N05BT1006E

List

N05BT1006E

80W Surface Mount TVS Bi-Directional For ESD Protection 5.0V

Features

- Package optimized for high-speed lines.
- Ultra-small package (1.0mm x 0.6mm x 0.55mm).
- Protects one data, control or power line.
- Low capacitance : 16pF (Typical).
- Low leakage current : 10nA, @V_{RWM} (Typical).
- Low clamping voltage.
- Provide transient protection:
  IEC 61000-4-2 (ESD) ±25KV(Air), ±17KV(Contact).
  IEC 61000-4-4 (EFT) 40A (5/50ns) Cable discharge event (CDE).
- Each I/O pin can withstand over 1000 ESD Strikes for ±8KV contact discharge.
- We declare that the material of product compliance with RoHS requirements.
- Suffix "-H" indicates Halogen-free parts, ex.N05BT1006E-H

Applications

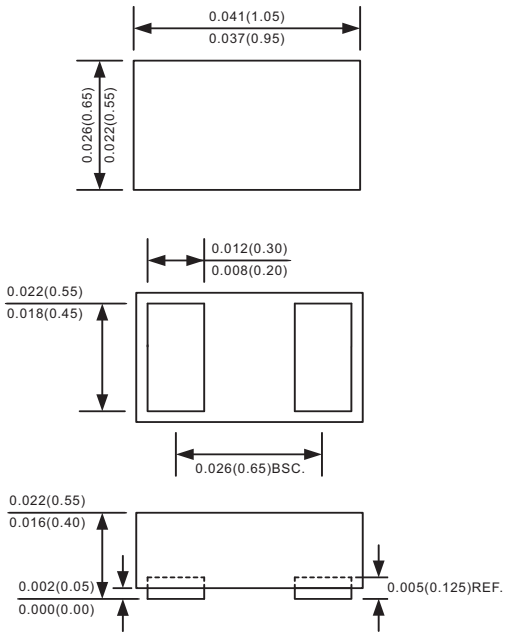
- Serial ATA.
- PCI Express.
- USB 2.0/3.0/3.1 Power and data line protection.
- HDMI 1.4/2.0.

Mechanical data

- T1006P2 package
- Molding compound flammability rating : UL94V-0
- Packaging : Tape and reel per EIA 481
- RoHS Compliant
- Weight : Approximated 0.73 mg

Package outline

T1006P2



Dimensions in inches and (millimeters)

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

Parameter	Symbol	Value	Unit
Peak pulse power (tp=8/20μs)	P_{PP}	80	W
Peak pulse current (tp=8/20μs)	I_{PP}	10	A
ESD per IEC 61000-4-2 (Contact)	V_{ESD}	±17	KV
ESD per IEC 61000-4-2 (Air)		±25	
Operating temperature	T_{OPT}	+125	℃
Storage temperature	T_{STG}	-55 to +150	℃

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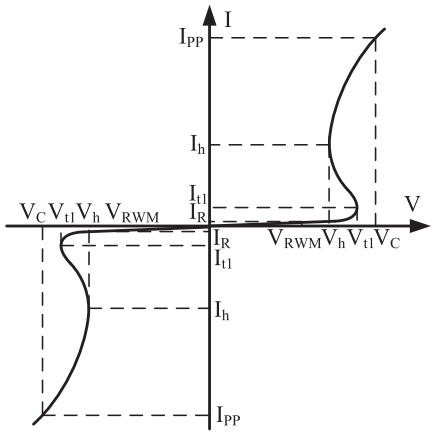
Electrical characteristics (at T_A=25°C unless otherwise noted)

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Reverse stand-off voltage		V_{RWM}			5.0	V
Reverse leakage current	V_{RWM}=5.0V	I_R		0.01	0.1	μA
Trigger voltage	I_{t1}=10nA	V_{t1}	5.8		7.5	V
Holding voltage	I_h=50mA	V_h	5.5		6.0	V
Clamping voltage @I_{PP}	I_{PP}=1A, t_p=8/20μs	V_C			7.0	V
	I_{PP}=4A, t_p=8/20μs				8.5	
	I_{PP}=8A, t_p=8/20μs				10.0	
Junction capacitance	V_R=0V, f=1MHz	C_d		16	20	pF

