

N05BT0603D

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N05BT0603D

170W Bi-directional TVS For ESD

Protection : 5.0V

Features

- Protects one data or power line.
- Operating voltage: 5V.
- Ultra low leakage: nA level.
- Very low capacitance.
- Low clamping voltage.
- Meet MSL: level 3 per J-STD-020.
- Complies with following standards:
 - IEC 61000-4-2(ESD) $\pm 30\text{kV}$ (Air) , $\pm 30\text{kV}$ (Contact).
 - IEC 61000-4-5(Lighting) 17A (8/20 μs) .
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free parts, ex.N05BT0603D-H.

Applications

- Cellular handsets and accessories.
- Personal digital assistants.
- Notebooks and handhelds.
- Portable instrumentation.
- Digital cameras.
- Peripherals.
- Audio players.
- Keypads, side keys, USB2.0, LCD displays.

Mechanical data

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

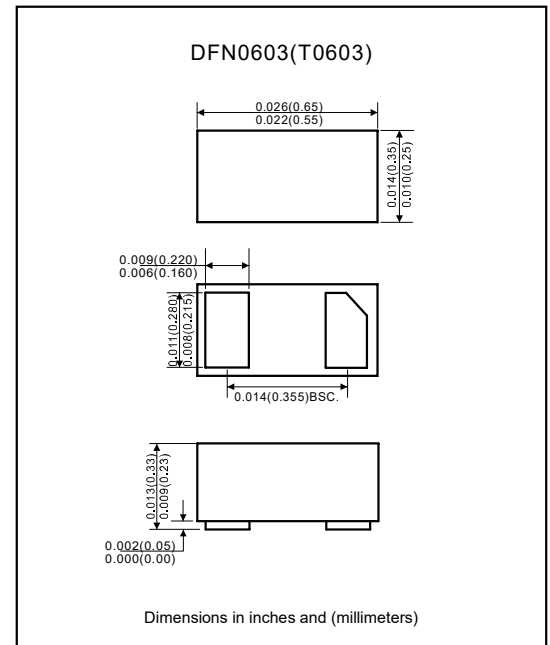
Maximum ratings (At $T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Ratings	Units
Peak pulse power (8/20 μs)	P_{PK}	170	W
Peak pulse current (8/20 μs)	I_{PP}	17	A
ESD per IEC61000-4-2 (Air)	V_{ESD}	± 30	kV
ESD per IEC61000-4-2 (Contact)			
Operating temperature range	T_J	+125	$^\circ\text{C}$
Storage temperature range	T_{STG}	-55 to +150	$^\circ\text{C}$

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

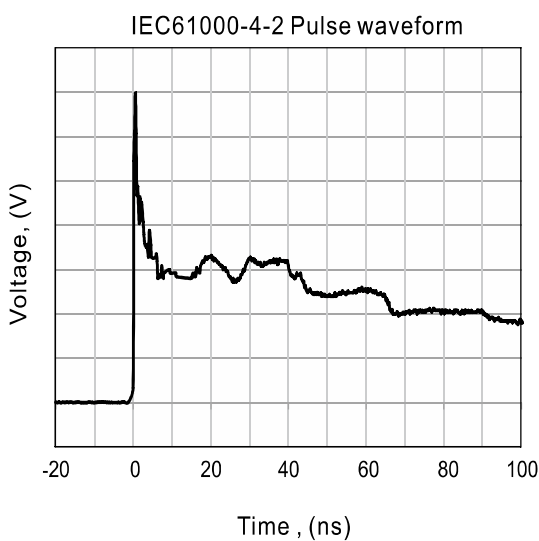
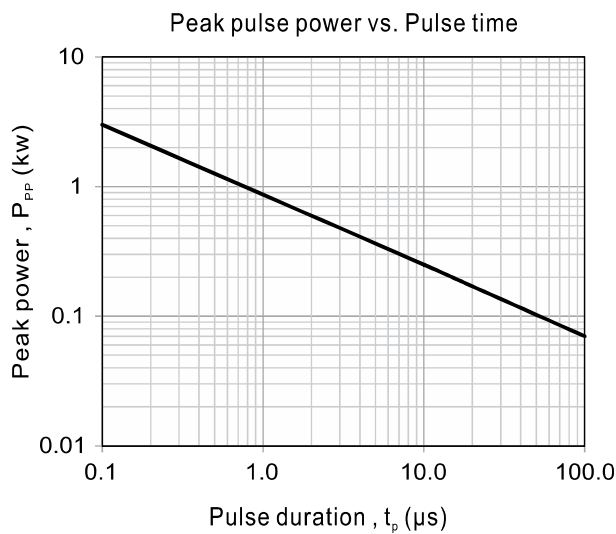
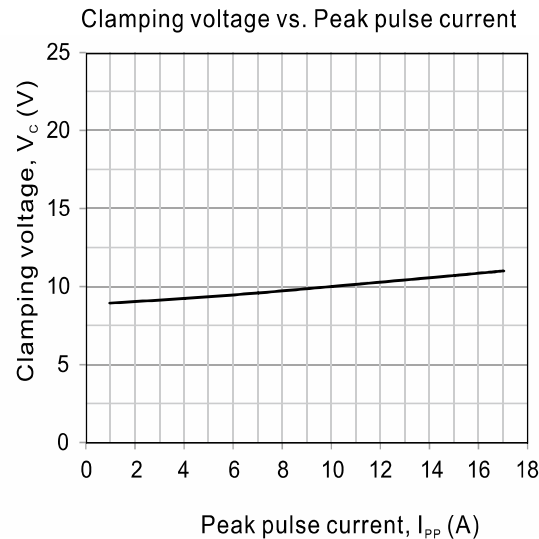
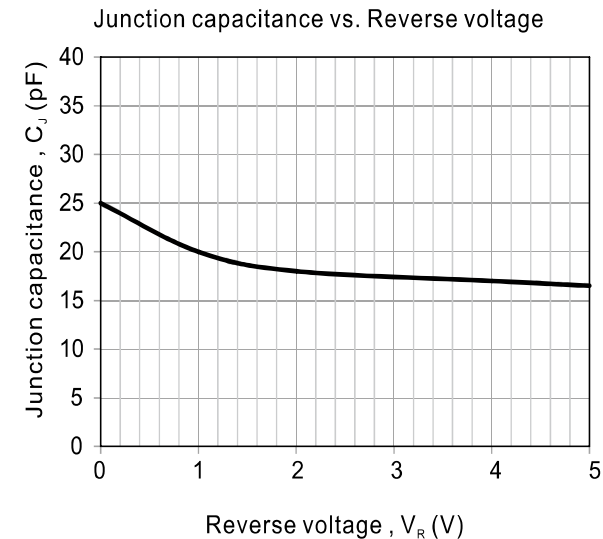
Parameter	Test Condition	Symbol	Min.	Typ.	Max.	Units
Reverse working voltage		V_{RWM}			5	V
Reverse leakage current	$V_{RWM}=5\text{V}$	I_R			0.5	μA
Reverse breakdown voltage	$I_T=1\text{mA}$	V_{BR}	5.8		8	V
Clamping voltage	$I_{PP} = 1\text{A}$ (8/20 μs pulse)	V_C			9	V
	$I_{PP} = 17\text{A}$ (8/20 μs pulse)				11	
Junction capacitance	$V_R=0\text{V}$, $f=1.0\text{MHz}$	C_J		25	50	pF

