

Features

- Low capacitance: 1.7pF typical (I/O to I/O)
- Ultra low leakage: nA level
- Ultra low operating voltage: 2.5V
- Low clamping voltage
- Protects two line pairs
- Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test
Air discharge: ±30kV
Contact discharge: ±30kV
 - IEC61000-4-4 (EFT) 40A (5/50ns)
 - IEC61000-4-5 (Lightning) 40A (8/20µs)
- RoHS Compliant

Mechanical Characteristics

- Package: DFN3020-10
- Lead Finish: NiPdAu
- Case Material: “Green” Molding Compound
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 3 per J-STD-020
- Terminal Connections: See Diagram

Applications

- LVDS Interfaces
- 10/100/1000 Ethernet
- Notebooks, Desktops, Servers
- Networking Equipment
- Switching Systems
- Audio/Video Inputs

Part Number Code

E	S	D	0	5	1	1	L	1
1	2	3	4	5	6	7	8	9

Product Type	
ESD	TSK Electrostatic suppressor ESD Type

Reverse Working Voltage (V)	
3V3	3.3V
05	5V
16	16V

Line	
1	1-Line
2	2-Line
3	3-Line

Capacitance Type	
L	Low
X	Normal

directional	
0	Bi
1	Uni

Size	
1	0201
2	0402
3	DFN0603
4	DFN1006

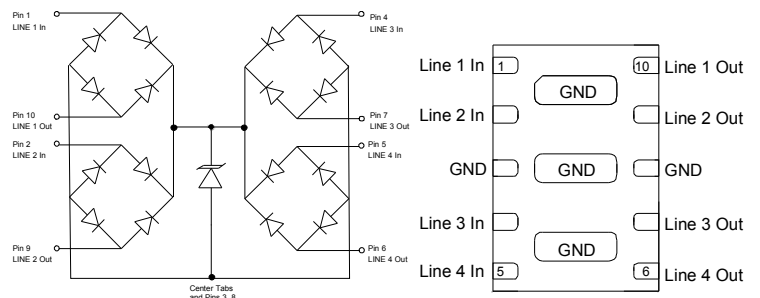
★ Code 4 to 9 is optional

Description

The ESD2V541LC is a low capacitance high power TVS, 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 ESD2V541LC complies with the IEC 61000-4-2 (ESD) standard with ±15kV air and ±8kV contact discharge. It is assembled into a 10-pin DFN3020-10 lead-free package. The leads are finished with Ni Pd Au. Each device will protect two line pairs high speed lines. The combination of small size, low capacitance, and high surge capability makes them ideal for use in applications such as Gigabit Ethernet, telecommunication lines, and LVDS interfaces.



Dimensions and Pin Configuration



Circuit Schematic

Pin Schematic

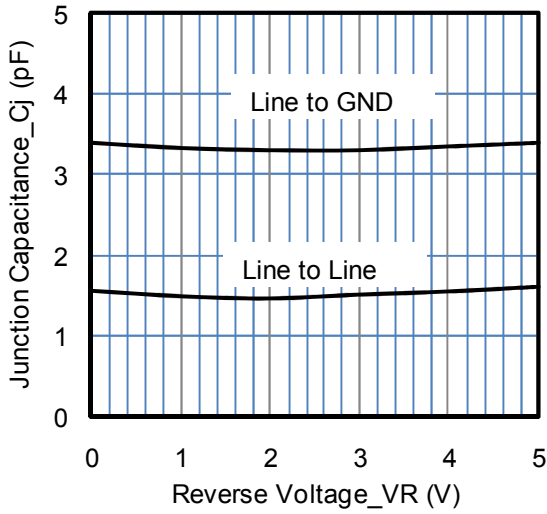
Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20 μs)	Ppk	1000	W
Peak Pulse Current (8/20 μs)	I _{PP}	40	A
ESD per IEC 61000-4-2 (Air)	VESD	± 30	kV
ESD per IEC 61000-4-2 (Contact)		± 30	
Operating Temperature Range	T _J	-55 to +125	$^{\circ}\text{C}$
Storage Temperature Range	T _{stg}	-55 to +150	$^{\circ}\text{C}$

