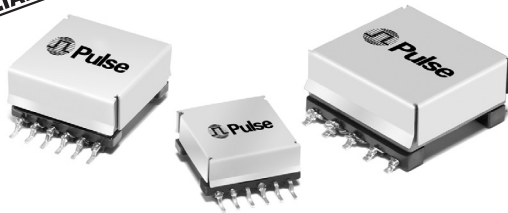


# HIGH FREQUENCY WIRE WOUND TRANSFORMERS

## EFD Platforms - EFD15, EFD20 and EFD25



- 🔌 Transformers and Inductors
- 🔌 Power: 30W to 180W
- 🔌 Three Different Platforms: THT and SMT
- 🔌 Low Profile Platforms: 8.4mm to 13.5mm
- 🔌 Custom designs available

### Electrical Specifications @ 25°C — Operating Temperature -40°C to 125°C

| TRANSFORMERS                                     |                                                                                         |             |              |                    |                                   |                                   |                                   |              |                    |                   |                    |
|--------------------------------------------------|-----------------------------------------------------------------------------------------|-------------|--------------|--------------------|-----------------------------------|-----------------------------------|-----------------------------------|--------------|--------------------|-------------------|--------------------|
| Part <sup>6,7</sup><br>Number                    | Application <sup>2</sup>                                                                | Turns Ratio |              |                    | Primary<br>Secondary<br>Isolation | Primary<br>Inductance<br>(μH MIN) | Leakage<br>Inductance<br>(μH MAX) | DCR (mΩ MAX) |                    |                   |                    |
|                                                  |                                                                                         | Pri.        | Sec.         | Pri. Aux.          |                                   |                                   |                                   | Pri.         | Pri.<br>Aux.       | Sec.<br>A         | Sec.<br>B          |
| EFD 15 PLATFORMS - UP TO 30W                     |                                                                                         |             |              |                    |                                   |                                   |                                   |              |                    |                   |                    |
| EFD 15 - 10 PIN SMT - (21.6MM x 16.3MM x 8.4MM)  |                                                                                         |             |              |                    |                                   |                                   |                                   |              |                    |                   |                    |
| PB2187NL                                         | 15W Flyback Transformer<br>Vin=36-75v, Freq.=225kHz<br>Vout=12v/1.7A, 15v/20mA          | 24          | 12           | 16                 | 1500Vrms<br>Operational           | 38<br>@ 2.2A                      | 0.6                               | 190          | 410                | 50                | N/A                |
| EFD 15 - 12 PIN SMT - (22.2MM x 17.2MM x 8.4MM)  |                                                                                         |             |              |                    |                                   |                                   |                                   |              |                    |                   |                    |
| PA0476NL                                         | 15W Flyback Transformer<br>Vin=18-72v, Freq.=500kHz<br>Vout=5v/3A, 10v/20mA             | 16          | 3            | 7                  | 500Vrms<br>Operational            | 35.5                              | 0.15                              | 23.5         | 87                 | 8                 | N/A                |
| PA0691NL                                         | 15W Flyback Transformer<br>Vin=30-57v, Freq.=100kHz<br>Vout=3.3v/3A, 5.6v/10mA10v/20mA  | 52          | 8 &<br>14    | 26                 | 500Vdc<br>Operational             | 146<br>@ 1.2A                     | 2.4                               | 600          | 2000               | 20<br>(3.3v)      | 720<br>(5.6v)      |
| PA1039NL                                         | 15W Flyback Transformer<br>Vin=29-59v, Freq.=100kHz<br>Vout=5v/2A, 7.5v/10mA10v/20mA    | 50          | 10 &<br>15   | 22                 | 500Vdc<br>Operational             | 137.5<br>@ 1.2A                   | 2.0                               | 500          | 1300               | 25                | 760                |
| PA1067NL                                         | 20W Forward Transformer<br>Vin=34-75v, Freq.=555kHz<br>Vout=3.3v/6A, 12v/25mA           | 12          | 3            | 10 &<br>12 (reset) | 500Vrms                           | 79                                | 1                                 | 70           | 70 & 70<br>(reset) | 6                 | N/A                |
