

LL03BT0603A

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LL03BT0603A

40W TVS Bi-directional For ESD : 3.3V

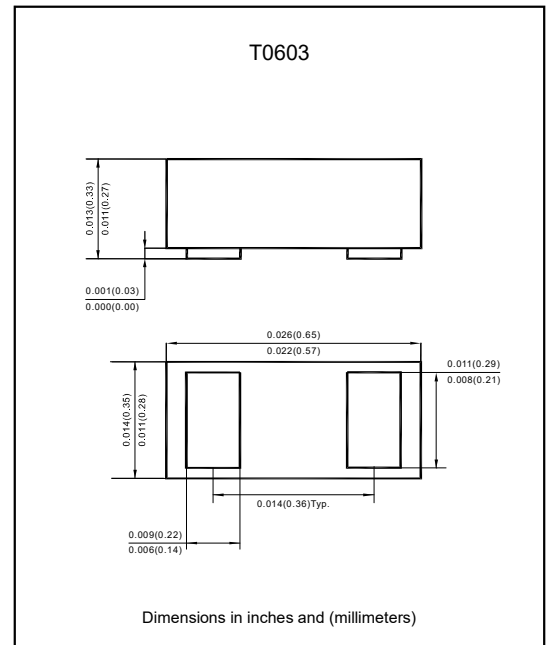
Features

- Protects optimized high-speed data lines.
- Protects one data, Control or power line.
- Low clamping voltage.
- Transient protection for high-speed data lines.
- IEC 61000-4-2 (ESD) $\pm 17\text{KV}$ (Air), $\pm 8\text{KV}$ (Contact).
- Each I/O pin can withstand over 1000 ESD strikes for $\pm 8\text{KV}$ contact discharge.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen free parts, ex. LL03BT0603A-H.

Mechanical data

- Molding compound flammability rating : UL 94V-0.
- Pb-Free, Halogen Free, RoHS/WEEE compliant.
- Case : Molded plastic, T0603
- Terminals : Solder plated, solder able per J-STD-002.
- Polarity : Indicated by cathode band.
- Mounting Position : Any.
- Weight : Approximated 0.109 gram.

Package outline



Maximum ratings (At $T_A=25^\circ\text{C}$, RH=45% ~ 75%, unless otherwise noted)

Parameter	Symbol	Ratings	Unit
Peak pulse power ($t_p=8/20\mu\text{s}$)	P_{PK}	40	W
Peak pulse current ($t_p=8/20\mu\text{s}$)	I_{PP}	6	A
ESD per IEC 61000-4-2 (Air discharge)	ESD	± 17	KV
ESD per IEC 61000-4-2 (Contact discharge)		± 8	KV
Operating junction temperature	T_{OPT}	125	$^\circ\text{C}$
Storage temperature range	T_{STG}	-55 ~ 150	$^\circ\text{C}$

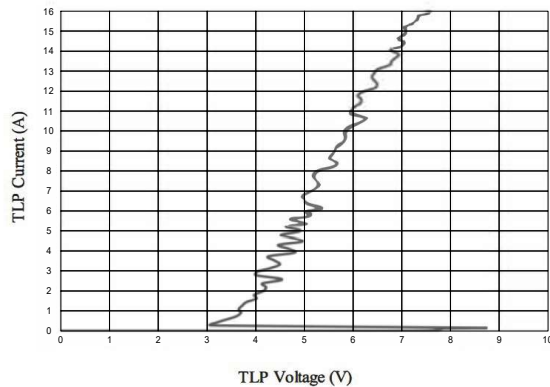
Electrical characteristics (At $T_A=25^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Test condition	Min	Typ	Max	Unit
Nominal reverse working voltage	V_{RWM}				3.3	V
Reverse leakage current	I_R	$V_{RWM}=3.3\text{V}$		0.1	0.5	μA
Trigger voltage	V_{t1}	$I_{t1}=1\text{mA}$	6		10	V
Holding voltage	V_h	$I_h=30\text{mA}$		2.4		V
Clamping voltage	V_c	$I_{pp}=1\text{A}$, $t_p=8/20\mu\text{s}$			4.0	V
		$I_{pp}=6\text{A}$, $t_p=8/20\mu\text{s}$			5.5	
Dynamic impedance	R_{DYN}	IEC61000-4-2, 0 ~ 8KV		0.27		Ω
ESD Clamping voltage	V_{ESD}	$I_{pp}=8.0\text{A}$, $t_p=100\text{ns}$		5.3		V
		$I_{pp}=16.0\text{A}$, $t_p=100\text{ns}$		7.5		
Junction capacitance	C_J	$V_R=0\text{V}$, $f=1\text{MHz}$		0.18	0.3	pF

