N03BT0603D-H

List

N03BT0603D-H

90W Bi-Directional
TVS For ESD Protection : 3.3V

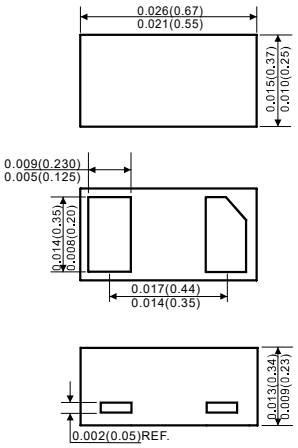
Features
- Bi-directional ESD protection of one line.
- Low reverse working voltage:3.3V.
- Low reverse clamping voltage.
- Low leakage current.
- Fast response time.
- JESD22-A114-B ESD rating of class 3B per human body model.
- Complies with following standards:
  IEC 61000-4-2(ESD) ±30kV (Air) , ±30kV (Contact).
- Lead-free parts meet RoHS requirements.
- Halogen-free (IEC61249-2-21).

Applications
- Computers, peripherals, and portable electronics.
- High speed data lines.
- Audio, video equipment, and USB interfaces.
- Cellular handsets and accessories.
- Other electronics equipment communi-cation systems.

Mechanical data
- Epoxy: UL94-V0 rated Flame retardant.
- Case: Molded plastic, DFN0603 (T0603).

Package outline

DFN0603(T0603)



Dimensions in inches and (millimeters)

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

Parameter	Symbol	Ratings	Units
Peak pulse power (8/20μs) (Note2)	P_{PK}	90	W
Peak pulse current (8/20μs) (Note2)	I_{PP}	10	A
ESD per IEC61000-4-2 (Note1) (Air)	V_{ESD}	±30	kV
ESD per IEC61000-4-2 (Note1) (Contact)		±30	
ESD per JESD22-A114-B (Note1) (Per human body)		±30	
ESD per JESD22-A114-B (Note1) (Machine)		±0.4	
Lead solder temperature (10 seconds duration)	T_L	260	°C
Junction temperature	T_J	+150	°C
Storage temperature range	T_{STG}	-55 to +150	°C

Note:1. Device stressed with ten non-repetitive ESD pulses.
2. Non-repetitive current pulse 8/20μs exponential decay waveform according to IEC61000-4-5.

N03BT0603D-H

Electrical Characteristics (At T_A=25°C unless otherwise noted)

Parameter	Test Condition	Symbol	Min.	Typ.	Max.	Units
Reverse working voltage (Note1)		V_{RWM}			3.3	V
Reverse leakage current	V_{RWM}=3.3V	I_R			0.2	μA
Reverse breakdown voltage	I_T=1mA	V_{BR}	4		6.5	V
Clamping voltage	I_{PP} = 1A	V_C			6.5	V
	I_{PP} = 4A				7.5	
	I_{PP} = 10A				9	
TLP clamping voltage	I_{TLP} =±8A, pulse width=100ns	V_C		±6.0		V
	I_{TLP} =±16A, pulse width=100ns			±7.2		
Dynamic resistance (Note3)	Pulse width=100ns	R_{DYN}		0.15		Ω
Junction capacitance	V_R=0V, f=1.0MHz	C_J			25	pF

Note : 1.Other voltages available upon request.
2. Non-repetitive current pulse 8/20μs exponential decay waveform according to IEC61000-4-5.
3. R_{DYN} is calculated from 8A to 16A.

Rating and characteristic curves (ESD standards compliance)

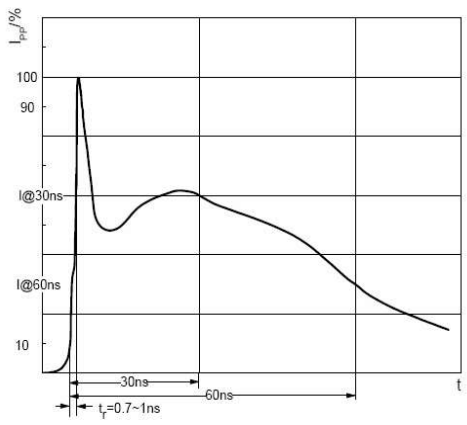
IEC61000-4-2 Standard

Contact Discharge		Air Discharge	
Level	Test Voltage kV	Level	Test Voltage kV
1	2	1	2
2	4	2	4
3	6	3	8
4	8	4	15

