

LL05UT1006-Q1

List

List.....	1
Package outline.....	2
Features.....	2
Applications.....	2
Mechanical data.....	2
Maximum ratings	2
Electrical characteristics.....	2
Rating and characteristic curves.....	3
Pinning information.....	4
Marking.....	4
Suggested solder pad layout.....	4
Package Information.....	5
Reel packing.....	6
Suggested thermal profiles for soldering processes.....	6

LL05UT1006-Q1

Ultra Low Capacitance Uni-Directional TVS For ESD Protection 5.0V

Features

- Package optimized for high-speed lines.
- Ultra-small package (1.0mm x 0.6mm x 0.55mm).
- Protects one data, control or power line.
- Low capacitance : 0.5pF (Typ.).
- Low leakage current : 0.1 μ A @ V_{RWM} (Typ.).
- Low clamping voltage.
- Each I/O pin can withstand over 1000 ESD strikes for $\pm$ 8kV contact discharge.
- Provide transient protection:
 - IEC 61000-4-2 (ESD) $\pm$ 25kV(Air), $\pm$ 20kV(Contact).
 - IEC 61000-4-4 (EFT) 40A (5/50ns).
 - Cable discharge event (CDE).
- Qualified to AEC-Q101 standards for high reliability.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free parts, ex. LL05UT1006-Q1-H,

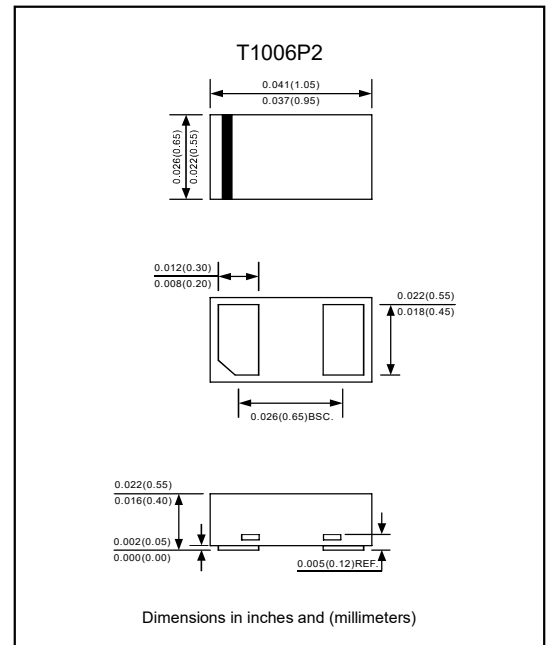
Applications

- Serial ATA.
- PCI Express.
- Desktops, servers, notebooks and cellular phones.
- MDDI ports, display ports, and digital visual interfaces (DVI).
- USB 2.0/3.0 Power and data line protection.
- High definition multi-media interface (HDMI).

Mechanical data

- Epoxy: UL94V-0 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
ESD per IEC 61000-4-2 (Contact)	V_{ESD}	$\pm$ 20	kV
ESD per IEC 61000-4-2 (Air)		$\pm$ 25	
Operating temperature	T_{OPT}	+125	$^\circ\text{C}$
Storage temperature	T_{STG}	-55 to +150	$^\circ\text{C}$

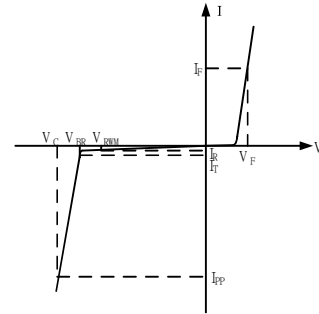
Electrical characteristics (at $T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Reverse stand-off voltage		V_{RWM}			5	V
Reverse leakage current	$V_{RWM}=5.0\text{V}$, Between I/O and GND	I_R		0.1	1	μA
Trigger voltage	$I_T=1\text{mA}$, Between I/O and GND	V_{BR}	6	8	9	V
Clamping voltage	$I_{PP}=1\text{A}$, $t_p=8/20\mu\text{s}$, Between I/O and GND	V_C			10	V
Junction capacitance	$V_R=0\text{V}$, $f=1.0\text{MHz}$, Between I/O and I/O	C_{ESD}		0.5	0.8	pF