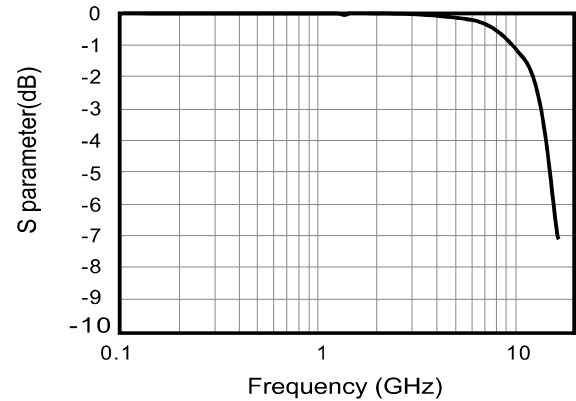
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Ratings and V-I characteristics curves ($T_A=25^\circ\text{C}$, Unless otherwise noted)

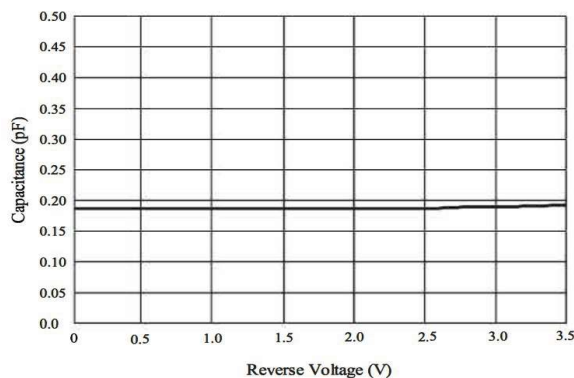
TLP Measurement of I/O to I/O



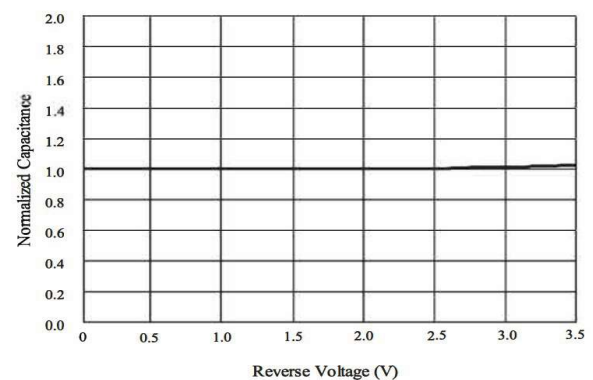
Insertion Loss S21 of I/O to I/O



Capacitance vs. Reverse Voltage



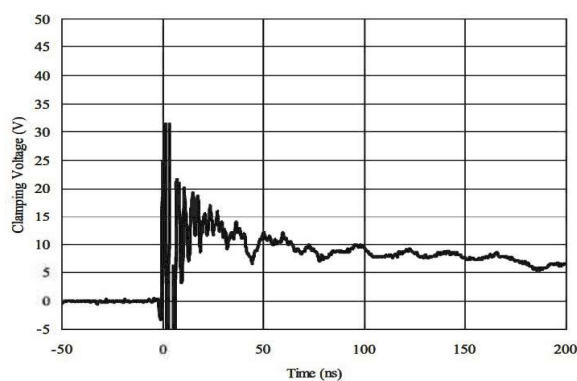
Normalized Capacitance vs. Reverse Voltage



