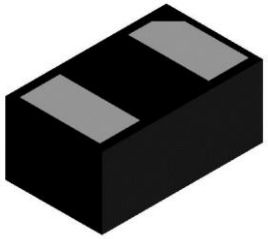
FEATURES

- Stand-off voltage: 5.5V Max.
- Transient protection for each line according to
  IEC61000-4-2 (ESD): ±20kV (contact discharge)
  IEC61000-4-5 (surge): 3A (8/20μs)
- Ultra-low capacitance: C_J = 0.22pF typ.
- Ultra-low leakage current
- Low clamping voltage: V_{CL} = 22V typ. @ I_{PP} = 16A (TLP)
- Solid-state silicon technology
- Device meets MSL 1 requirements
- AEC-Q101 qualified

PRODUCT APPEARANCE



Provide green and environmentally friendly lead-free package

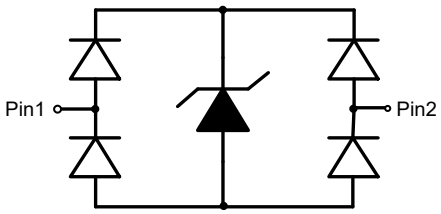
DESCRIPTION

The SITBN5V51BNQ is an ultra-low capacitance TVS (Transient Voltage Suppressor) designed to protect high speed data interfaces. It has been specifically designed to protect sensitive electronic components which are connected to data and transmission lines from over-stress caused by ESD (Electrostatic Discharge).
The SITBN5V51BNQ incorporates one pair of ultra-low capacitance steering diodes plus a TVS diode.
The SITBN5V51BNQ may be used to provide ESD protection up to ±20kV (contact discharge) according to IEC61000-4-2, and withstand peak pulse current up to 3A (8/20μs) according to IEC61000-4-5.
The SITBN5V51BNQ is available in DFN1006-2L package. Standard products are Pb-free and Halogen-free.

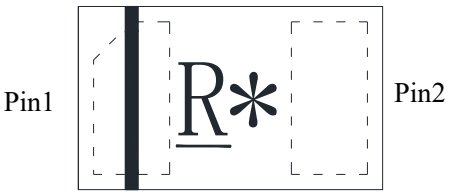
Applications:

- Portable electronics
- Communication systems
- High-speed data lines
- Computers and peripherals
- Audio and video equipment
- Cellular handsets and accessories

PIN CONFIGURATION



MARKING (TOP VIEW)

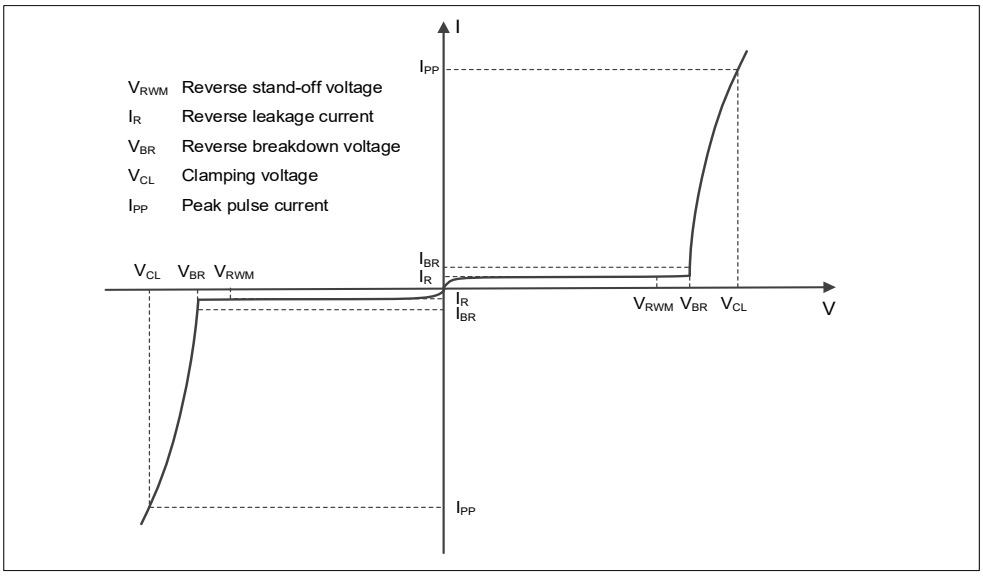


R = Device code
* = Month code (A~Z)

