LL05BT0603D-Q1

List

LL05BT0603D-Q1

50W Surface Mount TVS Bi-Directional For ESD Protection-5.0V

Features

- Protects one high-speed data line.
- Low capacitance : 0.2pF (Typical).
- Low leakage current : < 10nA Typical @V_R=5V.
- Dynamic resistance : 0.90Ω(Typ).
- Qualified to AEC-Q101 Grade 1.
- Provide transient protection : IEC 61000-4-2 (ESD) ±25KV(Air), ±22KV(Contact).
- We declare that the material of product compliance with RoHS requirements.
- Suffix "-H" indicates Halogen-free parts, ex.LL05BT0603D-Q1-H.

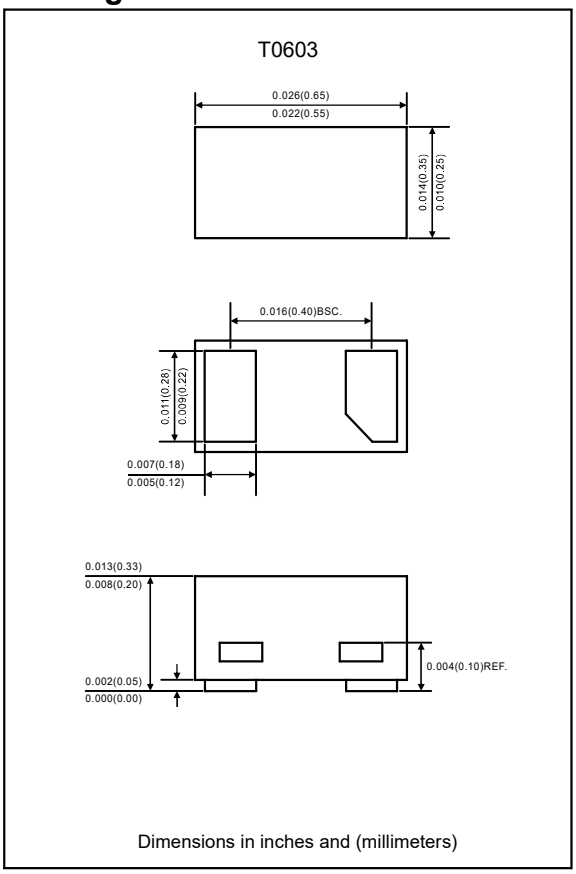
Applications

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

Mechanical data

- T0603 package
- Molding compound flammability rating : UL94V-0
- Packaging : Tape and reel per EIA 481
- RoHS Compliant
- 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 power (t_P=8/20μs)	P_{PP}	80	W
Peak pulse current (t_P=8/20μs)	I_{PP}	4.5	A
ESD per IEC 61000-4-2 (Contact)	V_{ESD}	±22	KV
ESD per IEC 61000-4-2 (Air)		±25	
Junction temperature	T_J	+125	℃
Storage temperature	T_{STG}	-55 to +150	℃

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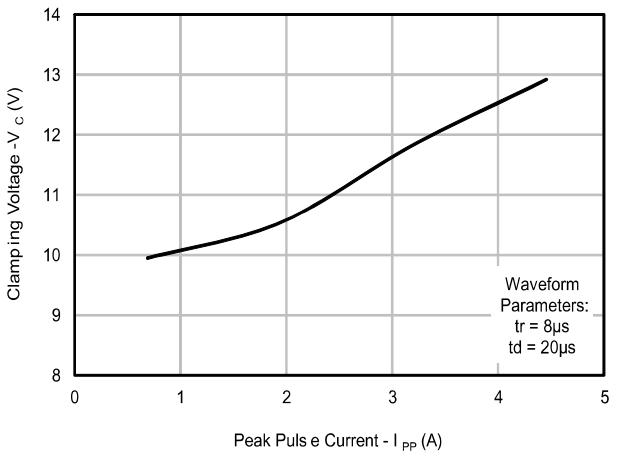
Electrical characteristics (at T_A=25°C unless otherwise noted)

