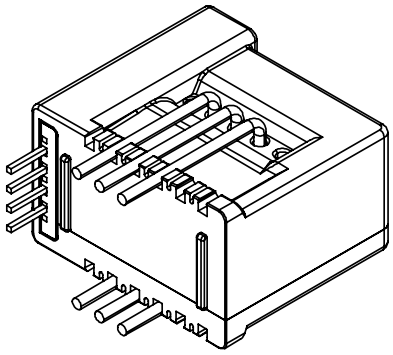
CR1V PB03 SERIES

Current Sensor

Model Number:

CR1V 6 PB03
CR1V 15 PB03
CR1V 25 PB03
CR1V 50 PB03



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

Features

- Closed loop（compensated）current sensor using the Hall effect
- Supply voltage:3.3V
- Galvanic separation between primary and secondary
- Insulating plastic case recognized according to UL 94-V0
- Very good linearity
- High accuracy
- Very low offset drift over temperature
- No insertion losses
- Standards:
  - IEC 60664-1:2020
  - IEC 61800-5-1:2022
  - IEC 62109-1:2010

Applications

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

Safety

The sensor must be used according to IEC 61800-5-1.
The 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.

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

Absolute maximum ratings(not operating)

Parameter	Symbol	Unit	Value
Supply voltage	V_C	V	4

※ Stresses 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	℃	-40		85	
Ambient storge temperature	T_S	℃	-40		125	
Mass	m	g		10		

Insulation coordination

Parameter	Symbol	Unit	Value	Comment
Rms voltage for AC insulation test @50Hz,1min	V_d	kV	3	According to IEC 60664-1
Impulse withstand voltage 1.2/50μs	V_W	kV	8	According to IEC 60664-1
Clearance(Pri.-sec.)	d_{Cl}	mm	6.35	
Creepage distance (pri.- sec.)	d_{Cp}	mm	15.5	
Plastic case	-	-	UL94-V0	
Comparative traking index	CTI	PLC	3	
Application example	-	-	300V	Reinforced insulation,according to IEC 61800-5-1, IEC 62109-1CATⅢ, PD2
Application example	-	-	600V	Basic insulation,according to IEC 61800-5-1, IEC 62109-1CATⅢ, PD2

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Electrical data

CR1V 6 PB03

※ With T_A = 25℃, V_C = 3.3V, R_L = 2kΩ,unless otherwise noted.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal rms current	I_{PN}	At		±6		
Maximum measuring current	I_{PM}	At	-12		12	
Turns ratio	K_N	-		1-2-3: 1000		
Internal sampling resistance（0.1%）	R_{IM}	Ω		15		
Theoretical sensitivity	G_{th}	mV/A		104.17		@ V_C=3.3V
Load resistance	R_L	kΩ	2			
Current consumption	I_C	mA		15 + I_P/N_S+ V_{OUT}/R_L		
Supply voltage	V_C	V		3.3		@ ±5%
Output voltage	V_0	V		1.62±(0.625*I_P/I_{PN})		
Reference voltage@I_P=0A	V_{REF}	mV	1643	1650	1657	
Offset voltage@I_P=0A	V_{OE}	mV	1643	1650	1657	
Temperature drift of offset voltage	TCV_{OE}	mV/℃	-0.05		0.05	@ -40℃~85℃
Sensitivity error	ε_G	%	-0.5		0.5	Exclusive of V_{OE}
Temperature of G	TCG	%/℃	-0.05		0.05	@ -40℃~85℃
Hysteresis offset voltage@I_P=0 after 3 × I_{PN}	V_M	mV	-1	±0.5	1	
Linearity error	ε_L	% of I_{PN}	-0.1		0.1	Exclusive of V_{OE}
Accuracy@ I_{PN}	X	% of I_{PN}	-0.7		0.7	Exclusive of V_{OE}
Response time @90% of I_{PN}	t_r	μs		0.5	1	@ di/dt=50A/s
Frequency bandwidth (-3dB)	BW	kHz	200			

