

Product Summary

V _{BR} (Min)	I _{PP} (Max)	C _{IO} (Typ)
5V	5.5A	0.55pF

Description

The DT1240A-04LPQ is a high-performance device suitable for protecting four high-speed I/Os. These devices are assembled in U-DFN2510-10 package and have high ESD surge capability and low capacitance.

Applications

Typically used at high-speed ports such as USB2.0, USB3.0, USB3.1, IEEE1394 (FireWire[®], iLink), Serial ATA, DVI[™], HDMI1.4, HDMI2.0 and PCI[™].

Features

- Clamping Voltage: 7.5V at 10A 100ns, TLP 8.2V at 5.5A (8µs/20µs)
- IEC 61000-4-2 (ESD): Air – ±16kV, Contact – ±14kV
- IEC 61000-4-5 (Lighting): 5.5A (8/20µs)
- 4 Channels of ESD Protection
- Low Channel Input Capacitance of 0.55pF Typical
- TLP Dynamic Resistance: 0.2Ω
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. “Green” Device (Note 3)**
- The DT1240A-04LPQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**

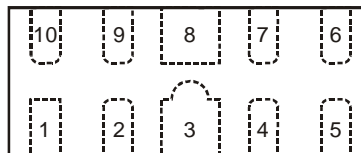
<https://www.diodes.com/quality/product-definitions/>

Mechanical Data

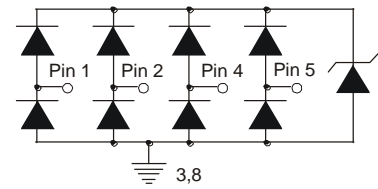
- Case: U-DFN2510-10
- Case Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Schematic
- Terminals: Finish – NiPdAu, Solderable per MIL-STD-202, Method 208 ^(e4)
- Weight: 0.038 grams (Approximate)

Pin Number	Description
1, 2, 4, 5	I/O
6, 7, 9, 10	No Connection
3, 8	V _{SS}

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Pin Description (Top View)



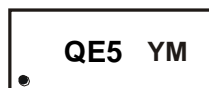
Device Schematic

Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DT1240A-04LPQ-7	Automotive	QE5	7	8	3,000/Tape & Reel

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

Marking Information



QE5 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: H = 2020)
 M = Month (ex: 9 = September)

Date Code Key

Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Code	H	I	J	K	L	M	N	O	P	R	S	T

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	Condition
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}	52	W	I/O to V _{SS} , 8/20μs
Operating Voltage (DC)	V _{DC}	3.6	V	I/O to V _{SS}
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	350	mW
Thermal Resistance, Junction to Ambient Typical (Note 5)	R _{θJA}	360	°C/W

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V _{RWM}	—	—	3.3	V	I _R = 1mA, I/O to V _{SS}
Reverse Current	I _R	—	—	1.0	μA	V _R = 3.3V, I/O to V _{SS}
Reverse Breakdown Voltage	V _{BR}	5	—	—	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	—	8.2	9.5	V	I _{PP} = 5.5A, I/O to V _{SS} , 8/20μs
ESD Clamping Voltage	V _{ESD}	—	7.5	—	V	TLP, 10A, t _P = 100ns, I/O to V _{SS}
Dynamic Reverse Resistance	R _{DIF-R}	—	0.2	—	Ω	TLP, 10A, t _P = 100ns, I/O to V _{SS}
Dynamic Forward Resistance	R _{DIF-F}	—	0.2	—	Ω	TLP, 10A, t _P = 100ns, V _{SS} to I/O
Channel Input Capacitance	C _{I/O}	—	0.55	0.65	pF	V _{I/O} = 2.5V, V _{SS} = 0V, f = 1MHz
Delta C _{I/O}	C _{I/OMAX} -C _{I/OMIN}	—	0.04	—	pF	C _{I/OMAX} -C _{I/OMIN}

- Notes:
- Device mounted on FR-4 PCB pad layout (2oz copper) as shown on Diodes Incorporated's website at <http://www.diodes.com/package-outlines.html>.
 - Clamping voltage value is based on an 8μs × 20μs peak pulse current (I_{PP}) waveform.

