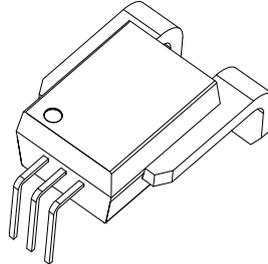


Current Sensor

Model Number:

AN1V 50 PB501
AN1V 100 PB501
AN1V 150 PB501
AN1V 200 PB501
AN1V 250 PB501
AN1V 300 PB501



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

Features

- ✧ Open loop current sensor using the Hall effect
- ✧ ASIC Technology
- ✧ Galvanic separation between primary and secondary
- ✧ Insulating plastic case recognized according to UL 94-V0
- ✧ No insertion losses
- ✧ Small size
- ✧ Standards:
 - IEC 60664-1:2020
 - IEC 61800-5-1:2022
 - IEC 62109-1:2010

Applications

- ✧ AC variable speed
- ✧ 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

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.

AN1V PB501

Absolute maximum ratings(not operating)

Parameter	Symbol	Unit	Value
Supply voltage	V_C	V	6.5
ESD rating, Human Body Model (HBM)	V_{ESD}	V	8000

- ✘ 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	°C	-40		150	AN1V 50 PB501
			-40		150	AN1V 100 PB501
			-40		125	AN1V 150 PB501
			-40		85	AN1V 200 PB501
			-40		85	AN1V 250 PB501
			-40		85	AN1V 300 PB501
Ambient storage temperature	T_S	°C	-55		150	
Primary resistance value	R_P	$\mu\Omega$		100		
Mass	m	g		5		

Insulation coordination

Parameter	Symbol	Unit	Value	Comment
Rms voltage for AC insulation test, @50Hz, 1min	V_d	kV	4.8	According to IEC 60664-1
Plastic case	-	-	UL94-V0	
Comparative tracking index	CTI	PLC	2	
Application example	-	-	475V _{RMS}	Reinforced insulation, according to IEC 61800-5-1, IEC 62109-1CATIII, PD2
Application example	-	-	960V _{RMS}	Basic insulation, according to IEC 61800-5-1, IEC 62109-1CATIII, PD2

AN1V PB501

Electrical data

AN1V 50 PB501

※ With $T_A = 25^\circ\text{C}$, $V_C = 5\text{V}$, $R_L = 10\text{k}\Omega$, unless otherwise noted.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Electrical data						
Primary nominal rms current	I_{PN}	A	0		50	
Primary current measuring range	I_{PM}	A	0		50	
Supply voltage	V_C	V	4.5	5.0	5.5	
Output voltage	V_{OUT}	V	$V_{OUT} = V_{QOV} + G_{th} \times I_P \times (V_C/5)$			
Electrical offset voltage	V_{QOV}	V		0.1 V_{CC}		
Theoretical sensitivity	G_{th}	mV/A		80		
Current consumption	I_C	mA		8	11	
Load resistance	R_L	k Ω	5.1			
Load capacitor	C_2	nF		1	10	
Power filter capacitor	C_1	nF		100		
Performance data						
Sensitivity error	ε_G	%	-1		1	
Temperature of G	T_{CG}	%	-1.5		1.5	@ $T_A = -40^\circ\text{C} \sim 150^\circ\text{C}$
Electrical offset current	V_{OE}	mV	-10	± 5	10	@ $V_C = 5\text{V}$ also $I_P = 0\text{A}$
Electrical offset error of temperature drift	TCV_{OE}	mV	-10		10	@ $T_A = -40^\circ\text{C} \sim 150^\circ\text{C}$
Hysteresis offset voltage	V_{OM}	mV		4		@ $V_C = 5\text{V}$, after $\pm I_{PN}$
Linearity error	ε_L	% of I_{PN}	-1		1	Exclusive of V_{OE}
Accuracy@ I_{PN}	X	% of I_{PN}	-1 -2		1 2	@ $T_A = 25^\circ\text{C}$ @ $T_A = -40^\circ\text{C} \sim 85^\circ\text{C}$
Response time @ 90% of I_{PN}	t_r	μs		2.5	5	@ $C_2 = 1\text{nF}$
Frequency bandwidth(-3dB)	BW	kHz		250		@ $C_2 = 1\text{nF}$
Output noise	V_{no}	mV		5		@ $C_2 = 1\text{nF}$

