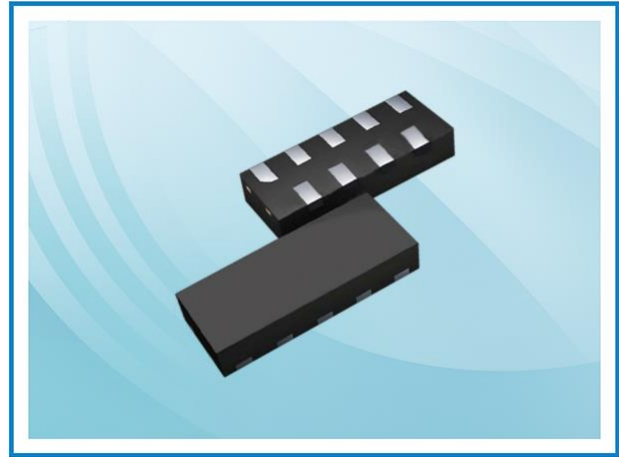


PTUC0518N – ESD Protection Diode

Feature

- 30 Watts peak pulse power (8/20 μ s)
- Protect up to eight lines
- 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) 40A (5/50ns)
- IEC61000-4-5 (Lightning): 3A (8/20 μ s)



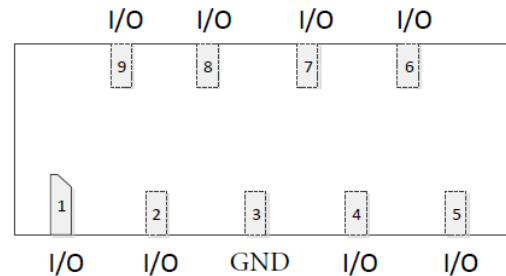
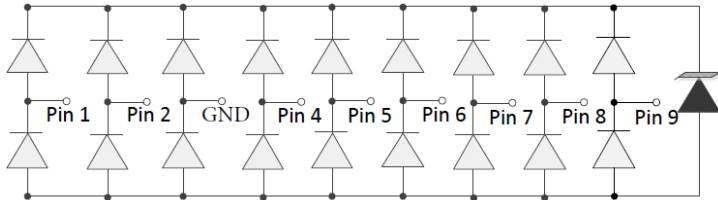
Applications

- USB3.0/3.1, Type C
- HDMI1.4/2.0, Display Port 1.3
- Unified Display Interface
- Digital Video Interface

Mechanical Data

- DFN3810 package
- Molding compound flammability rating: UL94 V-0
- Tape and Reel Packaging
- RoHS/WEEE Compliant

Schematic and PIN Configuration



Maximum Rating

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

Note:

1. Device stressed with ten non-repetitive ESD pulses.
2. Non-repetitive current pulse 8/20 μ s 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.

PTUC0518N – ESD Protection Diode

Electrical Characteristics

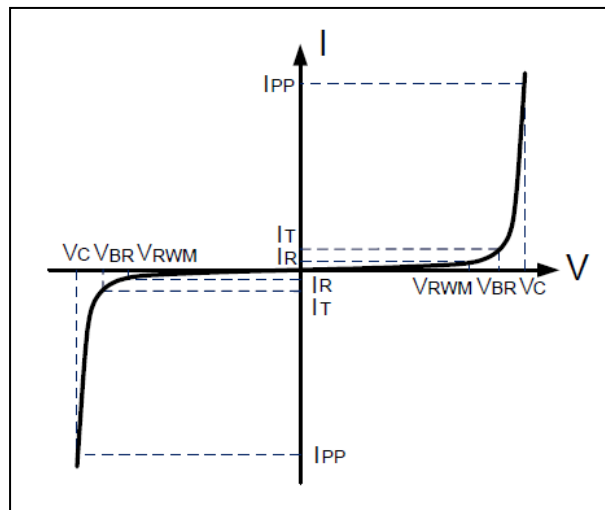
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Reverse Stand-off Voltage	$V_{RWM}^{(1)}$				5.0	V
Reverse Breakdown Voltage	V_{BR}	$I_T = 1\text{mA}$	6.0	7.2	9.5	V
Reverse Leakage Current	I_R	$V_{RWM} = 5\text{V}$			0.5	μA
Clamping Voltage	$V_C^{(2)}$	$I_{PP} = 3\text{A}$			12	V
Junction Capacitance	C_J	$V_R = 0\text{V}, f = 1\text{MHz}, I/O \text{ to } I/O$		0.2	0.3	pF
		$V_R = 0\text{V}, f = 1\text{MHz}, I/O \text{ to } \text{GND}$		0.2	0.35	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



