GESD0506PHL

Ultra Low Capacitance ESD Protection Array

DESCRIPTION

GESD0506PHL is an ultra-low capacitance ESD Protection Array designed to protection for high-speed data interfaces. With typical capacitance of 0.2pF (I/O to I/O) only, GESD0506PHL 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 (±8KV contact, ±15KV air discharge), IEC61000-4-4 (electrical fast transient-EFT) (40A, 5/50ns), very fast charged device model (CDM) ESD and cable discharge event (CDE) etc.

GESD0506PHL uses small DFN4120-10L package. Each GESD0506PHL device can protect six high-speed data lines and one Vcc line. The combined features of ultra-low capacitance, small size and high ESD robustness make GESD0506PHL ideal for high-speed data ports and high-frequency lines (e.g., USB & HDMI) applications. The low clamping voltage of the GESD0506PHL guarantees a minimum stress on the protected IC.

FEATURES

✧Transient protection for high-speed data lines
IEC 61000-4-2(ESD) ±20KV(Contact)
±25KV(Air)
IEC 61000-4-4(EFT) 40A(5/50ns)
Cable Discharge Event (CDE)
✧Package optimized for high-speed lines
✧Small package (4.1mm*2.0mm*0.5mm)
✧Protects six data lines and one Vcc line
✧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

✧DFN4120-10L package
✧Flammability Rating: UL 94V-0
✧Packaging: Tape and Reel
✧High temperature soldering guaranteed: 260℃/10s
✧Reel size: 7 inch

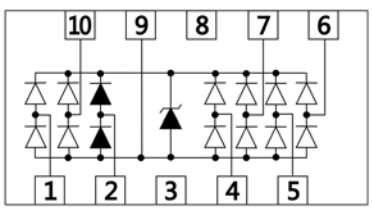
ORDERING INFORMATION

✧Device: GESD0506PHL
✧Package: DFN4120-10L
✧Marking: 56L
✧Material: Halogen free and RoHS compliant
✧Packing: Tape & Reel
✧Quantity per reel: 3,000pcs

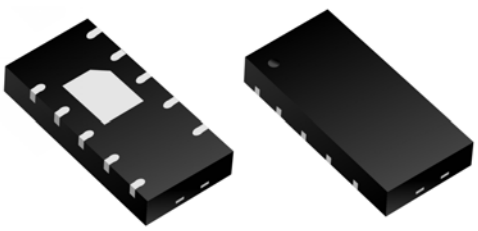
APPLICATIONS

✧USB3.0
✧HDMI1.4
✧High Speed I/O Ports in any electronic product

CIRCUIT DIAGRAM



PACKAGE OUTLINE



ABSOLUTE MAXIMUM RATING

Symbol	Parameter	Value	Units
P_{PP}	Peak Pulse Power (8/20μs)	60	W
V_{ESD}	ESD per IEC 61000-4-2 (Contact) ESD per IEC 61000-4-2 (Air)	±20 ±25	kV
T_{OPT}	Operating Temperature	-55/+125	°C
T_{STG}	Storage Temperature	-55/+150	°C

ELECTRICAL CHARACTERISTICS (Tamb=25°C)

Symbol	Parameter	Test Condition	Min	Typ	Max	Units
V_{RWM}	Reverse Working Voltage	Any I/O or Vcc pin to GND			5.0	V
V_{BR}	Reverse Breakdown Voltage	I_T = 1mA Any I/O or Vcc pin to GND	6.0		9.0	V
I_R	Reverse Leakage Current	V_{RWM} = 5V Any I/O or Vcc pin to GND			1.0	μA
V_C	Clamping Voltage	I_{PP} = 1A, t_p = 8/20μs Any I/O pin to GND			10	V
		I_{PP} = 4A, t_p = 8/20μs Any I/O pin to GND			15	V
		I_{PP} = 8A, t_p = 8/20μs Vcc pin to GND			15	V
V_{CTLP}	TLP Clamping Voltage	I_{PP} = 8A IEC61000-4-2 Level 2 equivalent (±4kV Contact, ±8kV Air) Between I/O and GND		16		V
		I_{PP} = 16A IEC61000-4-2 Level 4 equivalent (±8kV Contact, ±16kV Air) Between I/O and GND		23		V
C_{ESD}	Parasitic Capacitance	V_R = 0V, f = 1MHz Between I/O and I/O		0.2	0.3	pF
		V_R = 0V, f = 1MHz Between I/O and GND		0.4	0.5	pF
		V_R = 0V, f = 1MHz Between Vcc and GND		0.80		pF

Note: I/O are pin 1,4,5,6,7,10; Vcc is pin 2; GND are pin9 and heatsink.

