

1-Line Low Capacitance Bi-directional TVS Diode
DESCRIPTION

The HSBLC03C is a bi-directional TVS diode, utilizing leading monolithic silicon technology to provide fast re-sponse time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive high-speed data lines. The HSBLC03C has an ultra-low capacitance with a typical value at 1.0pF, and complies with the IEC 61000-4-2 (ESD) with $\pm 30\text{kV}$ air and $\pm 30\text{kV}$ contact discharge. It is assembled into a SOD-323 lead-free package. The small size, ultra-low capacitance and high ESD surge protection make HSBLC03C an ideal choice to protect cell phone, digital video interfaces and other high speed ports.

FEATURES

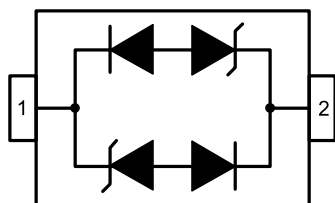
- ◆ 340W peak pulse power (8/20us)
- ◆ Ultra low capacitance: 1pF typical
- ◆ Ultra low leakage: nA level
- ◆ Operating voltage: 3.3V
- ◆ Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test
 - Air discharge: $\pm 30\text{kV}$
 - Contact discharge: $\pm 30\text{kV}$
 - IEC61000-4-5 (Lightning) 21A (8/20us)
- ◆ RoHS Compliant

MECHANICAL CHARACTERISTICS

- ◆ Package: SOD-323
- ◆ Lead Finish: Matte Tin
- ◆ Case Material: "Green" Molding Compound.
- ◆ Terminal Connections: See Diagram Below
- ◆ Marking Information: See Below

APPLICATIONS

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

SCHEMATIC & PIN CONFIGURATION

Circuit diagram
MARKING INFORMATION


CC = Device code

Marking (Top View)

**1-Line Low Capacitance Bi-directional TVS Diode****Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ unless otherwise specified)**

