

## Features

- Power from 10 to 60 W
- Output voltage from 3.3 to 12 V
- Hi-Pot up to 1500 VAC
- Surface mount
- RoHS compliant\*

## Applications

- High efficiency PoE interface and DC/DC controllers
- PoE PD controllers
- Synchronous flyback converters

## PDC-FD Series – DC to DC Transformers

### General Specifications

Operating Temperature..... -40 °C to +125 °C  
 Storage Temperature..... -40 °C to 85 °C  
 Moisture Sensitivity Level..... 1

### Additional Information

Click these links for more information:



### Electrical Specifications @ 25 °C

| Bourns Part Number | Primary Inductance   | Leakage Inductance | DC Resistance @ 0.3 V  | Turns Ratio @ 100 kHz, 0.1 V <sub>rms</sub> <sup>1</sup> | Hi-Pot   |
|--------------------|--|--------------------|--|--|--|
| PDC010-FD15A03S    | (3-5)<br>@ 100 kHz,<br>0.1 V <sub>rms</sub>                          | 166.5 µH<br>±10 %  | (3-5)<br>Other terminals shorted @ 250 kHz, 0.1 V <sub>rms</sub>     | 2.5 µH max.  | (2,3-8,11,12)<br>@ 2 mA,<br>1 sec.                                       |
|                    |  |                    | (7-8)<br>Secondary terminals shorted @ 250 kHz, 0.1 V <sub>rms</sub> | 0.4 µH max.  |  |
|                    |  |                    | (1-2)  | 720 mΩ max.  |  |
|                    |  |                    | (3-5)  | 765 mΩ max.  |  |
| PDC015-FD15A05S    | (1,2-3,4)<br>@ 250 kHz,<br>0.1 V <sub>rms</sub>                      | 95 µH<br>±10 %     | (1,2-3,4)<br>Other terminals shorted @ 100 kHz, 0.1 V <sub>rms</sub> | 1.5 µH max.  | (1,2,5-10,11,12)<br>@ 2 mA,<br>1 sec.                                    |
|                    |  |                    | (4-6)  | 375 mΩ max.  |  |
|                    |  |                    | (7,8,9-10,11,12)   | 10 mΩ max.   |  |
|                    |  |                    | (1-3:10-7,11-8,12-9)   | 5.4 ±2 %   |  |
| PDC020-FD15A12S    | (3,4-5,6)<br>@ 250 kHz,<br>0.1 V <sub>rms</sub>                      | 200 µH<br>±10 %    | (3,4-5,6) w/ (9,10-11,12 shorted) @ 250 kHz, 0.1 V <sub>rms</sub>    | 1.8 µH max.  | (2,3,4-8,11,12)<br>@ 5 mA,<br>1 sec.                                     |
|                    |  |                    | (3,4-5,6) w/ (7-8 shorted) @ 250 kHz, 0.1 V <sub>rms</sub>           | 5.8 µH max.  |  |
|                    |  |                    | (1-2)  | 250 mΩ max.  |  |
|                    |  |                    | (8-7)  | 160 mΩ max.  |  |
| PDC025-FD20A05S    | 1 - 3<br>(1,2 short 3,4 short)<br>@ 250 kHz,<br>0.5 V <sub>rms</sub> | 70 µH<br>±10 %     | (1-3) w/ (1,2 short 3,4 short)                                       | 70 mΩ max.   | (5-1) w/ (1,2 short 3,4 short 7,8, 9 short 10,11,12 short) @ 1mA, 2 sec. |
|                    |  |                    | (12-7)   |  |  |
|                    |  |                    | (11-8)   | 20 mΩ max.   |  |
|                    |  |                    | (10-9)   |  |  |
|                    |  |                    | (5-6)  | 310 mΩ max.  |  |

<sup>1</sup> Turn ratio condition of PDC025-FD20A05S is 250 kHz, 0.5 V<sub>rms</sub>, other part numbers are 100 kHz, 0.1 V<sub>rms</sub>

(Continued)



