

# Isolation Power Transformers

UI5 Platform SMD PMT9085.XXXNLT Series



**Pulse**  
a YAGEO company

- ② 2W Push Pull/SiC & GaN drive Transformer
- ② Reinforced insulation, 6mm creepage & 4.5mm clearance<sup>4</sup>
- ② 3KVrms Hi-Pot isolation voltage
- ② Up to 625Vpk rated voltage<sup>5</sup>
- ② Footprint: 10.4 x 9.0 x 6.6 mm MAX

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

Part Number	Inductance (1-3) (mH min/typ)	Leakage Inductance (uH MAX)	Capacitance (pF MAX)	DCR (1-2)=(2-3) (Ω MAX)	DCR (4-5)=(5-6) (Ω MAX)	E*T(1-3) <sup>1</sup> (V*uSec)	Turns Ratio ±3.0%	Core Loss factor <sup>3</sup> K1	Hi-Pot Voltage (Vrms)
PMT9085.011NLT	0.6/1.0	3.9	20	0.96	1.08	60	1CT : 1CT	3.47	3000
PMT9085.012NLT	0.34/0.56	2.7	18	0.70	1.70	45	1CT : 2CT	4.63	
PMT9085.013NLT	0.15/0.25	1.15	17	0.48	1.57	30	1CT : 3CT	6.94	
PMT9085.015NLT	0.1/0.16	0.96	15	0.41	2.20	24	1CT : 5CT	8.68	
PMT9085.027NLT	0.1/0.16	0.96	17	0.41	1.43	24	2CT : 7CT	8.68	
PMT9085.034NLT	0.48/0.8	2.8	17	0.98	1.22	54	3CT : 4CT	3.86	
PMT9085.038NLT	0.12/0.2	0.98	16	0.43	1.30	27	3CT : 8CT	7.72	
PMT9085.047NLT	0.39/0.65	3.0	23	0.88	1.50	48	4CT : 7CT	4.34	
PMT9085.089NLT	0.39/0.65	2.5	18	0.75	1.00	48	8CT : 9CT	4.34	
PMT9085.311NLT	0.12/0.2	1.05	15	0.52	1.65	27	3CT : 11CT	7.72	

## Notes:

- The E\*T rating limits the peak flux density to 2100 gauss (flux swing 4200 gauss). When used in bipolar drive applications, E\*T should be limited to  
 $E*T_{max} = 0.05 * (340 - Temp * 1.4) * E*T$  if temperature is in range of 100°C to 125°C.
- 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:  
 $Copper\ Loss\ (W) = I_{rms\_Primary}^2 * DCR\_Primary + I_{rms\_Secondary}^2 * DCR\_Secondary$
  - To calculate total core loss (W), use the following formula:  
 $Core\ Loss\ (W) = 1.0E-10 * f^{1.89} * (E*T * K1)^{2.1}$   
 Where f is the working frequency in KHz, E\*T is the voltage\*times in V\*uSecond, K1 is the Core Loss factor.
  - To calculate temperature rise, use the following formula: Temperature Rise (°C)  
 $= 200 * (Core\ Loss(W) + Copper\ Loss(W))$
- Creepage and clearance is in accordance with IEC 61558-1 for reinforced insulation to a working voltage of 300Vrms (for basic insulation to a working voltage of 600Vrms) based on material group III, pollution degree 2, OVC II and 5000M altitude.
- Rated voltage is based on a positive partial discharge test (discharge < 10pC) for the profile shown in page 3, in accordance with IEC60664 for basic insulation. In an application which requires a reinforced insulation barrier, a rated voltage of the equivalent peak voltage of the 300Vrms (sinusoidal) working voltage, 424Vpk, is defined and confirmed by partial discharge testing.

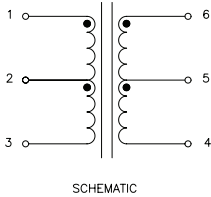
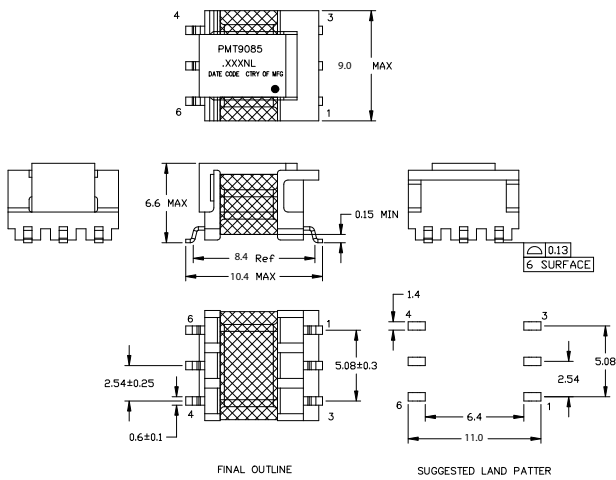
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Mechanical

