

PTLC05R – ESD Protection Diode

Feature

- 100 Watts peak pulse power (8/20 μ s)
- Tiny SOT-143 Package
- Unidirectional Configuration
- Protect two I/O lines
- Solid state silicon-avalanche technology
- Low operating voltage: 5V
- Low capacitance ($C_j = 0.4$ pF typ I/O to I/O)
- IEC61000-4-2 (ESD) ± 20 kV (Air), ± 15 kV (Contact)
- IEC61000-4-4 (EFT) 40A (5/50ns)
- IEC61000-4-5 (Lightning): 6A (8/20 μ s)



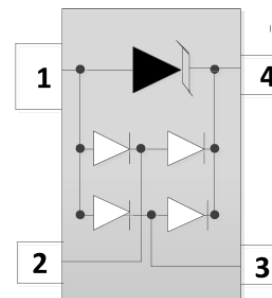
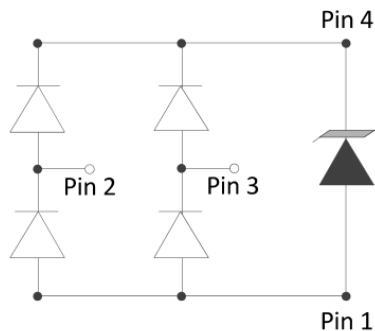
Applications

- USB2.0
- Ethernet
- Notebooks, Desktops and Servers
- Video Line Protection

Mechanical Data

- JEDEC SOT-143 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	$V_{ESD}^{(1)}$	± 20	kV
IEC61000-4-2 ESD Voltage – Contact Mode		± 15	
Peak Pulse Power	$P_{pp}^{(2)}$	100	W
Peak Pulse Current	$I_{pp}^{(2)}$	6.0	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.

PTLC05R – ESD Protection Diode

Electrical Characteristics

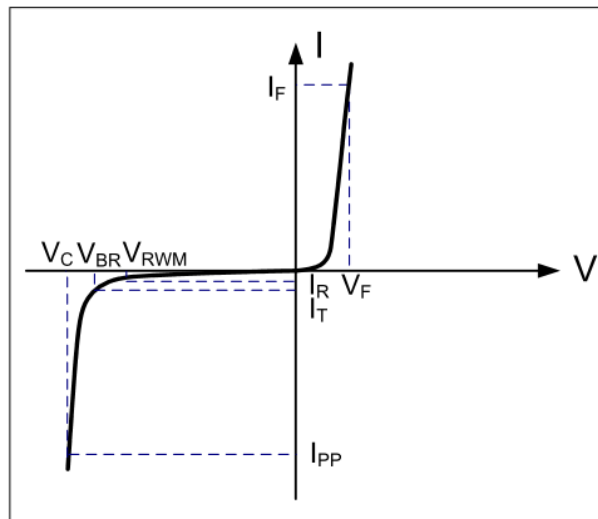
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Reverse Stand-off Voltage	$V_{RWM}^{(1)}$				5.0	V
Reverse Breakdown Voltage	V_{BR}	$I_T = 1mA$	6.0	6.8	8.5	V
Reverse Leakage Current	I_R	$V_{RWM} = 5V$		50	500	nA
Peak Pulse Current	I_{PP}				6.5	A
Clamping Voltage	$V_C^{(2)}$	$I_{PP} = 6A$		14	16	V
Junction Capacitance	C_J	$V_R = 0V, f = 1MHz, I/O \text{ to } I/O$		0.3	0.4	pF
		$V_R = 0V, f = 1MHz, I/O \text{ to } GND$		0.6	0.8	pF

Note:

