# Flyback & Forward Transformers for PoE

- Flyback and Forward transformers for PoE up to 72 Watts
- Operates with 9 – 57 V input (POE21, 22, 23, 33, 35 and 38)
- Operates with 33 – 57 V input (POE23, 30, 36, 53, 70, and 72)
- One minute isolation (hipot): 1500Vrms, from pri and aux to each sec; 500 Vrms from pri to aux; 500 Vrms between two secondary
- Dual outputs can be configured as one single higher power output
- AEC-Q200 Grade 1 (~40°C to +125°C)

## Core material
Ferrite

**Environment**
RoHS compliant, halogen free

**Terminations**
Tin-silver-copper over tin over nickel over phos bronze.

**Weight**
7.1 – 7.9 g

**Ambient temperature**
−40°C to +125°C

**Maximum part temperature**
+165°C (Ambient + temp rise)

**Storage temperature**
Component: −40°C to +165°C
Tape and reel packaging: −40°C to +80°C

**Resistance to soldering heat**
Max three 40 second reflows at +260°C, parts cooled to room temperature between cycles

**Moisture Sensitivity Level (MSL)**
1 (unlimited floor life at <30°C / 85% relative humidity)

## Flyback Transformers

<table>
<thead>
<tr>
<th>Part number</th>
<th>Power (W)</th>
<th>L at 0 A ±10% (µH)</th>
<th>Isat (A)</th>
<th>DCR max (mOhms)</th>
<th>Leakage inductance (µH)</th>
<th>Turns ratio</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>pri</td>
<td>sec1</td>
<td>sec2</td>
<td>aux</td>
<td>pri : sec1 : sec2 : aux</td>
<td></td>
<td></td>
</tr>
<tr>
<td>POE21PR-33ED</td>
<td>21</td>
<td>6.2</td>
<td>31</td>
<td>10</td>
<td>0.30</td>
<td>1 : 0.231 : 0.231 : 0.692</td>
<td>3.3 V, 3.2 A</td>
</tr>
<tr>
<td>POE23PR-33ED</td>
<td>23</td>
<td>3.2</td>
<td>62</td>
<td>6.5</td>
<td>0.67</td>
<td>1 : 0.125 : 0.125 : 0.375</td>
<td>3.3 V, 3.5 A</td>
</tr>
<tr>
<td>POE22PR-50ED</td>
<td>22</td>
<td>6.2</td>
<td>31</td>
<td>17</td>
<td>0.16</td>
<td>1 : 0.333 : 0.333 : 0.750</td>
<td>5.0 V, 2.2 A</td>
</tr>
<tr>
<td>POE30PR-50ED</td>
<td>30</td>
<td>3.6</td>
<td>62</td>
<td>10</td>
<td>0.40</td>
<td>1 : 0.188 : 0.188 : 0.375</td>
<td>5.0 V, 3.0 A</td>
</tr>
<tr>
<td>POE24PR-12ED</td>
<td>24</td>
<td>6.3</td>
<td>31</td>
<td>52</td>
<td>0.15</td>
<td>1 : 0.750 : 0.750 : 0.667</td>
<td>12 V, 1.0 A</td>
</tr>
<tr>
<td>POE36PR-12ED</td>
<td>36</td>
<td>4.2</td>
<td>62</td>
<td>23</td>
<td>0.28</td>
<td>1 : 0.375 : 0.375 : 0.375</td>
<td>12 V, 1.5 A</td>
</tr>
</tbody>
</table>

1. **Packaging:** D = 13” machine-ready reel. EIA-481 embossed plastic tape (150 parts per full reel). Quantities less than full reel available: in tape (not machine ready) or with leader and trailer ($25 charge).

2. Inductance is for the primary, measured at 200 kHz, 0.1 Vrms, 0 Adc.

3. DC current at 25°C that causes an inductance drop of < 30% from its value without current.

4. Leakage inductance measured between pins 1 and 3 with all other pins shorted.

5. Output is for each secondary. Output of the aux winding is 10 V, 50 mA.

6. Electrical specifications at 25°C.

Refer to Doc 362 “Soldering Surface Mount Components” before soldering.

