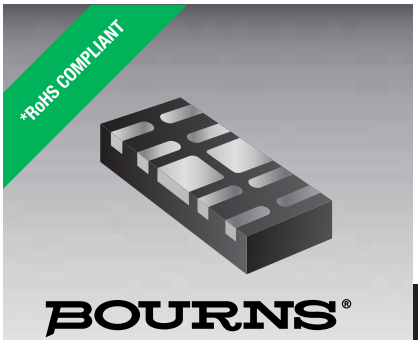


Features

- RoHS compliant*
- Low capacitance - 0.04 pF (I/O to I/O)
- ESD protection to IEC 61000-4-2 (Level 4)

Applications

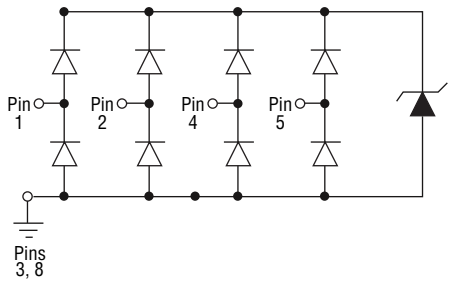
- HDMI 1.3, 1.4 and 2.0
- DisplayPort
- Digital Visual Interface (DVI)
- SATA and eSATA
- USB 3.0
- Memory protection
- SIM card ports

CDDFN10-3324P - Surface Mount TVS Diode Array

General Information

The Model CDDFN10-3324P device provides ESD, CDE and EFT protection for high-speed data ports, meeting IEC 61000-4-2 (ESD) requirements. The Transient Voltage Suppressor array, protecting up to four data lines, offers a Working Peak Reverse Voltage of 3.3 V and a Minimum Breakdown Voltage of 4.5 V.

The DFN10 packaged device has an ultra-low typical capacitance of only 0.04 pF between I/O lines. This allows it to be used for protecting sensitive components used on high-speed interfaces. The small footprint of the device allows for flow-through routing on the PCB, helping to maintain matched impedances of the high-speed data lines.



Absolute Maximum Ratings (@ T_A = 25 °C Unless Otherwise Noted)

Parameter	Symbol	CDDFN10-3324P	Unit
Peak Pulse Power (t_p = 8/20 μS)	P_{pp}	30	W
Peak Pulse Current (t_p = 8/20 μS)	I_{pp}	4	A
Operating Temperature	T_J	-55 to +85	ºC
Storage Temperature	T_{STG}	-55 to +150	ºC

Electrical Characteristics (@ T_A = 25 °C Unless Otherwise Noted)

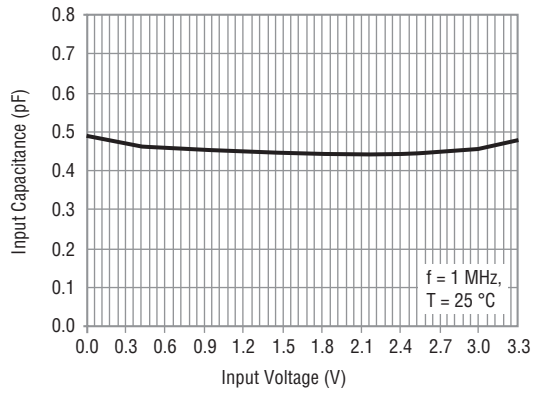
Parameter	Symbol	Min.	Typ.	Max.	Unit
Working Peak Reverse Voltage	V_{WM}			3.3	V
Breakdown Voltage @ 1 mA	V_{BR}	4.5			V
Leakage Current @ V_{WM}	I_R		0.1	0.5	μA
Capacitance @ 1.65 V, f = 1 MHz (I/O to GND) (Vpin-3, -8= 0 V)	C_{IN}		0.45	0.65	pF
Capacitance @ 1.65 V, f = 1 MHz (I/O to I/O) (Vpin-3, -8= 0 V)	C_{CROSS}		0.04	0.08	pF
Clamping Voltage @ 8/20 μs @ I_{PP}	V_C			7.5	V
ESD Protection per IEC 6-1000-4-2 Contact Discharge Air Discharge				 12 15	kV

