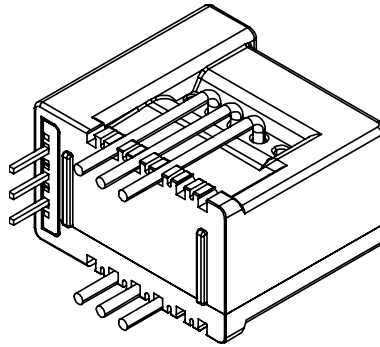


CR1V PB00 SERIES

Current Sensor

Model Number

CR1V 6 PB00
CR1V 15 PB00
CR1V 25 PB00



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
- ✧ 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.

CR1VPB00 SERIES

Absolute maximum ratings(not operating)

Parameter	Symbol	Unit	Value
Supply voltage	V_C	V	6
ESD rating, Human Body Model (HBM)	V_{ESD}	kV	2

- ※ 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	Max	Typ	Max	Comment
Ambient operating temperature	T_A	°C	-40		85	
Ambient storage temperature	T_S	°C	-40		125	
Mass	m	g		10		

Insulation coordination

Parameter	Symbol	Unit	Value	Comment
Rms voltage for AC insulation test 50Hz, 1min	V_d	kV	2.5	According to IEC 60664-1
Impulse withstand voltage 1.2/50 μ s	V_W	kV	9	According to IEC 60664-1
Insulation resistance	R_{IS}	M Ω	1500	@500V, $T_A=25^\circ\text{C}$
Clearance(Pri.-sec.)	d_{cl}	mm	6.35	
Creepage distance(Pri.-sec.)	d_{cp}	mm	15.5	
Plastic case	-	-	UL94-V0	
Comparative tracking 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

CR1V PB00 SERIES

Electrical data

CR1V 6 PB00

※ With $T_A = 25^\circ\text{C}$, $V_C = 5\text{V}$, $R_L = 2\text{k}\Omega$, Unless otherwise noted.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal rms current	I_{PN}	At		±6		
Maximum measured current	I_{PM}	At	-18		18	
Turns ratio	K_N	-	1-2-3:1000			
Internal sampling resistance (0.1%)	R_{IM}	Ω		100		
Theoretical sensitivity	G_{th}	mV/A		104.17		@ $V_C=5\text{V}$
Load resistance	R_L	k Ω	2			
Current consumption	I_C	mA	$15 + I_P/N_S + V_{OUT}/R_L$			
Supply voltage	V_C	V		5		@ ±5%
Output voltage	V_O	V	$2.5 \pm (0.625 * I_P / I_{PN})$			
Offset voltage@I _P =0A	V_{OE}	mV	2475	2500	2525	
Temperature drift of offset voltage	TCV_{OE}	mV/°C	-0.05		0.05	@ -40°C~85°C
Sensitivity error	ε_G	%	-0.5		0.5	Exclusive of V_{OE}
Temperature of G	TCG	%/°C	-0.05		0.05	@ -40°C~85°C
Hysteresis offset voltage@ $I_P=0$ after 3 I_{PN}	V_M	mV	-1	±0.5	1	
Linearity error	ε_L	% of I_{PN}	-0.2		0.2	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			1	@ di/dt=50A/s
Frequency bandwidth (-3dB)	BW	kHz	100			

CR1V PB00 SERIES

Electrical data

CR1V 15 PB00

※ With $T_A = 25\text{ }^\circ\text{C}$, $V_C = 5\text{V}$, $R_L = 2\text{k}\Omega$, Unless otherwise noted.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal rms current	I_{PN}	At		± 15		
Maximum measured current	I_{PM}	At	-45		45	
Turns ratio	K_N	-	1-2-3:1200			
Internal sampling resistance (0.1%)	R_{IM}	Ω		50		
Theoretical sensitivity	G_{th}	mV/A		41.66		@ $V_C=5\text{V}$
Load resistance	R_L	k Ω	2			
Current consumption	I_C	mA	$15 + I_P/N_S + V_{OUT}/R_L$			
Supply voltage	V_C	V		5		@ $\pm 5\%$
Output voltage	V_O	V	$2.5 \pm (0.625 * I_P / I_{PN})$			
Offset voltage@ $I_P=0\text{A}$	V_{OE}	mV	2475	2500	2525	
Temperature drift of offset voltage	TCV_{OE}	mV/ $^\circ\text{C}$	-0.05		0.05	@ $-40\text{ }^\circ\text{C} \sim 85\text{ }^\circ\text{C}$
Sensitivity error	ε_G	%	-0.5		0.5	Exclusive of V_{OE}
Temperature of G	TCG	%/ $^\circ\text{C}$	-0.05		0.05	@ $-40\text{ }^\circ\text{C} \sim 85\text{ }^\circ\text{C}$
Hysteresis offset voltage@ $I_P=0$ after $3 \times I_{PN}$	V_M	mV	-1	± 0.5	1	
Linearity error	ε_L	% of I_{PN}	-0.2		0.2	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			1	@ $di/dt=50\text{A/s}$
Frequency bandwidth (-3dB)	BW	kHz	100			