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

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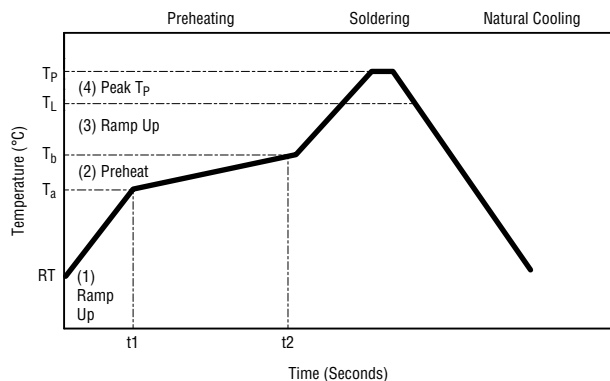
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### Electrical Specifications @ 25 °C (continued)

| Bourns Part Number | Primary Inductance                        |              | Leakage Inductance  |              | DC Resistance @ 0.3 V |             | Turns Ratio @ 100 kHz, 0.1 V <sub>rms</sub> <sup>1</sup> |           | Hi-Pot                          |               |
|--------------------|---|--------------|---|--------------|-----------------------|-------------|--|-----------|---------------------------------|---------------|
| PDC025-FD20A12S    | (3,4-5,6) @ 250 kHz, 0.1 V <sub>rms</sub> | 75 μH ±10 %  | (3,4-5,6) w/ (9,10,11,12 shorted) @ 250 kHz, 0.1 V <sub>rms</sub>         | 0.76 μH max. | (3,4-5,6)             | 77 mΩ max.  | (3,4-5,6:12,11-9,10)                                     | 4.0 ±2 %  | (2,3,4-8,11,12) @ 5 mA, 2 sec.  | 1500 VAC ref. |
|                    |   |              |   |              | (9,10-11,12)          | 9.8 mΩ max. | (3,4-5,6:2-1)  | 4.0 ±2 %  |                                 |               |
|                    |   |              |   |              | (1-2)                 | 96 mΩ max.  | (3,4-5,6:8-7)  | 6.66 ±2 % |                                 |               |
|                    |   |              |   |              | (8-7)                 | 70 mΩ max.  |  |           |                                 |               |
| PDC060-FD20A12S    | (1,2-3,4) @ 200 kHz, 1.0 V <sub>rms</sub> | 20.5 μH ±5 % | (1,2-3,4) w/ (5,6,7,8,9,10,11,12 shorted) @ 100 kHz, 1.0 V <sub>rms</sub> | 1.0 μH max.  | (1,2-3,4)             | 45 mΩ max.  | (1,2-3,4:10,11,12-7,8,9)                                 | 2.67 ±5 % | (1,2,5-10,11,12) @ 1 mA, 2 sec. |               |
|                    |   |              |   |              | (10,11,12-7,8,9)      | 12 mΩ max.  | (1,2-3,4:10,11,12-7,8,9)                                 | 2.28 ±5 % |                                 |               |
|                    |   |              |   |              | (5-6)                 | 250 mΩ max. |  |           |                                 |               |

<sup>1</sup> Turn ratio condition of PDC025-FD20A05S is 250 kHz, 0.5 V<sub>rms</sub>, other part numbers are 100 kHz, 0.1 V<sub>rms</sub>

### Solder Profile



| IR Reflow Profile |  | Pb-Free Assembly      |
|-------------------|--|-----------------------|
| Step #            | Profile Feature  | Condition / Duration  |
| Step 1            | Ramp Up Rate   | 3 °C / second max.    |
| Step 2            | Preheat 150 °C to 200 °C (T <sub>a</sub> to T <sub>b</sub> ) | t1-t2: 60-120 seconds |
| Step 3            | Ramp Up Rate (T <sub>L</sub> to T <sub>P</sub> )             | 3 °C / second max.    |
|                   | Temperature Maintained Above 217 °C                          | 60-150 seconds        |
| Step 4            | Peak Temperature (T <sub>P</sub> )                           | 260 +0/-5 °C          |
|                   | Time Within 5 °C of Actual Peak Temperature                  | 30 seconds max.       |
|                   | Ramp Down Rate (T <sub>P</sub> to T <sub>L</sub> )           | 6 °C/second max.      |