ELECTRICAL CHARACTERISTICS CURVE

Fig 1 Power Derating Curve

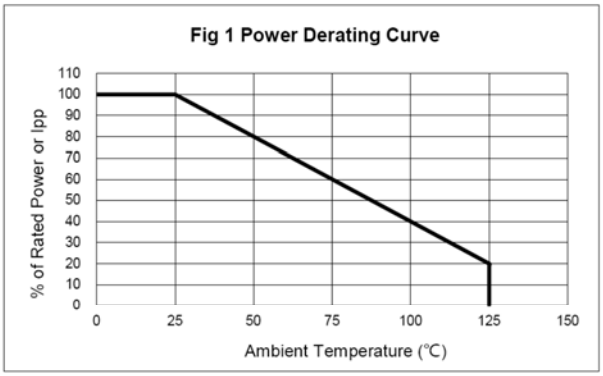


Fig 2 Clamping Voltage vs Peak Pulse Current

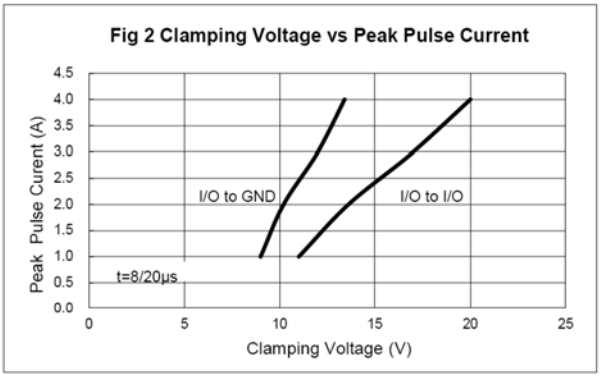


Fig 3 Voltage Sweeping of I/O to I/O

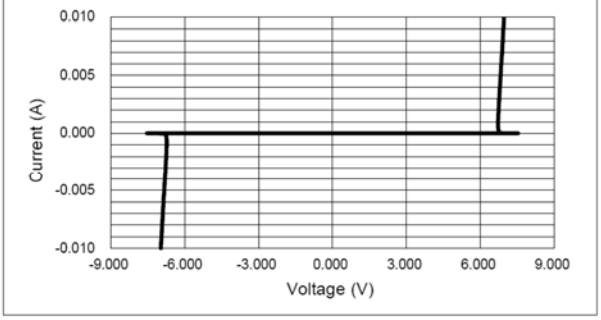


Fig 4 Voltage vs Capacitance

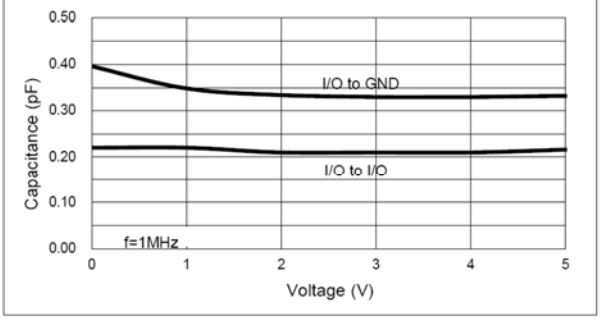


Fig 5 ESD Clamping of I/O to GND
(+8kV Contact per IEC 61000-4-2)

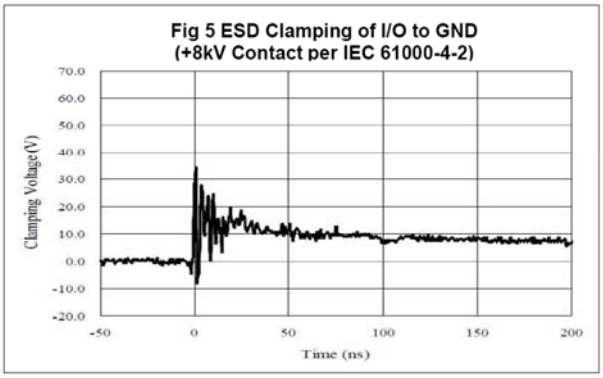


Fig 6 ESD Clamping of I/O to GND
(-8kV Contact per IEC 61000-4-2)