LIMITING VALUES

Parameter	Symbol	Value	Unit
Peak pulse power (t_p = 8/20μs)	P_{PK}	54	W
Peak pulse current (t_p = 8/20μs)	I_{PP}	3	A
ESD according to IEC61000-4-2 air discharge	V_{ESD}	±20	kV
ESD according to IEC61000-4-2 contact discharge		±20	kV
ESD according to ISO 10605 contact discharge C = 330 pF, R = 330 Ω; C = 150 pF, R = 330 Ω; C = 330 pF, R = 2 kΩ; C = 150 pF, R = 2 kΩ;		±20	kV
Junction temperature	T_J	150	℃
Operating temperature	T_{OP}	-55~150	℃
Lead temperature	T_L	260	℃
Storage temperature	T_{STG}	-65~150	℃

ELECTRICAL CHARACTERISTICS



Definitions of electrical characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse maximum working voltage	V_{RWM}				5.5	V
Reverse leakage current	I_R	V_{RWM} = 5.5V			100	nA
Reverse breakdown voltage	V_{BR}	I_T = 1mA	6.0		10.0	V
Clamping voltage (1)	V_{CL}	I_{PP} = 16A, t_p = 100ns		22.0		V
Dynamic resistance (1)	R_{DYN}			0.75		Ω
Clamping voltage (2)	V_{CL}	V_{ESD} = 8kV		22.0		V
Clamping voltage (3)	V_{CL}	I_{PP} = 1A, t_p = 8/20μs			14.0	V
		I_{PP} = 3A, t_p = 8/20μs			18.0	V
Junction capacitance	C_J	V_R = 0V, f = 1MHz, Any I/O pin to GND		0.22	0.4	pF

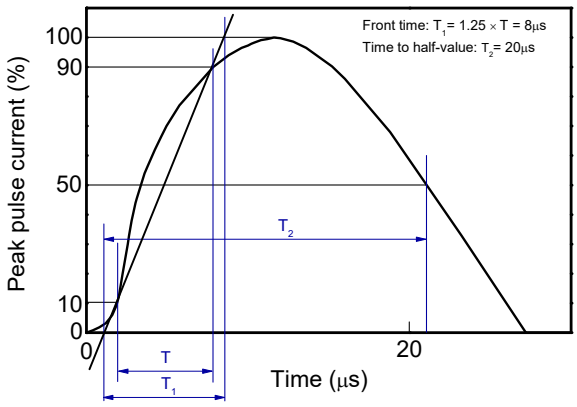
(T_A=25°C, unless otherwise noted.)

(1) TLP parameter: Z_0 = 50Ω, t_p = 100ns, averaging window from 70ns to 90ns. R_{DYN} is calculated from 4A to 16A.

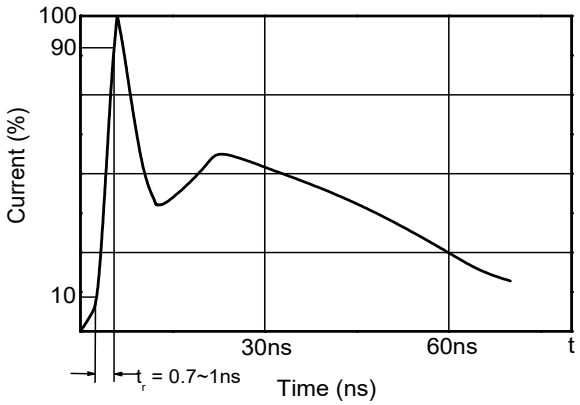
(2) Contact discharge mode, according to IEC61000-4-2.

(3) Non-repetitive current pulse, according to IEC61000-4-5.

