Current Transducer TLxxx-A2(T)PV



RoHS

Features

- Accuracy up to ±0.5%
- Linearity up to ±0.1%
- Low temperature drift 70ppm/K
- Wide frequency bandwidth 200kHz
- Low response time
- No insertion losses
- High immunity to external interference
- Withstand symmetrical voltage change ±5%

TLxxx-A2(T)PV series products are used for DC, AC and pulse current measurement under the condition of primary and secondary side isolation. Hall effect and zero flux closed-loop control principle are adopted to achieve high measurement accuracy in the full bandwidth range of the sensor.

Application areas: photovoltaic, motor drive, welding power supply, power supply equipment, power heating equipment, large UPS equipment, etc.

Selection Guide

Certification	Part No.	Input Voltage(VDC)	Primary Current Effective Range (A)	Primary Current Measurement Range (A)	Output Voltage Range (V)	Turns Ratio
--	TL100-A2PV	5	100	-300~+300	1.875~3.125	1:1800
	TL150-A2PV		150	-450~+450①	1.875~3.125	1:1800
	TL200-A2PV		200	-500~+500①	1.875~3.125	1:1800
	TL100-A2TPV		100	-300~+300	1.875~3.125	1:1800
	TL150-A2TPV		150	-300~+300	1.875~3.125	1:1800
	TL200-A2TPV		200	-300~+300	1.875~3.125	1:1800

Electrical Characteristics

Item	Operating Conditions		Min	Typ	Max	Unit.
Primary Current Effective Range I_{PN}	T_A=25℃	TL100-A2(T)PV	--	100	--	A
		TL150-A2(T)PV	--	150	--	
		TL200-A2(T)PV	--	200	--	
Primary Current Measurement Range I_{PM}	T_A=25℃	TL100-A2(T)PV	-300	--	300	
		TL150-A2PV①	-450	--	450	
		TL200-A2PV①	-500	--	500	
		TL150-A2TPV	-300	--	300	
		TL200-A2TPV	-300	--	300	
Over-current Pin Detection Current I_{OCD}	T_A=25℃	TL100-A2(T)PV	--	±200	--	
		TL150-A2(T)PV	--	±300	--	
		TL200-A2(T)PV	--	±400	--	
Supply Voltage V_{CC}	T_A=25℃		4.75	5	5.25	V
Reference Voltage V_{ref}	T_A=25℃		2.495	2.5	2.505	
Over-current Detection Pin Output Voltage U_{OCD}	Primary current ⩾2I_{PM}, R_L=10kΩ	Output Voltage (High)	V_{CC}-0.5	--	V_{CC}	V
	Primary current<2I_{PM}, R_L=10kΩ	Output Voltage (Low)	0	--	0.5	
Turns Ratio K_N	Primary Turns=1		1:1800			--
Max consumption Current I_C	I_P indicates the actual input current, NS=1800 circle		14+I_P/NS*1000			mA

①The measurement range of primary current I_{PM} gradually decreases to -375~375A when T_A=25℃ changes to 105℃.

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Dynamic Characteristics

Item	Operating Conditions		Min	Typ	Max	Unit.
Output Voltage Range V_{out}	T_A=25℃		1.875	--	3.125	V
Full Scale Voltage	T_A=25℃, (V_{out}–V_{ref})@I_{PN}		--	±0.625	--	
Output Accuracy ε	T_A=25℃		-0.5	±0.2	0.5	%
Sensitivity G	T_A=25℃, @I_{PN}	TL100-A2(T)PV	--	6.25	--	mV/A
		TL150-A2(T)PV	--	4.167	--	
		TL200-A2(T)PV	--	3.125	--	
Sensitivity Error GERR	T_A=25℃, @I_{PN}		--	±0.4	--	%
Linearity Error ε_L	T_A=25℃		--	0.05	0.1	
Current Response Time t_r	Up to 10% of I_{PN}		--	0.3	--	μs
	di/dt=100A/μs, up to 90% of I_{PN}		--	0.3	--	
Frequency Bandwidth(-3dB)BW			--	--	200	kHz
Temperature Drift	T_A=25℃, @I_{PN}		--	45	70	ppm/K

General Characteristics

Item	Operating Conditions	Min	Typ	Max	Unit.
Operating Temperature T_A		-40	--	+105	℃
Storage Temperature T_S		-55	--	+115	
Weight	TLxxx-A2PV	32	40	48	g
	TLxxx-A2TPV	56	68	80	

Isolation Characteristics

Item	Operating Conditions	Min	Typ	Max	Unit.
Power Frequency Withstand Voltage V_d	Primary edge input, secondary output; 50Hz,1min; Leakage current<0.1mA	--	4.5	--	kVAC
Pulse Tolerance Voltage V_w	1.2/50μs	--	8	--	kV
Comparative Tracking Index CTI		--	600	--	V