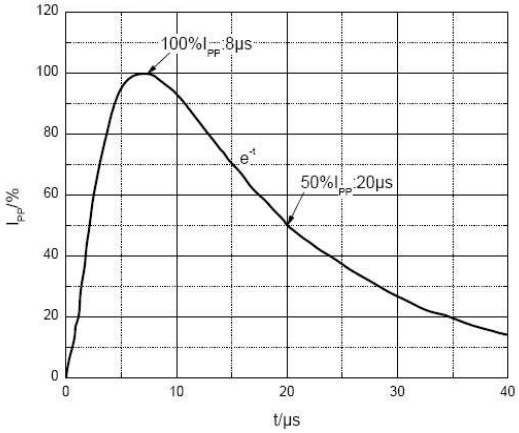
JESD22-A114-B Standard

ESD Class	Human Body Discharge V
0	0 ~ 249
1A 1B 1C	250 ~ 499 500 ~ 999 1000 ~ 1999
2	2000 ~ 3999
3A 3B	4000 ~ 7999 8000 ~ 15999

ESD pulse waveform according to IEC61000-4-2



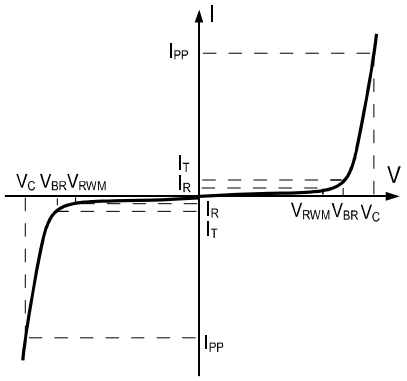
8/20μs pulse waveform according to IEC 61000-4-5



N03BT0603D-H

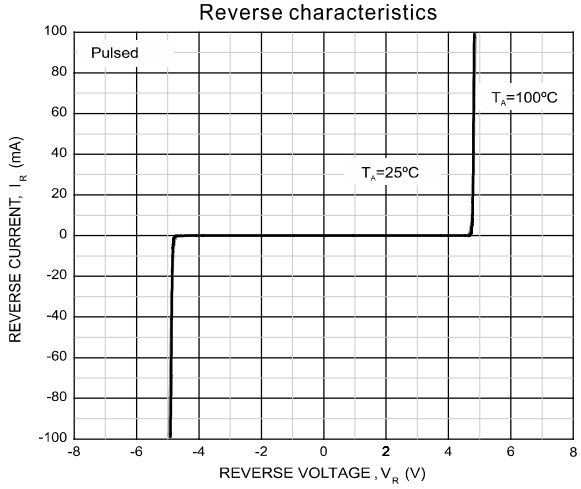
Rating and characteristic curves

Symbol	Parameter
V_C	Clamping voltage@ I_{PP}
I_{PP}	Peak pulse current
V_{BR}	Breakdown voltage@ I_T
I_T	Test current
I_R	Reverse leakage current @V_{RWM}
V_{RWM}	Reverse working voltage

