

Versatile Planar Transformer



FEATURES

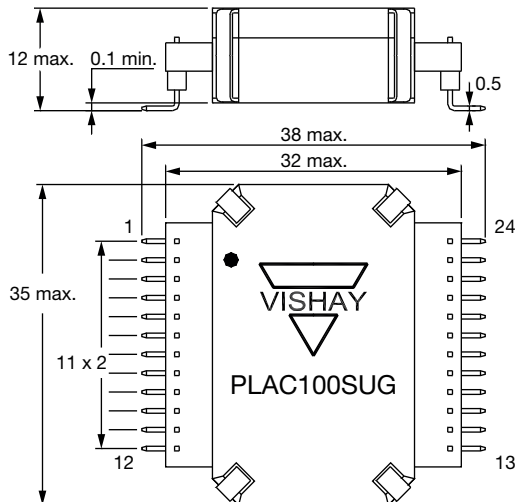
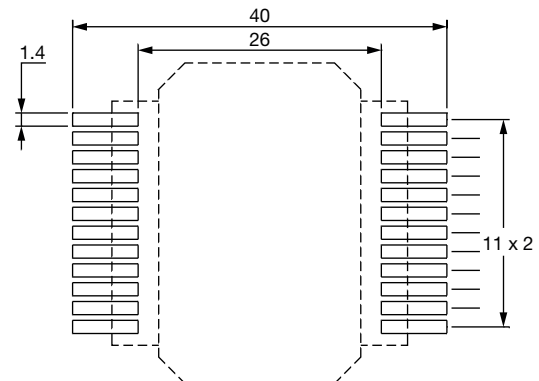
- Patent N° 99 00241
- Designed for switch mode power supply applications (transformer and choke inductor)
- End user configures the transformer by using a software supplied
- Frequency range: 50 kHz to 400 kHz
- Suitable for surface mount or through hole
- UL 94 V-0 material
- High power up to 220 W
- Operating temperature: -55 °C to +125 °C
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT

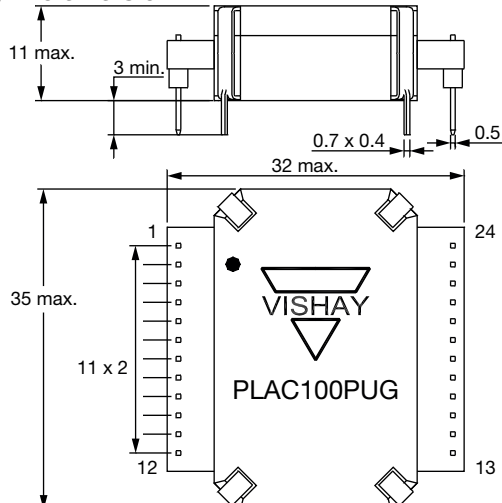
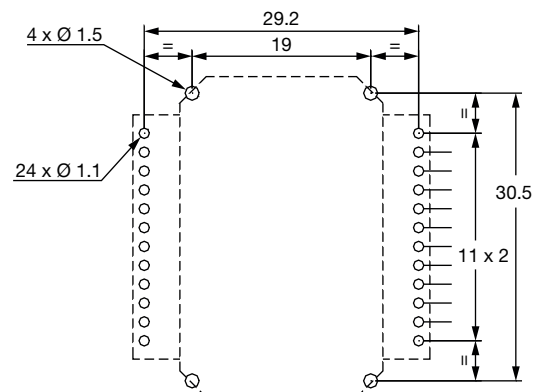
QUICK REFERENCE DATA	
Type	Transformer
Size (L x W x H)	40 mm x 35 mm x 12 mm
Terminals	SMD or through holes
Power	Up to 220 W
Frequency range	50 kHz to 400 kHz
Inductance range	5.2 μ H to 4032 μ H

DIMENSIONS in millimeters (± 0.5)

SMD Version


 Recommended PCB Layout
Weight: 35 g


Through-Hole Version


 Recommended PCB Layout
Weight: 35 g


APPLICATIONS: DC/DC POWER SUPPLY

- Switching mode power supplies
- DC/DC converters

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 ...

