

LL05BT1006L2-Q1

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80W Surface Mount TVS Bi-Directional For ESD Protection 5.0V

Features

- Protects one I/O or power line .
- Low clamping voltage.
- Low leakage current.
- Ultra low capacitance : 0.3pF.
- Response time is typically < 1ns.
- Provide transient protection:
IEC 61000-4-2 (ESD) $\pm 20\text{KV}$ (Air), $\pm 20\text{KV}$ (Contact)
IEC 61000-4-4 (EFT) 40A (5/50ns)
IEC 61000-4-5 (Lightning) 4A (8/20us)
- We declare that the material of product
compliance with RoHS requirements.
- Qualified to AEC-Q101 standards for high reliability.
- Suffix "-H" indicates Halogen-free parts, ex.LL05BT1006L2-Q1-H

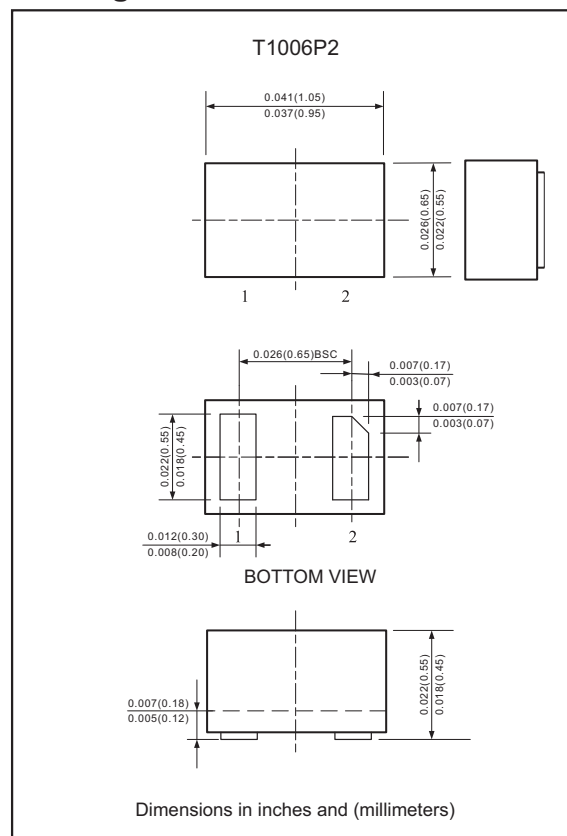
Applications

- Laptop Computers.
- Cellular Phones.
- Digital Cameras.
- Personal Digital Assistants (PDAs).

Mechanical data

- T1006P2 package
- Molding compound flammability rating : UL94V-0
- Packaging : Tape and reel per EIA 481
- RoHS Compliant
- Weight : Approximated 0.73 mg

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}	80	W
Peak pulse current ($t_p = 8/20\mu\text{s}$)	I_{PP}	4	A
ESD per IEC61000-4-2 (air) ESD per IEC 61000-4-2 (contact)	ESD	± 20	KV
Operating temperature	T_J	+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}			5.0	V
Breakdown voltage	$I_T = 1\text{mA}$	V_{BR}	6.0		9.0	V
Reverse leakage current	$V_{RWM} = 5\text{V}$	I_R			200	nA
Clamping voltage	$I_{PP} = 4\text{A}$, $t_p = 8/20\mu\text{s}$	V_C		17	20	V
ESD Clamping Voltage ¹	$I_{PP} = 4\text{A}$, $t_p = 0.2/100\text{ns}$			13.0		V
	$I_{PP} = 16\text{A}$, $t_p = 0.2/100\text{ns}$			25.0		V
Dynamic resistance ^{1,2}	$TLP = 0.2/100\text{ns}$	R_{DYN}		0.95		Ω
Junction capacitance	$V_R = 0\text{V}$, $f = 1\text{MHz}$	C_j		0.3	0.5	pF

Note : 1. TLP Setting : $t_p = 100\text{ns}$, $t_r = 0.2\text{ns}$, I_{TLP} and V_{TLP} sample window : $t_i = 70\text{ns}$ to $t_f = 90\text{ns}$.

