

## Features

- RoHS compliant\*
- Low capacitance - 0.5 pF
- ESD protection >15 kV

## Applications

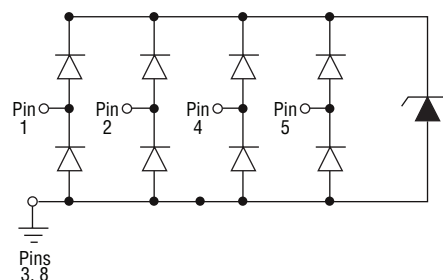
- HDMI 1.4
- Digital Visual Interface (DVI)
- USB 3.0 / USB OTG
- Memory protection
- SIM card ports

# CDDFN10-0524P - Surface Mount TVS Diode Array

## General Information

The CDDFN10-0524P device provides ESD, EFT and Surge protection for high-speed data ports meeting IEC 61000-4-2 (ESD) requirements. The Transient Voltage Suppressor array, protecting up to 4 data lines, offers a Working Peak Reverse Voltage of 5 V and Minimum Breakdown Voltage of 6 V.

The DFN10 packaged device will mount directly onto the industry standard DFN10 footprint. Bourns® Chip Diodes conform to JEDEC standards, are easy to handle with standard pick and place equipment and their flat configuration minimizes roll away.



## Absolute Maximum Ratings (@ T<sub>A</sub> = 25 °C Unless Otherwise Noted)

Parameter	Symbol	CDDFN10-0524P	Unit
Peak Pulse Power (t <sub>p</sub> = 8/20 μs)	P <sub>pp</sub>	30	W
Peak Pulse Current (t <sub>p</sub> = 8/20 μs)	I <sub>pp</sub>	3.8	A
Operating Voltage (I/O pin - GND)	V <sub>DC</sub>	6	V
Storage Temperature	T <sub>STG</sub>	-55 to +150	°C
Operating Temperature	T <sub>OPR</sub>	-55 to +85	°C

## Electrical Characteristics (@ T<sub>A</sub> = 25 °C Unless Otherwise Noted)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Breakdown Voltage @ 1 mA	V <sub>BR</sub>	6			V
Reverse Standoff Voltage	V <sub>RWM</sub>			5	V
Forward Voltage I <sub>f</sub> =15 mA (Gnd to I/O Pin)	V <sub>F</sub>		0.9	1.1	V
Channel Leakage Current V <sub>RWM</sub> = 5 V, (I/O Pin to Gnd)	I <sub>D</sub>			1.5	μA
Clamping Voltage IEC 61000-4-2 +6 kV, Contact mode (I/O Pin to Gnd)	V <sub>C</sub>		12		V
Channel Input Capacitance V <sub>pin3,8</sub> =0 V, V <sub>in</sub> =2.5 V, f=1 MHz (I/O Pin to Gnd)	C <sub>IN</sub>		0.5	0.65	pF
Channel to Channel Input Capacitance V <sub>pin3,8</sub> =0 V, V <sub>in</sub> =2.5 V, f=1 MHz (Between I/O pins)	C <sub>CROSS</sub>		0.04	0.08	pF
ESD Protection per IEC 6-1000-4-2 Contact Discharge		8		10	kV
Air Discharge		15		15	kV
ESD Dynamic Turn-on Resistance (any I/O Pin to Gnd)	R <sub>dynamic</sub>		0.3		Ω
EFT Protection per IEC 61000-4-4 @ 5/50 ns		40			A
Surge Protection per IEC 61000-4-5 @ 8/20 μs				3.8	A

\*RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.

Specifications are subject to change without notice.

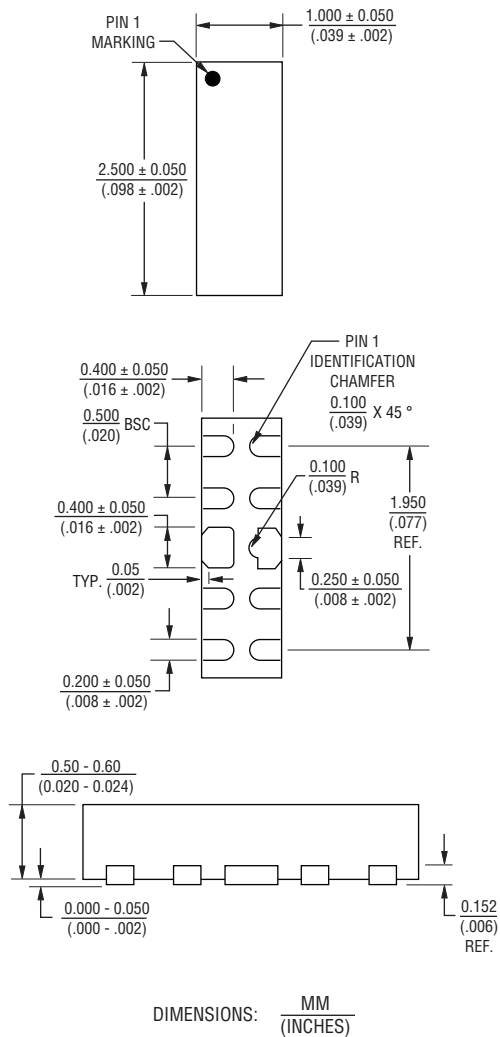
Users should verify actual device performance in their specific applications.

