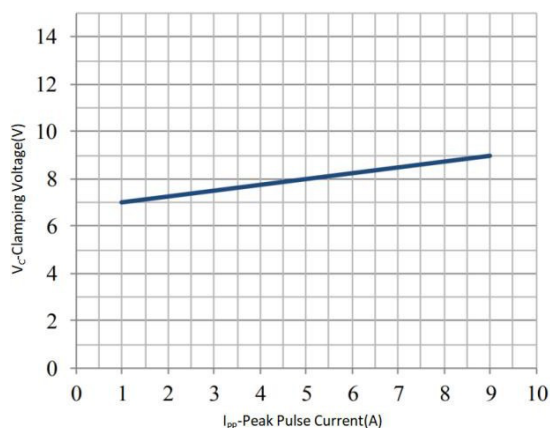
IEC61000-4-2 Pulse Waveform



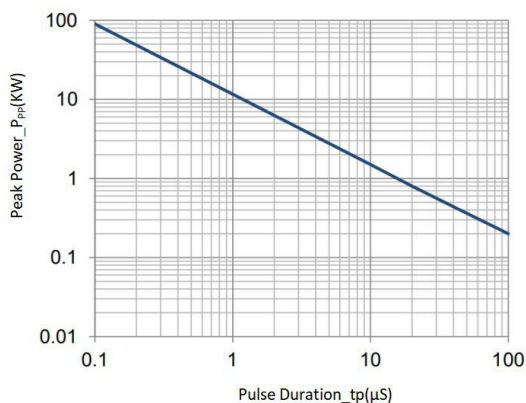
IEC61000-4-5 Waveform( 8/20 $\mu\text{s}$  pulse)



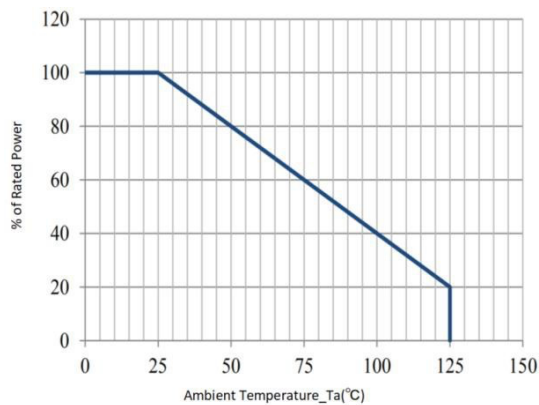
Junction Capacitance vs. Reverse Voltage



Clamping Voltage vs. Peak Pulse Current



Peak Pulse Power vs. Pulse Time



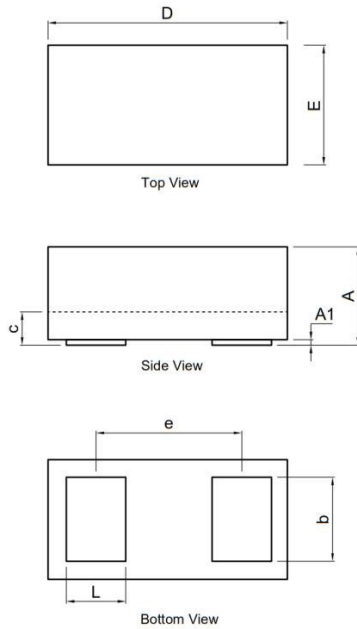
Power Derating Curve

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## Package Outline Dimensions

DFN0603-2L



| SYMBOL | Dimensions In Millimet |      |
|--------|------------------------|------|
|        | MIN                    | MAX  |
| A      | 0.23                   | 0.33 |
| A1     | 0                      | 0.05 |
| b      | 0.21                   | 0.28 |
| c      | 0.05                   | 0.18 |
| D      | 0.55                   | 0.65 |
| E      | 0.25                   | 0.35 |
| L      | 0.15                   | 0.23 |