

LL05BT1006E

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LL05BT1006E

88W Ultra Low Capacitance Bi-Directional TVS For ESD Protection : 5.0V

Features

- 88Watts peak pulse power ($t_p=8/20\mu s$).
- Solid-state silicon-avalanche technology.
- Capacitance: 0.2pF (typ.).
- Low clamping voltage.
- Low leakage current.
- Complies with following standards:
 - IEC 61000-4-2 (ESD) $\pm 20kV$ (Air), $\pm 20kV$ (Contact).
 - IEC 61000-4-4 (EFT) 40A (5/50ns).
 - IEC 61000-4-5 (Lightning) 4A (8/20 μs).
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free parts, ex.LL05BT1006E-H.

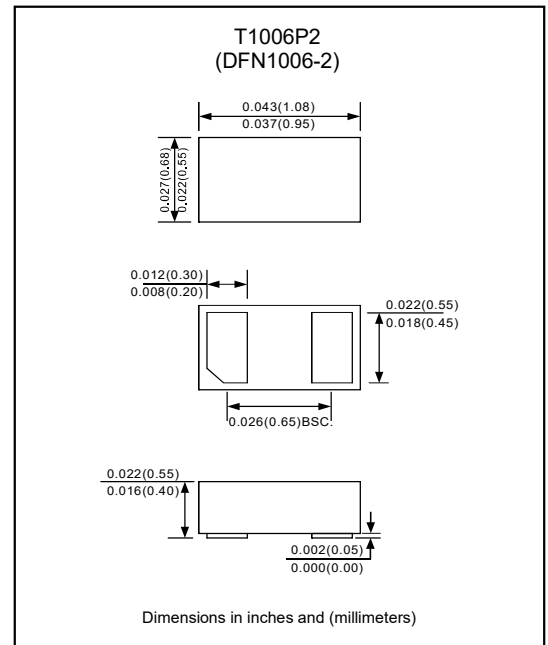
Applications

- USB2.0 and USB3.0.
- HDMI 1.3 and HDMI1.4.
- SATA and eSATA.
- DVI and PCI-E.

Mechanical data

- Epoxy: UL94V-0 rated flame retardant.
- Case : Molded plastic, T1006P2 (DFN1006-2).

Package outline



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

Parameter	Symbol	Ratings	Units
Peak pulse power (8/20 μs)	P_{PK}	88	W
Peak pulse current (8/20 μs)	I_{PP}	4	A
ESD per IEC 61000-4-2 (Contact)	V_{ESD}	± 20	KV
ESD per IEC 61000-4-2 (Air)		± 20	
Lead temperature for soldering during 10 seconds	T_L	260	$^\circ C$
Operating temperature	T_J	+125	$^\circ C$
Storage temperature range	T_{STG}	-55 to +150	$^\circ C$