2 Dynamic resistance calculated from $I_{PP} = 4\text{A}$ to $I_{PP} = 16\text{A}$ using "best Fit"

Rating and characteristic curves(LL05BT1006L2-Q1)

Figure 1: Peak Pulse Power Vs Pulse Time

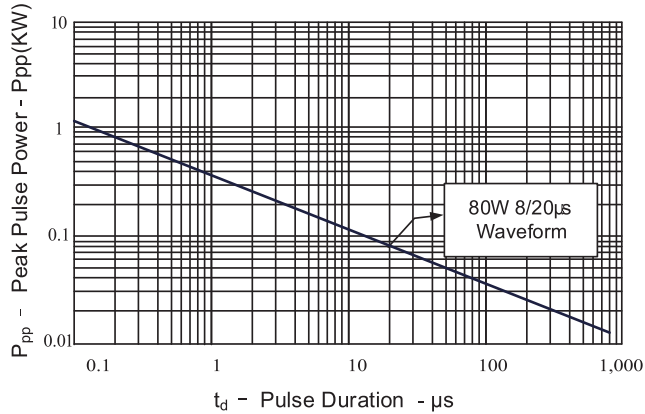


Figure 2: Power Derating Curve

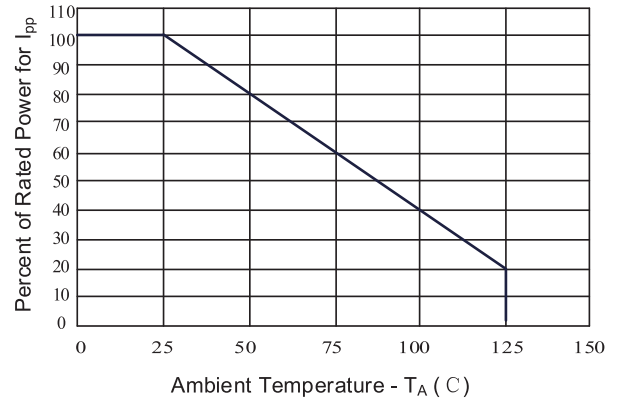


Figure 3: Clamping Voltage vs. Peak Pulse Current

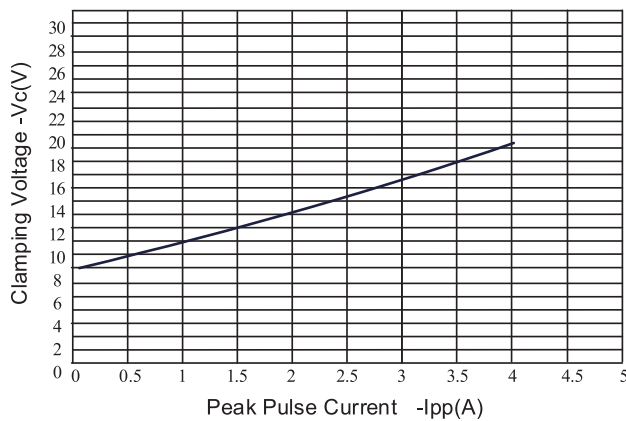


Figure 4: Normalized Junction Capacitance vs. Reverse Voltage

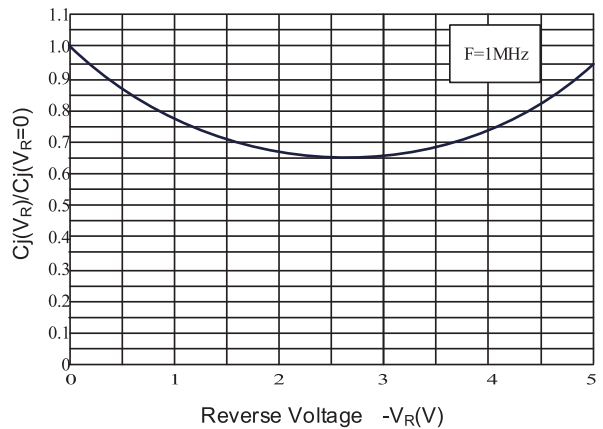