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Reverse stand-off voltage		V_{RWM}			5.0	V
Reverse breakdown voltage	I_T=1mA	V_{BR}	7	9	10	V
Reverse leakage current	V_{RWM}=5.0V	I_R		5	100	nA
Clamping voltage @I_{PP}	I_{PP}=1A, t_p=8/20μs	V_C			11	V
	I_{PP}=4.5A, t_p=8/20μs				15	
Dynamic resistance (Note 2, 3, 4)	t_p=100ns	R_D		0.90		Ω
Junction capacitance	V_R=0V, f=1MHz	C_{ESD}		0.2		pF

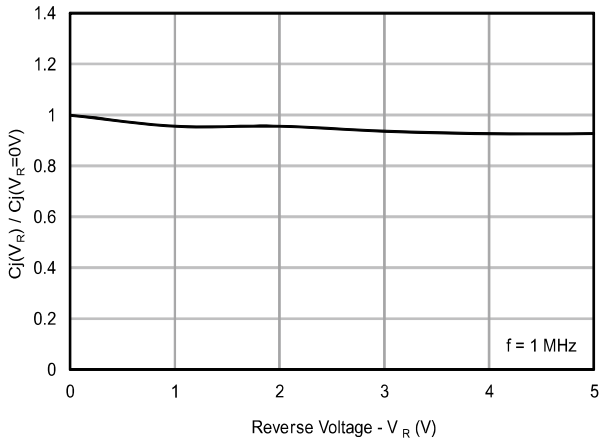
Note : 1. ESD gun return path connected to ESD ground reference plane.
2. Transmission line pulse test (TLP) setting : t_p=100ns, tr=0.2ns, I_{TLP} and V_{TLP} averaging window : t_1=70ns to t_2=90ns.
3. Dynamic resistance calculated from I_{TLP}=4A to I_{TLP}=16A.
4. Guaranteed by design. Not production tested.

Rating and characteristic curves(LL05BT0603D-Q1)