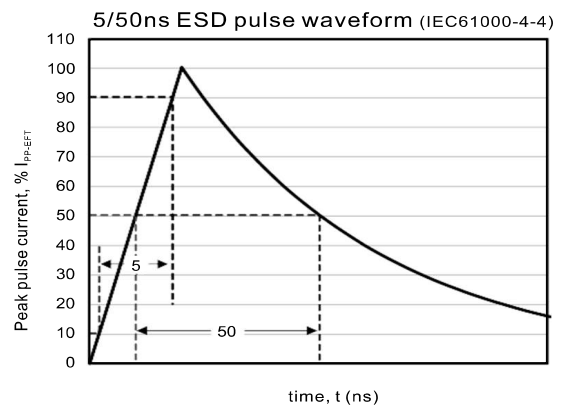
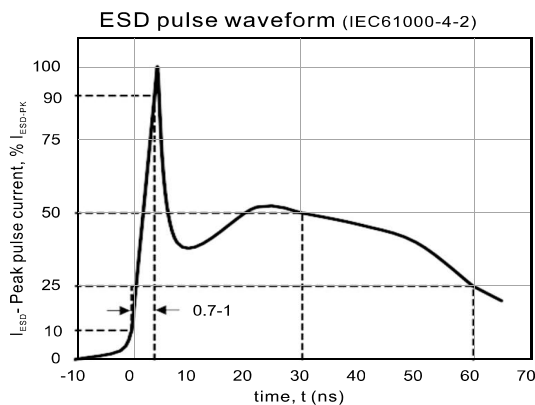
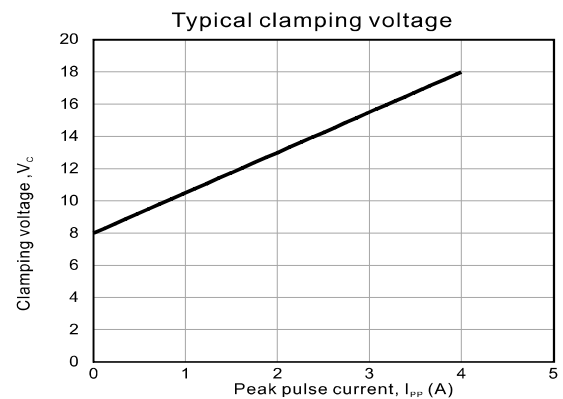
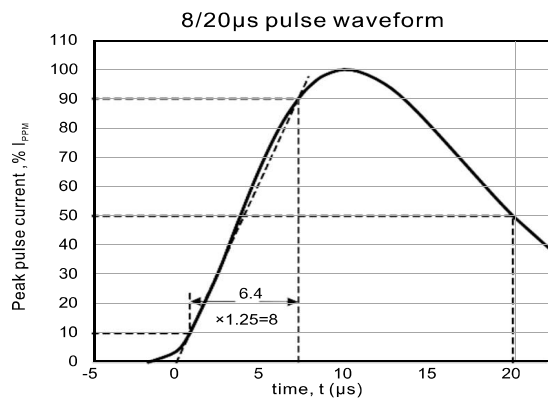
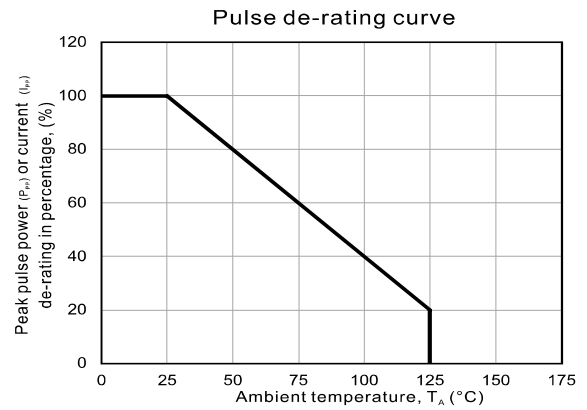
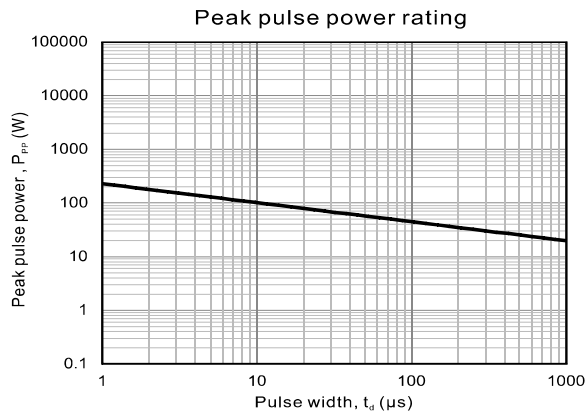
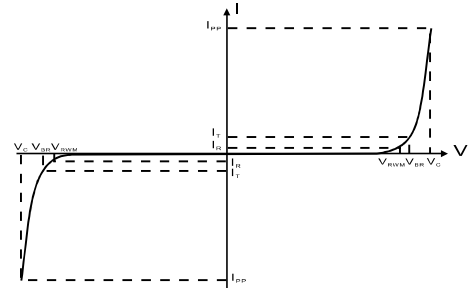
Electrical characteristics (At $T_A=25^\circ C$ unless otherwise noted)