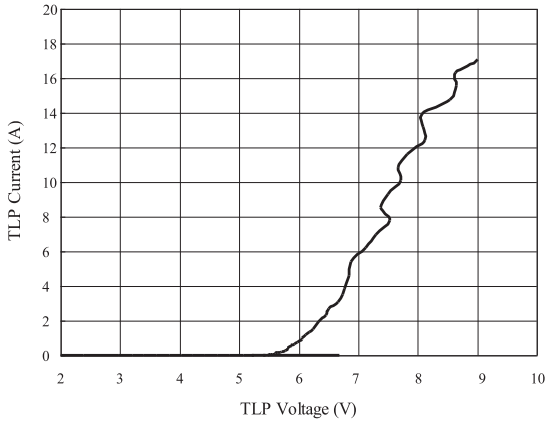
Symbol	Parameter
V_{RWM}	Nominal Reverse Working Voltage
I_R	Reverse Leakage Current @ V_{RWM}
V_{t1}	Trigger Voltage
I_{t1}	Trigger Current @ V_{t1}
V_h	Holding Voltage
I_h	Holding Current @ V_h
V_C	Clamping Voltage @ I_{PP}
I_{PP}	Maximum Peak Pulse Current
C_d	Diode Capacitance



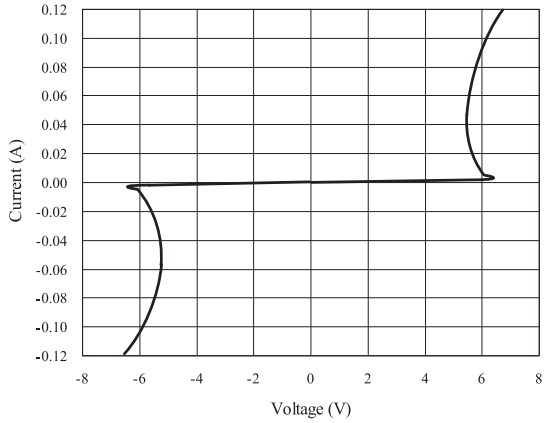
Bi-Directional TVS

Rating and characteristic curves(N05BT1006E)

TLP Measurement of I/O _1 to I/O_2

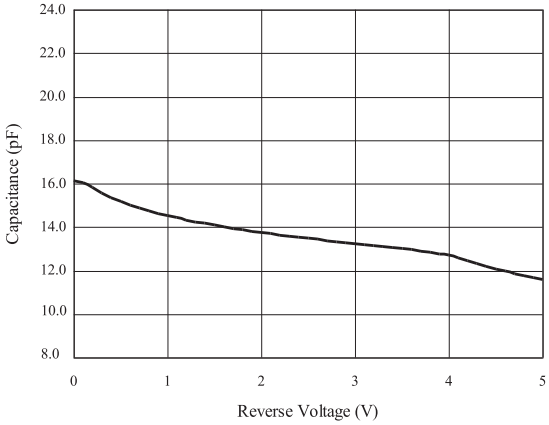


Voltage Sweeping of I/O_1 to I/O_2

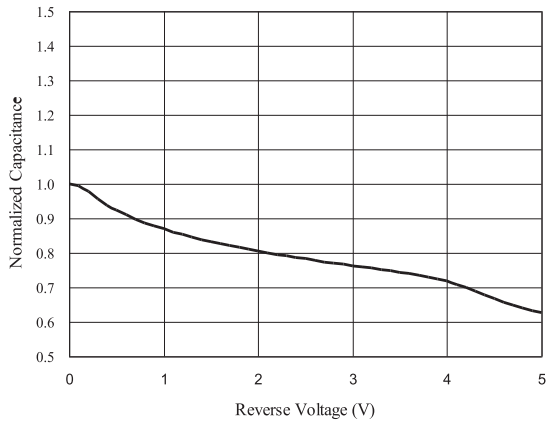


Capacitance vs. Voltage of I/O_1 to I/O _2 (f = 1MHz)