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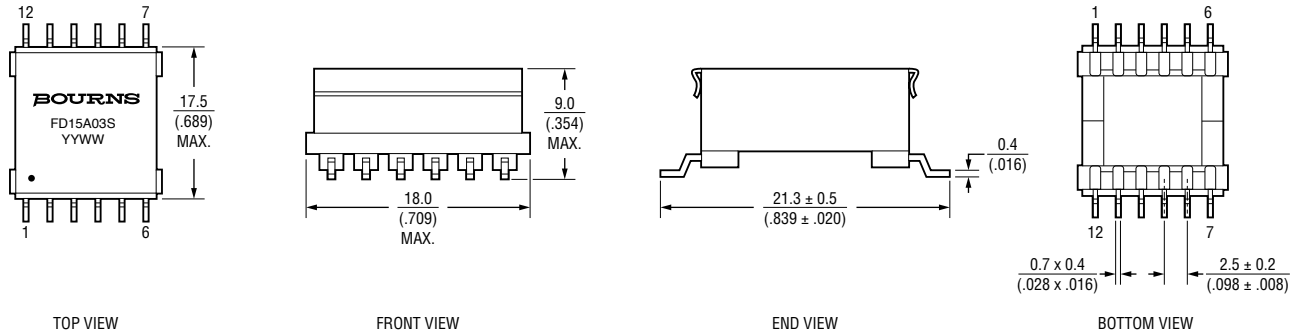
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## PDC-FD Series – DC to DC Transformers

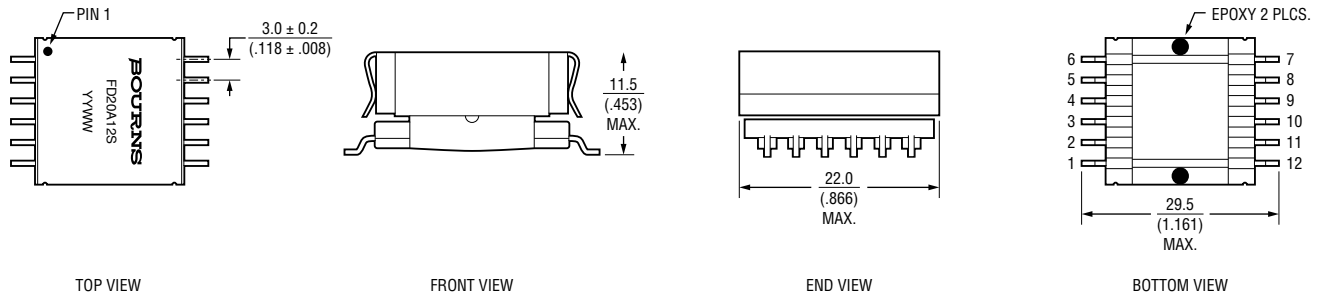
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### Product Dimensions

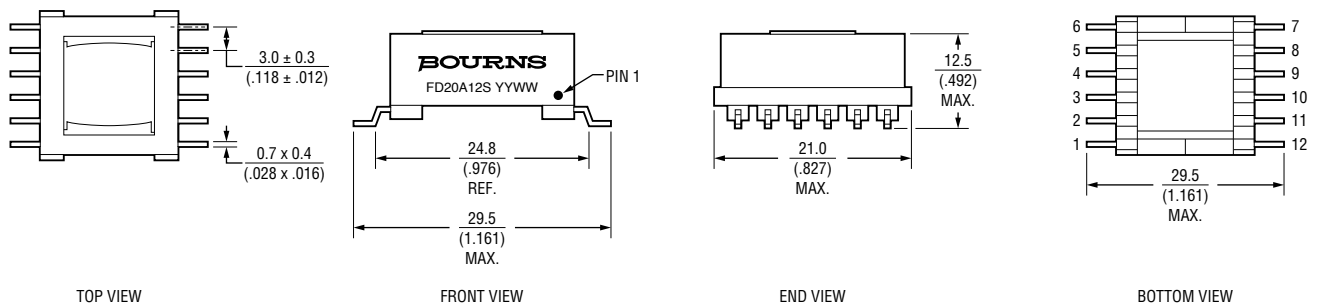
#### PDC010-FD15A03S, PDC015-FD15A05S, PDC020-FD15A12S



