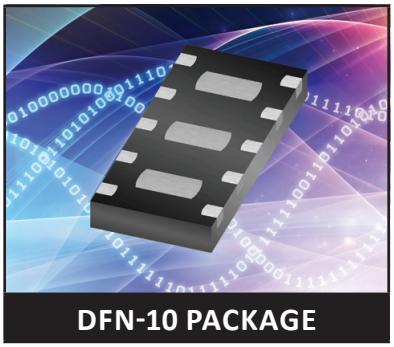
ULTRA LOW CAPACITANCE STEERING DIODE/TVS ARRAY



DESCRIPTION

The SRV25-4 is a dual USB port protection array that features ultra low capacitance. This device can be used in applications such as video cards, SMART phones, Gigabit Ethernet and other computer interfaces. Designed for ESD protection, the SRV25-4 can clamp the effects of electrical fast transients on the power bus.

The SRV25-4 combines 8 low capacitance steering diodes for up to four individual data or transmission lines and one TVS diode for power bus protection. This device is available in the space-saving DFN-10 package configuration, which minimizes lead inductance to prevent overshoot voltages during high ESD current events. The SRV25-4 meets the IEC 61000-4-2, 61000-4-2 and 61000-4-5 requirements.

FEATURES

- Compatible with IEC 61000-4-2 (ESD): Air 15kV, Contact 8kV
- Compatible with IEC 61000-4-4 (EFT): 40A, 5/50ns
- Compatible with IEC 61000-4-5 (Surge): 24A, 8/20µs - Level 2(Line-Gnd) & Level 3(Line-Line0
- 800 Watts Peak Pulse Power per Line(tp = 8/20µs)
- ESD Protection > 25 kilovolts
- Low Clamping Voltage
- Protection for 4 Lines
- Ultra Low Capacitance: 3.5pF Typical
- RoHS Compliant
- REACH Compliant

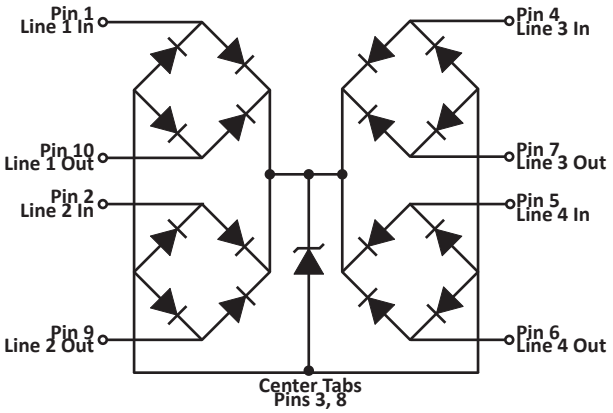
APPLICATIONS

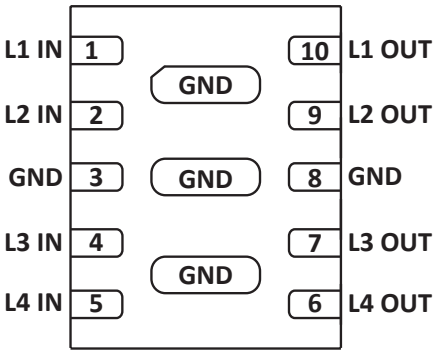
- Gigabit Ethernet
- SMART Phones
- Portable Electronics
- Video Card Interfaces
- USB 2.0 Interfaces
- DVI Interfaces

MECHANICAL CHARACTERISTICS

- Molded JEDEC DFN-10 Package
- Approximate Weight: 7 milligrams
- Lead-Free Pure-Tin Plating (Annealed)
- Solder Reflow Temperature:
  Pure-Tin - Sn, 100: 260-270°C
- Flammability Rating UL 94V-0
- 8mm Tape and Reel per EIA Standard 481

CIRCUIT DIAGRAM AND PIN CONFIGURATION





TYPICAL DEVICE CHARACTERISTICS

MAXIMUM RATINGS @ 25°C Unless Otherwise Specified			
PARAMETER	SYMBOL	VALUE	UNITS
Peak Pulse Power (tp = 8/20µs) - See Figure 1	P_{PP}	800	Watts
Operating Temperature	T_L	-55 to 150	°C
Storage Temperature	T_{STG}	-55 to 150	°C
Forward Surge Rating (5ms @ 25°C, I_F = 10mA)	V_F	0.5 Min. - 1.2 Max.	Volts
Peak Pulse Current (tp = 8/20µs) - Note 1	I_{PP}	40	Amps

NOTES
1. Measured with I/O pins tied together.

