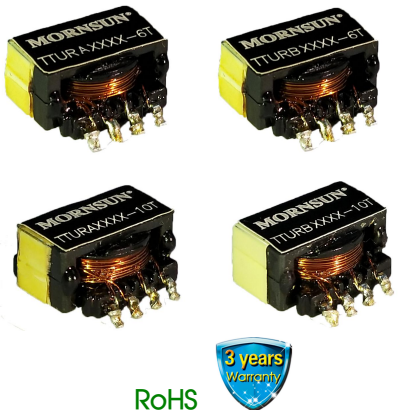
DC/DC Transformer

TTURA(B)-6(10)T Series

MORNSUN®

6W/10W flyback transformer in SMD package
4:1 input voltage range and 1650VDC isolation test voltage



RoHS

3 years Warranty

FEATURES

- Power up to 10W
- High saturated flux density
- Low DCR loss
- Class F insulation
- SMD package
- ER11.5 Bobbin, Dimensions: 11.00 x 12.20 x 5.90mm
- Meets EN62368 standards

TTURA/B-6/10T transformer series feature with 1650VDC primary to secondary isolation, an operating ambient temperature range of -40℃ to +125℃. It can be used with our control IC SCM1101AMA to achieve flyback power supply design with an 4:1 wide input volatge 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)	Power (W)	Pri-Sec Isolated Voltage (VDC)
--	TTURA2405-6T	9-36	±5	±600	11.6	50	6	1650
	TTURA2412-6T	9-36	±12	±250	12	50	6	1650
	TTURA2415-6T	9-36	±15	±200	11.8	50	6	1650
	TTURA2424-6T	9-36	±24	±125	12	50	6	1650
	TTURB2403-6T	9-36	3.3	1500	11.6	50	6	1650
	TTURB2405-6T	9-36	5	1200	11.6	50	6	1650
	TTURB2409-6T	9-36	9	667	11.7	50	6	1650
	TTURB2412-6T	9-36	12	500	11	50	6	1650
	TTURB2415-6T	9-36	15	400	10.7	50	6	1650
	TTURB2424-6T	9-36	24	250	11.6	50	6	1650
	TTURA4805-6T	18-75	±5	±600	12	50	6	1650
	TTURA4812-6T	18-75	±12	±250	12	50	6	1650
	TTURA4815-6T	18-75	±15	±200	11.5	50	6	1650
	TTURB4803-6T	18-75	3.3	1500	8.3	50	6	1650
	TTURB4805-6T	18-75	5	1200	10	50	6	1650
	TTURB4812-6T	18-75	12	500	9.8	50	6	1650
	TTURB4815-6T	18-75	15	400	10.4	50	6	1650
	TTURB4824-6T	18-75	24	250	12	50	6	1650
	TTURA2405-10T	9-36	±5	±1000	11	50	10	1650
	TTURA2409-10T	9-36	±9	±555	10.3	50	10	1650
	TTURA2412-10T	9-36	±12	±416	12.5	50	10	1650
	TTURA2415-10T	9-36	±15	±334	12.5	50	10	1650
	TTURA2424-10T	9-36	±24	±208	12	50	10	1650
	TTURB2403-10T	9-36	3.3	2400	9.9	50	10	1650
	TTURB2405-10T	9-36	5	2000	11	50	10	1650
	TTURB2409-10T	9-36	9	1111	10.3	50	10	1650
	TTURB2412-10T	9-36	12	833	12.5	50	10	1650

--	TTURB2415-10T	9-36	15	667	12.5	50	10	1650
	TTURB2424-10T	9-36	24	416	12	50	10	1650
	TTURA4805-10T	18-75	±5	±1000	11.25	50	10	1650
	TTURA4812-10T	18-75	±12	±416	10.5	50	10	1650
	TTURA4815-10T	18-75	±15	±333	10.5	50	10	1650
	TTURA4824-10T	18-75	±24	±208	12	50	10	1650
	TTURB4803-10T	18-75	3.3	2400	13	50	10	1650
	TTURB4805-10T	18-75	5	2000	11.25	50	10	1650
	TTURB4812-10T	18-75	12	833	10.7	50	10	1650
	TTURB4815-10T	18-75	15	667	10	50	10	1650
	TTURB4824-10T	18-75	24	416	9	50	10	1650

