N02V5BT1610

List

N02V5BT1610

900W Bi-Directional TVS For ESD Protection : 2.5V

Features

- Protects one data/power line to:
  IEC 61000-4-2 (ESD) ±30KV(Contact) / ±30KV (Air).
  IEC 61000-4-4 (EFT) 40A (5/50ns).
  IEC 61000-4-5 (Lightning) 100A (8/20μs).
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free parts, ex.N02V5BT1610-H.

Applications

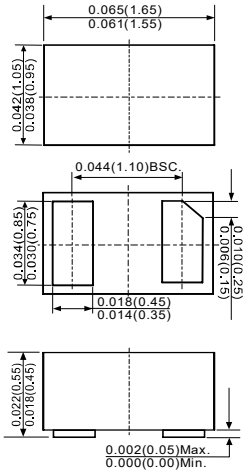
- Mobile phones.
- Battery protection.
- Power line protection.
- Vbat pin for mobile devices.
- Hand held portable applications.

Mechanical data

- Epoxy : UL94-V0 rated flame retardant.
- Case : Molded plastic, DFN1610-2 (T1610P2).

Package outline

DFN1610-2
(T1610P2)



Dimensions in inches and (millimeters)

Maximum ratings (At T_A=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak pulse power (t_p=8/20μs)	P_{PP}	900	W
Peak pulse current (t_p=8/20μs)	I_{PP}	100	A
ESD per IEC61000-4-2 (Air)	V_{ESD}	±30	KV
ESD per IEC61000-4-2 (Contact)		±30	
Operating temperature	T_J	+125	°C
Storage temperature range	T_{STG}	-55 to +150	°C

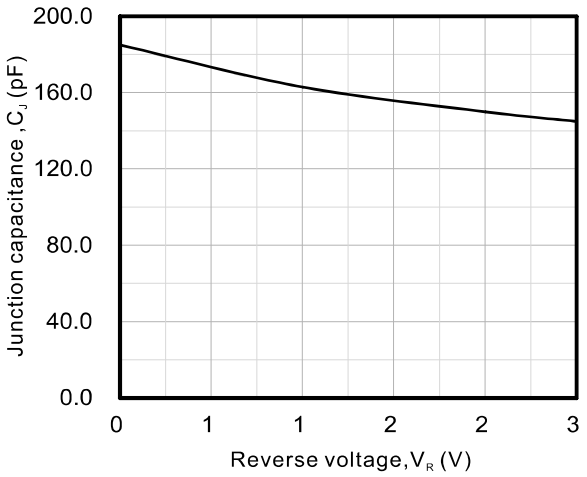
Electrical characteristics (at T_A=25°C unless otherwise noted)

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Reverse stand-off voltage		V_{RWM}			2.5	V
Reverse leakage current	V_R = 2.5V	I_R			1	μA
Reverse breakdown voltage	I_T = 1mA	V_{BR}	3	4		V
Clamping voltage	I_{PP} = 20A, 8/20μs pulse	V_C		5.5		V
	I_{PP} = 100A, 8/20μs pulse			9		
Junction capacitance	V_R=0V, f=1.0MHz	C_J		185	230	pF