WARNING Cancer and Reproductive Harm - www.P65Warnings.ca.gov

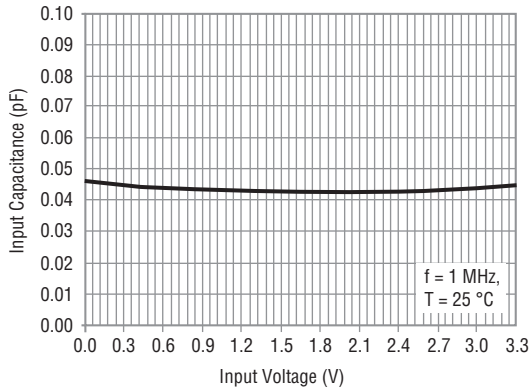
*RoHS Directive 2015/863, Mar 31, 2015 and Annex.
Specifications are subject to change without notice.
Users should verify actual device performance in their specific applications.

Rating & Characteristic Curves

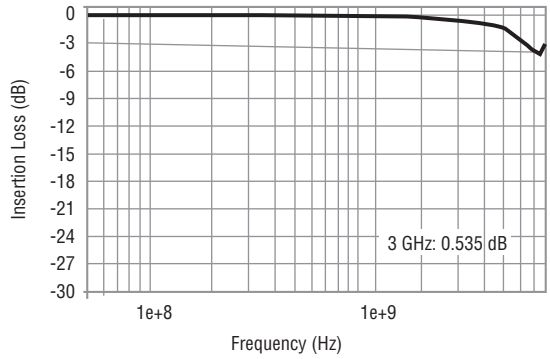
Typical Voltage vs. Capacitance C_{IN}



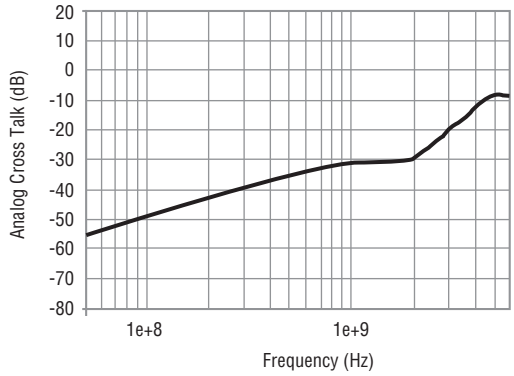
Typical Voltage vs. Capacitance C_{CROSS}



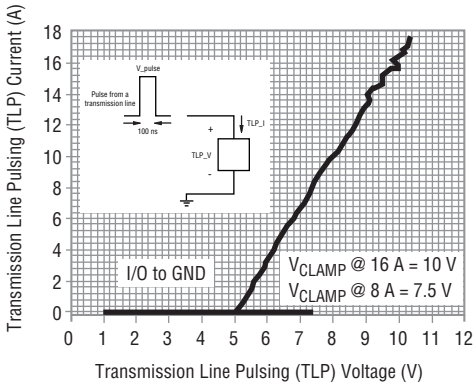
Typical Insertion Loss S21



Typical Analog Cross Talk

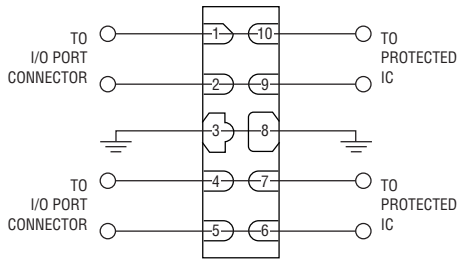


Typical Transmission Line Pulsing (TLP)