Pin Function

Pin	Symbol	Function Description
1	OCD	Over-current detection pin, when the primary current ⩾2I_{PM}, the pin is high; when the primary current ＜2I_{PM}, the pin is low.
2	Vref	Reference pin, provides reference voltage of 2.5V.
3	Vout	Output voltage pin, Vout = Vref + G*Ip.
4	GND	Power supply ground.
5	+Uc	Power supply (V_{CC}).
6	NC	No functional pin.
7	NC	No functional pin.
8	NC	No functional pin.
9	NC	No functional pin.

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Product Characteristic Curve

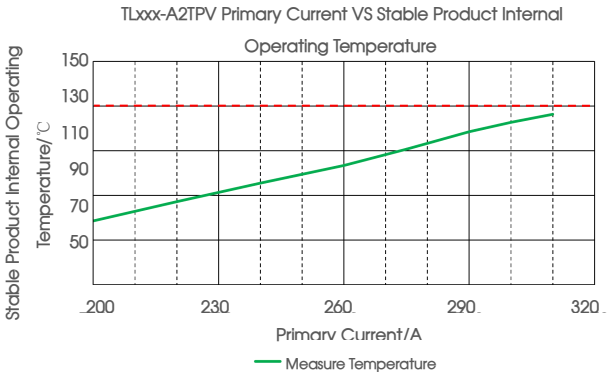


FIG.1

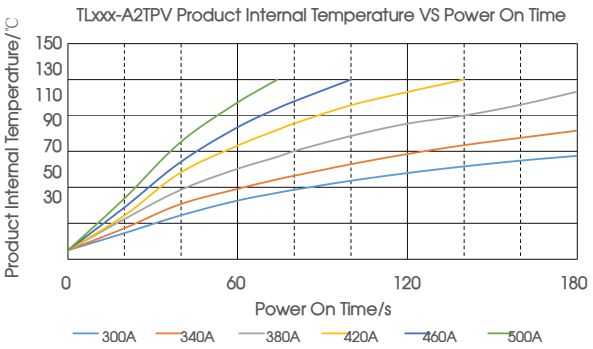


FIG.2

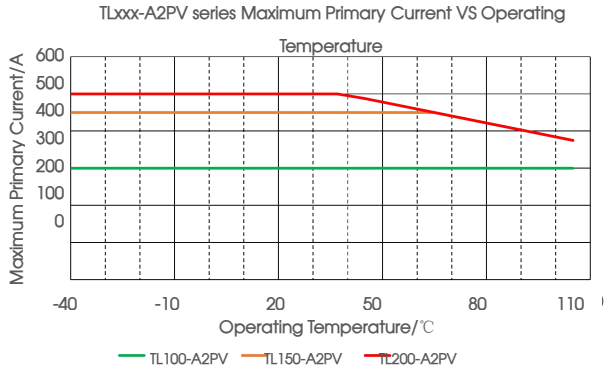


FIG.3

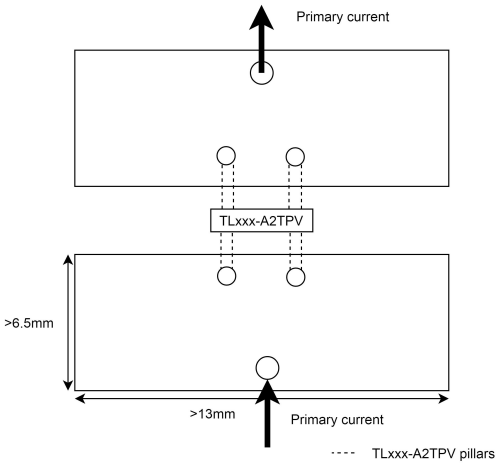


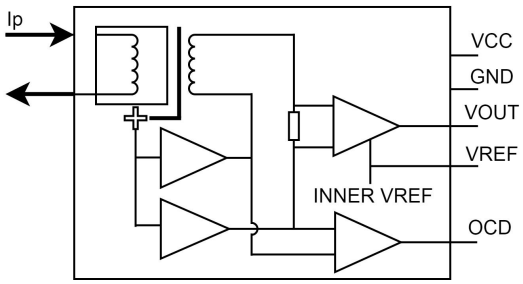
FIG.4

Note:

