

## Ultra Low Capacitance ESD Protection Array

### DESCRIPTION

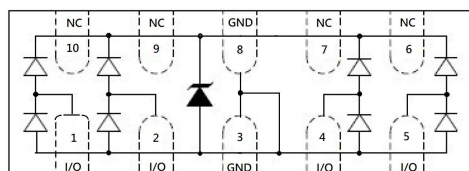
SL4E05U is an ultra-low capacitance Transient Voltage Suppressor (TVS) designed to protection for high-speed data interfaces. With typical capacitance of 0.2pF (I/O to I/O) only, SL4E05U is designed to protect parasitic-sensitive systems against over-voltage and over-current transient events. It complies with IEC 61000-4-2 (ESD), Level 4(±15KV air, ±8KV contact discharge), IEC61000-4-4 (electrical fast transient-EFT) (40A, 5/50ns),very fast charged device model (CDM) ESD and cable discharge event(CDE), etc.

SL4E05U uses ultra-small DFN2510 package. Each SL4E05U device can protect four high-speed data lines. The combined features of ultra-low capacitance, ultra-small size and high ESD robustness make SL4E05U ideal for high-speed data ports and high-frequency lines (e.g., HDMI & DVI) applications. The low clamping voltage of the SL4E05U guarantees a minimum stress on the protected IC.

### ORDERING INFORMATION

- ✧ Device: SL4E05U
- ✧ Package: DFN2510
- ✧ Marking:05U
- ✧ Material: Halogen free
- ✧ Packing: Tape & Reel
- ✧ Quantity per reel: 3,000pcs

### PIN CONFIGURATION



### FEATURES

- ✧ Transient protection for high-speed data lines  
IEC 61000-4-2(ESD) ±25KV(Air)  
±20KV(Contact)
- IEC 61000-4-4(EFT)40A(5/50ns)  
Cable Discharge Event(CDE)
- ✧ Package optimized for high-speed lines
- ✧ Ultra-small package(2.5mm\*1.0mm\*0.5mm)
- ✧ Protects four data lines
- ✧ Low capacitance: 0.2pF (I/O to I/O)
- ✧ Low leakage current
- ✧ Low clamping voltage
- ✧ Each I/O pin can withstand over 1000 ESD strikes for ±8KV contact discharge

### MACHANICAL DATA

- ✧ DFN2510 package
- ✧ Flammability Rating: UL 94V-0
- ✧ Terminal: Matte tin plated.
- ✧ Packaging: Tape and Reel
- ✧ High temperature soldering guaranteed:260°C/10s
- ✧ Reel size: 7 inch

### APPLICATIONS

- ✧ Serial ATA
- ✧ PCI Express
- ✧ Desktops, Servers and Notebooks
- ✧ MDDI Ports
- ✧ USB 2.0/3.0 Power and Data Line Protection
- ✧ Display Ports
- ✧ High Definition Multi-Media Interface (HDMI)
- ✧ Digital Visual Interface (DVI)

### PACKAGE OUTLINE



**ABSOLUTE MAXIMUM RATING**

Symbol	Parameter	Value	Units
P <sub>PP</sub>	Peak Pulse Power (8/20μs)	60	W
V <sub>ESD</sub>	ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	±25 ±20	kV
T <sub>OPT</sub>	Operating Temperature	-55/+125	°C
T <sub>STG</sub>	Storage Temperature	-55/+150	°C

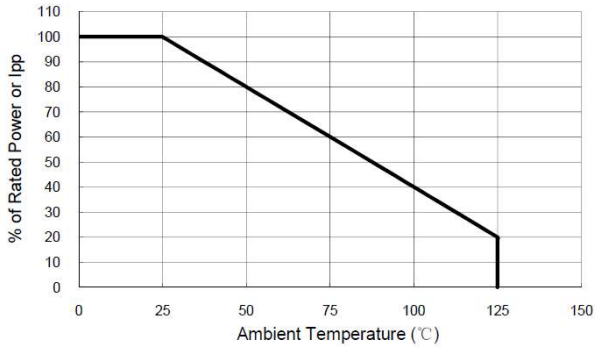
**ELECTRICAL CHARACTERISTICS (T<sub>amb</sub>=25°C)**