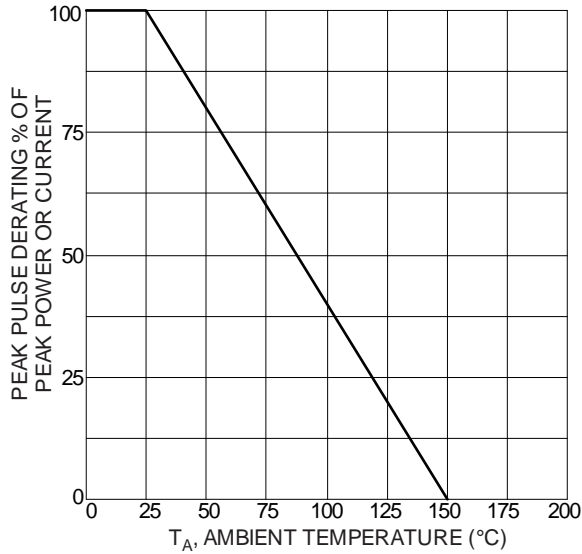


Figure 1 Pulse Derating Curve

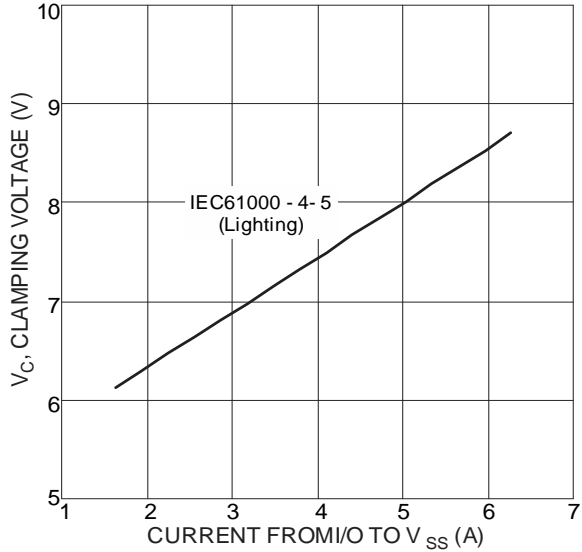


Figure 3 Clamping Voltage Characteristic

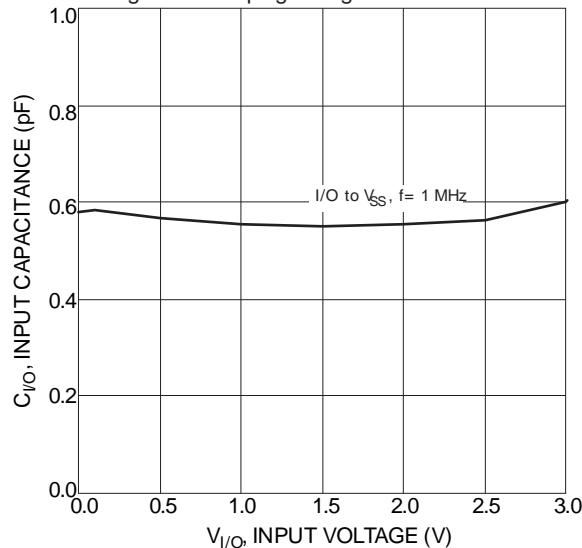


Figure 5 Input Capacitance vs. Input Voltage

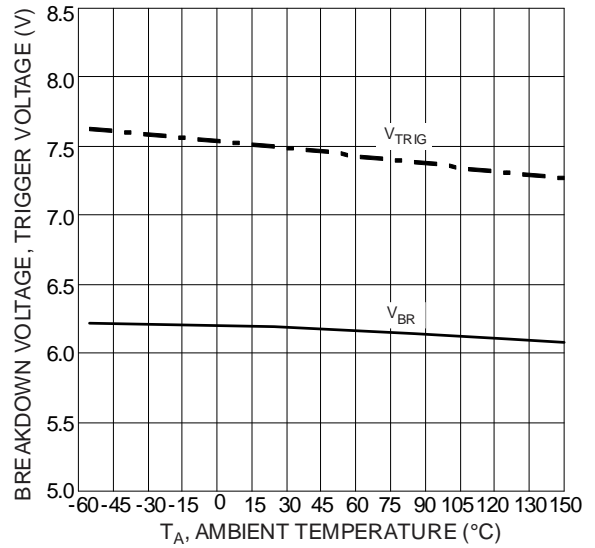


Figure 2 V_{BR} , Trigger Voltage vs. Ambient Temperature

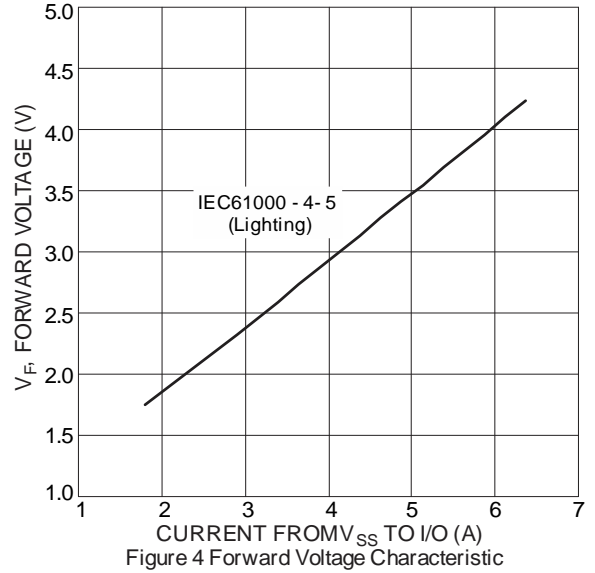


Figure 4 Forward Voltage Characteristic

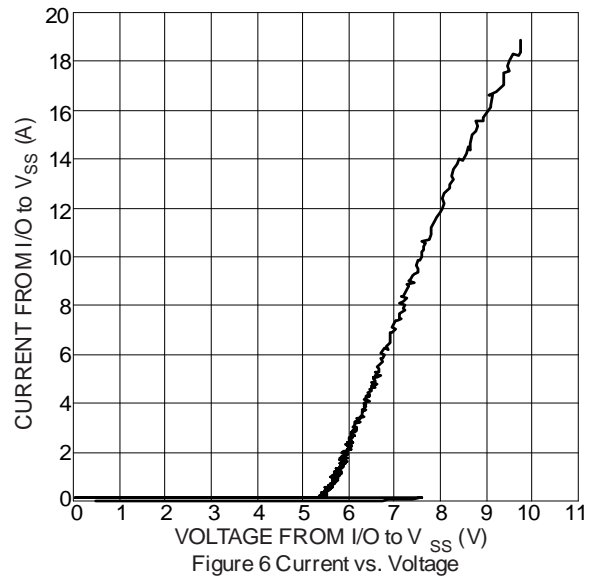
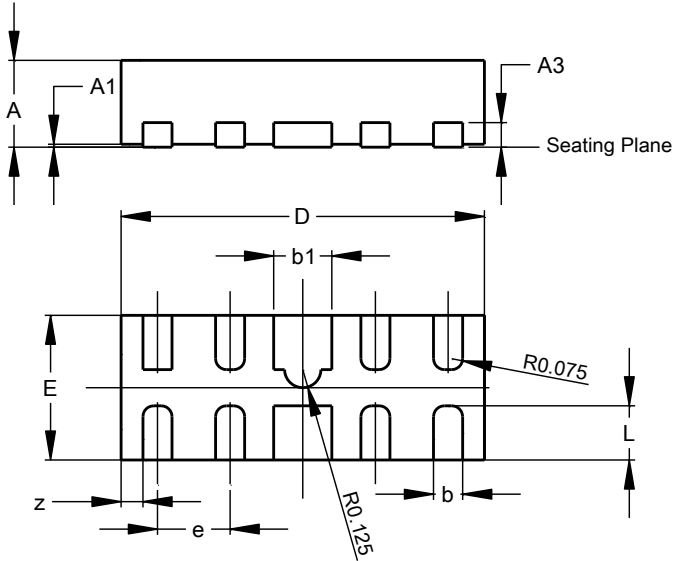


Figure 6 Current vs. Voltage

Package Outline Dimensions