| EFD 20 PLATFORMS - UP TO 80W                     |                                                                                         |             |              |                    |                                   |                                   |                                   |              |                    |                   |                    |
| EFD 20 - 8 PIN THT - (21.0MM x 21.0MM x 13.0MM)  |                                                                                         |             |              |                    |                                   |                                   |                                   |              |                    |                   |                    |
| PA1040NL                                         | 80W Forward Transformer<br>Vin=30-57v, Freq.=250kHz<br>Vout=12v/5A, -12v/1.6A, 12v/0.1A | 14          | 7 & 7        | 7                  | 1500Vdc<br>Operational            | 154                               | 2                                 | 45           | 80                 | 15                | 24                 |
| EFD 20 - 10 PIN SMT - (26.2MM x 21.8MM x 10.4MM) |                                                                                         |             |              |                    |                                   |                                   |                                   |              |                    |                   |                    |
| PB2003NL                                         | 30W Flyback Transformer<br>Vin=36-72v, Freq.=300kHz<br>Vout=5v/6A, 15v/0.1A             | 16          | 2            | 7                  | 1500Vrms<br>Operational           | 29.2<br>@ 3.0A                    | 1.7                               | 75           | 75                 | 4.5               | N/A                |
| EFD 20 - 12 PIN SMT - (29.2MM x 21.8MM x 11.4MM) |                                                                                         |             |              |                    |                                   |                                   |                                   |              |                    |                   |                    |
| PA0273NL                                         | 50W Forward Transformer<br>Vin=36-72v, Freq.=250kHz<br>Vout=12v/4.5A, 12v/0.1A          | 16          | 10           | 10                 | 1500Vrms<br>Basic                 | 230                               | 0.35                              | 65           | 240                | 27                | N/A                |
| PA0751NL                                         | 13W Flyback Transformer<br>Vin=25-75v, Freq.=250kHz<br>Vout=3.3v/4.5A, 15v/0.1A         | 26          | 6            | 18                 | 700Vdc<br>Operational             | 99                                | 2                                 | 85           | 300                | 12                | N/A                |
| PA0769NL                                         | 100W Forward Transformer<br>Vin=36-75v, Freq.=250kHz<br>Vout=±12v/2.1A, 5v/9A           | 15          | 7 & 7<br>& 3 | 5                  | 1500Vdc<br>Operational            | 74                                | 1.5                               | 50           | 110                | 35 & 35<br>(±12v) | 3.8<br>(5v)        |
| PA1066NL                                         | 45W Forward Transformer<br>Vin=30-75v, Freq.=550kHz<br>Vout=±5v/4.5A, 12v/20mA          | 11          | 4 & 4        | 9 & 11<br>(reset)  | 500Vrms                           | 93                                | 1                                 | 35           | 100                | 15 & 15           | N/A                |
| PB2041NL                                         | 48W Forward Transformer<br>Vin=36-75v, Freq.=230kHz<br>Vout=12v/3A, -12v/1A             | 10 + 10     | 12<br>& 12   | N/A                | 1500Vrms<br>Basic                 | 324                               | 1                                 | 82           | N/A                | 30.8<br>(+12v)    | 86.4<br>(-12v Sec) |
| PB2089NL                                         | 33W Forward Transformer<br>Vin=36-72v, Freq.=250kHz<br>Vout=3.3v/10A, 2.2v/0.05A        | 13          | 3 & 2        | 13<br>(reset)      | 1500Vrms<br>Basic                 | 141                               | 1                                 | 31           | 923                | 5.5<br>(3.3v Sec) | 112<br>(2.2v Sec)  |
| PB2134NL                                         | 12W Flyback Transformer<br>Vin=36-57v, Freq.=200kHz<br>Vout=3.3v/3.5A, 12v/0.1A         | 32          | 4            | 15                 | 1800Vdc<br>Operational            | 195<br>@ 1.0A                     | 5                                 | 200          | 215                | 12                | N/A                |

(Transformers continued on next page)