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Reverse working voltage		V_{RWM}			5	V
Reverse leakage current	$V_{RWM} = 5V$	I_R		0.001	0.1	μA
Breakdown voltage	$I_T = 1mA$	V_{BR}	6.5	8		V
Clamping voltage	$I_{PP} = 1A, t_p = 8/20\mu s$	V_C		10		V
	$I_{PP} = 4A, t_p = 8/20\mu s$			18	22	
Junction capacitance	$V_{DC} = 0V, f = 1.0MHz$	C_J		0.2	0.4	pF

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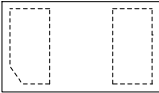
Rating and characteristic curves

Symbol	Parameter
V_{RWM}	Reverse working voltage
I_R	Reverse leakage current
V_{BR}	Reverse breakdown voltage
I_T	Test current for reverse breakdown
V_C	Clamping voltage
I_{PP}	Peak pulse current



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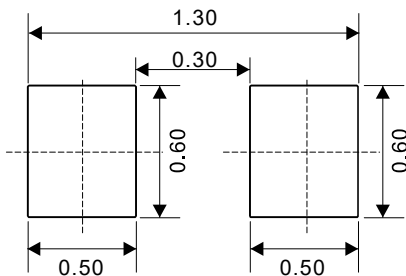
Pinning information

