

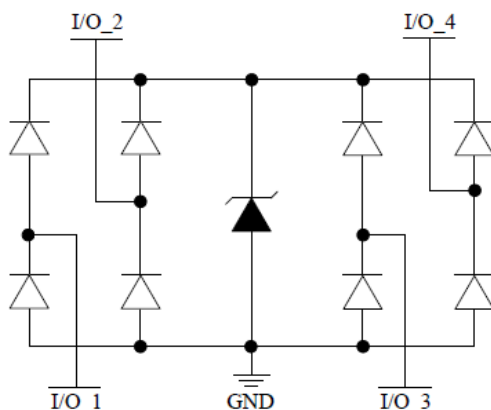
■ Description

HWET03146P is an ultra-low - capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. With Maximum capacitance 0.65 pF only, HWET03146P is designed to protect parasitic – sensitive systems against over-voltage and over-current transient events. It complies with IEC 61000-4-2 (ESD), Level 4 ($\pm 15\text{kV}$ air, $\pm 8\text{kV}$ contact discharge), IEC 61000-4-4 (electrical fast transient - EFT) (40A, 5/50 ns), very fast charged device model (CDM) ESD and cable discharge event (CDE), etc. HWET03146P uses small DFN-10L package. Each HWET03146P device can protect four high-speed data lines. The combined features of ultra- low capacitance, ultra- small size and high ESD robustness make HWET03146P ideal for high-speed data ports and high-frequency lines (e.g., HDMI & DVI) applications. The low clamping voltage of the HWET03146P guarantees a minimum stress on the protected IC.

■ Mechanical Characteristics

- DFN-10L package
- Flammability Rating: UL 94V-0
- Marking: Part number
- Packaging: Tape and Reel

■ Circuit Diagram



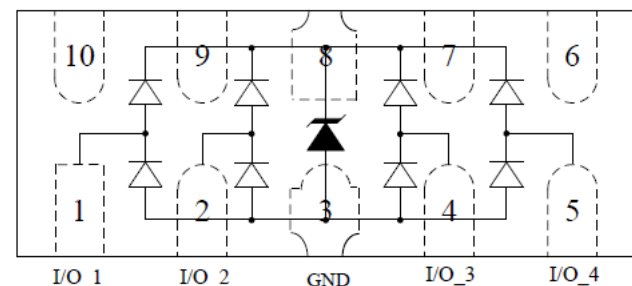
■ Features

- Transient protection for high-speed data lines
IEC 61000-4-2 (ESD) $\pm 17\text{kV}$ (Air)
 $\pm 8\text{kV}$ (Contact)
IEC 61000-4-4 (EFT) 40A (5/50 ns)
- Cable Discharge Event (CDE)
- Package optimized for high-speed lines
- Ultra-small package (2.5mm*1.0mm*0.55mm)
- Protects four data lines
- Low capacitance: 0.65Pf
- Low leakage current: 0.1 μ A @ VRWM (Max.)
- Low clamping voltage
- Each I/O pin can withstand over 1000 ESD strikes for $\pm 8\text{kV}$ contact discharge
- ROHS compliant

■ Applications

- Serial ATA
- PCI Express
- Desktops, Servers and Notebooks
- MDDI Ports
- USB2.0/3.0 Power and Data Line Protection
- Display Ports
- High Definition Multi-Media Interface (HDMI)
- Digital Visual Interfaces (DVI)

■ Pin Configuration



DFN-10L
(Top View)

■ Electrical characteristics (Ta = 25 °C)