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified							
PART NUMBER	DEVICE MARKING	RATED STAND-OFF VOLTAGE (Note 1) V_{WM} VOLTS	MINIMUM BREAKDOWN VOLTAGE (Note 1) @ 1mA $V_{(BR)}$ VOLTS	MAXIMUM CLAMPING VOLTAGE (Fig. 2) (Note 1) @ I_P = 1A V_C VOLTS	MAXIMUM CLAMPING VOLTAGE (Fig. 2) (Note 1) @ I_P = 10A V_C VOLTS	MAXIMUM LEAKAGE CURRENT (Note 1) @V_{WM} I_D µA	TYPICAL CAPACITANCE (Note 1) @0V, 1MHz $C_{J(SD)}$ pF
SRV25-4	S4	2.5	3.0	4.5	7.4	0.5	3.5

NOTES
1. Measured from I/O pin to ground.

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified			
MAXIMUM CLAMPING VOLTAGE (Fig. 2) (Note 1) @ I_P = 25A V_C VOLTS	MAXIMUM CLAMPING VOLTAGE (Fig. 2) (Note 2) @ I_P = 40A V_C VOLTS	MAXIMUM CAPACITANCE (Note 1) @0V, 1MHz $C_{J(SD)}$ pF	TYPICAL CAPACITANCE I/O TO I/O @0V, 1MHz $C_{J(SD)}$ pF
12.0	20.0	5.0	1.7

NOTES
1. Measured from I/O pin to ground.
2. Measured with I/O pins tied together.

