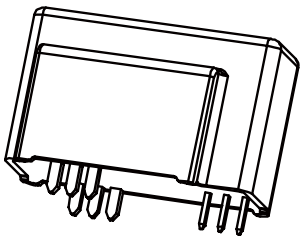
CN2A PB02 SERIES

Current Sensor

Model Number:

CN2A 25 PB02
CN2A 40 PB02
CN2A 50 PB02



For the electronic measurement of voltage: DC, AC, pulsed…, with galvanic separation between the primary and the secondary circuit.

Features

- Closed loop (compensated) current sensor using the Hall Effect
- Galvanic separation between primary and secondary
- Insulating plastic case recognized according to UL94-V0
- Very good linearity
- High accuracy
- Very low offset drift over temperature
- No insertion loss
- Standards:
  - IEC 60664-1:2020
  - IEC 61800-5-1:2022
  - IEC 62109-1:2010

Applications

- AC variable speed and servo motor drives
- Uninterruptible Power Supplies (UPS)
- Static converters for DC motor drives
- Switch Mode Power Supplies (SMPS)
- Power supplies for welding applications
- Battery management
- Wind energy inverter
- Test and detection devices

Safety

This sensor must be used according to IEC 61800-5-1.
This sensor must be used in electric/electronic equipment with respect to applicable standards and safety requirements in accordance with the following manufacture'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
ESD rating, Human Body Model (HBM)	V_{ESD}	kV	2

※ Stress above these ratings may cause permanent damage.

※ Exposure to absolute maximum ratings for extended periods may degrade reliability.

Environmental and mechanical characteristics

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Ambient operating temperature	T_A	℃	-25		85	
Ambient storage temperature	T_S	℃	-40		90	
Mass	m	g		20		

Insulation coordination

Parameter	Symbol	Unit	Value	Comment
Rms voltage for AC insulation test @ 50Hz,1min	V_d	kV	5	According to IEC 60664-1
Impulse withstand voltage 1.2/50μs	V_W	kV	12	According to IEC 60664-1
Plastic case	-	-	UL94-V0	
Comparative traking index	*CTI*	PLC	3	
Clearance (pri.- sec.)	d_{Cl}	Mm	11.75	
Creepage distance (pri.- sec.)	d_{Cp}	Mm	11.75	
Application example	-	-	500V	Reinforced insulation,according to IEC 61800-5-1, IEC 62109-1CATⅢ，PD2
Application example	-	-	1000V	Basic insulation,according to IEC 61800-5-1, IEC 62109-1CATⅢ，PD2

Electrical data

CN2A 25 PB02

※ With T_A = 25℃, V_C = ±15V, R_L = 100Ω,unless otherwise noted.

Parameter	Symbo	Unit	Min	Typ	Max	Comment
Primary nominal rms current	I_{PN}	At		25		
Maximum measuring current	I_{PM}	At	-55		55	
Measuring resistance	R_M	Ω	0		284	@I_{PN}(DC)&±12V,T_A=70°C
			0		182	@I_{PN}(RMS)&±12V,T_A=70°C
			67		398	@I_{PN}(DC)&±15V,T_A=70°C
			67		263	@I_{PN}(RMS)&±15V,T_A=70°C
			0		280	@I_{PN}(DC)&±12V,T_A=85°C
			0		178	@I_{PN}(RMS)&±12V,T_A=85°C
			70		394	@I_{PN}(DC)&±15V,T_A=85°C
			70		259	@I_{PN}(RMS)&±15V,T_A=85°C
Secondary coil resistance	R_S	Ω		72		@ 70°C
				76		@ 85℃
Output nominal rms current	I_{SN}	mA	-25		25	
Supply voltage	V_C	V	±12		±15	@ ±5%
Coil turn ratio	K_N	-	1:1000			
Current consumption	I_C	mA		10 + I_S		@±15V
Zero offset current	I_O	mA	-0.15		0.15	
Thermal drift of offset current	I_{OT}	mA	-0.6	±0.1	0.6	@ 0℃~70℃
			-0.7	±0.1	0.7	@ -25℃~85℃
Residual curren@ I_P=0 after 3×I_{PN}	I_{OM}	mA	-0.25	±0.2	0.25	
Linearity error	ε_L	% of I_{PN}			0.2	Exclusive of I_O
Accuracy@ I_{PN}	X	% of I_{PN}	-0.3		0.3	Exclusive of I_O
Response time@ 90% of I_{PN}	t_r	μs			0.5	@ di/dt=100A/s
Frequency bandwidth(-1dB)	BW	kHz	200			

CHIPSENSE reserves the right to carry out modifications on sensor, in order to improve them, without prior notice.

