

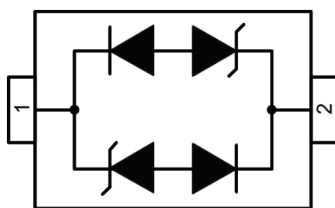
Description

DLLCxxCI a 3.3V ~24V bi-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 DLLCxxCI 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 DLLCxxCI 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

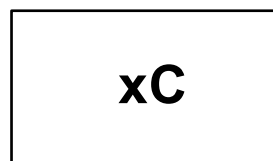
Features

- ◆ 350W peak pulse power (8/20 μs)
- ◆ Ultra low capacitance : 1.0pF typical
- ◆ Ultra low leakage: nA level
- ◆ Low Operating: 3.3V,5V,8V,12V,15V,24V
- ◆ 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



xC: Device Marking Code

Ordering Information

Part Number	Marking	Packaging	Reel Size
DLLCxxCI	xC	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 _{ESD}	±30	kV
ESD per IEC 61000-4-2 (Contact)		±30	
Operating Temperature Range	T _J	-40 to +85	°C
Storage Temperature Range	T _{stg}	-55 to +150	°C

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

DLLC03CI (Marking Code: CC)						
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V _{RWM}			3.3	V	
Breakdown Voltage	V _{BR}	4			V	I _T = 1mA
Reverse Leakage Current	I _R		1	100	nA	V _{RWM} = 3.3V
Clamping Voltage	V _C			7	V	I _{PP} = 1A (8 x 20µs pulse)
Clamping Voltage	V _C			16	V	I _{PP} = 20A (8 x 20µs pulse)
Peak Pulse Current	I _{PP}			20	A	t _p =8/20µs
Junction Capacitance	C _J		1		pF	V _R = 0V, f = 1MHz

DLLC05CI (Marking Code: AC)						
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V_{RWM}			5	V	
Breakdown Voltage	V_{BR}	6			V	$I_T = 1\text{mA}$
Reverse Leakage Current	I_R		1	100	nA	$V_{RWM} = 5\text{V}$
Clamping Voltage	V_C			10	V	$I_{PP} = 1\text{A}$ (8 x 20 μs pulse)
Clamping Voltage	V_C			18	V	$I_{PP} = 18\text{A}$ (8 x 20 μs pulse)
Peak Pulse Current	I_{PP}			18	A	$t_p=8/20\mu\text{s}$
Junction Capacitance	C_J		1		pF	$V_R = 0\text{V}$, $f = 1\text{MHz}$

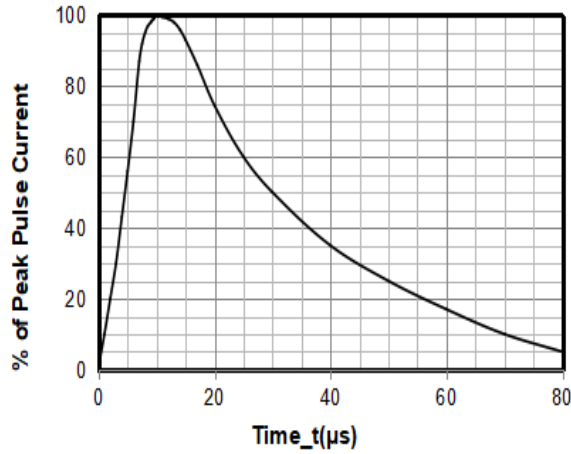
DLLC08CI (Marking Code: BC)						
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V_{RWM}			8	V	
Breakdown Voltage	V_{BR}	8.5			V	$I_T = 1\text{mA}$
Reverse Leakage Current	I_R		1	100	nA	$V_{RWM} = 8\text{V}$
Clamping Voltage	V_C			14	V	$I_{PP} = 1\text{A}$ (8 x 20 μs pulse)
Clamping Voltage	V_C			19	V	$I_{PP} = 13\text{A}$ (8 x 20 μs pulse)
Peak Pulse Current	I_{PP}			13	A	$t_p=8/20\mu\text{s}$
Junction Capacitance	C_J		1		pF	$V_R = 0\text{V}$, $f = 1\text{MHz}$

DLLC12CI (Marking Code: DC)						
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V_{RWM}			12	V	
Breakdown Voltage	V_{BR}	13.3			V	$I_T = 1\text{mA}$
Reverse Leakage Current	I_R		1	100	nA	$V_{RWM} = 12\text{V}$
Clamping Voltage	V_C			19	V	$I_{PP} = 1\text{A}$ (8 x 20 μs pulse)
Clamping Voltage	V_C			25	V	$I_{PP} = 10\text{A}$ (8 x 20 μs pulse)
Peak Pulse Current	I_{PP}			10	A	$t_p = 8/20\mu\text{s}$
Junction Capacitance	C_J		1		pF	$V_R = 0\text{V}$, $f = 1\text{MHz}$

