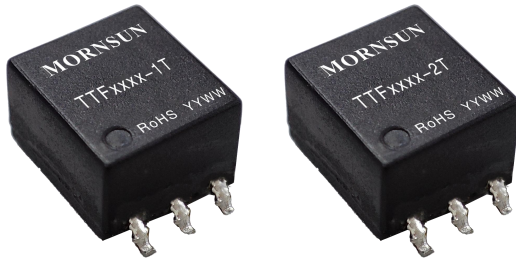


TTFxxxx-1T/2T Transformer



RoHS

FEATURES

- Compact SMD package
- Reinforced insulation
- I/O isolation test voltage 3000VDC
- Operating ambient temperature range:  
-40°C to +105°C

TTFxxxx-1T/2T transformers feature 3000VDC primary side to secondary side and operating temperature of -40°C to +105°C. Compatible with IC SCM1201/SCM1209/SCM1212 used as an 2W DC-DC converter. They are suitable for: pure digital circuits, low frequency analog circuits, relay-driven circuits and data switching circuits.

Selection Guide

Part No.	Input Voltage(VDC)	Output Voltage(VDC)	Output Current(mA) Max.	Power (W)
	Nominal (Range)			
TTF0503-1T	5 (4.5-5.5)	3.3	303	1
TTF0503-2T	5 (4.5-5.5)	3.3	400	2
TTF0505-1T	5 (4.5-5.5)	5	200	1
TTF0505-2T	5 (4.5-5.5)	5	400	2
TTF0509-1T	5 (4.5-5.5)	9	111	1
TTF0509-2T	5 (4.5-5.5)	9	222	2
TTF0512-1T	5 (4.5-5.5)	12	83	1
TTF0512-2T	5 (4.5-5.5)	12	167	2
TTF0515-1T	5 (4.5-5.5)	15	67	1
TTF0515-2T	5 (4.5-5.5)	15	133	2
TTF0524-1T	5 (4.5-5.5)	24	42	1
TTF0524-2T	5 (4.5-5.5)	24	83	2
TTF1205-1T	12 (10.8-13.2)	5	200	1
TTF1205-2T	12 (10.8-13.2)	5	400	2
TTF1212-1T	12 (10.8-13.2)	12	83	1
TTF1212-2T	12 (10.8-13.2)	12	166	2
TTF2405-1T	24 (21.6-26.4)	5	200	1
TTF2405-2T	24 (21.6-26.4)	5	400	2

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

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Inductance(L) <sup>®</sup>	TTF0503-1T/2T	pin 1 to pin 3	--	700	--	μ H
		pin 4 to pin 6	--	348	--	
	TTF0505-1T/2T	pin 1 to pin 3	--	700	--	
		pin 4 to pin 6	--	564	--	
	TTF0509-1T/2T	pin 1 to pin 3	--	700	--	
		pin 4 to pin 6	--	2100	--	
	TTF0512-1T/2T	pin 1 to pin 3	--	700	--	
		pin 4 to pin 6	--	1270	--	
	TTF0515-1T/2T	pin 1 to pin 3	--	700	--	
		pin 4 to pin 6	--	2422	--	
	TTF0524-1T/2T	pin 1 to pin 3	--	550	--	
		pin 4 to pin 6	--	3136	--	
	TTF1205-1T/2T	pin 1 to pin 3	--	1560	--	
		pin 4 to pin 6	--	330	--	
	TTF1212-1T/2T	pin 1 to pin 3	--	1500	--	
		pin 4 to pin 6	--	1560	--	
	TTF2405-1T/2T	pin 1 to pin 3	--	4100	--	
		pin 4 to pin 6	--	190	--	
DCR	TTF0503-1T/2T	pin 1 to pin 3	--	300	--	mΩ
		pin 4 to pin 6	--	315	--	
	TTF0505-1T/2T	pin 1 to pin 3	--	300	--	
		pin 4 to pin 6	--	350	--	
	TTF0509-1T/2T	pin 1 to pin 3	--	300	--	
		pin 4 to pin 6	--	1000	--	
	TTF0512-1T/2T	pin 1 to pin 3	--	300	--	
		pin 4 to pin 6	--	900	--	
	TTF0515-1T/2T	pin 1 to pin 3	--	300	--	
		pin 4 to pin 6	--	1000	--	
	TTF0524-1T/2T	pin 1 to pin 3	--	300	--	
		pin 4 to pin 6	--	1300	--	
	TTF1205-1T/2T	pin 1 to pin 3	--	1104	--	
		pin 4 to pin 6	--	550	--	
	TTF1212-1T/2T	pin 1 to pin 3	--	1000	--	
		pin 4 to pin 6	--	1104	--	
	TTF2405-1T/2T	pin 1 to pin 3	--	1870	--	
		pin 4 to pin 6	--	460	--	
Isolation	Primary-Secondary Electric Strength Test for 1 minute with a leakage current of 1mA max.	3000	--	--	VDC	
Isolation Capacitance	Primary-Secondary capacitance at 100kHz/0.1V	--	20	--	pF	
Voltage-Time <sup>®</sup>	5V input	--	--	15	μVs	
	12V input	--	--	33		
	24V input	--	--	66		
Storage Humidity	Non-condensing	5	--	95	%RH	
Operating Temperature <sup>®</sup>		-40	--	+105	℃	
Storage Temperature <sup>®</sup>		-55	--	+125		
Reflow Soldering Temperature <sup>®</sup>		Peak temp. ≤245℃, maximum duration time ≤150s over 217℃.				
Moisture Sensitivity Level (MSL)	IPC/JEDEC J-STD-020D.1	Level 1				