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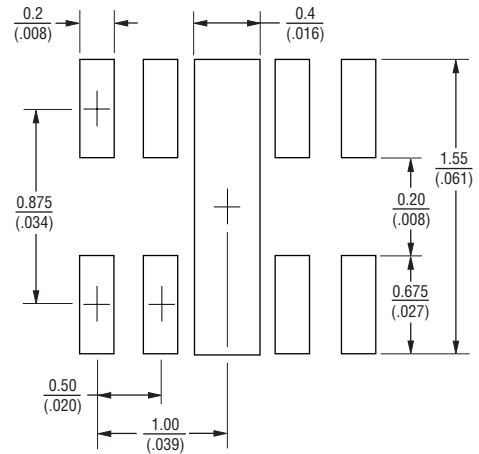
# CDDFN10-0524P - Surface Mount TVS Diode Array

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## Product Dimensions



## Recommended Footprint



## Typical Part Marking

CDDFN10-0524P .....524

## Environmental Specifications

Moisture Sensitivity Level .....3  
ESD Classification (HBM).....3B

## How to Order

**CD DFN10 - 05 24 P**

Common Diode \_\_\_\_\_  
Chip Diode \_\_\_\_\_  
Package \_\_\_\_\_  
DFN10 = DFN-10 Package \_\_\_\_\_  
Working Peak Reverse Voltage \_\_\_\_\_  
05 = 5 V<sub>RWM</sub> (Volts) \_\_\_\_\_  
Number of Lines \_\_\_\_\_  
24 = 2 Ground / 4 Data Lines \_\_\_\_\_  
Suffix \_\_\_\_\_  
P = Ultra-low Capacitance \_\_\_\_\_

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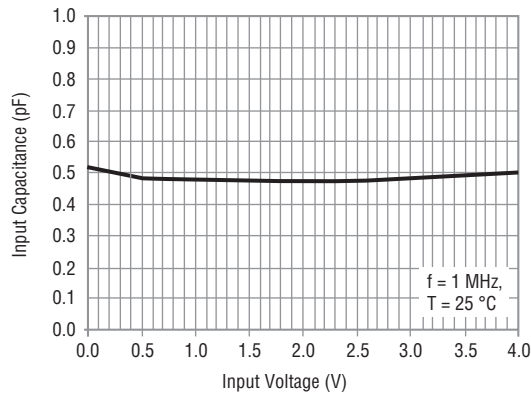
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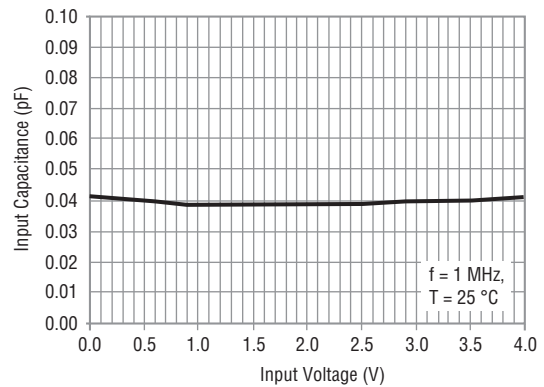
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## Rating & Characteristic Curves

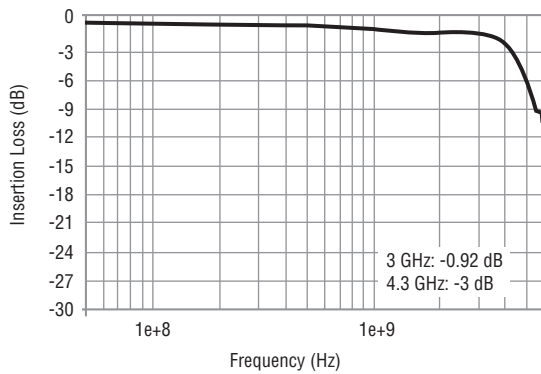
### Typical Variation $C_{IN}$ vs $V_{IN}$



