LL05BT0603E

List

LL05BT0603E

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

Features

- Transient protection for high-speed data line.
- Low capacitance : 0.2pF (Typical).
- Low reverse current : <100nA (@VR=5V).
- Solid-state silicon-avalanche technology.
  IEC 61000-4-2 (ESD) ±15KV(Air), ±10KV(Contact).
- We declare that the material of product compliance with RoHS requirements.
- Suffix "-H" indicates Halogen-free parts, ex.LL05BT0603E-H.

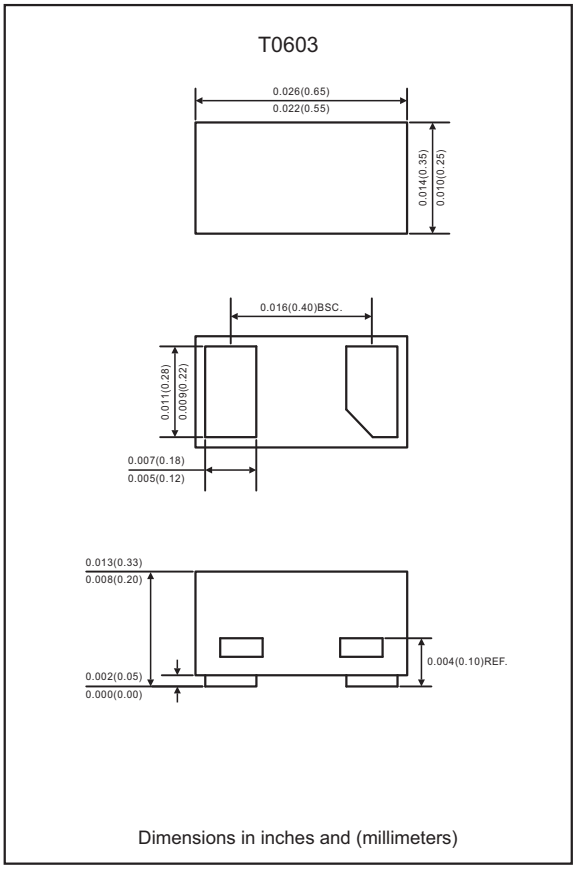
Applications

- HDMI 1.3 / 1.4 and HDMI 2.0.
- USB 2.0 and USB 3.0.
- LVDS Interfaces.
- FM Antenna.
- PCI Express.
- MHL.
- eSATA Interfaces.

Mechanical data

- T0603 package
- pb-Free, Halogen free. RoHS / WEEE compliant.
- Nominal dimensions : 0.6 x 0.3 x 0.25mm.
- Lead finish : NiAu.
- Molding compound flammability rating : UL 94V-0.
- Weight : Approximated 1 mg.

Package outline



Dimensions in inches and (millimeters)

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

Parameter	Symbol	Value	Unit
Peak pulse current (t_P=8/20μs)	I_{PP}	4.5	A
ESD per IEC 61000-4-2 (Contact)	V_{ESD}	±10	KV
ESD per IEC 61000-4-2 (Air)		±15	
Operating temperature	T_J	+125	℃
Storage temperature	T_{STG}	-55 to +150	℃

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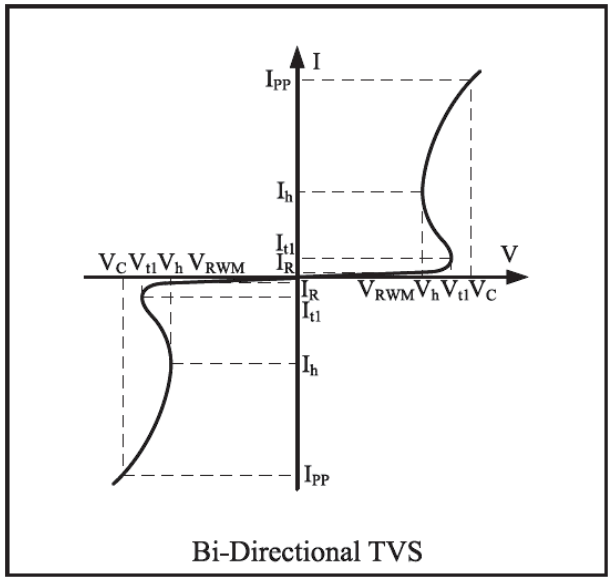
Symbol	Parameter
V_{RWM}	Nominal Reverse Working Voltage
I_R	Reverse Leakage Current @ V_{RWM}
V_{t1}	Trigger Voltage
I_{t1}	Trigger Current @ V_{t1}
V_h	Holding Voltage
I_h	Holding Current @ V_h
V_C	Clamping Voltage @ I_{PP}
I_{PP}	Maximum Peak Pulse Current



