4 CHANNEL LOW CAPACITANCE TVS DIODE ARRAY

Product Summary

V_{BR} (Min)	I_{PP} (Max)	$C_{I/O}$ (Typ)
6V	5.5A	0.55pF

Description

The DT1240-04LP20 is a high-performance device suitable for protecting four high speed I/Os. These devices are assembled in X2-DFN2010-8 (Type B) package and have high ESD surge capability and low capacitance.

Applications

Typically used at high-speed ports such as USB2.0, USB3.0, IEEE1394 (Firewire®, iLink™), Serial ATA, DVI™, HDMI™, PCI™.

Features

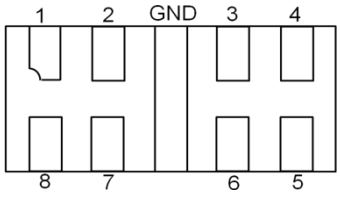
- Clamping Voltage: 9V at 10A 100ns, TLP
  9.4V at 5.5A 8µs/20µs
- IEC 61000-4-2 (ESD): Air — ±16kV, Contact — ±14kV
- IEC 61000-4-5 (Lightning): ±5.5A (8/20µs)
- 4 Channels of ESD Protection
- Low Channel Input Capacitance of 0.55pF Typical
- TLP Dynamic Resistance: 0.25Ω
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please contact us or your local Diodes representative. https://www.diodes.com/quality/product-definitions/**

Mechanical Data

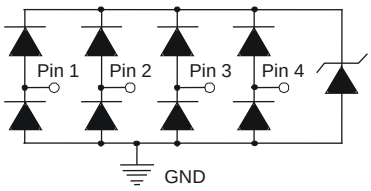
- Case: X2-DFN2010-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Schematic
- Terminals: Finish – NiPdAu, Solderable per MIL-STD-202, Method 208 e4
- Weight: 0.025 grams (Approximate)

X2-DFN2010-8 (Type B)

Pin #	Description
1, 2, 3, 4	I/O
5, 6, 7, 8	No Connection



Pin Description (Bottom View)



Device Schematic

Ordering Information (Note 4)

Part Number	Compliance	Marking Code	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DT1240-04LP20-7	Standard	MU4	7	8	3,000/Tape & Reel

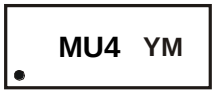
Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

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Marking Information



MU4 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: I = 2021)
M = Month (ex: 9 = September)

Date Code Key

Year	2018	…	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Code	F	…	I	J	K	L	M	N	O	P	R	S

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit	Conditions
Peak Pulse Current, per IEC 61000-4-5	I_{PP}	5.5	A	I/O to V_{SS}, 8/20µs
Peak Pulse Power, per IEC 61000-4-5	P_{PP}	60	W	I/O to V_{SS}, 8/20µs
ESD Protection – Contact Discharge, per IEC 61000-4-2	$V_{ESD_CONTACT}$	±14	kV	I/O to V_{SS}
ESD Protection – Air Discharge, per IEC 61000-4-2	V_{ESD_AIR}	±16	kV	I/O to V_{SS}
Operating Temperature	T_{OP}	-55 to +85	°C	—
Storage Temperature	T_{STG}	-55 to +150	°C	—

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation Typical (Note 5)	P_D	360	mW
Thermal Resistance, Junction to Ambient Typical (Note 5)	$R_{\theta JA}$	350	°C/W

