

Ultra-Low Capacitance TVS Protection

SE03NRC14HA

Feature

- ◆ 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 x 1.0mm x 0.55mm)
- ◆ Protects four data lines
- ◆ Low capacitance: 0.65pF (Maximum)
- ◆ Low leakage current: $0.1\mu\text{A}$ @ V_{RWM} (Maximum)
- ◆ Low clamping voltage
- ◆ Each I/O pin can withstand over 1000 ESD strikes for $\pm 8\text{kV}$ contact discharge

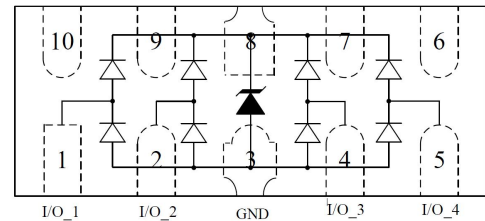
Applications

- ◆ Serial ATA
- ◆ PCI Express
- ◆ Desktops, Servers and Notebooks
- ◆ MDDI Ports
- ◆ USB 2.0/3.0/3.1 Power and Data Line Protection
- ◆ Display Ports
- ◆ High Definition Multi-Media Interface (HDMI)
- ◆ Digital Visual Interfaces (DVI)

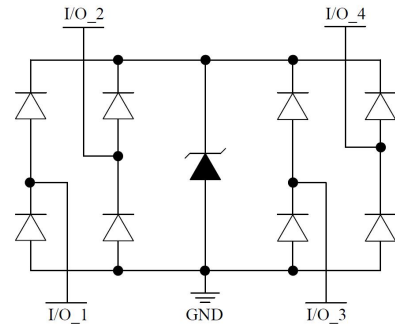
Mechanical Characteristics

- ◆ DFN2510-10L package
- ◆ Quantity Per Reel :3,000pcs
- ◆ Flammability Rating: UL 94V-0
- ◆ Packaging: Tape and Reel

DFN2510-10L



Pin Configuration



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Absolute Maximum Rating

Symbol	Parameter	Value	Units
I_{PP}	Peak Pulse Current($t_p=8/20\mu s$)	5.0	A
V_{ESD}	ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	± 17 ± 8	KV
T_{OPT}	Operating Temperature	-55/+125	°C
T_{STG}	Storage Temperature	-55/+150	°C

Electrical Characteristics (T=25°C)

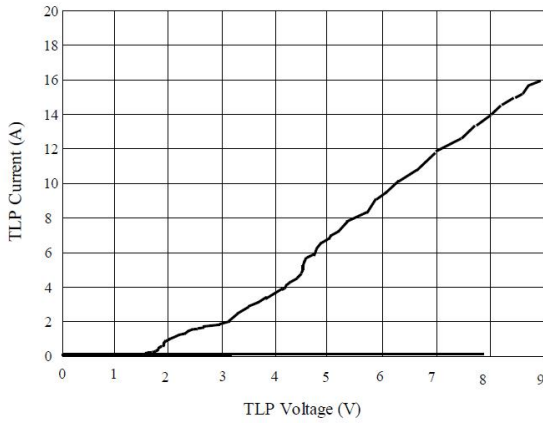
Symbol	Test Condition	Minimum	Typical	Maximum	Units
V_{RWM}	---	---	---	3.3	V
I_R	$V_{RWM} = 3.3V, T = 25^\circ C$	---	0.01	0.1	μA
V_{t1}	$I_{t1} = 1mA$	---	6.5	---	V
V_h	$I_h = 50mA$	1.7	---	---	V
V_C	$I_{PP} = 5.0A, t_p = 8/20\mu s$	---	4.0	---	V
V_C	$I_{PP} = 8.0A, t_p = 100ns^{(1)}$	---	5.5	---	V
	$I_{PP} = 16.0A, t_p = 100ns^{(1)}$	---	9.0	---	
R_{dyn}	IEC61000-4-2 0-6KV, T=25°C Contact, I/O to GND	---	0.3	---	Ω
C_{ESD}	$V_R = 0V, f = 1MHz$ Between I/O and GND	---	0.55	0.65	pF
	$V_R = 0V, f = 1MHz$ Between I/O and I/O	---	0.2	0.3	pF

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

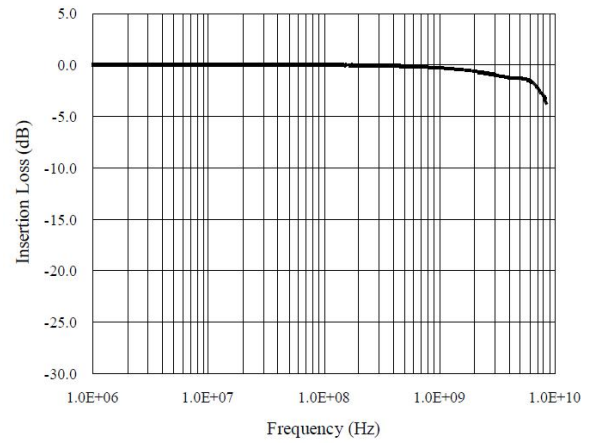
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TLP Measurement of I/O to GND