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 Inductance① Max.	3-1	7-5	8-6	4-2	
TTURA2405-6T	16±15%	0.3(4-2)	--	63.9	67.7	85.9	1322
TTURA2412-6T	16±15%	0.3(4-2)	--	271	288	85.9	1322
TTURA2415-6T	16±15%	0.3(4-2)	--	296	297	86.9	1322
TTURA2424-6T	16±15%	0.15(4-2)	--	--	650	90	1322
TTURB2403-6T	16±15%	0.15(4-2)	116.4	32.64	34.92	--	1322
TTURB2405-6T	16±15%	0.23	105	60	71	560	1322
TTURB2409-6T	16±15%	1.3(4-2)	142	182	218	--	1322
TTURB2412-6T	16±15%	0.4(4-2)	114.7	--	--	--	1322
TTURB2415-6T	16±15%	1.0(4-2)	--	--	363	--	1322
TTURB2424-6T	16±15%	0.4	110	650	750	520	1322
TTURA4805-6T	51.84±15%	1.16(4-2)	--	65.16	68.04	--	1408
TTURA4812-6T	51.84±15%	1.14(4-2)	--	270.6	282.5	--	2375
TTURA4815-6T	51.84±15%	2.59(4-2)	--	295.2	292.3	--	2375
TTURB4803-6T	51.84±15%	4.7(3-1)	--	54.24	63.36	--	1408
TTURB4805-6T	51.84±15%	0.75(3-1)	--	59	71	--	1408
TTURB4812-6T	51.84±15%	4.96	433	380	222	408	2375
TTURB4815-6T	51.84±15%	0.8(3-1)	--	--	261	--	2375
TTURB4824-6T	51.84±15%	4.14(3-1)	--	--	--	--	2375
TTURA2405-10T	7.04±15%	0.45(3-1)	54.5	33.8	35.5	--	704
TTURA2409-10T	7.04±15%	0.2(3-1)	60	85	85	--	704
TTURA2412-10T	7.04±15%	0.2(3-1)	70	170	170	--	704
TTURA2415-10T	7.04±15%	0.2	64	248	258	390	704
TTURA2424-10T	7.04±15%	0.1(3-1)	65	415	415	--	704
TTURB2403-10T	7.04±15%	0.45(3-1)	61	29	29	--	704
TTURB2405-10T	7.04±15%	0.45	55	34	36	438	704
TTURB2409-10T	7.04±15%	0.45(3-1)	58	--	--	--	704
TTURB2412-10T	7.04±15%	0.45(3-1)	57	140	178	--	704
TTURB2415-10T	7.04±15%	0.45(3-1)	58	--	--	--	704
TTURB2424-10T	7.04±15%	0.45(3-1)	58	--	--	--	704
TTURA4805-10T	31.36±15%	1.6(3-1)	144	29	30	370	1851
TTURA4812-10T	31.36±15%	1.6(3-1)	160	140	150	--	1851

TTURA4815-10T	31.36±15%	1.56(3-1)	150	180	180	--	1851
TTURA4824-10T	31.36±15%	1.6(3-1)	157	267	286	--	1851
TTURB4803-10T	28.16±15%	1.4(3-1)	183	44	44	--	1851
TTURB4805-10T	28.16±15%	1.1(3-1)	168	31	42	370	1851
TTURB4812-10T	28.16±15%	1.4(3-1)	184	140	186	--	1851
TTURB4815-10T	28.16±15%	1.4(3-1)	176	370	246	--	1851
TTURB4824-10T	28.16±15%	1.4(3-1)	184	--	--	--	1851

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: Bm=K*Ipk,Ipk stands for the peak current of input, which unit is A;
②Approximate transformer core loss(Pcv) can be calculated as following formula: $Pcv=3.9E-14*f^{1.82}*\triangle B^{2.59}$, the unit of Pcv is W, f stands for operating frequency, which unit is kHz, △B is the operating flux density, which unit is Gauss. △B can be calculated as:△B=K*△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 Temperature①		-40	--	+125	℃
Storage Humidity	Non-condensing	5	--	95	%RH
Storage Temperature②		-55	--	+125	℃
Reflow Soldering Temperature③		Peak temp.≤245℃, maximum duration time≤60s over 217℃.			

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.