PTUC0518N – ESD Protection Diode

Typical Characteristics

Fig.1 IEC61000-4-2 Waveform

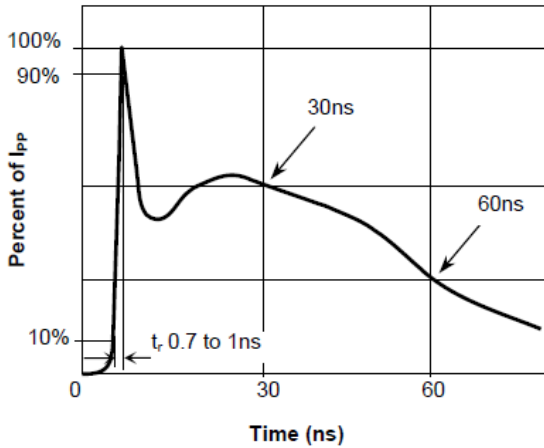


Fig.2 IEC61000-4-2 +8kV Contact ESD Clamping Waveform

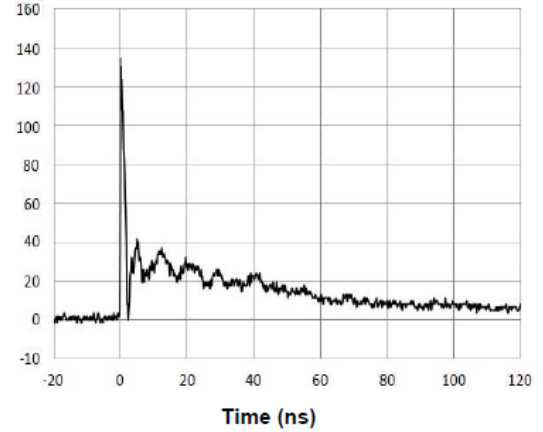


Fig.3 Eye Diagram - USB3.1 at 10Gbps per channel

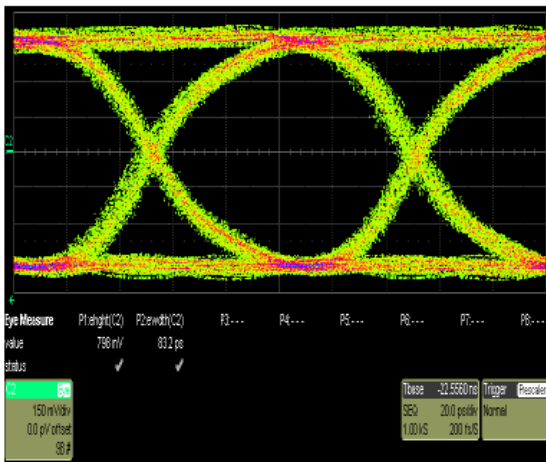
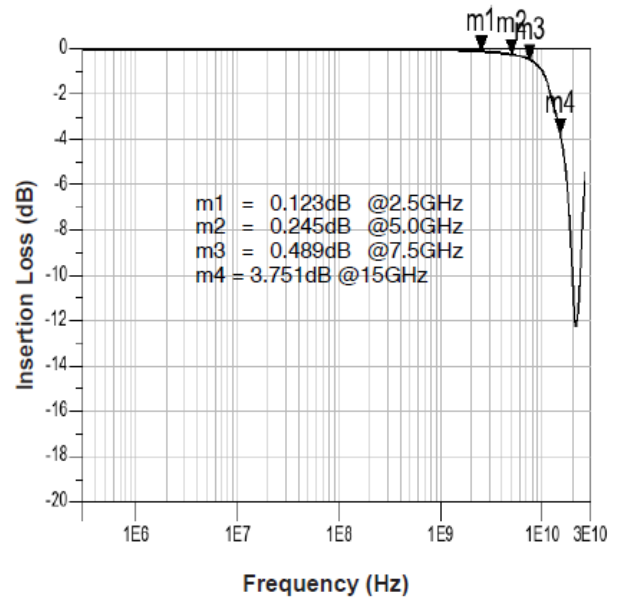
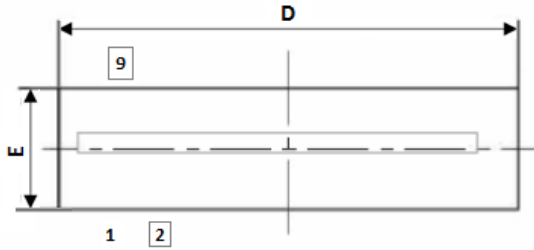