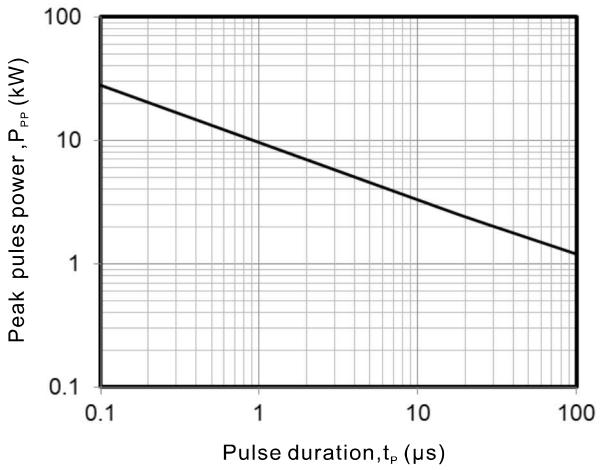
N02V5BT1610

Typical performance characteristics

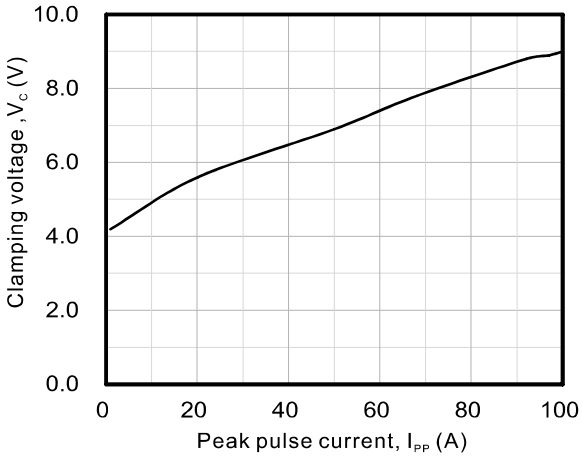
Junction capacitance vs. Reverse voltage