TYPICAL DEVICE CHARACTERISTICS

FIGURE 1
PEAK PULSE POWER VS PULSE TIME

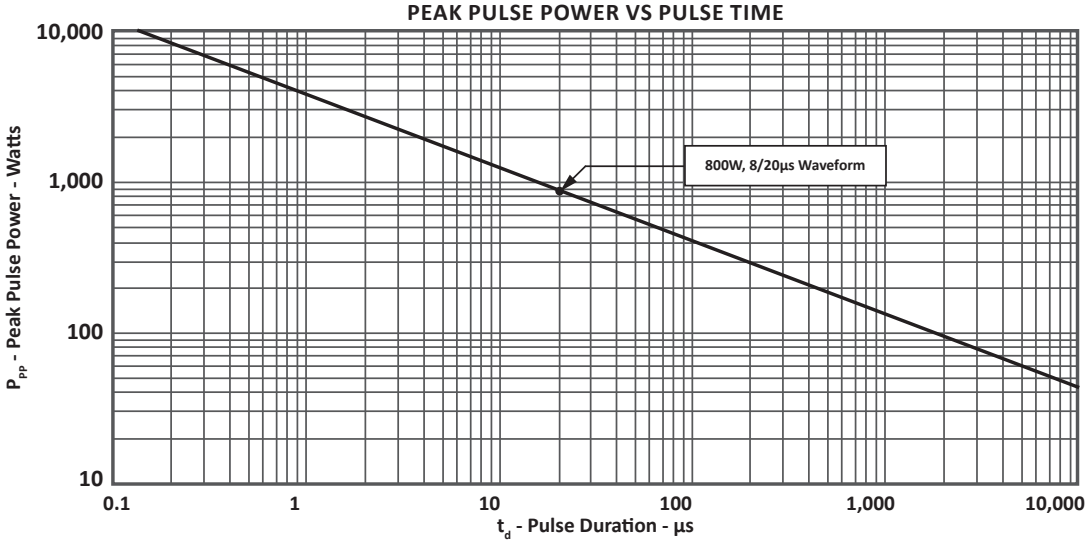


FIGURE 2
PULSE WAVE FORM

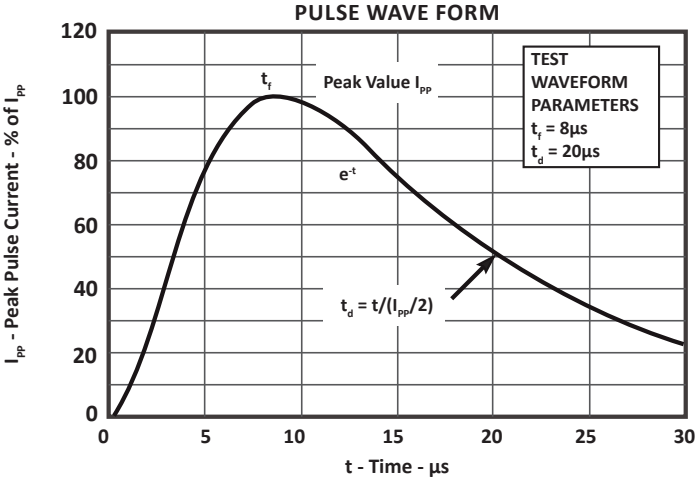
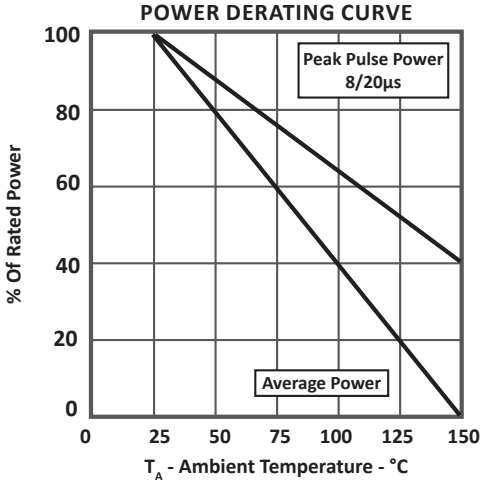