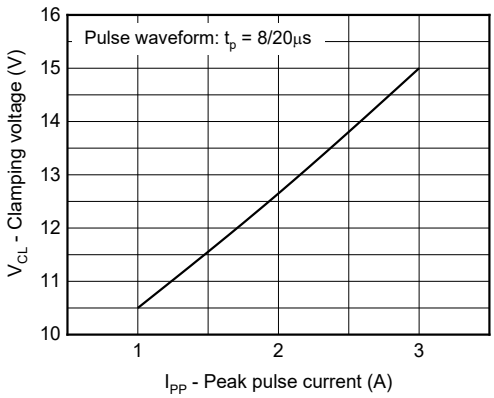
TYPICAL CHARACTERISTICS



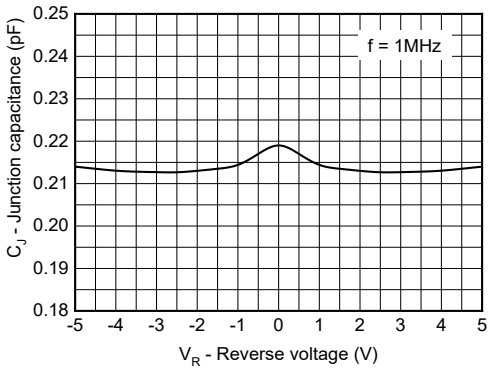
8/20μs waveform per IEC61000-4-5



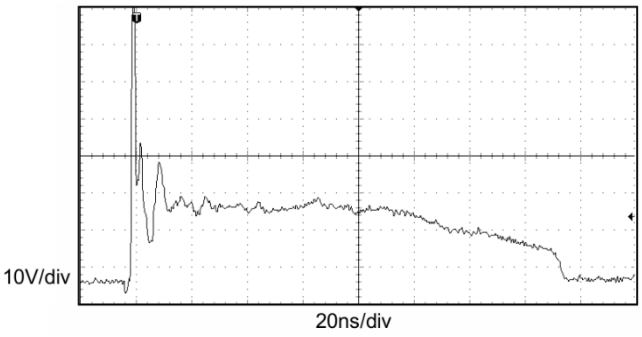
Contact discharge current waveform per IEC61000-4-2



Clamping voltage vs. Peak pulse current

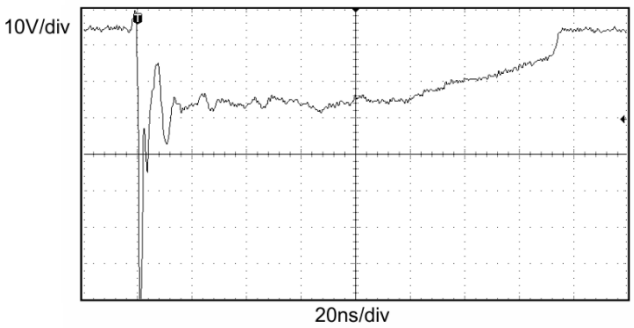


Capacitance vs. Reverse voltage



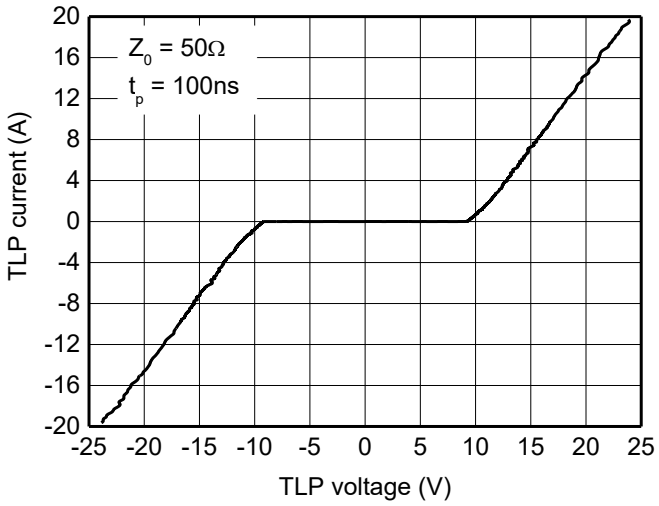
ESD clamping

(+8kV contact discharge per IEC61000-4-2)



ESD clamping

(-8kV contact discharge per IEC61000-4-2)

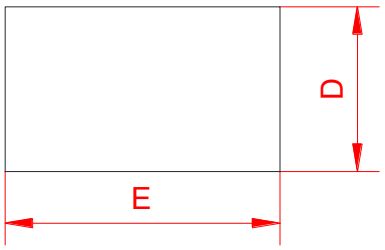


TLP Measurement

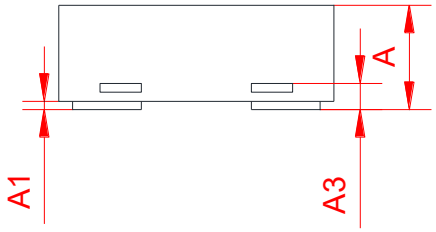
DFN1006-2L DIMENSIONS

PACKAGE SIZE

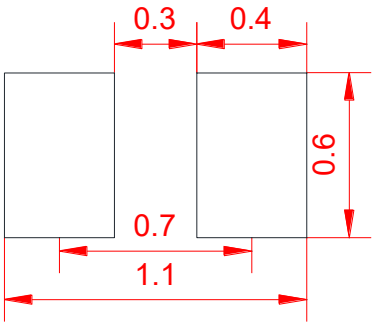
Symbol	Min.	Typ.	Max.
A	0.41	0.45	0.50
A1	0.00	-	0.05
A3	0.127REF		
D	0.55	0.60	0.65
E	0.95	1.00	1.05
L	0.20	0.25	0.30
b	0.45	0.50	0.55
e	0.65 BSC		



