

LL05BT1006C

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LL05BT1006C

40W Ultra Low Capacitance Bi-Directional TVS For ESD Protection Diode : 5.0V

Features

- Protects one data or power line.
- Complies with following standards:
IEC 61000-4-2(ESD) $\pm 25\text{kV}$ (Air).
IEC 61000-4-2(ESD) $\pm 20\text{kV}$ (Contact).
IEC 61000-4-5(Lighting) 2.5A (8/20 μs) .
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free parts, ex.LL05BT1006C-H.

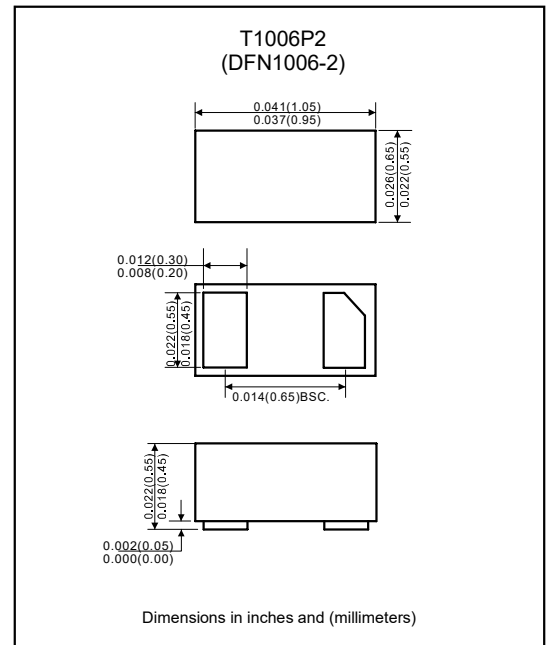
Applications

- Cellular handsets and accessories.
- Display ports.
- MDDI ports.
- USB ports.
- Digital visual interface (DVI).
- PCI express and serial SATA ports.

Mechanical data

- Epoxy:UL94-V0 rated flame retardant.
- Case : Molded plastic, T1006P2 (DFN1006-2) .
- Mounting Position : Any.

Package outline



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

Parameter	Symbol	Value	Units
Peak pulse power (8/20 μs)	P_{PK}	40	W
Peak pulse current (8/20 μs)	I_{PP}	2.5	A
ESD per IEC61000-4-2 (Air)	V_{ESD}	± 25	kV
ESD per IEC61000-4-2 (Contact)		± 20	
Operating temperature	T_J	+125	$^\circ\text{C}$
Storage temperature range	T_{STG}	-55 to +150	$^\circ\text{C}$

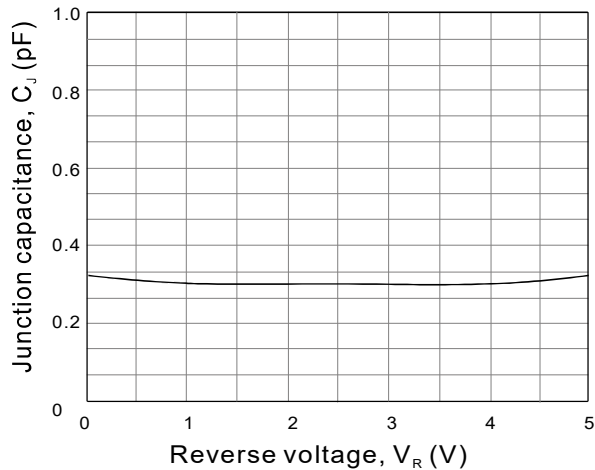
Electrical Characteristics (At $T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Test Condition	Symbol	Min.	Typ.	Max.	Units
Reverse working voltage		V_{RWM}			5	V
Punch- through voltage	$I_T = 1\text{mA}$	V_{BR}	6.5		9.5	V
Reverse leakage current	$V_{RWM}=5\text{V}$	I_R			0.2	μA
Clamping voltage	$I_{PP} = 1\text{A}$ (8/20 μs pulse)	V_C			11	V
	$I_{PP} = 2.5\text{A}$ (8/20 μs pulse)				16	
Junction capacitance	$V_R=0\text{V}$, $f=1.0\text{MHz}$	C_J		0.3	0.5	pF