Fig.4 Insertion Loss S21 - I/O to I/O

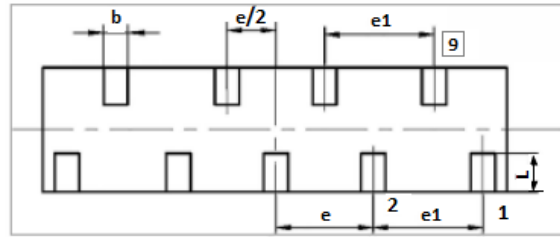


PTUC0518N – ESD Protection Diode

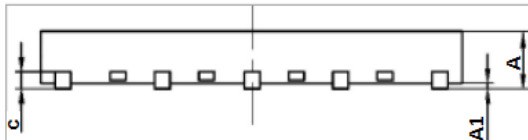
DFN3810 Package Outline Dimensions



TOP VIEW



BOTTOM VIEW



SIDE VIEW

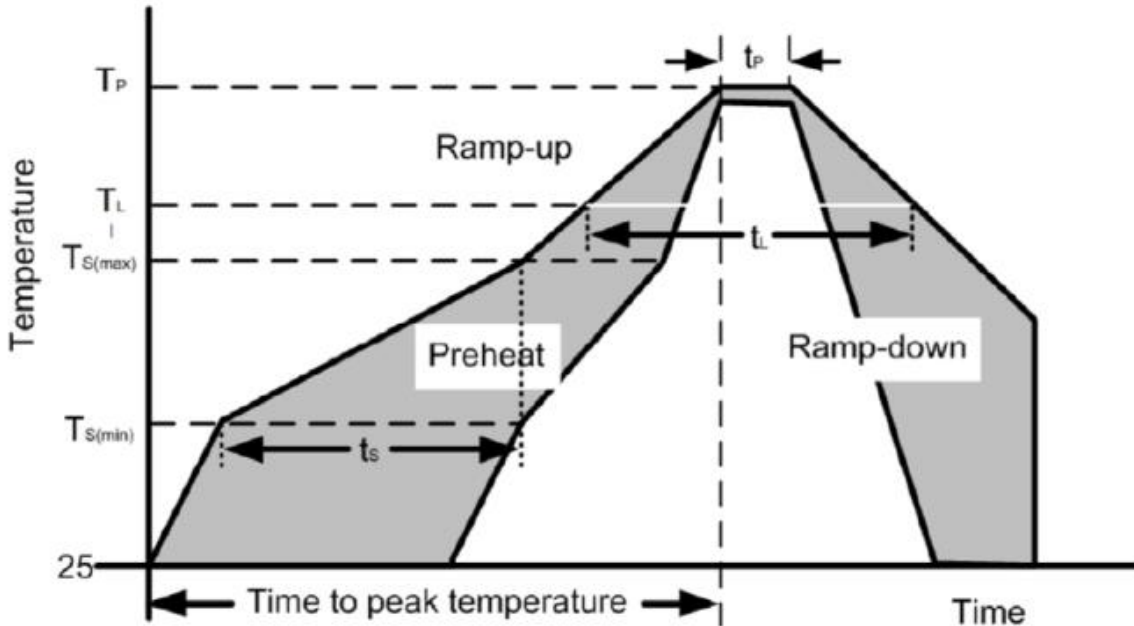
Symbol	Dimensions (mm)		
	Min	Typ	Max
A	0.45	0.50	0.55
A1	0.00	0.02	0.05
b	0.15	0.20	0.25
c	0.10	0.15	0.20
D	3.75	3.80	3.90
e	0.80 BSC		
e1	0.90 BSC		
E	0.90	1.00	1.10
L	0.20	0.30	0.40