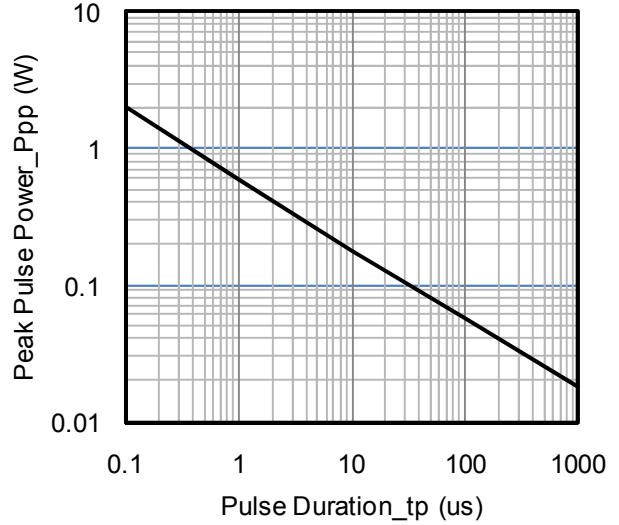
Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V _{RWM}			2.5	V	
Punch-Through Voltage	V _{PT}	2.7			V	I _T = 2 μA
Snap-Back Voltage	V _{SB}	2.0			V	I _{SB} = 50mA
Reverse Leakage Current	I _R			0.5	μA	V _{RWM} = 2.5V
Clamping Voltage	V _C			4.5	V	I _{PP} = 1A (8 x 20 μs pulse), any I/O pin to ground
Clamping Voltage	V _C			7.5	V	I _{PP} = 10A (8 x 20 μs pulse), any I/O pin to ground
Clamping Voltage	V _C			12	V	I _{PP} = 25A (8 x 20 μs pulse), any I/O pin to ground
Clamping Voltage	V _C			25	V	I _{PP} = 40A (8 x 20 μs pulse), line to line (two I/O pins connected together on each line)
Junction Capacitance	C _J		1.7	2.5	pF	V _R = 0V, f = 1MHz, between I/O pins
Junction Capacitance	C _J		3.8	5.0	pF	V _R = 0V, f = 1MHz, any I/O pin to ground

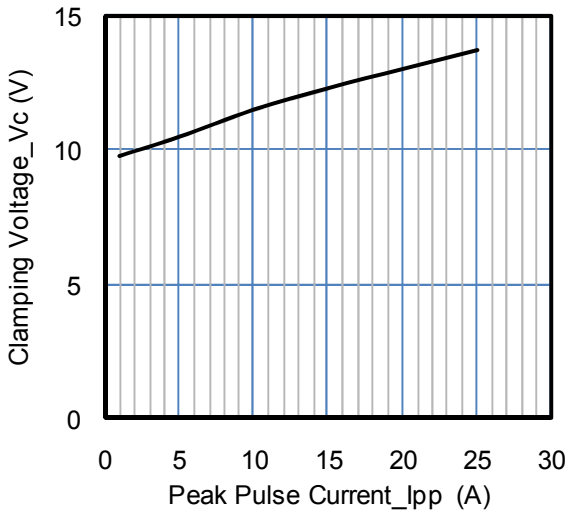
Typical Performance Characteristics (TA=25°C unless otherwise Specified)



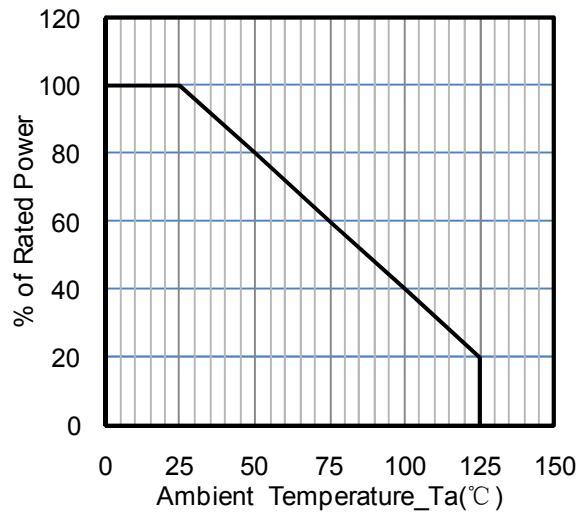
Junction Capacitance vs. Reverse Voltage



