

20W flyback transformer in SMD package  
4:1 input voltage range and 1650VDC isolation test voltage



### FEATURES

- Power up to 20W
- High saturated flux density
- Low DCR loss
- Class F insulation
- SMD package
- ER14.5 Bobbin, Dimensions: 14.70 x 16.00 x 6.80mm
- Meets EN62368 standards

TTURB-20T transformer series feature with 1650VDC primary to secondary isolation, an operating ambient temperature range of -40°C ~ +125°C. It can be used with our control IC SCM1101AMA to achieve flyback power supply design with an 4:1 wide input voltage range and various protection functions and superior EMI performance.

### Selection Guide

| Certification | Part No.      | Input Voltage (VDC) | Output Voltage (VDC) | Output Current (mA) | Auxiliary Voltage (VDC) | Auxiliary Current (mA) | Driven Current (mA) | Driven Voltage (mA) | Power (W) | Pri-Sec Isolated Voltage (VDC) |
|---------------|---------------|---------------------|----------------------|---------------------|-------------------------|------------------------|---------------------|---------------------|-----------|--------------------------------|
| --            | TTURB2405-20T | 9-36                | 5                    | 4000                | 6.67                    | 50                     | 11.67               | 50                  | 20        | 1650                           |

Note: Pins and phase points of the transformers refer to Phase Diagram.

### Electrical Specifications

| Part No.      | Inductance(uH)   |                                      | DCR(mΩ) Typ. |    |    |    |    |     | K<br>(Flux Density Factor)<br>(Gauss/A) |
|---------------|------------------|--------------------------------------|--------------|----|----|----|----|-----|---|
|               | Input Inductance | Leakage Inductance <sup>①</sup> Max. | N1           | N2 | N3 | N4 | N5 | N6  |   |
| TTURB2405-20T | 6.86±12%         | 1                                    | 23           | 59 | 12 | 12 | 93 | 273 | 572                                     |

Notes: ① Approximate leakage inductance: test the inductance of N1 and N2 in parallel based on N3, N4, N5 and N6 are shorted;  
② To ensure the transformer will not saturate in all of the applications and conditions, the peak flux density(Bm) should remain below 3000 Gauss. Use the following formula to calculate the peak flux density:  $B_m = K \cdot I_{pk}$ , I<sub>pk</sub> stands for the peak current of input, which unit is A;  
③ Approximate transformer core loss(P<sub>cv</sub>) can be calculated as following formula:  $P_{cv} = 3.9E-14 \cdot f^{1.82} \cdot \Delta B^{2.59}$ , the unit of P<sub>cv</sub> is W, f stands for operating frequency, which unit is kHz, ΔB is the operating flux density, which unit is Gauss. ΔB can be calculated as:  $\Delta B = K \cdot \Delta I$ .

### General Specifications

| Item                                       | Operating Conditions   | Min.  | Typ. | Max. | Unit |
|--|--|---|------|------|------|
| Isolation                                  | Pri-Sec Electric Strength Test for 1 minute with a leakage current of 1mA max. | 1650  | --   | --   | VDC  |
| Surface operating Temperature <sup>①</sup> |  | -40   | --   | +125 | °C   |
| Storage Humidity                           | Non-condensing   | 5   | --   | 95   | %RH  |
| Storage Temperature <sup>②</sup>           |  | -55   | --   | +125 | °C   |
| Reflow Soldering Temperature <sup>③</sup>  |  | Peak temp. ≤245°C, maximum duration time ≤60s over 217°C. |      |      |      |

Notes: ① The temperature of the transformer(ambient plus temperature rise) should be within the surface operating temperature range;  
② The storage temperature of the transformer only;  
③ Please refer to IPC/JEDEC J-STD-020D.1. And we suggest that times of reflow soldering should not exceed twice.