AN1V PB501

Electrical data

AN1V 100 PB501

※ With $T_A = 25^\circ\text{C}$, $V_C = 5\text{V}$, $R_L = 10\text{k}\Omega$, unless otherwise noted.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Electrical data						
Primary nominal rms current	I_{PN}	A	0		100	
Primary current measuring range	I_{PM}	A	0		100	
Supply voltage	V_C	V	4.5	5.0	5.5	
Output voltage	V_{OUT}	V	$V_{OUT} = V_{DOV} + G_{th} \times I_P \times (V_C/5)$			
Electrical offset voltage	V_{DOV}	V		0.1 V_{CC}		
Theoretical sensitivity	G_{th}	mV/A		40		
Current consumption	I_C	mA		8	11	
Load resistance	R_L	k Ω	5.1			
Load capacitor	C_2	nF		1	10	
Power filter capacitor	C_1	nF		100		
Performance data						
Sensitivity error	ε_G	%	-1		1	
Temperature of G	T_{CG}	%	-1.5		1.5	@ $T_A = -40^\circ\text{C} \sim 150^\circ\text{C}$
Electrical offset current	V_{OE}	mV	-10	± 5	10	@ $V_C = 5\text{V}$ also $I_P = 0\text{A}$
Electrical offset error of temperature drift	TCV_{OE}	mV	-10		10	@ $T_A = -40^\circ\text{C} \sim 150^\circ\text{C}$
Hysteresis offset voltage	V_{OM}	mV		4		@ $V_C = 5\text{V}$, after $\pm I_{PN}$
Linearity error	ε_L	% of I_{PN}	-1		1	Exclusive of V_{OE}
Accuracy@ I_{PN}	X	% of I_{PN}	-1 -2		1 2	@ $T_A = 25^\circ\text{C}$ @ $T_A = -40^\circ\text{C} \sim 85^\circ\text{C}$
Response time @ 90% of I_{PN}	t_r	μs		2.5	5	@ $C_2 = 1\text{nF}$
Frequency bandwidth(-3dB)	BW	kHz		250		@ $C_2 = 1\text{nF}$
Output noise	V_{no}	mV		2.7		@ $C_2 = 1\text{nF}$

AN1V PB501

Electrical data

AN1V 150 PB501

※ With $T_A = 25^\circ\text{C}$, $V_C = 5\text{V}$, $R_L = 10\text{k}\Omega$, unless otherwise noted.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Electrical data						
Primary nominal rms current	I_{PN}	A	0		150	
Primary current measuring range	I_{PM}	A	0		150	
Supply voltage	V_C	V	4.5	5.0	5.5	
Output voltage	V_{OUT}	V	$V_{OUT} = V_{QOV} + G_{th} \times I_P \times (V_C/5)$			
Electrical offset voltage	V_{QOV}	V		0.1 V_{CC}		
Theoretical sensitivity	G_{th}	mV/A		26.66		
Current consumption	I_C	mA		8	11	
Load resistance	R_L	k Ω	5.1			
Load capacitor	C_2	nF		1	10	
Power filter capacitor	C_1	nF		100		
Performance data						
Sensitivity error	ε_G	%	-1		1	
Temperature of G	TCG	%	-1.5		1.5	@ $T_A = -40^\circ\text{C} \sim 125^\circ\text{C}$
Electrical offset current	V_{OE}	mV	-10	± 5	10	@ $V_C = 5\text{V}$ also $I_P = 0\text{A}$
Electrical offset error of temperature drift	TCV_{OE}	mV	-10		10	@ $T_A = -40^\circ\text{C} \sim 125^\circ\text{C}$
Hysteresis offset voltage	V_{OM}	mV		4		@ $V_C = 5\text{V}$, after $\pm I_{PN}$
Linearity error	ε_L	% of I_{PN}	-1		1	Exclusive of V_{OE}
Accuracy@ I_{PN}	X	% of I_{PN}	-1 -2		1 2	@ $T_A = 25^\circ\text{C}$ @ $T_A = -40^\circ\text{C} \sim 85^\circ\text{C}$
Response time @ 90% of I_{PN}	t_r	μs		2.5	5	@ $C_2 = 1\text{nF}$
Frequency bandwidth(-3dB)	BW	kHz		250		@ $C_2 = 1\text{nF}$
Output noise	V_{no}	mV		1.8		@ $C_2 = 1\text{nF}$

