ULTRA-LOW CAPACITANCE BIDIRECTIONAL TVS

Product Summary

$V_{BR\ MIN}$	$I_{PP\ MAX}$	$C_{IN\ TYP}$
13.3V	10A	0.6pF

Description

The DBLC12CIQ is an ultra-low capacitance & high surge "Q" grade bidirectional TVS product in SOD323, which is designed for automotive to protect sensitive ESD and surge lightning discharge electronics.

This device protects sensitive electronics from electrostatic discharge and surge lightning events, thereby safeguarding high-speed data interfaces and reducing EMI interference.

Applications

- Ethernet – 1G/2.5G secondary protects
- USB 2.0 interfaces
- A2B (auto. audio bus)
- PLC communication interfaces
- AUX I/O

Features

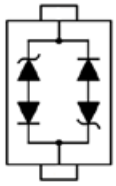
- Provides ESD Protection per IEC 61000-4-2 Standard:
  Air ±30kV, Contact ±30kV
- 1 Channel of ESD Protection
- 350 Watts Peak Pulse Power per Line (t_P = 8/20μs)
- Low Channel Input Capacitance
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The DBLC12CIQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**
  https://www.diodes.com/quality/product-definitions/

Mechanical Data

- Package: SOD323
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Alloy 42 Leadframe (Lead-Free Plating). Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.004 grams (Approximate)

SOD323

Top View



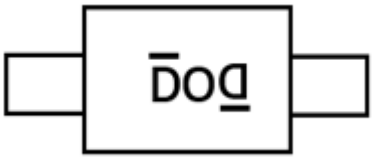
Device Schematic

Ordering Information (Note 4)

Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
DBLC12CIQ-7	SOD323	D0Q	7	8	3,000	Tape & Reel

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information



D0Q = Product Type Marking Code

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit	Conditions
Peak Pulse Power Dissipation	P_{PP}	350	W	8/20μs, Per Figure 3
Peak Pulse Current	I_{PP}	10	A	8/20μs, Per Figure 3
ESD Protection – Contact Discharge	$V_{ESD\_CONTACT}$	±30	kV	Standard IEC 61000-4-2
ESD Protection – Air Discharge	V_{ESD_AIR}	±30	kV	Standard IEC 61000-4-2

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Package Power Dissipation (Note 5)	P_D	250	mW
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	500	°C/W
Operating Temperature Range	T_J	-55 to +150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C
Soldering Temperature, t max = 10s	T_L	+260	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
Reverse Working Voltage	V_{RWM}	—	—	12	V	—
Reverse Current (Note 6)	I_R	—	—	1	μA	$V_R = V_{RWM}$ = 12V
Reverse Breakdown Voltage	V_{BR}	13.3	—	—	V	I_R = 1mA
Reverse Clamping Voltage	V_{CL}	—	—	23	V	I_{PP} = 1A, t_P = 8/20μs
		—	—	35		I_{PP} = 10A, t_P = 8/20μs
Capacitance	C_{IN}	—	0.6	0.7	pF	V_R = 0V, f = 1MHz

Notes: 5. Device mounted on FR-4 PCB pad layout (2oz copper) as shown in Diodes Incorporated's package outline PDFs, which can be found on our website at http://www.diodes.com/package-outlines.html.
6. Short duration pulse test used to minimize self-heating effect.