Bi-Directional TVS

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
Trigger voltage	I_{t1}=1mA	V_{t1}	6.0		10.0	V
Holding voltage	I_h=30mA	V_h	2.0		3.0	V
Reverse leakage current	V_{RWM}=5.0V	I_R			0.1	μA
Clamping voltage @I_{PP}	I_{PP}=2.5A, t_P=8/20μs	V_C		4.0		V
	I_{PP}=4.5A, t_P=8/20μs			5.0		
Dynamic resistance (Note 1)	I_{PP}=12.0A, t_P=100ns	R_D		0.3		Ω
Junction capacitance	V_R=0V, f=1MHz	C_J		0.2	0.3	pF

Note :
1.Measurements performed using a 100ns Transmission Line Pulse(TLP) system.

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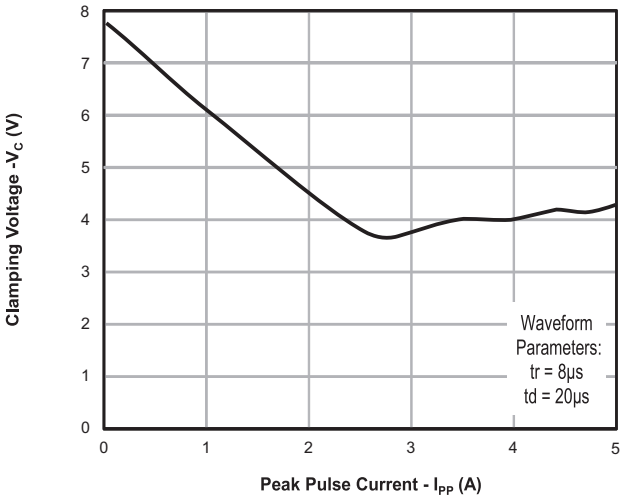
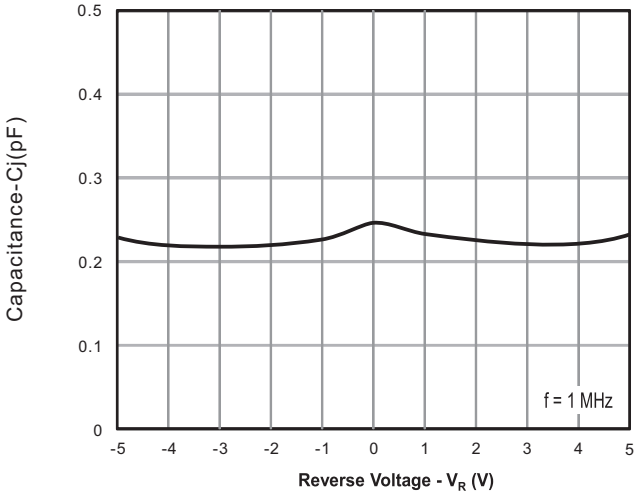
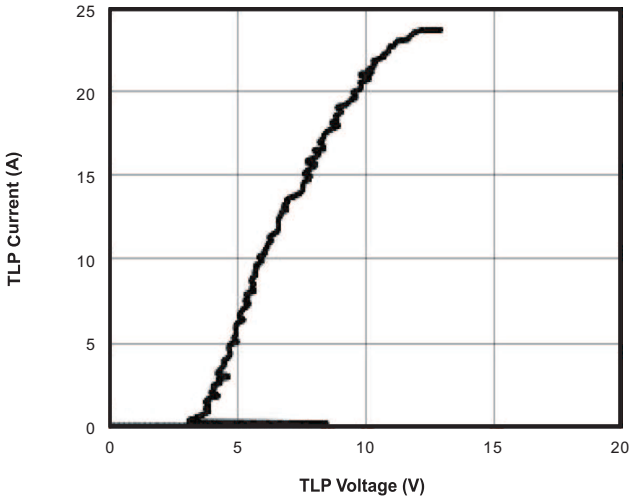
Clamping Voltage vs. Peak Pulse Current



