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)*

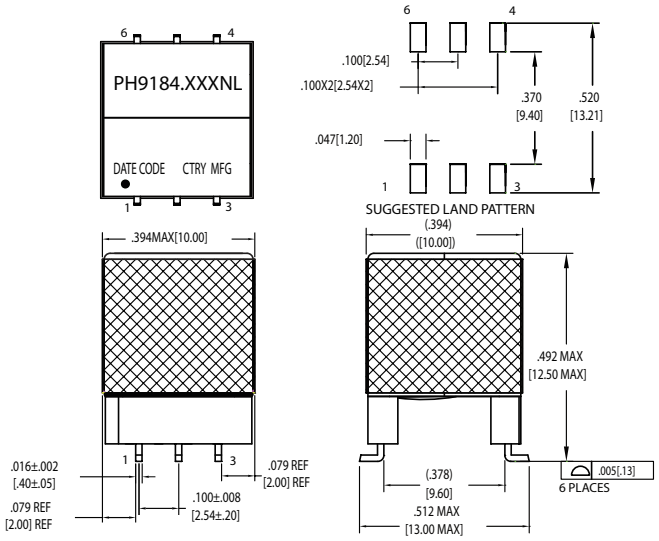
Electrical Specifications @ 25°C – Operating Temperature -40°C to +125°C								
Part Number	**Inductance (1-3)** (mH ±45%)	**Leakage Inductance** (uH MAX)	**Capacitance** (pF MAX)	**DCR (1-3)** (Ω MAX)	**DCR (4-6)** (Ω MAX)	**MAX (1-3)[1]** (V-µsec Max)	**Turns Ratio** (1:3) (6:4)	**Isolated Voltage** (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:

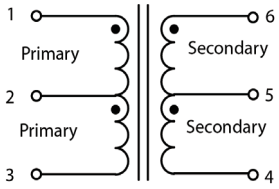
1. The ET Max is calculated to limit the core loss and temperature rise at 100KHz based on a bipolar flux swing of 180mT Peak.
2. For Push-Pull topology, where the voltage is applied across half the primary winding turns, the ET needs to be derated by 50% for the same flux swing.
3. The applied ET may need to be further derated for higher frequencies based on the temperature rise which results from the core and copper losses.
   A. To calculate total copper loss (W), use the following formula:
   Copper Loss (W) = $Irms\_Primary^2 * DCR\_Primary + Irms\_Secondary^2 * DCR\_Secondary$
   B. To calculate total core loss (W), use the following formula:
   Core Loss (W) = $4.40E\text{-}10 * (Frequency\ in\ kHz)^{1.67} * (180 * [ET/ET\ Max])^{2.53}$
   Where ET is the applied Volt Second, ET Max is the rated Volt Second for 180mT flux swing
   C. To calculate temperature rise, use the following formula:
   Temperature Rise (°C) = 90 * (Core Loss(W) + Copper Loss (W))
4. Optional Tape & Reel packing can be ordered by adding a "**T**" suffix to the part number (i.e. PH9184.011NL becomes PH9184.011NL**T**). Pulse complies to industry standard tape and reel specification EIA481.
5. The "NL" suffix indicates an RoHS-compliant part number.
6. The temperature of the component (ambient plus the temperature rise) must be within the stated operating temperature range.

Mechanical

PH9184.XXXXNL



Schematic



Weight 2.6grams
Tape & Reel 150/reel
Tray 80/tray

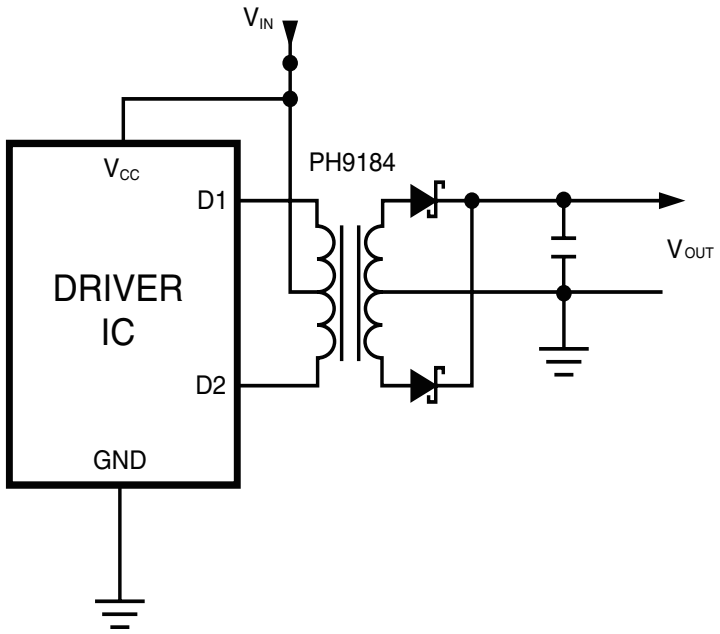
Dimensions: Inches / mm

Unless otherwise specified, all tolerances are ± .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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