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
Reverse Working Voltage	V_{RWM}	—	—	5.5	V	—
Reverse Current	I_R	—	—	0.5	µA	V_R = 5V, I/O to V_{SS}
Reverse Breakdown Voltage	V_{BR}	6	—	—	V	I_R = 1mA, I/O to V_{SS}
Forward Clamping Voltage	V_F	-1.0	-0.85	—	V	I_F = -15mA, I/O to V_{SS}
Reverse Clamping Voltage (Note 6)	V_C	—	9.4	11	V	I_{PP} = 5.5A, I/O to V_{SS}, 8/20µs
ESD Clamping Voltage	V_{ESD}	—	9	—	V	TLP, 10A, t_P = 100ns, I/O to V_{SS}
Dynamic Reverse Resistance	R_{DIF-R}	—	0.25	—	Ω	TLP, 10A, t_P = 100ns, I/O to V_{SS}
Dynamic Forward Resistance	R_{DIF-F}	—	0.25	—	Ω	TLP, 10A, t_P = 100ns, V_{SS} to I/O
Channel Input Capacitance	$C_{I/O}$	—	0.55	—	pF	$V_{I/O}$ = 2.5V, V_{SS} = 0V, f = 1MHz

Notes: 5. Device mounted on FR-4 PCB pad layout (2oz copper) as shown on Diodes Incorporated's suggested pad layout, which can be found on our website at http://www.diodes.com/package-outlines.html.
6. Clamping voltage value is based on an 8x20µs peak pulse current (I_{PP}) waveform.

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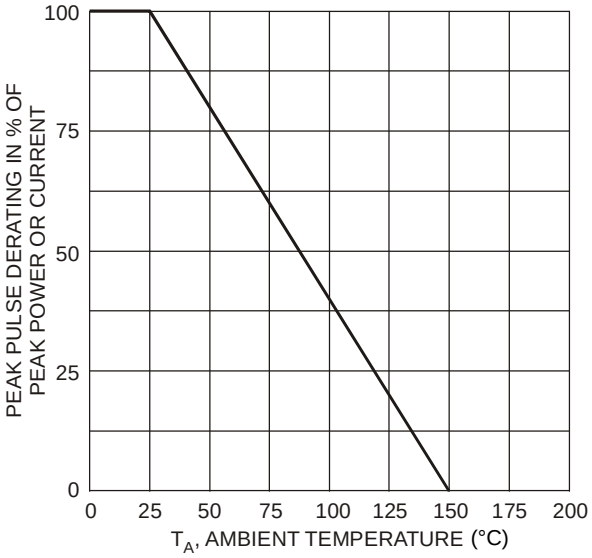


Figure 1 Pulse Derating Curve

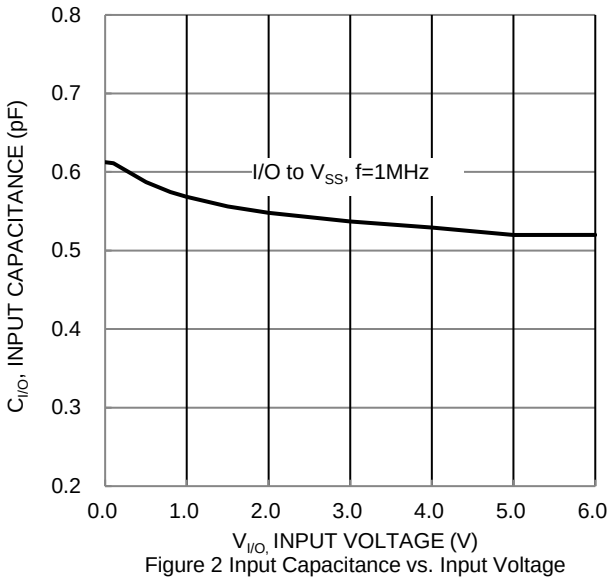


Figure 2 Input Capacitance vs. Input Voltage

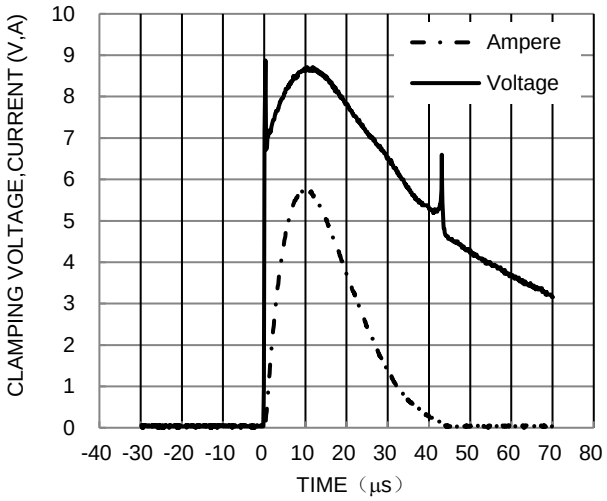


Figure 3. Waveform of Clamping Voltage, Current vs. Time (8/20μs,I/O to V_{SS})