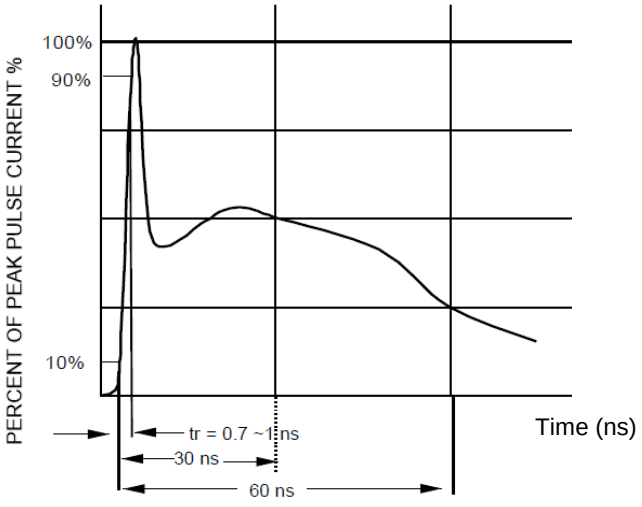


Figure 1. ESD Pulse Waveform According to IEC 61000-4-2

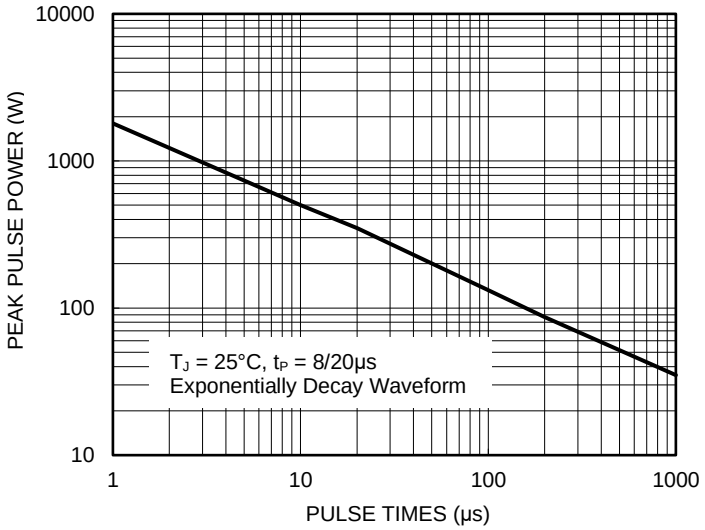


Figure 2. Power Dissipation Versus Pulse Time

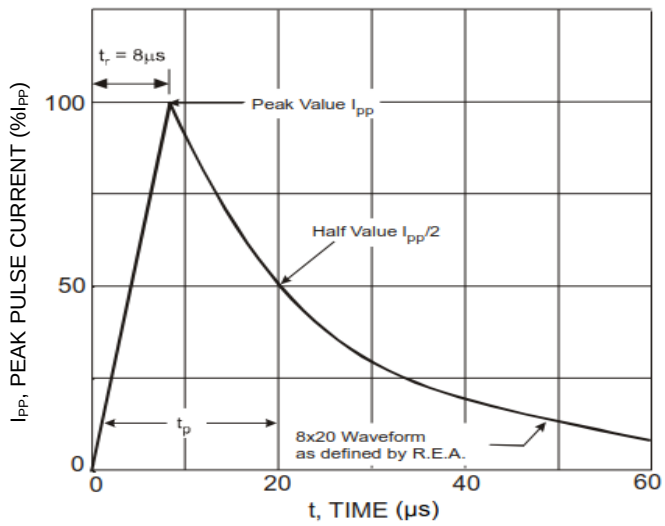


Figure 3. Typical 8 x 20µs Pulse Waveform

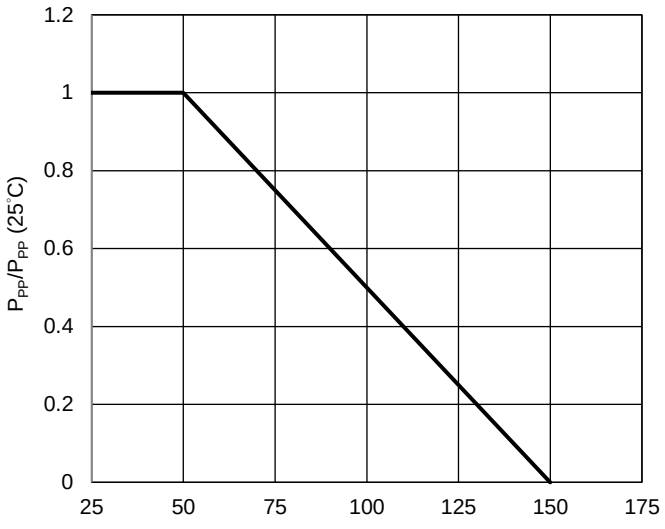


Figure 4. Peak Pulse Power Versus T_J

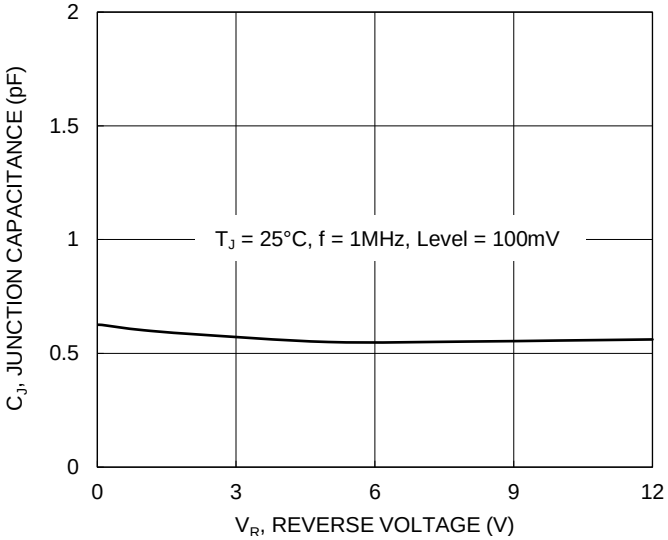