1. The outer four copper columns of TLxxx-A2TPV product are used to pass the measured current. When working through the primary current, the internal operating temperature of the product should not be higher than 130℃. When TLxxx-A2TPV series products are used, a piece of copper not less than 6.5mmx6.5mm area 4oz thick should be added to the welded PCB on each flow copper column, or two flow copper columns should share a piece of copper not less than 6.5mm*13mm area 4oz thick for product heat dissipation. Attention should be paid to the heat dissipation problem during continuous operation. Attention should be paid to the heat dissipation time when intermittent high current is applied. If necessary, TLxxx-A2PV products should be selected.
2. The internal working temperature of the stable product is the test result after 10min of power-on at 35℃.
3. Internal temperature VS power-on time is the result of a maximum of 3 minutes after power-on from 35℃ or a maximum temperature of 130℃.
4. FIG. 3: With the increase of operating temperature, the maximum operating current of TLxxx-A2PV series which can maintain stable linear output gradually decreases.

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Connection and Description



Test instructions:

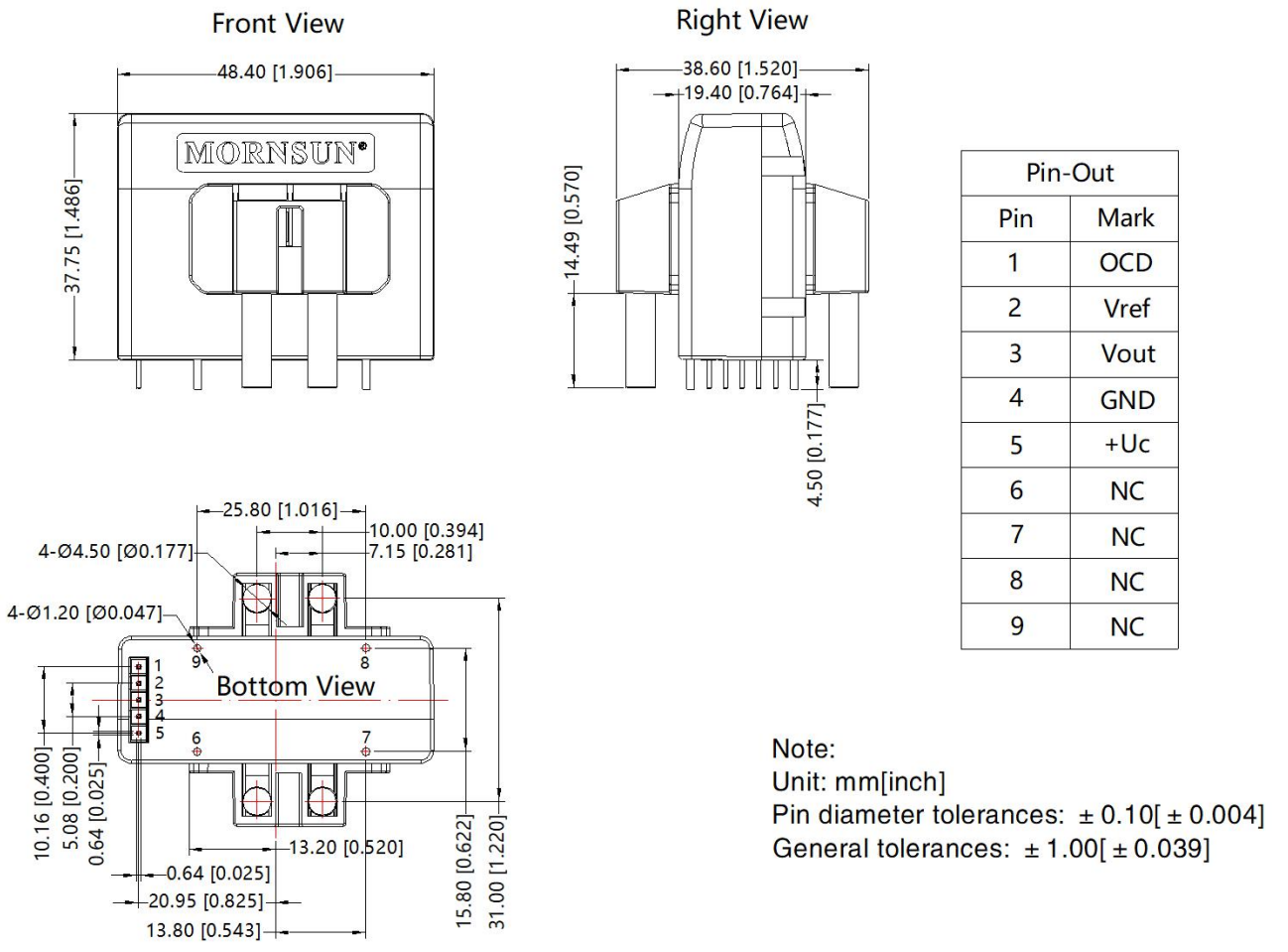
1. I_P is measured current, V_{out} is the output voltage;
2. The relationship between the output voltage V_{out} and the measured current I_p is:

$$V_{out} = V_{ref} \pm G*I_P$$

3. The module has a built-in Vref of 2.500V, and the reference output can be adjusted using an external reference pin;
4. Hot swap is unavailable;
5. The temperature of the primary winding coil should be lower than 125℃;
6. It is recommended to use a power supply URB2405MT-3WR3(MORNSUN) with 3W output power and output voltage of 5V.

