

LL18BT1006A-Q1

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36W 18V Surface Mount Bi-directional TVS For ESD Protection

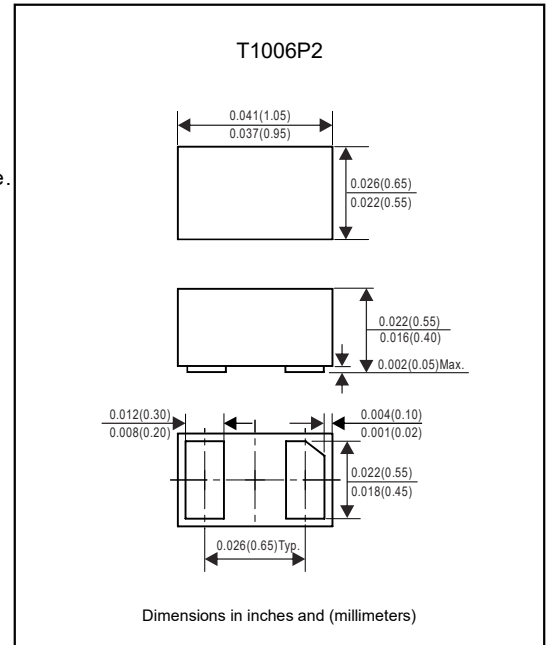
Features

- Small package saves board space.
- Array of surge rated diodes with internal TVS diode.
- Protects I/O lines.
- Low clamping voltage.
- Each I/O pin can withstand over 1K ESD strikes for $\pm 8\text{kV}$ contact discharge.
- Cable discharge event (CDE).
- Provide transient protection for high-speed data lines:
IEC 61000-4-2 (ESD) $\pm 12\text{kV}$ (Contact) / $\pm 10\text{kV}$ (Air).
IEC 61000-4-5 (Lightning) 6A (8/20us).
- Qualified to AEC-Q101 standards for high reliability.
- Only use for data line protect, don't on power line.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free parts, ex.LL18BT1006A-Q1-H.

Mechanical data

- Epoxy: UL94-V0 rated flame retardant.
- Case : Molded plastic, T1006P2

Package outline



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

Parameter	Symbol	Value	Unit
Peak pulse power ($t_p=8/20\mu\text{s}$)	P_{PP}	36	W
Peak pulse current ($t_p=8/20\mu\text{s}$)	I_{PP}	6	A
ESD per IEC 61000-4-2 (Air)	V_{ESD}	± 10	kV
ESD per IEC 61000-4-2 (Contact)		± 12	
Operating temperature	T_J	-55 to +125	$^\circ\text{C}$
Storage temperature	T_{STG}	-55 to +150	$^\circ\text{C}$