Pin	Simplified outline	Symbol
Bi-directional	 Top view  Bottom view	

Marking

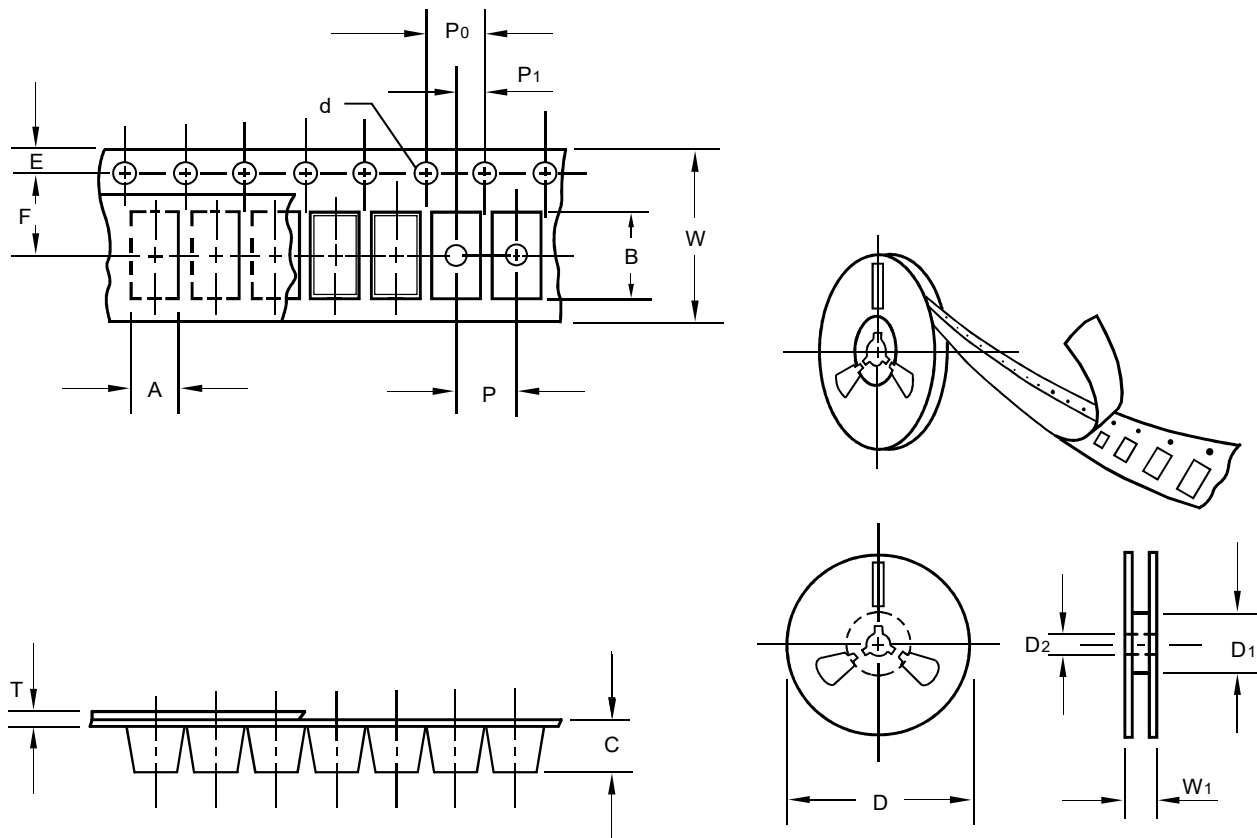
Type number	Marking code
LL05BT1006E	21

Suggested solder pad layout



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Packing information



unit:mm

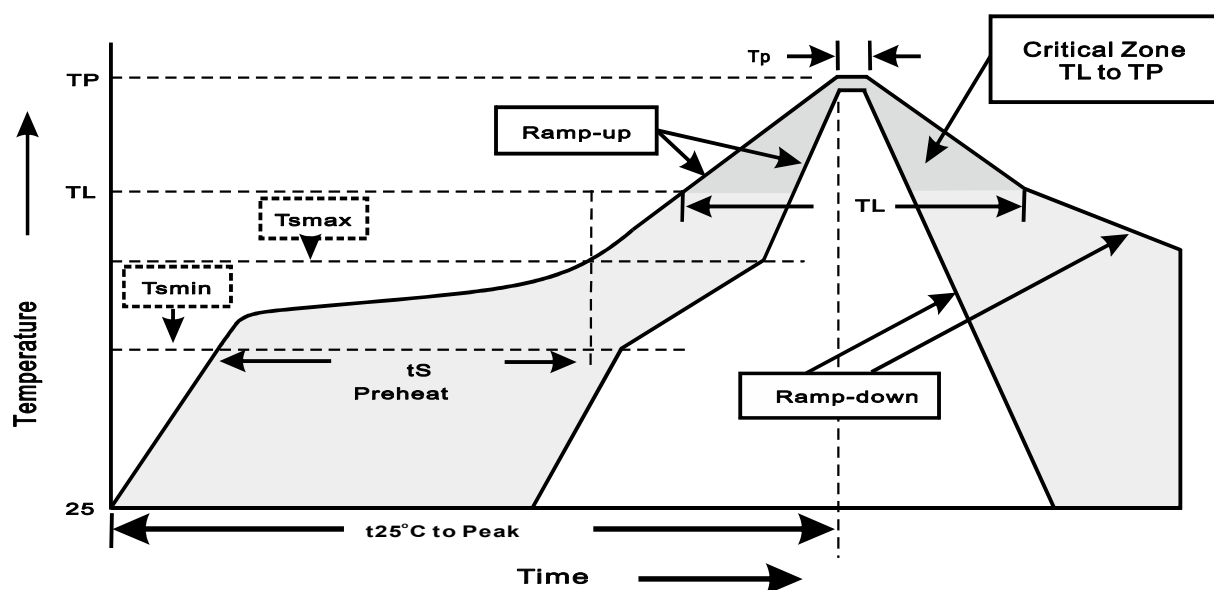
Item	Symbol	Tolerance	T1006P2 (DFN1006-2)
Carrier width	A	0.1	0.70
Carrier length	B	0.1	1.15
Carrier depth	C	0.1	0.55
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D1	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D1	min	55.00
Feed hole diameter	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	0.20
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.

Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	REEL DIA, (m/m)	CARTON (pcs)
T1006P2 (DFN1006-2)	7"	10,000	4.0	100,000	178	800,000

1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
2.Reflow soldering of surface-mount devices



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