Versatile Planar Transformer

FEATURES
- Designed for switch mode power supply applications (transformer and choke inductor)
- End user configures the transformer by using a software supplied
- Frequency range: 50 kHz to 400 kHz
- Suitable for through hole
- UL 94 V-0 material
- High power up to 220 W
- Operating temperature: -55 °C to +125 °C
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

APPLICATIONS: DC/DC POWER SUPPLY
- Switching mode power supplies
- DC/DC converters

**QUICK REFERENCE DATA**

<table>
<thead>
<tr>
<th>Type</th>
<th>Transformer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size (L x W x H)</td>
<td>40 mm x 35 mm x 12 mm</td>
</tr>
<tr>
<td>Terminals</td>
<td>Through holes</td>
</tr>
<tr>
<td>Power</td>
<td>Up to 220 W</td>
</tr>
<tr>
<td>Frequency range</td>
<td>50 kHz to 400 kHz</td>
</tr>
<tr>
<td>Inductance range</td>
<td>5.2 μH to 4032 μH</td>
</tr>
</tbody>
</table>

**DIMENSIONS** in millimeters (± 0.5)

**TECHNOLOGY**

PLAC 100 is a highly flexible planar transformer. Inhouse the design engineer can adapt the different combinations of serial and parallel configurations of the windings to give a substantial number of ratio and current possibilities via the supplied software.

The transformer is one of the first critical components in the design of power supply and converters. PLAC 100 allows a great versatility for many power supply topologies: forward, flyback, half-bridge, bridge ...

Thanks to this adaptability it enables user to reduce and optimize times during the development and the production of power supplies.
PRINCIPLE OF USE

Available windings:
- 6 windings with 1 turn
- 6 windings with 3 turns

The user determines their own configuration of the windings via the PCB layout - software provided PLAC 100 SOFT.

Note
- See also application note: www.vishay.com/doc?59056

### TECHNICAL DATA ALLOWING CONCEPTION

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$B_{sat}$</td>
<td>Saturation flux density</td>
<td>$&lt; 300$ mT at 100 °C</td>
</tr>
<tr>
<td>$A_e$</td>
<td>Effective cross-sectional area of a core</td>
<td>$113$ mm²</td>
</tr>
<tr>
<td>$V_e$</td>
<td>Effective volume of a core</td>
<td>$4234$ mm³</td>
</tr>
<tr>
<td>$R_{th}$</td>
<td>Thermal resistance</td>
<td>$22$ °C/W</td>
</tr>
<tr>
<td>$P_c$</td>
<td>Core power loss</td>
<td></td>
</tr>
</tbody>
</table>

$f$: 50 kHz to 200 kHz (excluded)
$f$: 200 kHz (included) to 400 kHz

**Core power loss**

$f$: $P_c = 5.8 \times 10^{-6} \cdot f \cdot (\frac{B}{T})^{1.51} \cdot (\frac{V}{T})^{2.94}$

$f$: $P_c = 11 \times 10^{-9} \cdot f \cdot (\frac{B}{T})^{1.96} \cdot (\frac{V}{T})^{2.55}$

**f**: frequency; **B**: peak-peak flux density

### STANDARD ELECTRICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>MODEL</th>
<th>INDUCTANCE $\mu$H</th>
<th>POWER RANGE W</th>
<th>FREQUENCY kHz</th>
<th>POWER SUPPLY TOPOLOGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLAC 100</td>
<td>7 to 63</td>
<td>Up to 220</td>
<td>50 to 400</td>
<td>Flyback; forward; push-pull; bridge; half-bridge</td>
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</table>

### ELECTRICAL CHARACTERISTICS at 25 °C

3 turn coil (13 to 24)
Inductance without air gap (0.1 V, 10 kHz) $63 \mu$H ± 25 %
1 turn coil (1 to 12)
Inductance without air gap (0.1 V, 10 kHz) $7 \mu$H ± 25 %
Al (nH) without air gap (UG) 7000
Al (nH) expendable 100; 160; 250; 400; 630

$R_{DC}$ 1 turn coil (1 to 12) (typical value) 3 mΩ
$R_{DC}$ 3 turn coil (13 to 24) (typical value) 35 mΩ

Hipot between 1 turn winding/3 turns winding with if < 100 µA 1000 VAC
Hipot between 1 turn winding with if < 100 µA 300 VAC
Hipot between 3 turn winding with if < 100 µA 300 VAC
Hipot between winding and ground with if < 100 µA 800 VAC
FORWARD: $P_{\text{out, max.}}$; Duty cycle = 0.45

FLYBACK: $P_{\text{out, max.}}$; Duty cycle = 0.45

**MARKING**
- Vishay trademark
- Part number
- Manufacturing date

**TERMINALS FINISH**
- e3 = pure tin

**PACKAGE**
- Box of 15 pieces

**SAP PART NUMBERING**

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<table>
<thead>
<tr>
<th>P</th>
<th>L</th>
<th>A</th>
<th>C</th>
<th>1</th>
<th>0</th>
<th>0</th>
<th>P</th>
<th>2</th>
<th>5</th>
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<tr>
<td>MODEL</td>
<td>FORMAT</td>
<td>STYLE</td>
<td>TYPE</td>
<td>SPECIAL NUMBER</td>
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<tr>
<td>100</td>
<td>P = pin through hole</td>
<td>250 = AL 250</td>
<td>(if applicable)</td>
<td>Given by Vishay for custom design</td>
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