Notes: ①Test conditions: 100kHz/0.1V;  
 ②Product of input voltage and excitation time;  
 ③The temperature of the transformer(ambient plus temperature rise) should be within the operating temperature range;  
 ④The storage temperature of the transformer only;  
 ⑤We suggest that times of reflow soldering should not exceed twice, For actual application, please refer to IPC/JEDEC J-STD-020D.1.

### Mechanical Specifications

Case Material	Black plastic; flame-retardant and heat-resistant (UL94 V-0)
Dimensions	12.50 x 8.70 x 5.90mm
Weight	0.6g(Typ.)
Cooling Method	Free air convection

### Material certification

Material	UL No.
Wire	E234867
Bobbin	E150608

### Phase Diagram

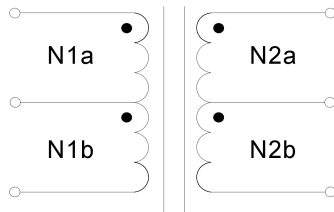


Fig. 1

Turns Ratio (Np: Ns)		
Part No.	N1a: N2a	N1b: N2b
TTF0503-1T/2T	1: 0.73 (Typ.)	
TTF0505-1T/2T	1: 1.08 (Typ.)	
TTF0509-1T/2T	1: 1.93 (Typ.)	
TTF1205-1T/2T	1: 0.462 (Typ.)	
TTF1212-1T/2T	1: 1.040(Typ.)	
TTF2405-1T/2T	1: 0.220 (Typ.)	

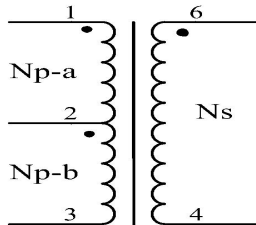


Fig. 2

Turns Ratio (Np: Ns)		
Part No.	Np-a: Ns	Np-b: Ns
TTF0512-1T/2T	1: 2.63 (Typ.)	
TTF0515-1T/2T	1: 3.22(Typ.)	
TTF0524-1T/2T	1: 5.08(Typ.)	