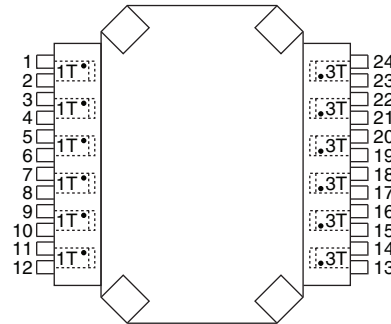
Thanks to this adaptability it enables user to reduce and optimize times during the development and the production of power supplies.

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

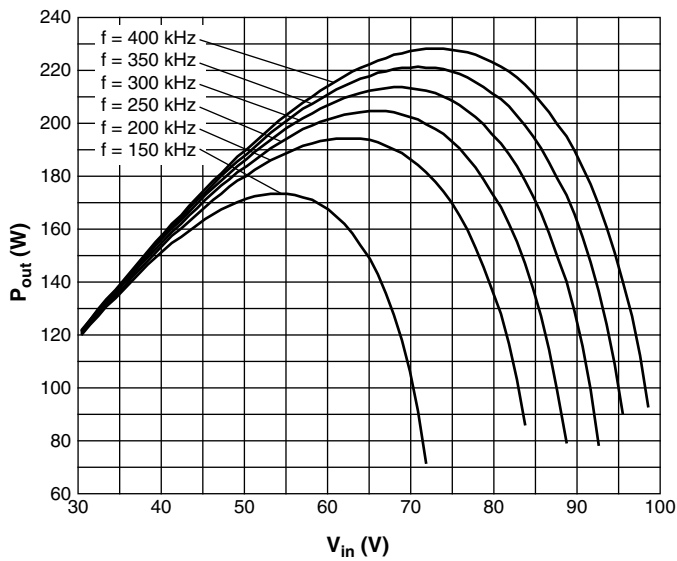
- See also Application Notes: www.vishay.com/doc?59056

TECHNICAL DATA ALLOWING CONCEPTION		
B_{sat}	Saturation flux density	< 300 mT à 100 °C
A_e	Effective cross-sectional area of a core	113 mm ²
V_e	Effective volume of a core	4234 mm ³
R_{th}	Thermal resistance	22 °C/W
P_c	Core power loss	f: 50 kHz to 200 kHz (excluded) $P_c = 5.8 \times 10^{-6} f (Hz)^{1.51} \left(\frac{B(T)}{2}\right)^{2.94}$ f: 200 kHz (included) to 400 kHz $P_c = 11 \times 10^{-9} f (Hz)^{1.96} \left(\frac{B(T)}{2}\right)^{2.55}$ f: Frequency; B: Peak-peak flux density

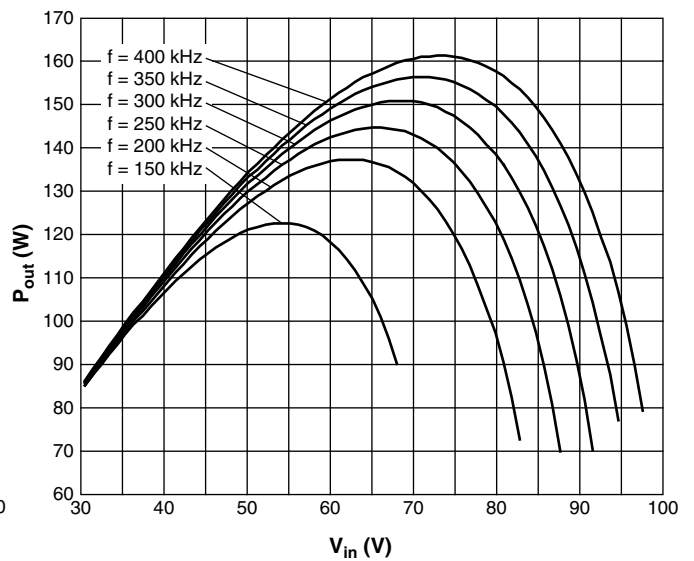
STANDARD ELECTRICAL SPECIFICATIONS				
MODEL	INDUCTANCE μH	POWER RANGE W	FREQUENCY kHz	POWER SUPPLY TOPOLOGY
PLAC 100	7 to 63	up to 220	50 to 400	Flyback; forward; push-pull; bridge; half-bridge