AN1V PB501

Electrical data

AN1V 200 PB501

※ With $T_A = 25^\circ\text{C}$, $V_C = 5\text{V}$, $R_L = 10\text{k}\Omega$, unless otherwise noted.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Electrical data						
Primary nominal rms current	I_{PN}	A	0		200	
Primary current measuring range	I_{PM}	A	0		200	
Supply voltage	V_C	V	4.5	5.0	5.5	
Output voltage	V_{OUT}	V	$V_{OUT} = V_{QOV} + G_{th} \times I_P \times (V_C/5)$			
Electrical offset voltage	V_{QOV}	V		0.1 V_{CC}		
Theoretical sensitivity	G_{th}	mV/A		20		
Current consumption	I_C	mA		8	11	
Load resistance	R_L	k Ω	5.1			
Load capacitor	C_2	nF		1	10	
Power filter capacitor	C_1	nF		100		
Performance data						
Sensitivity error	ε_G	%	-1		1	
Temperature of G	T_{CG}	%	-1.5		1.5	@ $T_A = -40^\circ\text{C} \sim 85^\circ\text{C}$
Electrical offset current	V_{OE}	mV	-10	± 5	10	@ $V_C = 5\text{V}$ also $I_P = 0\text{A}$
Electrical offset error of temperature drift	TCV_{OE}	mV	-10		10	@ $T_A = -40^\circ\text{C} \sim 85^\circ\text{C}$
Hysteresis offset voltage	V_{OM}	mV		4		@ $V_C = 5\text{V}$, after $\pm I_{PN}$
Linearity error	ε_L	% of I_{PN}	-1		1	Exclusive of V_{OE}
Accuracy@ I_{PN}	X	% of I_{PN}	-1 -2		1 2	@ $T_A = 25^\circ\text{C}$ @ $T_A = -40^\circ\text{C} \sim 85^\circ\text{C}$
Response time @ 90% of I_{PN}	t_r	μs		2.5	5	@ $C_2 = 1\text{nF}$
Frequency bandwidth(-3dB)	BW	kHz		250		@ $C_2 = 1\text{nF}$
Output noise	V_{no}	mV		1.4		@ $C_2 = 1\text{nF}$

