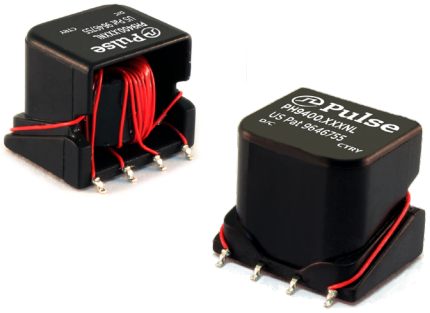
High Isolation Gate Drive Transformers

PH9400.XXXNL and PH9400.XXXANL - SMT

Pulse
a YAGEO company



- *Basic and Reinforced Insulation*[3]
- *Sidecar package with 12mm creepage*
- *Up to 5000Vrms gate to drive isolation*
- *Up to 1000Vpk Rated Voltage*[5]
- *Up to 8W of Driver Power*
- ***Patented:*** *US Patent 9,646,755*

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

Part Number	Turns Ratio	ET (1-4) (V * µsec MAX)	Core Loss Factor K1	Primary Inductance (1-4) (mH +/-35%)	Leakage Inductance Drive to Gate (µH MAX)	Parasitic Capacitance Drive to Gate (pF MAX)	DCR Drive (1-4) (Ω MAX)	DCR Gates (5-6) (7-8) (Ω MAX)	Hi-Pot	
									Drive-Gate (Vrms)	Gate-Gate (Vrms)
PH9400.XXXNL – Basic Insulation Rated Voltage – 600Vpk										
PH9400.111NL	1:1:1	315	0.67	4.5		60	1.8	2.5	4000	1500
PH9400.566NL	5:6:6	315	0.67	4.5	3.5	60	1.8	3.0	4000	1500
PH9400.122NL	1:2:2	250	0.84	2.88	3.5	60	1.5	4.2	4000	1500
PH9400.655NL	6:5:5	375	0.56	6.48	5.3	60	2.2	2.5	4000	1500
PH9400.211NL	2:1:1	375	0.56	6.48	8.0	60	2.2	1.6	4000	1500
PH9400.XXXANL – Reinforced Insulation Rated Voltage – 800Vpk (1000Vpk Basic)										
PH9400.111ANL	1:1:1	160	1.32	1.21	2.5	45	0.9	0.9	5000	2000
PH9400.566ANL	5:6:6	155	1.36	1.12	3.0	45	0.9	1.0	5000	2000
PH9400.233ANL	2:3:3	125	1.68	0.72	2.0	45	0.7	1.0	5000	2000
PH9400.655ANL	6:5:5	185	1.14	1.62	3.0	45	1.0	0.9	5000	2000
PH9400.211ANL	2:1:1	185	1.14	1.62	3.5	45	1.0	0.55	5000	2000

Notes:

1. The max ET is calculated to limit the core loss and temperature rise at 100KHz based on a bipolar flux swing of 2100Ga Peak. This value needs to be derated for higher frequencies using the temperature rise calculation.
2. 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 (W), use the following formula:
   Core Loss (W) = 5.1E-10 * (Frequency in kHz)$^{1.42}$ * (K1 * ET)$^{2.5}$
   Where ET = (V * Duty Cycle) / Frequency
   C. To calculate temperature rise, use the following formula:
   Temperature Rise (°C) = 71 * (Core Loss(W) + Copper Loss (W))
3. ANL versions, which use triple insulated wire on both the drive and gate windings, comply with IEC 61558, IEC 61010 & IEC 60601 for reinforced. NL versions, which use triple insulated wire on just the drive winding, comply with basic insulation requirements.
4. The 12mm package creepage & clearance distance satisfies IEC 61558 requirements for working voltage up to 600Vrms/reinforced and 1000Vrms/basic based on material group III for OVC II, pollution degree 2 and altitude up to 5000m. .
5. Rated voltage is based on a positive partial discharge test (discharge < 10pC), in accordance with IEC 60664 for basic or reinforced insulation.
6. Optional Tape & Reel packaging can be ordered by adding a "T" suffix to the part number (i.e. PH9400.111NL becomes PH9400.111NLT). Pulse complies to industry standard tape and reel specification EIA481.

