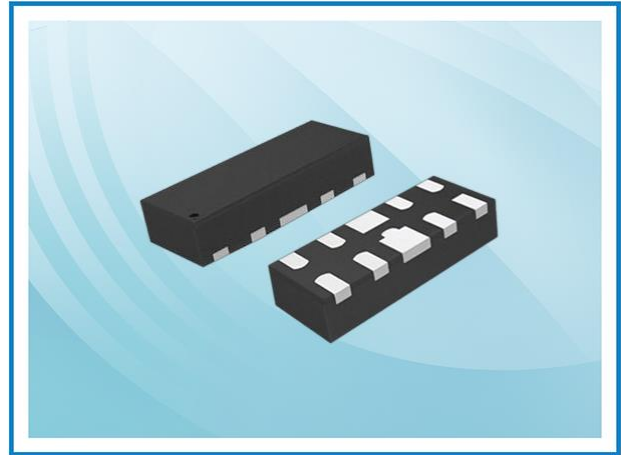


PTUC0524PA – ESD Protection Diode

Feature

- 30 Watts peak pulse power (8/20 μ s)
- Uni-directional configurations
- Solid state silicon-avalanche technology
- Low clamping voltage
- Low leakage current
- Low capacitance ($C_j = 0.2$ pF typ. I/O to I/O)
- IEC61000-4-2 (ESD) ± 15 kV (Air), ± 12 kV (Contact)
- IEC61000-4-4 (EFT) 40 A (5/50ns)
- IEC61000-4-5 (Lightning): 3 A (8/20 μ s)



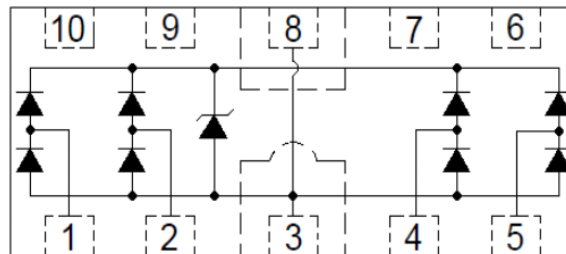
Applications

- USB3.0, USB2.0, Ethernet
- HDMI 2.0, Displayport 1.3, eSATA
- Unified Display Interface
- Digital Video Interface
- High Speed Serial Interface

Mechanical Data

- Tiny DFN10L(2.5mmx1.0mm) package
- Molding compound flammability rating: UL94V-0
- Tape and Reel Packaging
- RoHS/WEEE Compliant

Schematic and PIN Configuration



Maximum Rating

Parameter	Symbol	Value	Unit
IEC61000-4-2 ESD Voltage – Air Mode	$V_{ESD}^{(1)}$	± 15	kV
IEC61000-4-2 ESD Voltage – Contact Mode		± 12	
Peak Pulse Power ($t_p = 8/20\mu s$)	P_{PP}	30	W
Peak Pulse Current ($t_p = 8/20\mu s$) (note1)	I_{PP}	3	A
Lead Solder Temperature (10 seconds duration)	T_L	260	$^{\circ}C$
Junction Temperature	T_J	-55~125	$^{\circ}C$
Storage Temperature Range	T_{stg}	-55~150	$^{\circ}C$

Note:

1. Device stressed with ten non-repetitive ESD pulses.
2. Non-repetitive current pulse 8/20 μs exponential decay waveform according to IEC61000-4-5.
3. All ratings are measured at environmental temperature of $T_A = 25^{\circ}C$ unless otherwise noted.

PTUC0524PA – ESD Protection Diode

Electrical Characteristics

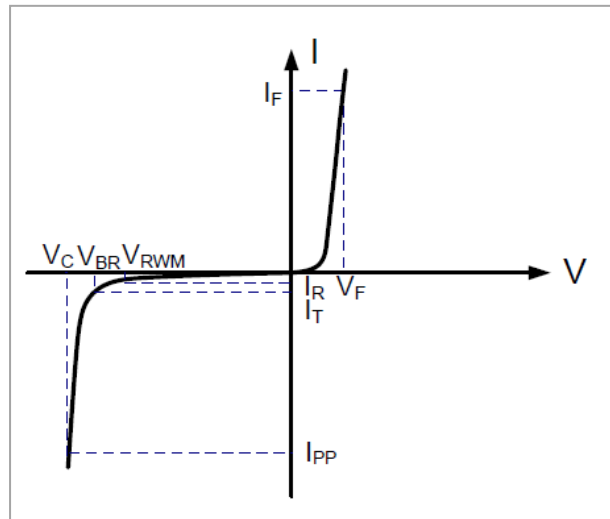
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Reverse Stand-off Voltage	$V_{RWM}^{(1)}$				5.0	V
Reverse Breakdown Voltage	V_{BR}	$I_T = 1 \text{ mA}$	6.0	7.2	9.5	V
Forward Voltage	V_F	$I_F = 10 \text{ mA}$	0.6		1.2	V
Reverse Leakage Current	I_R	$V_{RWM} = 5 \text{ V}$			0.5	μA
Clamping Voltage	$V_C^{(2)}$	$I_{PP} = 3 \text{ A}$		10	11	V
ESD Clamping Voltage	V_C	$I_{TLP} = 16 \text{ A}, t_p = 0.2/100 \text{ ns}$			15	V
Junction Capacitance	C_J	$V_R = 0 \text{ V}, f = 1\text{MHz}, I/O \text{ to } I/O$		0.20	0.35	pF
		$V_R = 0 \text{ V}, f = 1\text{MHz}, I/O \text{ to } GND$		0.36	0.55	pF