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

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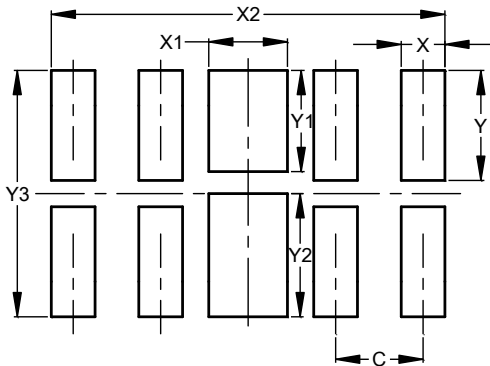


U-DFN2510-10			
Dim	Min	Max	Typ
A	0.545	0.605	0.575
A1	0.00	0.05	0.03
A3	-	-	0.13
b	0.15	0.25	0.20
b1	0.35	0.45	0.40
D	2.450	2.575	2.500
e	-	-	0.50
E	0.950	1.075	1.000
L	0.325	0.425	0.375
z	-	-	0.150
All Dimensions in mm			

Suggested Pad Layout

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

U-DFN2510-10



Dimensions	Value (in mm)
C	0.500
X	0.250
X1	0.450
X2	2.250
Y	0.625
Y1	0.575
Y2	0.700
Y3	1.400

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