FIGURE 3
POWER DERATING CURVE



TYPICAL DEVICE CHARACTERISTICS

FIGURE 4
TYPICAL LEAKAGE CURRENT VS JUNCTION TEMPERATURE

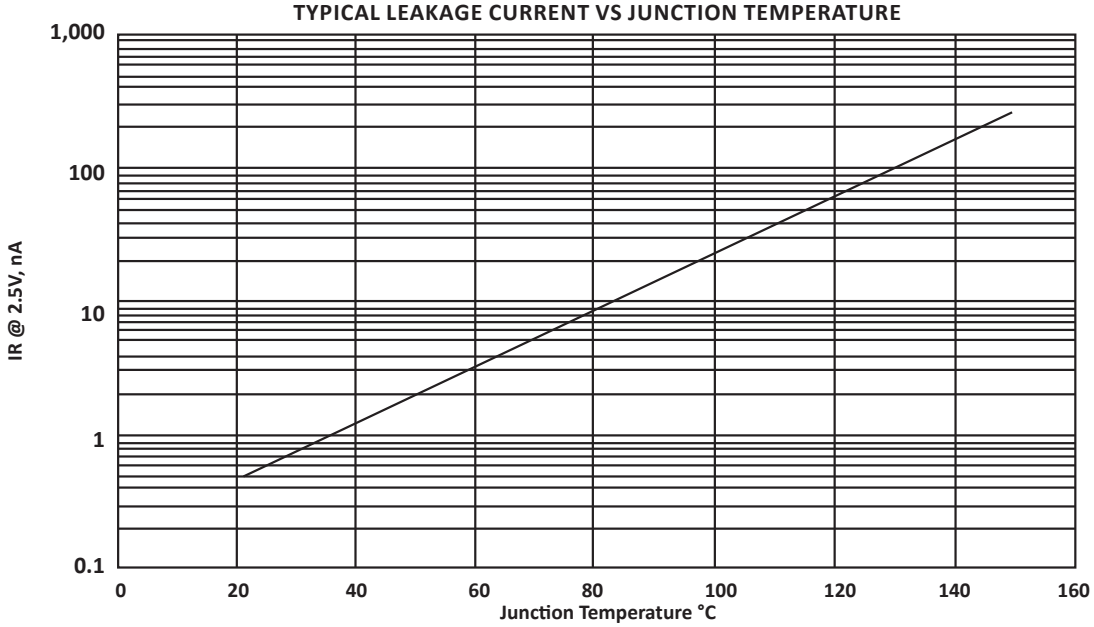
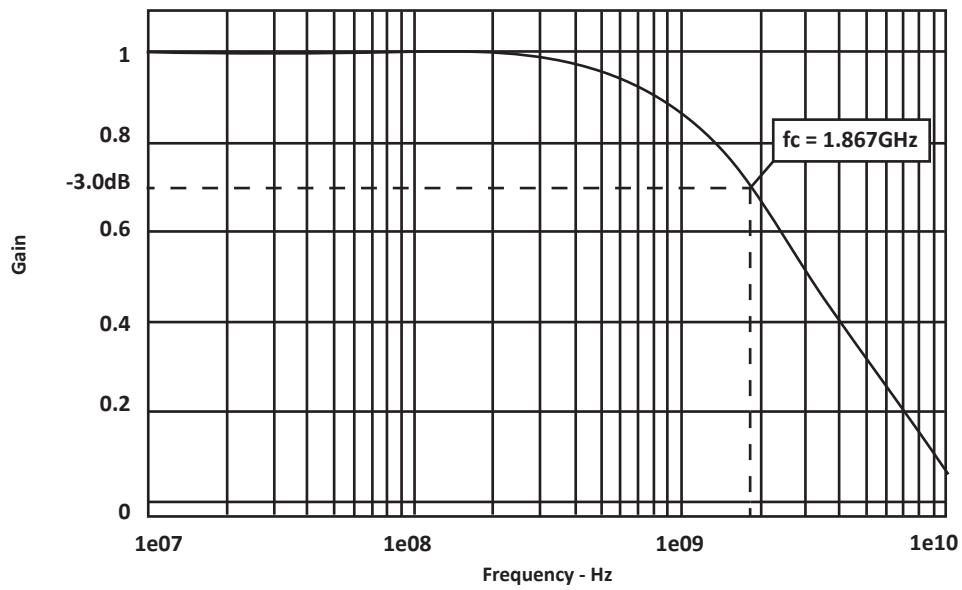


FIGURE 5
INSERTION LOSS - IO TO IO



APPLICATION INFORMATION

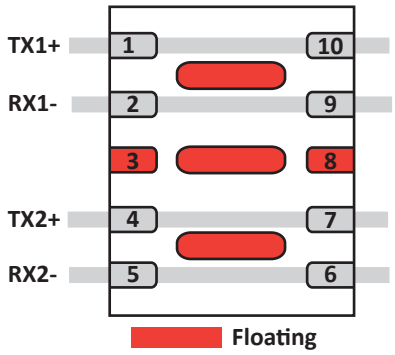


FIGURE 1 - DIFFERENTIAL-MODE PROTECTION

Figure 1 represents, rail-to-rail protection configuration for two differential-mode data line pairs - i.e., 10/100/1000 Base T Ethernet applications. Paralleling two I/O connections will provide superior protection - up to 800 Watts (8/20µs). Ground points are not necessary and should be left unconnected (floating). Device I/O to I/O off-state capacitance at 0Vdc and 1MHz signal will typically be at 2.8pF.

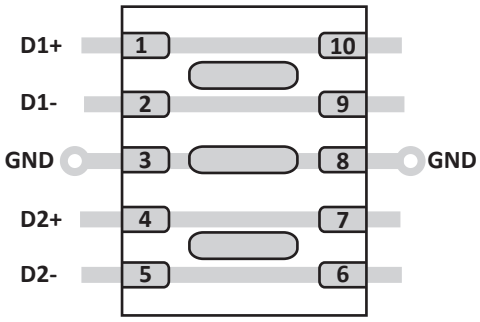


FIGURE 2 - COMMON-MODE PROTECTION

Figure 2 represents, rail-to-rail protection configuration for two common-mode data line pairs - i.e., USB, HDMI, DVI applications. Paralleling two I/O connections will provide superior protection - up to 800 Watts (8/20µs). Device I/O to ground off-state capacitance at 0Vdc and 1MHz signal will typically be at 5.5pF.