AN1V PB501

Electrical data

AN1V 250 PB501

※ With $T_A = 25^\circ\text{C}$, $V_C = 5\text{V}$, $R_L = 10\text{k}\Omega$, unless otherwise noted.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Electrical data						
Primary nominal rms current	I_{PN}	A	0		250	
Primary current measuring range	I_{PM}	A	0		250	
Supply voltage	V_C	V	4.5	5.0	5.5	
Output voltage	V_{OUT}	V	$V_{OUT} = V_{QOV} + G_{th} \times I_P \times (V_C/5)$			
Electrical offset voltage	V_{QOV}	V		$0.1 V_{CC}$		
Theoretical sensitivity	G_{th}	mV/A		16		
Current consumption	I_C	mA		8	11	
Load resistance	R_L	k Ω	5.1			
Load capacitor	C_2	nF		1	10	
Power filter capacitor	C_1	nF		100		
Performance data						
Sensitivity error	ε_G	%	-1		1	
Temperature of G	T_{CG}	%	-1.5		1.5	@ $T_A = -40^\circ\text{C} \sim 85^\circ\text{C}$
Electrical offset current	V_{OE}	mV	-10	± 5	10	@ $V_C = 5\text{V}$ also $I_P = 0\text{A}$
Electrical offset error of temperature drift	TCV_{OE}	mV	-10		10	@ $T_A = -40^\circ\text{C} \sim 85^\circ\text{C}$
Hysteresis offset voltage	V_{OM}	mV		4		@ $V_C = 5\text{V}$, after $\pm I_{PN}$
Linearity error	ε_L	% of I_{PN}	-1		1	Exclusive of V_{OE}
Accuracy@ I_{PN}	X	% of I_{PN}	-1 -2		1 2	@ $T_A = 25^\circ\text{C}$ @ $T_A = -40^\circ\text{C} \sim 85^\circ\text{C}$
Response time @ 90% of I_{PN}	t_r	μs		2.5	5	@ $C_2 = 1\text{nF}$
Frequency bandwidth(-3dB)	BW	kHz		250		@ $C_2 = 1\text{nF}$
Output noise	V_{no}	mV		1.1		@ $C_2 = 1\text{nF}$

