

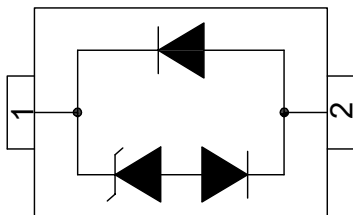
## Description

DLLCxxI-L a 3.3V~8V uni-directional TVS diode, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive high-speed data lines. The DLLCxxI-L has a low capacitance with a typical value at 1pF, and complies with the IEC 61000-4-2(ESD) standard with  $\pm 30\text{kV}$  air and  $\pm 30\text{kV}$  contact discharge. It is assembled into a lead-free SOD-323 package. The small size, low capacitance and high ESD surge protection make DLLCxxI-L an ideal choice to protect cell phone, wireless systems, and communication equipment.

## Mechanical Characteristics

- ◆ Package: SOD-323
- ◆ Lead Finish: Matte Tin
- ◆ Case Material: "Green" Molding Compound.
- ◆ UL Flammability Classification Rating 94V-0
- ◆ Moisture Sensitivity: Level 3 per J-STD-020
- ◆ Terminal Connections: See Diagram Below
- ◆ Marking Information: See Below

## Dimensions and Pin Configuration



Circuit and Pin Schematic

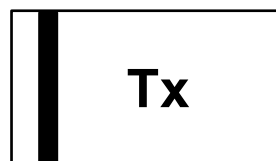
## Features

- ◆ 150W peak pulse power (8/20 $\mu\text{s}$ )
- ◆ Ultra low capacitance : 1.0pF typical
- ◆ Ultra low leakage: nA level
- ◆ Low Operating: 3.3V,5V,8V
- ◆ Low clamping voltage
- ◆ Protects one power line or data line
- ◆ Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
    - Air discharge:  $\pm 30\text{kV}$
    - Contact discharge:  $\pm 30\text{kV}$
  - IEC61000-4-4 (EFT) 40A (5/50ns)
- ◆ RoHS Compliant

## Applications

- ◆ USB Ports
- ◆ Smart Phones
- ◆ Wireless Systems
- ◆ Ethernet 10/100/1000 Base T

## Marking Information



Tx: Device Marking Code

## Ordering Information

Part Number	Marking	Packaging	Reel Size
DLLCxxI-L	Tx	3000/Tape & Reel	7 inch

### Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
ESD per IEC 61000-4-2 (Air)	V <sub>ESD</sub>	±30	kV
ESD per IEC 61000-4-2 (Contact)		±30	
Operating Temperature Range	T <sub>J</sub>	-40 to +85	°C
Storage Temperature Range	T <sub>stg</sub>	-55 to +150	°C

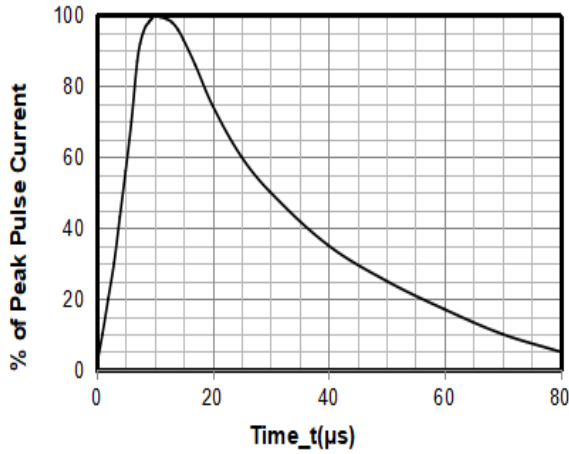
### Electrical Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise specified)

DLLC03I-L (Marking Code:T1)						
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V <sub>RWM</sub>			3.3	V	
Breakdown Voltage	V <sub>BR</sub>	4			V	I <sub>T</sub> = 1mA
Reverse Leakage Current	I <sub>R</sub>		1	100	nA	V <sub>RWM</sub> = 3.3V
Forward Voltage	V <sub>F</sub>		0.8	1.2	V	I <sub>F</sub> =10mA
Clamping Voltage	V <sub>C</sub>		7		V	I <sub>PP</sub> = 1A (8 x 20µs pulse)
Clamping Voltage	V <sub>C</sub>		12		V	I <sub>PP</sub> = 10A (8 x 20µs pulse)
Peak Pulse Current	I <sub>PP</sub>			10	A	t <sub>p</sub> =8/20µs
Junction Capacitance	C <sub>J</sub>		1		pF	V <sub>R</sub> = 0V, f = 1MHz

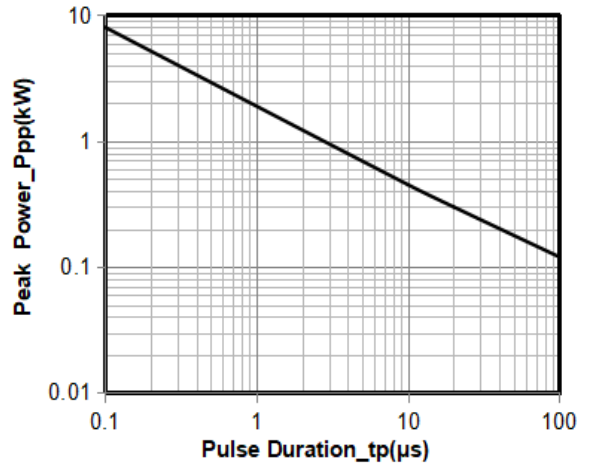
DLLC051-L (Marking Code:T5)						
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	VRWM			5	V	
Breakdown Voltage	VBR	6			V	IT = 1mA
Reverse Leakage Current	IR		1	100	nA	VRWM = 5V
Forward Voltage	VF		0.8	1.2	V	IF=10mA
Clamping Voltage	VC		9		V	I <sub>PP</sub> = 1A (8 x 20μs pulse)
Clamping Voltage	VC		12		V	I <sub>PP</sub> = 8.5A (8 x 20μs pulse)
Peak Pulse Current	I <sub>PP</sub>			8.5	A	tp=8/20μs
Junction Capacitance	CJ		1		pF	VR = 0V, f = 1MHz