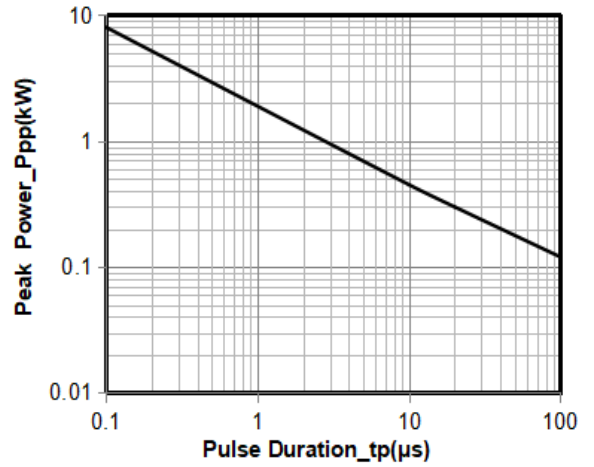
DLLC15CI (Marking Code: EC)						
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V_{RWM}			15	V	
Breakdown Voltage	V_{BR}	16.7			V	$I_T = 1\text{mA}$
Reverse Leakage Current	I_R		1	100	nA	$V_{RWM} = 15\text{V}$
Clamping Voltage	V_C			20	V	$I_{PP} = 1\text{A}$ (8 x 20 μs pulse)
Clamping Voltage	V_C			31	V	$I_{PP} = 8\text{A}$ (8 x 20 μs pulse)
Peak Pulse Current	I_{PP}			8	A	$t_p = 8/20\mu\text{s}$
Junction Capacitance	C_J		1		pF	$V_R = 0\text{V}$, $f = 1\text{MHz}$

DLLC24CI (Marking Code: HC)						
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V_{RWM}			24	V	
Breakdown Voltage	V_{BR}	26.7			V	$I_T = 1\text{mA}$
Reverse Leakage Current	I_R		1	100	nA	$V_{RWM} = 24\text{V}$
Clamping Voltage	V_C			40	V	$I_{PP} = 1\text{A}$ (8 x 20 μs pulse)
Clamping Voltage	V_C			71	V	$I_{PP} = 3.5\text{A}$ (8 x 20 μs pulse)
Peak Pulse Current	I_{PP}			3.5	A	$t_p = 8/20\mu\text{s}$
Junction Capacitance	C_J		1		pF	$V_R = 0\text{V}$, $f = 1\text{MHz}$

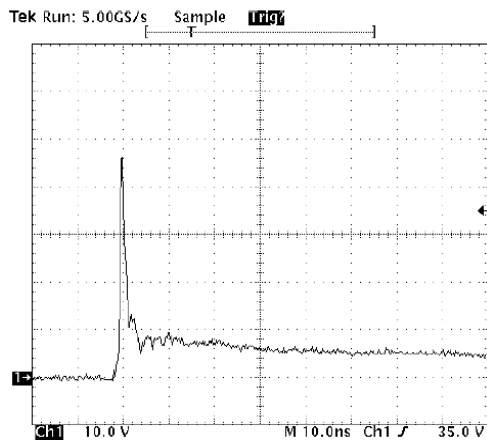
Typical Performance Characteristics (TA=25°C unless otherwise Specified)



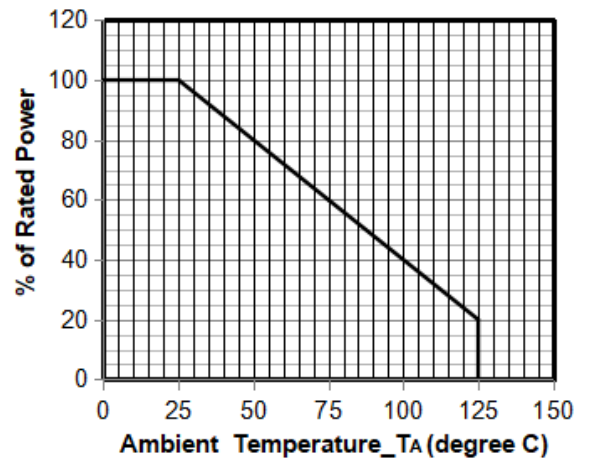
8 X 20μs Pulse Waveform



Peak Pulse Power vs. Pulse Time

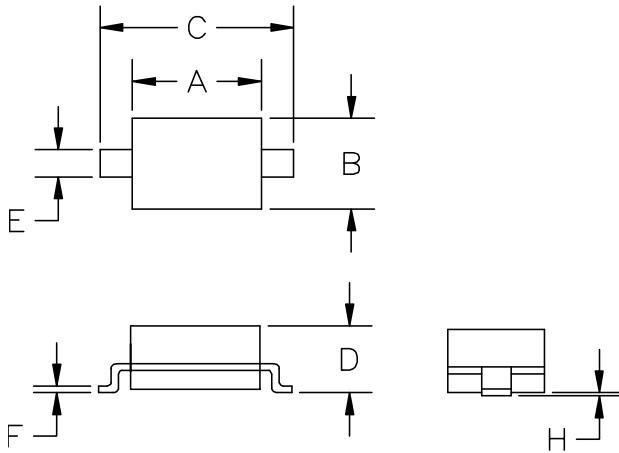


Note: Data is taken with a 10x attenuator
ESD Clamping Voltage
8 kV Contact per IEC61000-4-2



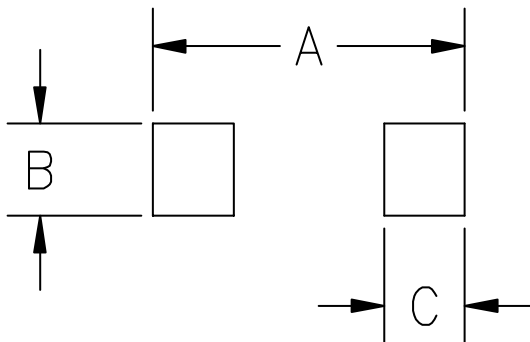
Power Derating Curve

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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