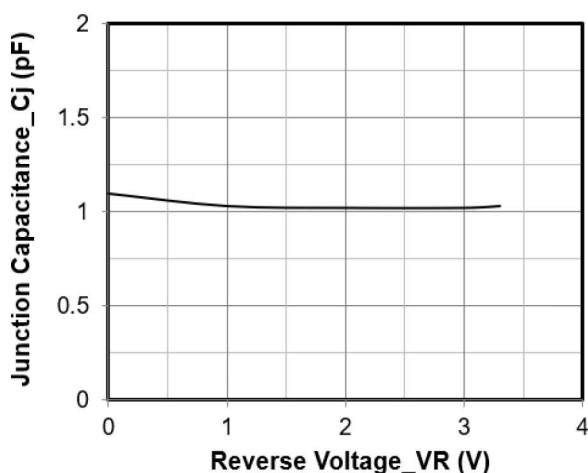
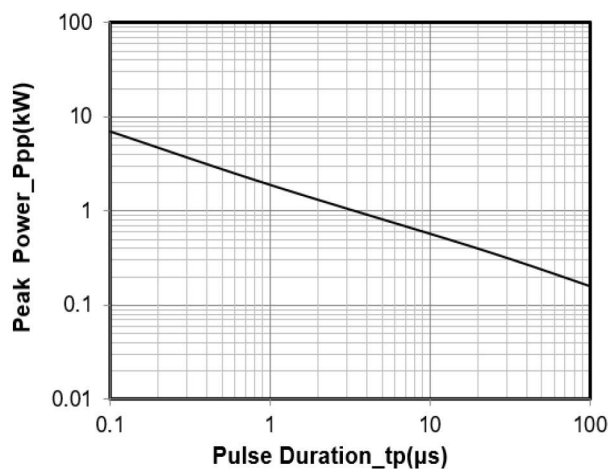
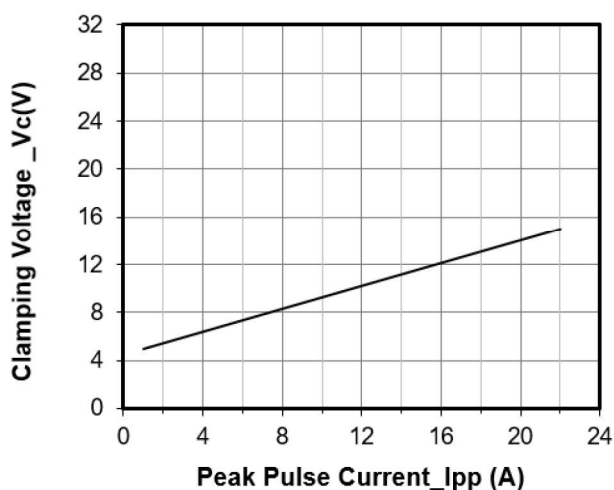
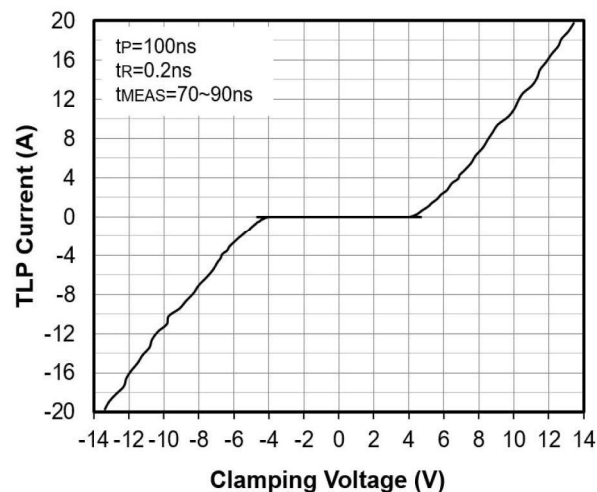
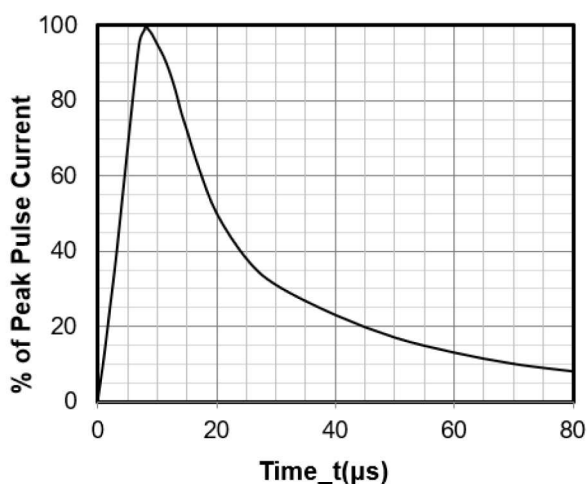
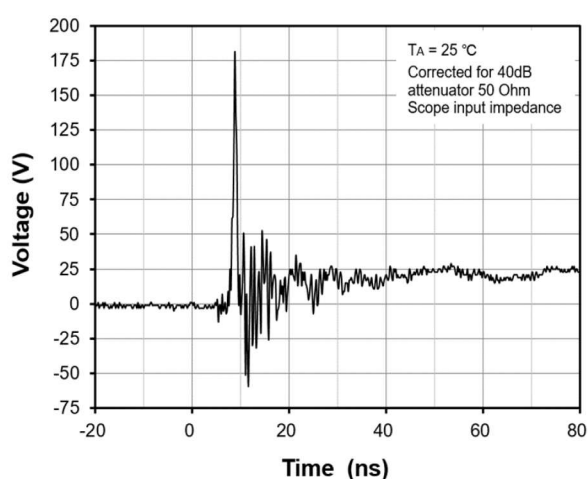
Parameter	Symbol	Rating	Unit
Peak pulse power ($t_p = 8/20\mu\text{s}$)	P_{pk}	350	W
Peak pulse current ($t_p = 8/20\mu\text{s}$)	I_{PP}	21	A
ESD according to IEC61000-4-2 air discharge	V_{ESD}	± 30	kV
ESD according to IEC61000-4-2 contact discharge		± 30	
Junction temperature	T_J	125	$^{\circ}\text{C}$
Operation temperature	T_{OP}	-40~85	$^{\circ}\text{C}$
Lead temperature	T_L	260	$^{\circ}\text{C}$
Storage temperature	T_{STG}	-55~150	$^{\circ}\text{C}$

