

# JE05B1MD20-2

## 1-Line Bi-directional Ultra-low Capacitance TVS Diode



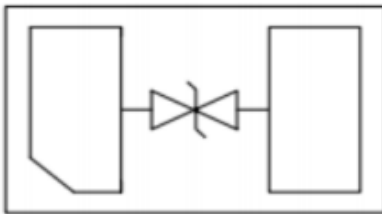
### Description

The JE05B1MD20-2 help protect sensitive electronic equipment against electrostatic discharge (ESD). They supplement the on-chip protection of integrated circuitry and are best suited for low-voltage, high-speed applications where low capacitance is important. Data ports utilizing such high-speed protocols as USB 2.0, IEEE1394, HDMI and DVI can benefit from this new technology.

### Features

- \* Ultra-Low capacitance:0.05pF(typ.)
- \* Low leakage current: (<10nA )
- \* Fast response time (<1ns)
- \* Bi-directional,single line protection
- \* 2-pin leadless package
- \* Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
  - Air discharge: ±15kV
  - Contact discharge: ±8kV
- \* RoHS Compliant
- \* Package:DFN1006-2

### Circuit Diagram

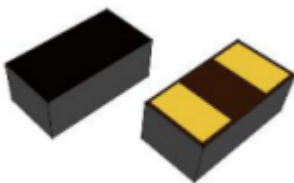


Circuit and Pin Schematic

### Applications

- \* USB 3.0/3.1
- \* HDMI 1.3/1.4/2.0
- \* RF Antenna
- \* External Storage
- \* Digital Camera

### Package Outline



### Ordering Information

Part Number	Packaging	Reel Size
JE05B1MD20-2	10000/Tape & Reel	7 inch

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

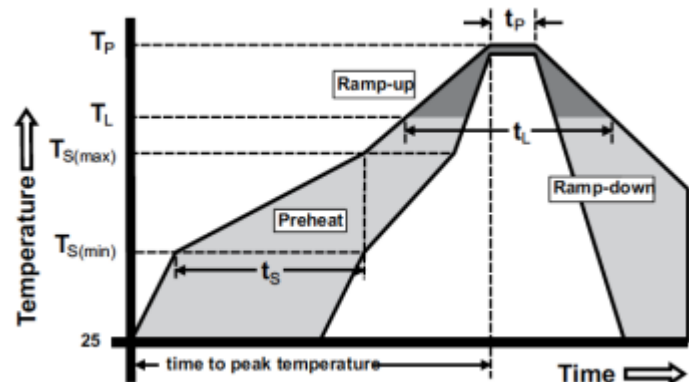
Parameter	Symbol	Value	Unit
ESD per IEC 61000-4-2 (Air)	VESD	$\pm 15$	kV
ESD per IEC 61000-4-2 (Contact)		$\pm 8$	
Operating Temperature Range	TJ	-40to 120	$^{\circ}\text{C}$
Storage Temperature Range	Tstg	-40to +85	$^{\circ}\text{C}$

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

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Continuous Operating Voltage	$V_{DC}$				5	V
Trigger Voltage	$V_T$	IEC61000-4-2 8KV Contact		450		V
Clamping Voltage	$V_C$	IEC61000-4-2 8KV Contact		40		V
Leakage Current	$I_L$	DC 5V shall be applied on component			10	nA
Junction Capacitance	$C_J$	Measured at 10MHz		0.05		pF

**Soldering Parameters**

Reflow Condition	Pb – Free assembly	
Pre Heat	- Temperature Min ( $T_{s(min)}$ )	150 $^{\circ}\text{C}$
	- Temperature Max ( $T_{s(max)}$ )	200 $^{\circ}\text{C}$
	- Time (min to max) ( $t_s$ )	60 – 180 seconds
Average ramp up rate (Liquidus Temp ( $T_L$ ) to peak)		3 $^{\circ}\text{C}/\text{second}$ max
$T_{s(max)}$ to $T_L$ - Ramp-up Rate		3 $^{\circ}\text{C}/\text{second}$ max
Reflow	- Temperature ( $T_L$ ) (Liquidus)	217 $^{\circ}\text{C}$
	- Temperature ( $t_L$ )	60 – 150 seconds
Peak Temperature ( $T_p$ )		260 $^{\circ}\text{C}$
Time within 5 $^{\circ}\text{C}$ of actual peak Temperature ( $t_p$ )		10 – 30 seconds
Ramp-down Rate		6 $^{\circ}\text{C}/\text{second}$ max
Time 25 $^{\circ}\text{C}$ to peak Temperature ( $T_p$ )		8 minutes max



