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ESDR0524P

Transient Voltage Suppressors

Low Capacitance ESD Protection for High Speed Data

The ESDR0524P transient voltage suppressor is designed to protect high speed data lines from ESD. Ultra−low capacitance and low ESD clamping voltage make this device an ideal solution for protecting voltage sensitive high speed data lines. The flow−through style package allows for easy PCB layout and matched trace lengths necessary to maintain consistent impedance between high speed differential lines such as HDMI.

Features

- Low Capacitance (0.3 pF Typical, I/O to I/O)
- ESD Rating of Class 3B (Exceeding 8 kV) per Human Body model and Class C (Exceeding 400 V) per Machine Model
- Protection for the Following IEC Standards:
  IEC 61000−4−2 (±8 kV Contact)
- UL Flammability Rating of 94 V−0
- This is a Pb−Free Device

Typical Applications

- HDMI
- DVI
- Display Port
- MDDI
- eSATA

MAXIMUM RATINGS (T_J = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Operating Junction Temperature Range	T_J	−55 to +125	°C
Storage Temperature Range	T_{stg}	−55 to +150	°C
Lead Solder Temperature − Maximum (10 Seconds)	T_L	260	°C
IEC 61000−4−2 Contact (ESD) IEC 61000−4−2 Air (ESD)	ESD ESD	±12 ±15	kV kV

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

See Application Note AND8308/D for further description of survivability specs.

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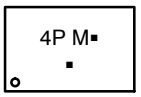
MARKING DIAGRAM



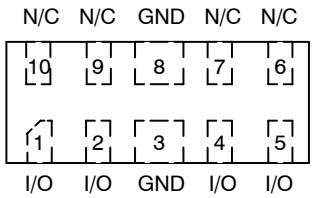
UDFN10
CASE 517BB

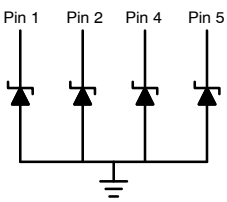


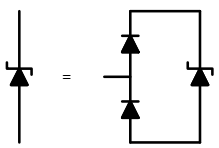
4P = Specific Device Code
M = Date Code*
▪ = Pb−Free Package
(Note: Microdot may be in either location)

*Date Code orientation and/or position may vary depending upon manufacturing location.

PIN CONFIGURATION AND SCHEMATIC







ORDERING INFORMATION

Device	Package	Shipping
ESDR0524PMUTAG	UDFN10 (Pb−Free)	3000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

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ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}	I/O Pin to GND (Note 1)			5.0	V
Breakdown Voltage	V_{BR}	I_T = 1 mA, I/O Pin to GND	5.5			V
Reverse Leakage Current	I_R	V_{RWM} = 5 V, I/O Pin to GND			1.0	μA
Clamping Voltage	V_C	I_{PP} = 1 A, I/O Pin to GND (8 x 20 μs pulse)			15	V
Junction Capacitance	C_J	V_R = 0 V, f = 1 MHz between I/O Pins		0.3	0.4	pF
Junction Capacitance	C_J	V_R = 0 V, f = 1 MHz between I/O Pins and GND		0.5	0.8	pF

1. TVS devices are normally selected according to the working peak reverse voltage (V_{RWM}), which should be equal or greater than the DC or continuous peak operating voltage level.