APPLICATION INFORMATION

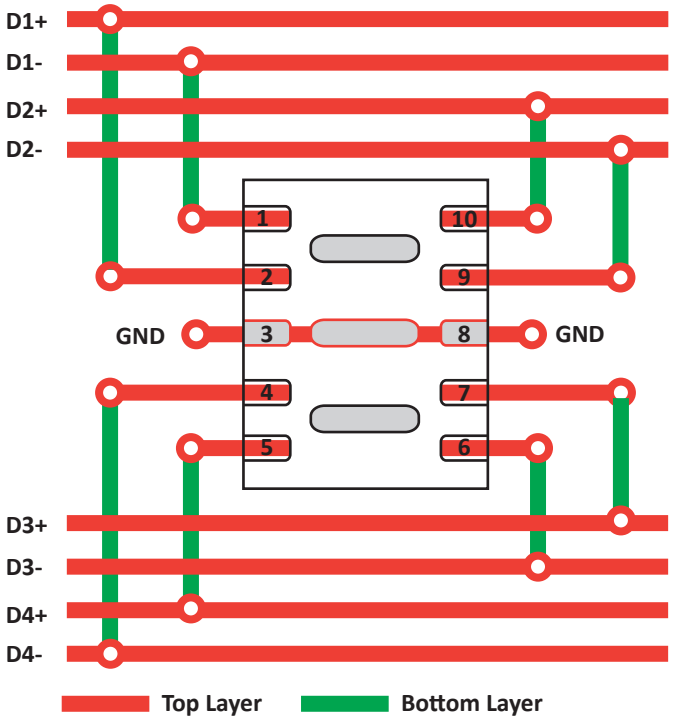


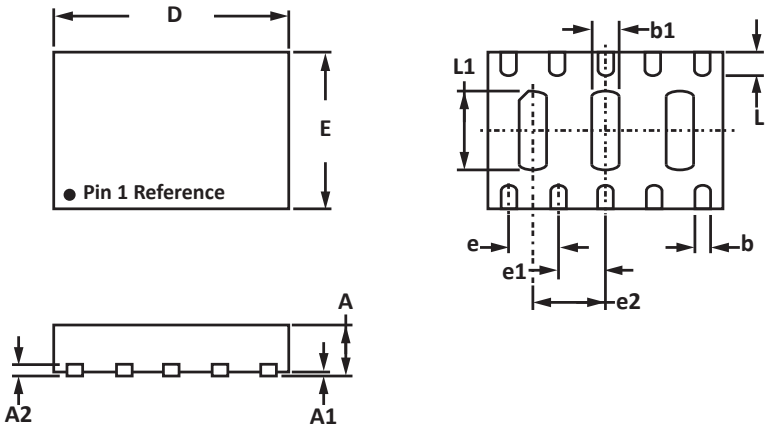
FIGURE 3 - COMMON-MODE PROTECTION

Figure 3 represents, protection configuration for four common-mode data line pairs - i.e., USB, HDMI, DVI or LVDS applications. Lines are connected through vias on the bottom PCB layer. Using this non-parallel configuration, the device provides superior protection - up to 400 Watts (8/20µs) - for each I/O. Device I/O to ground off-state capacitance at 0Vdc and 1MHz signal will typically be at 1.5pF.

