

High Isolation Power Transformers

EP7 Platform SMD



- Push Pull Converter Transformer
- Basic insulation for isolated power supply driver
- 4.0mm Creepage
- 4KVrms Isolation (600Vrms continuous)

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

Part Number	Inductance (1-3) (mH ±45%)	Leakage Inductance (µH MAX)	Capacitance (pF MAX)	DCR (1-3) (Ω MAX)	DCR (4-6) (Ω MAX)	MAX (1-3) ¹ (V-µsec Max)	Turns Ratio (1:3) (6:4)	Isolated Voltage (Vrms)
PH9184.011NL	12.2	12.5	28.5	1.9	2.4	266	1CT : 1CT	4000
PH9184.021NL	15.0	15.0	26.5	2.1	1.4	296	2CT : 1CT	
PH9184.034NL	6.8	5.0	31.5	1.4	2.2	200	3CT : 4CT	

Notes:

- The ET Max is calculated to limit the core loss and temperature rise at 100KHz based on a bipolar flux swing of 180mT Peak.
- For Push-Pull topology, where the voltage is applied across half the primary winding turns, the ET needs to be derated by 50% for the same flux swing.
- The applied ET may need to be further derated for higher frequencies based on the temperature rise which results from the core and copper losses.
 - To calculate total copper loss (W), use the following formula:

$$\text{Copper Loss (W)} = \text{Irms_Primary}^2 * \text{DCR_Primary} + \text{Irms_Secondary}^2 * \text{DCR_Secondary}$$
 - To calculate total core loss (W), use the following formula:

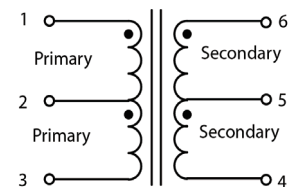
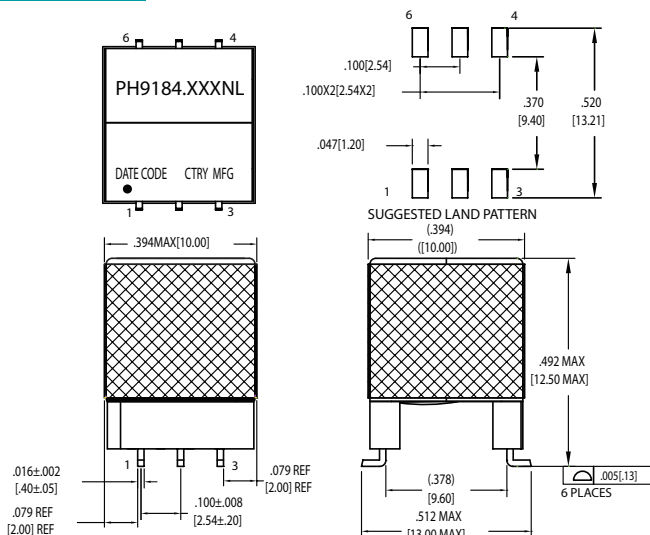
$$\text{Core Loss (W)} = 4.40\text{E-}10 * (\text{Frequency in kHz})^{1.67} * (180 * [\text{ET/ET Max}])^{2.53}$$
- Where ET is the applied Volt Second, ET Max is the rated Volt Second for 180mT flux swing
- To calculate temperature rise, use the following formula:

$$\text{Temperature Rise (°C)} = 90 * (\text{Core Loss (W)} + \text{Copper Loss (W)})$$
- Optional Tape & Reel packing can be ordered by adding a "T" suffix to the part number (i.e. PH9184.011NL becomes PH9184.011NLT). Pulse complies to industry standard tape and reel specification EIA481.
- The "NL" suffix indicates an RoHS-compliant part number.
- The temperature of the component (ambient plus the temperature rise) must be within the stated operating temperature range.

Mechanical

Schematic

PH9184.XXXNL



Weight2.6grams
 Tape & Reel150/reel
 Tray80/tray

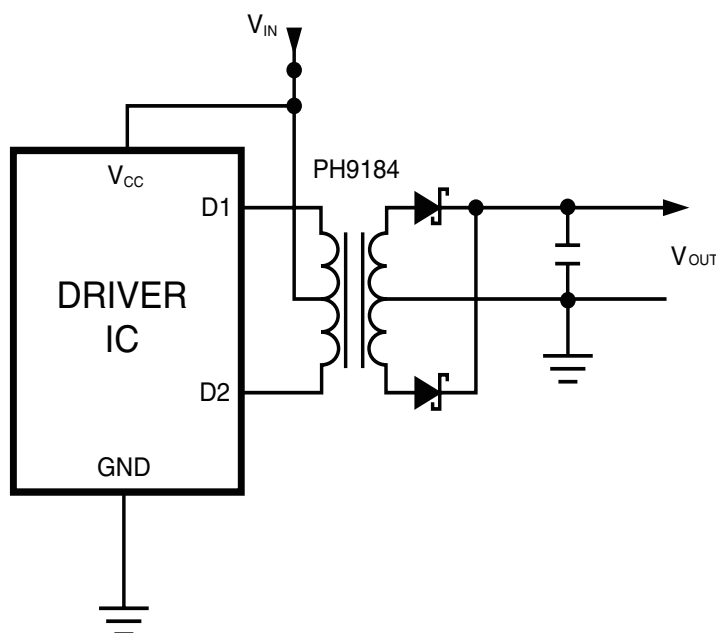
Dimensions: $\frac{\text{Inches}}{\text{mm}}$

Unless otherwise specified,
 all tolerances are $\pm \frac{.010}{0.25}$

Application

PH9184NL is a series of high isolation power supply transformer drivers. Intended to operate in a fixed duty cycle Push Pull topology, it is a part of a low cost solution for delivering lower power (up to 3W) from a low voltage source. A typical implementation would be an isolated RS-485/RS-232 power supply driver circuit, the design is compatible with the MAXIM™ MAX253 IC.

A schematic diagram for the Push Pull converter topology is given below.



For a fixed 50% duty cycle mode of operation, the output voltage is simply determined by the input voltage and turns ratio. So, with the available turns ratios, a variety of output voltages can be selected.

This transformer design conforms to UL60950-1 2 edition with basic insulation for a working voltage up to 300Vac. 3.2mm creepage and 3000Vrms isolation voltage is guaranteed to meet this requirement. The actual isolation and creepage capability of the design exceeds these UL ratings.

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