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TYPICAL CHARACTERISTICS

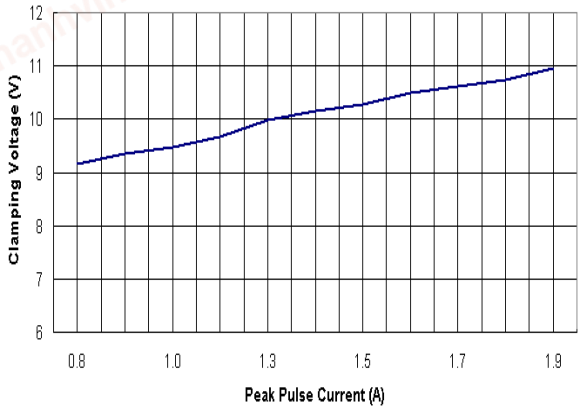

Figure 1. Clamping Voltage vs. Peak Pulse Current

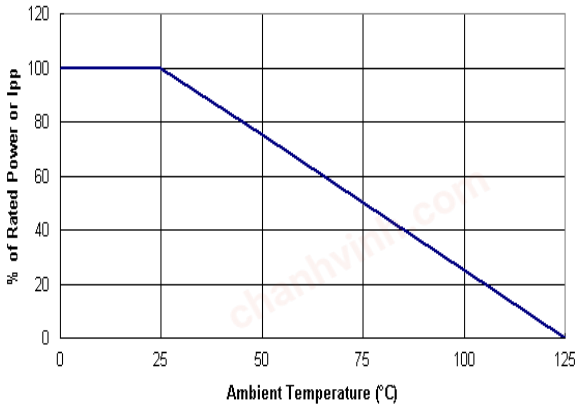

Figure 2. Power Derating Curve

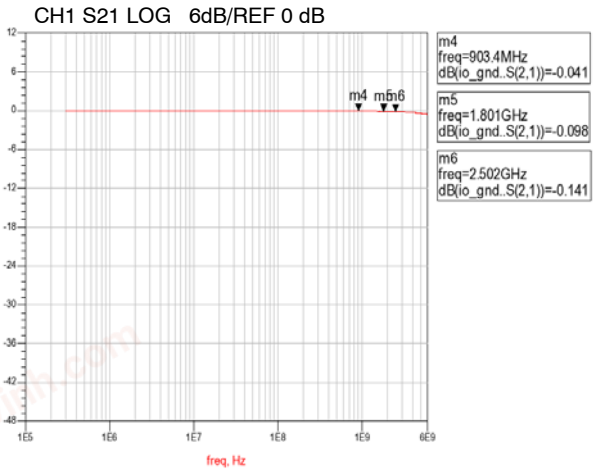

Figure 3. Insertion Loss S21 – I/O to GND

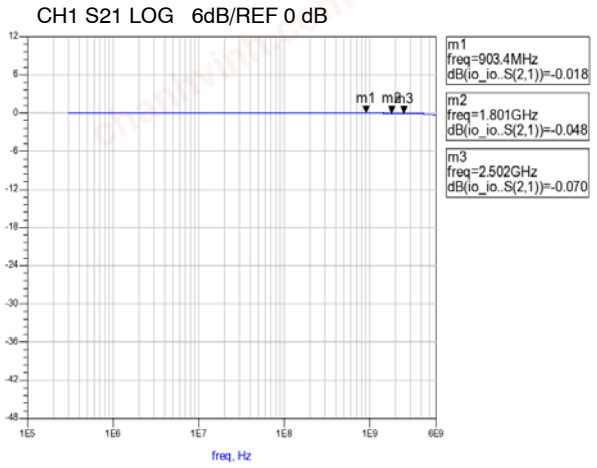

Figure 4. Insertion Loss S21 – I/O to I/O

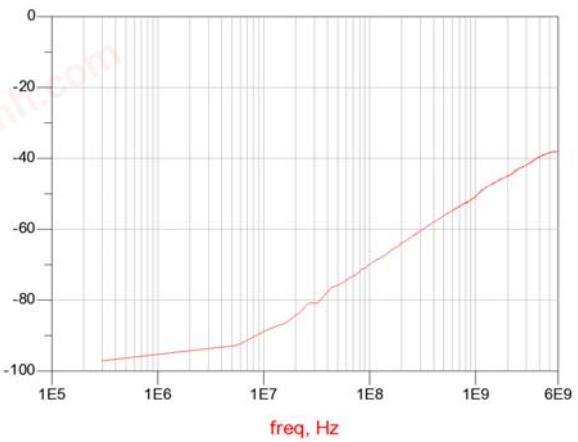

Figure 5. Analog Crosstalk – I/O to I/O

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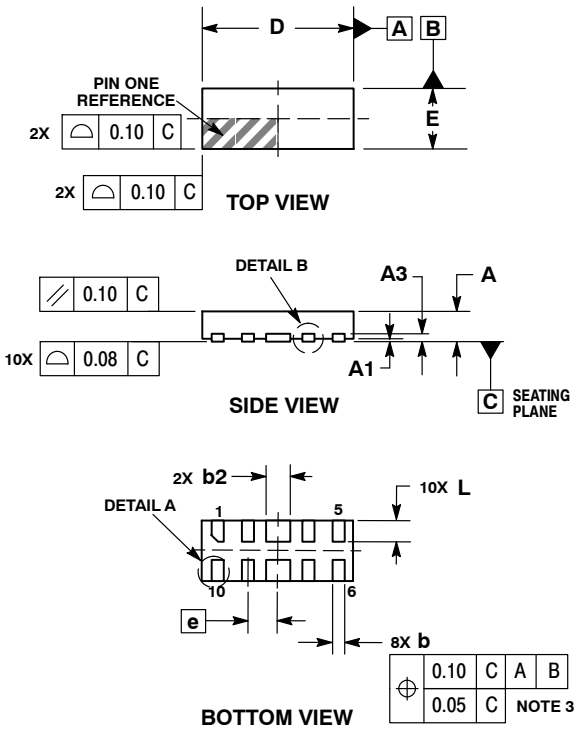
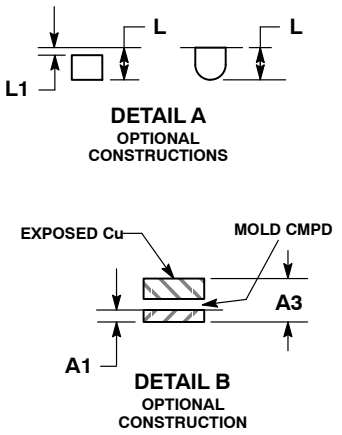
ESDR0524P

PACKAGE DIMENSIONS

UDFN10 2.5x1, 0.5P
CASE 517BB
ISSUE O

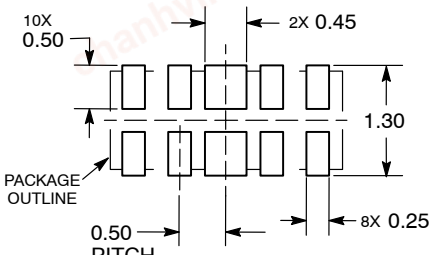




NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSION b APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.30mm FROM TERMINAL.

	MILLIMETERS	
DIM	MIN	MAX
A	0.45	0.55
A1	0.00	0.05
A3	0.13 REF	
b	0.15	0.25
b2	0.35	0.45
D	2.50 BSC	
E	1.00 BSC	
e	0.50 BSC	
L	0.30	0.40
L1	---	0.05

RECOMMENDED SOLDERING FOOTPRINT*



DIMENSIONS: MILLIMETERS

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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