# HIGH FREQUENCY WIRE WOUND TRANSFORMERS

## EFD Platforms - EFD15, EFD20 and EFD25



### Electrical Specifications @ 25°C — Operating Temperature -40°C to 125°C

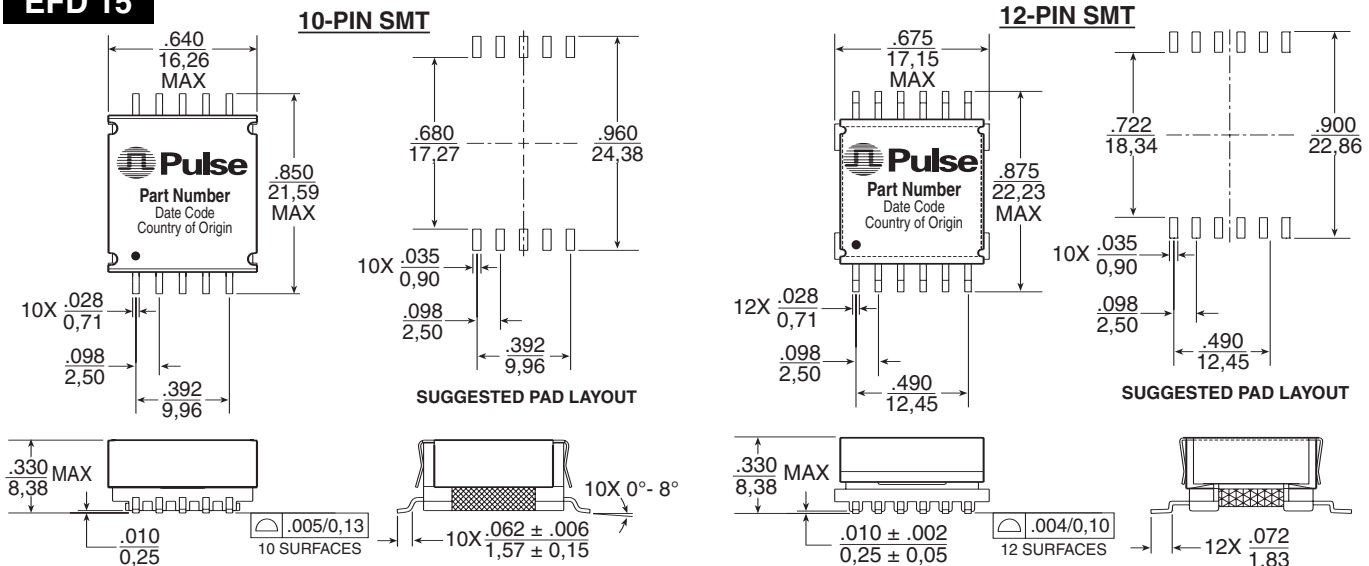
| TRANSFORMERS (continued)                         |                                                                                 |                           |              |                       |                             |                             |                             |                                     |                                      |                                  |                                |
|--------------------------------------------------|---------------------------------------------------------------------------------|---------------------------|--------------|-----------------------|-----------------------------|-----------------------------|-----------------------------|-------------------------------------|--------------------------------------|----------------------------------|--------------------------------|
| Part <sup>6,7</sup> Number                       | Application <sup>2</sup>                                                        | Turns Ratio               |              |                       | Primary Secondary Isolation | Primary Inductance (μH MIN) | Leakage Inductance (μH MAX) | DCR (mΩ MAX)                        |                                      |                                  |                                |
|                                                  |                                                                                 | Pri.                      | Sec.         | Pri. Aux.             |                             |                             |                             | Pri.                                | Pri. Aux.                            | Sec. A                           | Sec. B                         |
| EFD 25 PLATFORMS - UP TO 180W                    |                                                                                 |                           |              |                       |                             |                             |                             |                                     |                                      |                                  |                                |
| EFD 25 - 10 PIN THT - (26.4MM x 26.1MM x 14.0MM) |                                                                                 |                           |              |                       |                             |                             |                             |                                     |                                      |                                  |                                |
| PA0397NL                                         | 100W Forward Transformer<br>Vin=36-75v, Freq.=250kHz<br>Vout=3.3v/30A, 12v/0.1A | 9                         | 2            | 8                     | 1500Vdc Basic               | 113                         | 0.64                        | 21                                  | 570                                  | 3.3                              | N/A                            |
| EFD 25 - 10 PIN SMT - (32.0MM x 26.2MM x 13.5MM) |                                                                                 |                           |              |                       |                             |                             |                             |                                     |                                      |                                  |                                |
