

# High Frequency Wire Wound Transformers

EP13Plus Platforms - SMT PA3855/56.XXXNLT



- Industry standard footprint, 30% more power handling
- Power Range:** Up to 70W
- Height:** 14.0mm Max
- Footprint:** 17.7mm x 14.5mm Max
- Topology:** Forward and Flyback

| Part Number  | Electrical Specifications @25°C – Operating Temperature -40°C to 130°C <sup>1</sup> |                                    |              |        | Schematic                  |
|--------------|-------------------------------------------------------------------------------------|------------------------------------|--------------|--------|----------------------------|
| PA3855.001NL | Pri. Inductance                                                                     | (1-3)                              | 54uH +/- 10% |        | <p>Flyback Transformer</p> |
|              | Lk. Inductance                                                                      | (1-3) w/<br>(10,9,6,7,4,5) shorted | 0.67uH Max   |        |                            |
|              | DCR                                                                                 | (1-3)                              | 62           | mΩ Max |                            |
|              |                                                                                     | (9-6)                              | 6.5          |        |                            |
|              |                                                                                     | (10-7)                             | 6.5          |        |                            |
|              |                                                                                     | (4-5)                              | 120          |        |                            |
|              | Hi-Pot                                                                              | Pri-Sec                            | 2250         | Vdc    |                            |
| K1 Factor    | 1125.0                                                                              |                                    |              |        |                            |
| PA3855.002NL | Pri. Inductance                                                                     | (1-3)                              | 48uH +/- 10% |        | <p>Flyback Transformer</p> |
|              | Lk. Inductance                                                                      | (1-3) w/<br>(10,9,6,7,4,5) shorted | 0.67uH Max   |        |                            |
|              | DCR                                                                                 | (1-3)                              | 62           | mΩ Max |                            |
|              |                                                                                     | (9-6)                              | 10           |        |                            |
|              |                                                                                     | (10-7)                             | 10           |        |                            |
|              |                                                                                     | (4-5)                              | 120          |        |                            |
|              | Hi-Pot                                                                              | Pri-Sec                            | 2250         | Vdc    |                            |
| K1 Factor    | 1000.0                                                                              |                                    |              |        |                            |
| PA3855.003NL | Pri. Inductance                                                                     | (1-3)                              | 41uH +/- 10% |        | <p>Flyback Transformer</p> |
|              | Lk. Inductance                                                                      | (1-3) w/<br>(10,9,6,7,4,5) shorted | 0.67uH Max   |        |                            |
|              | DCR                                                                                 | (1-3)                              | 62           | mΩ Max |                            |
|              |                                                                                     | (9-6)                              | 20           |        |                            |
|              |                                                                                     | (10-7)                             | 23           |        |                            |
|              |                                                                                     | (4-5)                              | 120          |        |                            |
|              | Hi-Pot                                                                              | Pri-Sec                            | 2250         | Vdc    |                            |
| K1 Factor    | 854.2                                                                               |                                    |              |        |                            |
| PA3855.004NL | Pri. Inductance                                                                     | (1-3)                              | 21uH +/- 10% |        | <p>Flyback Transformer</p> |
|              | Lk. Inductance                                                                      | (1-3) w/<br>(10,9,6,7,4,5) shorted | 0.3uH Max    |        |                            |
|              | DCR                                                                                 | (1-3)                              | 31           | mΩ Max |                            |
|              |                                                                                     | (9-6)                              | 10           |        |                            |
|              |                                                                                     | (10-7)                             | 10           |        |                            |
|              |                                                                                     | (4-5)                              | 180          |        |                            |
|              | Hi-Pot                                                                              | Pri-Sec                            | 2250         | Vdc    |                            |
| K1 Factor    | 538.5                                                                               |                                    |              |        |                            |