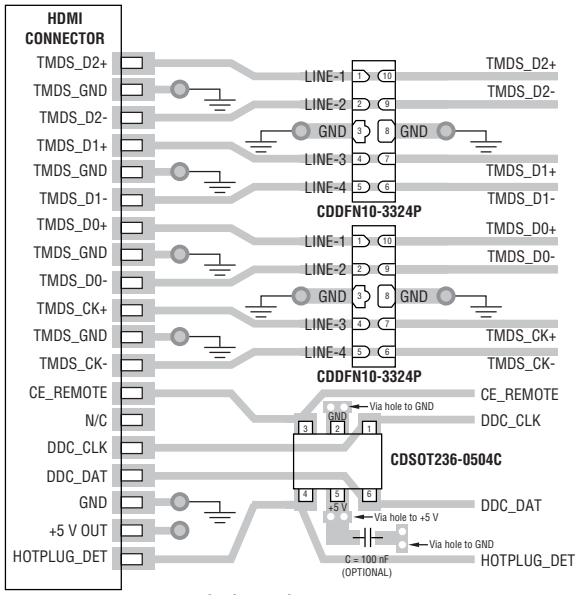


Reference Application

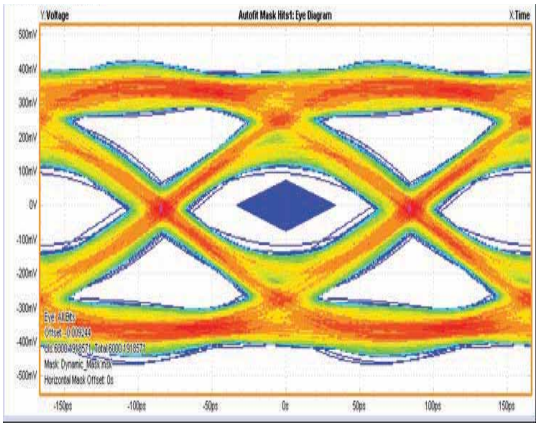
The Bourns® Model CDDFN10-3324P is designed to protect high-speed data ports from ESD transients. For high-speed ports above 5 Gbps such as HDMI 2.0 and USB 3.0, maintaining signal line impedance is a critical requirement. The use of a DFN10 package using a "feed-through" layout provides minimal impedance change on the high-speed data line, while the ultra-low capacitance performance of the device limits signal degradation on each channel.



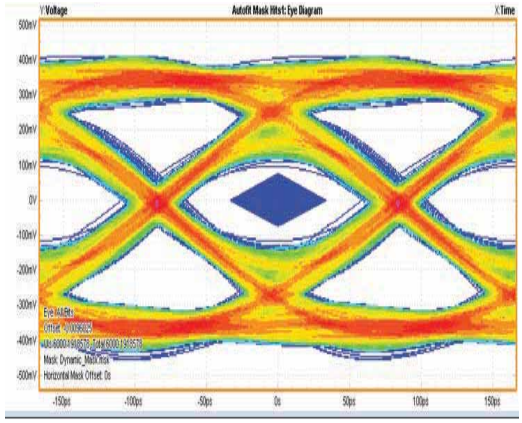
Model CDDFN10-3324P Layout on HDMI Port



Feed-Through Layout -
Model CDDFN10-3324P in HDMI Application



HDMI 2.0 Eye Diagram Test
Without Model CDDFN10-3324P
(PCB Only)