| PA0302NL                                         | 165 F-Bridge Transformer<br>Vin=21-56v, Freq.=230kHz<br>Vout=15v/11A            | 1                         | 1            | 1                     | 500Vrms Operational         | 24                          | 0.1                         | 8                                   | 130                                  | 8                                | 8                              |
| EFD 25 - 12 PIN SMT - (32.0MM x 26.2MM x 13.7MM) |                                                                                 |                           |              |                       |                             |                             |                             |                                     |                                      |                                  |                                |
| PA0700NL                                         | 72W Forward Transformer<br>Vin=12v, Freq.=250kHz<br>Vout=48v/1.5A               | 3                         | 22           | N/A                   | 2250Vrms Operational        | 21.4                        | 0.5                         | 4                                   | N/A                                  | 95                               | N/A                            |
| INDUCTORS                                        |                                                                                 |                           |              |                       |                             |                             |                             |                                     |                                      |                                  |                                |
| Part <sup>6,7</sup> Number                       | Application <sup>2</sup>                                                        | Induct. @ Irated (μH MIN) | Irated (Adc) | Turns Ratio           | DCR (mΩ MAX)                |                             |                             | Induct. 0 Adc <sup>3</sup> (μH ±7%) | Saturation Current <sup>4</sup> @25° | Heating Current <sup>5</sup> (A) | ±12v Winding to Aux. Isolation |
|                                                  |                                                                                 |                           |              |                       | Winding 1                   | Winding 2                   | Winding 3                   |                                     |                                      |                                  |                                |
| EFD 20 PLATFORMS                                 |                                                                                 |                           |              |                       |                             |                             |                             |                                     |                                      |                                  |                                |
| EFD 20 - 12 PIN SMT - (29.2MM x 21.8MM x 11.4MM) |                                                                                 |                           |              |                       |                             |                             |                             |                                     |                                      |                                  |                                |
| PB2042NL                                         | Output Inductor for PB2041 Transformer                                          | 13                        | 4            | 3:3:4 (+12v:-12v:Aux) | 29.2 (+12v)                 | 87.6 (+12v)                 | 253 (15v Aux.)              | 14.4                                | 5                                    | 4                                | 1500 Vrms Basic                |

