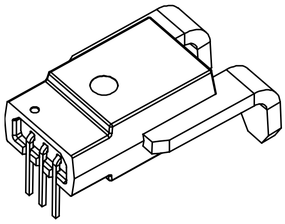
AN1V PB22

CHIPSENSE

Current Sensor

Model Number：

AN1V 50 PB22
AN1V 100 PB22
AN1V 150 PB22
AN1V 200 PB22
AN1V 250 PB22



RoHS compliant

CE

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.
- ✧ Maintain output proportional to changes in the power supply（include offset and sensitivity）.
- ✧ 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.

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	℃	-40 -40 -40 -40 -40		150 150 125 85 85	AN1V 50 PB22 AN1V 100 PB22 AN1V 150 PB22 AN1V 200 PB22 AN1V 250 PB22
Ambient storge temperature	T_S	℃	-55		150	
Primary resistance value	R_P	µΩ		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 traking 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 50 PB22

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

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Electrical data						
Primary nominal rms current	I_{PN}	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	kΩ	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℃~150℃
Electrical offset current	V_{OE}	mV	-10	±5	10	@V_C=5V also I_P=0A
Electrical offset error of temperature drift	TCV_{OE}	mV	-10		10	@ T_A=-40℃~150℃
Hysteresis offset voltage	V_{OM}	mV		4		@V_C=5V, after ±I_{PN}
Linearity error	ε_L	% of I_{PN}	-1		1	Exclusive of V_{OE}
Accuracy@ I_{PN}	X	% of I_{PN}	-2		2	@ T_A=-40℃~150℃
Response time@ 90% of I_{PN}	t_r	µs		2.5	5	@C_2=1 nF
Frequency bandwidth(-3dB)	BW	kHz		250		@C_2=1 nF
Output noise	V_{no}	mV		5		@C_2=1 nF

Electrical data

AN1V 100 PB22

※ With T_A = 25℃, V_C = 5V, R_L = 10kΩ,Unless otherwise noted.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Electrical data						
Primary nominal rms current	I_{PN}	A	0		100	
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		40		
Current consumption	I_C	mA		8	11	
Load resistance	R_L	kΩ	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℃~150℃
Electrical offset current	V_{OE}	mV	-10	±5	10	@ V_C=5V also I_P=0A
Electrical offset error of temperature drift	TCV_{OE}	mV	-10		10	@ T_A=-40℃~150℃
Hysteresis offset voltage	V_{OM}	mV		4		@ V_C=5V, after ±I_{PN}
Linearity error	ε_L	% of I_{PN}	-1		1	Exclusive of V_{OE}
Accuracy@ I_{PN}	X	% of I_{PN}	-2		2	@ T_A=-40℃~150℃
Response time@ 90% of I_{PN}	t_r	µs		2.5	5	@ C_2=1 nF
Frequency bandwidth(-3dB)	BW	kHz		250		@ C_2=1 nF
Output noise	V_{no}	mV		2.7		@ C_2=1 nF

AN1V 150 PB22

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

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Electrical data						
Primary nominal rms current	I_{PN}	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	kΩ	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℃~125℃
Electrical offset current	V_{OE}	mV	-10	±5	10	@V_C=5V also I_P=0A
Electrical offset error of temperature drift	TCV_{OE}	mV	-10		10	@T_A=-40℃~125℃
Hysteresis offset voltage	V_{OM}	mV		4		@V_C=5V, after ±I_{PN}
Linearity error	ε_L	% of I_{PN}	-1		1	Exclusive of V_{OE}
Accuracy@ I_{PN}	X	% of I_{PN}	-2		2	@T_A=-40℃~125℃
Response time@ 90% of I_{PN}	t_r	µs		2.5	5	@C_2=1 nF
Frequency bandwidth(-3dB)	BW	kHz		250		@C_2=1 nF
Output noise	V_{no}	mV		1.8		@C_2=1 nF

Electrical data

AN1V 200 PB22

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

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Electrical data						
Primary nominal rms current	I_{PN}	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	kΩ	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℃~85℃
Electrical offset current	V_{OE}	mV	-10	±5	10	@V_C=5V also I_P=0A
Electrical offset error of temperature drift	TCV_{OE}	mV	-10		10	@T_A=-40℃~85℃
Hysteresis offset voltage	V_{OM}	mV		4		@V_C=5V, after ±I_{PN}
Linearity error	ε_L	% of I_{PN}	-1		1	Exclusive of V_{OE}
Accuracy@ I_{PN}	X	% of I_{PN}	-2		2	@T_A=-40℃~85℃
Response time@ 90% of I_{PN}	t_r	µs		2.5	5	@C_2=1 nF
Frequency bandwidth(-3dB)	BW	kHz		250		@C_2=1 nF
Output noise	V_{no}	mV		1.4		@C_2=1 nF

