

LL05BT0603C-Q1

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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 : 0.35 Ω (Typ).
- Qualified to AEC-Q101 Grade 1.
- Provide transient protection :
IEC 61000-4-2 (ESD) $\pm 25KV$ (Air), $\pm 15KV$ (Contact).
- We declare that the material of product compliance with RoHS requirements.
- Suffix "-H" indicates Halogen-free parts, ex.LL05BT0603C-Q1-H.

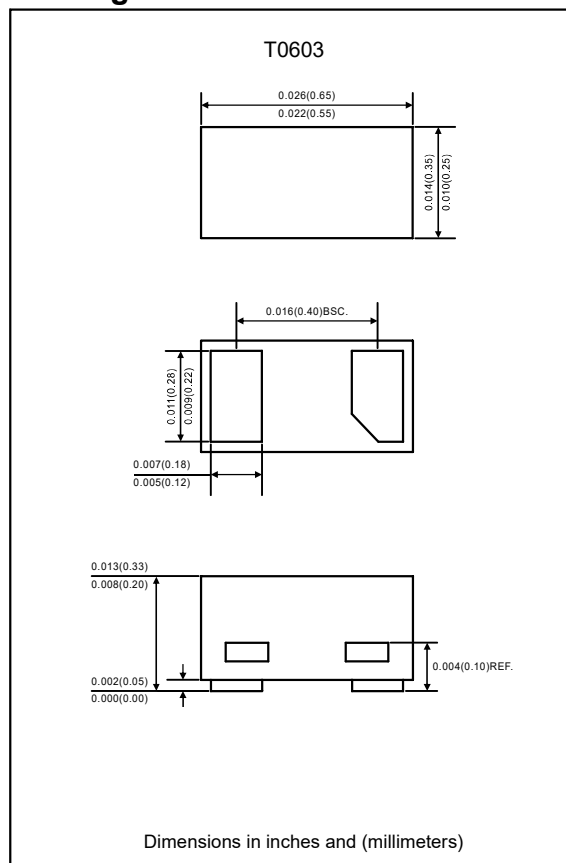
Applications

- 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

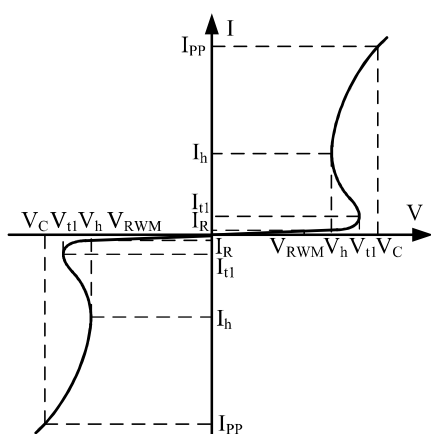


Maximum ratings (at $T_A=25^\circ C$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak pulse power ($t_p=8/20\mu s$)	P_{PP}	50	W
Peak pulse current ($t_p=8/20\mu s$)	I_{PP}	7	A
ESD per IEC 61000-4-2 (Contact)	V_{ESD}	± 15	KV
ESD per IEC 61000-4-2 (Air)		± 25	
Operating temperature	T_{OPT}	+125	$^\circ C$
Storage temperature	T_{STG}	-55 to +150	$^\circ C$

LL05BT0603C-Q1**Electrical characteristics** (at $T_A=25^\circ\text{C}$ unless otherwise noted)

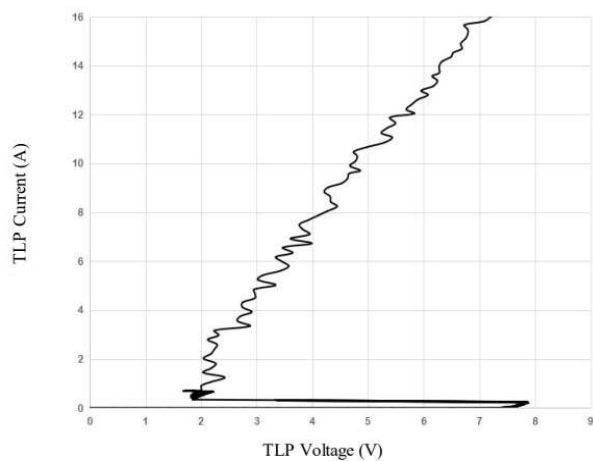
Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Reverse stand-off voltage		V_{RWM}			5.0	V
Reverse leakage current	$V_{RWM}=5.0\text{V}$	I_R			0.1	μA
Trigger voltage	$I_{t1}=100\mu\text{A}$	V_{t1}	6.0		10.0	V
Holding voltage	$I_h=30\text{mA}$	V_h		2.0		V
Clamping voltage @ I_{pp}	$I_{pp}=1\text{A}$, $t_p=8/20\mu\text{s}$	V_c		4.0		V
	$I_{pp}=7\text{A}$, $t_p=8/20\mu\text{s}$			7.0		
Junction capacitance	$V_R=0\text{V}$, $f=1\text{MHz}$	C_{ESD}		0.2	0.28	pF



