LL05BT1006A

List

LL05BT1006A

70W 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 : 0.3pF (Typical).
- Low leakage current : 10nA, @V_{RWM} (Typical).
- Low clamping voltage.
- Provide transient protection:
  IEC 61000-4-2 (ESD) ±15KV(Air), ±8KV(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.LL05BT1006A-H

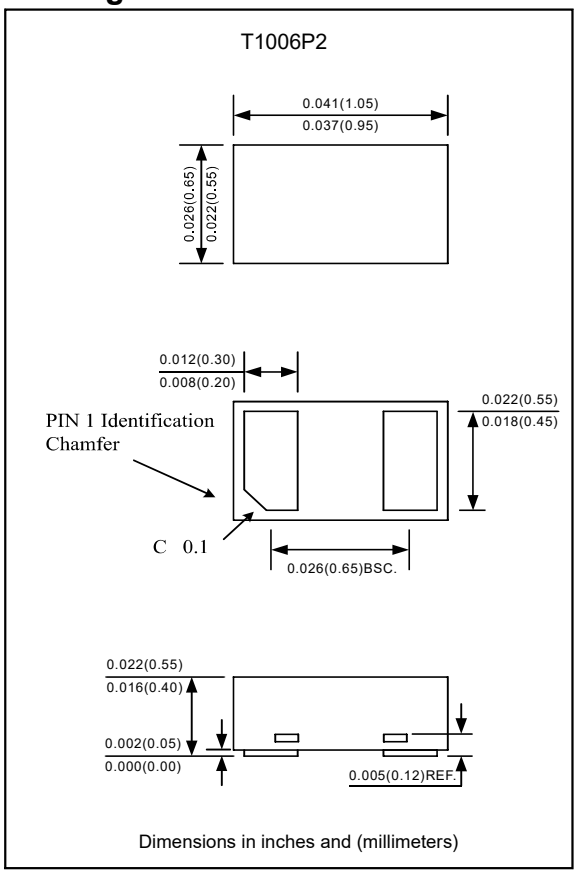
Applications

- 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



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

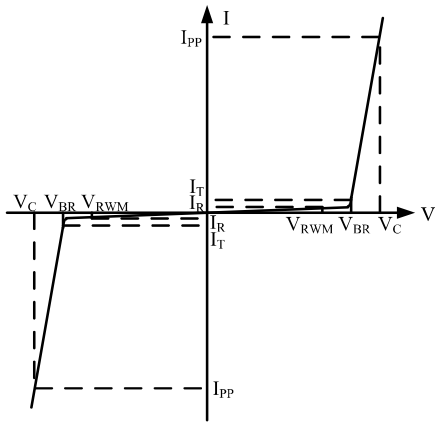
Parameter	Symbol	Value	Unit
Peak pulse power (tp=8/20μs)	P_{PP}	70	W
Peak pulse current (tp=8/20μs)	I_{PP}	5	A
ESD per IEC 61000-4-2 (Contact)	V_{ESD}	±8	KV
ESD per IEC 61000-4-2 (Air)		±15	
Operating temperature	T_{OPT}	+125	℃
Storage temperature	T_{STG}	-55 to +150	℃

LL05BT1006A

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	1.0	μA
Trigger voltage	I_T=1mA	V_{BR}	6.5		8.5	V
Clamping voltage @I_{PP}	I_{PP}=5A, t_p=8/20μs	V_C			14	V
Junction capacitance	V_R=0V, f=1MHz	C_{ESD}		0.3	0.4	pF

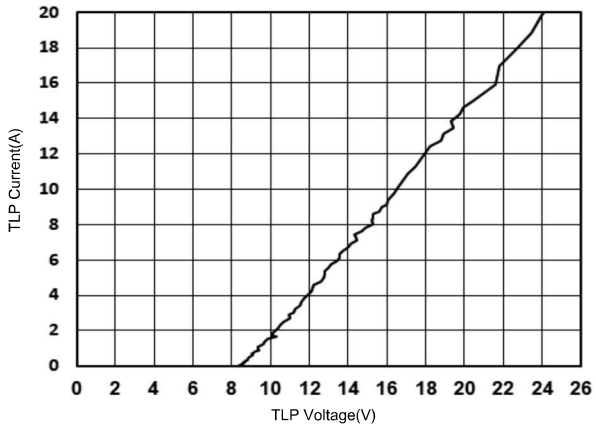
Symbol	Parameter
V_{RWM}	Nominal Reverse Working Voltage
I_R	Reverse Leakage Current @ V_{RWM}
V_{BR}	Reverse Breakdown Voltage @ I_T
I_T	Test Current for Reverse Breakdown
V_C	Clamping Voltage @ I_{PP}
I_{PP}	Peak Pulse Current
C_{ESD}	Parasitic Capacitance
V_R	Reverse Voltage
f	Small Signal Frequency