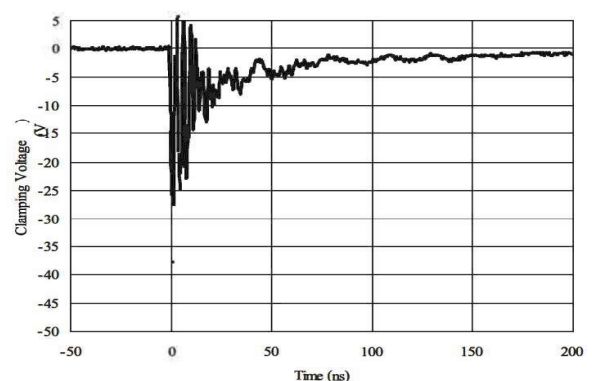
ESD Clamping of I/O to GND

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

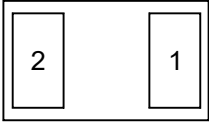


**ESD Clamping of I/O to GND
(-8kV Contact per IEC 61000-4-2)**

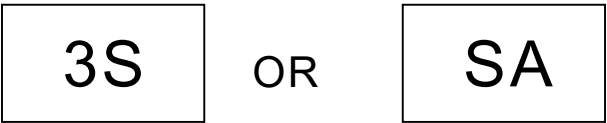


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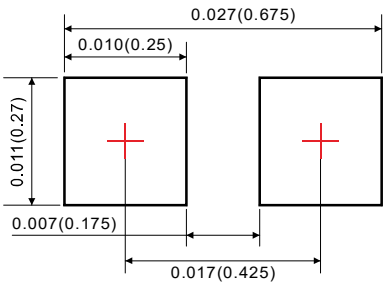
Pinning information