#### PDC025-FD20A05S, PDC025-FD20A12S



#### PDC060-FD20A12S



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

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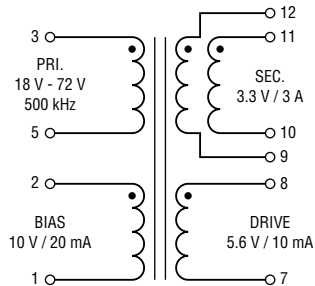
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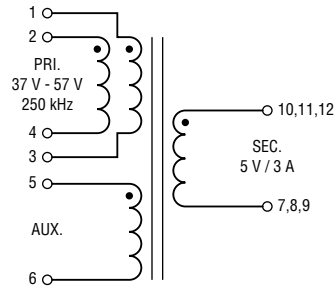
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### Electrical Schematics

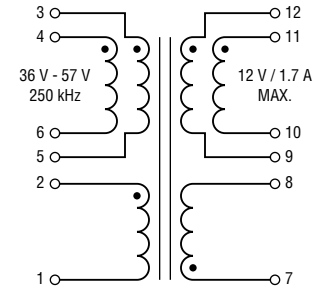
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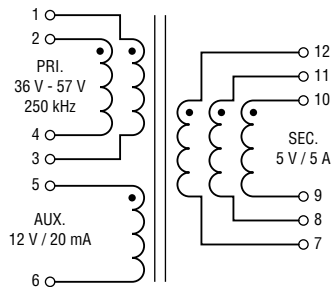
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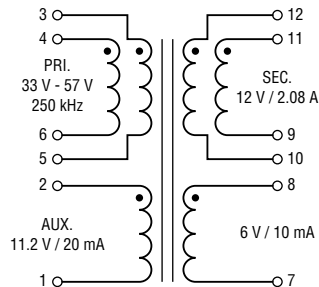
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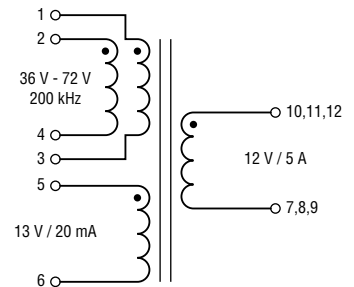
**PDC025-FD20A05S**



**PDC025-FD20A12S**

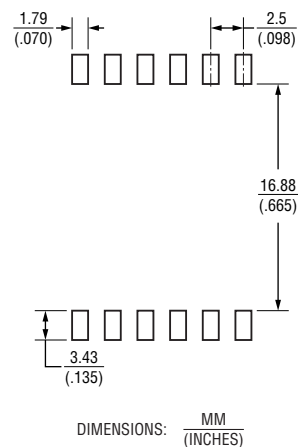


**PDC060-FD20A12S**

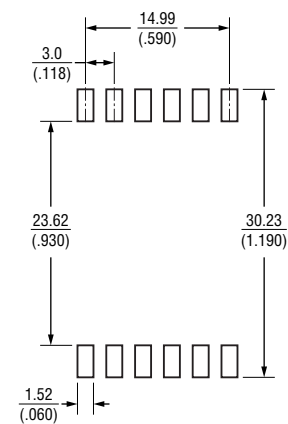


### Recommended Layout

**PDC010-FD15A03S, PDC015-FD15A05S, PDC020-FD15A12S**



**PDC025-FD20A05S, PDC025-FD20A12S, PDC060-FD20A12S**



### How To Order

**PDC 010 - FD15 A 03 S**

Model \_\_\_\_\_  
PDC = DC to DC Transformer

Power Rating \_\_\_\_\_  
010 = 10 W

Core and Size \_\_\_\_\_  
FD15 = EFD15  
EP13 = EP13  
EF13 = EF12.6  
RM08 = RM8