Schematic

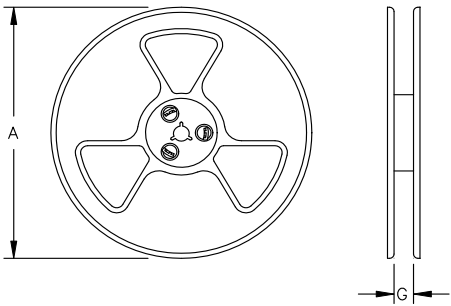
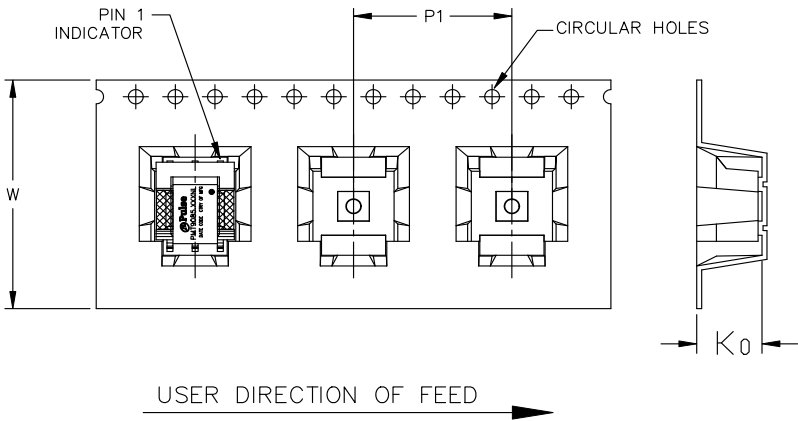
PMT9085.XXXNLT



Weight .....0.7grams

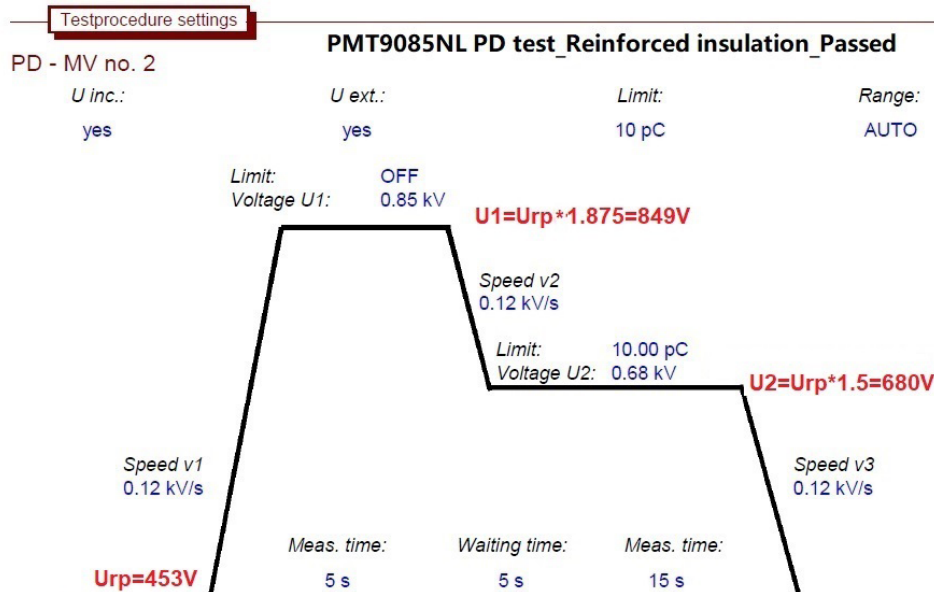
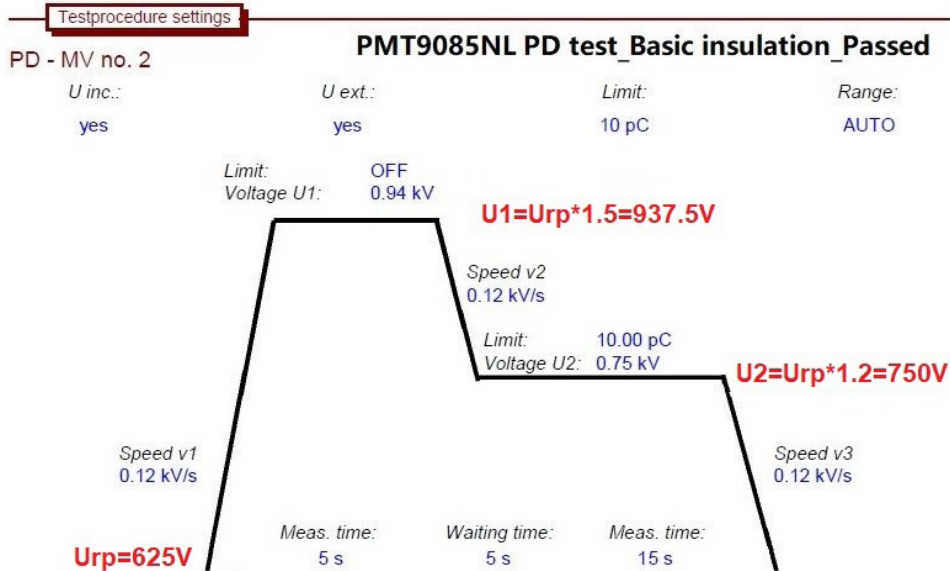
Dimensions: mm  
Unless otherwise specified,  
all tolerances are ±0.25