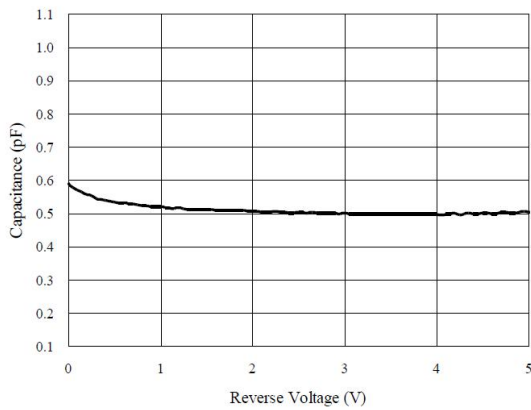


Insertion Loss S21 of I/O to GND

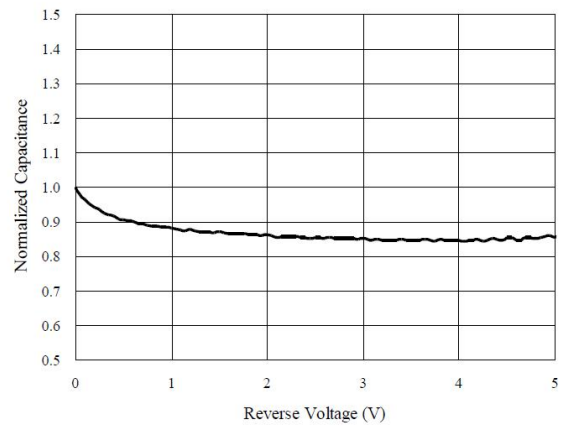


Capacitance vs. Voltage of I/O to GND (f = 1MHz)

Capacitance vs. Reverse Voltage



Normalized Capacitance vs. Reverse Voltage

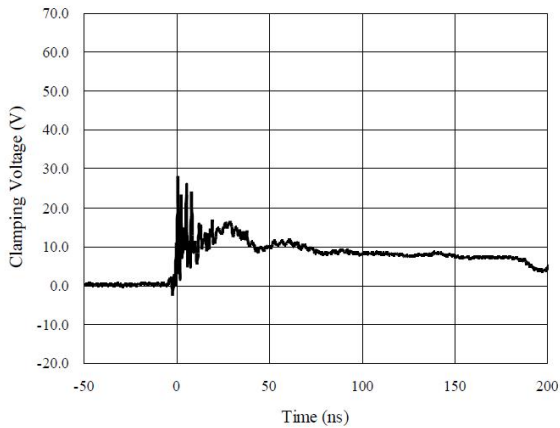


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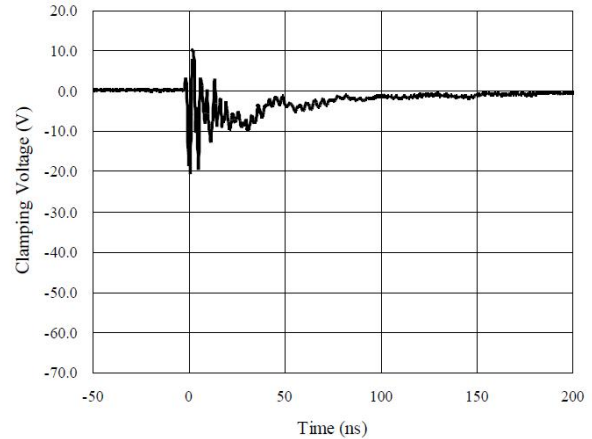
ESD Clamping of I/O to GND

(+8KV Contact per IEC 61000- 4-2)



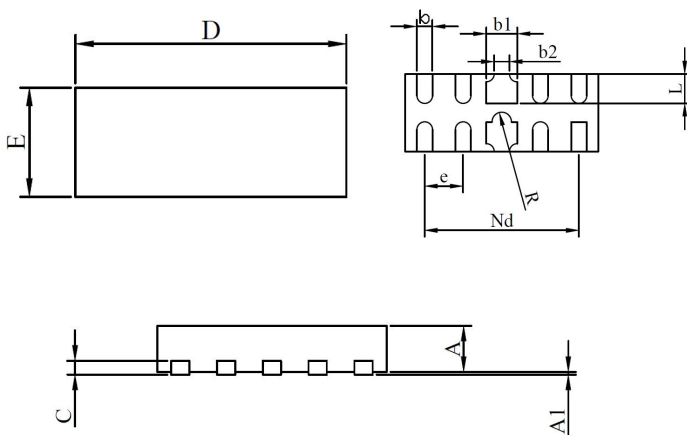
ESD Clamping of I/O to GND

(- 8KV Contact per IEC 61000- 4-2)



Package Outline

- ◆ DFN2510-10Lpackage
- ◆ Thermally-Enhanced
- ◆ MSL-1 Level



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	2.00REF		
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