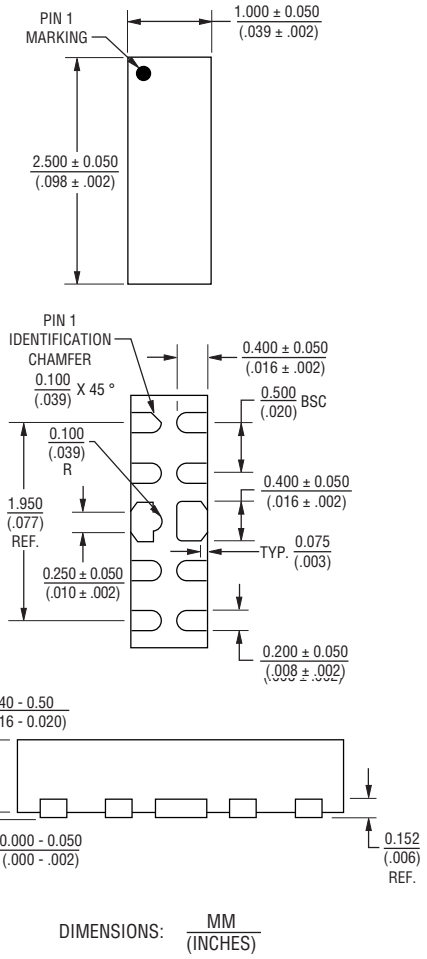


HDMI 2.0 Eye Diagram Test
With Model CDDFN10-3324P

CDDFN10-3324P - Surface Mount TVS Diode Array

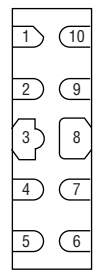
BOURNS®

Product Dimensions



DIMENSIONS: MM / (INCHES)

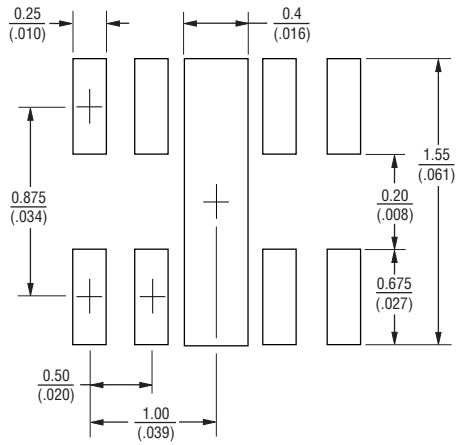
Device Pinout



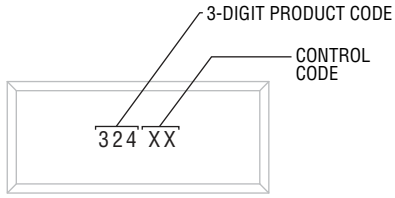
TOP VIEW

Pin	Function
1,2,4,5	Input and Output Lines
6,7,9,10	NC (No Internal Connection) for Feed-Through Layout design
3,8	GND

Recommended Footprint



Typical Part Marking



Environmental Specifications

Moisture Sensitivity Level 3
ESD Classification (HBM) 3B

How to Order

CD DFN10 - 33 24 P - 13

Common Code
Chip Diode

Package
DFN10 = DFN-10 Package

Working Peak Reverse Voltage
33 = 3.3 V_{RWM} (Volts)