ELECTRICAL CHARACTERISTICS at 25 °C		
3 turn coil (13 to 24) Inductance without air gap (0.1 V, 10 kHz)	63 μH ± 25 %	
1 turn coil (1 to 12) Inductance without air gap (0.1 V, 10 kHz)	7 μH ± 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 V _{AC}	
Hipot between 1 turn winding with if < 100 μA	300 V _{AC}	
Hipot between 3 turn winding with if < 100 μA	300 V _{AC}	
Hipot between winding and ground with if < 100 μA	800 V _{AC}	

FORWARD: $P_{out\ max.}$; Duty cycle = 0.45



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



MARKING

- Vishay trademark
- Part number
- Manufacturing date

TERMINALS FINISH

- e3 = Pure tin

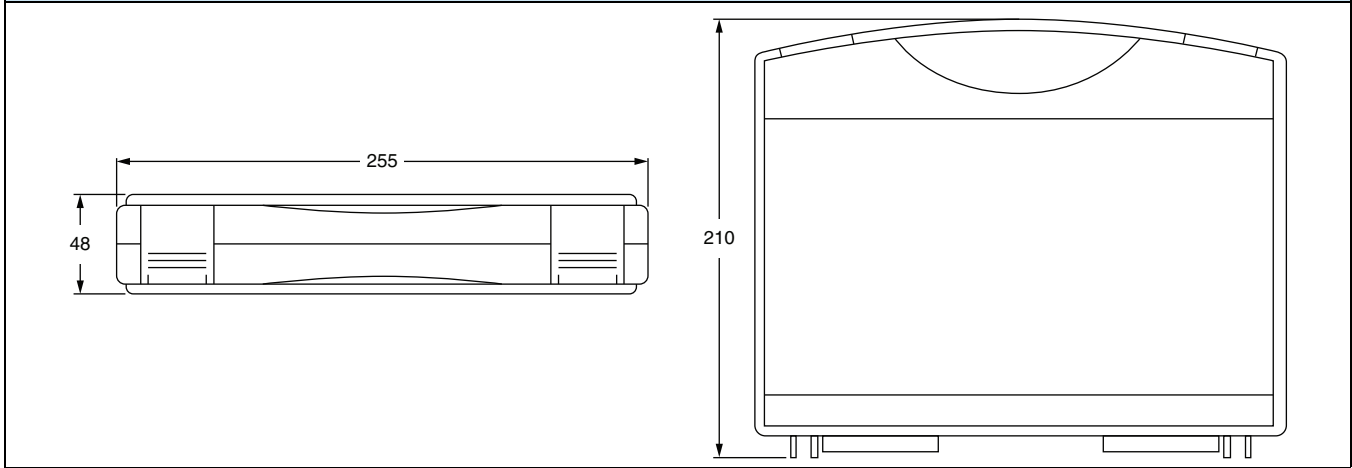
PACKAGING

- Box of 15 pieces

KIT WITH SOFTWARE FOR DESIGN SUPPORT ON PLAC 100 TRANSFORMER



DIMENSIONS in millimeters (± 10)



FEATURES OF SOFTWARE

- Interactive
- Directly executable
- Compatible with all versions of WINDOWS
- Available on USB key
- English and French languages
- Designed solutions on PDF format
- Kit includes
 - Software in USB key
 - One part of each type (through hole)
 - 12 female headers

HARDWARE REQUIREMENTS

- PC compatible, WINDOWS 2000, XP and VISTA
- Minimum processor Intel P3 or equivalent
- RAM 128 Mo minimum
- Screen resolution 1024 x 768 minimum
- Directly executable, no installation required

WARNING: This software is a support to technical designers. User is responsible to validate the solution in its own configuration.