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

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse maximum working voltage	V_{RWM}				3.3	V
Reverse leakage current	I_R	$V_{RWM} = 3.3\text{V}$		10	200	nA
Reverse breakdown voltage	V_{BR}	$I_T = 1\text{mA}$	3.5			V
Clamping voltage ¹⁾	V_{CL}	$I_{PP} = 16\text{A}$, $t_p = 100\text{ns}$		12		V
Dynamic resistance ¹⁾	R_{DYN}			0.41		Ω
Clamping voltage ²⁾	V_{CL}	$V_{ESD} = 8\text{kV}$		12		V
Clamping voltage ³⁾	V_{CL}	$I_{PP} = 1\text{A}$, $t_p = 8/20\mu\text{s}$		6	7	V
		$I_{PP} = 21\text{A}$, $t_p = 8/20\mu\text{s}$		15	17	V
Junction capacitance	C_J	$V_R = 0\text{V}$, $f = 1\text{MHz}$		1		pF

Notes:

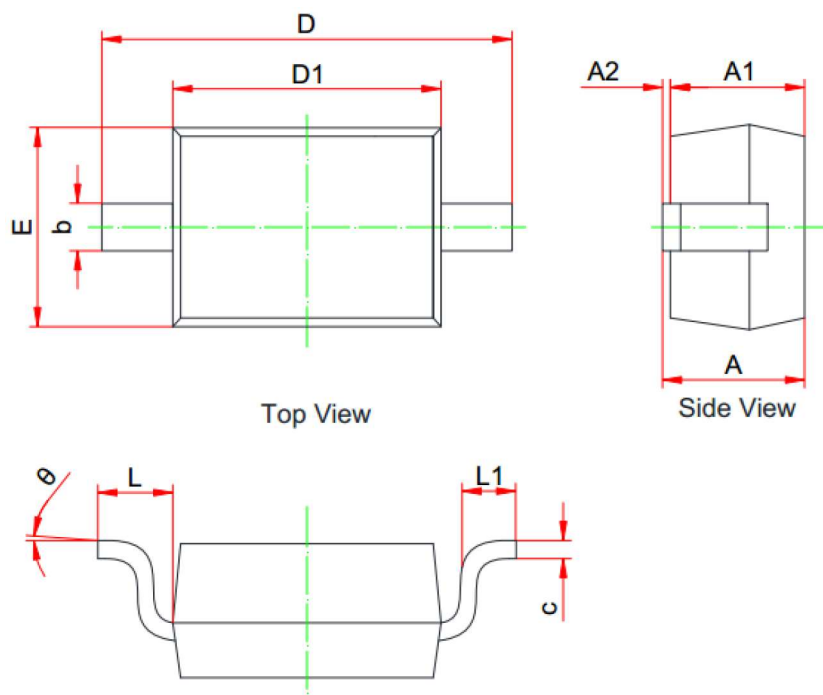
- 1) TLP parameter: $Z_0 = 50\Omega$, $t_p = 100\text{ns}$, $t_r = 0.2\text{ns}$, averaging window from 70ns to 90ns. R_{DYN} is calculated from 4A to 16A.
- 2) Contact discharge mode, according to IEC61000-4-2.
- 3) Non-repetitive current pulse, according to IEC61000-4-5.