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| Part Number  | Electrical Specifications @25°C – Operating Temperature -40°C to 130°C <sup>1</sup> |                                 |                | Schematic                  |
|--------------|-------------------------------------------------------------------------------------|---------------------------------|----------------|----------------------------|
| PA3855.005NL | Pri. Inductance                                                                     | (1-3)                           | 21uH +/- 10%   | <p>Flyback Transformer</p> |
|              | Lk. Inductance                                                                      | (1-3) w/ (10,9,6,7,4,5) shorted | 0.3uH Max      |                            |
|              | DCR                                                                                 | (1-3)                           | 31             |                            |
|              |                                                                                     | (9-6)                           | 14             |                            |
|              |                                                                                     | (10-7)                          | 14             |                            |
|              |                                                                                     | (4-5)                           | 180            |                            |
|              | Hi-Pot                                                                              | Pri-Sec                         | 2250 Vdc       |                            |
| PA3855.006NL | Pri. Inductance                                                                     | (1-3)                           | 21uH +/- 10%   | <p>Flyback Transformer</p> |
|              | Lk. Inductance                                                                      | (1-3) w/ (10,9,6,7,4,5) shorted | 0.3uH Max      |                            |
|              | DCR                                                                                 | (1-3)                           | 31             |                            |
|              |                                                                                     | (9-6)                           | 58             |                            |
|              |                                                                                     | (10-7)                          | 58             |                            |
|              |                                                                                     | (4-5)                           | 180            |                            |
|              | Hi-Pot                                                                              | Pri-Sec                         | 2250 Vdc       |                            |
| PA3855.008NL | Pri. Inductance                                                                     | (6-9)                           | 2.5uH +/- 10%  | <p>Flyback Transformer</p> |
|              | Lk. Inductance                                                                      | (6-9) w/ (1,2,3,5) shorted      | 0.2uH Max      |                            |
|              | DCR                                                                                 | (1-2)                           | 80             |                            |
|              |                                                                                     | (3-5)                           | 100            |                            |
|              |                                                                                     | (6,7-9,10)                      | 9              |                            |
|              | Hi-Pot                                                                              | Pri-Sec                         | 2250 Vdc       |                            |
|              | K1 Factor                                                                           |                                 | 208.3          |                            |
| PA3856.001NL | Pri. Inductance                                                                     | (1-3)                           | 100 uH +/- 15% | <p>Forward Transformer</p> |
|              | Lk. Inductance                                                                      | (1-3) w/ (10,9,6,7,4,5) shorted | 0.4uH Max      |                            |
|              | DCR                                                                                 | (1-3)                           | 29.4           |                            |
|              |                                                                                     | (9-6)                           | 6.5            |                            |
|              |                                                                                     | (10-7)                          | 6.5            |                            |
|              |                                                                                     | (4-5)                           | 120            |                            |
|              | Hi-Pot                                                                              | Pri-Sec                         | 2250 Vdc       |                            |
| PA3856.002N  | Pri. Inductance                                                                     | (1-3)                           | 100uH +/- 15%  | <p>Forward Transformer</p> |
|              | Lk. Inductance                                                                      | (1-3) w/ (10,9,6,7,4,5) shorted | 0.4uH Max      |                            |
|              | DCR                                                                                 | (1-3)                           | 29.4           |                            |
|              |                                                                                     | (9-6)                           | 10             |                            |
|              |                                                                                     | (10-7)                          | 10             |                            |
|              |                                                                                     | (4-5)                           | 120            |                            |
|              | Hi-Pot                                                                              | Pri-Sec                         | 2250 Vdc       |                            |
|              | K1 Factor                                                                           |                                 | 27.8           |                            |

