

# THT Current Sense Transformers

For Arc Fault Detection Circuits



- Works with the TI SolarMagic RD-195 DC Arc Fault Detection Reference Design Kit
- For the TI SM73201-ARC-EV PCB
- UL/C-UL recognized components
- 3000 Vrms gate to drive winding test
- Useful operating frequency from 50 kHz to 500 kHz

## Electrical Specifications @ 25°C — Operating Temperature -40°C to 130°C

Part Number	Turns Ratio	Primary Inductance (3-7) (mH MIN)	DCR Pri 1 (3-7) (Ω MAX)	DCR Pri 2 (4-8) (mΩ MAX)	DCR Sec (1-10) (mΩ MAX)	Hi-Pot (Pri-Sec) (Vrms)
PA3655NL	200:200:1	76	15.8	15.8	1.7	3000

## Electrical Specifications @ 25°C — Operating Temperature -40°C to 130°C

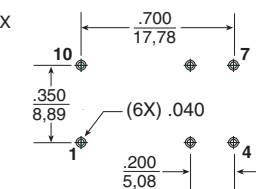
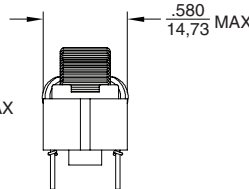
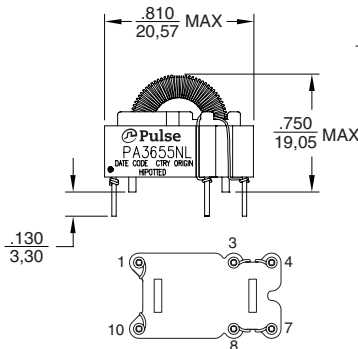
Part Number	Reference Data			Calculation Data
	RT (Ω)	Ipk (Amps)	Max Flux Density (Gauss)	Kb
PA3655NL	200	34	2000	17.12

- Notes:
- These current sense transformers have two one turn primaries that can be used in parallel. The listed current ratings are for parallel connection.
  - The reference values are for an application using the termination resistor (RT) and operating with unipolar waveform at 100kHz, 40% duty cycle. The estimated temperature rise is 55°C.
  - The peak flux density should remain below 2100 Gauss to ensure that the core does not saturate. Use the following formula to calculate the peak flux density:  $B_{pk} = K_b * I_{pk} * R_t * \text{don} / (F_f * \text{Freq. in kHz})$  where:  $R_t$  is the terminating resistor in the application and  $F_f$  is 1 for unipolar waveform and 2 for bipolar waveform
  - The temperature rise of the component is calculated based on the total core loss and copper loss:
    - To calculate total copper loss (W):  $P_{(cu)} = I_{pk}^2 * DCR_{Sec} * F_f * \text{don}$  where:  $F_f$  is 1 for unipolar waveform and 2 for bipolar waveform
    - To calculate total core loss (W):  $P_{(core)} = 0.000073 * (\text{Freq. in kHz})^{1.67} * (B_{op} \text{ in kG})^{2.532}$  where:  $B_{op} \text{ in kG} = K_b * I_{pk} * R_t * \text{don} / (2000 * \text{Freq. in kHz})$
    - To calculate temperature rise:  $\text{Temperature Rise (C)} = 60.18 * (\text{Core Loss(W)} + \text{Copper Loss (W)})^{.833}$

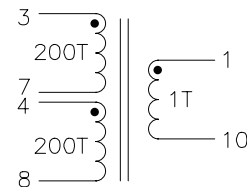
## Mechanicals

## Schematic

### PA3655NL



SUGGESTED PCB HOLE PATTERN



Weight.....5 grams  
Tray.....20/tray

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

Unless otherwise specified, all tolerances are  $\pm \frac{.010}{0,25}$

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