AN1V PB501

Electrical data

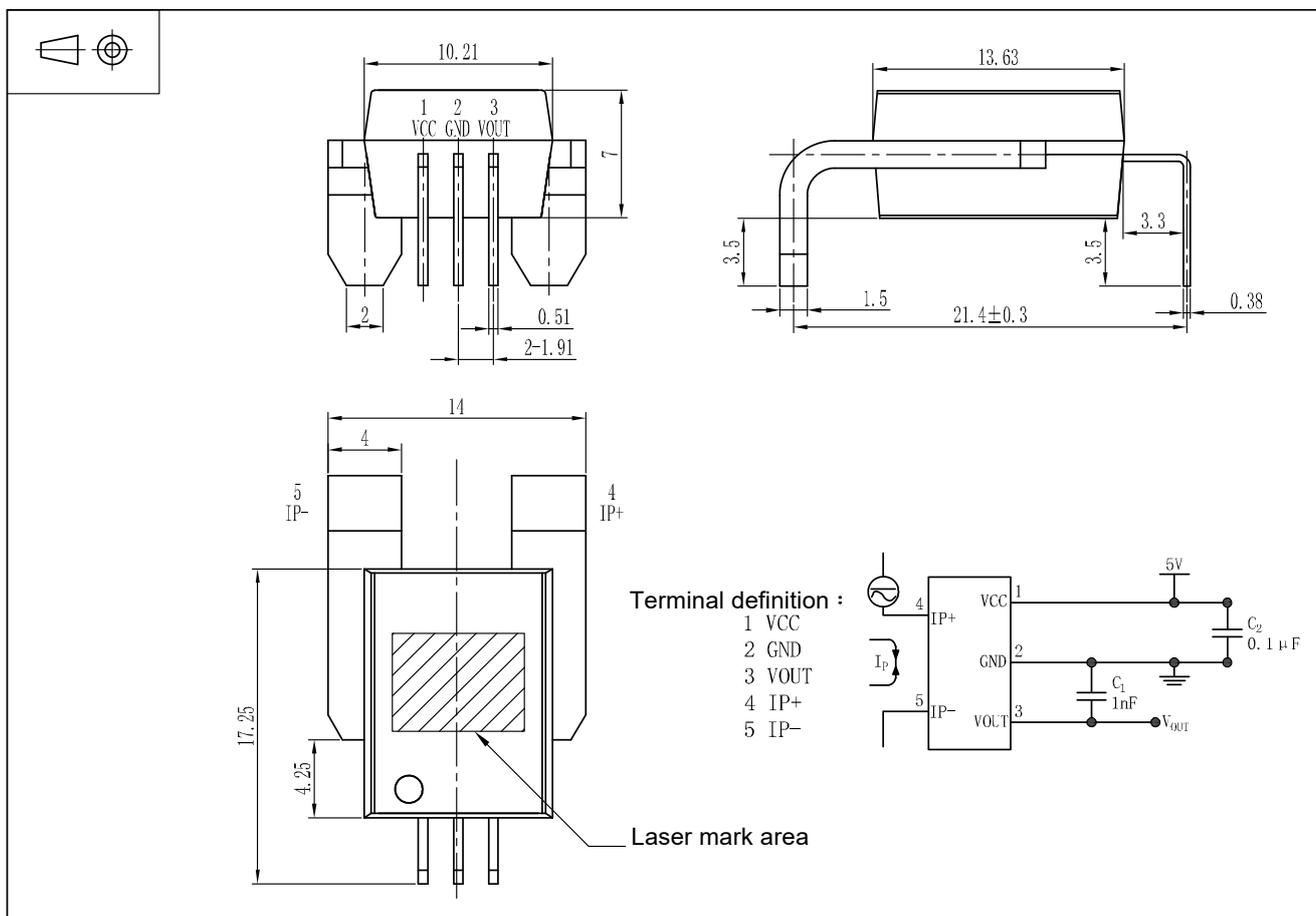
AN1V 300 PB501

※ With $T_A = 25^\circ\text{C}$, $V_C = 5\text{V}$, $R_L = 10\text{k}\Omega$, unless otherwise noted.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Electrical data						
Primary nominal rms current	I_{PN}	A	0		300	
Primary current measuring range	I_{PM}	A	0		300	
Supply voltage	V_C	V	4.5	5.0	5.5	
Output voltage	V_{OUT}	V	$V_{OUT} = V_{QOV} + G_{th} \times I_P \times (V_C/5)$			
Electrical offset voltage	V_{QOV}	V		0.1 V_{CC}		
Theoretical sensitivity	G_{th}	mV/A		13.33		
Current consumption	I_C	mA		8	11	
Load resistance	R_L	k Ω	5.1			
Load capacitor	C_2	nF		1	10	
Power filter capacitor	C_1	nF		100		
Performance data						
Sensitivity error	ε_G	%	-1		1	
Temperature of G	TCG	%	-1.5		1.5	@ $T_A = -40^\circ\text{C} \sim 85^\circ\text{C}$
Electrical offset current	V_{OE}	mV	-10	± 5	10	@ $V_C = 5\text{V}$ also $I_P = 0\text{A}$
Electrical offset error of temperature drift	TCV_{OE}	mV	-10		10	@ $T_A = -40^\circ\text{C} \sim 85^\circ\text{C}$
Hysteresis offset voltage	V_{OM}	mV		4		@ $V_C = 5\text{V}$, after $\pm I_{PN}$
Linearity error	ε_L	% of I_{PN}	-1		1	Exclusive of V_{OE}
Accuracy@ I_{PN}	X	% of I_{PN}	-1 -2		1 2	@ $T_A = 25^\circ\text{C}$ @ $T_A = -40^\circ\text{C} \sim 85^\circ\text{C}$
Response time @ 90% of I_{PN}	t_r	μs		2.5	5	@ $C_2 = 1\text{nF}$
Frequency bandwidth(-3dB)	BW	kHz		250		@ $C_2 = 1\text{nF}$
Output noise	V_{no}	mV		1.1		@ $C_2 = 1\text{nF}$

AN1V PB501

Dimensions(Unit mm)



Mechanical characteristics

- ◇ General tolerance ± 0.3 mm
- ◇ Conductor and pin material Red copper with tin plating

Remarks

- ◇ When I_p flows in the direction of pin4 to pin5, V_{out} increase.