DLLC081-L (Marking Code:T8)						
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	VRWM			8	V	
Breakdown Voltage	VBR	8.5			V	IT = 1mA
Reverse Leakage Current	IR		1	100	nA	VRWM = 8V
Forward Voltage	VF		0.8	1.2	V	IF=10mA
Clamping Voltage	VC		12		V	I <sub>PP</sub> = 1A (8 x 20μs pulse)
Clamping Voltage	VC		12		V	I <sub>PP</sub> = 7A (8 x 20μs pulse)
Peak Pulse Current	I <sub>PP</sub>			7	A	tp=8/20μs
Junction Capacitance	CJ		1		pF	VR = 0V, f = 1MHz

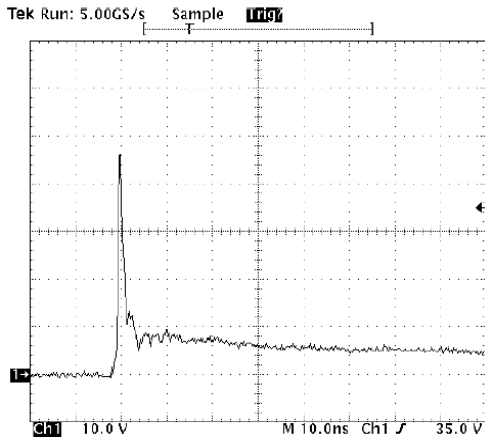
**Typical Performance Characteristics (TA=25°C unless otherwise Specified)**



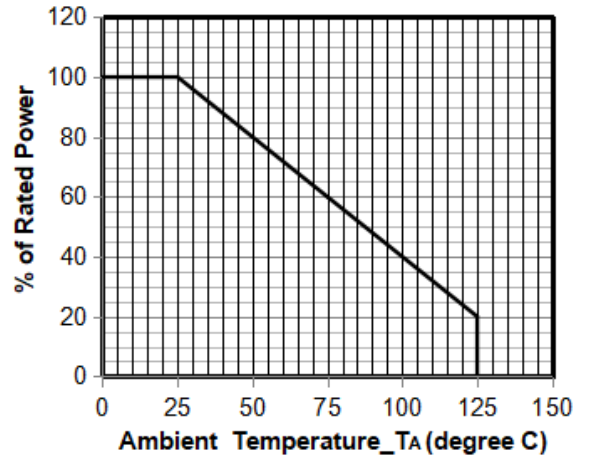
**8 X 20μs Pulse Waveform**



**Peak Pulse Power vs. Pulse Time**

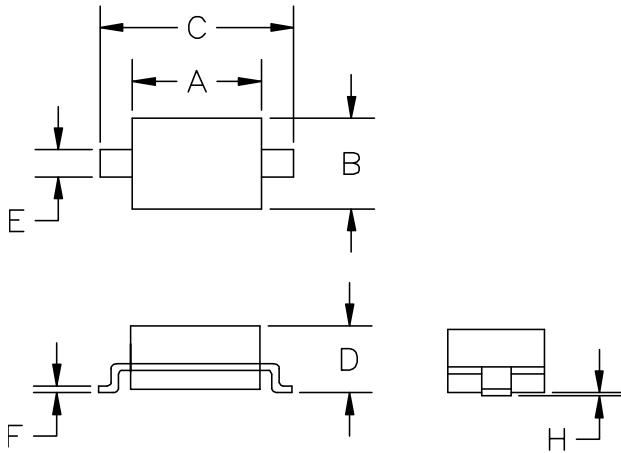


**Note: Data is taken with a 10x attenuator**  
**ESD Clamping Voltage**  
**8 kV Contact per IEC61000-4-2**



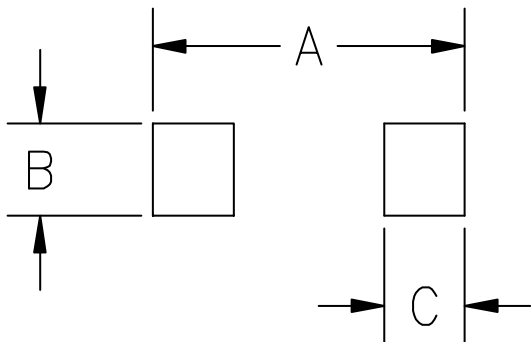
**Power Derating Curve**

## SOD-323 Package Outline Drawing



SYM	DIMENSIONS			
	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.50	1.80	0.060	0.071
B	1.20	1.40	0.045	0.054
C	2.30	2.70	0.090	0.107
D	-	1.10	-	0.043
E	0.30	0.40	0.012	0.016
F	0.10	0.25	0.004	0.010
H	-	0.10	-	0.004

## Suggested Land Pattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
A	3.15	0.120
B	0.80	0.031
C	0.80	0.031

## Contact Information

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