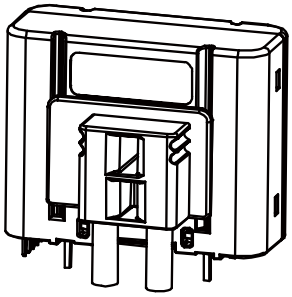
CS1V PB00 SERIES

Current Sensor

Model Number:

CS1V 100 PB00
CS1V 150 PB00
CS1V 200 PB00



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

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 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)
- Battery management
- Switch Mode Power Supplies (SMPS)
- Power supplies for welding applications
- Inverter

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 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	7
ESD rating, Human Body Model (HBM)	V_{ESD}	kV	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	℃	-55		125	
Mass	m	g		70		

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 voltage1.2/50μs	V_W	kV	8	According to IEC 60664-1
Insulation resistance	R_{IS}	GΩ	＞200	@500V，T_A=25℃
Clearance (pri.-sec.)	d_{Cl}	mm	12.2	
Creepage distance (pri.-sec.)	d_{Cp}	mm	12.2	
Plastic case	-	-	UL94-V0	
Comparative traking index	CTI		600	
Application example	-	-	600V	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

CS1V 100 PB00

※ With T_A = 25℃, V_C = 5V, R_L = 10Ω,unless otherwise noted.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal rms current	I_{PN}	A		100		
Primary current, measuring range	I_{PM}	A		270		
Supply voltage	V_C	V	4.75	5	5.25	@ ±5%
Current consumption	I_C	mA		18+I_P(mA)/ N_S	20+I_P(mA)/ N_S	@N_S =2026
Reference voltage	V_{REF}	V	2.485	2.5	2.515	@I_P=0A
Output voltage	V_{Out}	V	0.25		4.75	@ V_C=5V
Offset voltage	V_{Out}	V		V_{REF}		
Electrical offset voltage	V_{OE}	mV	-2.8		2.8	
Electrical offset cur	I_{OE}	mA	-448		448	
Temperature coefficient of I_{OE}	TCI_{OE}	A/K	-0.002		0.002	
Temperature coefficient of V_{REF}	TCV_{REF}	ppm/K	-100		100	
Temperature coefficient of V_{OE}	TCV_{OUT}	ppm/K	-3		3	@ ppm/K of 2.5V
Theoretical sensitivity	G_{th}	mV/A		6.250		
Sensitivity error	G	%	-0.65		0.65	
Temperature drift of G	TCG	ppm/K			70	@ ppm/k of I_{PN}
Linearity error	ε_L	% of I_{PN}	-0.15		0.15	
Magnetic offset current@ 10x I_P	I_{OM}	mA	-104		104	
Output noise	Vno	mVpp		5 6		@DC~10kHz @DC~100kHz
Primary current, detection threshold	I_{PTH}	A	1.87* I_{PN}	1.93* I_{PN}	1.98* I_{PN}	
Delay time of threshold output for high value	$t_{DH\ Th}$	μs		1.4	2.2	
Response time@ 10% of I_{PN}	t_r	μs			1	@ di/dt=50A/s
Response time@ 80% of I_{PN}	t_r	μs			2	@ di/dt=50A/s
Frequency bandwidth(±3dB)	BW	kHz	200			
Accuracy	X	% of I_{PN}			0.95	@Notes 1)
Accuracy@85°C	X	% of I_{PN}			1.25	@Notes 1)
Sum of sensitivity and and linearity	ε_{GL}	% of I_{PN}			0.68	@Notes 2)
Sum of sensitivity and and linearity@85°C	ε_{GL}	% of I_{PN}			1.1	@Notes 2)

Notes:

1) $X(T_A) = X_{25} + \left(TCG + \frac{TCI_{OE}}{I_{PN}}\right) X \mid T_A - 25 \mid$

2) $\varepsilon_{GL}(T_A) = \varepsilon_{GL\,25} + \left(TCG + \frac{TCI_{OE}}{I_{PN}}\right) X \mid T_A - 25 \mid$