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| Part Number  | Electrical Specifications @25°C – Operating Temperature -40°C to 130°C <sup>1</sup> |                                    |               | Schematic |                            |
|--------------|-------------------------------------------------------------------------------------|------------------------------------|---------------|-----------|----------------------------|
| PA3856.003NL | Pri. Inductance                                                                     | (1-3)                              | 100uH +/- 15% |           | <p>Forward Transformer</p> |
|              | Lk. Inductance                                                                      | (1-3) w/<br>(10,9,6,7,4,5) shorted | 0.4uH Max     |           |                            |
|              | DCR                                                                                 | (1-3)                              | 29.4          | mΩ Max    |                            |
|              |                                                                                     | (9-6)                              | 31.6          |           |                            |
|              |                                                                                     | (10-7)                             | 36            |           |                            |
|              |                                                                                     | (4-5)                              | 120           |           |                            |
|              | Hi-Pot                                                                              | Pri-Sec                            | 2250 Vdc      |           |                            |
| K1 Factor    | 27.8                                                                                |                                    |               |           |                            |
| PA3856.004NL | Pri. Inductance                                                                     | (1-3)                              | 128uH +/- 25% |           | <p>Forward Transformer</p> |
|              | Lk. Inductance                                                                      | (1-3) w/<br>(10,9,6,7,4,5) shorted | 0.15uH Max    |           |                            |
|              | DCR                                                                                 | (1-3)                              | 17.6          | mΩ Max    |                            |
|              |                                                                                     | (9-6)                              | 14.4          |           |                            |
|              |                                                                                     | (10-7)                             | 17            |           |                            |
|              |                                                                                     | (4-5)                              | 410           |           |                            |
|              | Hi-Pot                                                                              | Pri-Sec                            | 2250 Vdc      |           |                            |
| K1 Factor    | 41.7                                                                                |                                    |               |           |                            |
| PA3856.005NL | Pri. Inductance                                                                     | (1-3)                              | 128uH +/- 15% |           | <p>Forward Transformer</p> |
|              | Lk. Inductance                                                                      | (1-3) w/<br>(10,9,6,7,4,5) shorted | 0.15uH Max    |           |                            |
|              | DCR                                                                                 | (1-3)                              | 17.6          | mΩ Max    |                            |
|              |                                                                                     | (9-6)                              | 31.6          |           |                            |
|              |                                                                                     | (10-7)                             | 36            |           |                            |
|              |                                                                                     | (4-5)                              | 410           |           |                            |
|              | Hi-Pot                                                                              | Pri-Sec                            | 2250 Vdc      |           |                            |
| K1 Factor    | 41.7                                                                                |                                    |               |           |                            |
| PA3856.006NL | Pri. Inductance                                                                     | (1-3)                              | 128uH +/- 15% |           | <p>Forward Transformer</p> |
|              | Lk. Inductance                                                                      | (1-3) w/<br>(10,9,6,7,4,5) shorted | 0.15uH Max    |           |                            |
|              | DCR                                                                                 | (1-3)                              | 17.6          | mΩ Max    |                            |
|              |                                                                                     | (9-6)                              | 105.6         |           |                            |
|              |                                                                                     | (10-7)                             | 122           |           |                            |
|              |                                                                                     | (4-5)                              | 426           |           |                            |
|              | Hi-Pot                                                                              | Pri-Sec                            | 2250 Vdc      |           |                            |
| K1 Factor    | 41.7                                                                                |                                    |               |           |                            |
| PA3856.007NL | Pri. Inductance                                                                     | (1-2)                              | 200uH +/- 25% |           | <p>Forward Transformer</p> |
|              | Lk. Inductance                                                                      | (1-2) w/<br>(7,8,9,10) shorted     | 0.36uH Max    |           |                            |
|              | DCR                                                                                 | (1-2)                              | 60            | mΩ Max    |                            |
|              |                                                                                     | (3-4)                              | 75            |           |                            |
|              |                                                                                     | (8-7)                              | 90            |           |                            |
|              |                                                                                     | (10-9)                             | 90            |           |                            |
|              | Hi-Pot                                                                              | Pri-Sec                            | 2250 Vdc      |           |                            |
| K1 Factor    | 33.3                                                                                |                                    |               |           |                            |

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## Notes:

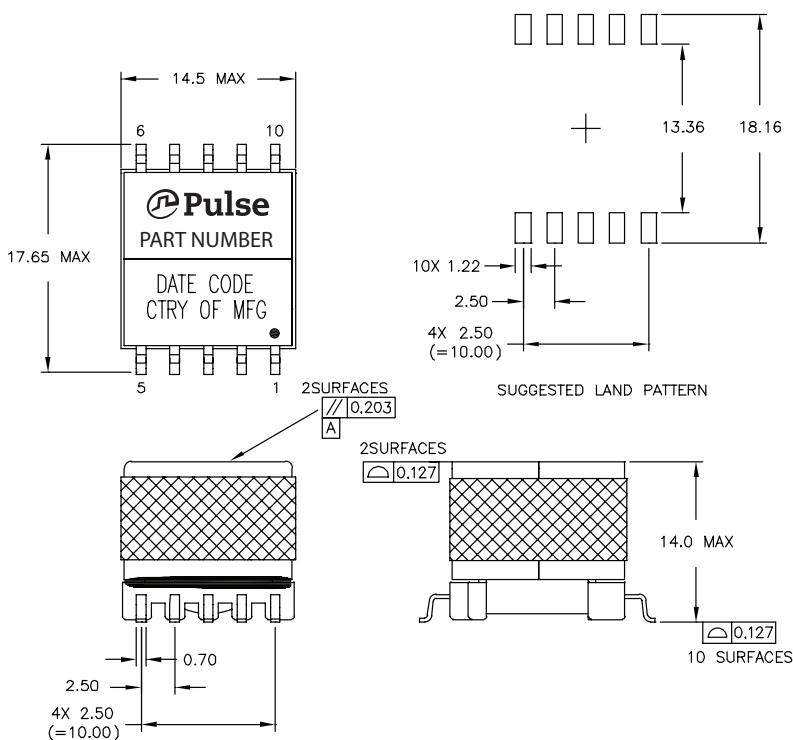
1. The temperature of the component (ambient plus temperature rise) must be within the stated operating temperature range.
2. For flyback topology applications, it is necessary to ensure that the transformer will not saturate in the application. The peak flux density (Bpk) should remain below 2700Gauss. To calculate the peak flux density use the following formula:  

$$B_{pk} \text{ (Gauss)} = K1\_Factor * I_{pk}(A)$$
3. In high volt-μsec applications, it is important to calculate the core loss of the transformer. Approximate transformer core loss can be calculated as:  