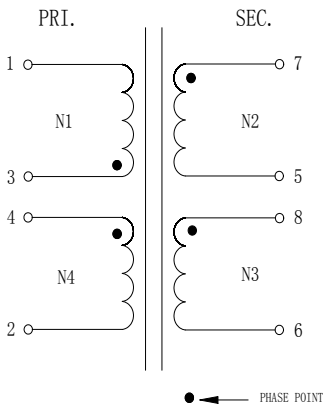
Mechanical Specifications

Dimensions	11.00 x 12.20 x 5.90mm
Weight	1.4g (Typ.)

Material certification

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

Phase Diagram

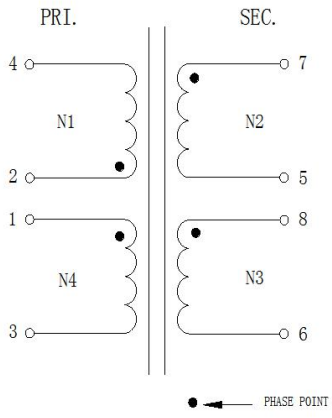


PHASE DIAGRAM

Turns Ratio	TTURB2403-6T	TTURB2405-6T	TTURB2409-6T	TTURB2412-6T	TTURB2415-6T	TTURB2424-6T
N1 : N4 : N2 : N3	2.5：3.5：1：1	1.67 : 2.33 : 1 : 1	1 : 1.3 : 1 : 1	1 : 1.1: 1.2 : 1.2	1 : 1 : 1.4 : 1.4	0.56 : 0.5 : 1 : 1

Turns Ratio	TTURB4803-6T	TTURB4805-6T	--	TTURB4812-6T	TTURB4815-6T	TTURB4824-6T
N1 : N4 : N2 : N3	4.5：2.5：1：1	3.6 : 2 : 1 : 1	--	2: 1: 1.22: 1.22	2：1：1.44：1.44	2：1：2：2
Turns Ratio	--	TTURA2405-10T	TTURA2409-10T	TTURA2412-10T	TTURA2415-10T	TTURA2424-10T
N1 : N4 : N2 : N3	--	1.6：2.2：1：1	1.14：1.14：1：1	1：1.13：1.13：1.13	0.67 : 0.83 : 1 : 1	1：1.13：2.23：2.23
Turns Ratio	TTURB2403-10T	TTURB2405-10T	TTURB2409-10T	TTURB2412-10T	TTURB2415-10T	TTURB2424-10T
N1 : N4 : N2 : N3	2：3：1：1	1.6 : 2.2 : 1 : 1	1.14：1.14：1：1	1：1.13：1.13：1.13	1：1.25：1.5：1.5	1：1.13：2.25：2.25
Turns Ratio	--	TTURA4805-10T	--	TTURA4812-10T	TTURA4815-10T	TTURA4824-10T
N1 : N4 : N2 : N3	--	3.5 : 2.25 : 1 : 1	--	2：1：1.14：1.14	2：1：1.43：1.43	2.33：1：2：2
Turns Ratio	TTURB4803-10T	TTURB4805-10T	--	TTURB4812-10T	TTURB4815-10T	TTURB4824-10T
N1 : N4 : N2 : N3	4：3.25：1：1	4 : 2.25 : 1 : 1	--	2：1：1.13：1.13	1.6：1：1.2：1.2	1.78：1：2：2
Note: Input: N1. Single output: N2/N3 in parallel. Dual output: N2/N3 in series. Auxiliary: N4.						