DFN-10 PACKAGE INFORMATION

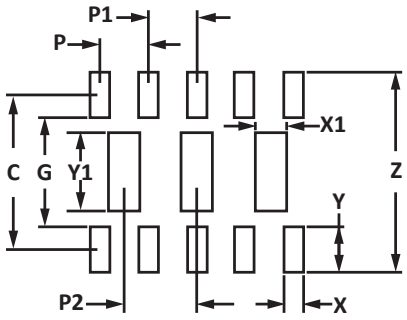
OUTLINE DIMENSIONS				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.50	0.65	0.020	0.026
A1	0.00	0.05	0.00	0.002
A2	0.15		0.006	
b	0.15	0.25	0.006	0.010
b1	0.25	0.45	0.010	0.018
D	2.90	3.10	0.114	0.122
E	1.90	2.10	0.075	0.083
e	0.60 BSC		0.024 BSC	
e1	0.65 BSC		0.026 BSC	
e2	0.95 BSC		0.037 BSC	
L	0.2	0.35	0.008	0.014
L1	0.95	1.05	0.037	0.041

NOTES
1. Controlling dimension: millimeters.
2. Dimensioning and tolerances per ANSI Y14.M, 1985.

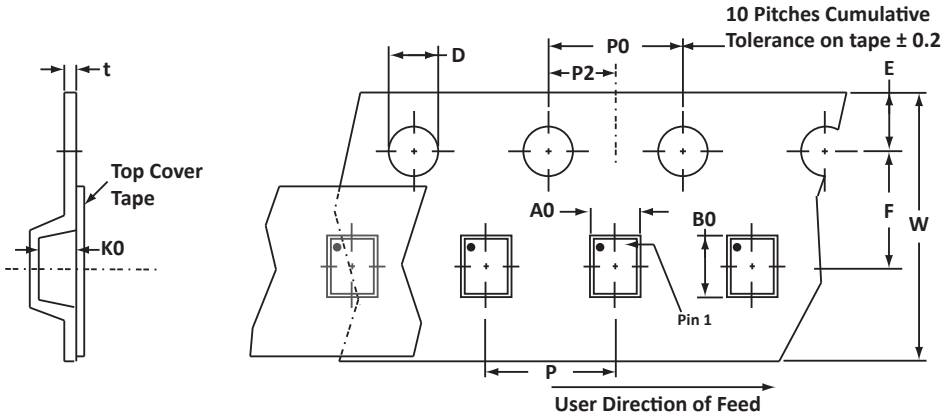


PAD LAYOUT DIMENSIONS		
DIM	MILLIMETERS	INCHES
	NOMINAL	NOMINAL
C	1.98	0.078
G	1.40	0.056
P	0.60	0.024
P1	0.65	0.026
P2	0.95	0.037
X	0.25	0.010
X1	0.40	0.016
Y	0.58	0.023
Y1	1.00	0.039
Z	2.56	0.101

NOTES
1. Controlling dimension: millimeters.



TAPE AND REEL



SPECIFICATIONS												
REEL DIA.	TAPE WIDTH	A0	B0	K0	D	E	F	W	P0	P2	P	tmax
178mm (7")	8mm	2.24 ± 0.05	3.23 ± 0.05	0.93 ± 0.05	1.50 ± 0.10	1.75 ± 0.10	3.50 ± 0.05	8.00 ± 0.30	4.00 ± 0.10	2.00 ± 0.05	4.00 ± 0.10	0.25

NOTES
1. Dimensions are in millimeters.
2. Surface mount product is taped and reeled in accordance with EIA-481.
3. Marking on Part - marking code (see page 2).

ORDERING INFORMATION					
BASE PART NUMBER	LEADFREE SUFFIX	TAPE SUFFIX	QTY/REEL	REEL SIZE	TUBE QTY
SRV25-4	N/A	-T7	3,000	7"	n/a
This device is only available in a Lead-Free configuration.					

COMPANY INFORMATION

COMPANY PROFILE

In business more than 30 years, ProTek Devices™ is a privately held semiconductor company. The company offers a product line of overvoltage protection that include Transient Voltage Suppressor (TVS) Arrays, Steering Diode Array Hybrids, High-power Components and Modules, as well as Steering Diodes, EMI Filter/TVS Arrays and Thyristor Surge Suppressors. These components deliver circuit protection in electronic systems from numerous overvoltage events. They include lightning; electrostatic discharge (ESD); nuclear electromagnetic pulses (NEMP); inductive switching; and electromagnetic interference (EMI) / radio frequency interference (RFI). ProTek Devices is an ISO 9001 certified company.

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