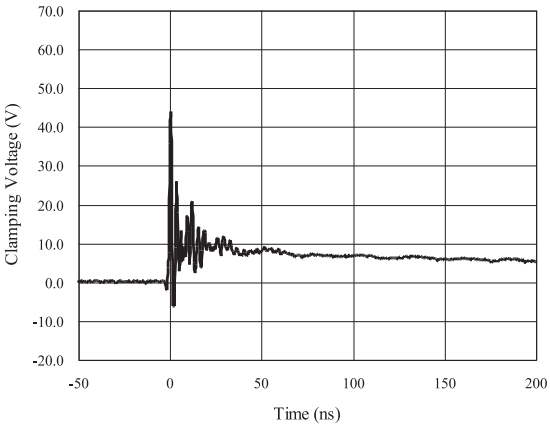
Capacitance vs. Reverse Voltage



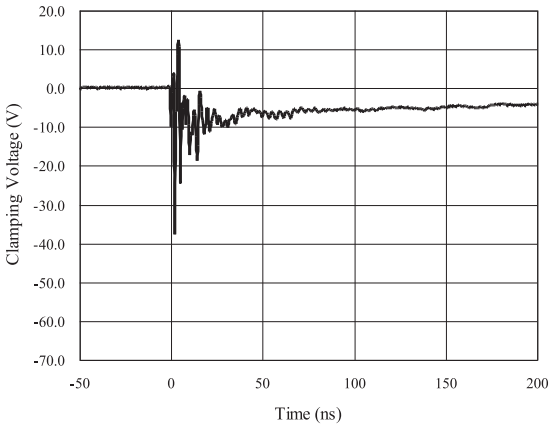
Normalized Capacitance vs. Reverse Voltage



ESD Clamping of I/O _1 to I/O_2 (+8kV Contact per IEC 61000-4-2)



ESD Clamping of I/O_1 to I/O_2 (-8kV Contact per IEC 61000-4-2)



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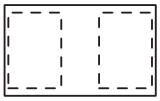
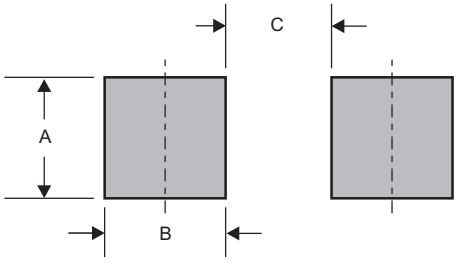
Pinning information

Pin	Simplified outline	Symbol
Bi-Directional		

Marking

Type number	Marking code
N05BT1006E	NB Or FX Note: 1. “NB” is part number, fixed. Note: 1. “F” is part number, fixed. 2. “X” is internal code

Suggested solder pad layout



Dimensions in inches and (millimeters)

PACKAGE	A	B	C
T1006	0.024 (0.60)	0.014 (0.35)	0.012 (0.30)

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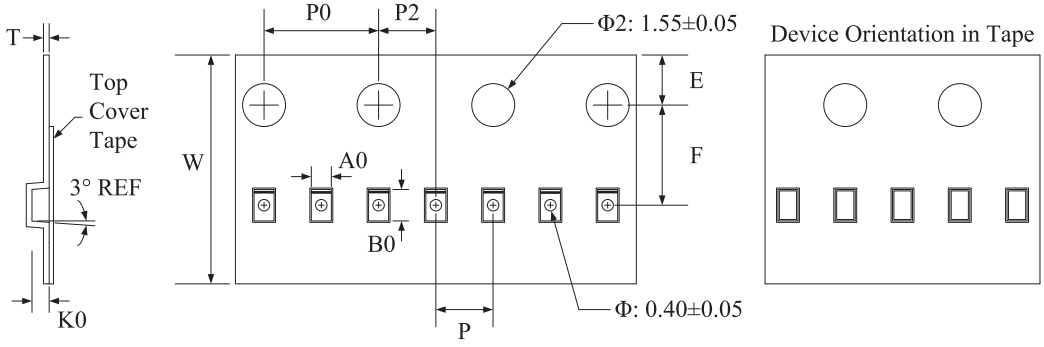
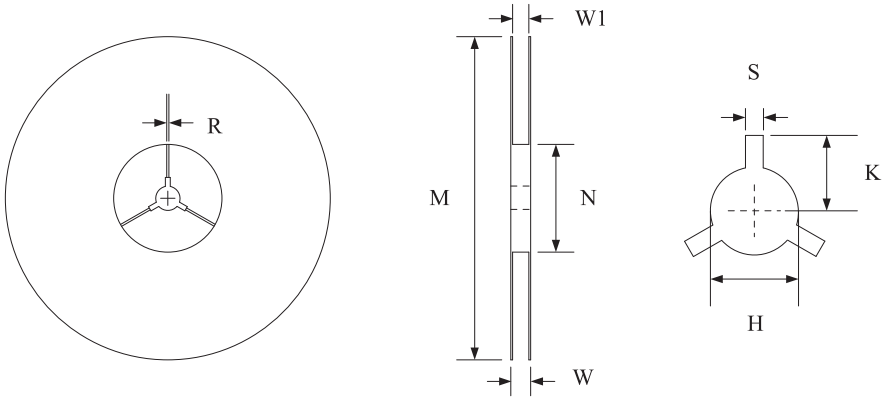
Packing information