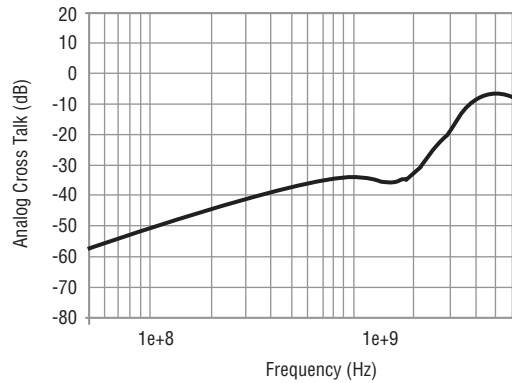
### Typical Variation of $C_{IO-to-IO}$ vs $V_{IN}$



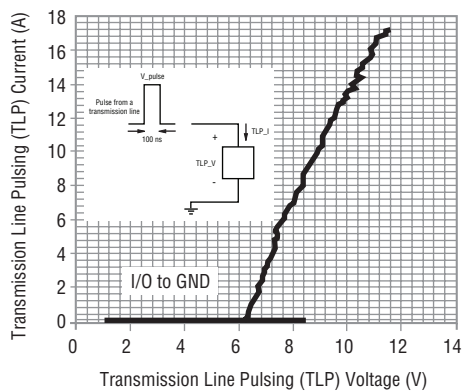
### Insertion Loss S21 (I/O-to-GND)



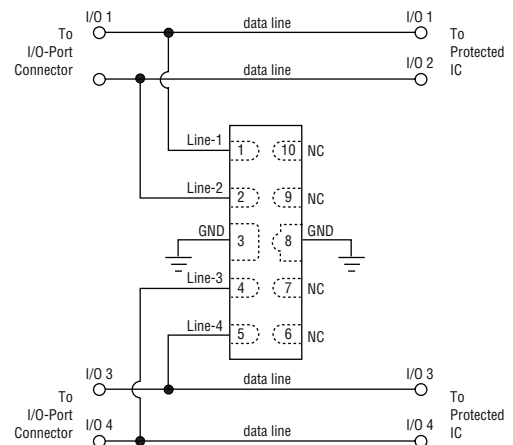
### Analog Cross Talk



### Transmission Line Pulsing (TLP)



### Data Lines Connection



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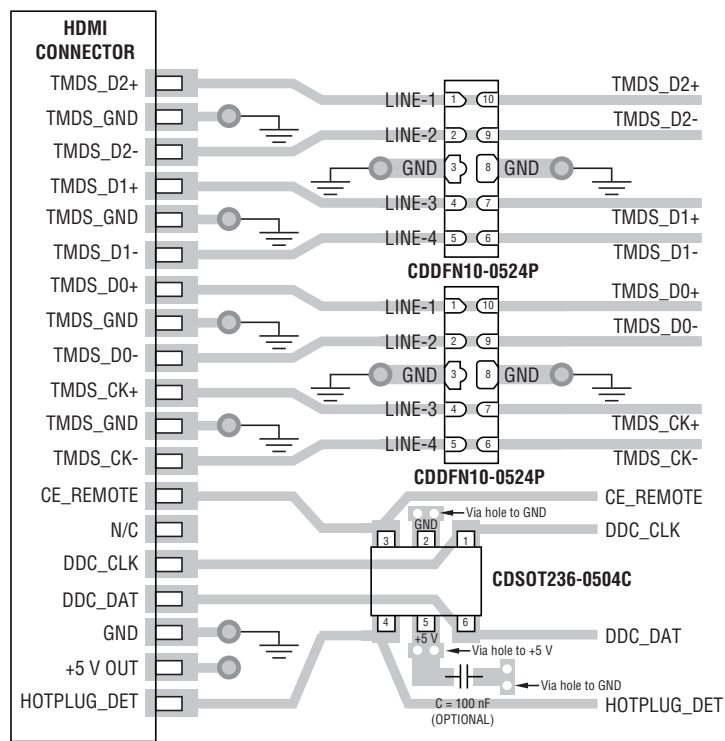
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# CDDFN10-0524P - Surface Mount TVS Diode Array

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## Reference Application

The Bourns® Model CDDFN10-0524P is designed to protect high-speed data ports from ESD transients. For high-speed ports such as HDMI 1.4 and USB 3.0, maintaining signal line impedance is a critical requirement. The use of a DFN10 package using a “feed-through” layout provides minimal impedance change on the high-speed data line, while the ultra-low capacitance performance of the device limits signal degradation on each channel.