1. Other voltages available upon request.
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.

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



PTLC05R – ESD Protection Diode

Typical Characteristics

Figure 1: Peak Pulse Power vs. Pulse Time

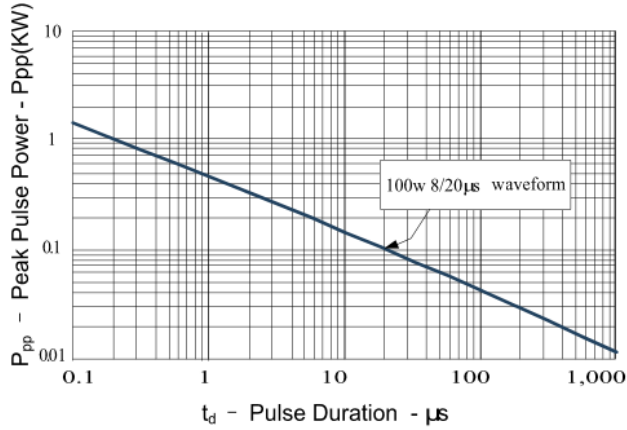


Figure 2: Power Derating Curve

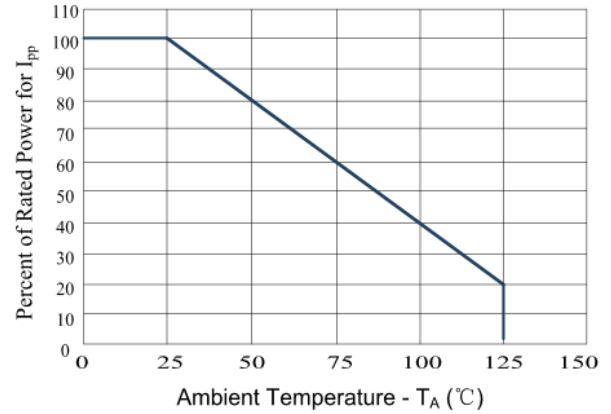


Figure3: Pulse Waveform

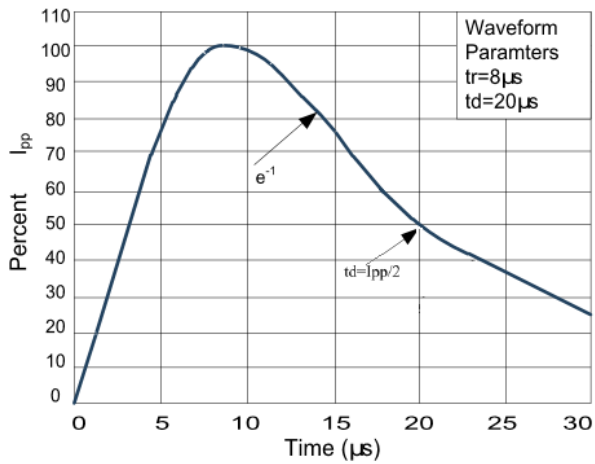
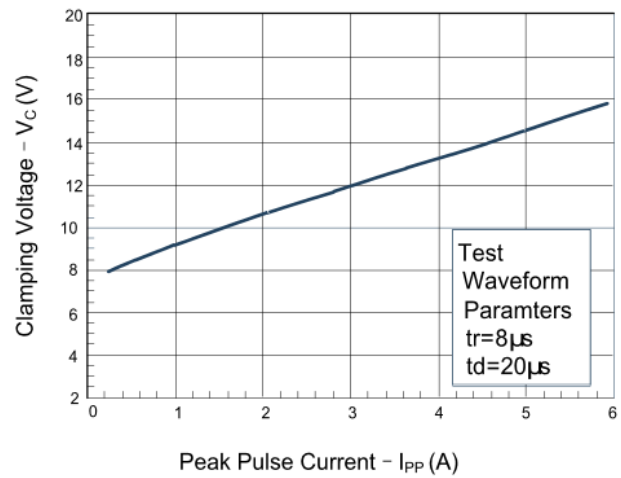
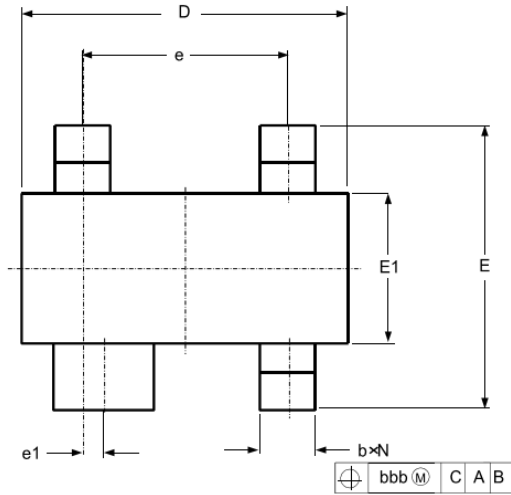


Figure 4: Clamping Voltage vs. I_pp

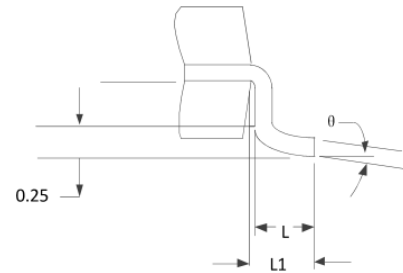
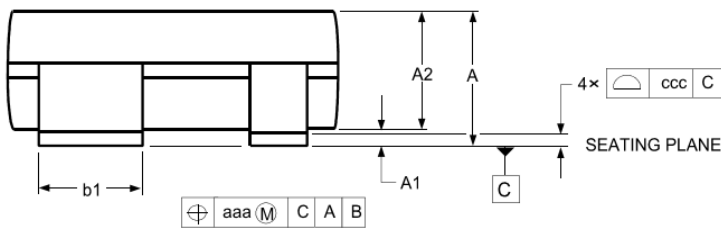


PTLC05R – ESD Protection Diode

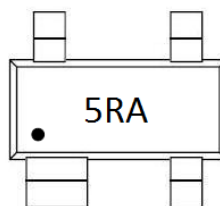
SOT-143 Package Outline Dimensions



Symbol	Dimensions (mm)	
	Min	Max
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
b1	0.750	0.900
c	0.080	0.150
D	2.800	3.000
e	1.800	2.000
e1	0.200 TYP	
E	2.250	2.550
E1	1.200	1.400
L1	0.550 REF	
L	0.300	0.500
θ	0°	8°



Marking



Packaging Information

Order Code	Packaging	Reel Size	PCS/Reel
PTLC05R	SOT-143	7 inch	3,000