Figure 5: Pulse Waveform

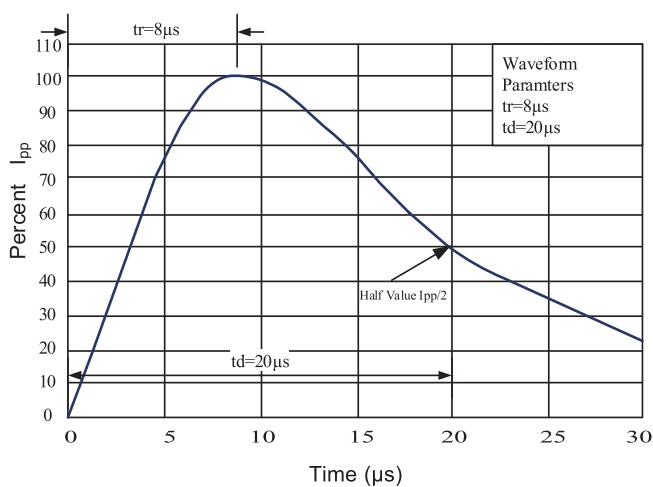
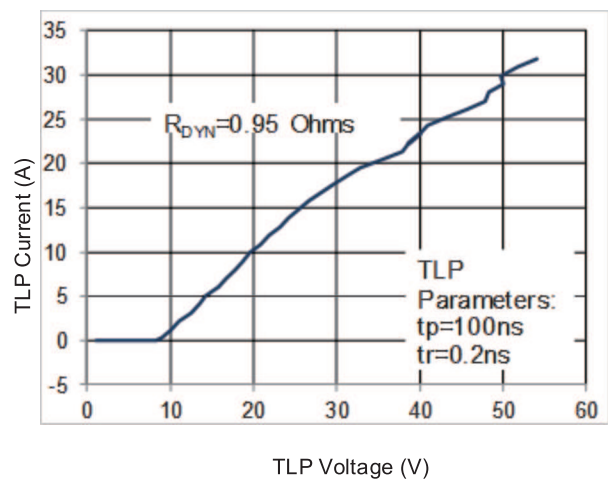
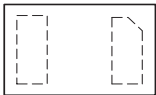


Figure 6: TLP Characteristic



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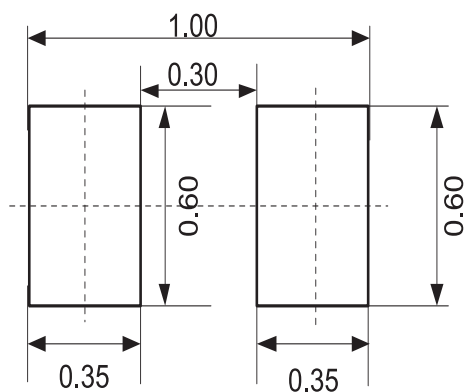
Pinning information

Pin	Simplified outline	Symbol
Bi-Directional		

Marking

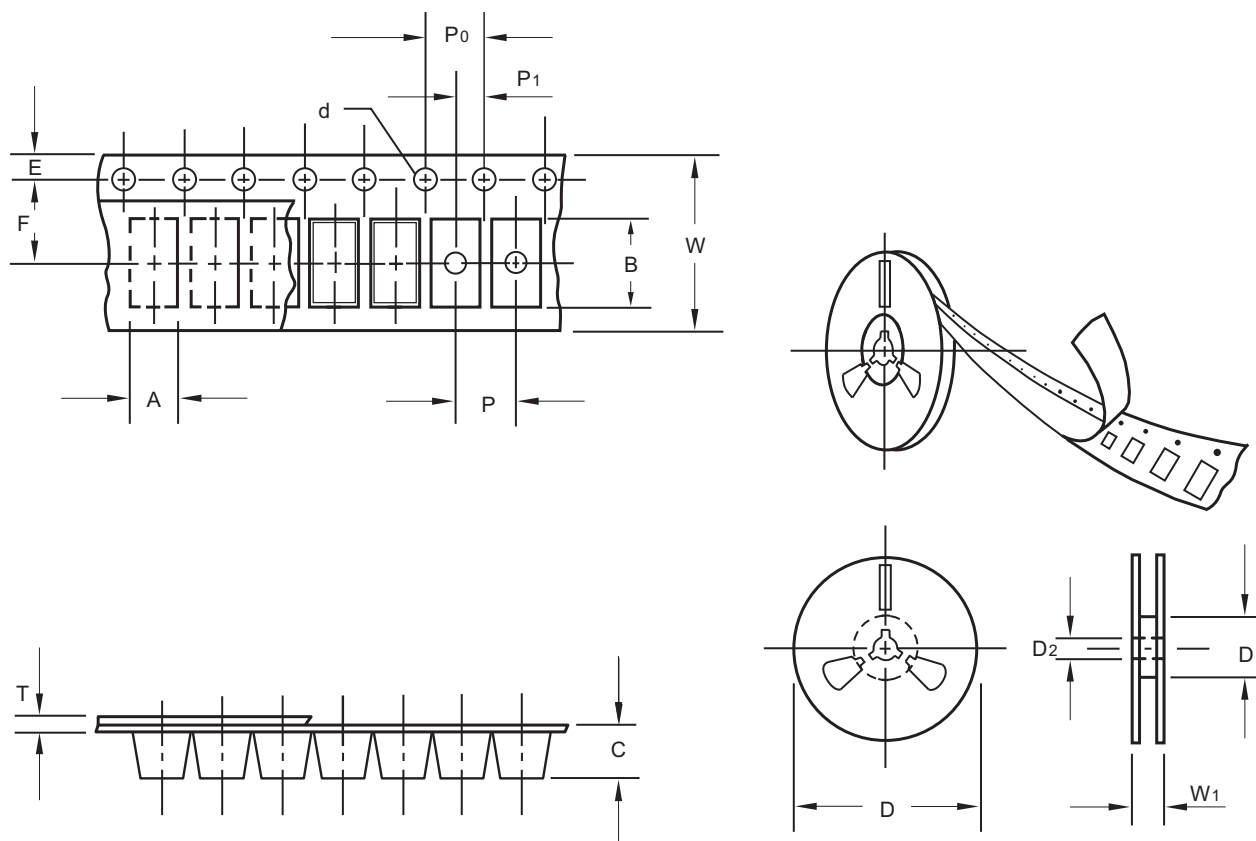
Type number	Marking code
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Suggested solder pad layout