Electrical data

CN2A 40 PB02

※ With T_A = 25℃, V_C = ±15V, R_L = 100Ω,unless otherwise noted.

Parameter	Symbo	Unit	Min	Typ	Max	Comment
Primary nominal rms current	I_{PN}	At		40		
Maximum measuring current	I_{PM}	At	-90		90	
Measuring resistance	R_M	Ω	0		107	@I_{PN}(DC)&±12V,T_A=70°C
			0		53	@I_{PN}(RMS)&±12V,T_A=70°C
			67		163	@I_{PN}(DC)&±15V,T_A=70°C
			67		93	@I_{PN}(RMS)&±15V,T_A=70°C
			0		103	@I_{PN}(DC)&±12V,T_A=85°C
			0		49	@I_{PN}(RMS)&±12V,T_A=85°C
			70		159	@I_{PN}(DC)&±15V,T_A=85°C
			70		89	@I_{PN}(RMS)&±15V,T_A=85°C
Secondary coil resistance	R_S	Ω		72		@ 70°C
				76		@ 85℃
Output nominal rms current	I_{SN}	mA	-40		40	
Supply voltage	V_C	V	±12		±15	@ ±5%
Coil turn ratio	K_N	-	1:1000			
Current consumption	I_C	mA		10 + I_S		@±15V
Zero offset current	I_O	mA	-0.3		0.3	
Thermal drift of offset current	I_{OT}	mA	-0.6	±0.1	0.6	@ 0℃~70℃
			-0.7	±0.1	0.7	@ -25℃~85℃
Residual curren@ I_P=0 after 3×I_{PN}	I_{OM}	mA	-0.25	±0.2	0.25	
Linearity error	ε_L	% of I_{PN}			0.2	Exclusive of I_O
Accuracy@I_{PN}	X	% of I_{PN}	-0.3		0.3	Exclusive of I_O
Response time@ 90% of I_{PN}	t_r	µs			0.5	@ di/dt=100A/s
Frequency bandwidth(-1dB)	BW	kHz	200			

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Electrical data

CN2A 50 PB02

※ With T_A = 25℃, V_C = ±15V, R_L = 100Ω,unless otherwise noted.

Parameter	Symbo	Unit	Min	Typ	Max	Comment
Primary nominal rms current	I_{PN}	At		50		
Maximum measuring current	I_{PM}	At	-90		90	
Measuring resistance	R_M	Ω	0		107	@I_{PN}(DC)&±12V,T_A=70°C
			0		53	@I_{PN}(RMS)&±12V,T_A=70°C
			67		163	@I_{PN}(DC)&±15V,T_A=70°C
			67		93	@I_{PN}(RMS)&±15V,T_A=70°C
			0		103	@I_{PN}(DC)&±12V,T_A=85°C
			0		49	@I_{PN}(RMS)&±12V,T_A=85°C
			70		159	@I_{PN}(DC)&±15V,T_A=85°C
			70		89	@I_{PN}(RMS)&±15V,T_A=85°C
Secondary coil resistance	R_S	Ω		72		@ 70°C
				76		@ 85℃
Output nominal rms current	I_{SN}	mA	-50		50	
Supply voltage	V_C	V	±12		±15	@ ±5%
Coil turn ratio	K_N	-	1:1000			
Current consumption	I_C	mA		10 + I_S		@±15V
Zero offset current	I_O	mA	-0.3		0.3	
Thermal drift of offset current	I_{OT}	mA	-0.6	±0.2	0.6	@ 0℃~70℃
			-0.8	±0.2	0.8	@ -25℃~85℃
Residual curren@ I_P=0 after 3×I_{PN}	I_{OM}	mA	-0.3	±0.2	0.3	
Linearity error	ε_L	% of I_{PN}			0.15	Exclusive of I_O
Accuracy@ I_{PN}	X	% of I_{PN}	-0.25		0.25	Exclusive of I_O
Response time@ 90% of I_{PN}	t_r	µs			0.5	@ di/dt=100A/s
Frequency bandwidth(-1dB)	BW	kHz	200			