Symbol	W	A0	B0	K0	E	F	P	P0	P2	T
Dimensions (mm)	8.00±0.1	0.7±0.05	1.15±0.05	0.55±0.05	1.75±0.1	3.5±0.05	2.0±0.1	4.0±0.1	2.0±0.05	0.2±0.05



Symbol	Reel Size	M	N	W	W1	H	S	K	R
Dimensions (mm)	Φ178	178.0±1.0	60.0±1.0	11.5±0.5	9.0±0.5	13.0±0.5	2.0±0.1	11.0±0.2	1.0±0.05

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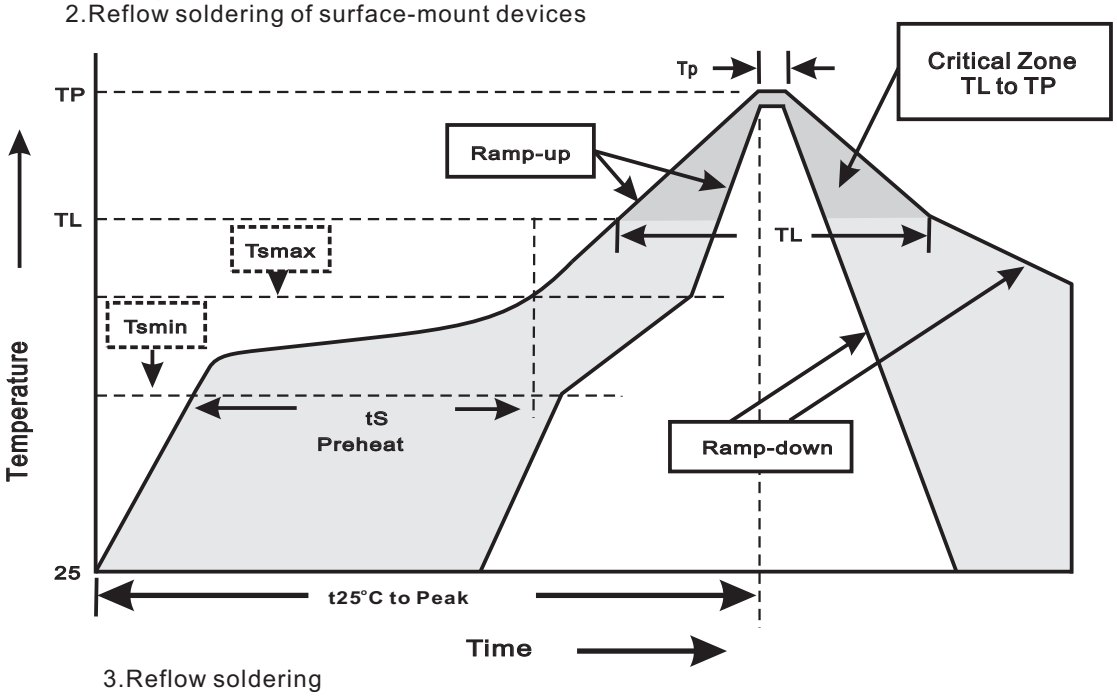
Reel packing

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)	APPROX. GROSS WEIGHT (kg)
T1006P2	7"	10,000	4.0	100,000	183*123*183	178	382*257*387	800,000	15.0

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