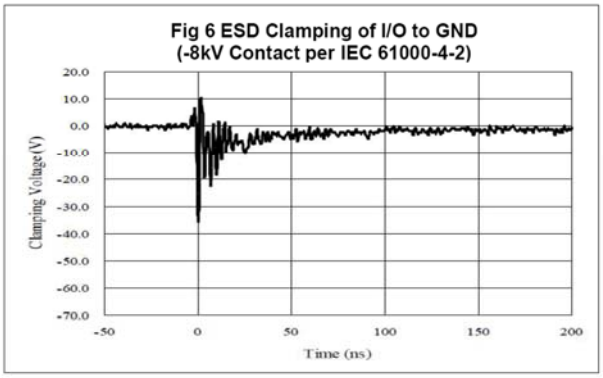
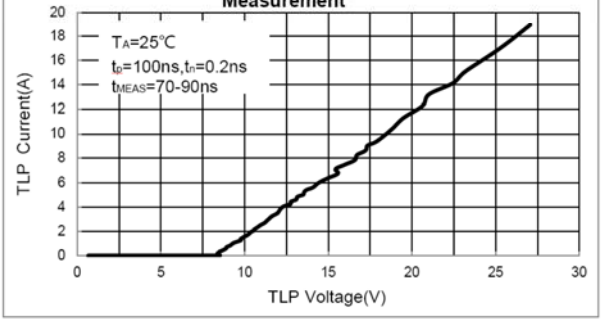
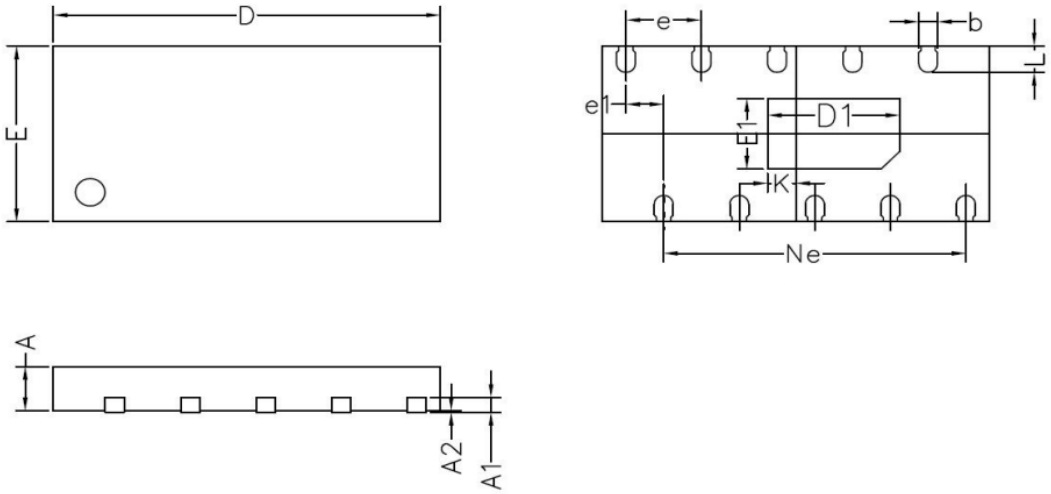


Fig7 Transmission Line Pulsing (TLP)
Measurement



DFN4120-10L PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions (mm)		
	Min.	Nom.	Max.
A	0.45	0.50	0.55
A1	0.15 REF		
A2	0.00	0.02	0.05
D	4.05	4.10	4.15
E	1.95	2.00	2.05
D1	1.35	1.40	1.45
E1	0.75	0.80	0.85
L	0.25	0.30	0.35
b	0.15	0.20	0.25
e	0.80 BSC		
Ne	3.20 BSC		
e1	0.40 BSC		
K	0.25	0.30	0.35