#### Notes:

- The temperature of the component (ambient plus temperature rise) must be within the stated operating temperature range.
- The above transformers and inductors have been tested and approved by Pulse's power IC partners and are sited in the appropriate datasheet or evaluation board documentation at these companies. To determine which IC and IC partners are matched with the above Pulse part numbers please consult the IC Cross Reference on the Pulse website.
- The rated current as listed is either 85% of the saturation current or the heating current whichever is lower.
- The saturation current is the current which causes the inductance to drop by 20% at 25°C. This current is determined by placing the component in the specified ambient environment and applying a short duration pulse current (to eliminate self-heating effects) to the component.
- The heating current is the dc current which causes the temperature of the part to increase by approximately 40°C.
- Add 'T' suffix to the part number for Tape & Reel version (ie: PB2041NLT).
- The "NL" suffix indicates an RoHS-compliant part number. Non-NL suffixed parts are not necessarily RoHS compliant, but are electrically and mechanically equivalent to NL versions. If a part number does not have the "NL" suffix, but an RoHS compliant version is required, please contact Pulse for availability.

## Mechanicals

### EFD 15



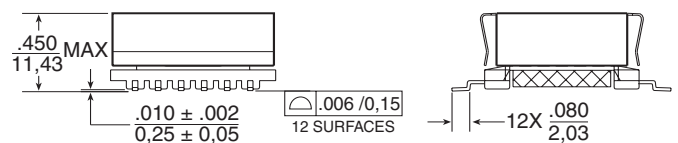
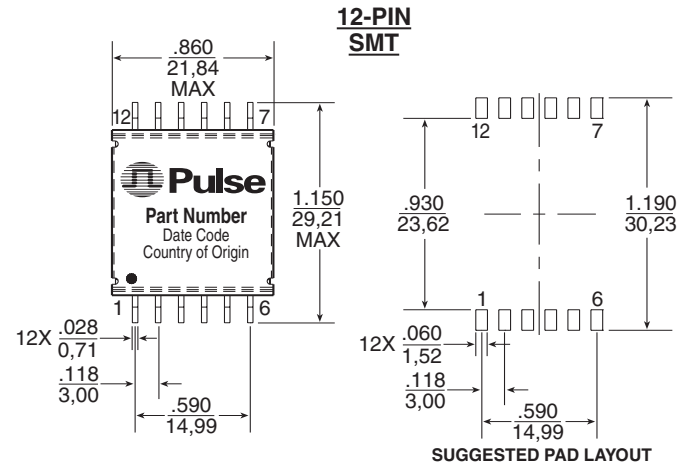
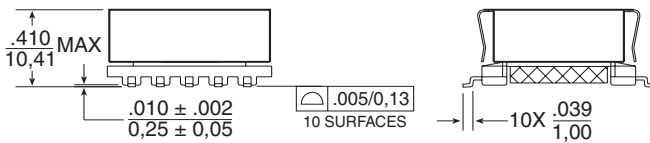
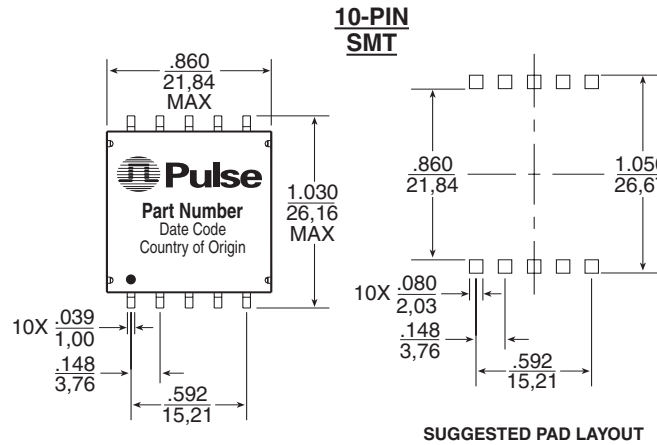
# HIGH FREQUENCY WIRE WOUND TRANSFORMERS