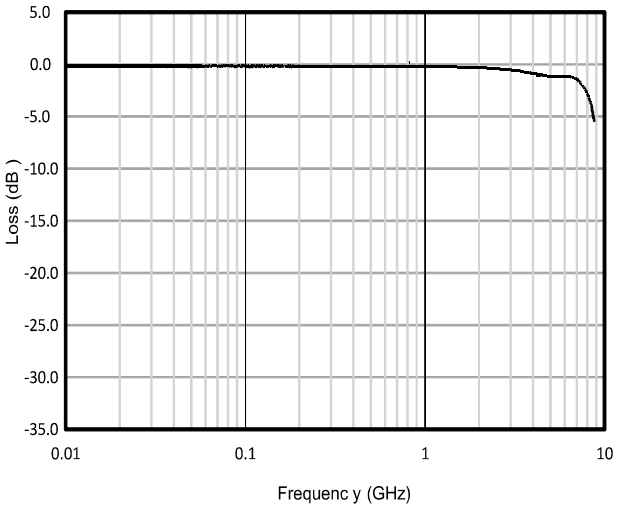
Clamping Voltage vs. Peak Pulse Current



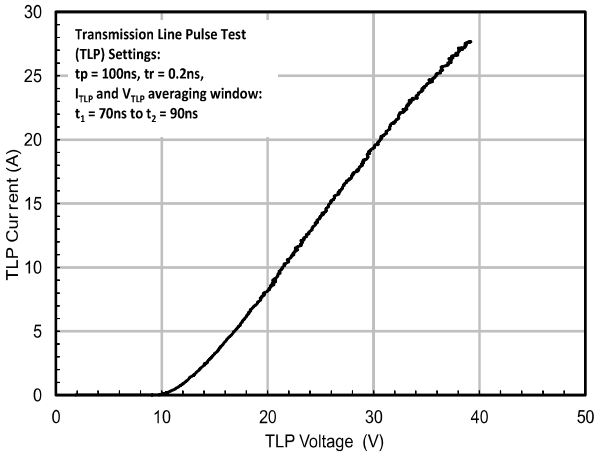
Typical Capacitance vs. Reverse Voltage



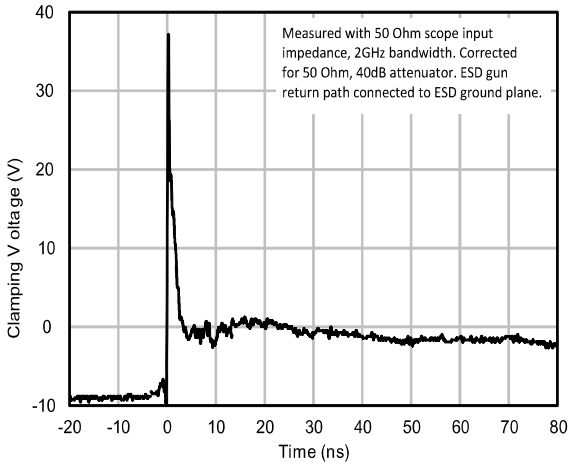
Typical Insertion Loss (S21)



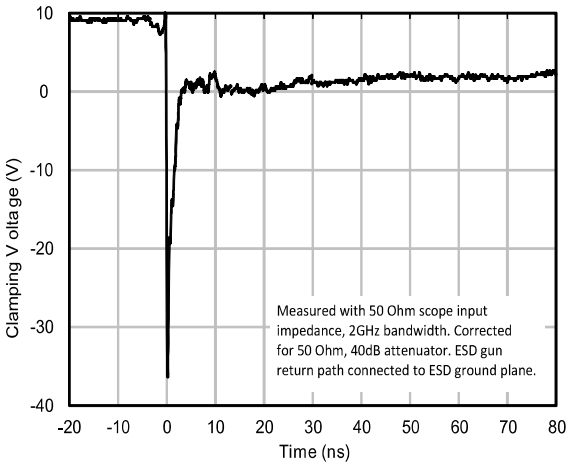
TLP Characteristic



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



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



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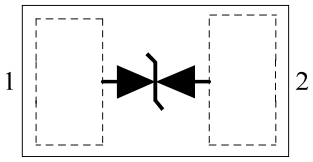
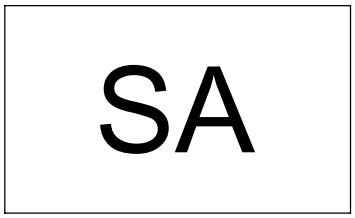
Pinning information

Type Number	Simplified outline	Circuit Diagram
LL05BT0603C-Q1		

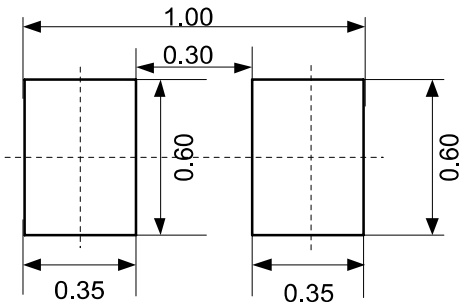
Marking code



Note:

