2-Line ESD Protection Diode Array

General description

The ESD0502L-SL is an uni-directional TVS diode, utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive high-speed data lines. The ESD0502L has an ultra-low capacitance with a typical value at 0.5pF, and complies with the IEC 61000- 4-2 (ESD) standard with ±15kV air and ±8kV contact discharge. It is assembled into an ultra-small 1.0x0.6x0.5mm lead-free DFN package. The small size, ultra-low capacitance and high ESD surge protection make ESD0502L an ideal choice to protect cell phone, digital video interfaces and other high speed ports.

Features and benefits

- 2 Unidirectional transil functions
- Ultra small package: 1.0x0.6x0.5mm
- Ultra Low Capacitance 0.5pF (I/O--GND)
- Reverse stand-off voltage: 5V Max
- Low leakage current: nA Level
- Low clamping voltage
- 3-pin leadless package
- Complies with following standards:
  - IEC 61000-4-2 (ESD) immunity test
    Air discharge: ±15kV
    Contact discharge: ±8kV
  - IEC61000-4-4 (EFT) 40A (5/50ns)
  - IEC61000-4-5 (Lightning) 4A (8/20μs)
- RoHS Compliant
- Lead Finish: NiPdAu

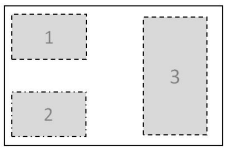
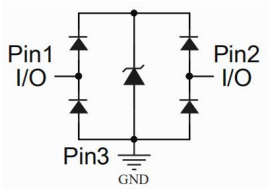
Application information

- Cellular Handsets and Accessories
- Display Ports
- MDDI Ports
- USB 2.0 and 3.0 Ports
- HDMI 1.3 and 1.4
- Digital Video Interface (DVI)
- PCI Express and Serial SATA Ports
- Notebook Computer
- IEEE 1394

Ordering information

Device	Package	Marking	Packaging
ESD0502L-SL	DFN1006-3L	L3	10000/Tape & Reel

Schematic & Pin configuration

Simplified outline	Graphic symbol
top view 	

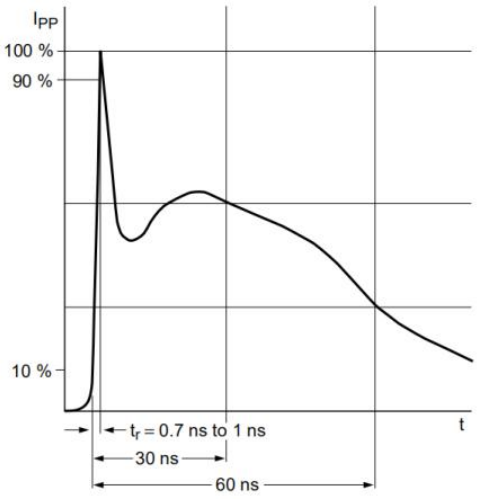
Maximum Ratings (T_{OP} = 25 °C, unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak Pulse Power (Tp = 8/20 μ s)	P_{PPM}	48	W
Rated Peak Pulse Current (Tp = 8/20 μ s)	I_{PPM}	4	A
ESD voltage IEC 61000-4-2 (air discharge)	V_{ESD}	15	kV
ESD voltage IEC 61000-4-2 (contact discharge)	V_{ESD}	8	kV
Maximum lead temperature for soldering during 10s	T_L	260	°C
Storage Temperature Range	T_{stg}	-55 to +150	°C
Operating Temperature Range	T_{OP}	-55 to +125	°C

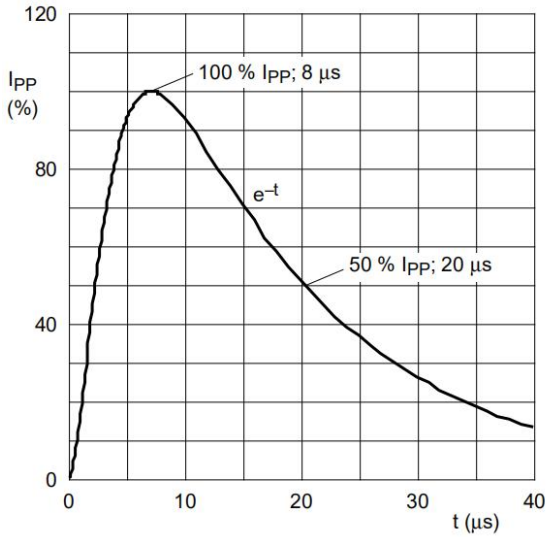
Electrical Characteristics (T_{OP} = 25 °C, unless otherwise specified)

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Reverse Working Voltage	V_{RWM}	--	--	5.0	V	
Breakdown Voltage	V_{BR}	6.5	--	9.0	V	I_T=1mA
Leakage Current ILeak	I_R	--	--	100	nA	V_{RWM}=5V
Clamping Voltage	V_C	--	10.0	12.0	V	I_{PP}=4A,Tp=8/20μs
Junction Capacitance	C_j	--	0.50	0.70	pF	V_R=0V, f=1MHz, I/O to GND
Junction Capacitance	C_j	--	0.25	0.35	pF	V_R=0V, f=1MHz, I/O to I/O

Typical Characteristics

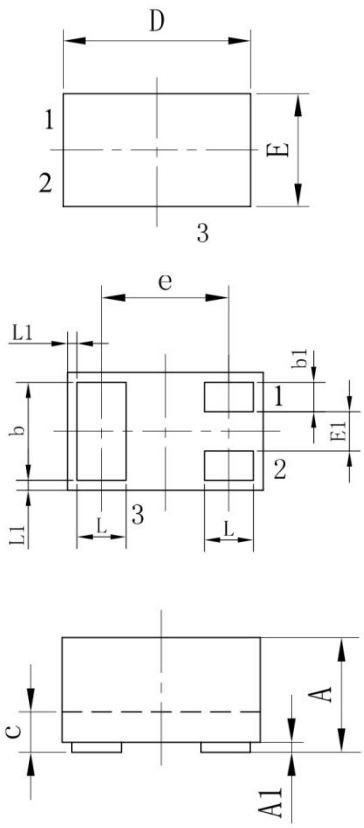


IEC61000−4−2 Waveform



IEC 61000-4-5 Waveform(8/20µs pulse)

Package Outline Dimensions (DFN1006-3L)



Symbol	Dimensions In Millimet	
	Min	Max
A	0.44	0.50
A1	0.00	0.05
b	0.45	0.55
b1	0.10	0.20
c	0.12	0.18
D	0.95	1.05
e	0.65BSC	
E	0.55	0.65
E1	0.15	0.25
L	0.20	0.30
L1	0.05REF	