Package outline



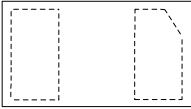
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Rating and characteristic curves



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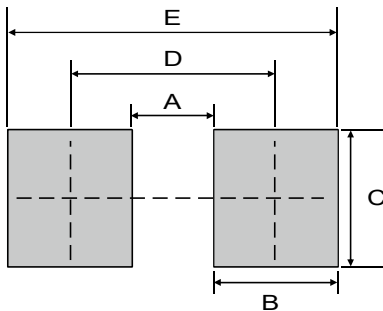
Pinning information

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

Marking

Type number	Marking code
N05BT0603D	3K

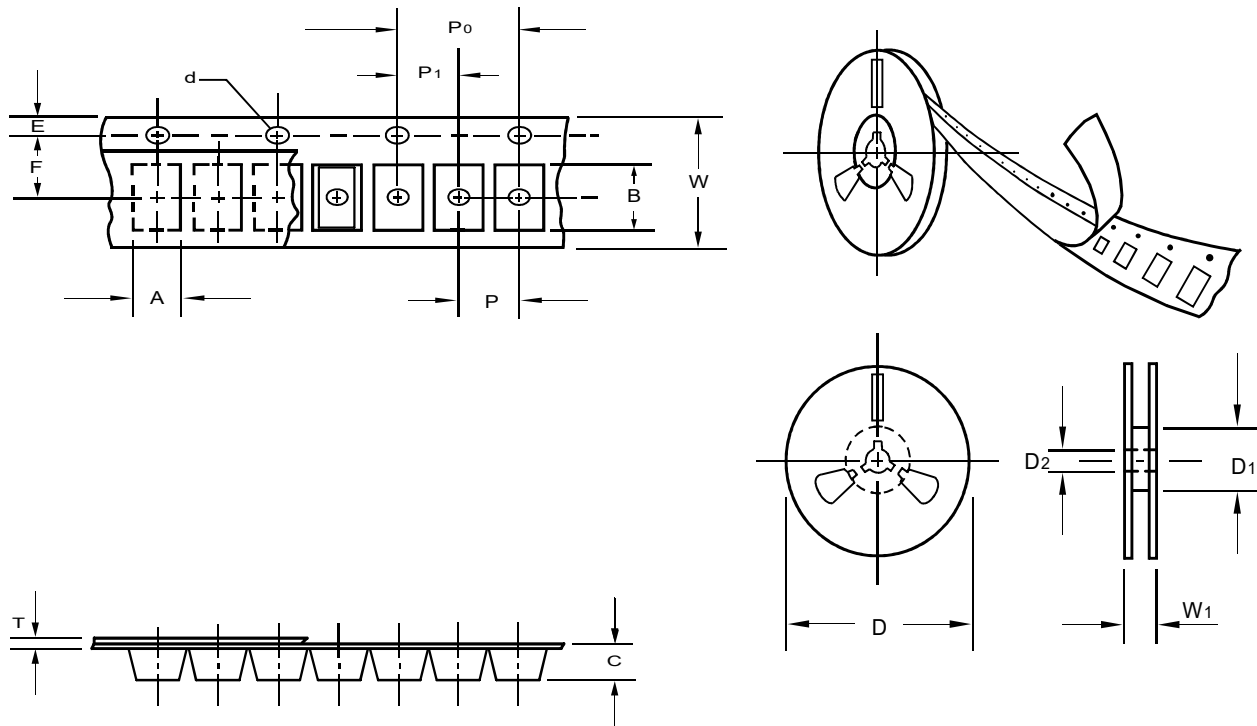
Suggested solder pad layout



Size	T0603	
	(mm)	(inch)
A	0.15	0.006
B	0.25	0.010
C	0.30	0.012
D	0.40	0.016
E	0.65	0.026

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Packing information



unit:mm

Item	Symbol	Tolerance	DFN0603 (T0603)
Carrier width	A	0.1	0.37
Carrier length	B	0.1	0.67
Carrier depth	C	0.1	0.32
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D1	min	-
7" Reel outside diameter	D	2.0	178.0
7" Reel inner diameter	D1	min	60.0
Feed hole diameter	D2	0.5	13.5