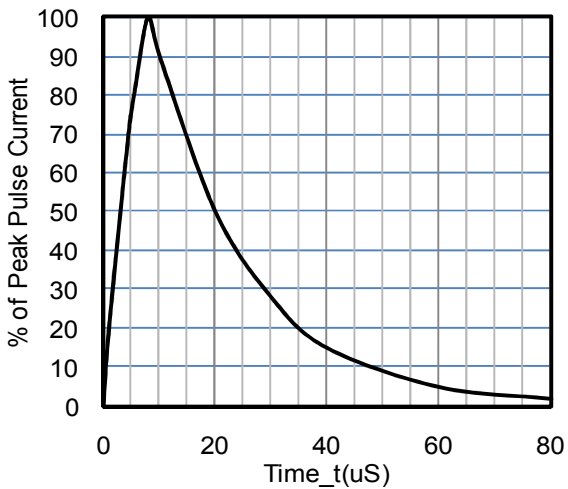
Peak Pulse Power vs. Pulse Time



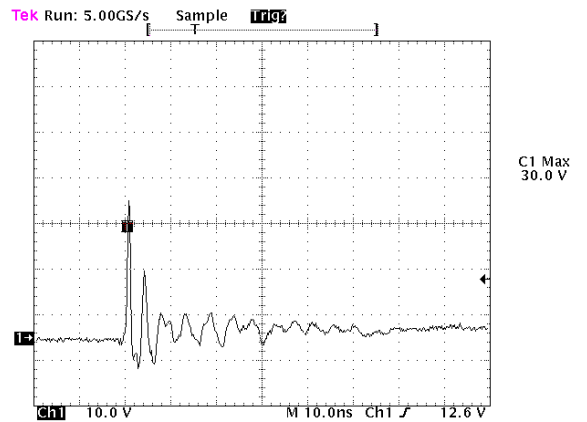
Clamping Voltage vs. Peak Pulse Current



Power Derating Curve



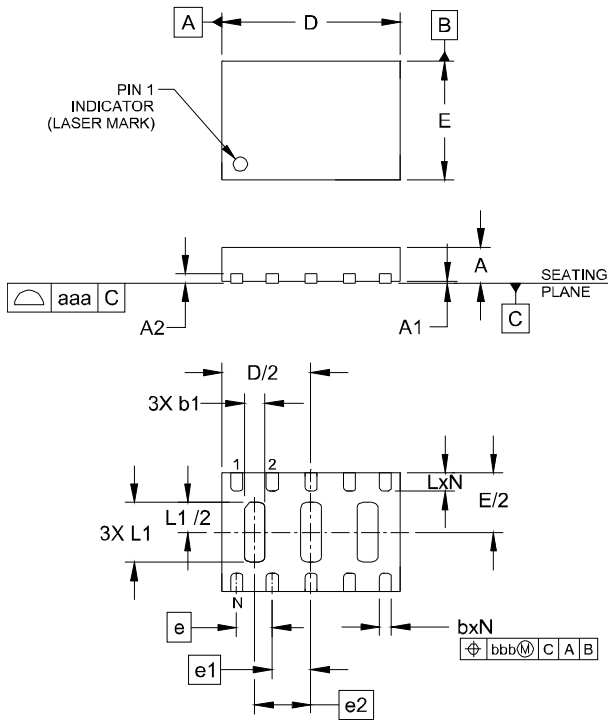
8 X 20us Pulse Waveform



ESD Clamping Voltage

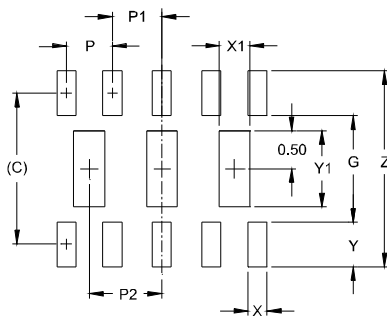
8 kV Contact per IEC61000-4-2

DFN3020-10 Package Outline Drawing



DIMENSIONS			
DIM	MILLIMETERS		
	MIN	NOM	MAX
A	0.50	0.60	0.65
A1	0.00	0.03	0.05
A2	(0.15)		
b	0.15	0.20	0.25
b1	0.25	0.35	0.45
D	2.90	3.00	3.10
E	1.90	2.00	2.10
e	0.60 BSC		
e1	0.65 BSC		
e2	0.95 BSC		
L	0.25	0.30	0.35
L1	0.95	1.00	1.05
N	10		
aaa	0.08		
bbb	0.10		

Suggested Land Pattern



DIMENSIONS	
DIM	MILLIMETERS
C	(1.98)
G	1.40
P	0.60
P1	0.65
P2	0.95
X	0.25
X1	0.40
Y	0.58
Y1	1.00
Z	2.56

Ordering Information

Part Number	Packaging	Reel Size
ESD2V541LC	3000/Tape & Reel	7 inch