Note:

1. Other voltages available upon request.
2. Non-repetitive current pulse 8/20 μs exponential decay waveform according to IEC61000-4-5.
3. All ratings are measured at environmental temperature of $T_A = 25^\circ\text{C}$ unless otherwise noted.

Electrical Parameters

Symbol	Parameter
V_C	Clamping Voltage @ I_{PP}
I_{PP}	Peak Pulse Current
V_{BR}	Breakdown Voltage @ I_T
I_T	Test Current
I_R	Reverse Leakage Current @ V_{RWM}
V_{RWM}	Reverse Stand-off Voltage
V_F	Forward Voltage @ I_F



PTUC0524PA – ESD Protection Diode

Typical Characteristics

Figure 1: Peak Pulse Power vs. Pulse Time

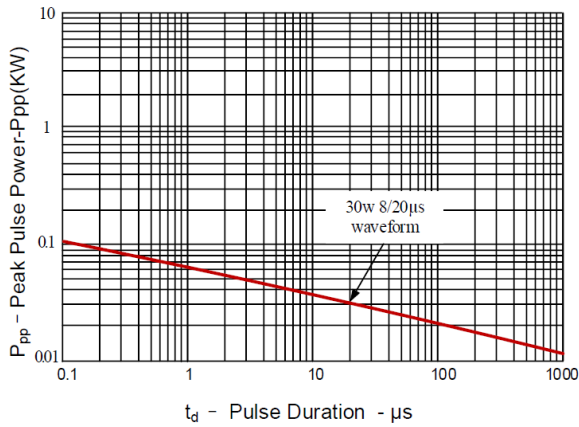


Figure 2: Power Derating Curve

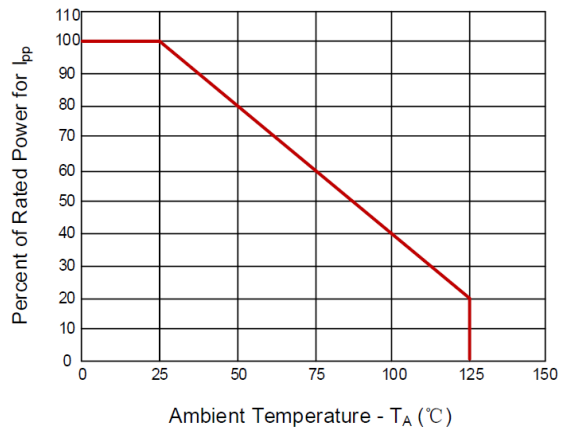