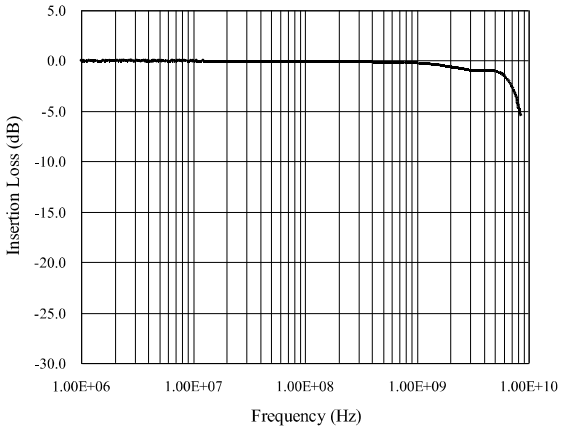
Bi-Directional TVS

Rating and characteristic curves(LL05BT1006A)

TLP Measurement of I/O to I/O

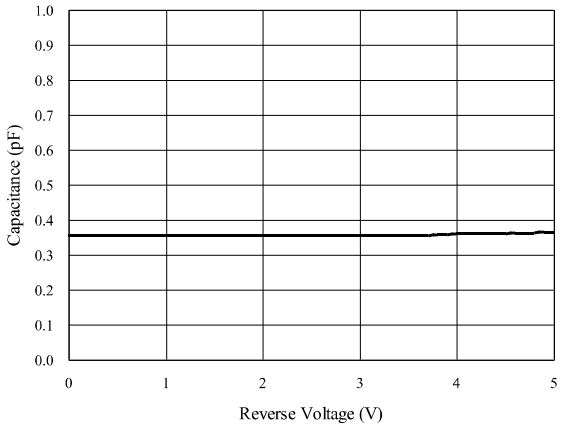


Insertion Loss S21 of I/O to I/O

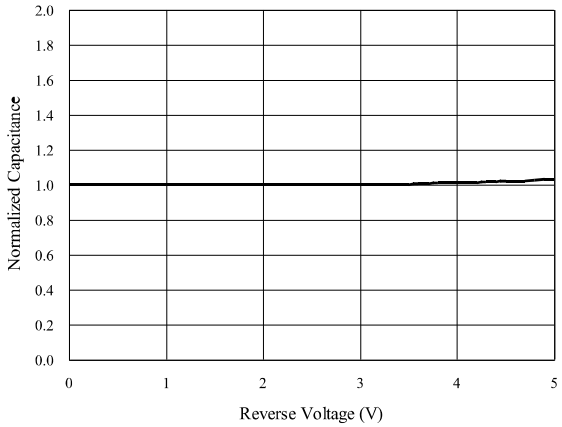


Capacitance vs. Voltage of I/O to I/O (f = 1MHz)

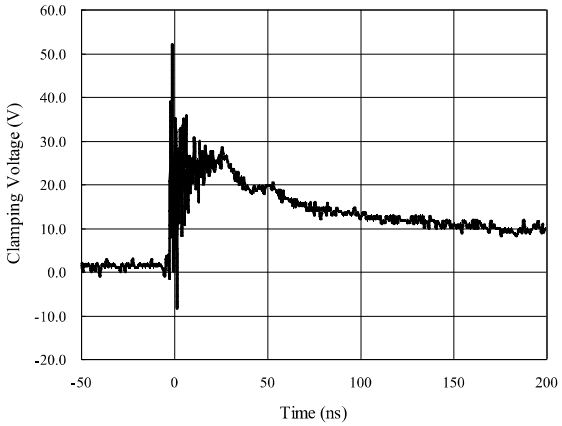
Capacitance vs. Reverse Voltage



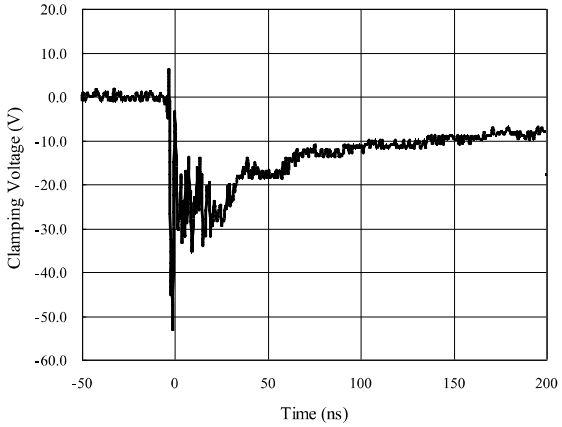
Normalized Capacitance vs. Reverse Voltage



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

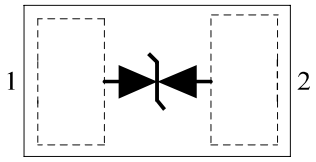


ESD Clamping of I/O to I/O (-8kV Contact per IEC 61000-4-2)

