High Isolation Gate Drive Transformers

PH9572.XXXNL and PH9572.XXXANL - SMT

Pulse
a YAGEO company

- *Functional and Basic[5] insulation*
- *5mm creepage between gate windings (ANL)*
- *Up to 2500Vrms gate to drive isolation*
- *Up to 1000Vdc constant isolation between windings*
- *Up to 6W of Driver Power*

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

Part Number	Turns Ratio (8-1):(3-4):(6-5)	ET (1-8) (V * µsec MAX)	Core Loss Factor K1	Primary Inductance (1-8) (mH MIN)	Leakage Inductance (1-8) short (3,4,5,6) (µH MAX)	Parasitic Capacitance (1,8) to (3,4) =(1,8)to(5,6) (pF MAX)	Parasitic Capacitance (3,4)to(5,6) (pF MAX)	DCR Drive (Ohms Max) DCR Drive (1-8)	DCR Gates (5-6)	DCR Gates (3-4)	Hi-Pot (Vrms) Drive-Gates (1,8) TO (3,4,5,6)	Gate-Gate (3,4) TO (5,6)
PH9572.XXXNL – Functional Insulation 500Vdc continuous isolation												
PH9572.111NL	1:1:1	80.9	2.6	2.8	1.8	20	11	0.85	0.72	0.95	1500	
PH9572.122NL	1:2:2	40.4	5.2	0.7	0.45	20	11	0.42	0.72	0.95		
PH9572.233NL	2:3:3	53.9	3.9	1.26	0.85	20	11	0.6	0.72	0.95		
PH9572.322NL	3:2:2	80.9	2.6	2.8	1.5	20	11	0.85	0.48	0.65		
PH9572.211NL	2:1:1	80.9	2.6	2.8	1.6	20	11	0.80	0.48	0.55		
PH9572.XXXANL – Basic Insulation 1000Vdc continuous isolation												
PH9572.111ANL	1:1:1	80.9	2.6	2.8	1.8	12	8	1.7	1.5	2.0	2500	
PH9572.122ANL	1:2:2	40.4	5.2	0.7	0.6	11	7	0.9	1.5	1.9		
PH9572.233ANL	2:3:3	53.9	3.9	1.26	0.9	11	7	1.1	1.5	2.0		
PH9572.322ANL	3:2:2	80.9	2.6	2.8	1.8	11	7	1.6	1.0	1.3		
PH9572.211ANL	2:1:1	80.9	2.6	2.8	1.6	11	7	1.6	0.8	1.0		

Notes:

1. The max ET is calculated to limit the core loss and temperature rise at 100KHz based on a bipolar flux swing of 2100 gauss Peak. This value needs to be derated for higher frequencies using the temperature rise calculation to keep the component temperature within the operating temperature range.

2. If the component temperature (T) exceeds 80C, the max ET spec needs to be derated to max ET*(325-1.4T)/210, to account for reduced saturation flux density at higher temperature

3. The temperature rise of the component is calculated based on the total core loss and copper loss:
   A. To calculate total copper loss (W), use the following formula:
      Copper Loss (W) = $Irms^2$ * (DCR_Drive + (# of Gates) * DCR_Gates)
   B. To calculate total core loss (mW), use the following formula:
      Core Loss (mW) = 2.64E-10 * (Frequency in kHz)$^{1.89}$ * (K1 * ET)$^{2.1}$
      Where ET = (V * Duty Cycle) / Frequency
   C. To calculate temperature rise, use the following formula:
      Temperature Rise (°C) = 140 * (Core Loss(W) + Copper Loss (W))

4. Continuous isolation voltage confirmed by partial discharge measurement.
   PH9572.XXXNL: 500Vdc
   PH9572.XXXANL: 1000Vdc

5. ANL versions, which use PFA insulated wire on both the drive and gate windings, are compliant with IEC 62368-1, IEC 61558-1, IEC 61010-1 & IEC 60601-1 for basic insulation.

6. 5mm creepage distance between ANL gate windings satisfies IEC62368-1 & IEC61558-1/-2-16 requirement for basic insulation with working voltage up to 500Vrms, OVC II, Pollution Degree 2 and altitude up to 2000 m. There is 2.5mm creepage between gate and drive windings.

7. Unless otherwise specified, all testing is made at 100kHz, 0.1V_{AC}.

8. Optional Tape & Reel packaging can be ordered by adding a "**T**" suffix to the part number (i.e. PH9572.111NL becomes PH9572.111NL**T**). Pulse complies to industry standard tape and reel specification EIA481.

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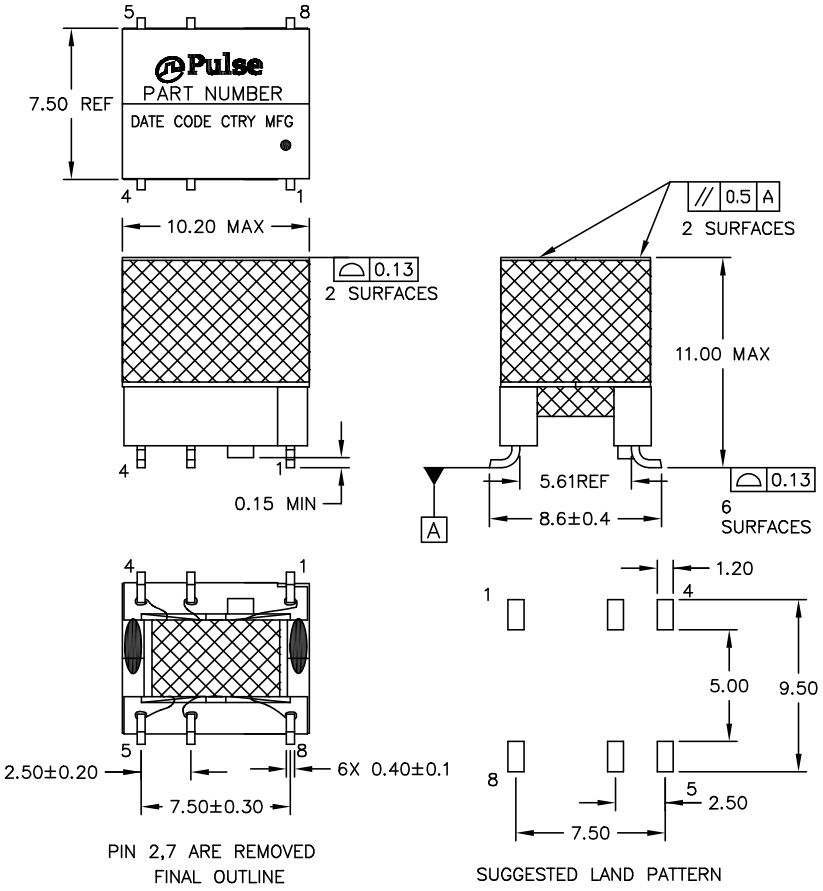
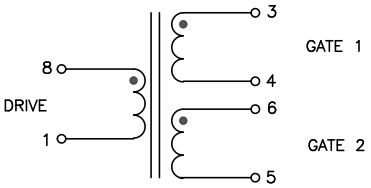
Mechanicals

PH9572.XXXNL and PH9572.XXXANL



Schematics



Weight .....1.9 grams
Tape & Reel 300/reel
Tray 80/tray

Dimensions: mm
Unless otherwise specified,
all tolerances are: ±0.25

For More Information:

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