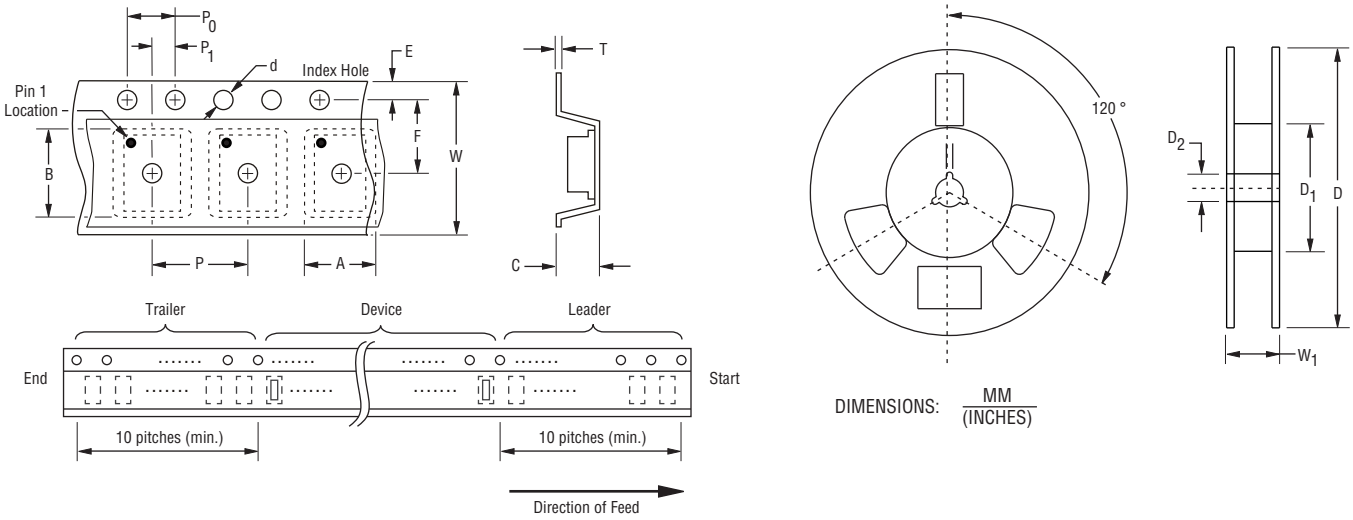
Number of Lines
24 = 2 Ground / 4 Data Lines

Suffix
P = Ultra-low Capacitance

Reel Option
(Blank) = 7-inch Reel
-13 = 13-inch Reel

Packaging Information

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



Item	Symbol	CDDFN10-3324P	CDDFN10-3324P-13
Carrier Width	A	1.70 ± 0.08 (0.067 ± 0.003)	1.2 ± 0.05 (0.047 ± 0.002)
Carrier Length	B	2.30 ± 0.08 (0.091 ± 0.003)	2.7 ± 0.05 (0.106 ± 0.002)
Carrier Depth	C	0.75 ± 0.05 (0.030 ± 0.002)	0.7 ± 0.05 (0.028 ± 0.002)
Sprocket Hole	d	1.15 ± 0.10 (0.045 ± 0.004)	1.5 +0.10/-0 (0.059 +0.004/-0)
Reel Outside Diameter	D	178 (7.008)	330 ± 1.0 (12.992 ± 0.039)
Reel Inner Diameter	D_1	54.40 ± 0.40 (2.142 ± 0.016)	100 ± 0.5 (3.937 ± 0.02)
Feed Hole Diameter	D_2	13.0 ± 0.20 (0.512 ± 0.008)	13.0 ± 0.20 (0.512 ± 0.008)
Sprocket Hole Position	E	1.75 ± 0.10 (0.069 ± 0.004)	1.75 ± 0.10 (0.069 ± 0.004)
Punch Hole Position	F	3.50 ± 0.05 (0.138 ± 0.002)	3.50 ± 0.05 (0.138 ± 0.002)
Punch Hole Pitch	P	4.00 ± 0.10 (0.157 ± 0.004)	4.00 ± 0.10 (0.157 ± 0.004)
Sprocket Hole Pitch	P_0	4.00 ± 0.10 (0.157 ± 0.004)	4.00 ± 0.10 (0.157 ± 0.004)
Embossment Center	P_1	2.00 ± 0.05 (0.079 ± 0.002)	2.00 ± 0.05 (0.079 ± 0.002)
Overall Tape Thickness	T	0.20 ± 0.30 (0.008 ± 0.012)	0.20 ± 0.30 (0.008 ± 0.012)
Tape Width	W	8.00 +0.30/-0.10 (0.315 +0.012/- 0.004)	8.00 +0.30/-0.10 (0.315 +0.012/- 0.004)
Reel Width	W_1	12.30 ± 1.00 (0.484 ± 0.039)	9.5 +3/-1 (0.374 +0.118/-0.039)
Quantity per Reel	--	3000	15,000

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