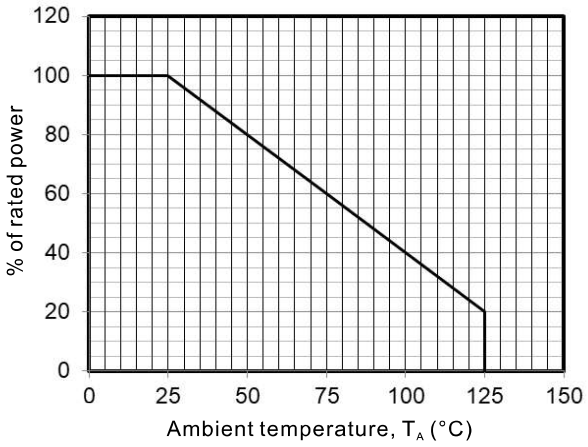
Peak pulse power vs. Pulse time



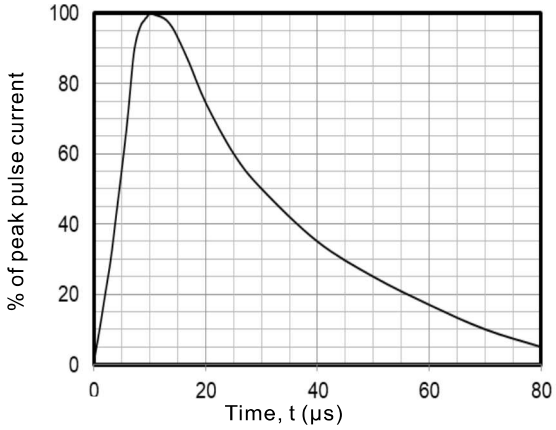
Clamping voltage vs. Peak pulse current



Power de-rating curve

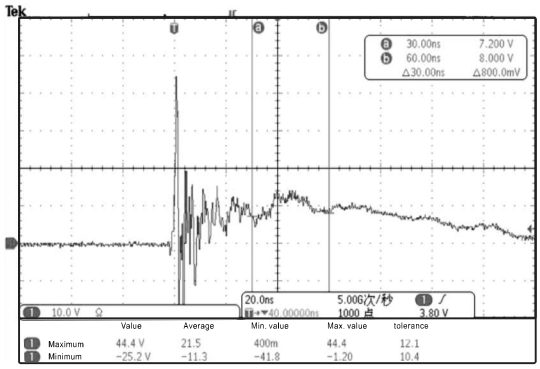


8x20 μs pulse waveform



ESD clamping voltage

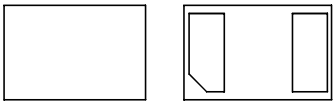
8 kV contact per IEC61000-4-2



Note: Data is taken with a 10x attenuator

N02V5BT1610

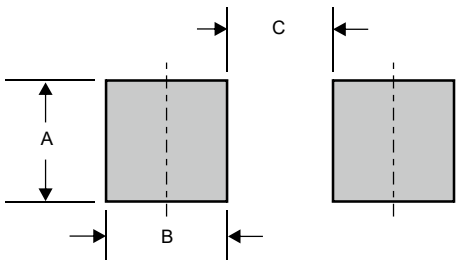
Pinning information

Pin	Simplified outline	Symbol
Bi-directional	 Top view Bottom view	

Marking

Type number	Marking code
N02V5BT1610	BP

Suggested solder pad layout

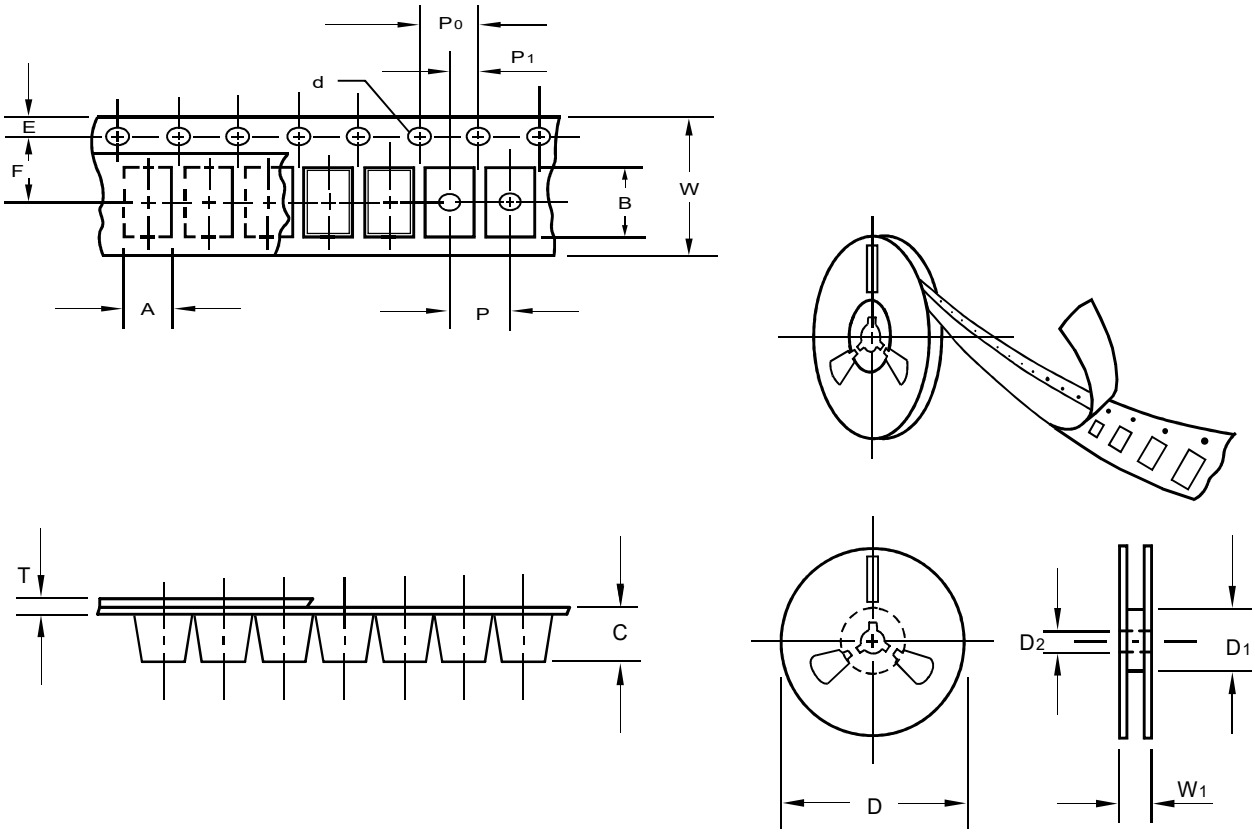


Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SOD-323FL	0.040 (1.00)	0.025 (0.62)	0.024 (0.60)

N02V5BT1610

Packing information



unit:mm

Item	Symbol	Tolerance	DFN1610-2 (T1610P2)
Carrier width	A	0.1	1.15
Carrier length	B	0.1	1.80
Carrier depth	C	0.1	0.63
Sprocket hole	d	0.1	1.55
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D_1	min	50.00
Feed hole diameter	D_2	0.2	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	2.00
Sprocket hole pitch	P_0	0.1	4.00
Embossment center	P_1	0.1	2.00
Overall tape thickness	T	0.1	0.20
Tape width	W	0.3	8.00
Reel width	W_1	1.0	9.50

Note:Devices are packed in accor dance with EIA standar RS-481-A and specifications listed above.