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Electrical data

CR1V 15 PB03

※ With T_A = 25℃, V_C = 3.3V, R_L = 2kΩ,unless otherwise noted.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal rms current	I_{PN}	At		±15		
Maximum measured current	I_{PM}	At	-30		30	
Turns ratio	K_N	-	1-2-3: 1000			
Internal sampling resistance（0.1%）	R_{IM}	Ω		10		
Theoretical sensitivity	G_{th}	mV/A		41.67		@ V_C=3.3V
Load resistance	R_L	kΩ	2			
Current consumption	I_C	mA	15 + I_P/N_S+ V_{OUT}/R_L			
Supply voltage	V_C	V		3.3		@ ±5%
Output voltage	V_O	V	1.62±(0.625* I_P/I_{PN})			
Reference voltage@I_P=0A	V_{REF}	mV	1643	1650	1657	
Offset voltage@I_P=0A	V_{OE}	mV	1643	1650	1657	
Temperature drift of offset voltage	TCV_{OE}	mV/℃	-0.05		0.05	@ -40℃~85℃
Sensitivity error	ε_G	%	-0.5		0.5	Exclusive of V_{OE}
Temperature of G	TCG	%/℃	-0.05		0.05	@ -40℃~85℃
Hysteresis offset voltage@I_P=0 after 3×I_{PN}	V_M	mV	-1	±0.5	1	
Linearity error	ε_L	% of I_{PN}	-0.1		0.1	Exclusive of V_{OE}
Accuracy@ I_{PN}	X	% of I_{PN}	-0.7		0.7	Exclusive of V_{OE}
Response time@ 90% of I_{PN}	t_r	μs		0.5	1	@ di/dt=50A/s
Frequency bandwidth (-3dB)	BW	kHz	200			

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Electrical data

CR1V 25 PB03

※ With T_A = 25℃, V_C = 3.3V, R_L = 2kΩ,unless otherwise noted.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal rms current	I_{PN}	At		±25		
Maximum measured current	I_{PM}	At	-50		50	
Turns ratio	K_N	-		1-2-3: 1000		
Internal sampling resistance（0.1%）	R_{IM}	Ω		6		
Theoretical sensitivity	G_{th}	mV/A		25		@ V_C=3.3V
Load resistance	R_L	kΩ	2			
Current consumption	I_C	mA		15 + I_P/N_S+ V_{OUT}/R_L		
Supply voltage	V_C	V		3.3		@ ±5%
Output voltage	V_0	V		1.62±(0.625*I_P/I_{PN})		
Reference voltage@I_P=0A	V_{REF}	mV	1643	1650	1657	
Offset voltage@I_P=0A	V_{OE}	mV	1643	1650	1657	
Temperature drift of offset voltage	TCV_{OE}	mV/℃	-0.05		0.05	@ -40℃~85℃
Sensitivity error	ε_G	%	-0.5		0.5	Exclusive of V_{OE}
Temperature of G	TCG	%/℃	-0.05		0.05	@ -40℃~85℃
Hysteresis offset voltage@I_P=0 after 3 × I_{PN}	V_M	mV	-1	±0.5	1	
Linearity error	ε_L	% of I_{PN}	-0.1		0.1	Exclusive of V_{OE}
Accuracy@ I_{PN}	X	% of I_{PN}	-0.7		0.7	Exclusive of V_{OE}
Response time@ 90% of I_{PN}	t_r	μs		0.5	1	@ di/dt=50A/s
Frequency bandwidth(-3dB)	BW	kHz	200			