LL05UT1006-Q1

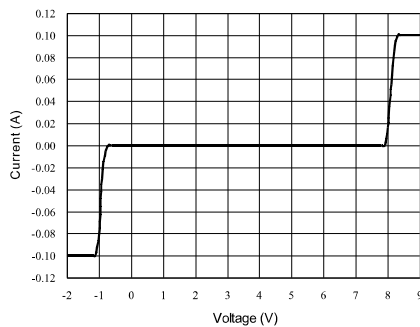
Rating and characteristic curves

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}	Peak pulse current
C_{ESD}	Parasitic capacitance
V_R	Reverse voltage
f	Small signal frequency
I_F	Forward current
V_F	Forward voltage @ I_F

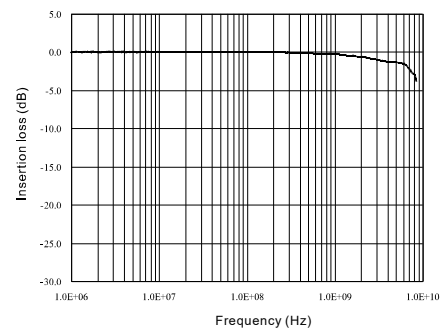


Uni-Directional TVS

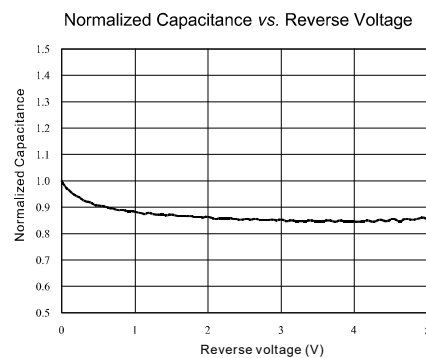
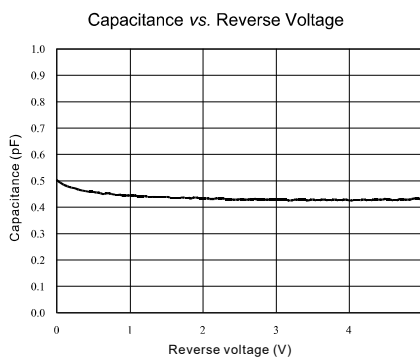
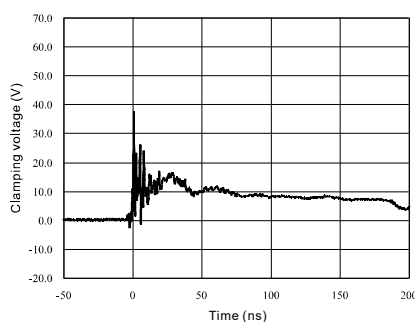
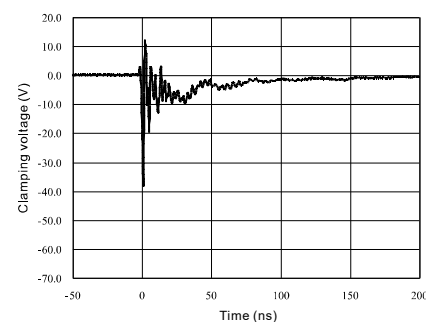
Voltage Sweeping of I/O to GND



Insertion Loss S21 of I/O to GND

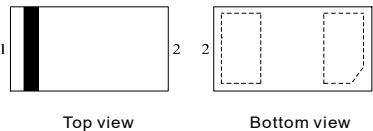
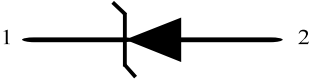


Capacitance vs. Voltage of I/O to GND (f = 1MHz)

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)