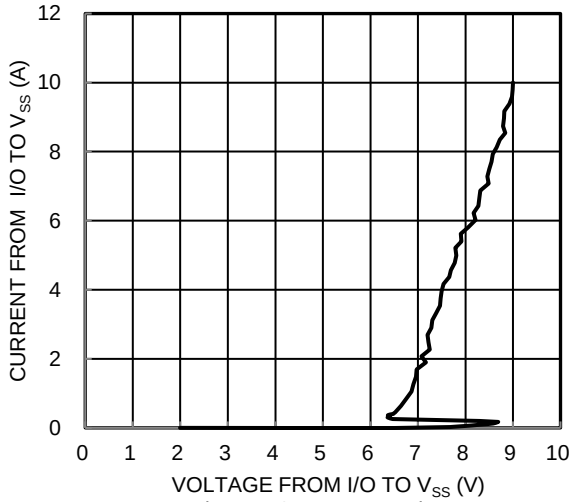


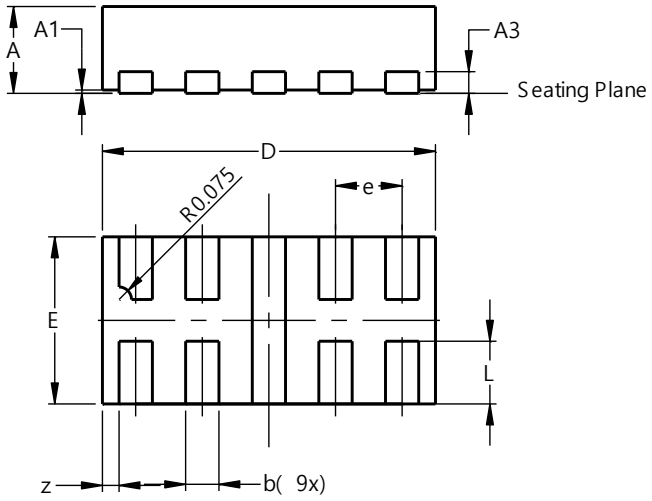
Figure 4 Current vs. Voltage

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Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

X2-DFN2010-8 (Type B)

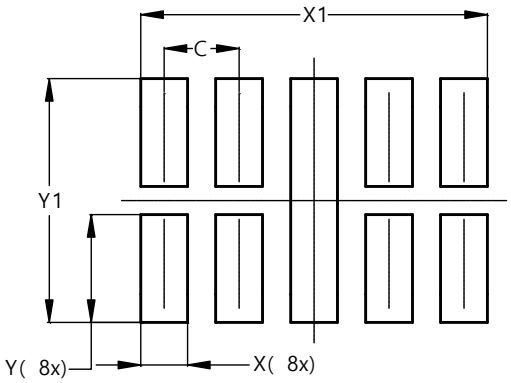


X2-DFN2010-8 (Type B)			
Dim	**Min**	**Max**	**Typ**
A	--	0.40	--
A1	0.00	0.05	0.02
A3	--	--	0.13
b	0.15	0.25	0.20
D	1.950	2.075	2.000
E	0.950	1.075	1.000
e	--	--	0.40
L	0.325	0.425	0.375
z	--	--	0.10
All Dimensions in mm			

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

X2-DFN2010-8 (Type B)



Dimensions	Value (in mm)
C	0.400
X	0.250
X1	1.850
Y	0.575
Y1	1.300

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