(1) "SA" is part number, fixed

Suggested solder pad layout



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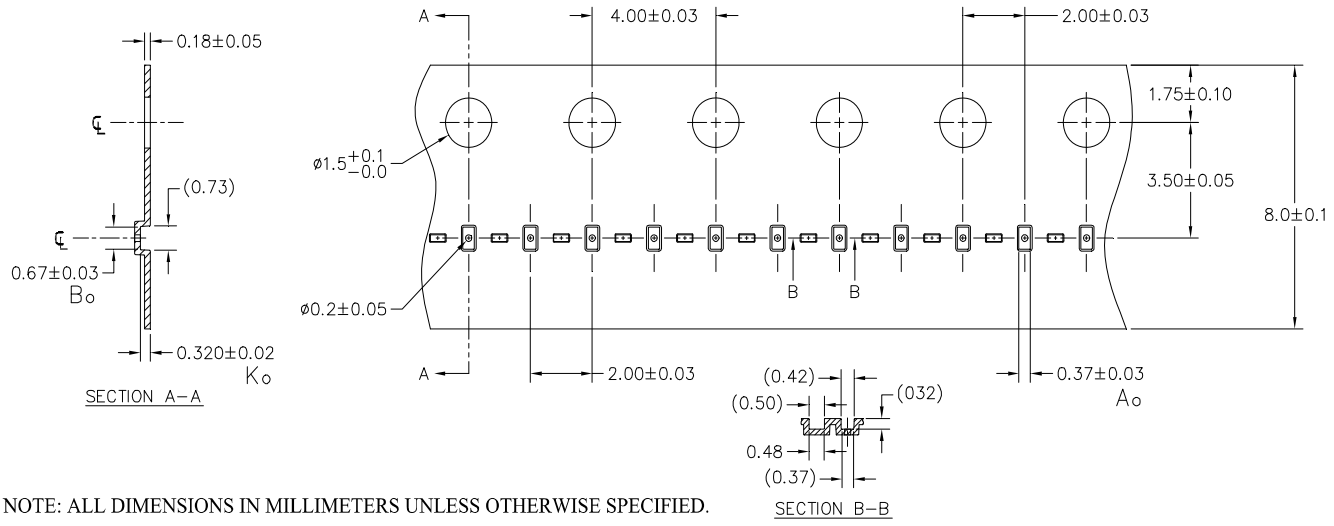
Packing information



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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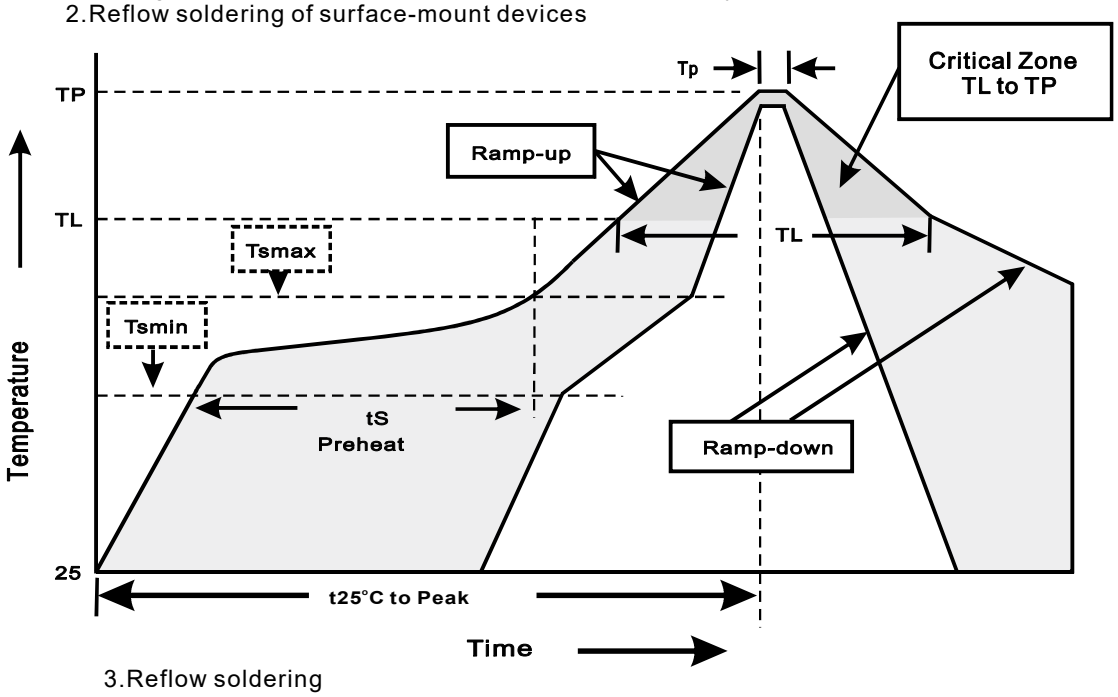
Suggested thermal profiles for soldering processes

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