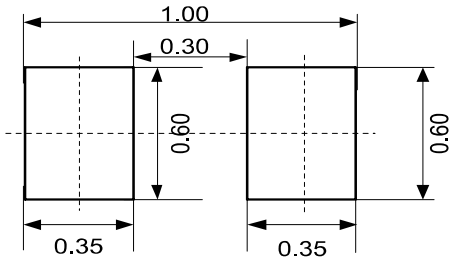


LL05BT1006A

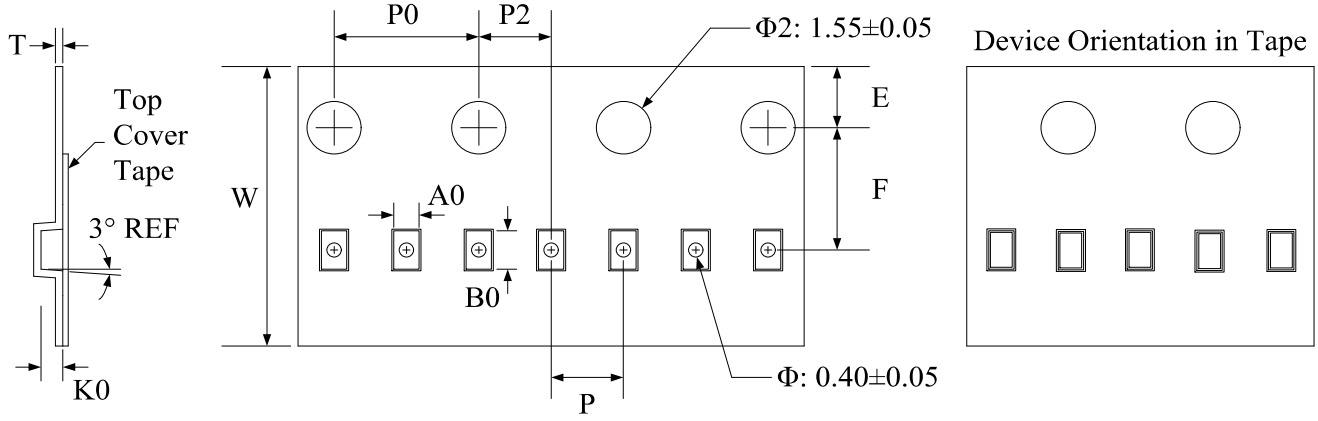
Pinning & Marking information

Marking Code	Symbol
4S Or 2B Note: (1) "4S" is part number, fixed . Note: (1) "2B" is part number, fixed .	

Suggested solder pad layout



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

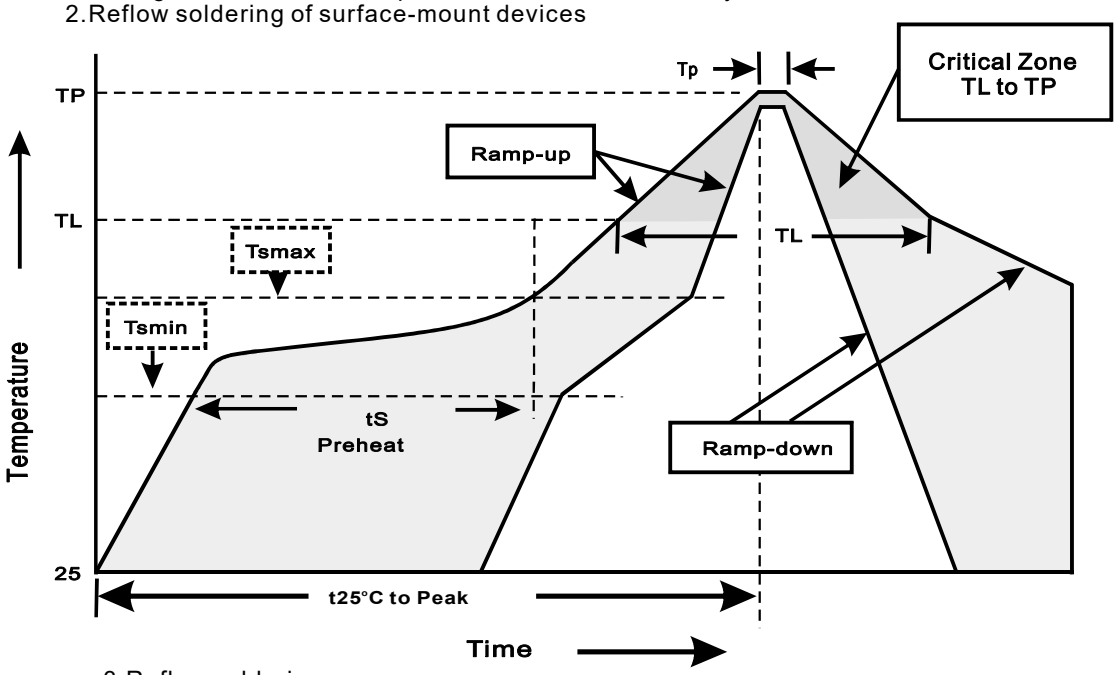
LL05BT1006A

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