

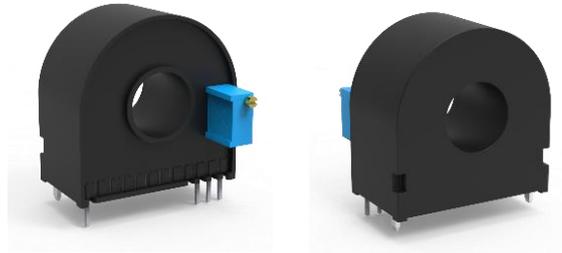
Current Sensor

Model number

TR3V 0.005 P01

TR3V 0.01 P01

TR3V 0.05 P01



Used to measure 50Hz AC current, with galvanic insulation between the primary and the secondary circuits.

Features

- ✧ AC current sensor based on transformer technology
- ✧ DC voltage output
- ✧ Insulating plastic case recognized according to UL94-V0
- ✧ High Accuracy
- ✧ Very low offset drift over temperature
- ✧ Standards:
 - IEC 60664-1:2020
 - IEC 61800-5-1:2022
 - IEC 62109-1:2010

Applications

- ✧ Residual AC current measurement
- ✧ Wide range of single-phase or three-phase current detection (up to $\pm 100A$ AC)
- ✧ Failure mode detection of current sources
- ✧ Symmetrical fault detection (such as at the output end of the inverter)
- ✧ AC screen

Safety

This sensor must be used according to IEC61800-5-1.

This sensor must be used in electric/electronic equipment with respect to applicable standards and safety requirements in accordance with the following manufacturer's operating instructions.

Caution, risk of electrical shock!



When operating the sensor, certain parts of the module can carry hazardous voltage (e.g., Primary busbar, power supply). Ignore this warning can lead to injury and/or cause serious damage.

This sensor is a built-in device, whose conducting parts must be inaccessible after installation. A protective housing or additional shield could be used.

Main supply must be able to be disconnected.

Absolute maximum ratings(not operating)

Parameter	Symbol	Unit	Value
Supply voltage	V_C	V	±18
Primary conductor temperature	T_B	°C	100

※ Using beyond the above voltage limit for power supply may cause permanent damage to the sensor.

Environmental and mechanical characteristics

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Ambient operating temperature	T_A	°C	-40		85	
Ambient storage temperature	T_S	°C	-45		105	
Mass	m	g		28		

※ Exposure to the above-mentioned maximum temperature for a long time may reduce the reliability of the product.

Insulation coordination

Parameter	Symbol	Unit	Value	Comment
Rms voltage for AC insulation test @ 50Hz, 1min	V_d	kV	3	According IEC 60664-1
Impulse withstand voltage 1.2/50µs	V_w	kV	6	According IEC 60664-1
Clearance (pri.- sec.)	d_{cl}	mm	10	
Creepage distance (pri.- sec.)	d_{cp}	mm	10	
Comparative tracking index	CTI	PLC	Group IIIa	
Application example	-	-	400V	Reinforced insulation, according to IEC 61800-5-1, IEC 62109-1CAT III, PD2
Application example	-	-	800V	Basic insulation, according to IEC 61800-5-1, IEC 62109-1CAT III, PD2

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※ With $T_A = 25^\circ\text{C}$, $V_C = \pm 12\text{V}$, Output measuring resistance $R_L = 10\text{k}\Omega$, unless otherwise noted.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary rated residual current	I_{PN}	mA		5		AC
Primary residual current measurement range	I_{PM}	mA		8		AC
Supply voltage	V_C	V	± 12		± 15	$\pm 5\%$
Current consumption	I_C	mA		3		@ $I_{PN}=0\text{A}$
Rated output voltage	V_{OUT}	V		3.3		DC Voltage
Measuring resistance	R_L	k Ω	10			
Theoretical sensitivity	G_{th}	V/A		660		
Temperature of G	TCG	mV/k		± 1.5		@ $-40^\circ\text{C} \sim 85^\circ\text{C}$
Electrical offset voltage	V_{OE}	mV	-20		20	
Temperature drift of zero voltage@ $I_P = 0$	TCV_{OE}	mV/k		± 0.2		@ $-40^\circ\text{C} \sim 85^\circ\text{C}$
Linearity error 0... I_{PN}	ϵ_L	%	-1	± 0.5	1	
Accuracy@ I_{PN}	X	%	-1	± 0.5	1	
Frequency bandwidth	BW	Hz		50		

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※ With $T_A = 25^\circ\text{C}$, $V_C = \pm 12\text{V}$, Output measuring resistance $R_L = 10\text{k}\Omega$, unless otherwise noted.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary rated residual current	I_{PN}	mA		10		AC
Primary residual current measurement range	I_{PM}	mA		15		AC
Supply voltage	V_C	V	± 12		± 15	$\pm 5\%$
Current consumption	I_C	mA		3		@ $I_{PN}=0\text{A}$
Rated output voltage	V_{OUT}	V		3.3		DC Voltage
Measuring resistance	R_L	$\text{k}\Omega$	10			
Theoretical sensitivity	G_{th}	V/A		330		
Temperature of G	TCG	mV/k		± 1.5		@ $-40^\circ\text{C} \sim 85^\circ\text{C}$
Electrical offset voltage	V_{OE}	mV	-20		20	
Temperature drift of zero voltage@ $I_P = 0$	TCV_{OE}	mV/k		± 0.2		@ $-40^\circ\text{C} \sim 85^\circ\text{C}$
Linearity error 0... I_{PN}	ϵ_L	%	-1	± 0.5	1	
Accuracy@ I_{PN}	X	%	-1	± 0.5	1	
Frequency bandwidth	BW	Hz		50		