$$CoreLoss \text{ (W)} = 3.84E-14 * (Freq\_kHz)^{1.65} * (\Delta B\_Gauss)^{2.65}$$
 where ΔB can be calculated as:  
 For Flyback Topology:  $\Delta B = K1\_Factor * \Delta I(A)$   
 For Forward Topology:  $\Delta B = K1\_Factor * Volt\text{-}\mu sec$
4. The standard pin-numbering for this package is indicated in the below mechanical drawing showing pin 1 on the lower right corner and the numbers proceeding clockwise to pin 10 on the upper right corner.
5. Optional Tape & Reel packaging can be ordered by adding a "T" suffix to the part number (i.e. PA2160.001NL becomes PA2160.001NLT). Pulse complies with industry standard tape and reel specification EIA481.

## Mechanical

### PM2160.XXXNL

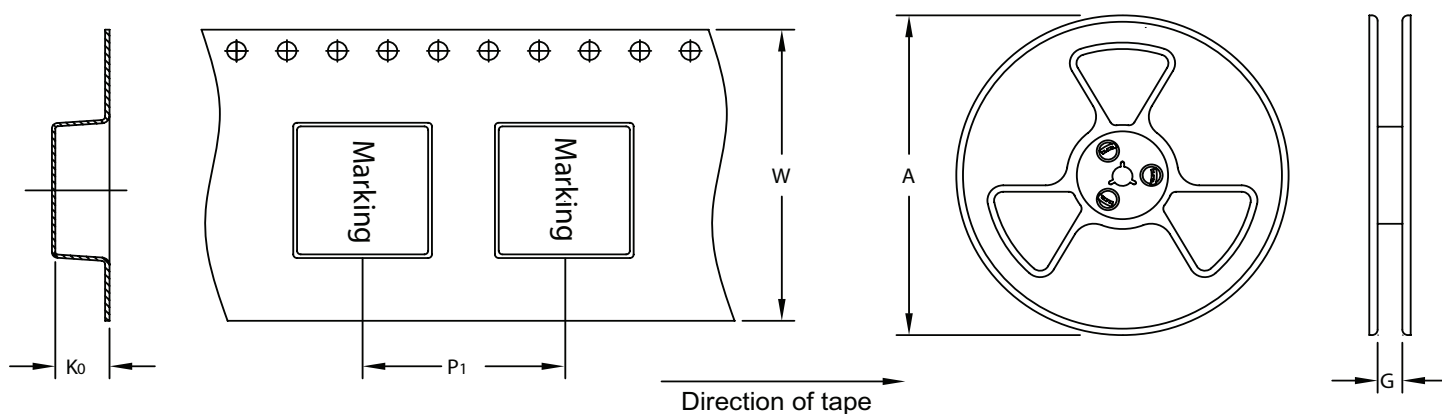


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## TAPE & REEL INFO



SURFACE MOUNTING TYPE, REEL/TAPE LIST

| PART NUMBER      | REEL SIZE (mm) |      | TAPE SIZE (mm) |    |                | QTY<br>PCS/REEL |
|------------------|----------------|------|----------------|----|----------------|-----------------|
|                  | A              | G    | P <sub>1</sub> | W  | K <sub>0</sub> |                 |
| PA3855/56.XXXNLT | Ø330           | 32.4 | 24             | 32 | 13.2           | 130             |

## For More Information

### Pulse Worldwide Headquarters

15255 Innovation Drive Ste 100  
San Diego, CA 92128  
U.S.A.

### Pulse Europe

Pulse Electronics GmbH  
Am Rottland 12  
58540 Meinerzhagen  
Germany

### Pulse China Headquarters

Pulse Electronics (ShenZhen) CO., LTD  
D708, Shenzhen Academy of  
Aerospace Technology,  
The 10th Keji South Road,  
Nanshan District, Shenzhen,  
P.R. China 518057

### Pulse North China

Room 2704/2705  
Super Ocean Finance Ctr.  
2067 Yan An Road West  
Shanghai 200336  
China

### Pulse South Asia

3 Fraser Street  
0428 DUO Tower  
Singapore 189352

### Pulse North Asia

1F., No.111 Xiyuan Rd  
Zhongli City  
Taoyuan City 32057  
Taiwan (R.O.C)

Tel: 858 674 8100  
Fax: 858 674 8262

Tel: 49 2354 777 100  
Fax: 49 2354 777 168

Tel: 86 755 33966678  
Fax: 86 755 33966700

Tel: 86 21 62787060  
Fax: 86 21 62786973

Tel: 65 6287 8998  
Fax: 65 6280 0080

Tel: 886 3 4356768  
Fax: 886 3 4356820

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### Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

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