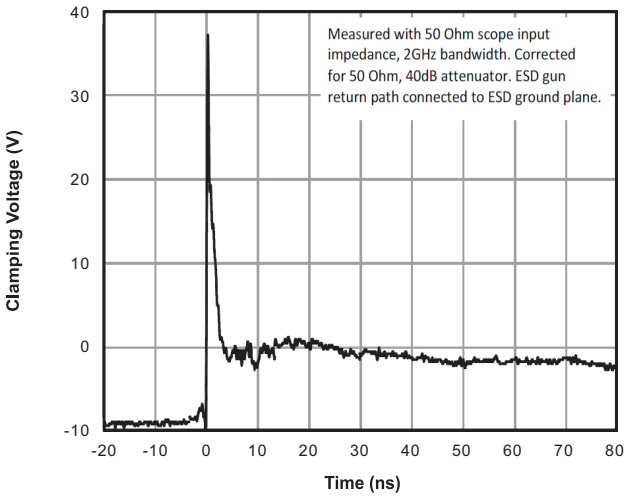
Typical Capacitance vs. Reverse Voltage



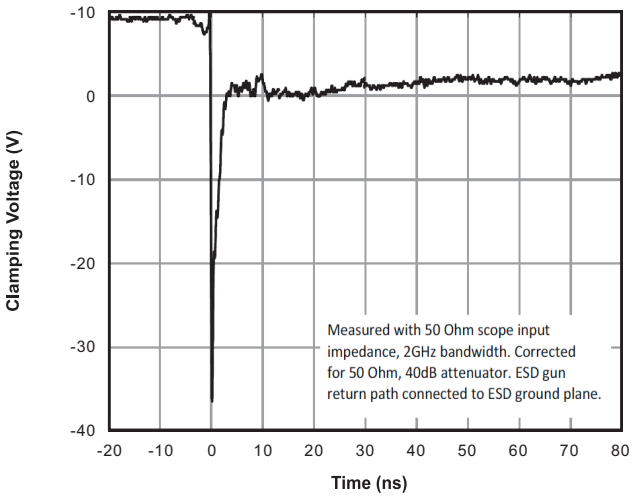
TLP Characteristic



ESD Clamping (+8kV Contact per IEC 61000-4-2)



ESD Clamping (-8kV Contact per IEC 61000-4-2)



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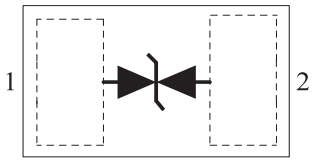
Pinning information

Type Number	Simplified outline	Circuit Diagram
LL05BT0603E		

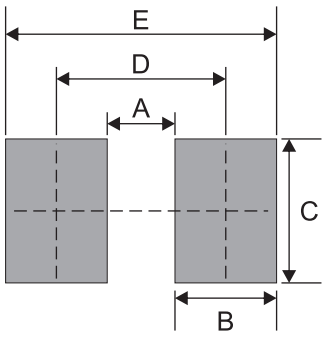
Marking code

Note:

(1) "SA" is part number, fixed

Suggested solder pad layout

SIZE	T0603	
	(mm)	(inch)
A	0.16	0.006
B	0.24	0.009
C	0.34	0.013
D	0.40	0.016
E	0.64	0.025