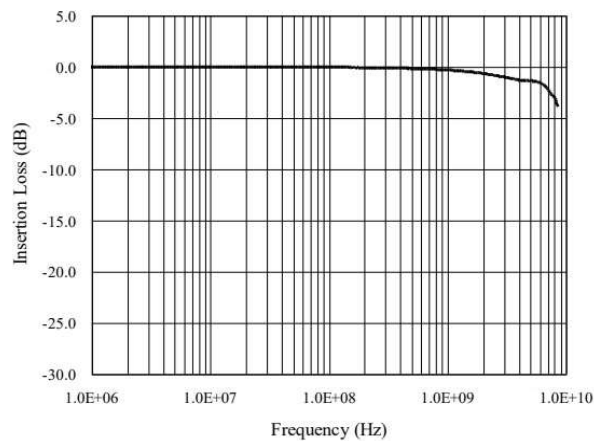
Bi-Directional TVS

Rating and characteristic curves(LL05BT0603C-Q1)

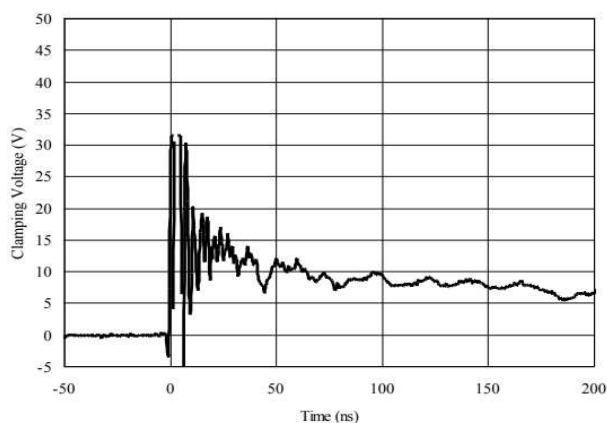
TLP Measurement of I/O to I/O



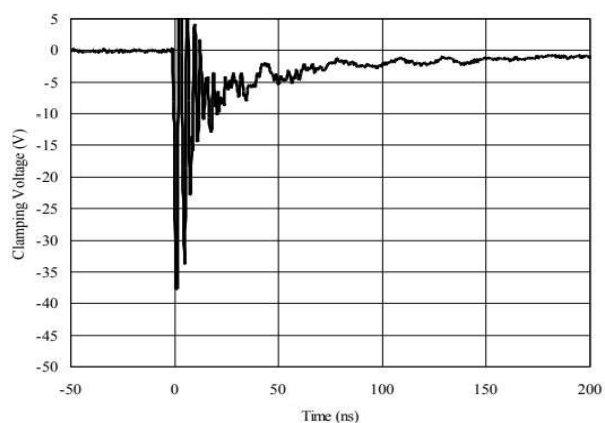
Insertion Loss S21 of I/O to I/O



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

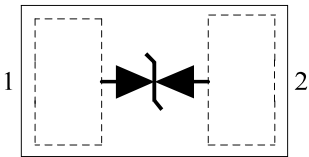


**ESD Clamping of I/O to I/O
(-8kV Contact per IEC 61000-4-2)**

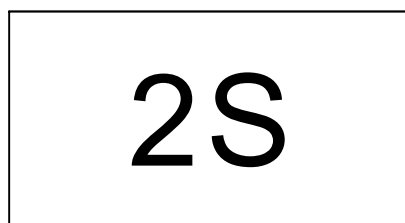


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Pinning information

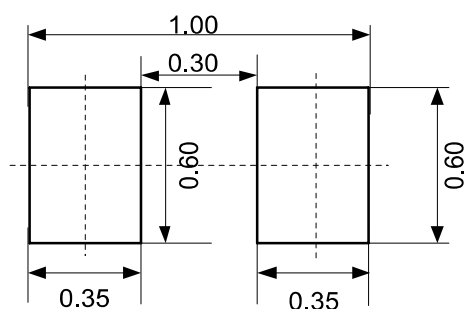
Type Number	Simplified outline	Circuit Diagram
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Marking code