LL05UT1006-Q1

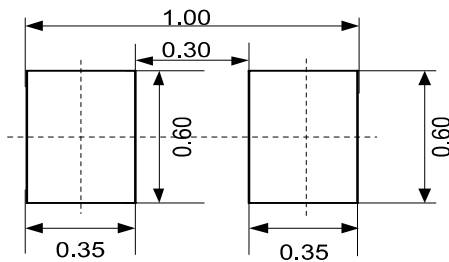
Pinning information

Pin	Simplified outline	Symbol
Pin1 Cathode Pin2 Anode	 Top view Bottom view	

Marking

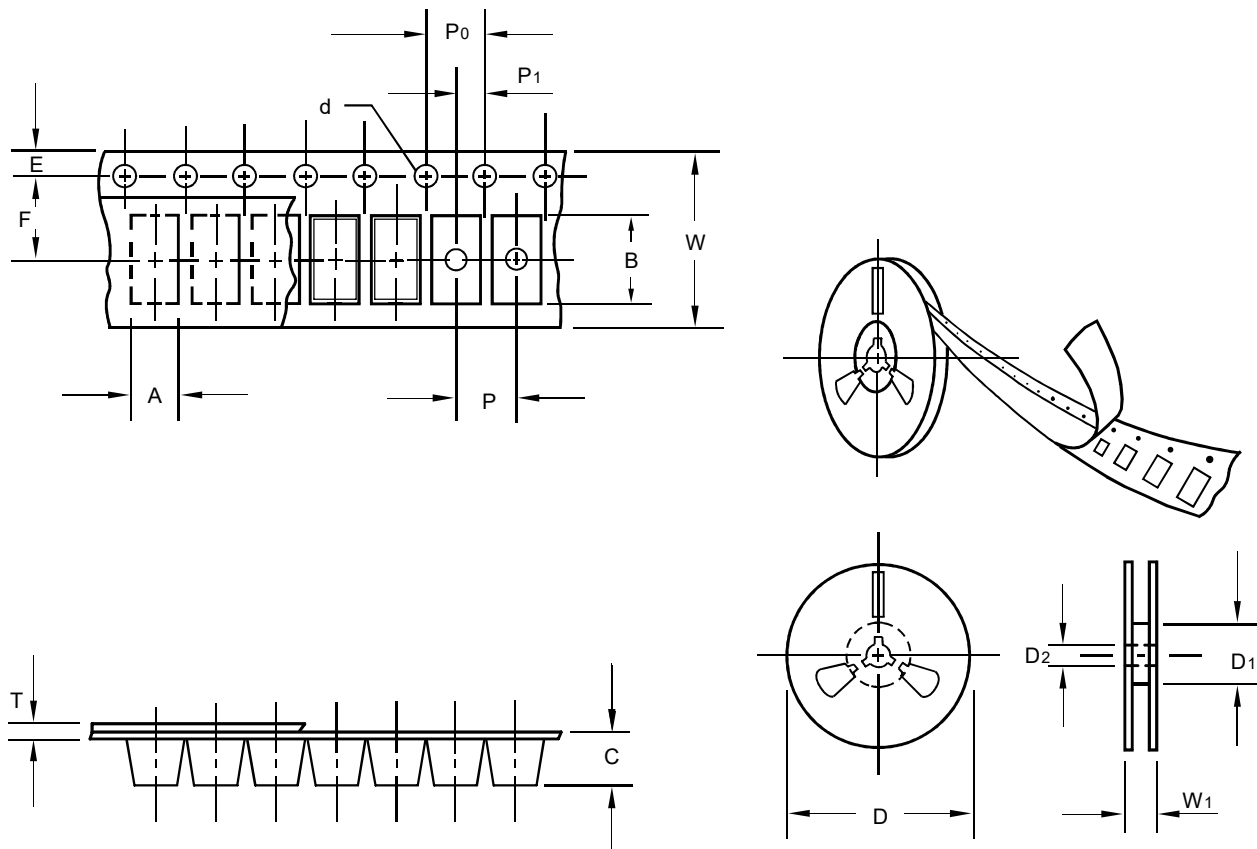
Type number	Marking code
LL05UT1006-Q1	TX

Suggested solder pad layout



LL05UT1006-Q1

Packing information



unit:mm

Item	Symbol	Tolerance	T1006P2
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	D ₁	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D ₁	min	55.00
Feed hole diameter	D ₂	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	P ₀	0.1	4.00
Embossment center	P ₁	0.1	2.00
Overall tape thickness	T	0.1	0.20
Tape width	W	0.3	8.00
Reel width	W ₁	1.0	9.50

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

