

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 to +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 <sup>①</sup> (VDC)	Auxiliary Current (mA)	Driven Current (mA)	Driven Voltage (mA)	Power (W)	Pri-Sec Isolated Voltage (VDC)
--	TTURB2403-20T	9-36	3.3	5000	5.5	50	12.1	50	20	1650
	TTURB2405-20T	9-36	5	4000	6.67	50	11.67	50	20	1650
	TTURB2412-20T	9-36	12	1667	--	--	12	50	20	1650
	TTURB2415-20T	9-36	15	1333	--	--	13.33	50	20	1650
	TTURB2424-20T	9-36	24	833	--	--	13.09	50	20	1650
	TTURB4803-20T	18-75	3.3	5000	5.5	50	12.1	50	20	1650
	TTURB4812-20T	18-75	12	1667	--	--	12.00	50	20	1650
	TTURB4815-20T	18-75	15	1333	--	--	13.33	50	20	1650
	TTURB4824-20T	18-75	24	833	--	--	13.09	50	20	1650

①Auxiliary Voltage for synchronous rectification scheme.  
Note: Pins and phase points of the transformers refer to Phase Diagram.

### Electrical Specifications

Part No.	Inductance(uH)		DCR(mΩ) Typ.						K (Flux Density Factor) (Gauss/A)
	Input Inductance	Leakage Inductance Max.	5-2	6-3	11-8	12-9	10-7	4-1	
TTURB2403-20T	8.96±15%	0.45 (4,5-1,2)	62	--	15	14.5	--	70	572
TTURB2405-20T	6.86±15%	1(4,5-1,2)	23	59	12	12	93	273	572
TTURB2412-20T	6.86±15%	0.4(4,5-1,2)	52	--	56	66	--	62	572
TTURB2415-20T	6.86±15%	0.35(4,5-1,2)	54	--	100	85	--	65	572
TTURB2424-20T	6.86±15%	0.4(4,5-1,2)	55	--	233	106	--	65	572
TTURB4803-20T	31.5±15%	1(4-1)	315	--	14	14	210	250	572
TTURB4812-20T	27.44±15%	1(4-1)	300	97	57.3	41	--	--	572
TTURB4815-20T	27.44±15%	1(4-1)	253	--	170	68	--	120	572
TTURB4824-20T	27.44±15%	1(4-1)	270	--	127	200	--	120	572

Notes:①To 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;

②Approximate transformer core loss(Pcv) can be calculated as following formula:  $P_{cv} = 3.9E-14 \cdot f^{1.82} \cdot \Delta B^{2.59}$ , the unit of Pcv 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: ①The temperature of the transformer(ambient plus temperature rise) should be within the surface operating temperature range;  
②The storage temperature of the transformer only;  
③Please refer to IPC/JEDEC J-STD-020D.1. And we suggest that times of reflow soldering should not exceed twice.

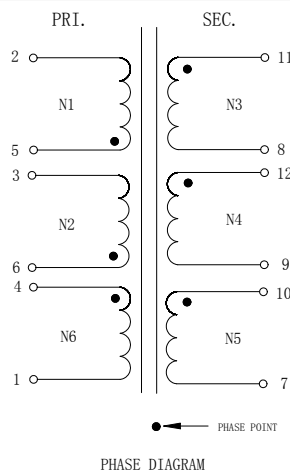
Mechanical Specifications

Dimensions	14.70 x 16.00 x 6.80mm
Weight	3.0g (Typ.)

Material certification

Material	UL No.
Bobbin	E41429
Tape	E17385
Wire 1	E253843
Wire 2	E234867
Varnish	E317427

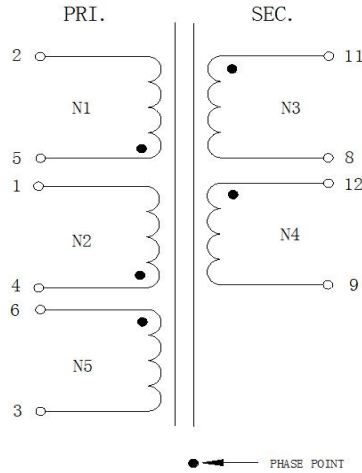
Phase Diagram



Turns Ratio	TTURB2403-20T	TTURB2405-20T	TTURB4803-20T
N1 : N2 : N5 : N6 : N3 : N4	2.67 : 3.67 : 1.67 : 2.67 : 1 : 1	2.33 : 2.33 : 1.33 : 2.33 : 1 : 1	5 : 3.67 : 1.67 : 5 : 1 : 1

