

JE05B1MD10-2

1-Line Bi-directional TVS Diode



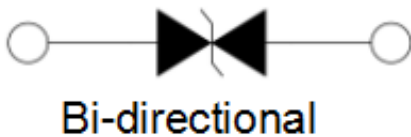
Description

The JE05B1MD10-2 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 3.0, IEEE1394, HDMI and DVI can benefit from this new technology.

Features

- * Ultra-Low capacitance: 0.05pF (typ.)
- * Low leakage: ($<10\text{nA}$)
- * Fast response time:($<1\text{ns}$)
- * Low clamping voltage
- * One power line protects
- * Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test
 - Air discharge: $\pm 15\text{kV}$
 - Contact discharge: $\pm 8\text{kV}$
- * RoHS Compliant
- * Package: DFN0603-2

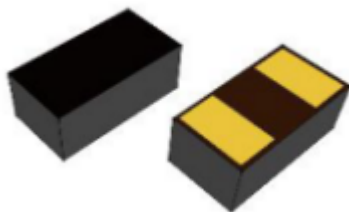
Circuit Diagram



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
JE05B1MD10-2	15000/Tape & Reel	7 inch

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

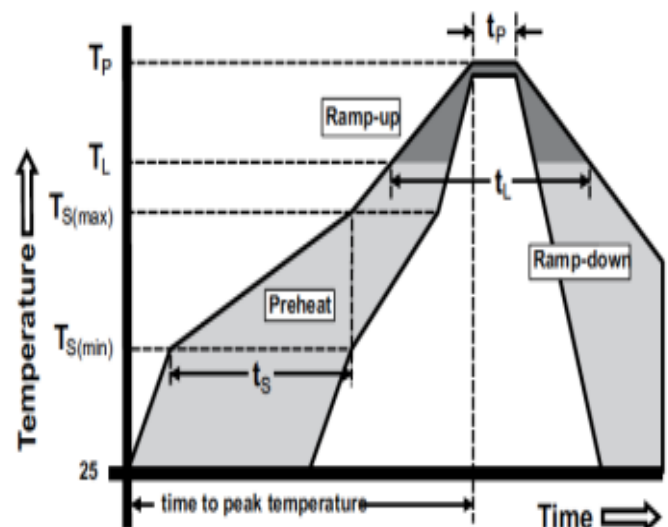
Parameter	Symbol	Value	Unit
ESD per IEC 61000-4-2 (Air)	VESD	± 15	kV
ESD per IEC 61000-4-2 (Contact)		± 8	
Operating Temperature Range	TJ	-40 to 120	$^{\circ}\text{C}$
Storage Temperature Range	Tstg	-40 to 85	$^{\circ}\text{C}$

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)

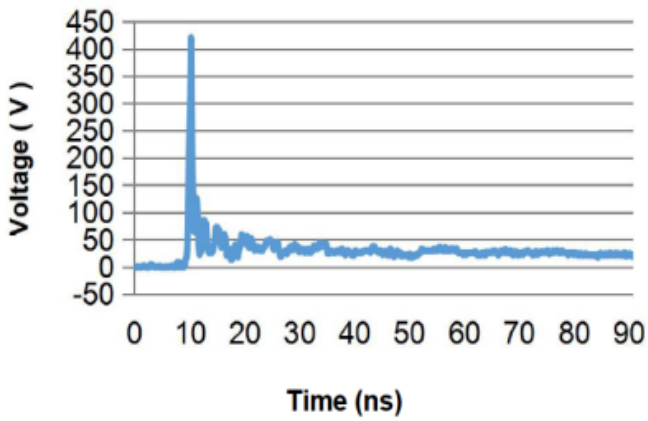


Figure 1. Typical ESD Response

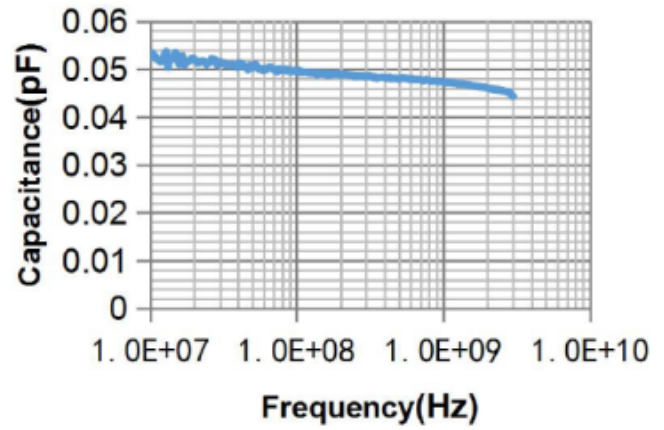
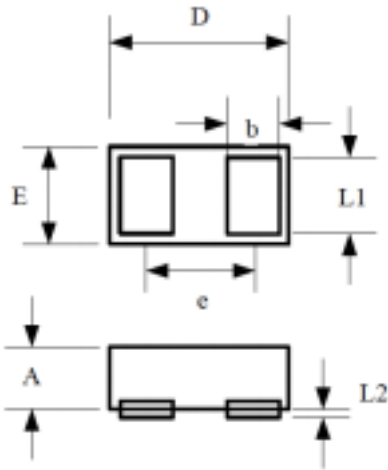


Figure 2. Typical Capacitance vs. Frequency



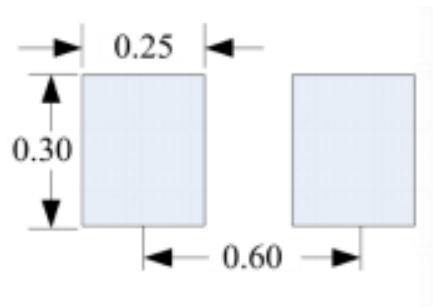
Figure 3. HDMI 2.0 Mask at 6.0 Gbps

DFN0603-2 Package Outline Drawing (Dimensions in millimeters)



<i>Dim</i>	<i>Millimeters</i>	
	<i>Min</i>	<i>Max</i>
<i>A</i>	0.25	0.40
<i>b</i>	0.15	0.20
<i>D</i>	0.50	0.70
<i>E</i>	0.25	0.35
<i>e</i>	0.45 BSC	
<i>L1</i>	0.20	0.30
<i>L2</i>	0.00	0.05

Suggested Land Pattern



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