Sub-series \_\_\_\_\_  
A = Sub-series A

Output Voltage \_\_\_\_\_  
03 = 3 V

PCB type \_\_\_\_\_  
S = SMD T = THT

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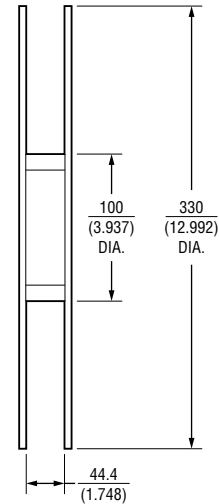
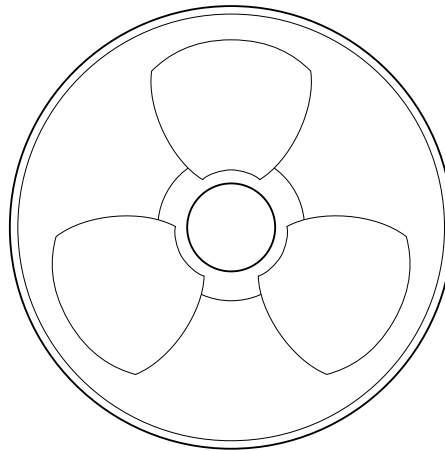
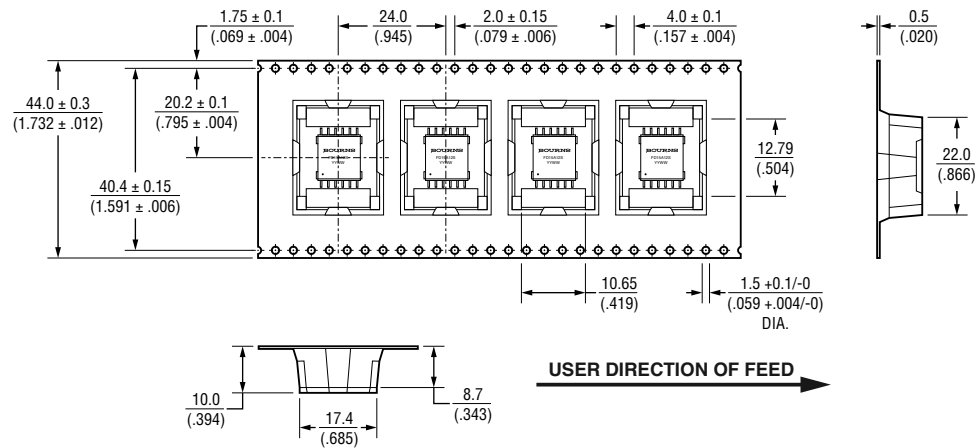
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## PDC-FD Series – DC to DC Transformers

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### Packaging Specifications

PDC010-FD15A03S, PDC015-FD15A05S, PDC020-FD15A12S: 200 pcs./reel, 2 reels/carton, 400 pcs.



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

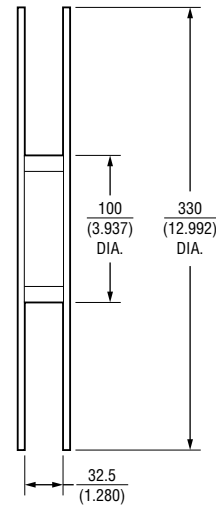
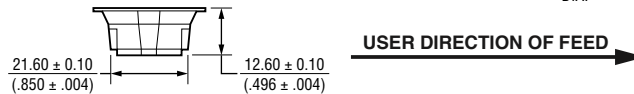
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**PDC025-FD20A05S, PDC025-FD20A12S:** 150 pcs./reel, 2 reels/carton, 300 pcs.


$$\frac{32.5}{(1.280)}$$

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