### Mechanical Specifications

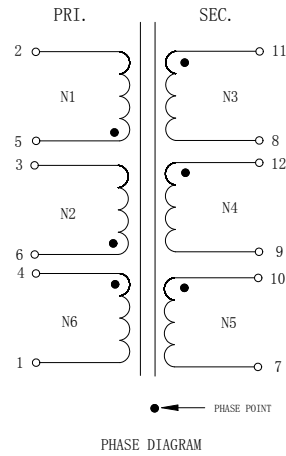
|            |                        |
|------------|------------------------|
| Dimensions | 14.70 x 16.00 x 6.80mm |
| Weight     | 3.00g (Typ.)           |

### Material certification

|          |        |
|----------|--------|
| Material | UL No. |
| Bobbin   | E41429 |
| Tape     | E17385 |

|         |         |
|---------|---------|
| Wire 1  | E253843 |
| Wire 2  | E234867 |
| Varnish | E317427 |

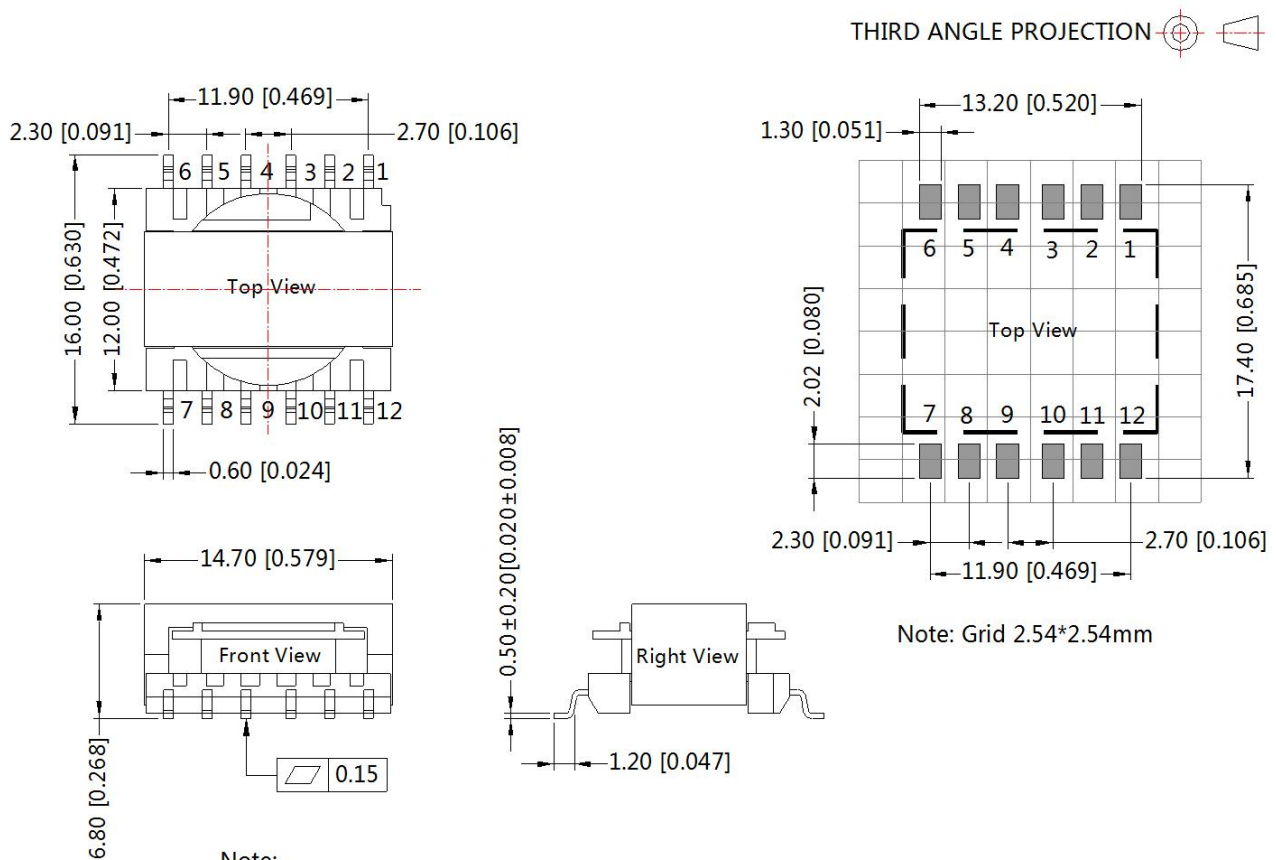
Phase Diagram



|                             |                                   |
|-----------------------------|-----------------------------------|
| Turns Ratio                 | TTURB2405-20T                     |
| N1 : N2 : N5 : N6 : N3 : N4 | 2.33 : 2.33 : 1.33 : 2.33 : 1 : 1 |

