

## Features

- Lead free as standard
- RoHS compliant\*
- Low capacitance - 1.2 pF
- No insertion loss to 2 GHz
- ESD, EFT, surge protection

## Applications

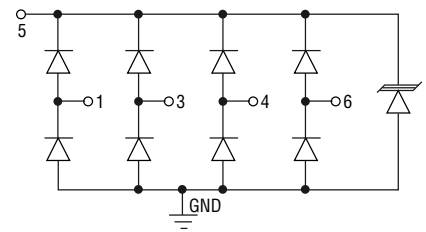
- USB 2.0 & USB OTG
- Multimedia card interface
- SD card interface
- SIM ports
- Gigabit Ethernet

# CDDFN6-0504P - TVS/Steering Diode Array

## General Information

The CDDFN6-0504P device provides ESD, EFT and surge protection for high speed data ports meeting IEC 61000-4-2 (ESD), IEC 61000-4-4 (EFT) and IEC 61000-4-5 (Surge) 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 molded packaged device will mount directly onto the industry standard DFN6 or QFN6 footprint. Bourns® Chip Diodes are easy to handle with standard pick and place equipment and their flat configuration minimizes roll away.



## Absolute Maximum Ratings

Parameter	Symbol	CDDFN6-0504P	Unit
Peak Pulse Power ( $t_p = 8/20 \mu s$ ) (NOTE 1)	$P_{pk}$	150	W
Peak Pulse Current ( $t_p = 8/20 \mu s$ ) (NOTE 1)	$I_{pp}$	6.5	A
Storage Temperature	$T_{STG}$	-55 to +150	°C
Operating Temperature	$T_{OPR}$	-55 to +125	°C
Operating Supply Voltage	VDC	6	V
ESD per IEC 61000-4-2 (Air)(I/O to GND)	$V_{ESD\_IO}$	18	kV
ESD per IEC 61000-4-2 (Contact) (I/O to GND)		14	
ESD per IEC 61000-4-2 (Air)( $V_{CC}$ to GND)	$V_{ESD\_VCC}$	30	kV
ESD per IEC 61000-4-2 (Contact)( $V_{CC}$ to GND)		30	
DC Voltage at any I/O Pin	$V_{IO}$	(GND-0.5) to ( $V_{CC}+0.5$ )	V

Note 1. See Power Derating Curve.

## Additional Information

Click these links for more information:



[PRODUCT SELECTOR](#) [TECHNICAL LIBRARY](#) [INVENTORY](#) [SAMPLES](#) [CONTACT](#)



**WARNING Cancer and Reproductive Harm** - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

\*RoHS Directive 2015/863, Mar 31, 2015 and Annex.

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Users should verify actual device performance in their specific applications.

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# CDDFN6-0504P - TVS/Steering Diode Array

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

Parameter	Symbol	CDDFN6-0504P	Unit
Maximum Reverse Standoff Voltage <sup>1</sup>	V <sub>RWM</sub>	5.0	V
Maximum Leakage Current <sup>1</sup> @ V <sub>RWM</sub>	I <sub>D</sub>	5.0	μA
Maximum Channel Leakage Current @ V <sub>RWM</sub>	I <sub>CD</sub>	1.0	μA
Minimum Reverse Breakdown Voltage <sup>1</sup> @ I <sub>BY</sub> =1 mA	V <sub>BR</sub>	6.0	V
Maximum Forward Voltage <sup>4</sup> @ I <sub>F</sub> = 15 mA	V <sub>F</sub>	1.0	V
Typical Clamping Voltage <sup>2</sup>	V <sub>C</sub>	8.1	V
Typical ESD Clamping Voltage - I/O per IEC 61000-4-2 +6 kV, Contact <sup>2</sup>	V <sub>clamp_io</sub>	12.5	V
Typical ESD Clamping Voltage-V <sub>CC</sub> <sup>1</sup>	V <sub>clamp_VCC</sub>	9.0	V
Maximum Channel Input Capacitance <sup>2</sup> @ V <sub>PIN5</sub> =5 V, V <sub>PIN2</sub> =0 V, V <sub>IN</sub> =2.5 V, f=1 MHz	C <sub>IN</sub>	1.6	pF
Maximum Channel to Channel Input Capacitance <sup>3</sup> @ V <sub>PIN5</sub> =5 V, V <sub>PIN2</sub> =0 V, V <sub>IN</sub> =2.5 V, f=1 MHz	C <sub>CROSS</sub>	0.14	pF
Maximum Variation of Channel Input Capacitance @ V <sub>PIN5</sub> =5 V, V <sub>PIN2</sub> =0 V, V <sub>IN</sub> =2.5 V, f=1 MHz. (I/O Pin to GND)	ΔC <sub>IN</sub>	0.06	pF

Note 1. Pin 5 to Pin 2 (ground).

Note 2. Pin 1, 3, 4 or 6 to Pin 2 (ground).

Note 3. Between any two of pins 1, 3, 4, 6.

Note 4. Pin 2 (ground) to Pin 5.