Figure 5. Typical Junction Capacitance

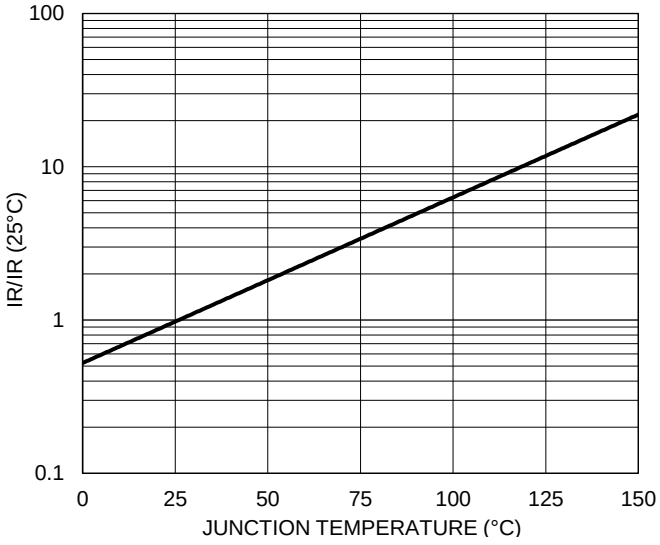


Figure 6. Reverse Leakage Current Versus T_J

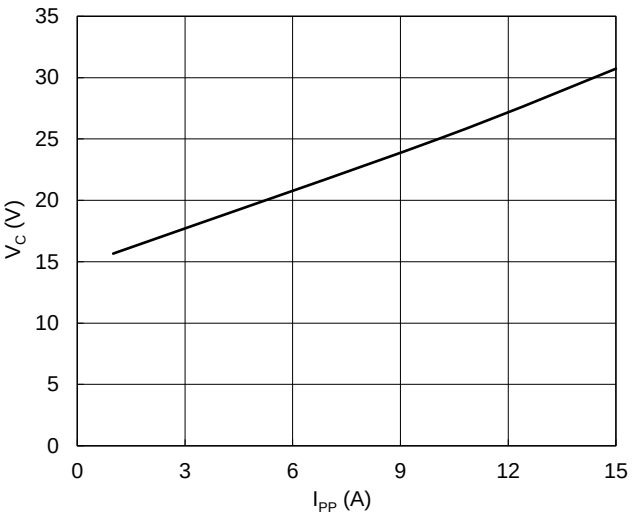


Figure 7. Typical Peak Clamping Voltage V_C vs. Peak Pulse Current I_{PP}

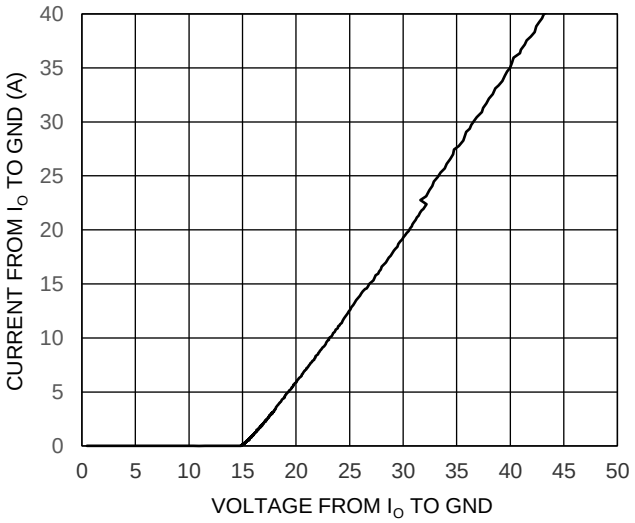
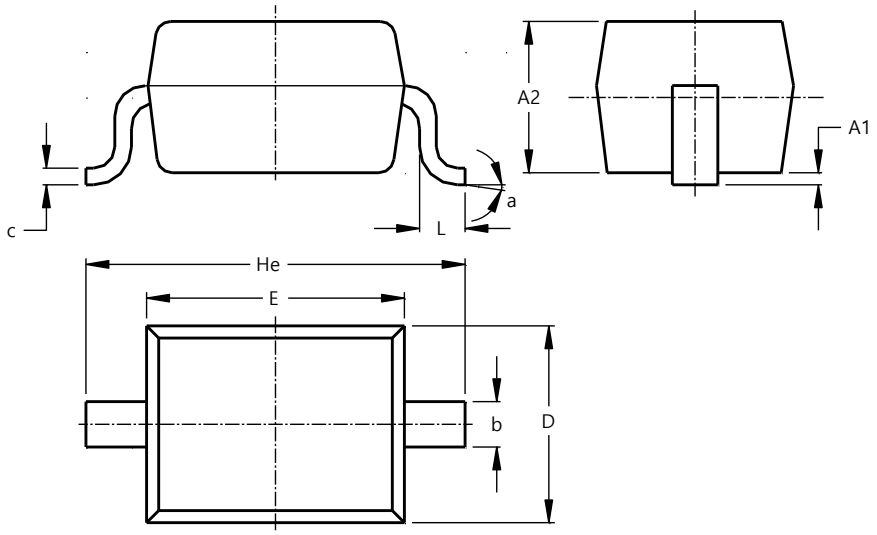


Figure 8. TLP Curve (t_P = 100ns)

Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOD323

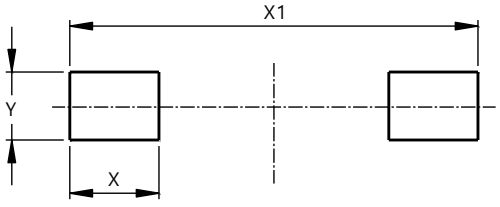


SOD323			
Dim	**Min**	**Max**	**Typ**
A1	--	0.10	0.05
A2	1.00	1.10	1.05
b	0.25	0.35	0.30
c	0.10	0.15	0.11
D	1.20	1.40	1.30
E	1.60	1.80	1.70
He	2.30	2.70	2.50
L	0.20	0.40	0.30
a	0º	8º	--
All Dimensions in mm			

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOD323



Dimensions	Value (in mm)
X	0.590
X1	2.700
Y	0.450

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