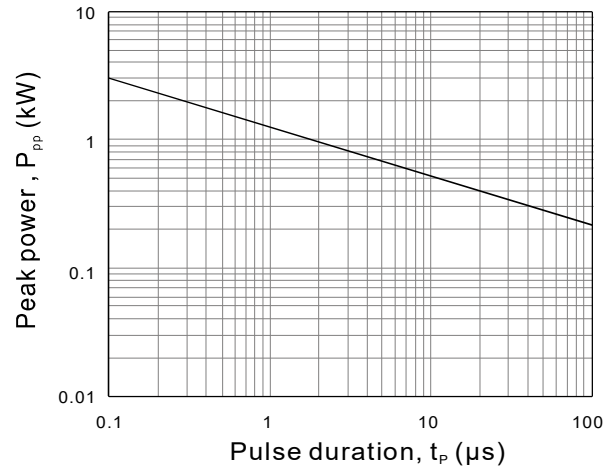
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Rating and characteristic curves

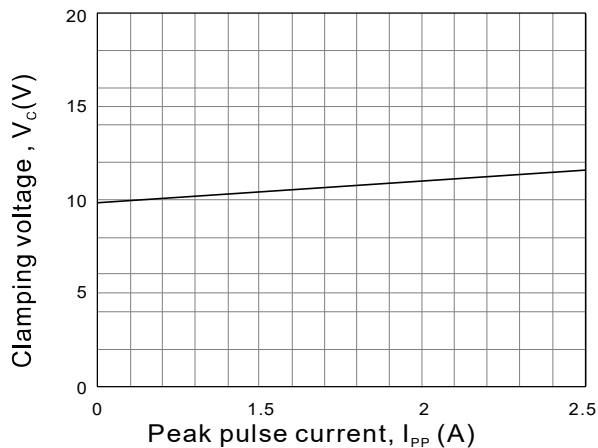
Junction capacitance vs. Reverse voltage



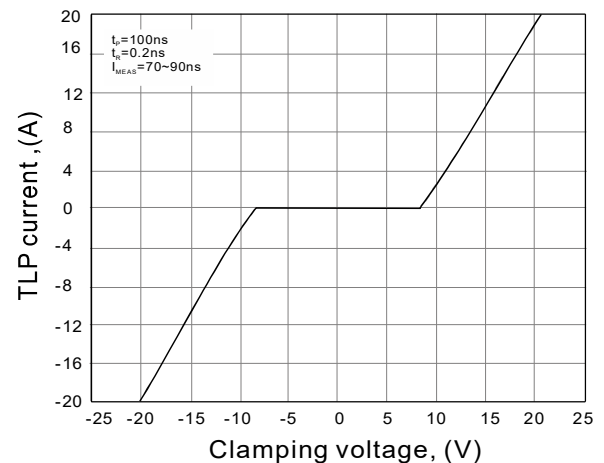
Peak pulse power vs. Pulse time



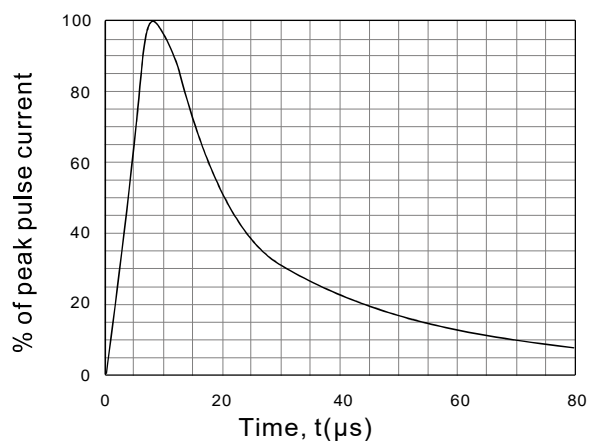
Clamping voltage vs. Peak pulse current



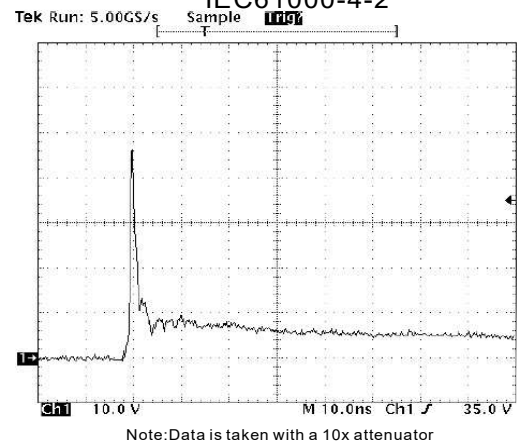
TLP curve



8 x 20 s Pulse waveform

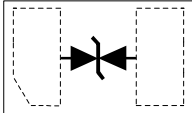


ESD clamping voltage 8kV contact per IEC61000-4-2



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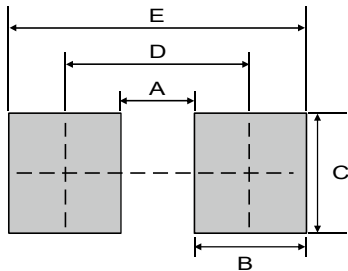
Pinning information