Figure 3: 8/20µs Pulse Waveform according to IEC61000-4-5

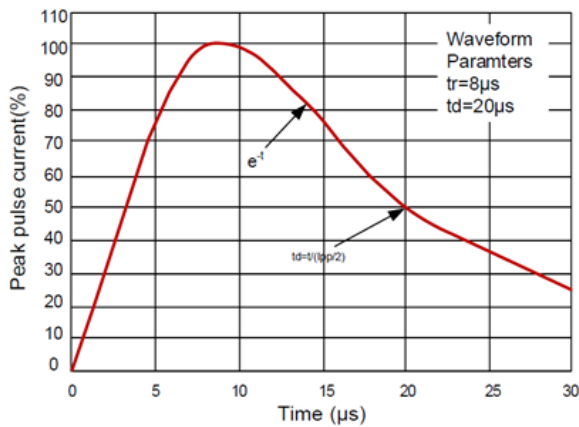


Figure 4: ESD pulse waveform according to IEC 61000-4-2

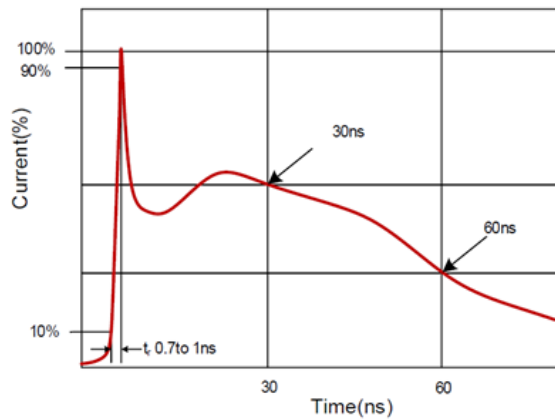


Figure 5: TLP I-V Curve

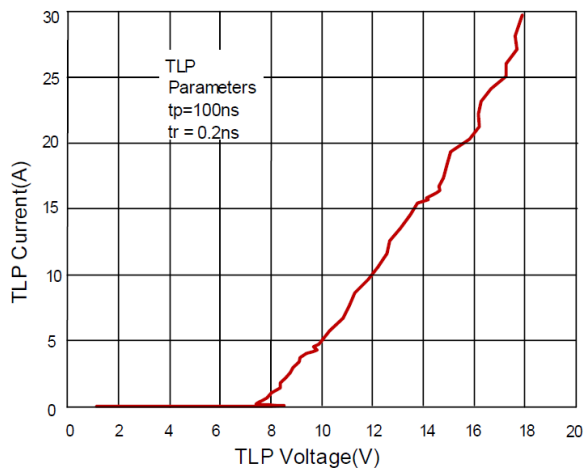
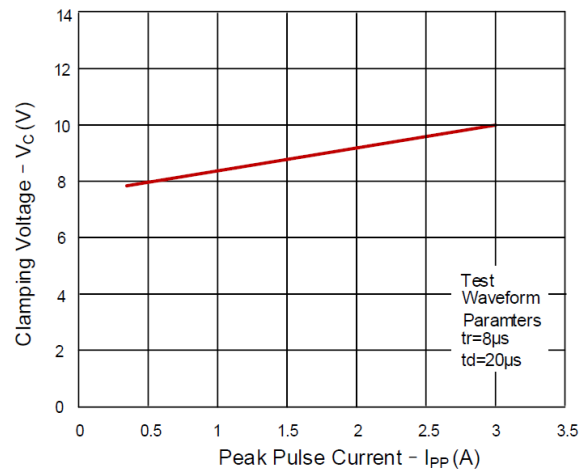
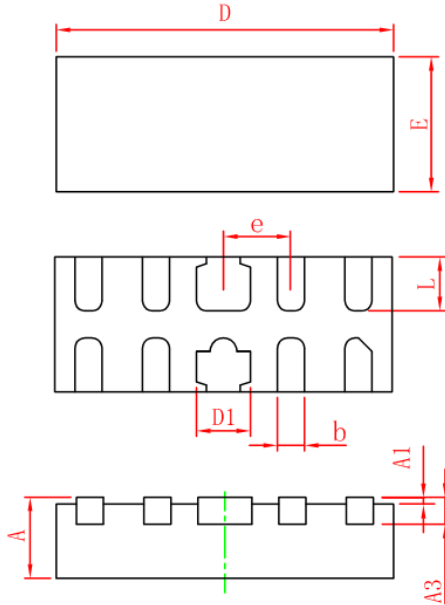


Figure 6: Clamping Voltage VS. Ipp



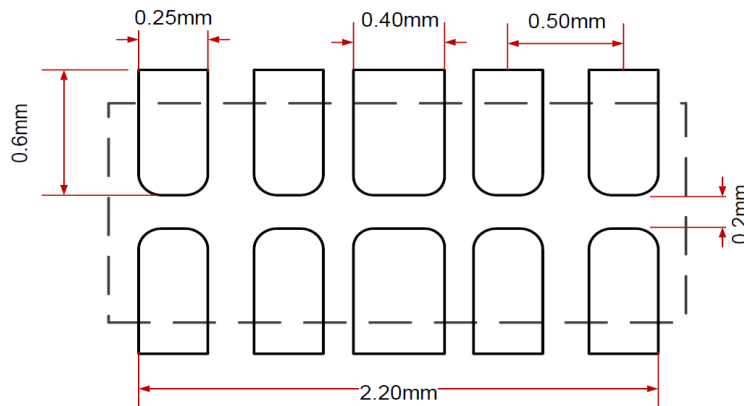
PTUC0524PA – ESD Protection Diode

DFN10L(2.5mmx1.0mm) Package Outline Dimensions

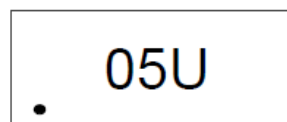


Symbol	Dimensions (mm)		
	Min	Nom	Max
A	0.45	0.50	0.60
A1	-	0.02	0.05
A3	0.10	0.15	0.20
D	2.45	2.50	2.55
E	0.95	1.00	1.05
D1	0.35	0.40	0.45
b	0.15	0.20	0.25
e	0.50BSC		
L	0.35	0.40	0.45