CR1V PB00 SERIES

Electrical data

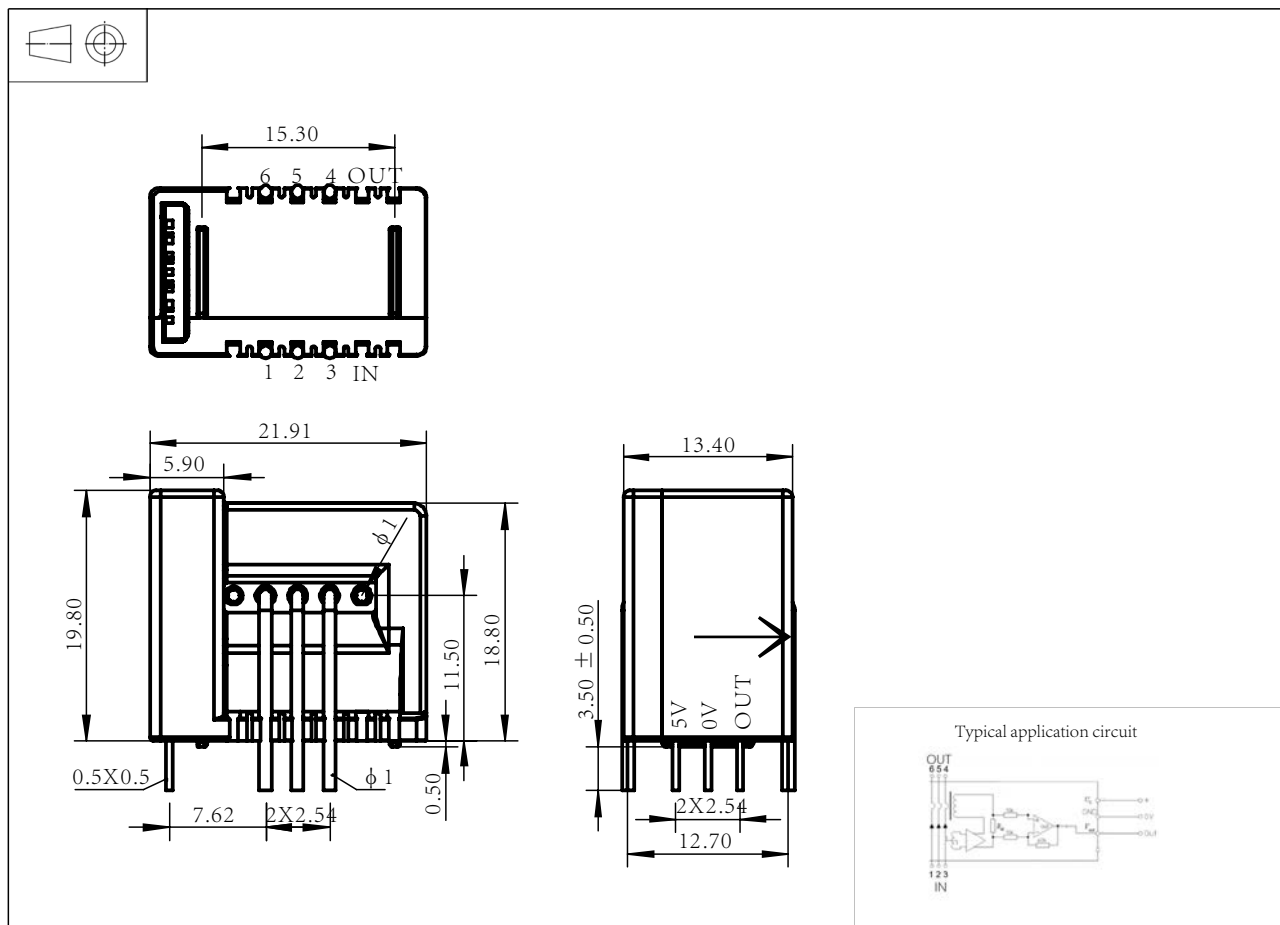
CR1V 25 PB00

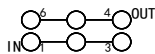
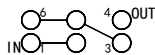
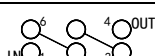
※ With $T_A = 25^\circ\text{C}$, $V_C = 5\text{V}$, $R_L = 2\text{k}\Omega$, Unless otherwise noted.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal rms current	I_{PN}	At		± 25		
Maximum measured current	I_{PM}	At	-75		75	
Turns ratio	K_N	-	1-2-3:1000			
Internal sampling resistance (0.1%)	R_{IM}	Ω		25		
Theoretical sensitivity	G_{th}	mV/A		25		@ $V_C=5\text{V}$
Load resistance	R_L	k Ω	2			
Current consumption	I_C	mA	$15 + I_P/N_S + V_{OUT}/R_L$			
Supply voltage	V_C	V		5		@ $\pm 5\%$
Output voltage	V_O	V	$2.5 \pm (0.625 * I_P / I_{PN})$			
Offset voltage@ $I_P=0\text{A}$	V_{OE}	mV	2475	2500	2525	
Temperature drift of offset voltage	TCV_{OE}	mV/ $^\circ\text{C}$	-0.05		0.05	@ $-40^\circ\text{C} \sim 85^\circ\text{C}$
Sensitivity error	ε_G	%	-0.5		0.5	Exclusive of V_{OE}
Temperature of G	TCG	%/ $^\circ\text{C}$	-0.05		0.05	@ $-40^\circ\text{C} \sim 85^\circ\text{C}$
Hysteresis offset voltage@ $I_P=0$ after $3 \times I_{PN}$	V_M	mV	-1	± 0.5	1	
Linearity error	ε_L	% of I_{PN}	-0.2		0.2	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			1	@ $di/dt=50\text{A/s}$
Frequency bandwidth(-3dB)	BW	kHz	100			

CR1V PB00 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 (m Ω)	Primary inductance L_p (μ H)	Recommended connections
1	± 6 (± 15 , ± 25)	2.5 ± 0.625	0.18	0.013	
2	± 3 (± 7.5 , ± 12.5)	2.5 ± 0.625	0.81	0.05	
3	± 2 (± 5 , ± 8.3)	2.5 ± 0.625	1.62	0.12	

Mechanical characteristics

- ◇ General tolerance ± 0.3 mm
- ◇ Connect the original side to the pin 6 pins 0.8×0.8 mm
- ◇ The secondary side signal connects to the pin 3 pins 0.3×0.5 mm

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.