### Application Circuit

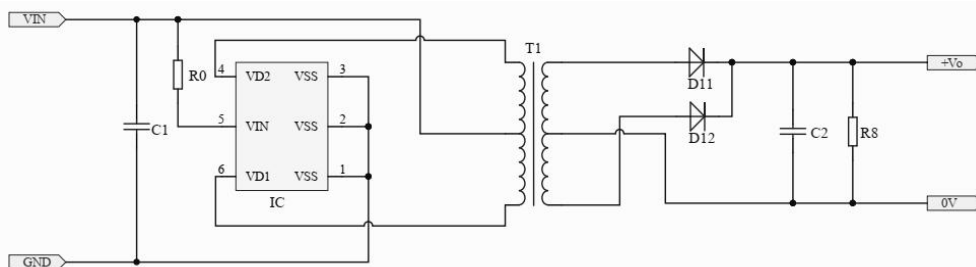


Fig. 3 Application circuit of TTF0503/05/09-1T/2T

Table 1: Recommended parameters

IC	SCM1201
C1	1μF/25V
C2	1μF/25V
D11	40V/1A
D12	40V/1A
R8	10kΩ
R0	0Ω

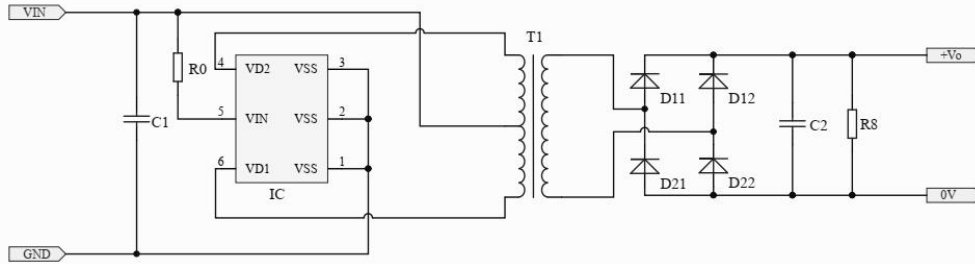


Fig. 4 Application circuit of TTF0512/15/24-1T/2T

Table 2: Recommended parameters

IC	SCM1201
C1	1μF/25V
C2	1μF/50V
D11	40V/1A
D12	40V/1A
D21	40V/1A
D22	40V/1A
R8	10kΩ
R0	0Ω

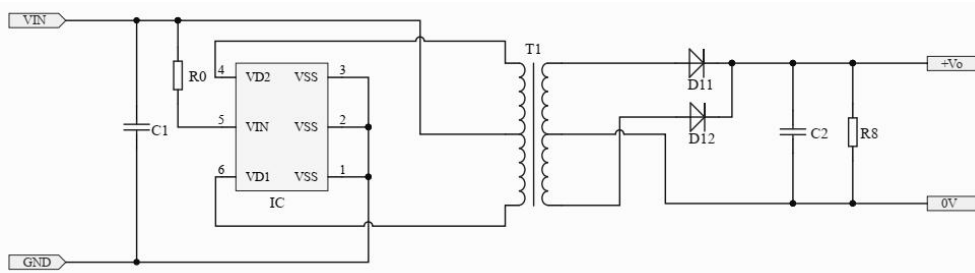


Fig. 5 Application circuit of TTF1205/12-1T/2T, TTF2405-1T/2T

Table 3: Recommended parameters

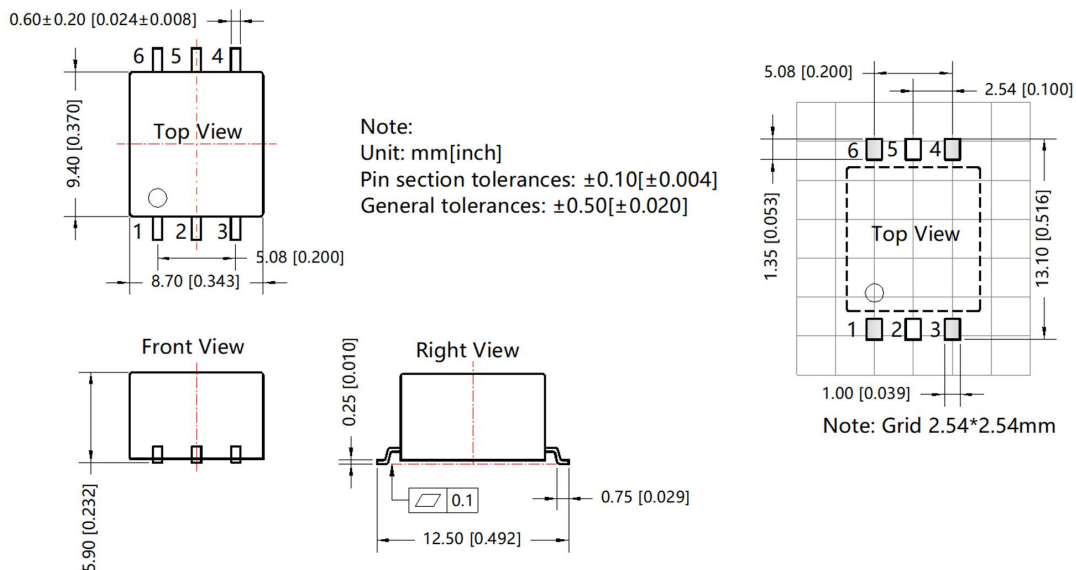
IC	SCM1209
C1	1μF/50V
C2	1μF/25V
D11	40V/1A
D12	40V/1A
R8	10kΩ
R0	10Ω