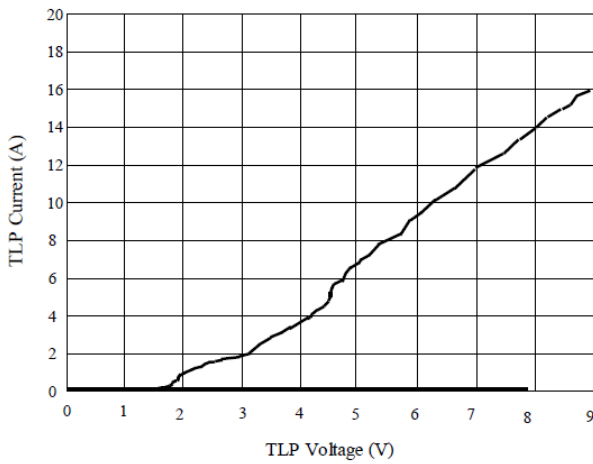
Symbol	Test Condition	Minimum	Typical	Maximum	Units
V _{RWM}				3.3	V
I _R	V _{RWM} = 3.3V, T = 25°C		0.01	0.1	μA
V _{t1}	I _{t1} = 1mA		6.5		V
V _h	I _h = 50mA	1.7			V
V _C	I _{PP} = 6.0A, t _p = 8/20μs		4		V
	I _{PP} = 8.0A, t _p = 100ns ⁽¹⁾		5.5		V
V _C	I _{PP} = 16.0A, t _p = 100ns ⁽¹⁾		9		V
R _{dyn}	IEC61000-4-2 0-6KV, T=25°C		0.3		Ω
	Contact, I/O to GND				
C _{ESD}	V _R = 0V, f = 1MHz Between I/O and GND		0.55	0.65	pF
C _{ESD}	V _R = 0V, f = 1MHz Between I/O and I/O		0.2	0.3	pF

Notes:(1)Measurements performed using a 100ns Transmission Line Pulse(TLP) system.

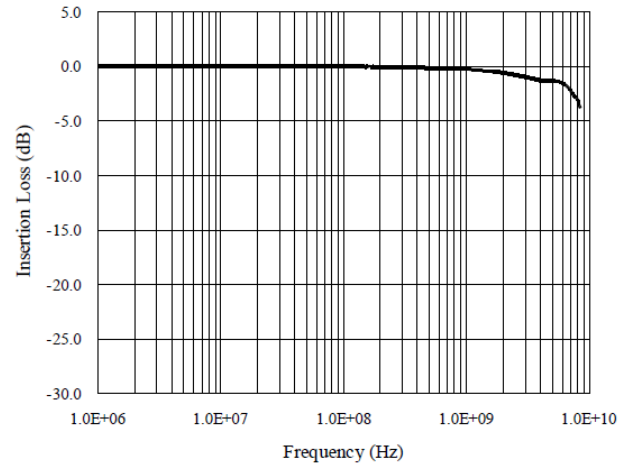
■ Absolute Maximum Rating

Symbol	Parameter	Value	Units
I _{PP}	Peak Pulse Current(tp=8/20us)	6	A
V _{ESD}	ESD per IEC 61000-4-2(Air)	±17	kV
	ESD per IEC 61000-4-2 (Contact)	±8	
T _{OPT}	Operating Temperature	-55/+125	°C
T _{STG}	Storage Temperature	-55/+150	°C