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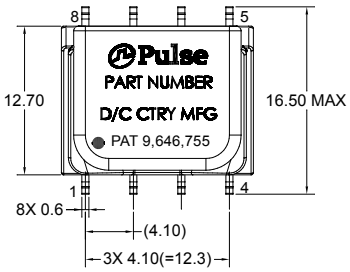
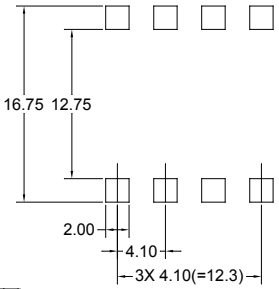
Mechanicals

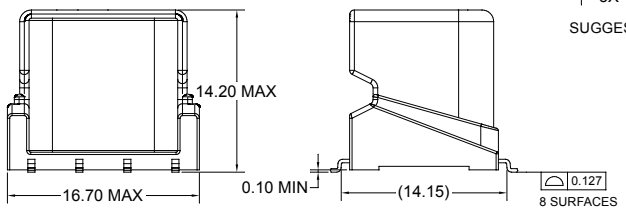
Schematics

PH9400.XXXNL and PH9400.XXXANL





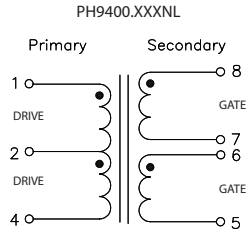
SUGGESTED PAD LAYOUT

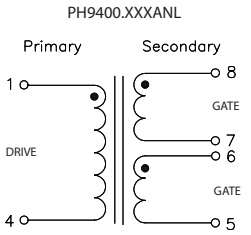


Weight .....2.5 grams
Tape & Reel 150/Reel
Tray 80/tray

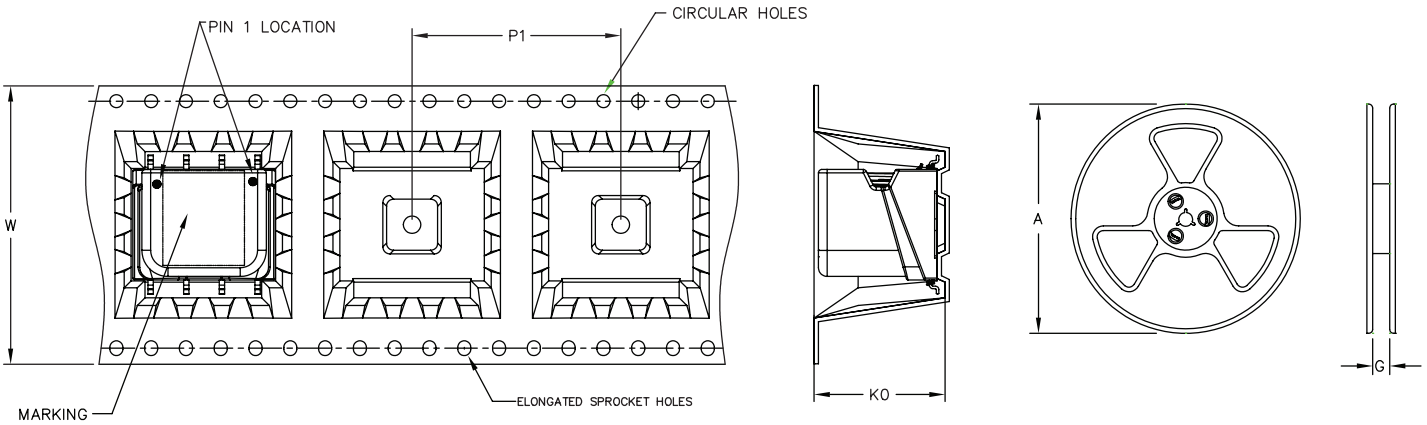
Dimension: Inches / mm

Unless otherwise specified, all tolerances are ± .010 / 0,25





TAPE & REEL INFO



SURFACE MOUNTING TYPE, REEL/TAPE LIST						
PART NUMBER	REEL SIZE (mm)		TAPE SIZE (mm)			QTY
	A	G	P_1	W	K_0	PCS/REEL
PH9400.XXXNLT	Ø330	32.4	24	32	14.6	150

For More Information:

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