

THT Current Sense Transformers

P0581NL / P0582NL AND P0583NL



- ⌚ UL/C-UL recognized components
- ⌚ 3000Vrms gate to drive winding test
- ⌚ Useful operating frequency from 50kHz to 500 kHz
- ⌚ Most popular winding configurations

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

| Part ⁶ Number | Turns Ratio | Primary Inductance (1-10) (mH MIN) | DCR Pri (1-10) (Ω MAX) | DCR Sec1 (3-7) (mΩ ±15%) | DCR Sec2 (4-8) (mΩ ±15%) | Hipot (Pri-Sec) (Vrms) |
|--------------------------|-------------|------------------------------------|------------------------|--------------------------|--------------------------|------------------------|
| P0581NL | 200:1:1 | 76 | 2.8 | 1.7 | 1.7 | 3000 |
| P0582NL | 100:1:1 | 19 | 1.4 | 1.7 | 1.7 | 3000 |
| P0583NL | 50:1:1 | 5 | 0.7 | 1.7 | 1.7 | 3000 |

Additional Specifications

| Part Number | Reference Data | | | | Calculation Data | |
|-------------|----------------|------------|-----------|------------------|------------------|----------|
| | RT | Ipk (Amps) | Droop (%) | Max Flux Density | Kb | Req (mΩ) |
| P0581NL | 200 | 34 | 1.00 | 2000 | 17.12 | .9 |
| P0582NL | 100 | 35 | 1.98 | 2000 | 68.49 | .8 |
| P0583NL | 15 | 36 | 1.19 | 2000 | 273.97 | .75 |

Notes:

1. These current sense transformers have two one turn primaries that can be used in parallel. The listed current ratings are for parallel connection.
2. 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.
3. 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: Rt is the terminating resistor in the application and the Ff is 1 for unipolar waveform and 2 for bipolar waveform.
4. To calculate the droop: Droop Exponent (D) = $R_t * \text{don} / (L_{pri} \text{ in mH} * \text{Freq. in kHz})$
 $\% \text{Droop} = (1 - e^{-D}) * 100$
5. The temperature rise of the component is calculated based on the total core loss and copper loss:
 - A. To calculate total copper loss (W): $P_{(cu)} = I_{pk}^2 * R_{eq} * F_f * \text{don}$ where Ff is 1 for unipolar waveform and 2 for bipolar waveform
 - B. To calculate total core loss (W): $P_{(core)} = 0.000073 * (\text{Freq. in kHz})^{1.67} * (B_{op} \text{ in kG})^{2.532}$ where: $B_{op} \text{ in kG} = K_b * I_{pk} * R_t * \text{don} / (2000 * \text{Freq. in kHz})$
 - C. To calculate temperature rise: $\text{Temperature Rise (C)} = 60.18 * (\text{Core Loss (W)} + \text{Copper Loss (W)})^{.433}$

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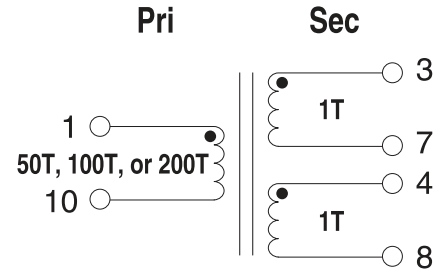
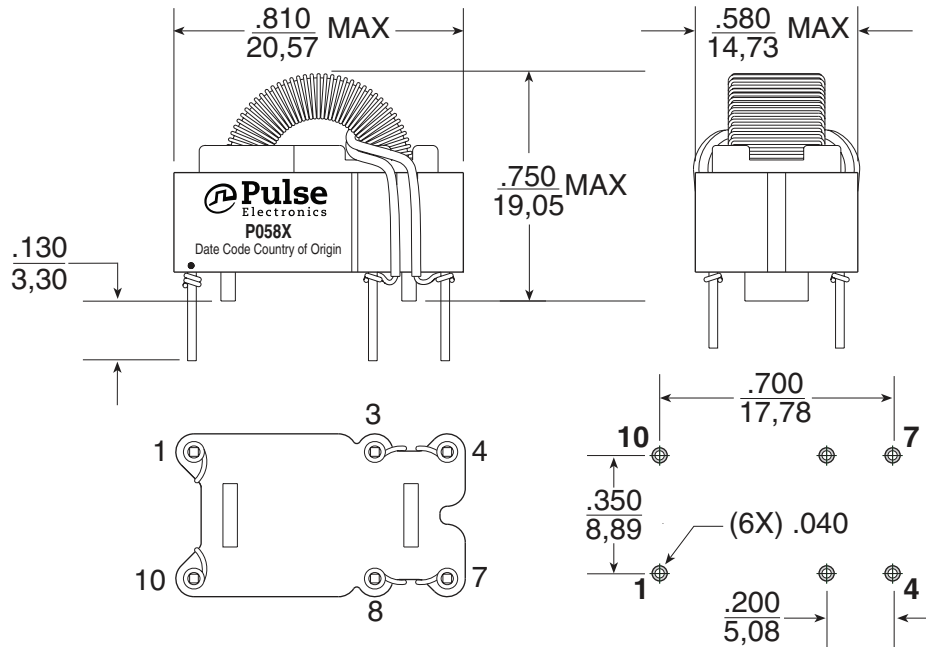
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Mechanical

Schematic

P058XNL



Weight 5 grams
 Tray 80/tray

Dimensions: $\frac{\text{Inches}}{\text{mm}}$
 Unless otherwise specified,
 all tolerances are: $\pm \frac{010}{0,25}$

SUGGESTED PCB HOLE PATTERN

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