## EFD Platforms - EFD15, EFD20 and EFD25

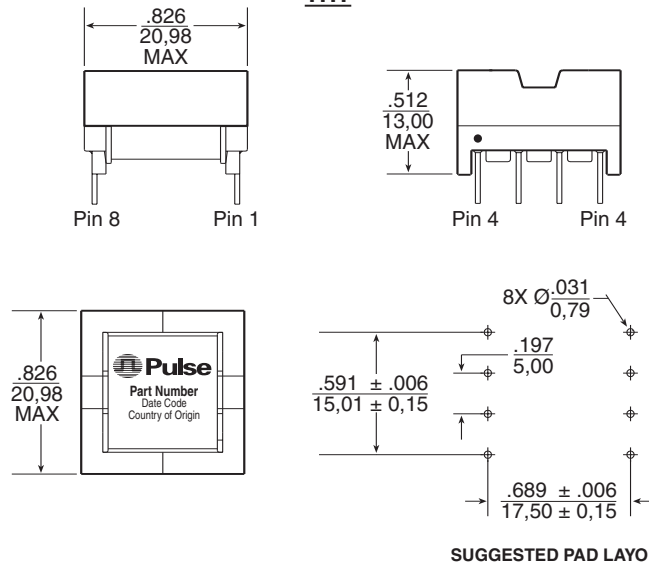


### Mechanicals

#### EFD 20



#### 8-PIN THT



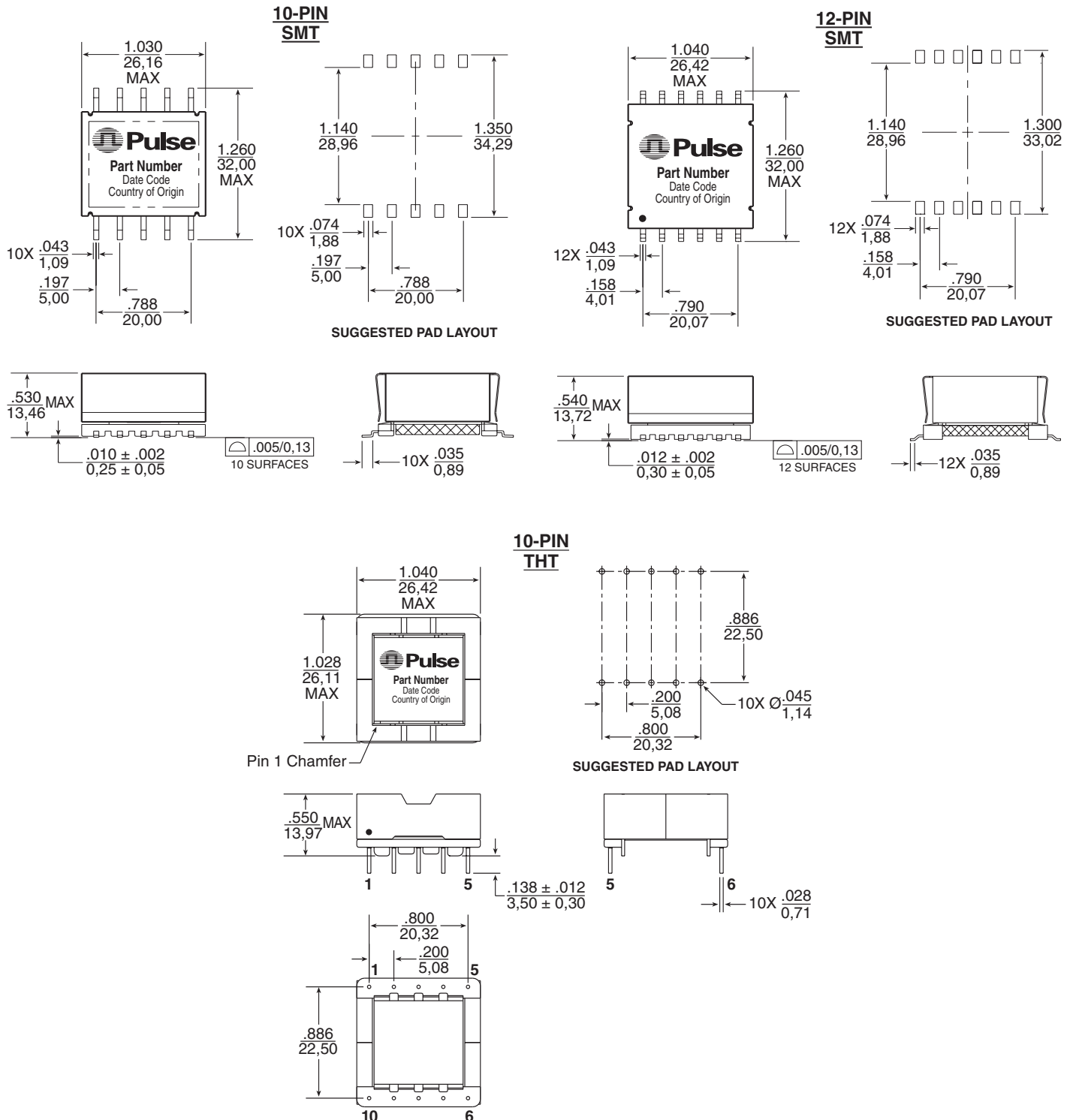
# HIGH FREQUENCY WIRE WOUND TRANSFORMERS