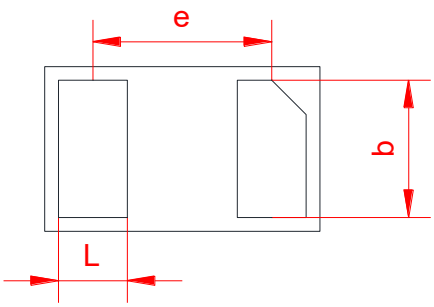
TOP VIEW



SIDE VIEW



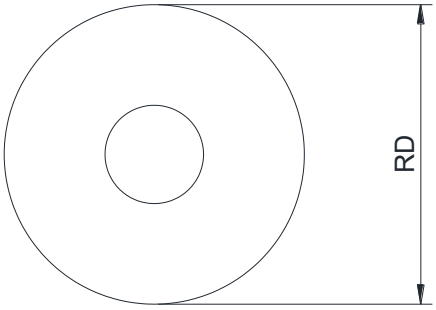
RECOMMENDED LAND PATTERN(Unit: mm)



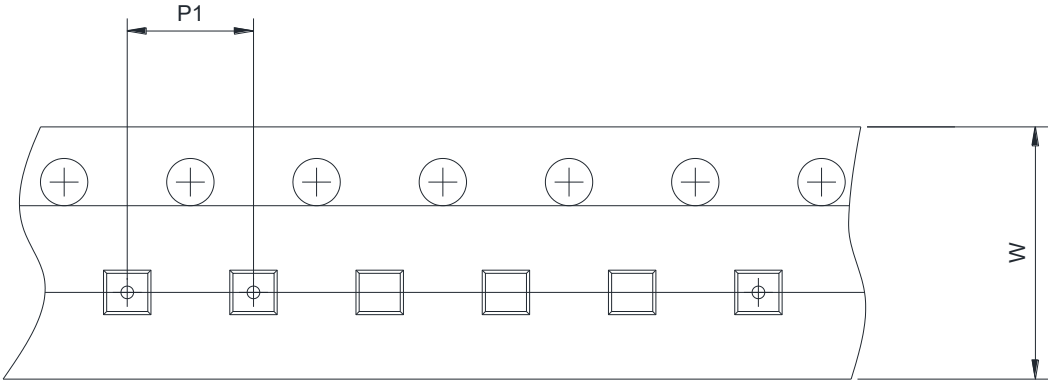
BOTTOM VIEW

TAPE AND REEL INFORMATION

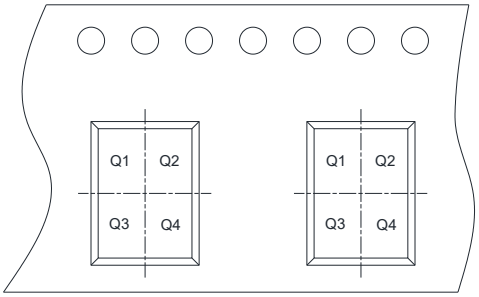
Reel Dimensions



Tape Dimensions



Quadrant Assignments For PIN1 Orientation In Tape



User Direction of Feed

RD	Reel Dimension	☑ 7inch	☐ 13inch		
W	Overall width of the carrier tape	☑ 8mm	☐ 12mm	☐ 16mm	
P1	Pitch between successive cavity centers	☑ 2mm	☐ 4mm	☐ 8mm	
Pin1	Pin1 Quadrant	☑ Q1	☑ Q2	☑ Q3	☐ Q4

ORDERING INFORMATION

TYPE NUMBER	PACKAGE	PACKING
SITBN5V51BNQ-2/TR	DFN1006-2L	Tape and reel

DFN1006-2L is packed with 10000 pieces/disc in braided packaging.

Important statement

SIT reserves the right to change the above-mentioned information without prior notice.

REVISION HISTORY

Version number	Datasheet status	Revision date
V1.0	Initial version.	May 2025