TAPE & REEL INFO



SURFACE MOUNTING TYPE, REEL/TAPE LIST						
PART NUMBER	REEL SIZE (mm)		TAPE SIZE (mm)			QTY
	A	G	P <sub>1</sub>	W	K <sub>0</sub>	
PMT9085.XXXNLT	Ø330	24.4	16	24	6.5	500

## Partial Discharge Test Profile

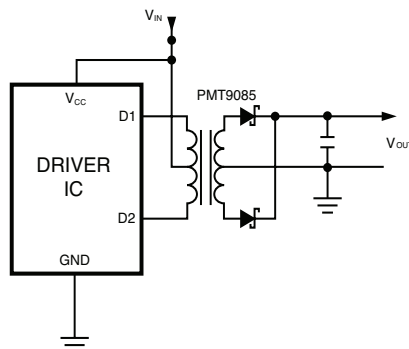


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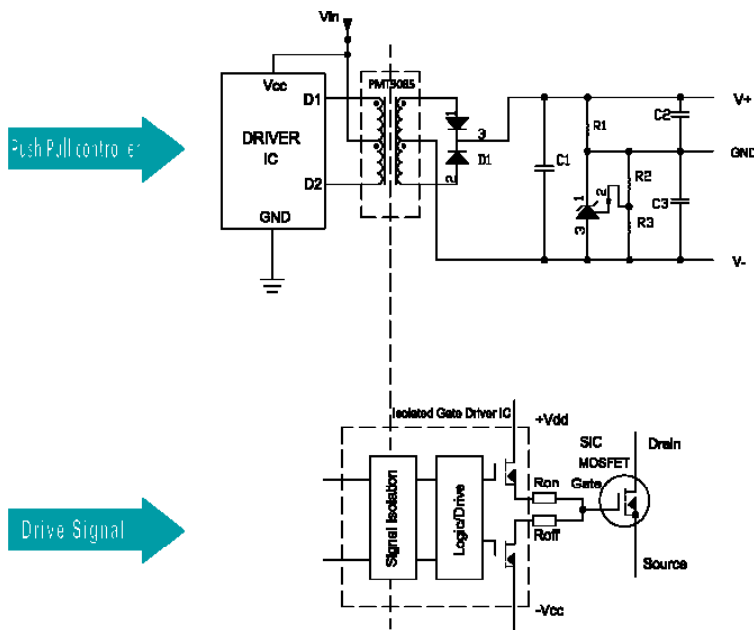
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## APPLICATION

PMT9085.XXXNLT is an automotive grade Push-Pull transformer series, designed to deliver up to 2W of power across a high withstand voltage insulation barrier. It is compatible with a wide range push-pull drivers, such as the TI SN650x family, as part of a low cost solution for delivering isolation power from a low voltage source. 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



Additionally, it can be used in applications that incorporate SiC/GaN device switching for enhanced efficiency. This requires a negative voltage for robust device switch off. An adjustment of the above circuit achieves this negative voltage from the existing PMT9085 series, making both voltages available to a driver such as the TI UCC21530-Q1, as shown in the following configuration.



In addition to the providing galvanic isolation between the high-voltage and low-voltage sides, the purpose of the transformer is to satisfy the requirements of the relevant safety standards. PMT9085NL is designed to comply with the requirements of IEC61558-1 for basic and reinforced insulation. With 6.4mm creepage distance and based on material group III, OVCII and 5000m altitude, this corresponds to a maximum working voltage of 600Vrms for basic insulation and 300Vrms for reinforced insulation. Contact your Pulse Electronics representative for queries in relation to safety requirements.

## For More Information:

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