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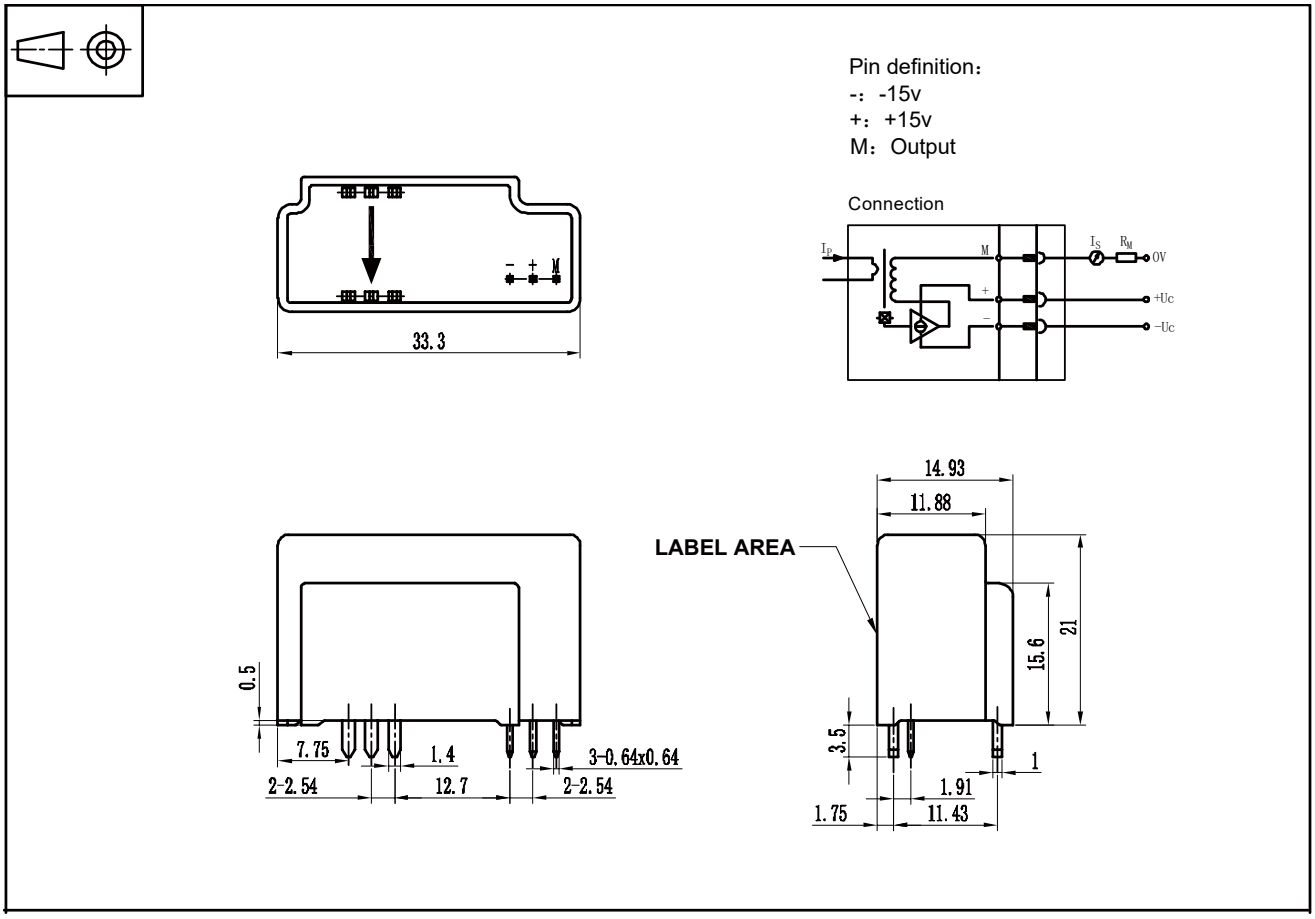
Dimensions（in mm. 1 mm = 0.0394 inch）



Model number	Primary turns	Primary current		Norminal output current I_{SN}(mA)	Turns ratio K_N	Primary resistance R_P (mΩ)	Primary inductance L_P (μH)
		Nominal current I_{PN}(A)	Max. current I_{PM}(A)				
CN2A 25 PB01	1	25	55	25	1 :1000	0.18	0.012
CN2A 40 PB01	1	40	100	40	1 :1000	0.12	0.008
CN2A 50 PB01	1	50	90	50	1 :1000	0.12	0.008

Mechanical characteristics

- ✧ General tolerance ±0.3 mm
- ✧ Primary connecting pin 6 pins 1.4×1.0mm
- ✧ Recommended PCB hole Φ2.0
- ✧ Secondary signal connecting pin 3 pins 0.64×0.64mm
- ✧ Recommended PCB hole Φ1.2

Remarks

- ✧ When the measured electric current flows from IN to OUT, the output current I_S positive.
- ✧ This is a standard model. For different applications (measurement, secondary connections…), please contact CHIPSENSE.

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