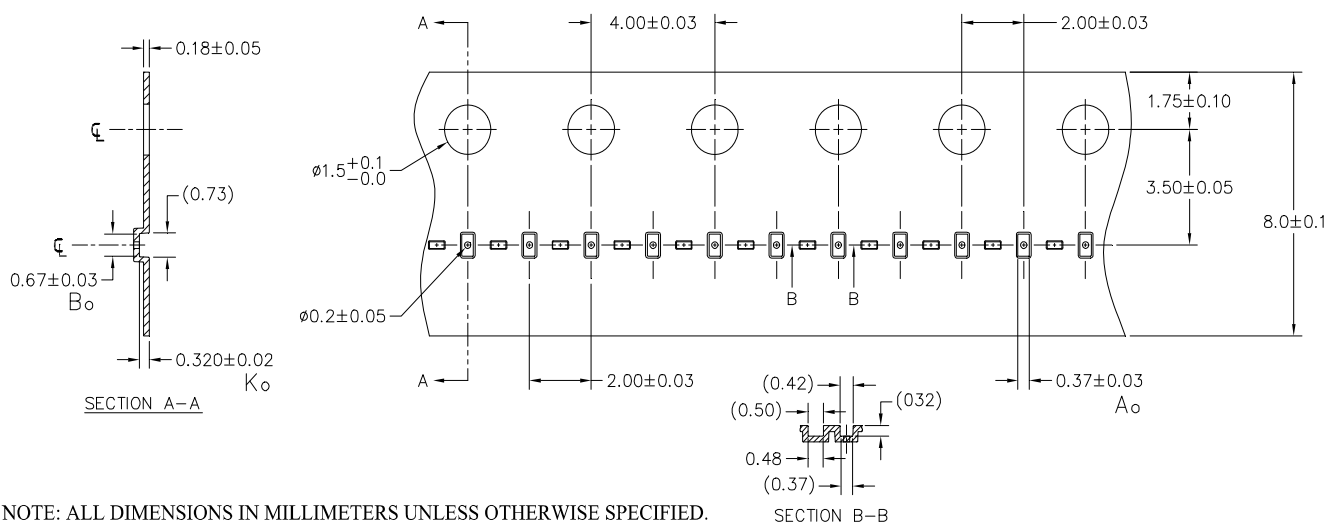
Note : 1. "2S" is part number find

Suggested solder pad layout



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Packing information



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

Note: All dimensions in mm unless otherwise specified

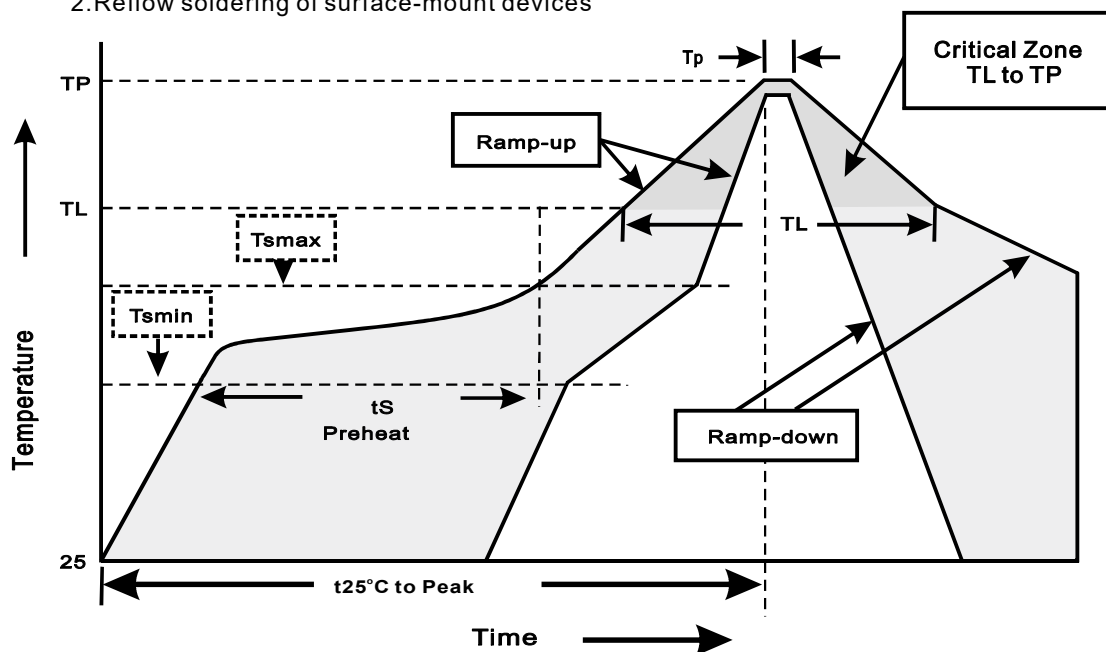
Reel packing

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(T _{sm}) -Temperature Max(T _{smx}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{smx} 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