Pin	Simplified outline	Symbol
Bi-Directional		

Marking

Type number	Marking code
LL05BT1006C	6U

Suggested solder pad layout



Size	T1006P2	
	(mm)	(inch)
A	0.30	0.012
B	0.50	0.020
C	0.60	0.024
D	0.80	0.032
E	1.30	0.052

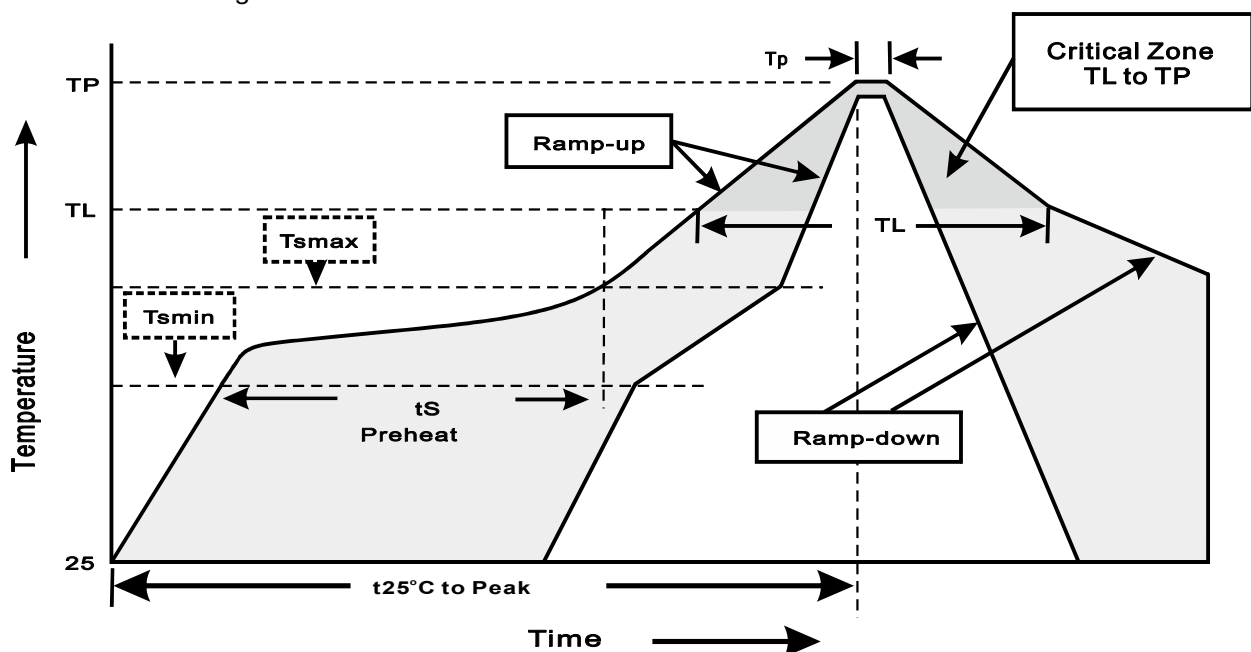
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Reel packing

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 (DFN1006-2)	7"	10,000	2.0	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(TL to TP)	<3°C/sec
Preheat -Temperature Min(Tsmin) -Temperature Max(Tsmax) -Time(min to max)(ts)	150°C 200°C 60~120sec
Tsmax to TL -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(TL) -Time(tL)	217°C 60~260sec
Peak Temperature(TP)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(tp)	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes

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High reliability test capabilities

Item Test	Conditions	Reference
1. Solder Resistance	at $260 \pm 5^{\circ}\text{C}$ for $10 \pm 2\text{sec.}$	MIL-STD-750D METHOD-2031
2. Solderability	at $245 \pm 5^{\circ}\text{C}$ for 5 sec.	MIL-STD-202F METHOD-208
3. High Temperature Reverse Bias	$V_{BR}=V_{BR\text{ MIN}}*80\%$ at $T_J=85^{\circ}\text{C}$ for 168 hrs.	MIL-STD-750D METHOD-1038
4. Pressure Cooker	$15P_{SIG}$ at $T_A=121^{\circ}\text{C}$ for 4 hrs.	JESD22-A102
5. Temperature Cycling	-55°C to $+125^{\circ}\text{C}$ dwelled for 30 min. and transferred for 5min. total 10 cycles.	MIL-STD-750D METHOD-1051
6. Humidity	at $T_A=85^{\circ}\text{C}$, RH=85% for 1000hrs.	MIL-STD-750D METHOD-1021
7. High Temperature Storage Life	at 150°C for 1000 hrs.	MIL-STD-750D METHOD-1031