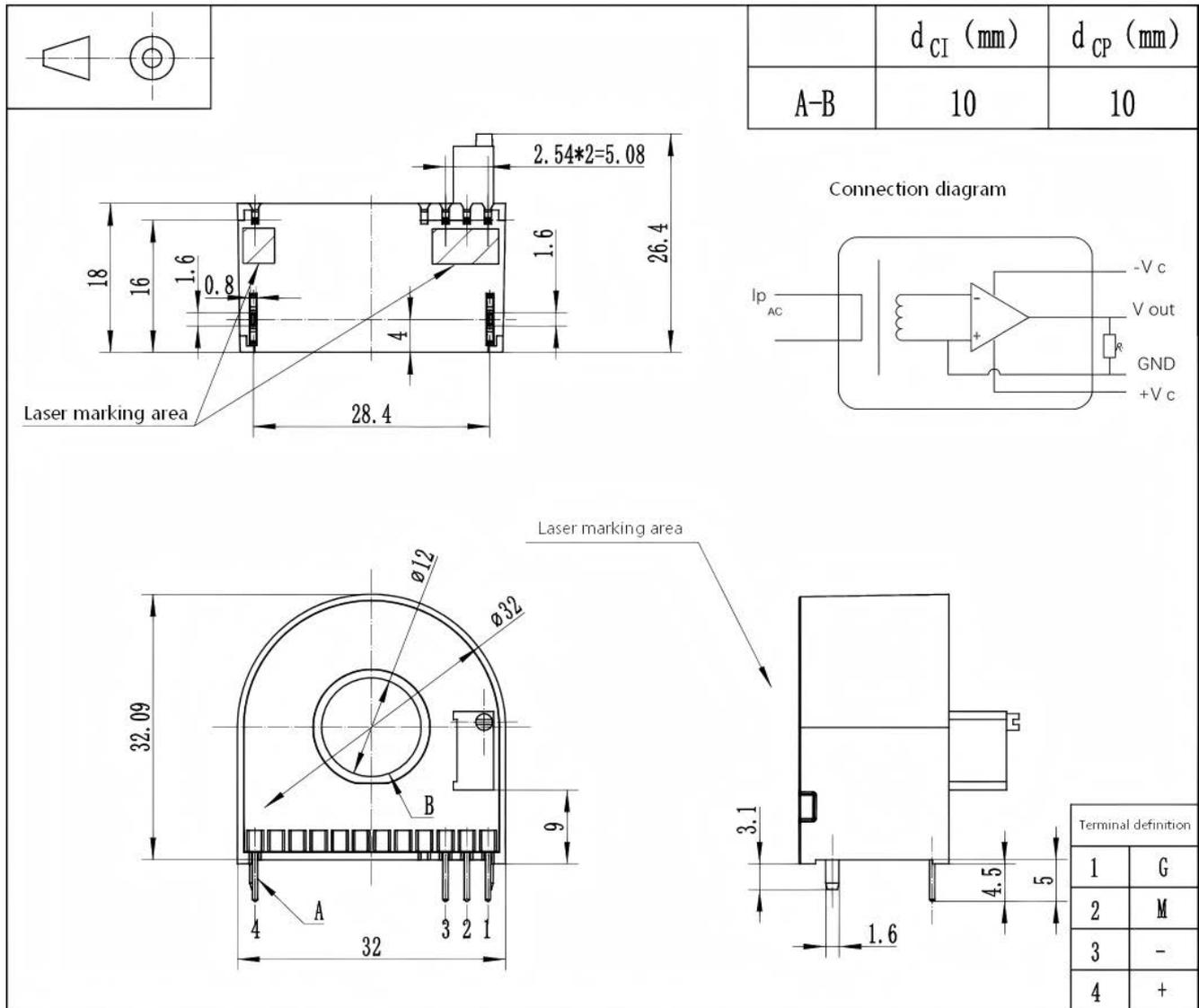
Electrical data

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※ With $T_A = 25^\circ\text{C}$, $V_C = \pm 12\text{V}$, Output measuring resistance $R_L = 10\text{k}\Omega$, unless otherwise noted.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary rated residual current	I_{PN}	mA		50		AC
Primary residual current measurement range	I_{PM}	mA		75		AC
Supply voltage	V_C	V	± 12		± 15	$\pm 5\%$
Current consumption	I_C	mA		3		@ $I_{PN}=0\text{A}$
Rated output voltage	V_{OUT}	V		3.3		DC Voltage
Measuring resistance	R_L	$\text{k}\Omega$	10			
Theoretical sensitivity	G_{th}	V/A		66		
Temperature of G	TCG	mV/k		± 1.5		@ $-40^\circ\text{C} \sim 85^\circ\text{C}$
Electrical offset voltage	V_{OE}	mV	-20		20	
Temperature drift of zero voltage@ $I_P = 0$	TCV_{OE}	mV/k		± 0.2		@ $-40^\circ\text{C} \sim 85^\circ\text{C}$
Linearity error 0... I_{PN}	ϵ_L	%	-1	± 0.5	1	
Accuracy@ I_{PN}	X	%	-1	± 0.5	1	
Frequency bandwidth	BW	Hz		50		

Dimensions (in mm. 1 mm = 0.0394 inch)



Mechanical characteristic

- ◇ General tolerance $\pm 0.3\text{mm}$
- ◇ Primary hole $\Phi 12\text{mm}$
- ◇ Suggested PCB wiring dimensions
- Electrical connection pins $4 \times \Phi 1.2$
- Fixed connection pins $4 \times \Phi 2.0$

Remarks

This is a standard model. For different applications (measurement, secondary connections...), please contact CHIPSENSE.