Electrical data

CS1V 150 PB00

※ With T_A = 25℃, V_C = 5V, R_L = 10Ω,unless otherwise noted.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal rms current	I_{PN}	A		150		
Primary current, measuring range	I_{PM}	A		270		
Supply voltage	V_C	V	4.75	5	5.25	@ ±5%
Current consumption	I_C	mA		18+I_P(mA)/ N_S	20+I_P(mA)/ N_S	@N_S =2026
Reference voltage	V_{REF}	V	2.485	2.5	2.515	@I_P=0A
Output voltage	V_{Out}	V	0.25		4.75	@ V_C=5V
Offset voltage	V_{Out}	V		V_{REF}		
Electrical offset voltage	V_{OE}	mV	-2.5		2.5	
Electrical offset cur	I_{OE}	mA	-600		600	
Temperature coefficient of I_{OE}	TCI_{OE}	A/K	-0.002		0.002	
Temperature coefficient of V_{REF}	TCV_{REF}	ppm/K	-100		100	
Temperature coefficient of V_{OE}	TCV_{OUT}	ppm/K	-3		3	@ ppm/K of 2.5V
Theoretical sensitivity	G_{th}	mV/A		4.167		
Sensitivity error	G	%	-0.65		0.65	
Temperature drift of G	TCG	ppm/K			70	@ ppm/k of I_{PN}
Linearity error	ε_L	% of I_{PN}	-0.15		0.15	
Magnetic offset current@ 10x I_P	I_{OM}	mA	-156		156	
Output noise	Vno	mVpp		5 6		@DC~10kHz @DC~100kHz
Primary current, detection threshold	I_{PTH}	A	1.39* I_{PN}	1.44* I_{PN}	1.5* I_{PN}	
Delay time of threshold output for high value	$t_{DH\ Th}$	μs		1.4	2.2	
Response time@ 10% of I_{PN}	t_r	μs			1	@ di/dt=50A/s
Response time@ 80% of I_{PN}	t_r	μs			2	@ di/dt=50A/s
Frequency bandwidth(±3dB)	BW	kHz	200			
Accuracy	X	% of I_{PN}			0.95	@Notes 1)
Accuracy@85°C	X	% of I_{PN}			1.25	@Notes 1)
Sum of sensitivity and and linearity	ε_{GL}	% of I_{PN}			0.68	@Notes 2)
Sum of sensitivity and and linearity@85°C	ε_{GL}	% of I_{PN}			1.1	@Notes 2)

Notes:

1) $X(T_A) = X_{25} + \left(TCG + \frac{TCI_{OE}}{I_{PN}}\right) X \mid T_A - 25 \mid$

2) $\varepsilon_{GL}(T_A) = \varepsilon_{GL\,25} + \left(TCG + \frac{TCI_{OE}}{I_{PN}}\right) X \mid T_A - 25 \mid$

Electrical data

CS1V 200 PB00

※ With T_A = 25℃, V_C = 5V, R_L = 10Ω,unless otherwise noted.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal rms current	I_{PN}	A		200		
Primary current, measuring range	I_{PM}	A	-450		450	
Supply voltage	V_C	V	4.75	5	5.25	@ ±5%
Current consumption	I_C	mA		18+I_P(mA)/ N_S	20+I_P(mA)/ N_S	@N_S =1500
Reference voltage	V_{REF}	V	2.485	2.5	2.515	@I_P=0A
Output voltage	V_{Out}	V	0.25		4.75	@ V_C=5V
Offset voltage	V_{Out}	V		V_{REF}		
Electrical offset voltage	V_{OE}	mV	-2.5		2.5	
Electrical offset cur	I_{OE}	mA	-800		800	
Temperature coefficient of I_{OE}	TCI_{OE}	A/K	-0.002		0.002	
Temperature coefficient of V_{REF}	TCV_{REF}	ppm/K			±100	
Temperature coefficient of V_{OE}	TCV_{OUT}	ppm/K			±2	@ ppm/K of 2.5V
Theoretical sensitivity	G_{th}	mV/A		3.125		
Sensitivity error	G	%	-0.65		0.65	
Temperature drift of G	TCG	ppm/K			70	@ ppm/k of I_{PN}
Linearity error	ε_L	% of I_{PN}	-0.18		0.18	
Magnetic offset current@ 10x I_P	I_{OM}	mA	-208		208	
Output noise	Vno	mVpp		5 6		@DC~10kHz @DC~100kHz
Primary current, detection threshold	I_{PTH}	A	1.87* I_{PN}	1.93* I_{PN}	1.98* I_{PN}	
Delay time of threshold output for high value	$t_{DH\ Th}$	μs		1.4	2.2	
Response time@ 10% of I_{PN}	t_r	μs			1	@ di/dt=70A/s
Response time@ 80% of I_{PN}	t_r	μs			3	@ di/dt=70A/s
Frequency bandwidth(±3dB)	BW	kHz	200			
Accuracy	X	% of I_{PN}			1.1	@Notes 1)
Accuracy@85°C	X	% of I_{PN}			1.4	@Notes 1)
Sum of sensitivity and and linearity	ε_{GL}	% of I_{PN}			0.83	@Notes 2)
Sum of sensitivity and and linearity@85°C	ε_{GL}	% of I_{PN}			1.2	@Notes 2)