Notes:

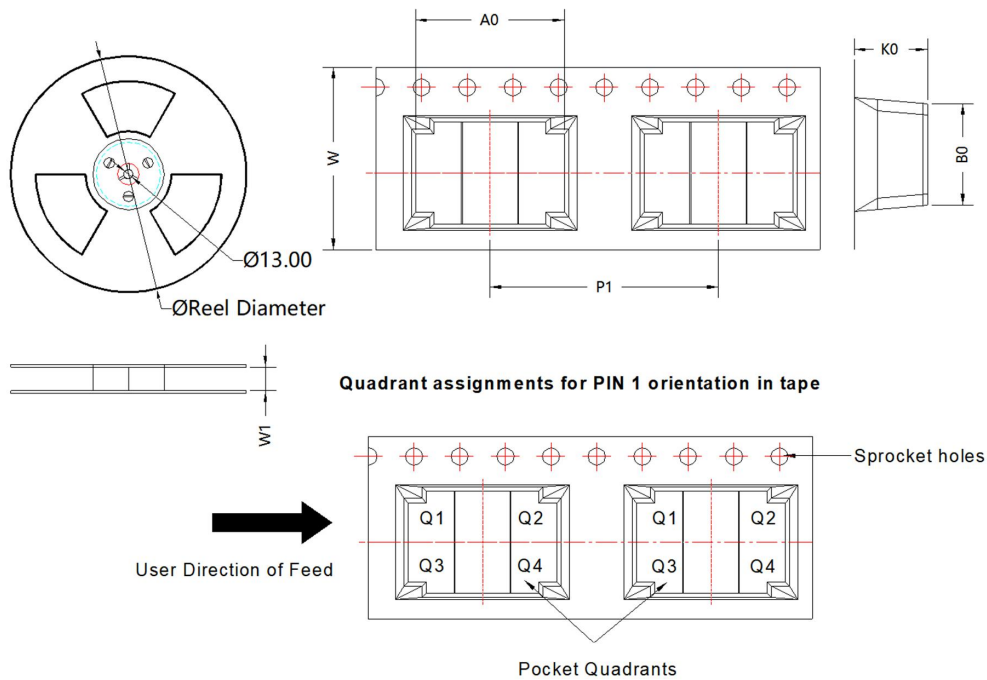
1. If it is required to further reduce input and output ripple, the capacitance of C1 and C2 can be increased properly if required, and should be connected close to the pin terminal of the module.
2. In order to ensure the converter can work reliably with high efficiency, the minimum load should not less than 1% rated load when it is used. If the needed power is indeed small, please parallel a resistor on the output side (The sum of the efficient power and resistor consumption power is not less than 1%).

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



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
TTFxxxx-1T/2T	SMD	6	500	330.0	16.4	13.00	8.90	6.40	20.00	16	Q1

Notes:

1. For additional information on Product Packaging please refer to [www.mornsun-power.com](http://www.mornsun-power.com). Roll packaging bag number: 58200091;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of  $T_a=25^{\circ}\text{C}$ , 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. 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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