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TPD1E01B04DPYR

1 - Channel ESD Protection Diode

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Features

- Ultra low capacitance: 0.25 pF typical (I/O to GND)
- Ultra low leakage: nA level
- Breakdown Voltage: 6.4 V (typ)
- Low clamping voltage
- Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
    - Air discharge: ±20kV
    - Contact discharge: ±15kV
  - IEC61000-4-4 (EFT) 80A (5/50ns)
  - IEC61000-4-5 (Lightning) : 3A(8/20μs)
- ROHS Compliant

Mechanical Characteristics

- Package: X1SON-2
- Ultra low leakage: nA level
- Case Material: “Green” Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 3 per J-STD-020
- Terminal Connections: See Diagram Below

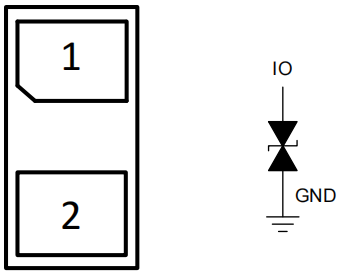
Applications

- USB Type-C
- Thunderbolt 3
- Set-Top Boxes
- DisplayPort 1.3
- PCI Express 3

Ordering Information

Part Number	Qty per Reel	Reel Size
TPD1E01B04DPYR	10000	7″

Dimensions and Pin Configuration



Marking: 5C

Absolute Maximum Ratings (Tamb=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20μs)	Ppk	30	W
Peak Pulse Current (8/20μs)	I_{PP}	3	A
ESD per IEC 61000−4−2 (Air) ESD per IEC 61000−4−2 (Contact)	V_{ESD}	± 20 ± 15	kV
Operating Temperature Range	T_J	−55 to +125	°C
Storage Temperature Range	Tstg	−55 to +150	°C

Electrical Characteristics (TA=25°C unless otherwise specified)

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V_{RWM}	-3.6		3.6	V	IIO < 10 nA
Breakdown Voltage	V_{BR}	5.5	6.4	8.5	V	I_T = 1mA, any I/O pin to ground
Breakdown Voltage	V_{BR}	-5.5	-6.4	-8.5	V	I_T = 1mA, any ground pin to I/O
Reverse Leakage Current	I_R			100	nA	V_{IO}=± 2.5V any I/O pin to ground
Dynamic resistance	R_{DYN}		0.47		Ω	any I/O pin to ground
Clamping Voltage	V_C		7.2		V	I_{PP} = 1A (8 x 20μs pulse), any I/O pin to ground
Clamping Voltage	V_C		9		V	I_{PP} = 3A (8 x 20μs pulse), any I/O pin to ground
Junction Capacitance	C_J		0.25		pF	VR = 0V, f = 1MHz, between I/O pins

Characteristic Curves

Fig1. 8/20μs Pulse Waveform

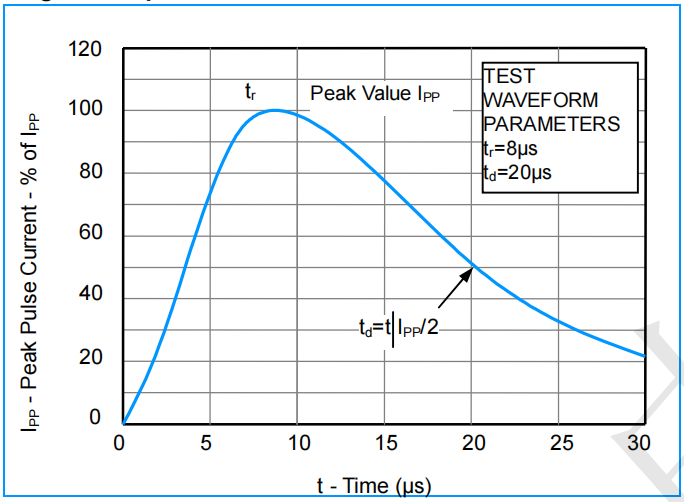


Fig2. ESD Pulse Waveform (according to IEC 61000-4-2)