## EFD Platforms - EFD15, EFD20 and EFD25



### Mechanicals

#### EFD 25



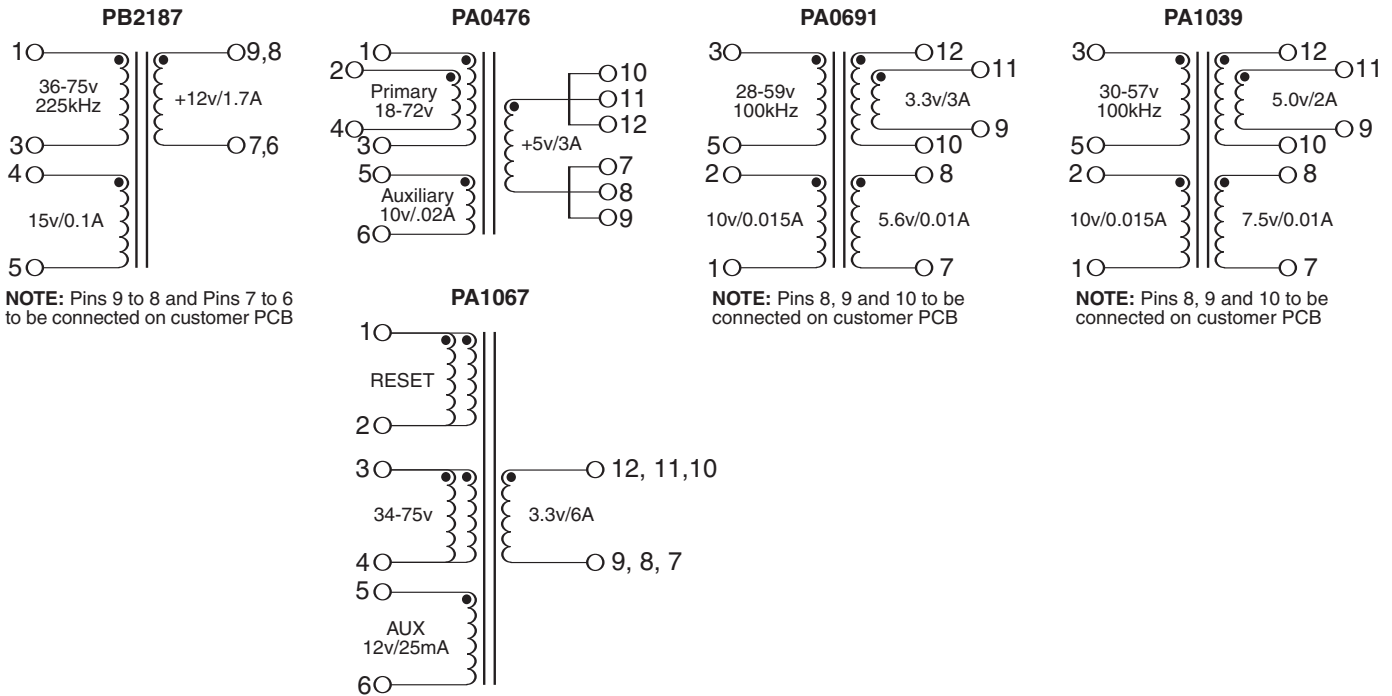
# HIGH FREQUENCY WIRE WOUND TRANSFORMERS