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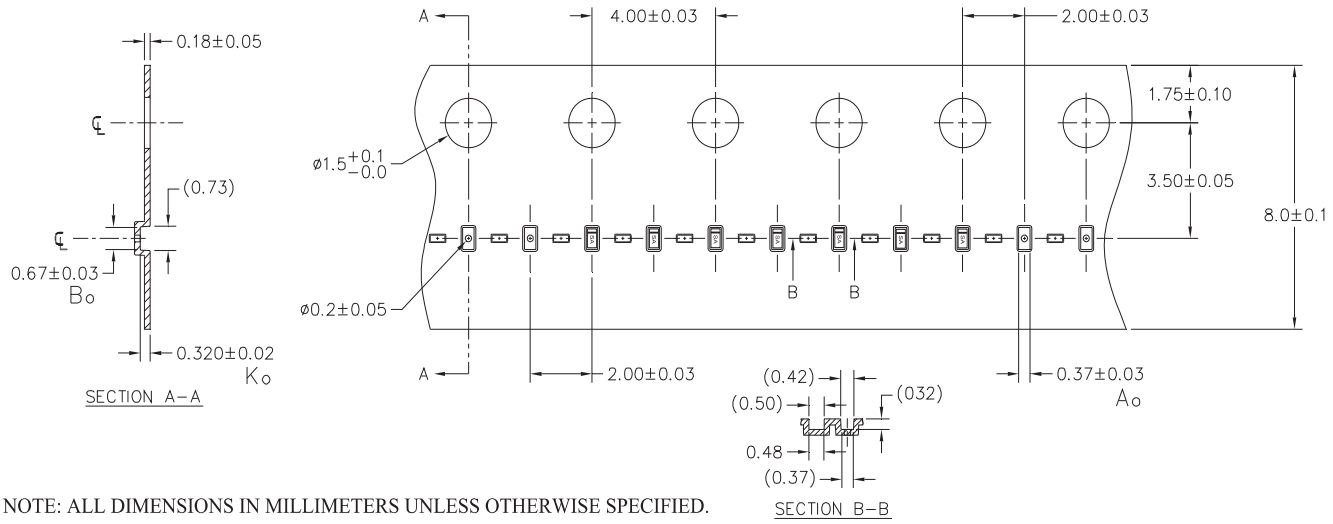
Packing information



NOTE: ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

A0	B0	K0
0.37 +/-0.03	0.67 +/-0.03	0.32 +/-0.02 mm

Note: All dimensions in mm unless otherwise specified

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)
T0603	7"	10,000	4.0	100,000	183*123*183	178	382*257*387	800,000	2.6

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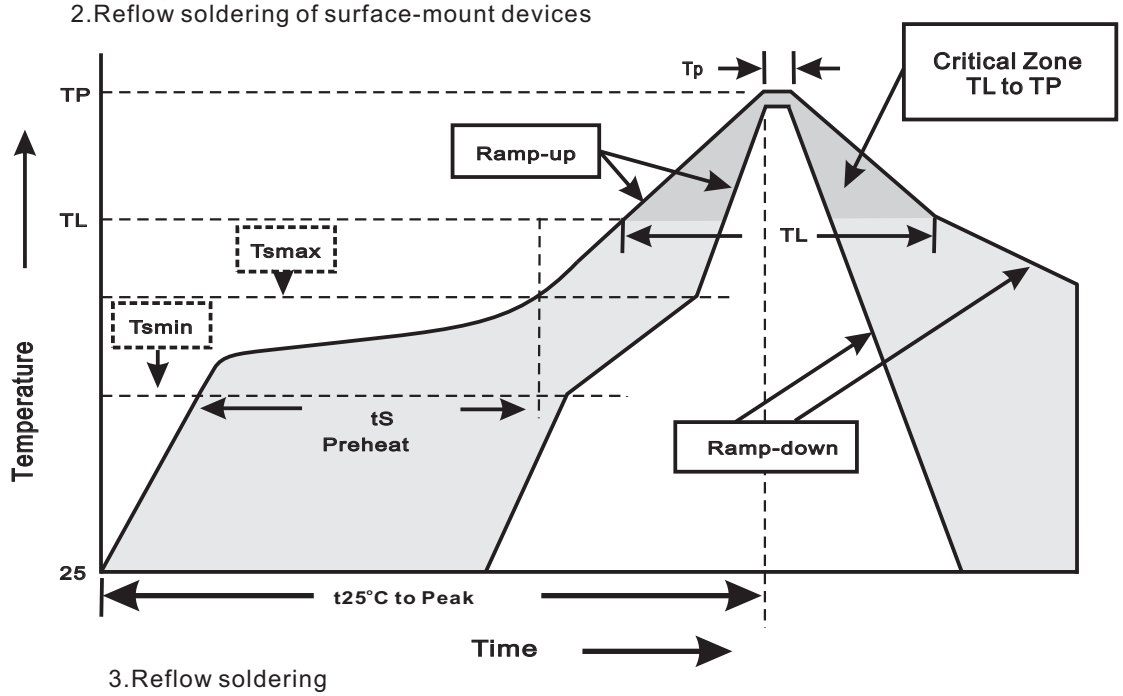
Suggested thermal profiles for soldering processes

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