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.5
Punch hole pitch	P	0.1	2.0
Sprocket hole pitch	P0	0.1	4.0
Embossment center	P1	0.1	2.0
Overall tape thickness	T	0.1	0.2
Tape width	W	0.3	8.0
Reel width	W1	1.0	12.0

Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

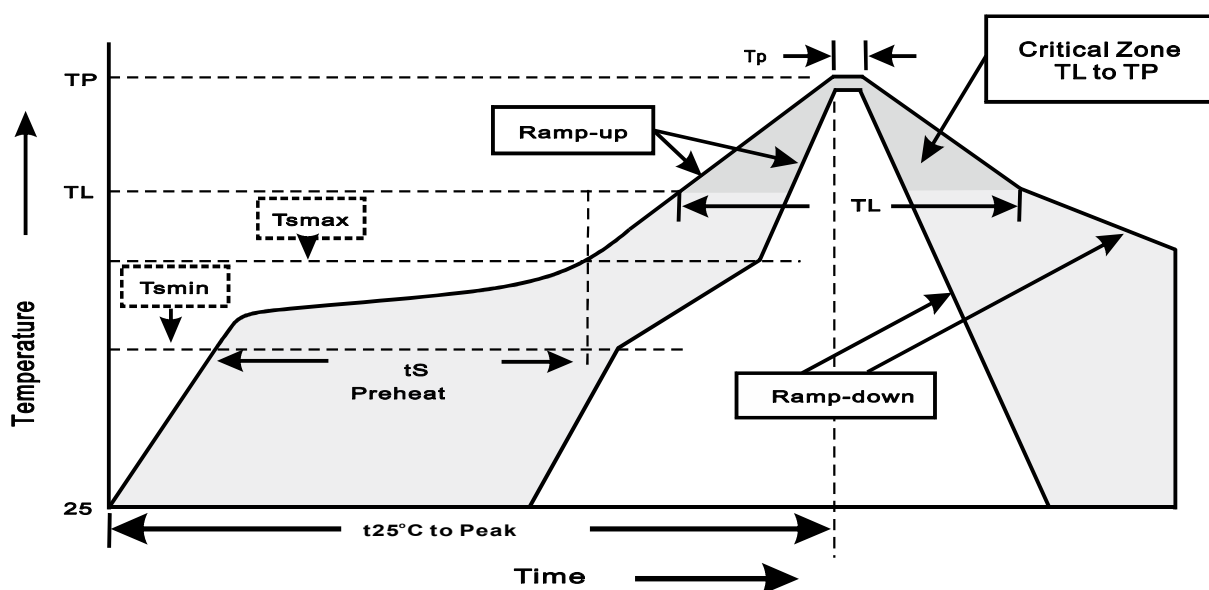
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Reel packing

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)	$<3^{\circ}\text{C/sec}$
Preheat -Temperature Min(T_{smin}) -Temperature Max(T_{smax}) -Time(min to max)(t_s)	150°C 200°C $60\sim 120\text{sec}$
T_{smax} to T_L -Ramp-upRate	$<3^{\circ}\text{C/sec}$
Time maintained above: -Temperature(T_L) -Time(t_L)	217°C $60\sim 260\text{sec}$
Peak Temperature(T_P)	$255^{\circ}\text{C}-0/+5^{\circ}\text{C}$
Time within 5°C of actual Peak Temperature(t_P)	$10\sim 30\text{sec}$
Ramp-down Rate	$<6^{\circ}\text{C/sec}$
Time 25°C to Peak Temperature	$<6\text{minutes}$