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

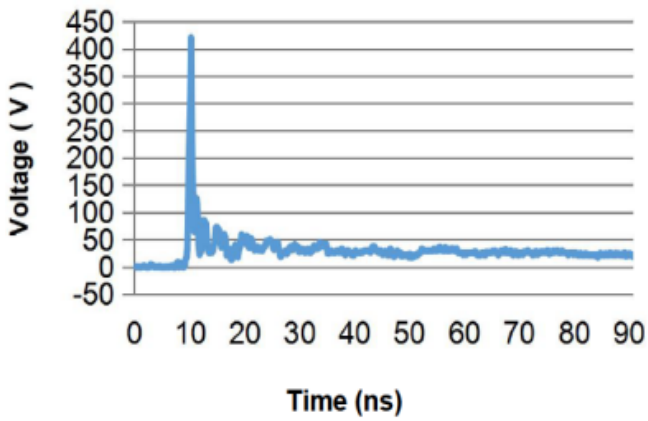


Figure 1. Typical ESD Response

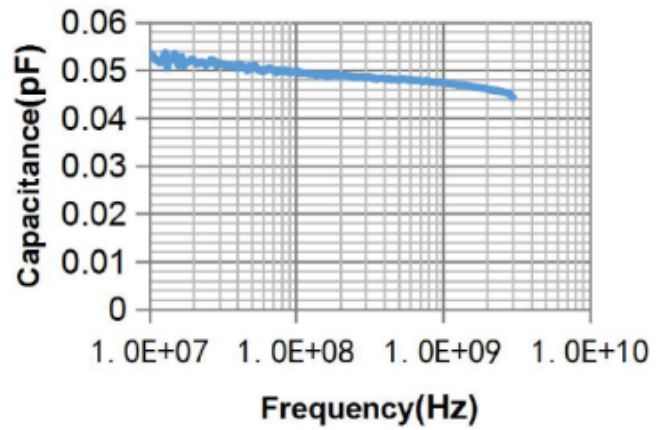


Figure 2. Typical Capacitance vs. Frequency

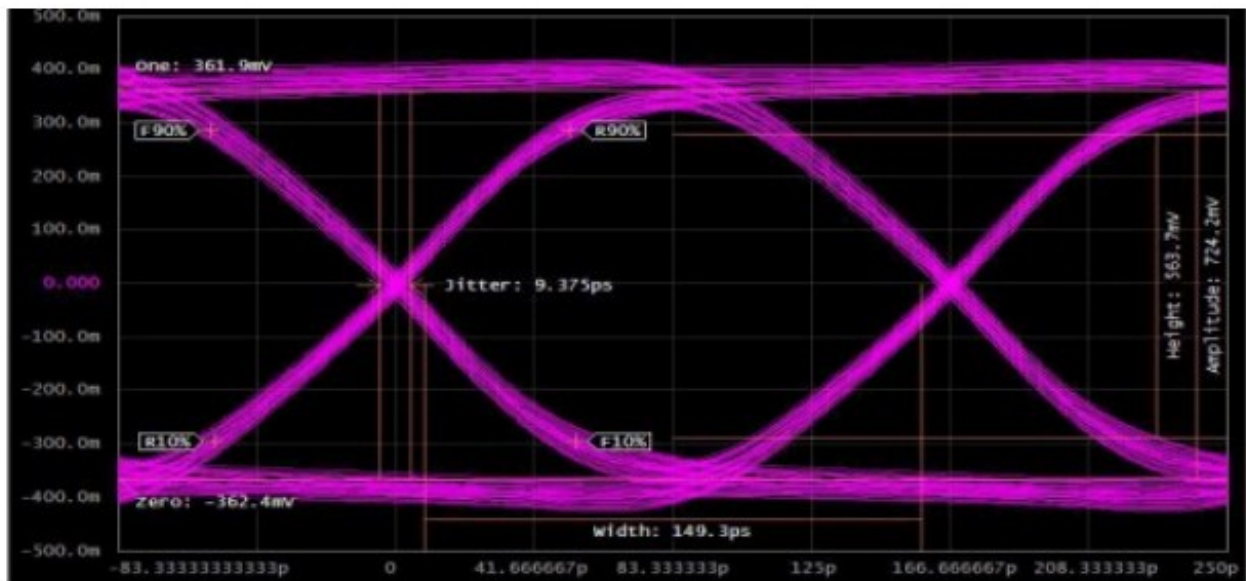
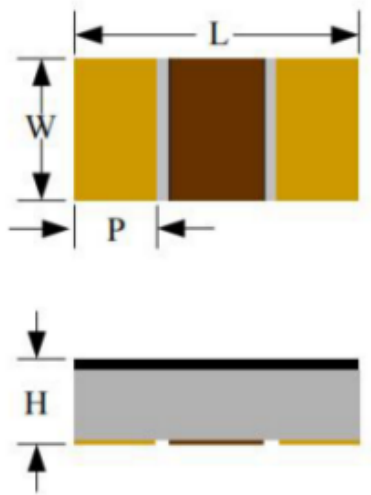


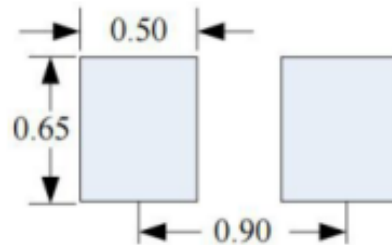
Figure 3. HDMI 2.0 Mask at 6.0 Gbps

**DFN1006-2 Package Outline Drawing** (Dimensions in millimeters)



<i>Dim</i>	<i>Millimeters</i>	
	<i>Min</i>	<i>Max</i>
<i>L</i>	0.90	1.10
<i>W</i>	0.42	0.62
<i>P</i>	0.15	0.35
<i>H</i>	0.25	0.45

**Suggested Land Pattern**



**\*Sizes in mm**

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