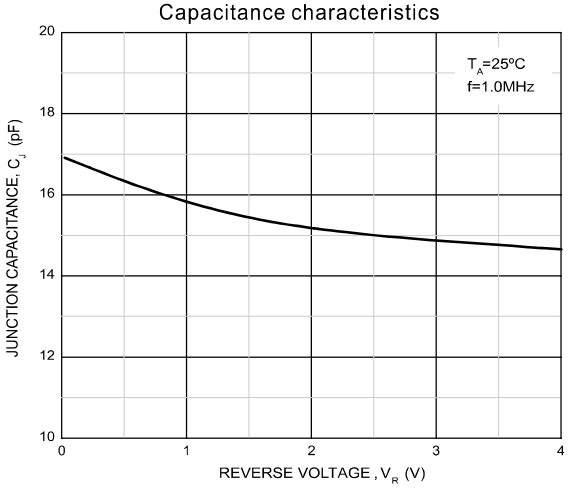


V-I characteristics for a Bi-directional TVS

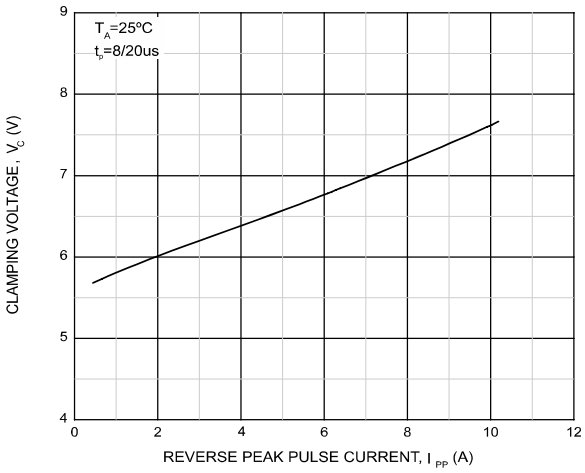
Reverse characteristics



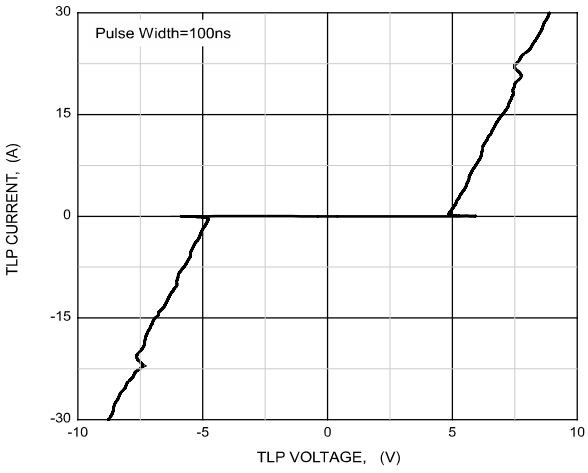
Capacitance characteristics



Clamping voltage vs. Reverse peak pulse current

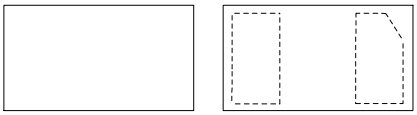


Transmission line pulsing (TLP) Measurement



N03BT0603D-H

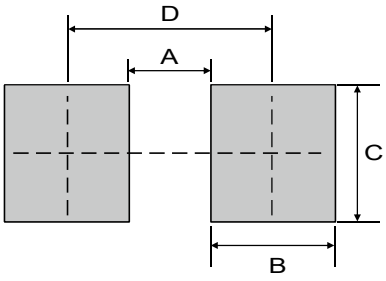
Pinning information

Pin	Simplified outline	Circuit Diagram
Bi-Directional	 Top view Bottom view	

Marking

Type number	Marking code
N03BT0603D-H	NC

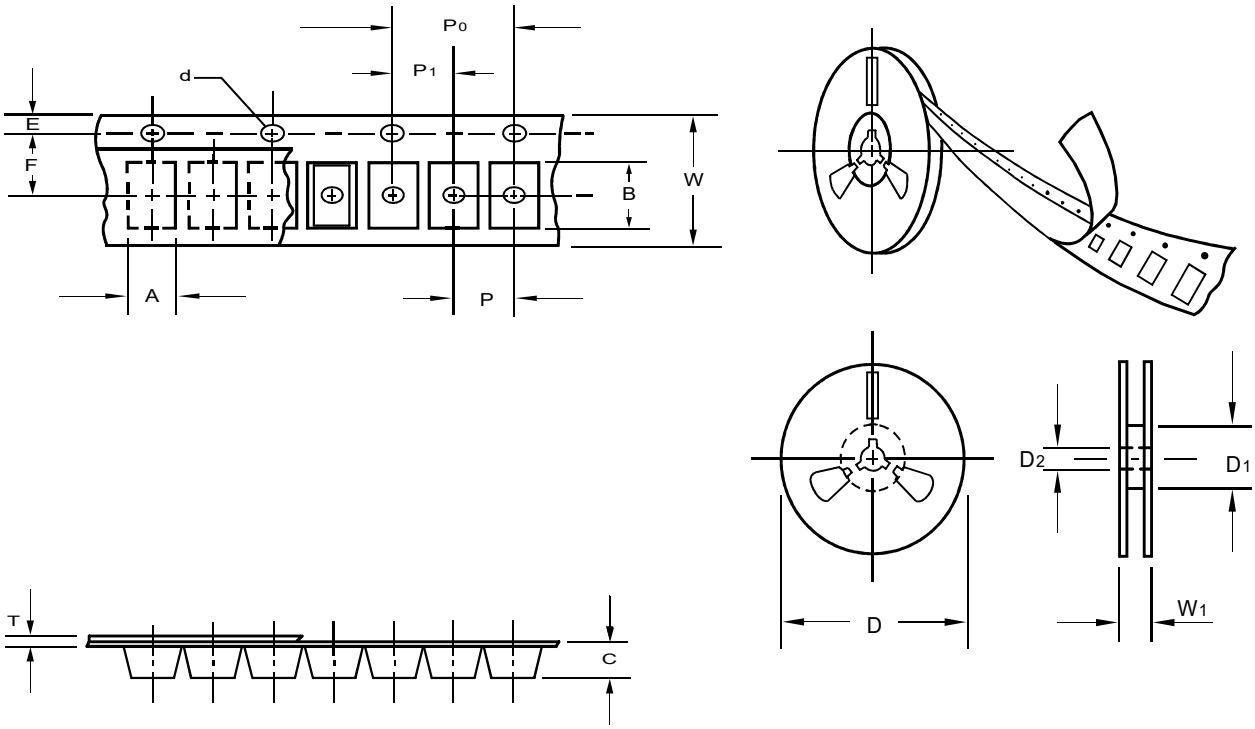
Suggested solder pad layout



Size	T0603	
	(mm)	(inch)
A	0.20	0.008
B	0.22	0.009
C	0.40	0.012
D	0.40	0.016

N03BT0603D-H

Packing information



unit:mm

Item	Symbol	Tolerance	DFN0603 (T0603)
Carrier width	A	0.3	0.41
Carrier length	B	0.3	0.70
Carrier depth	C	0.3	0.38
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D_1	min	-
7" Reel outside diameter	D	2.0	178.0