## EFD Platforms - EFD15, EFD20 and EFD25

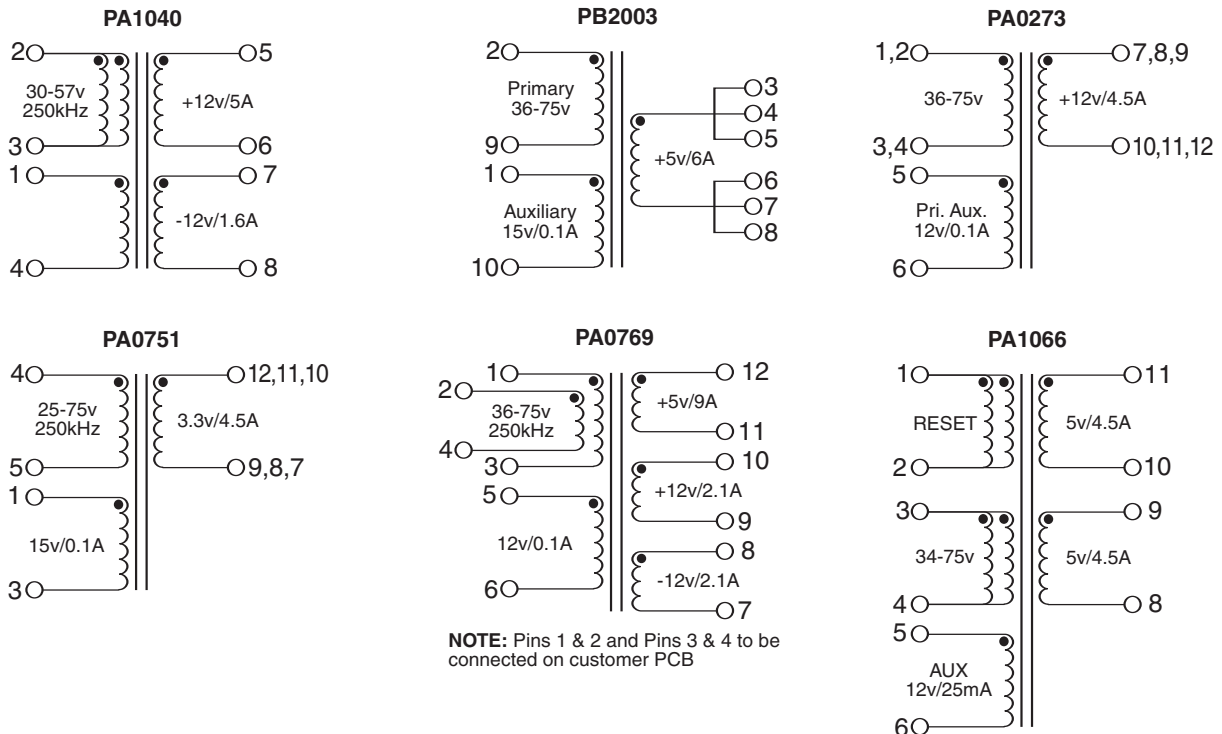


### Schematics

#### EFD 15



#### EFD 20



(EFD 20 Schematics continued on next page)

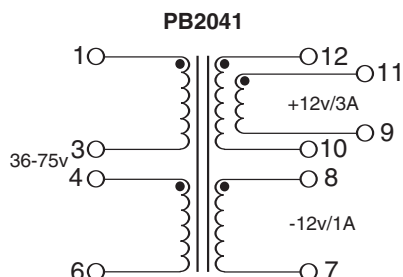
# HIGH FREQUENCY WIRE WOUND TRANSFORMERS

## EFD Platforms - EFD15, EFD20 and EFD25

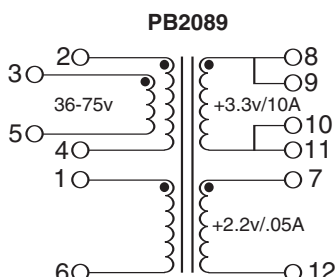


### Schematics

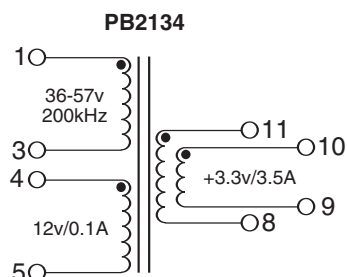
#### EFD 20 (continued)



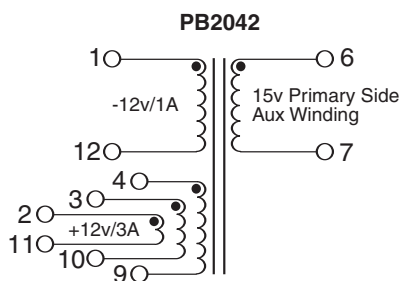
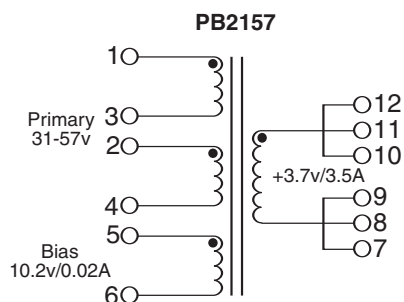
**NOTE:** Pins 12 & 11, Pins 9 & 10, and Pins 3 & 4 to be connected on customer PCB



**NOTE:** Pins 2 & 3 and Pins 4 & 5 to be connected on customer PCB

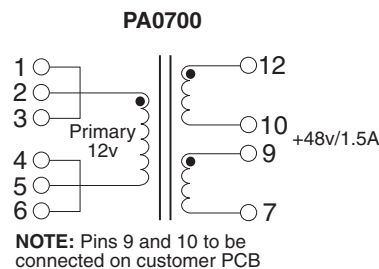
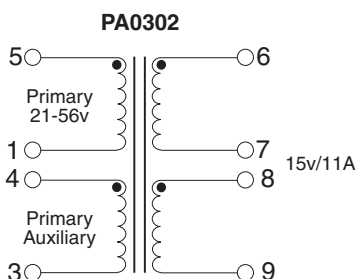
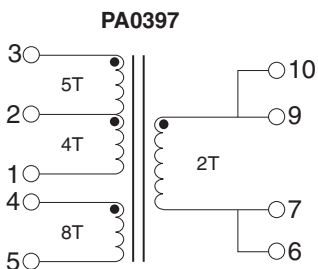


**NOTE:** Pins 10 & 11, Pins 8 & 9 to be connected on customer PCB



**NOTE:** Pins 2, 3 & 4 and Pins 9, 10 & 11 to be connected on customer PCB

#### EFD 25



**NOTE:** Pins 9 and 10 to be connected on customer PCB