Pin	Simplified outline	Symbol
Bi-Directional		

Marking

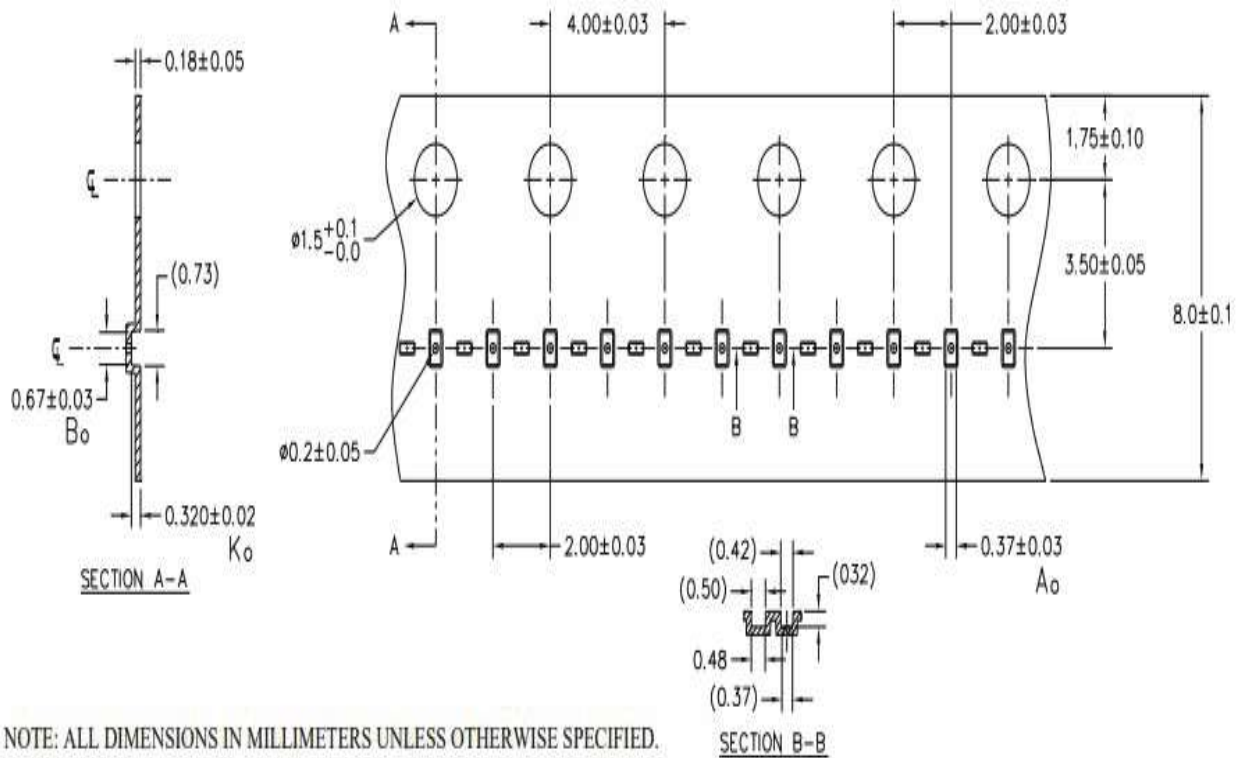


Suggested solder pad layout



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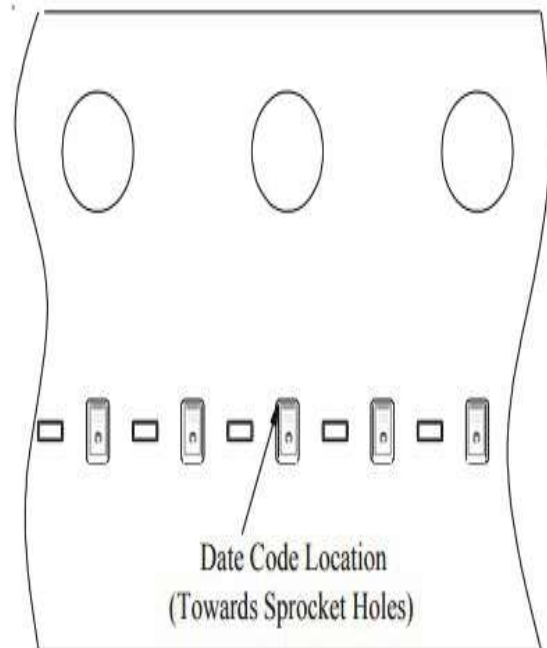
Packing information



Device Orientation in Tape

A0	B0	K0
0.37 ± 0.03	0.67 ± 0.03	0.32 ± 0.02 mm

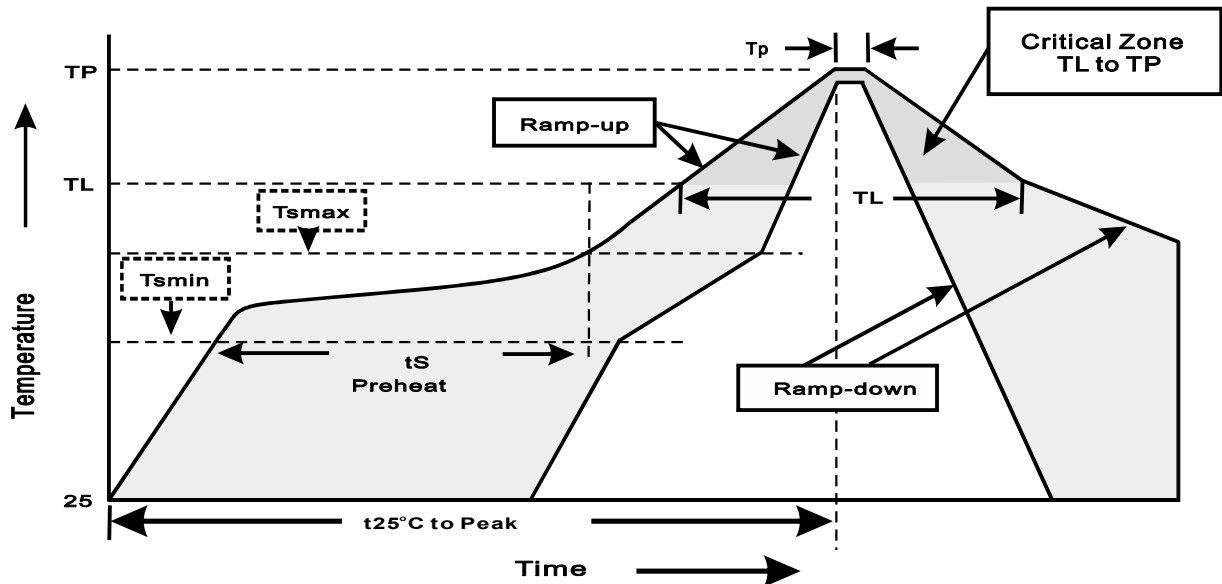
Note: All dimensions in mm unless otherwise specified



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