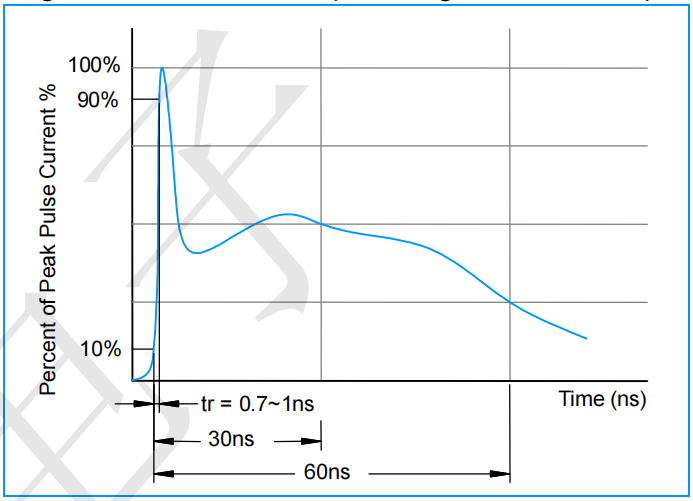
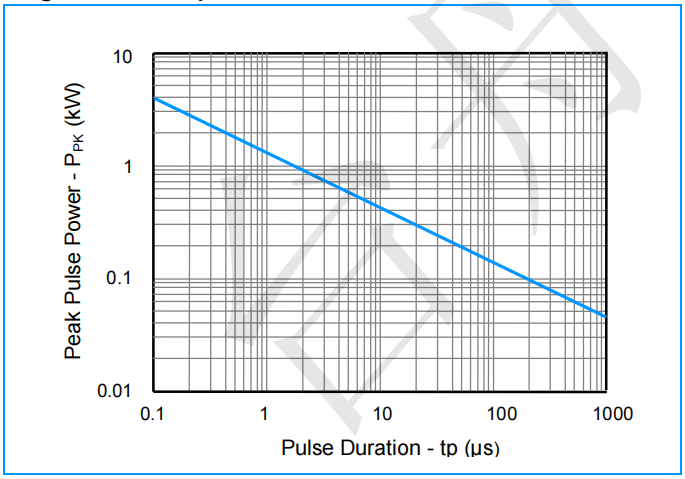
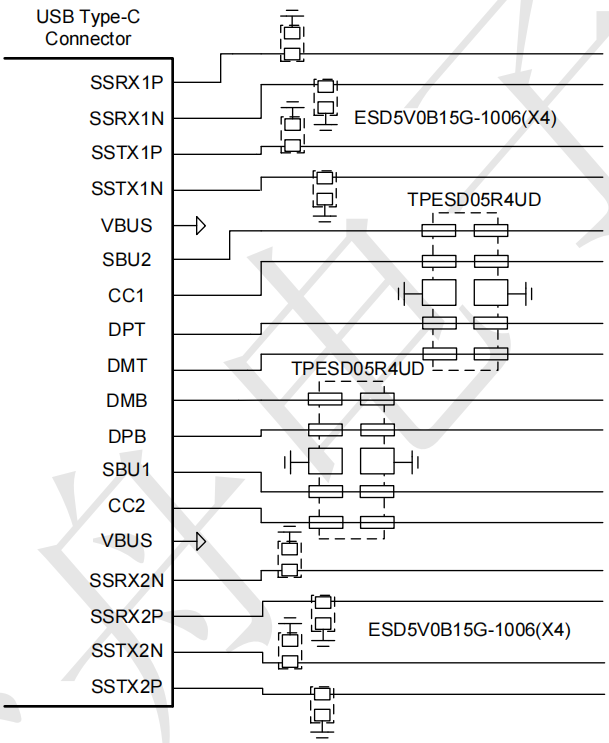


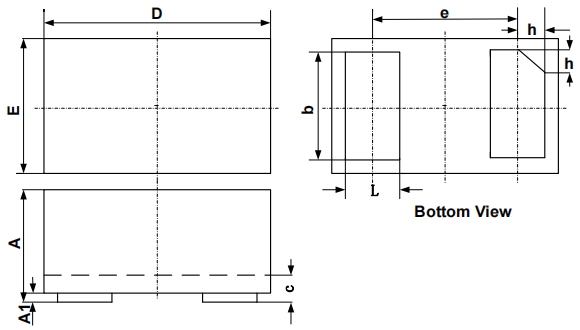
Fig3. Non - Repetitive Peak Pulse Power vs. Pulse Time



Application Information

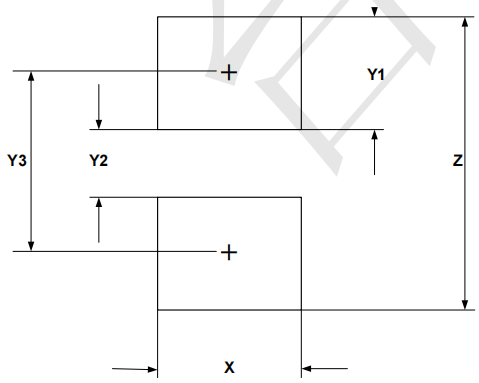


X1SON-2 Package Outline Drawing



SYM	DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.45	0.50	0.55	0.018	0.020	0.022
A1	0.00	0.02	0.05	0.000	0.001	0.002
b	0.45	0.50	0.55	0.018	0.020	0.022
c	0.12	0.15	0.18	0.005	0.006	0.007
D	0.95	1.00	1.05	0.037	0.039	0.041
e	0.65 BSC			0.026 BSC		
E	0.55	0.60	0.65	0.022	0.024	0.026
L	0.20	0.25	0.30	0.008	0.010	0.012
h	0.07	0.12	0.17	0.003	0.005	0.007

Suggested Land Pattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
X	0.60	0.024
Y1	0.50	0.020
Y2	0.30	0.012
Y3	0.80	0.032
Z	1.30	0.052