KIT WITH VISHAY AZTRONIC (c) 2007-2014 CONFIGURATION PLAC 100 - V1.22

Turns Nb	Comment	Np	Ns	M	A Max	I prms (A)	I srms (A)	AI (nH)
3 turns		3	2	0.6667	0.4219	5.0023	4.9094	7000.0000
1 turn		1	3	3.0000	0.0938	10.1688	2.3143	7000.0000
1 turn		2	3	1.5000	0.1875	7.1904	3.2730	7000.0000
1 turn		3	3	1.0000	0.2813	5.8710	4.0095	7000.0000
1 turn		4	3	0.7500	0.3750	5.0844	4.6287	7000.0000
1 turn		5	3	0.6000	0.4688	4.5476	5.1750	7000.0000

A Max, M, AI	Current (A)	Losses (W) 100°C	Resistances (Ohm)
AMax: 0.469 m: 0.60 AI: 7000.0 L: 175.00	I P rms: 4.548 I S rms: 5.175 I mag: 0.321 IC: 4.535 I max: 4.857	PCUp: 0.614 PCUs: 0.412 Pf: 0.124 PTOT: 1.563	Rp: 0.0297 Rs: 0.0154

Turns Nb	B max (T)	RTH Heatsink	T°C	Max Vin condition
Np: 5 Ns: 3	B max (T): 0.05		T°C: 34.38 n: 0.985	Max Ve Possible: 70.00

INPUT DATA

Type of power supply:

- Flyback
- Forward
- Push-pull
- Bridge
- Half-bridge

Electrical data:

- Input voltage (V)
- Output voltage (V)
- Power (W)
- Frequency (kHz)

Note

- See also Application Note: www.vishay.com/doc?59057

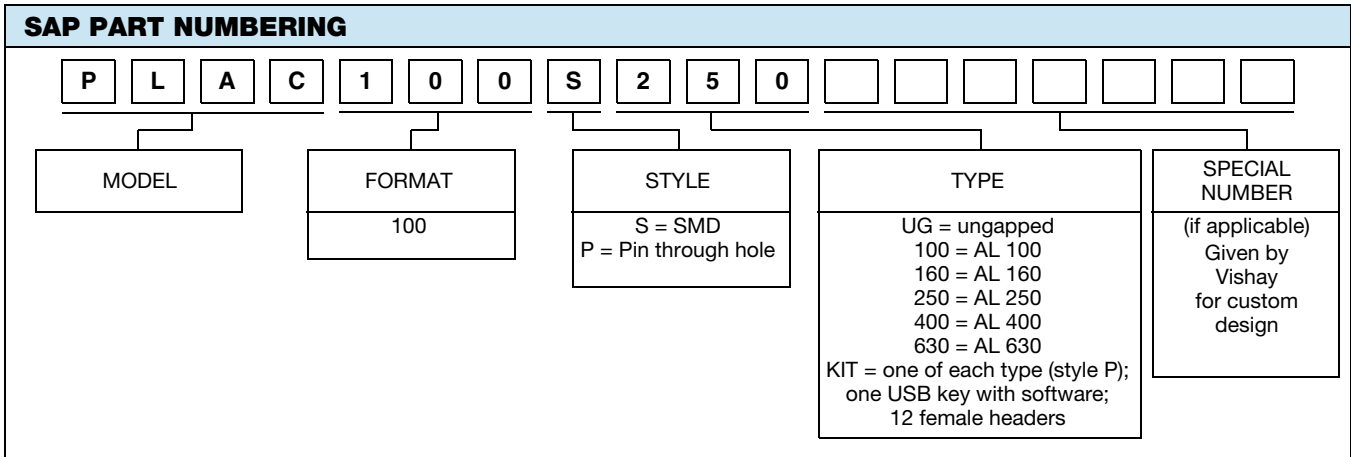
OUTPUT DATA

PCB layout

Electrical data:

- Maximum duty cycle
- Ratio
- Primary inductance (μH)
- Input and output current (A)
- Balance of power losses (W)
- Winding resistance (Ω)
- Difference between temperature inside PLAC 100 and ambient temperature

The software allows to calculate all data for the choke inductance when power supply structure needs it.





Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.