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Electrical data

CR1V 50 PB03

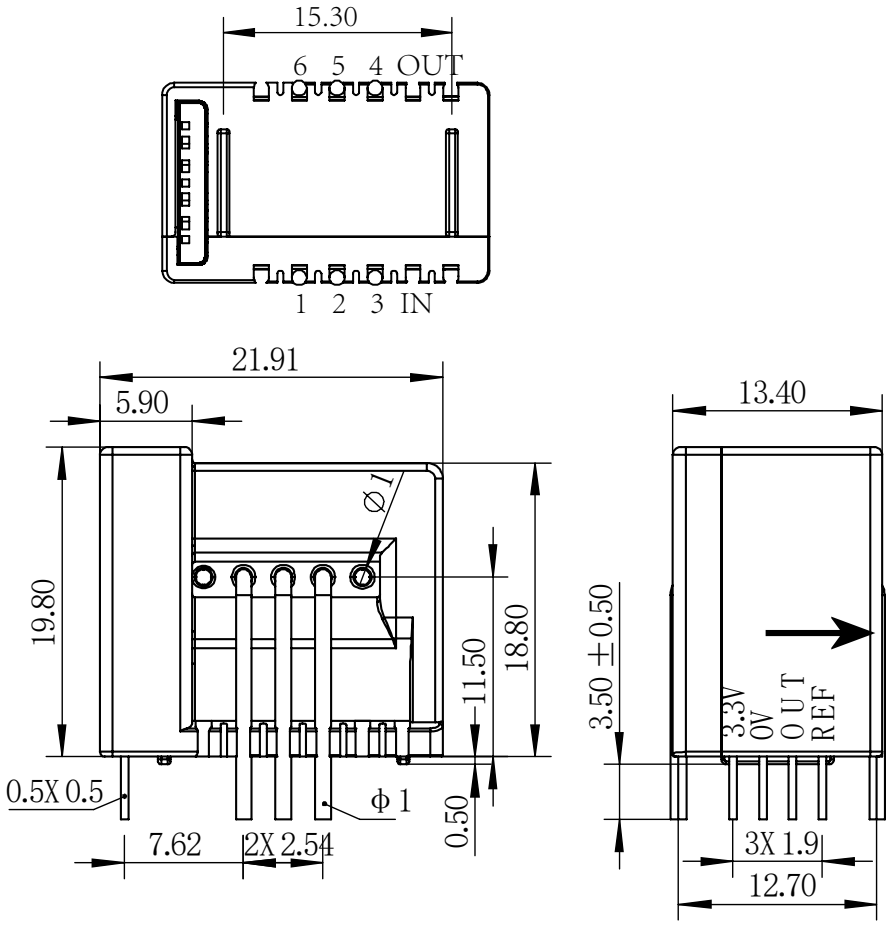
※ With T_A = 25℃, V_C = 3.3V, R_L = 2kΩ,unless otherwise noted.

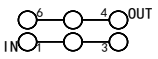
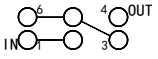
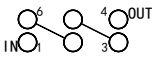
Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal rms current	I_{PN}	At		±50		
Maximum measured current	I_{PM}	At	-100		100	
Turns ratio	K_N	-		1-2-3: 1000		
Internal sampling resistance（0.1%）	R_{IM}	Ω		3		
Theoretical sensitivity	G_{th}	mV/A		13		@ V_C=3.3V
Load resistance	R_L	kΩ	2			
Current consumption	I_C	mA		15 + I_P/N_S+ V_{OUT}/R_L		
Supply voltage	V_C	V		3.3		@ ±5%
Output voltage	V_0	V		1.62±(0.625*I_P/I_{PN})		
Reference voltage@I_P=0A	V_{REF}	mV	1643	1650	1657	
Offset voltage@I_P=0A	V_{OE}	mV	1643	1650	1657	
Temperature drift of offset voltage	TCV_{OE}	mV/℃	-0.05		0.05	@ -40℃~85℃
Sensitivity error	ε_G	%	-0.5		0.5	Exclusive of V_{OE}
Temperature of G	TCG	%/℃	-0.05		0.05	@ -40℃~85℃
Hysteresis offset voltage@I_P=0 after 3×I_{PN}	V_M	mV	-1	±0.5	1	
Linearity error	ε_L	% of I_{PN}	-0.1		0.1	Exclusive of V_{OE}
Accuracy@ I_{PN}	X	% of I_{PN}	-0.7		0.7	Exclusive of V_{OE}
Response time @ 90% of I_{PN}	t_r	μs		0.5	1	@ di/dt=50A/s
Frequency bandwidth (-3dB)	BW	kHz	200			

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CR1V PB03 SERIES

Dimensions（in mm. 1 mm = 0.0394 inch）



Number of Primary turns	Primary nominal current I_{PN}(A)	Nominal *output voltage* V_O(V)	Primary resistance R_P（mΩ）	Primary inductance L_P（μH）	Recommended connections
1	±6 (±15, ±25, ±50)	1.65±0.625	0.18	0.013	
2	±3 (±7.5, ±12.5, ±25)	1.65±0.625	0.81	0.05	
3	±2 (±5, ±8.3, ±16.6)	1.65±0.625	1.62	0.12	

Mechanical characteristics

- ✧ General tolerance ±0.3 mm
- ✧ Connection of primary pin 6 pins 0.8×0.8mm
- ✧ Connection of secondary pin 4 pins 0.3×0.5mm

Remarks

- ✧ I_S is positive when the measured electric current flows from 1,2,3 to 4,5,6.

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

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