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**Document 1489-1**

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Transformers for PoE
Forward Mode Transformers

<table>
<thead>
<tr>
<th>Part number</th>
<th>Power (W)</th>
<th>L at 0 A² (µH)</th>
<th>DCR max (mOhms)</th>
<th>Turns ratio</th>
<th>Leakage inductance max (µH)</th>
<th>Output</th>
<th>Volt-time product (V-µsec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>POE33PR-33ED</td>
<td>33</td>
<td>128 ±25%</td>
<td>17</td>
<td>12.5</td>
<td>12.5</td>
<td>145</td>
<td>1 : 0.625 : 0.625 : 0.75</td>
</tr>
<tr>
<td>POE35PR-33ED</td>
<td>53</td>
<td>100 ±15%</td>
<td>30</td>
<td>6.5</td>
<td>6.5</td>
<td>120</td>
<td>1 : 0.167 : 0.167 : 0.50</td>
</tr>
<tr>
<td>POE35PR-50ED</td>
<td>35</td>
<td>128 ±15%</td>
<td>17.6</td>
<td>23</td>
<td>23</td>
<td>340</td>
<td>1 : 0.875 : 0.875 : 1.75</td>
</tr>
<tr>
<td>POE70PR-33ED</td>
<td>70</td>
<td>100 ±15%</td>
<td>30</td>
<td>10</td>
<td>10</td>
<td>120</td>
<td>1 : 0.250 : 0.250 : 0.50</td>
</tr>
<tr>
<td>POE38PR-12ED</td>
<td>38</td>
<td>128 ±15%</td>
<td>17.6</td>
<td>122</td>
<td>122</td>
<td>340</td>
<td>1 : 2.125 : 2.125 : 1.75</td>
</tr>
<tr>
<td>POE72PR-12ED</td>
<td>72</td>
<td>100 ±15%</td>
<td>38</td>
<td>27</td>
<td>27</td>
<td>120</td>
<td>1 : 0.583 : 0.583 : 0.50</td>
</tr>
</tbody>
</table>

1. **Packaging:** D = 13” machine-ready reel. EIA-481 embossed plastic tape (150 parts per full reel). Quantities less than full reel available: in tape (not machine ready) or with leader and trailer ($25 charge).

2. Inductance is for the primary, measured at 200 kHz, 0.1 Vrms, 0 Adc.

3. Leakage inductance measured between pins 1 and 3 with all other pins shorted.

4. Output is for each secondary. Output of the aux winding is 10 V, 50 mA.

5. Based on 280 mT at 25°C and number of turns on pins 1-3.

6. Electrical specifications at 25°C.

Refer to Doc 362 “Soldering Surface Mount Components” before soldering.

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**Dimensions are in inches/mm**

Packaging: 150 per 13” reel. Plastic tape: 44 mm wide, 0.5 mm thick, 28 mm pocket spacing, 14.6 mm pocket depth

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**Notes:**

1. **Electrical Spec:** 280 mT at 25°C.

2. **Reliability:** Lead-150, MIL-150, Class B, 2000 hours at 85°C.

3. **Environmental:** RoHS compliant, lead-free, halogen-free.

4. **Certifications:** UL, CE, FCC, REACH, AEC-Q200, CECC, UL/cUL, WEEE, RoHS.

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**Recommended Land Pattern:**

- **Internal code:** XXXX
- **Internal code:** Y
- **Dot indicates pin 1**

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**Packaging:**

- **150 per 13” reel**
- **Plastic tape:** 44 mm wide, 0.5 mm thick, 28 mm pocket spacing, 14.6 mm pocket depth

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Transformers for PoE
L vs Current

- **POE21PR-33ED**
- **POE23PR-33ED**
- **POE22PR-50ED**
- **POE30PR-50ED**
- **POE24PR-12ED**
- **POE36PR-12ED**

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