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

Junction Capacitance vs. Reverse Voltage

Peak Pulse Power vs. Pulse Time

Clamping Voltage vs. Peak Pulse Current ($t_p = 8/20\mu$ s)

TLP Measurement

8 X 20 μ s Pulse Waveform

**ESD Clamping Voltage
8 kV Contact per IEC61000-4-2**



Outline Drawing

SOD-323(Q)



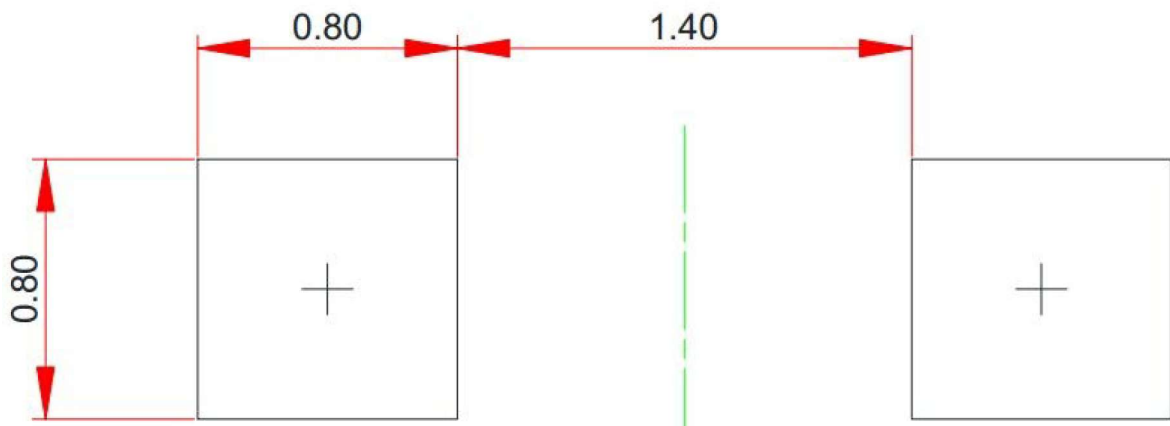
	MILLIMETERS		
	MIN	NOM	MAX
A	0.800	--	1.100
A1	0.800	--	0.900
A2	0.000	--	0.100
b	0.250	--	0.400
c	0.080	--	0.177
D1	1.600	1.700	1.800
D	2.300	--	2.800
E	1.150	--	1.400
L	0.475REF		
L1	0.100	--	0.500
θ	0°	--	8°

Rev.A



Suggested Soldering Pad Layout

SOD-323(Q)