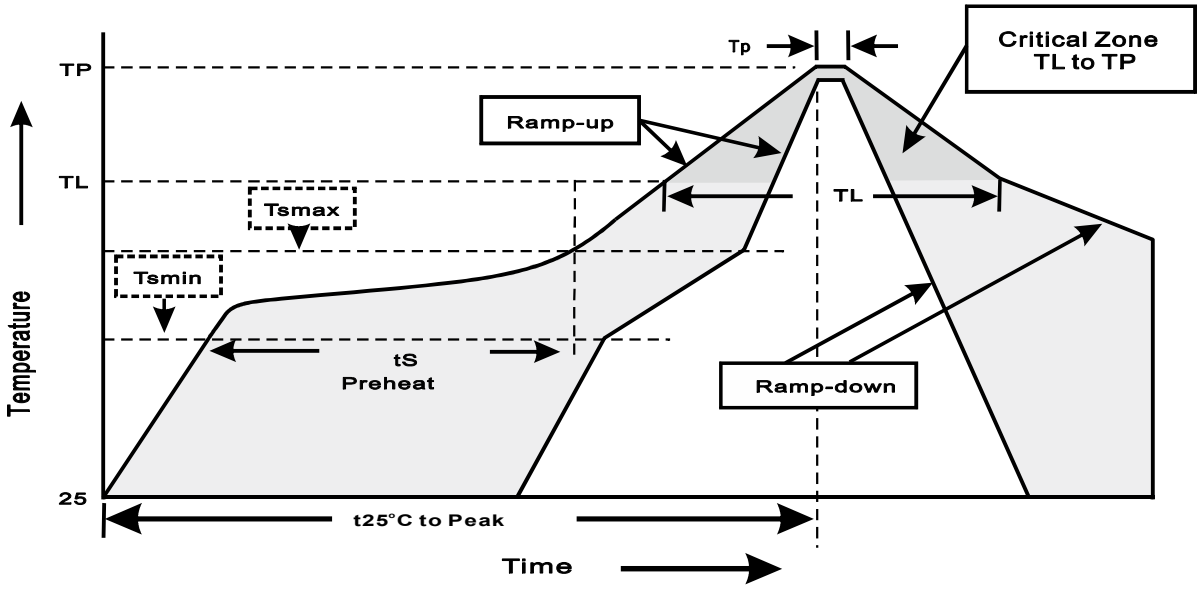
N02V5BT1610

Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	REEL DIA, (m/m)	CARTON (pcs)
DFN1610-2 (T1610P2)	7"	3,000	4.0	30,000	178	240,000

Suggested thermal profiles for soldering processes

1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
2.Reflow soldering of surface-mount devices



3.Reflow soldering

Profile Feature	Soldering Condition
Average ramp-up rate(T_L to T_P)	<3°C/sec
Preheat -Temperature Min(Tsmin) -Temperature Max(Tsmax) -Time(min to max)(t_s)	 150°C 200°C 60~120sec
Tsmax to T_L -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(T_L) -Time(t_L)	 217°C 60~260sec
Peak Temperature(T_P)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t_P)	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes

N02V5BT1610

High reliability test capabilities

Item Test	Conditions	Reference
1. Solder Resistance	at 260±5°C for 10±2sec.	MIL-STD-750D METHOD-2031
2. Solderability	at 245±5°C for 5 sec.	MIL-STD-202F METHOD-208
3. High Temperature Reverse Bias	V_{BR}= V_{BR} Min * 80% at T_J=125°C for 168 hrs.	MIL-STD-750D METHOD-1038
4. Pressure Cooker	15P_{SIG} at T_A=121°C for 4 hrs.	JESD22-A102
5. Temperature Cycling	-55°C to +125°C dwelled for 30 min. and transferred for 5min. total 10 cycles.	MIL-STD-750D METHOD-1051
6. Humidity	at T_A=85°C, RH=85% for 1000hrs.	MIL-STD-750D METHOD-1021
7. High Temperature Storage Life	at 150°C for 1000 hrs.	MIL-STD-750D METHOD-1031