Land Pattern

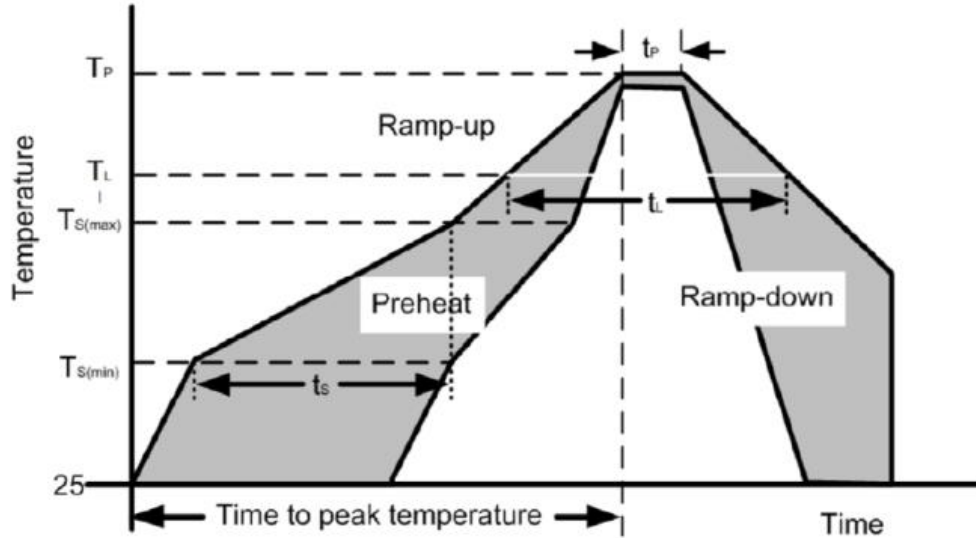


Marking



PTUC0524PA – ESD Protection Diode

Reflow Soldering Parameters

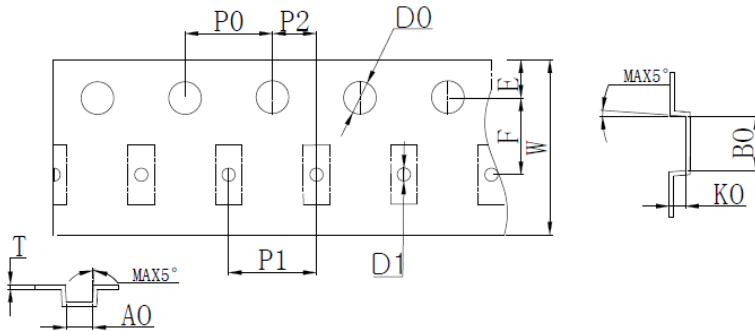


Reflow Condition	Pb-Free assembly
Pre Heat Temperature Min (Ts (min)) 150°C	Temperature Min (Ts (min)) 150°C
Pre Heat Temperature Min (Ts (max)) 200°C	Temperature Min (Ts (max)) 200°C
Pre Heat Time (min to max) (ts) 60-190 secs	Time (min to max) (ts) 60-190 secs
Average ramp up rate (Liquidus Temp) (TL) to peak	5°C/seconds max
Ts(max)to TL—Ramp-up Rate	5°C/seconds max
Reflow Temperature (TL) (Liquidus)	217°C
Reflow Temperature (tl)	60-150 seconds
Peak Temperature (Tp)	260+0/-5°C
Time within actual peak Temperature (tp)	20-40 seconds
Ramp-down Rate	5°C/seconds max
Time 25°C to peak Temperature (Tp)	8 minutes Max.
Do not exceed	280°C

PTUC0524PA – ESD Protection Diode

Packaging Information

Order Code	Packaging	Reel Size	PCS/Reel
PTUC0524PA	DFN10L(2.5x1.0mm)	7 inch	3,000



Symbol	Dimension (mm)
A0	1.20±0.05
B0	2.70±0.05
K0	0.72±0.05
P0	4.00±0.10
P1	4.00±0.05
P2	2.00±0.05
T	0.20±0.03
E	1.75±0.10
F	3.50±0.05
D0	1.55±0.05
D1	0.60±0.10
W	8.00+0.30/-0.10