Symbol	Parameter	Test Condition	Min	Typ	Max	Units
V <sub>RWM</sub>	Reverse Working Voltage	Any I/O pin to GND			5.0	V
V <sub>BR</sub>	Reverse Breakdown Voltage	I <sub>T</sub> = 1mA Any I/O pin to GND	6.0		9.0	V
I <sub>R</sub>	Reverse Leakage Current	V <sub>RWM</sub> = 5V Any I/O pin to GND			1.0	μA
V <sub>C</sub>	Clamping Voltage	I <sub>PP</sub> = 1A, t <sub>p</sub> = 8/20μs Any I/O pin to GND			10	V
V <sub>C</sub>	Clamping Voltage	I <sub>PP</sub> = 4A, t <sub>p</sub> = 8/20μs Any I/O pin to GND			15	V
C <sub>ESD</sub>	Parasitic Capacitance	V <sub>R</sub> = 0V, f = 1MHz Between I/O and GND		0.4	0.5	pF
C <sub>ESD</sub>	Parasitic Capacitance	V <sub>R</sub> = 0V, f = 1MHz Between I/O and I/O		0.2	0.3	pF

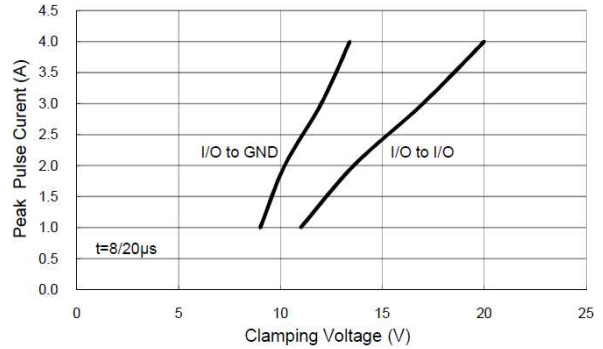
Note: I/O pins are pin 1,2,4,5, GND pins are pin 3,8.

## ELECTRICAL CHARACTERISTICS CURVE

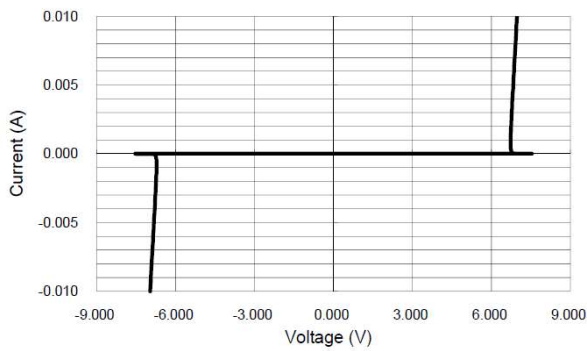
**Fig 1 Power Derating Curve**



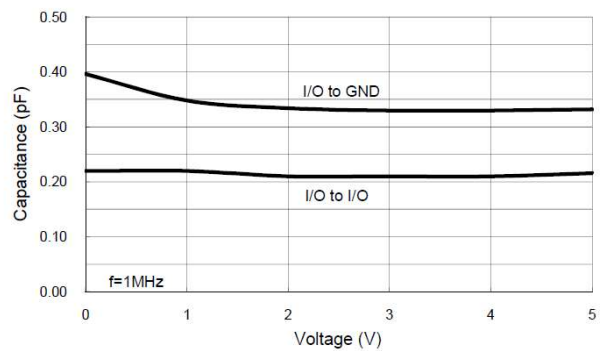
**Fig 2 Clamping Voltage vs Peak Pulse Current**