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

Phase Diagram



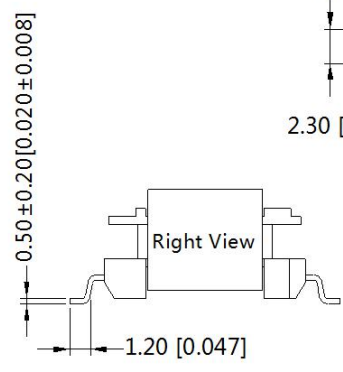
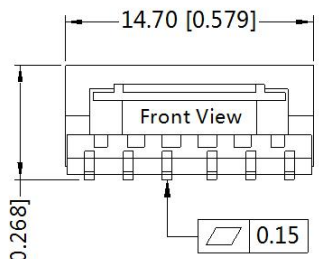
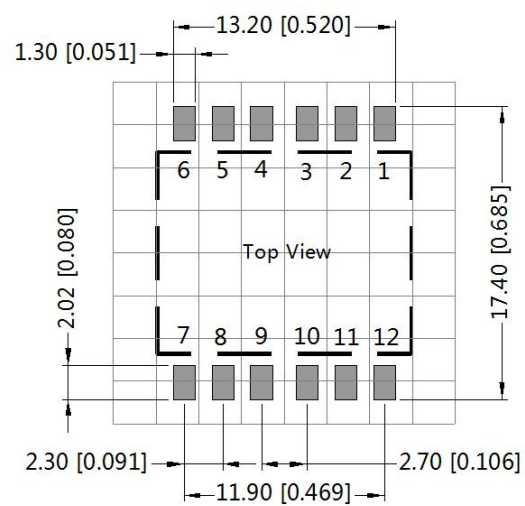
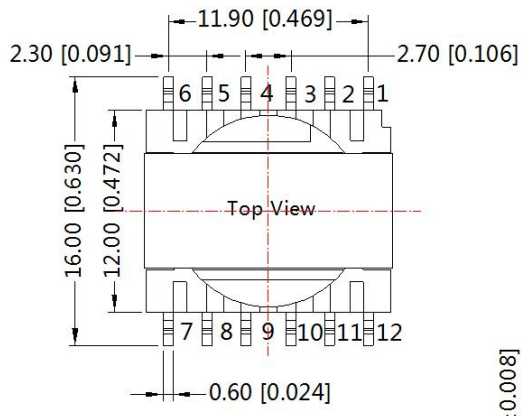
PHASE DIAGRAM

Turns Ratio	TTURB2412-20T	TTURB2415-20T	TTURB2424-20T
N1 : N2 : N5 : N3 : N4	1 : 1 : 1 : 1 : 1	1 : 1:1.29 : 1.29 : 1.14	1.17 : 1.17 : 1.83 : 1.83 : 1
Turns Ratio	TTURB4812-20T	TTURB4815-20T	TTURB4824-20T
N1 : N2 : N5 : N3 : N4	2 : 2 : 1 : 1 : 1	1.75 : 1.75 : 1.13 : 1.13 : 1	2.33 : 2.33 : 1.83 : 1.83 : 1

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

Dimensions and Recommended Layout

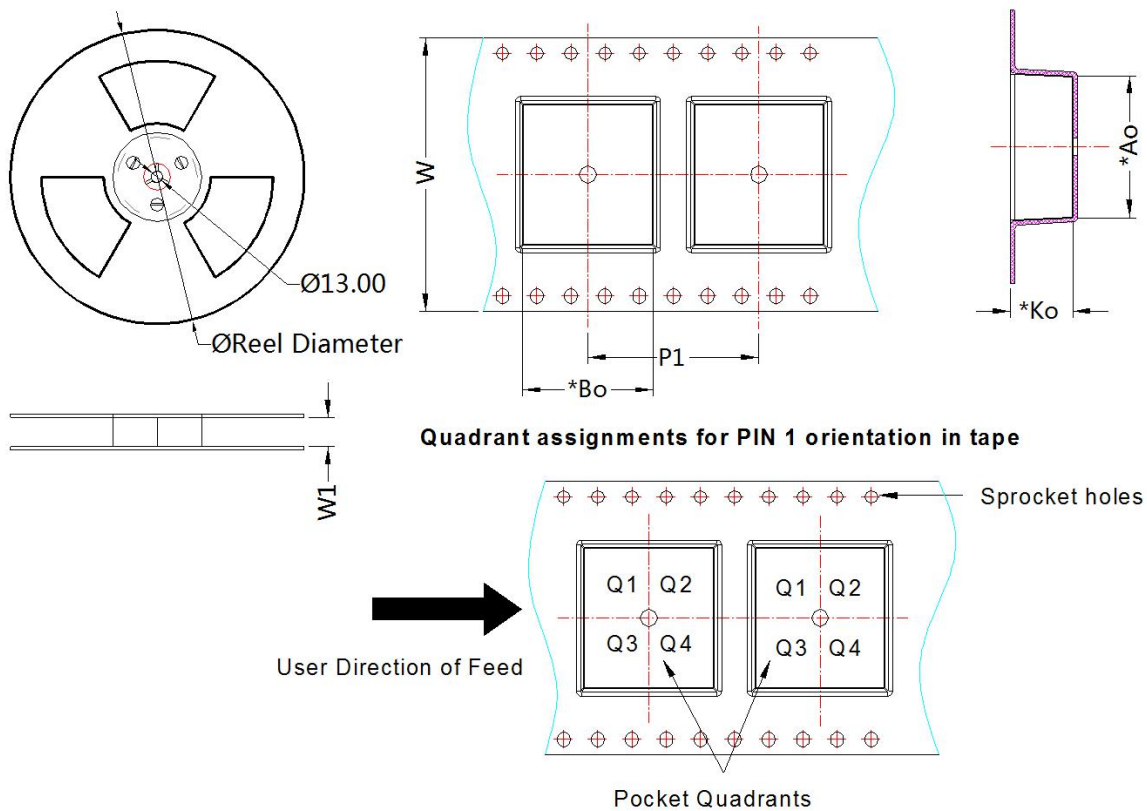
THIRD ANGLE PROJECTION



Note: Grid 2.54\*2.54mm

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)