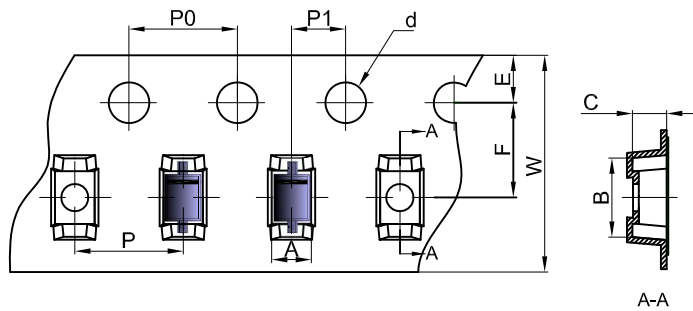
Unit: mm

Rev.A



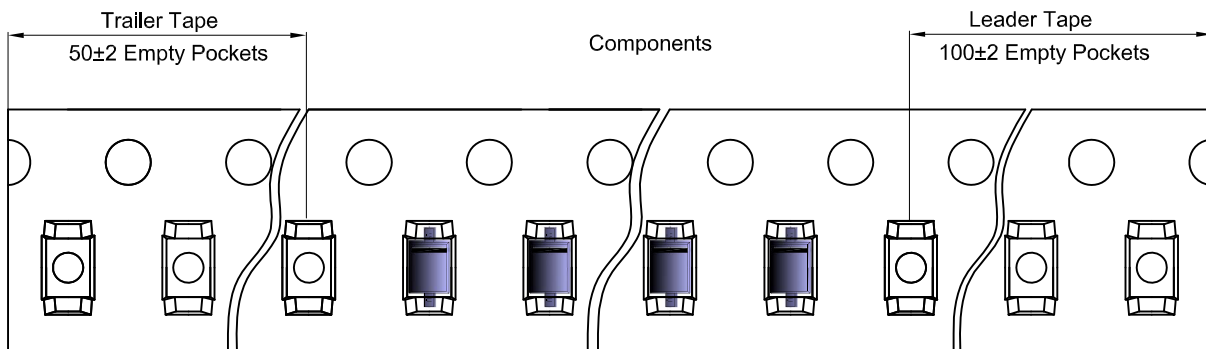
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SOD-323 Embossed Carrier Tape

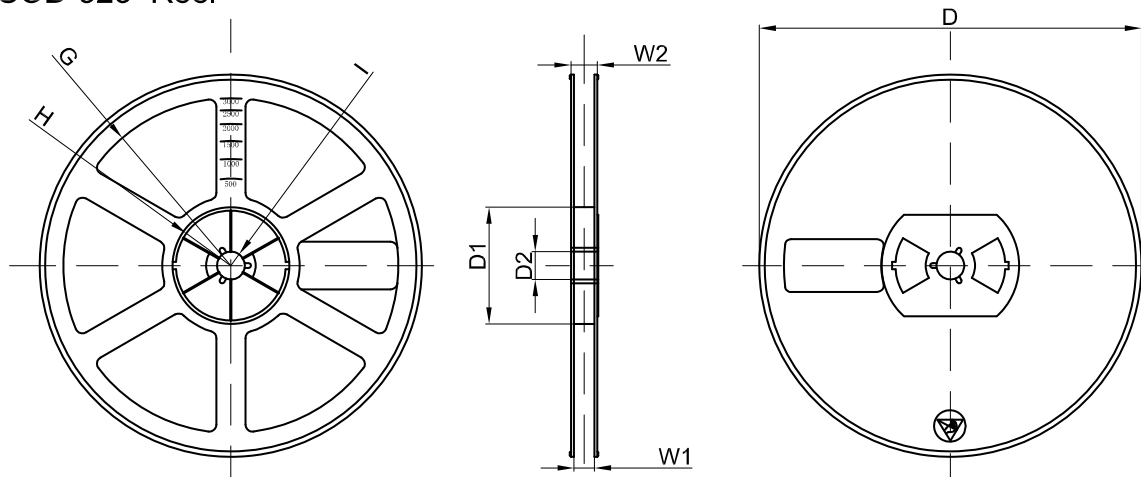


Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
SOD-323	1.48	3.3	1.25	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00

SOD-323 Tape Leader and Trailer



SOD-323 Reel



Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7"Dia	Ø178.00	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
3000 pcs	7 inch	45,000 pcs	203×203×195	180,000 pcs	438×438×220	

1-Line Low Capacitance Bi-directional TVS Diode
Ordering Information:

Device PN	Marking ⁽⁴⁾	Packing
HSBLC03C-T ⁽¹⁾ H ⁽²⁾ -WS ⁽³⁾	CC	Tape&Reel: 3Kpcs/Reel

Note: (1) Packing code, Tape & Reel Packing

(2) Packing code suffix "G" for RoHS product ; Packing code Suffix "H" for halogen free product.
All materials and products supplied comply with the U.S. Toxic Substances Control Act statement, PBT Chemicals.

(3) Willas brand abbreviation, Label Type does not display

(4) There may be additional marking, which relates to the lot trace code information (data code and vendor code), the logo or the environmental category on the device

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