*Feed-Through Layout -  
Model CDDFN10-0524P in HDMI Application*

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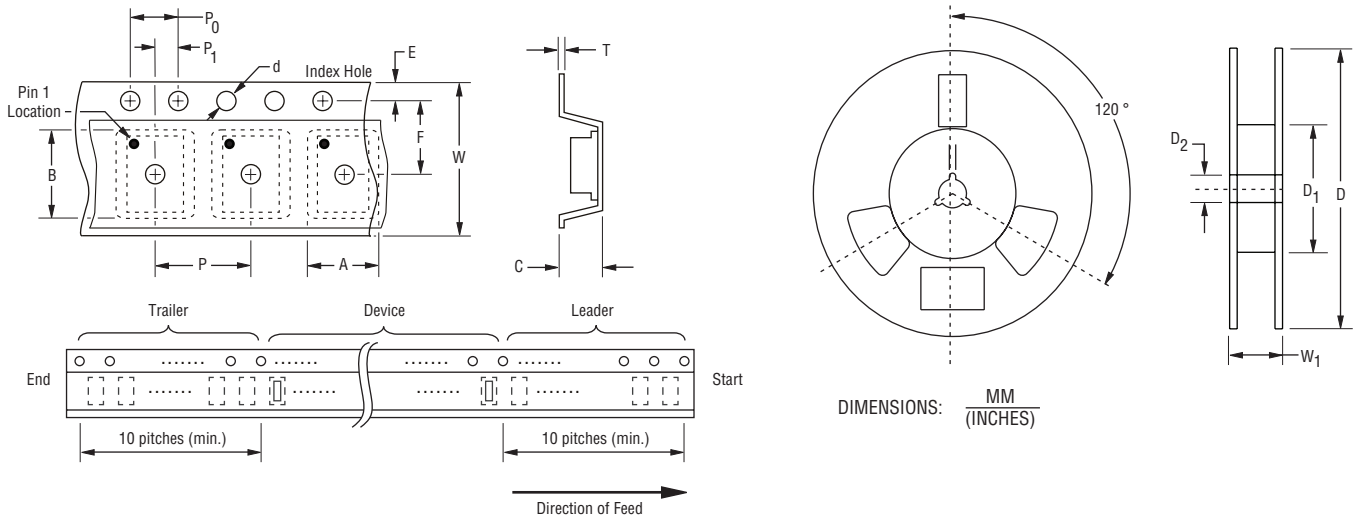
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## Packaging Information

The product is packaged in an 8 mm x 4 mm tape and reel format per EIA-481-A standard.



Item	Symbol	DFN-10
Carrier Width	A	$\frac{1.45 \pm 0.05}{(0.057 \pm 0.002)}$
Carrier Length	B	$\frac{2.95 \pm 0.05}{(0.116 \pm 0.002)}$
Carrier Depth	C	$\frac{0.90 \pm 0.05}{(0.035 \pm 0.002)}$
Sprocket Hole	d	$\frac{1.55 \pm 0.05}{(0.061 \pm 0.002)}$
Reel Outside Diameter	D	$\frac{178}{(7.008)}$
Reel Inner Diameter	D <sub>1</sub>	$\frac{50.0}{(1.969)}$ MIN.
Feed Hole Diameter	D <sub>2</sub>	$\frac{13.0 \pm 0.20}{(0.512 \pm 0.008)}$
Sprocket Hole Position	E	$\frac{1.75 \pm 0.10}{(0.069 \pm 0.004)}$
Punch Hole Position	F	$\frac{3.50 \pm 0.05}{(0.138 \pm 0.002)}$
Punch Hole Pitch	P	$\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$
Sprocket Hole Pitch	P <sub>0</sub>	$\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$
Embossment Center	P <sub>1</sub>	$\frac{2.00 \pm 0.05}{(0.079 \pm 0.002)}$
Overall Tape Thickness	T	$\frac{0.20 \pm 0.10}{(0.008 \pm 0.004)}$
Tape Width	W	$\frac{8.00 \pm 0.20}{(0.315 \pm 0.008)}$
Reel Width	W <sub>1</sub>	$\frac{14.4}{(0.567)}$ MAX.
Quantity per Reel	--	3000

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