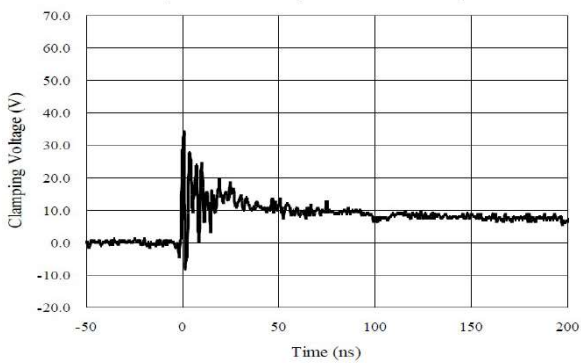
**Fig 3 Voltage Sweeping of I/O to I/O**



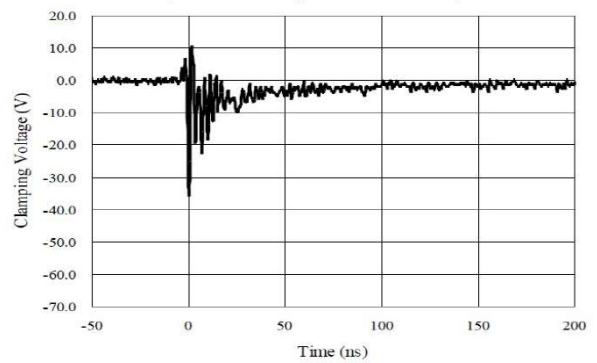
**Fig 4 Voltage vs Capacitance**

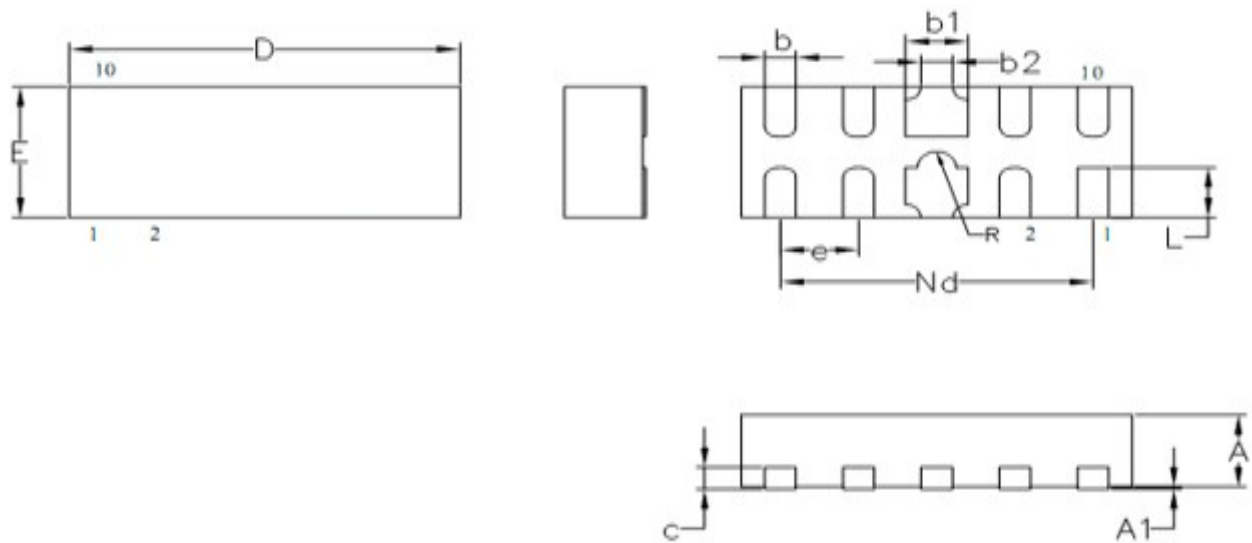


**Fig 5 ESD Clamping of I/O to GND (+8kV Contact per IEC 61000-4-2)**



**Fig 6 ESD Clamping of I/O to GND (-8kV Contact per IEC 61000-4-2)**



**DFN2510 PACKAGE OUTLINE DIMENSIONS**


Symbol	Dimensions (mm)		
	Min.	Nom.	Max.
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	2.00BSC		
e	0.50BSC		
R	0.10	0.125	0.15
A	0.45	0.50	0.55
c	0.15REF		
A1	0.00	-	0.05