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

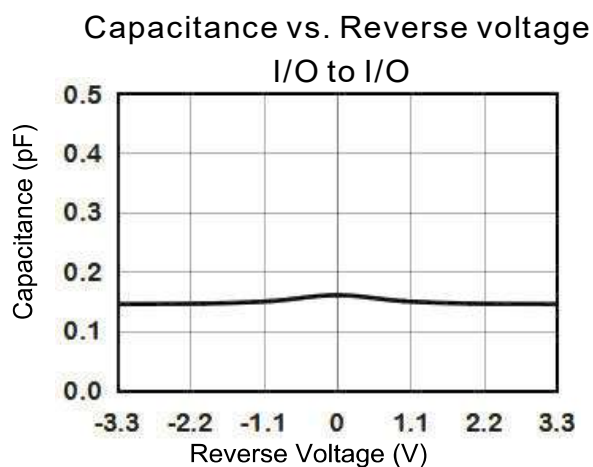
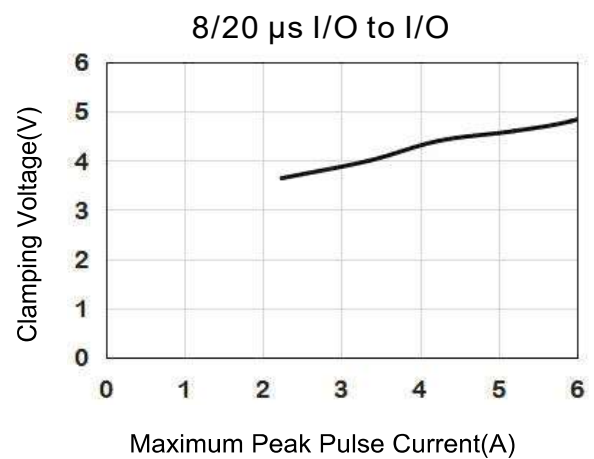
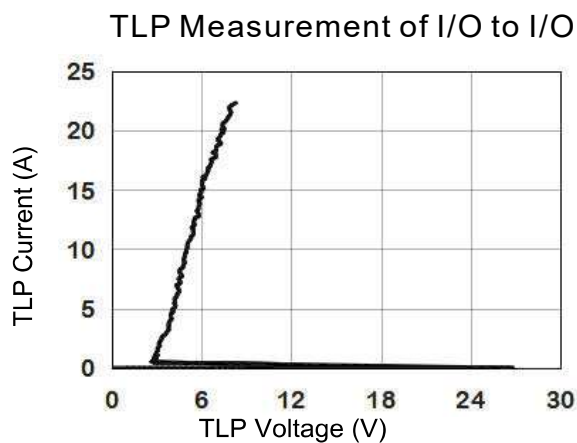
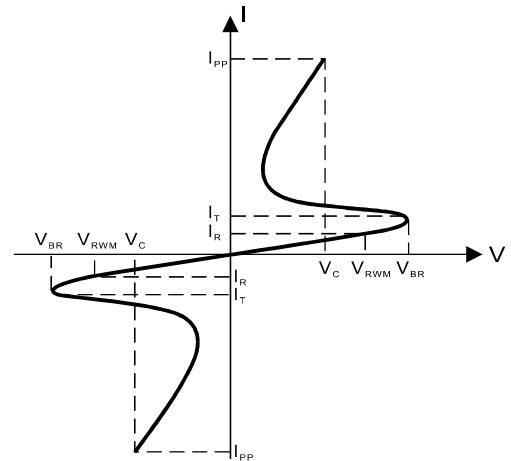
Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Reverse stand-off voltage		V_{RWM}			18	V
Breakdown voltage	$I_T=10\mu\text{A}$	V_{BR}	22	26		V
Reverse leakage current	$V_{RWM}=18\text{V}, T=25^\circ\text{C}$	I_R		1	10	nA
Clamping voltage	$I_{PP}=6\text{A}, t_p=8/20\mu\text{s}$	V_C		6	8	V
	$I_{PP}=8\text{A}, t_p=100\text{ns}$ (Note1)			4.5		
	$I_{PP}=16\text{A}, t_p=100\text{ns}$ (Note1)			6		
Dynamic resistance	$I_{PP}=12\text{A}, t_p=100\text{ns}$ (Note1)	R_{dyn}		0.2		Ω
Parasitic capacitance	$V_R=0\text{V}, f=1\text{MHz}$	C_{ESD}		0.16		pF

Note: 1. Measurements performed using a 100ns transmission line pulse (TLP) system.

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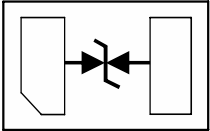
Rating and characteristic curves

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}	Maximum peak pulse current
C_{ESD}	Parasitic capacitance



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Pinning information

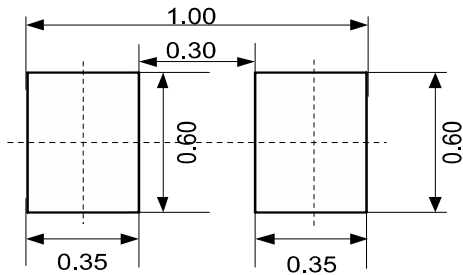
Pin	Simplified outline	Symbol
Bi-Directional		

Marking

Type number	Marking code
LL18BT1006A-Q1	MΣ

Note:1."M" is part number.
2."Σ" is the internal control code.