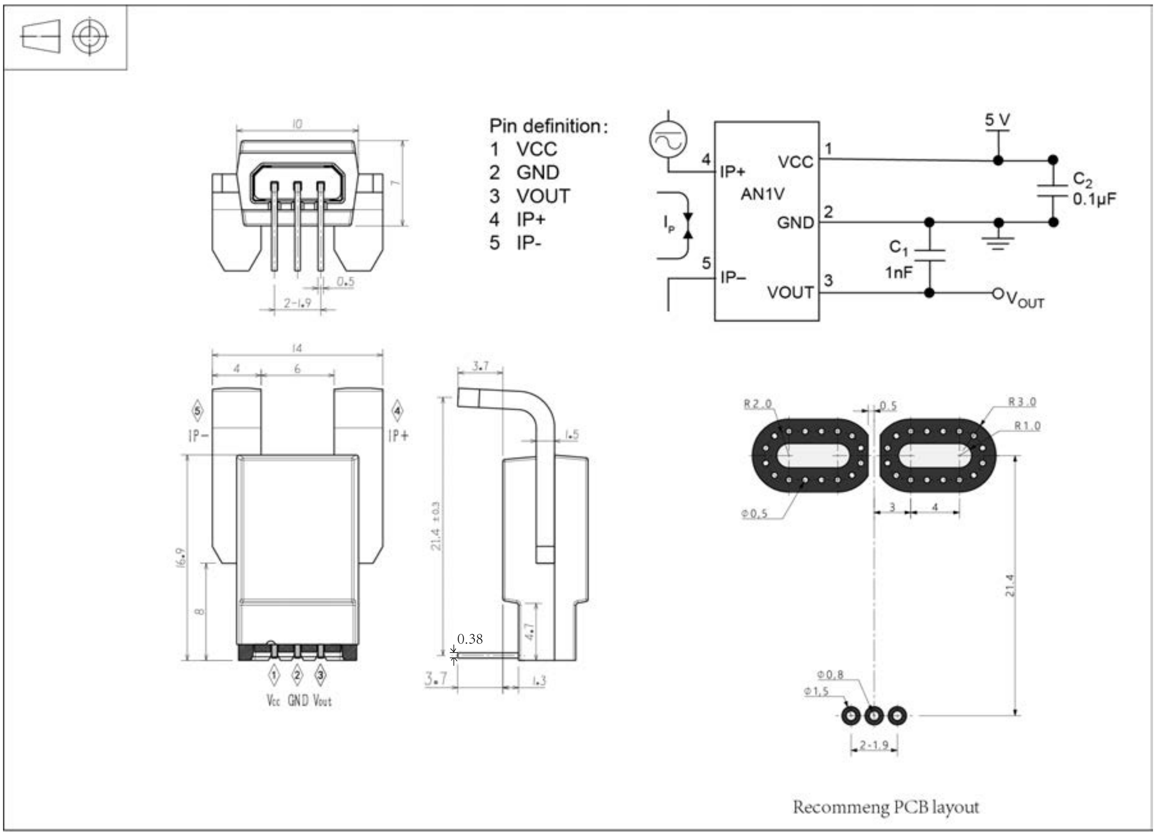
Electrical data

AN1V 250 PB22

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

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Electrical data						
Primary nominal rms current	I_{PN}	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	kΩ	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℃~85℃
Electrical offset current	V_{OE}	mV	-10	±5	10	@V_C=5V also I_P=0A
Electrical offset error of temperature drift	TCV_{OE}	mV	-10		10	@T_A=-40℃~85℃
Hysteresis offset voltage	V_{OM}	mV		4		@V_C=5V, after ±I_{PN}
Linearity error	ε_L	% of I_{PN}	-1		1	Exclusive of V_{OE}
Accuracy@ I_{PN}	X	% of I_{PN}	-2		2	@T_A=-40℃~85℃
Response time@ 90% of I_{PN}	t_r	µs		2.5	5	@C_2=1 nF
Frequency bandwidth(-3dB)	BW	kHz		250		@C_2=1 nF
Output noise	V_{no}	mV		1.1		@C_2=1 nF

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.