7" Reel inner diameter	D_1	min	54.4
Feed hole diameter	D_2	0.5	13.0
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	2.0
Sprocket hole pitch	P_0	0.1	4.0
Embossment center	P_1	0.1	2.0
Overall tape thickness	T	0.1	0.2
Tape width	W	0.3	8.0
Reel width	W_1	1.0	12.3

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

N03BT0603D-H

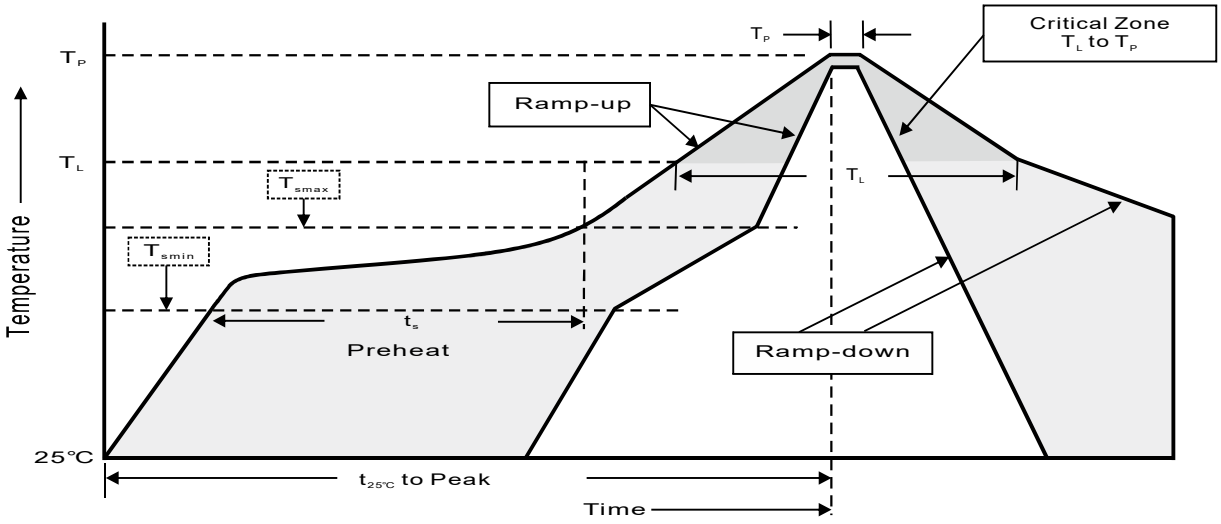
Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)
DFN0603 (T0603)	7"	10,000	4.0	100,000	183*123*183	178	382*257*387	800,000

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 ℃/sec
Preheat - Temperature Min (T_{smin}) - Temperature Max (T_{smax}) - Time (Min to Max) (t_s)	 150℃ 200℃ 60 ~ 120 sec
T_{smax} to T_L - Ramp-up rate	 < 3 ℃/sec
Time maintained above : - Temperature (T_L) - Time (T_L)	 217℃ 60 ~ 260 sec
Peak temperature (T_P)	255 ℃ -0/+5℃
Time with 5℃ of actual peak temperature (T_P)	10 ~30 sec
Ramp-down rate	< 6 ℃/sec
Time 25℃ to peak temperature	< 6 minutes