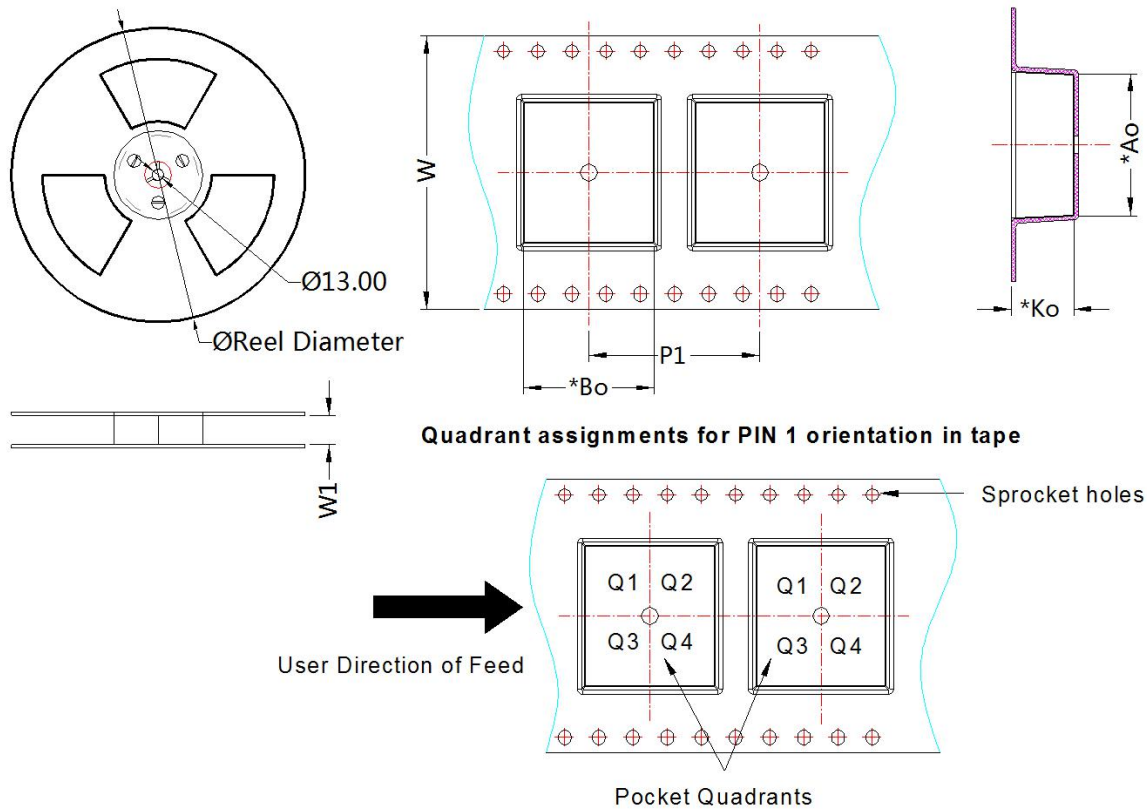
Note: Input: N1/N2 in parallel. Output: N3/N4 in parallel. Driven: N5. Auxiliary: N6.

Dimensions and Recommended Layout



Note:  
Unit :mm[inch]  
General tolerances:±0.5[±0.020]

Tape and Reel Info



| Device | Package Type | Pin | SPQ | Reel Diameter (mm) | Reel Width W1 (mm) | A0 (mm) | B0 (mm) | K0 (mm) | P1 (mm) | W (mm) | Pin1 Quadrant |
|--------|--------------|-----|-----|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| ER14.5 | SMD          | 12  | 400 | 330.0              | 32.4               | 16.56   | 15.26   | 7.30    | 20.00   | 32     | Q2            |

Notes:

1. For additional information on Product Packaging please refer to [www.mornsun-power.com](http://www.mornsun-power.com). Packaging bag number : 58210086;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25°C, humidity<75%RH, 100kHz and 100mV
3. All index testing methods in this datasheet are based on our company corporate standards;
4. We can provide other analog transformer customization service, please contact our technicians directly for specific information;
5. Products are related to laws and regulations: see "Features";
6. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

MORNSUN Guangzhou Science & Technology Co., Ltd.

Address: No. 5, Kehui St. 1, Kehui Development Center, Science Ave., Guangzhou Science City, Huangpu District, Guangzhou, P. R. China

Tel: 86-20-38601850

Fax: 86-20-38601272

E-mail: [info@mornsun.cn](mailto:info@mornsun.cn)

[www.mornsun-power.com](http://www.mornsun-power.com)