Dimensions and Recommended

THIRD ANGLE PROJECTION



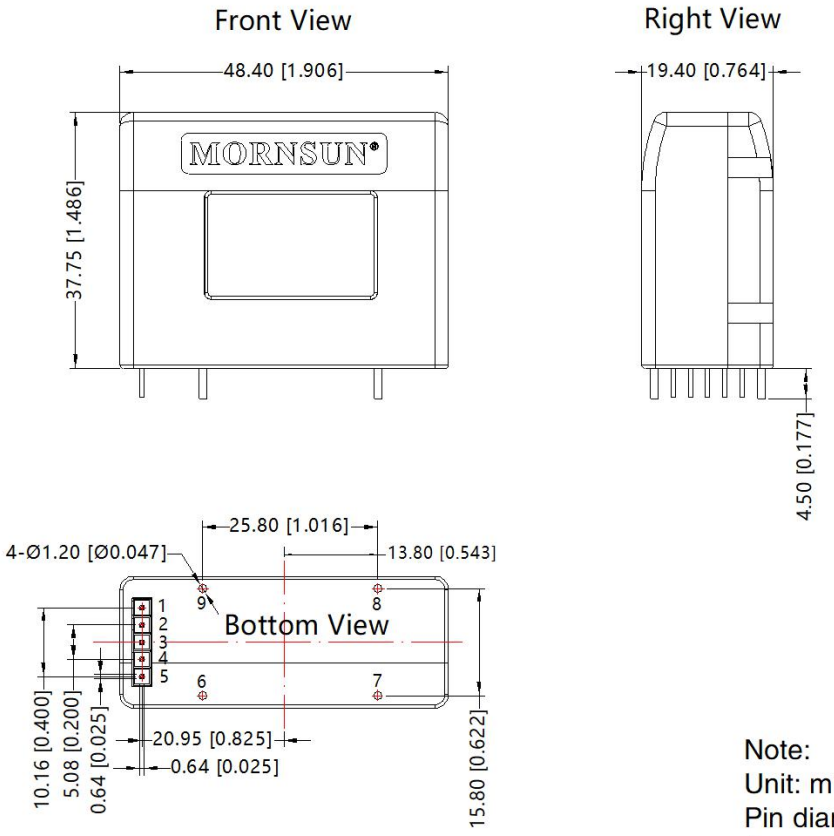
Pin-Out	
Pin	Mark
1	OCD
2	Vref
3	Vout
4	GND
5	+Uc
6	NC
7	NC
8	NC
9	NC

Note:
Unit: mm[inch]
Pin diameter tolerances: ± 0.10[± 0.004]
General tolerances: ± 1.00[± 0.039]

TLxxx-A2TPV Dimension

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THIRD ANGLE PROJECTION



Pin-Out	
Pin	Mark
1	OCD
2	Vref
3	Vout
4	GND
5	+Uc
6	NC
7	NC
8	NC
9	NC

Note:
Unit: mm[inch]
Pin diameter tolerances: ± 0.10[± 0.004]
General tolerances: ± 1.00[± 0.039]

TLxxx-A2PV Dimension

Notes:
1. For additional information on Product Packaging please refer to www.mornsun-power.com. package number: 58070002;
2. All index testing methods in this datasheet are based on company corporate standards;
3. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75%RH with nominal input voltage;
4. We can provide product customization service, please contact our technicians directly for specific information;
5. This products is used in electronic equipment, please follow the operation and instructions of the manual, and use it in a standard and safe environment;
6. Please do not install the product in a dangerous area; beware of the risk of electric shock during operating, some modules may generate dangerous voltages (such as primary wires, power supply wires);
7. This products is a build-in device, after installation, the conductive part must not be touched completely. A protective box or shield can be used;
8. It is strictly forbidden to disassemble and assemble the products privately to prevent equipment without failure or malfunction;
9. 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. 8 Nanyun 4th Road, Huangpu District, Guangzhou, China
Tel: 86-20-38601850 Fax: 86-20-38601272 E-mail: info@mornsun.cn www.mornsun-power.com

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