Marking



PTUC0518N – ESD Protection Diode

Wave Soldering Parameters



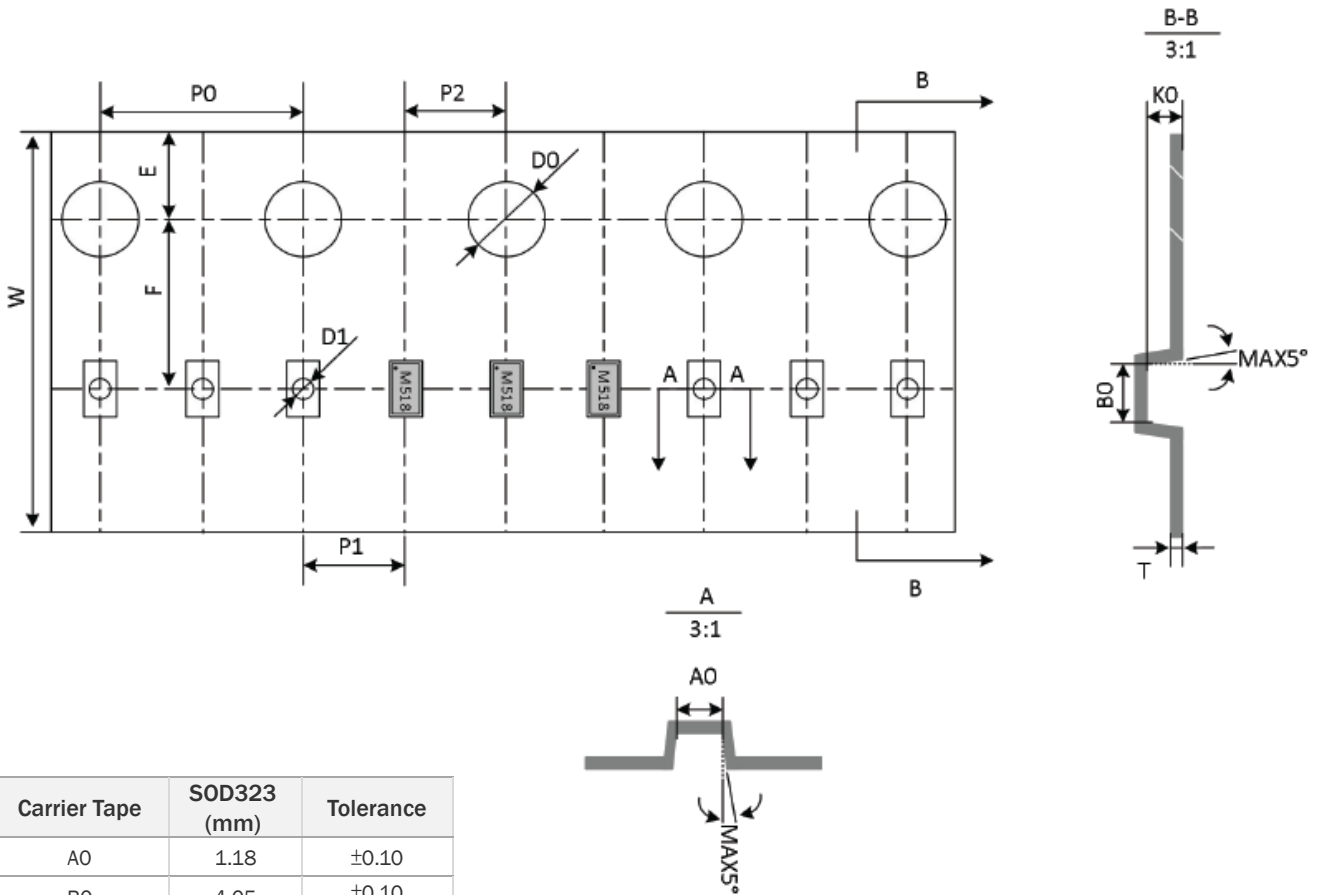
Reflow Condition	Pb-Free assembly
Pre Heat Temperature Min (Ts (min)) 150°C	Temperature Min (Ts (min)) 150°C
Pre Heat Temperature Min (Ts (max)) 200°C	Temperature Min (Ts (max)) 200°C
Pre Heat Time (min to max) (ts) 60-190 secs	Time (min to max) (ts) 60-190 secs
Average ramp up rate (Liquidus Temp) (TL) 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

PTUC0518N – ESD Protection Diode

Packaging Information

Order Code	Packaging	Reel Size	PCS/Reel
PTUC0518N	DFN3810	7 inch	3,000

Tape and Reel Specification



Carrier Tape	SOD323 (mm)	Tolerance
A0	1.18	±0.10
B0	4.05	±0.10
K0	0.72	±0.10
P0	4.00	±0.10
P0 X 10	40.00	±0.20
P1	4.00	±0.10
P2	2.00	±0.05
T	0.20	±0.05
E	1.75	±0.10
F	5.50	±0.05
D0	1.50	+0.1/0
D1	0.50	±0.25/0
W	12.00	±0.20