TLP Measurement of I/O to GND

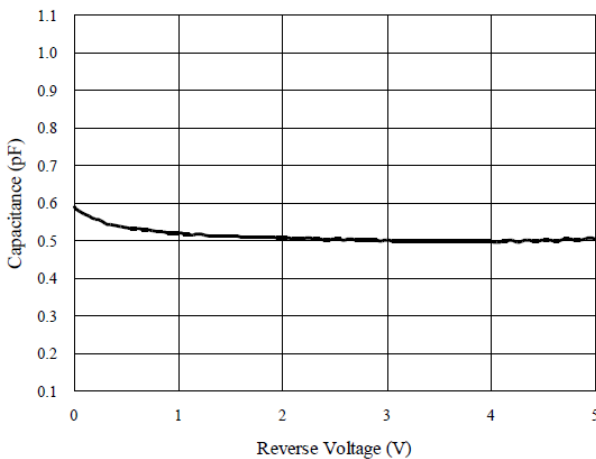


Insertion Loss S21 of I/O to GND

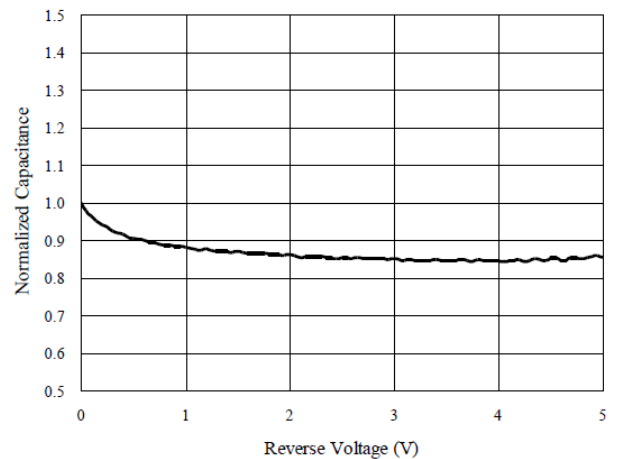


Capacitance vs. Voltage of I/O to GND (f = 1MHz)

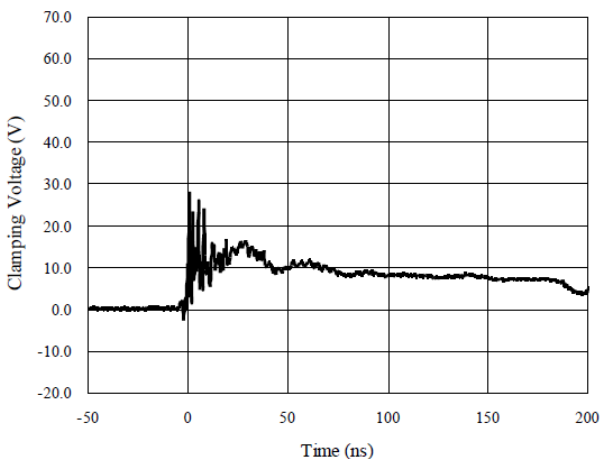
Capacitance vs. Reverse Voltage



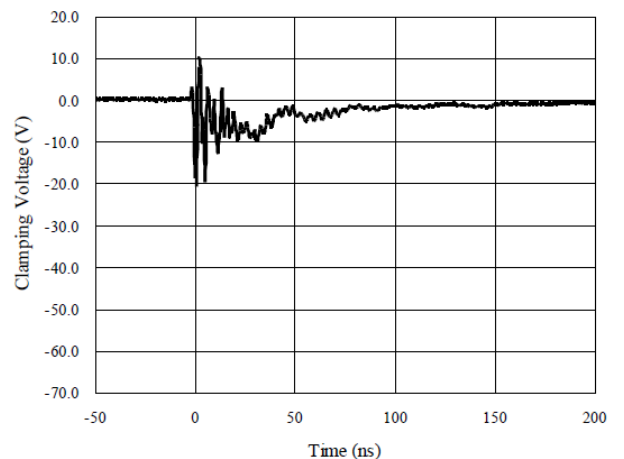
Normalized Capacitance vs. Reverse Voltage



ESD Clamping of I/O to GND (+8kV Contact per IEC 61000-4-2)