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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.

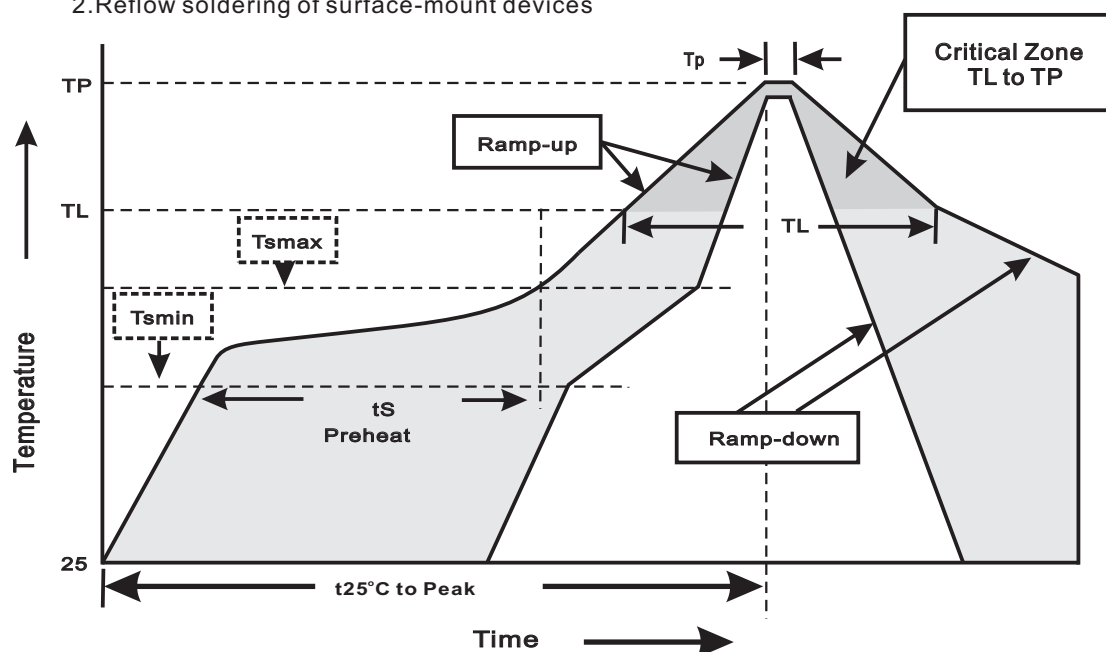
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Reel packing

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)	APPROX. GROSS WEIGHT (kg)
T1006P2	7"	10,000	4.0	100,000	183*123*183	178	382*257*387	800,000	15.0

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