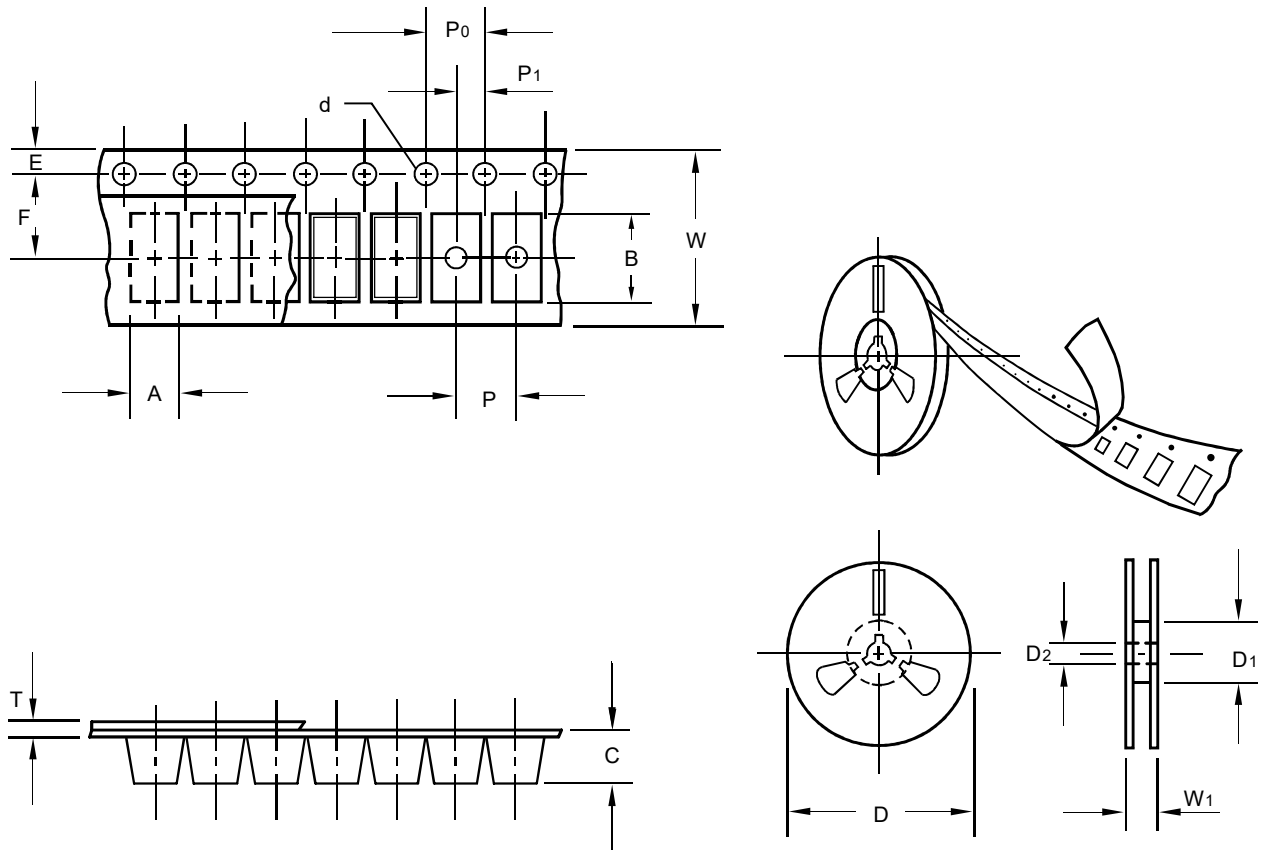
Suggested solder pad layout



Dimensions in millimeters

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Packing information



unit:mm

Item	Symbol	Tolerance	T1006P2
Carrier width	A	0.1	0.66
Carrier length	B	0.1	1.15
Carrier depth	C	0.1	0.66
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D1	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D1	min	55.00
Feed hole diameter	D2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	2.00
Sprocket hole pitch	P0	0.1	4.00
Embossment center	P1	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	8.00
Reel width	W1	1.0	9.50

Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

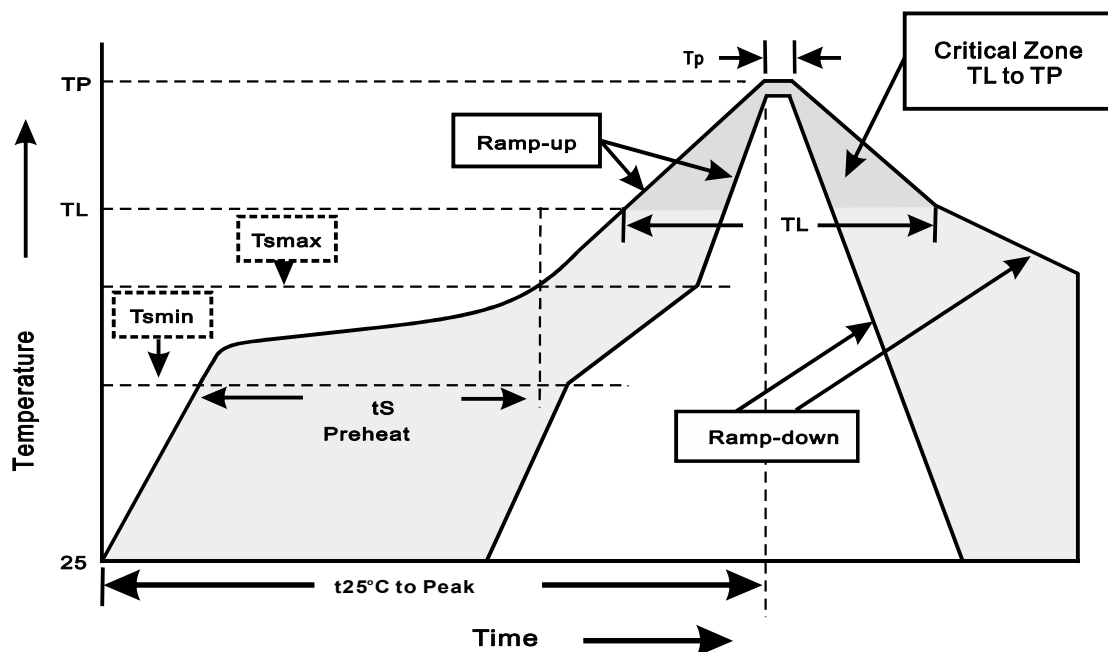
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Reel packing

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)
T1006P2	7"	10,000	4.0	100,000	183*123*183	178	382*257*387	800,000

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)	$<3^{\circ}\text{C}/\text{sec}$
Preheat -Temperature Min(T_{min}) -Temperature Max(T_{max}) -Time(min to max)(t_s)	150°C 200°C $60\sim 120\text{sec}$
T_{max} to T_L -Ramp-upRate	$<3^{\circ}\text{C}/\text{sec}$
Time maintained above: -Temperature(T_L) -Time(t_L)	217°C $60\sim 260\text{sec}$
Peak Temperature(T_P)	$255^{\circ}\text{C}-0/+5^{\circ}\text{C}$
Time within 5°C of actual Peak Temperature(t_P)	$10\sim 30\text{sec}$
Ramp-down Rate	$<6^{\circ}\text{C}/\text{sec}$
Time 25°C to Peak Temperature	$<6\text{minutes}$