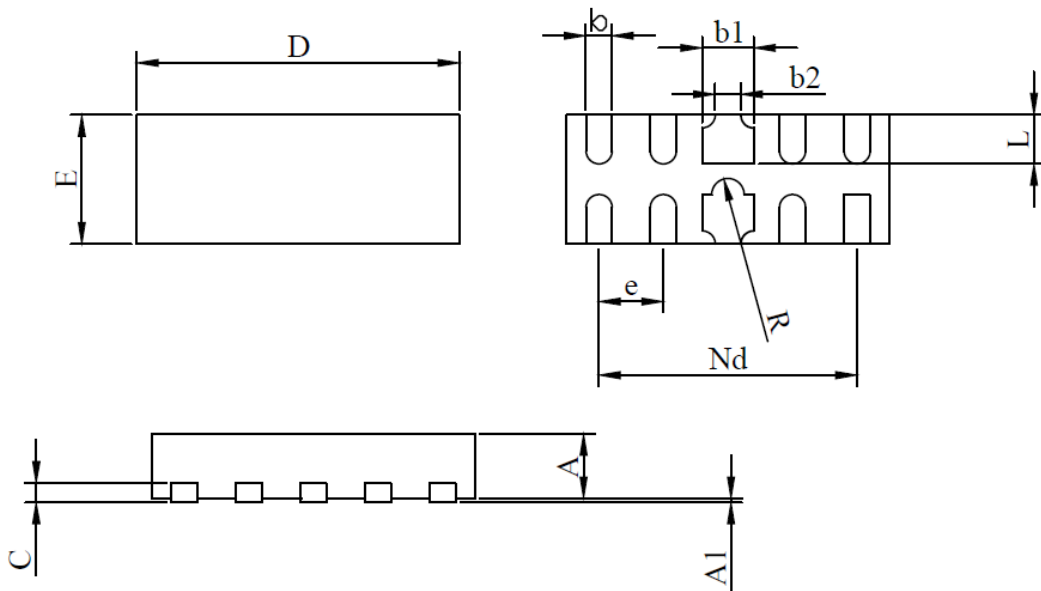


ESD Clamping of I/O to GND (-8kV Contact per IEC 61000-4-2)



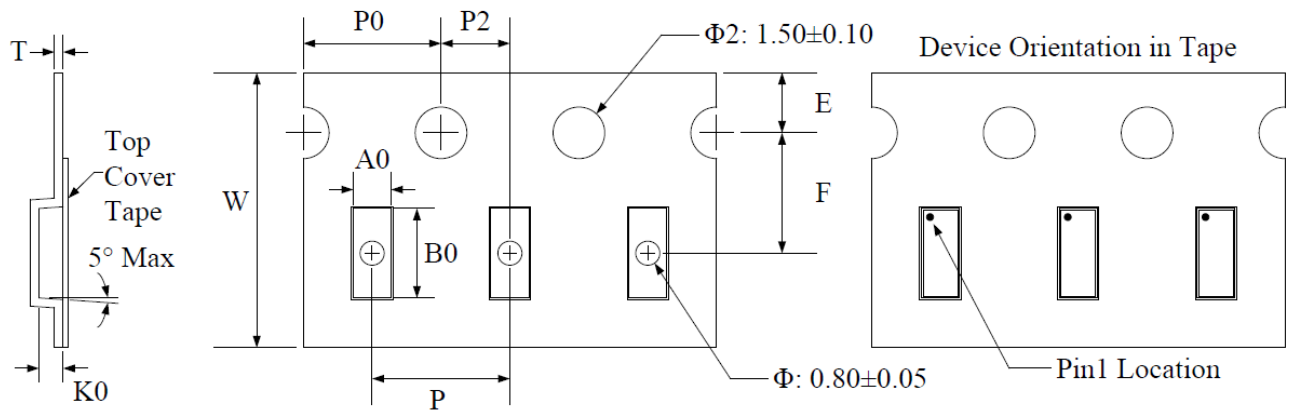
Package Outline

- DFN-10L package
- Thermally-Enhanced
- MSL-1 Level



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
L			
D	2.45	2.50	2.55
E	0.95	1.00	1.05
b1	0.35	0.40	0.45
b2	0.20REF		
b	0.15	0.20	0.25
L	0.33	0.38	0.43
Nd	2.00REF		
e	0.50REF		
R	0.10	0.125	0.15
A	0.45	0.50	0.55
c	0.15REF		
A1	0.00	-	0.05

Tape and Reel Specification



Symbol	W	A0	B0	K0	E	F	P	P0	P2	T
Dimensions (mm)	8.00+0.3 -0.1	1.23±0.05	2.7±0.05	0.7±0.05	1.75±0.1	3.5±0.05	4.0±0.1	4.0±0.1	2.0±0.05	0.25±0.02