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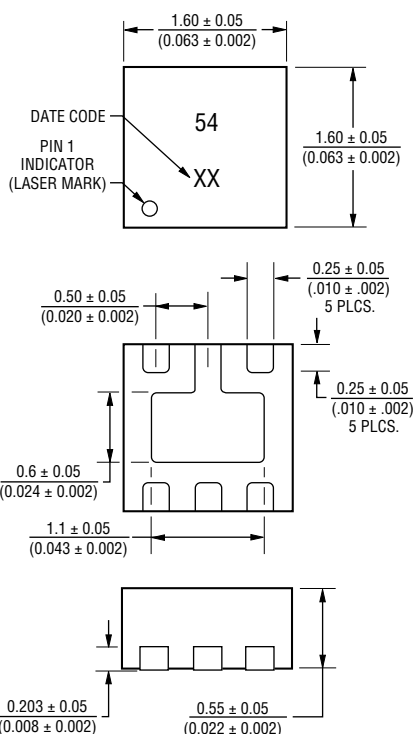
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# CDDFN6-0504P - TVS/Steering Diode Array

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## Product Dimensions

This is a molded DFN6 package with lead free Nickel-Palladium-Gold (Ni/Pd/Au) on the lead frame. It has a flammability rating of UL 94V-0.

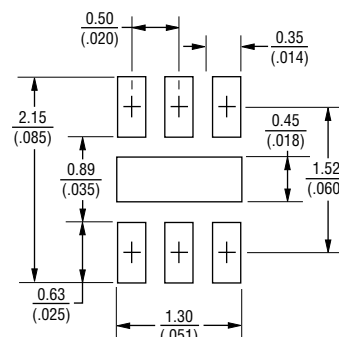


DIMENSIONS:  $\frac{\text{MM}}{(\text{INCHES})}$

## Pin Out

Pin	Function
1	I/O
2	GND
3	I/O
4	I/O
5	V <sub>CC</sub>
6	I/O
Center Tab	GND

## Recommended Footprint



## Typical Part Marking

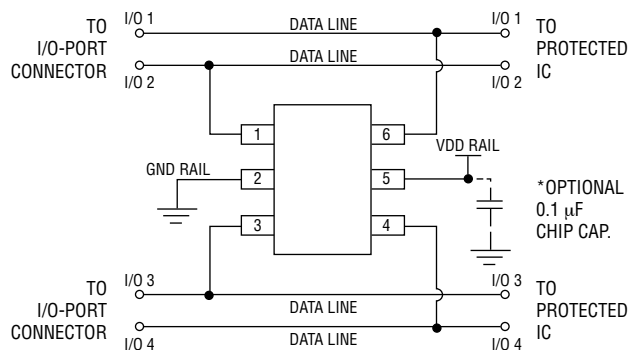
CDDFN6-0504P ..... 54

## How to Order

**CD DFN-6 - 05 04P**

Common Diode \_\_\_\_\_  
 Chip Diode \_\_\_\_\_  
 Package \_\_\_\_\_  
 DFN-6 = DFN-6 Package  
 Working Peak Reverse Voltage \_\_\_\_\_  
 05 = 5 V<sub>RWM</sub> (Volts)  
 Number of Lines \_\_\_\_\_  
 04P = 4 Data Lines

## Typical Application



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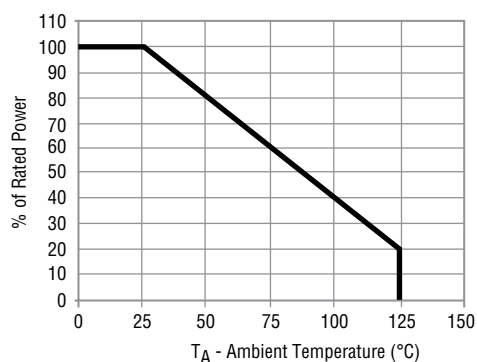
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# CDDFN6-0504P - TVS/Steering Diode Array

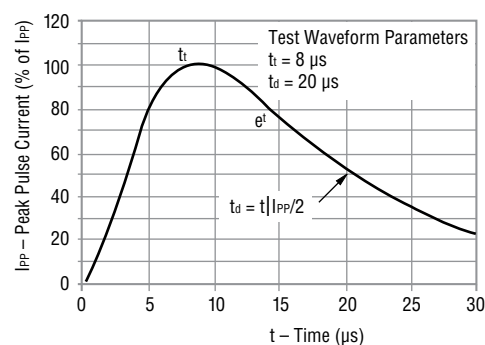
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## Rating & Characteristic Curves