Phase Diagram

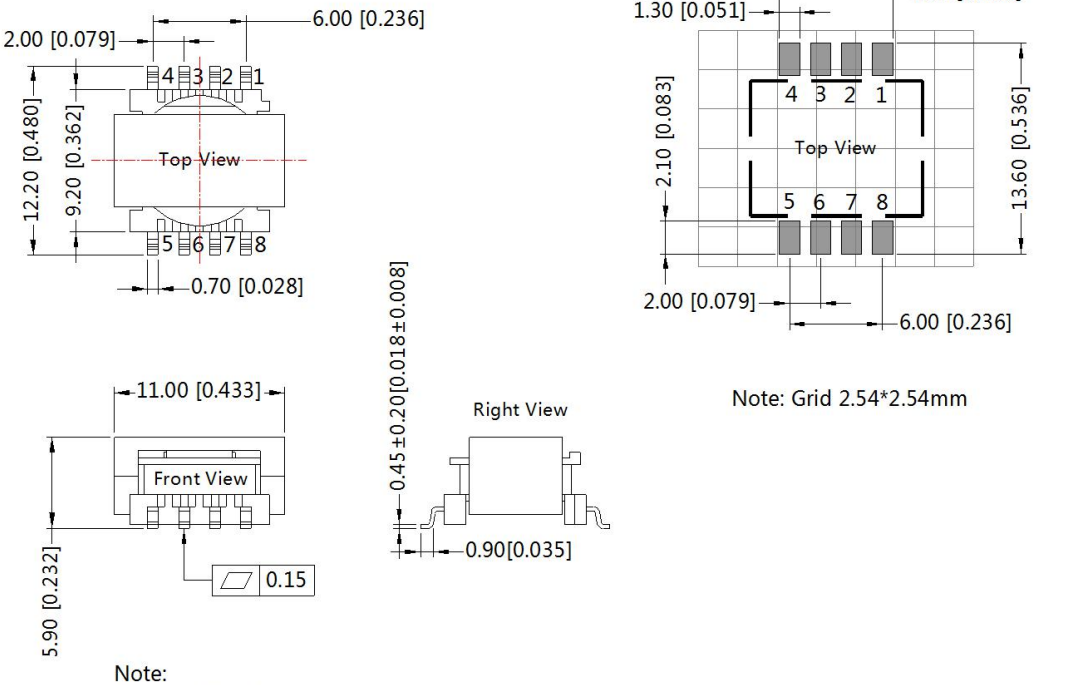


PHASE DIAGRAM

Turns Ratio	--	TTURA2405-6T	--	TTURA2412-6T	TTURA2415-6T	TTURA2424-6T
N1 : N4 : N2 : N3	--	1.67：2.33：1：1	--	1：1.3：1.3：1.3	1：1.1：1.4：1.4	1.11：1：2：2
Turns Ratio	--	TTURA4805-6T	--	TTURA4812-6T	TTURA4815-6T	--
N1 : N4 : N2 : N3	--	3.6：2.4：1：1	--	1.5：1：1：1	1.8：1：1.3：1.3	--
Note: Input: N1. Single output: N2/N3 in parallel. Dual output: N2/N3 in series. Auxiliary: N4.						

Dimensions and Recommended Layout

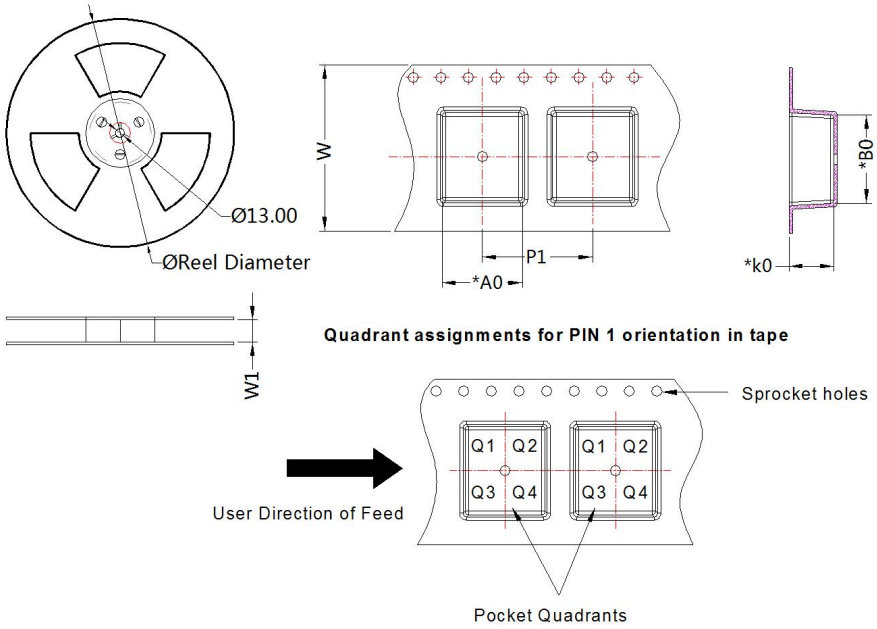
THIRD ANGLE PROJECTION



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
ER11.5-8	SMD	8	500	330.0	24.4	11.60	12.80	6.50	16.00	24	Q2

Notes:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number : 58210085;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, 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.

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