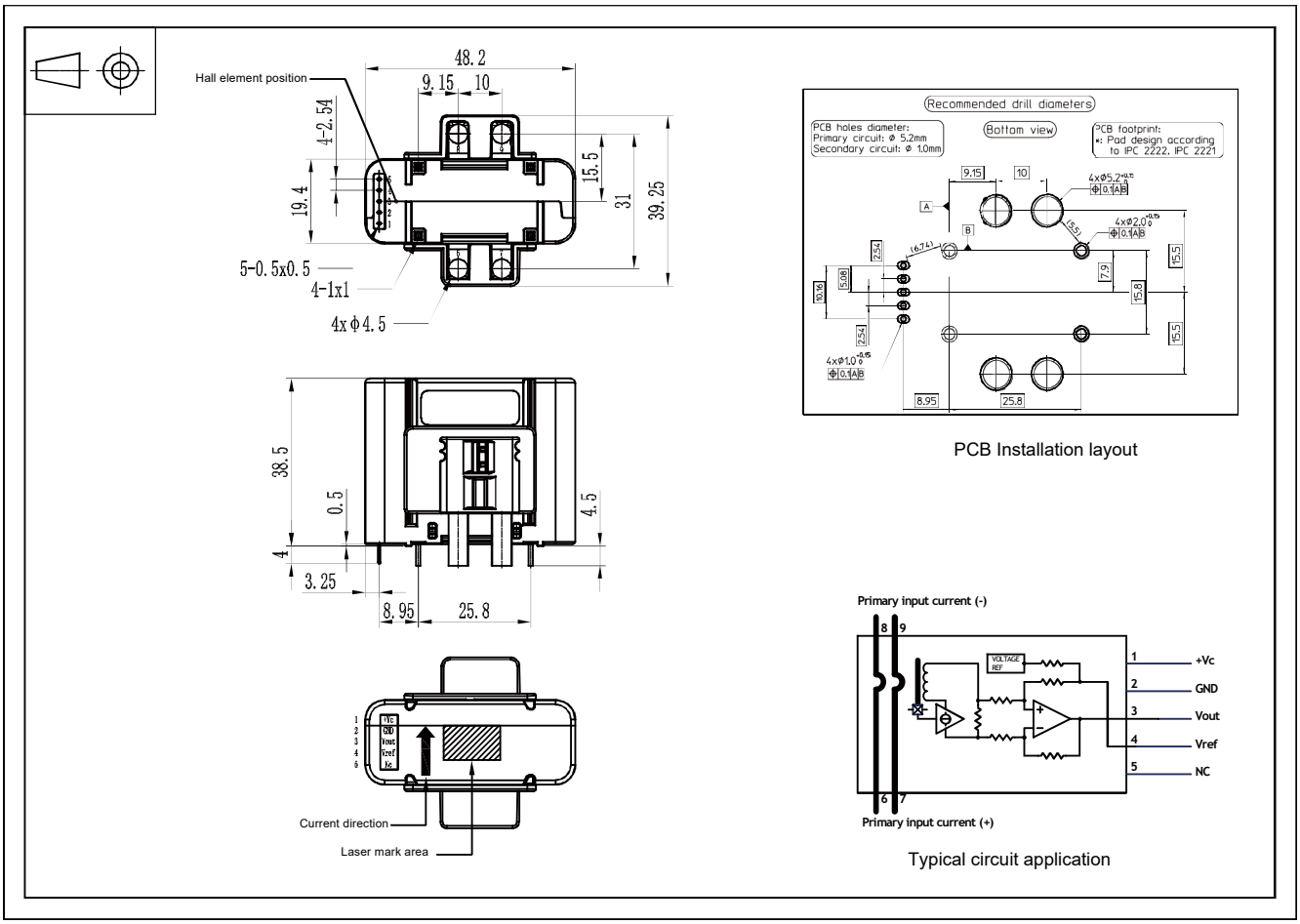
Notes:

1) $X(T_A) = X_{25} + \left(TCG + \frac{TCI_{OE}}{I_{PN}}\right) X \mid T_A - 25 \mid$

2) $\varepsilon_{GL}(T_A) = \varepsilon_{GL\,25} + \left(TCG + \frac{TCI_{OE}}{I_{PN}}\right) X \mid T_A - 25 \mid$

CS1A PB00 SERIES

Dimensions（in mm. 1 mm = 0.0394 inch）



Mechanical characteristics

- ✧ General tolerance ±0.6 mm

Remarks

This is a series of standard models, for different versions (supply voltages,connectors...), please contact CHIPSENSE.