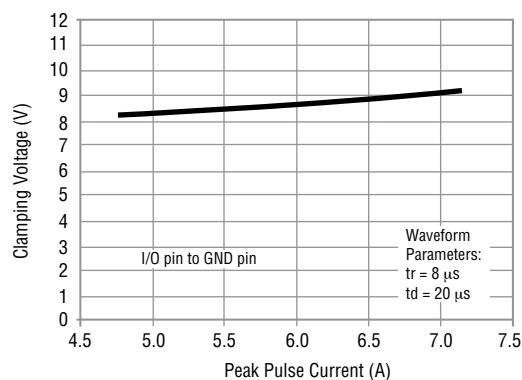
### Power Derating Curve



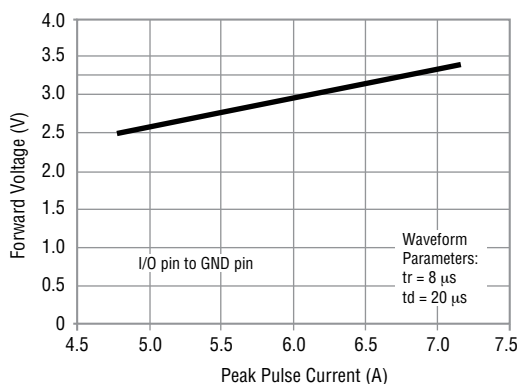
### Pulse Waveform



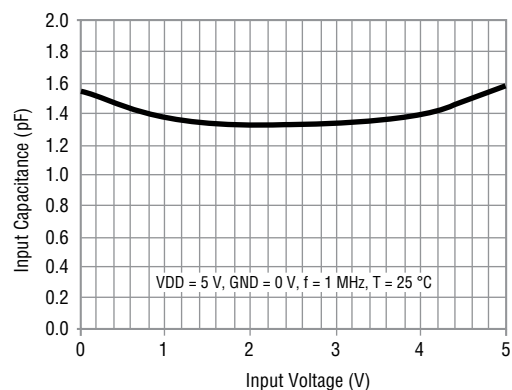
### Clamping Voltage vs. Peak Pulse Current



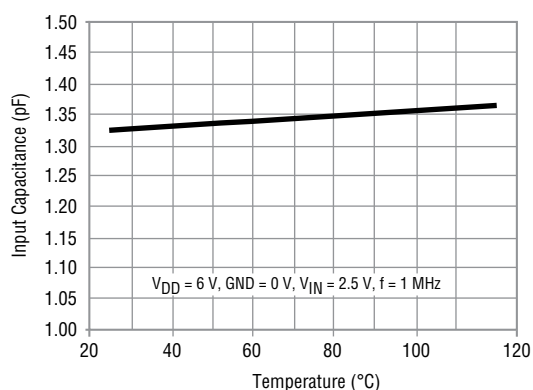
### Forward Voltage vs. Forward Current



### Capacitance vs. Line Voltage



### Capacitance vs. Temperature



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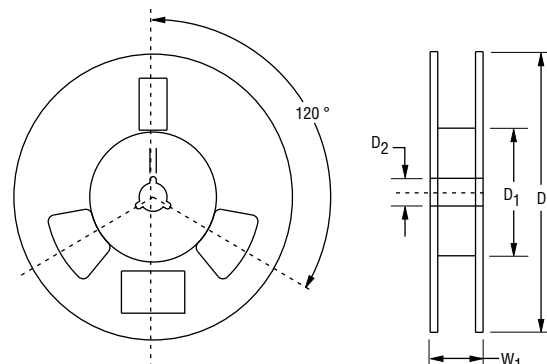
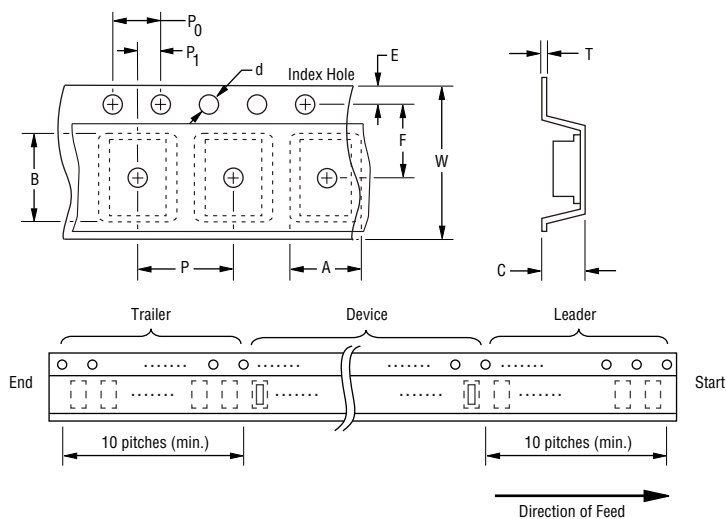
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# CDDFN6-0504P - TVS/Steering Diode Array

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## Packaging Information

The product will be dispensed in tape and reel format (see diagram below).



DIMENSIONS:  $\frac{\text{MM}}{(\text{INCHES})}$

Devices are packed in accordance with EIA standard RS-481-A.

Item	Symbol	DFN-6
Carrier Width	A	$\frac{1.78 \pm 0.05}{(0.070 \pm 0.002)}$
Carrier Length	B	$\frac{1.78 \pm 0.05}{(0.070 \pm 0.002)}$
Carrier Depth	C	$\frac{0.69 \pm 0.05}{(0.027 \pm 0.002)}$
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>	$\frac{50.0}{(1.969)} \text{ MIN.}$
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>	$\frac{14.4}{(0.567)} \text{ MAX.}$
Quantity per Reel	--	3000

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