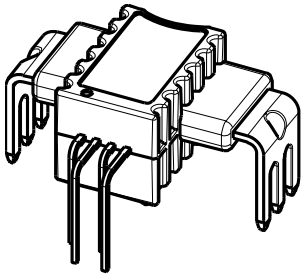
AN3V PB30 SERIES

Curren sensor

Model Number:

AN3V 10 PB30
AN3V 16 PB30
AN3V 20 PB30
AN3V 32 PB30
AN3V 40 PB30
AN3V 50 PB30



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
- Galvanic separation between primary and secondary
- Insulating plastic case recognized according to UL 94-V0
- No insertion losses
- Supply voltage：+3.3V
- h=8.7mm
- Standards:
  - IEC 60664-1:2020
  - IEC 61800-5-1:2022
  - IEC 62109-1:2010

Applications

- AC variable speed
- Servo motor drives
- Static converters for DC motor drives
- Uninterruptible Power Supply (UPS)
- Module power supply
- Switch Mode Power Supplies (SMPS)
- Combining manifolds
- MPPT

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
Primary conductor temperature	T_B	℃	120
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		105	
Ambient storage temperature	T_S	℃	-40		105	
Mass	m	g		3.35		

Insulation coordination

Parameter	Symbol	Unit	Value	Comment
Rms voltage for AC insulation test, 50Hz,1min	V_d	kV	4.3	AccordingtoIEC 60664-1
Impulsewithstandvoltage1.2/50μs	V_W	kV	8	AccordingtoIEC 60664-1
Clearance(Pri.-sec.)	d_{Cl}	mm	>8	
Creepage distance(Pri.-sec.)	d_{Cp}	mm	>8	
Plastic case	-	-	UL94-V0	
Application example	-	-	600V	Reinforced insulation,according to IEC 61800-5-1, IEC 62109-1CATⅢ，PD2
Application example	-	-	1000V	Reinforced insulation,according toIEC 61800-5-1, IEC 62109-1CATⅢ，PD2

Electrical data

AN3V 10 PB30

※ With T_A = 25℃, V_C = 3.3V, R_L = 10kΩ, unless otherwise noted

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal rms current	I_{PN}	A	-10		10	
Primary current,measuring range	I_{PM}	A	-25		25	
Supply voltage	V_C	V	3.135	3.3	3.465	
Current consumption	I_C	mA		6.5	11	
Primary coil resistance@T_A =25℃	R_P	mΩ		0.21		
Primary coil resistance@T_A =105℃	R_P	mΩ		0.29		
Load resistance V_{OUT}	R_L	kΩ	5.1			
Load resistance V_{REF}	R_{REF}	kΩ	5.1			
Load capacitor V_{OUT}	C_L	nF		1.0	10	
Load capacitor V_{REF}	C_{REF}	nF			1	
Reference voltage	V_{REF}	V	1.63	1.65	1.67	
Output voltage range	V_{OUT} -V_{REF}	V	-1.15		1.15	
Electrical offset voltage	V_{OE}	mV	-5		5	V_{OUT} -V_{REF}@ I_P=0A
Temperature coefficient of	TCV_{OE}	mV	0.4		6	@T_A=-40℃~105℃
Theoretical sensitivity	G_{th}	mV/A		46		
Temperature of G	TCG	%	-1.6		1.6	@T_A=-40℃~105℃
Linearity error	ε_L	% of I_{PN}	-0.5		0.5	Exclusive of V_{OE}
Linearity error	ε_L	% of I_{PM}	-0.5		0.5	Exclusive of V_{OE}
Hysteresis offset voltage	V_{OM}	mV	-5		5	@V_C=3.3V, After ±I_{PN}
Accuracy@ I_{PN}	X	% of I_{PN}	-1		1	
Accuracy @ I_{PN}	X	% of I_{PN}	-2.5		2.5	@T_A=-40℃~105℃
Response time@ 90% of I_{PN}	t_r	μs		2.5		@C_L=1.0nF
Frequency bandwidth(-3dB)	BW	kHz		250		@C_L=1.0nF
Output noise	Vno	mV_{RMS}		4.8		@C_L=1.0nF

Electrical data

AN3V 16 PB30

※ With T_A = 25℃, V_C = 3.3V, R_L = 10kΩ, unless otherwise noted.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal rms current	I_{PN}	A	-16		16	
Primary current,measuring range	I_{PM}	A	-40		40	
Supply voltage	V_C	V	3.135	3.3	3.465	
Current consumption	I_C	mA		6.5	11	
Primary coil resistance@T_A =25℃	R_P	mΩ		0.21		
Primary coil resistance@T_A =105℃	R_P	mΩ		0.29		
Load resistance V_{OUT}	R_L	kΩ	5.1			
Load resistance V_{REF}	R_{REF}	kΩ	5.1			
Load capacitor V_{OUT}	C_L	nF		1.0	10	
Load capacitor V_{REF}	C_{REF}	nF			1	
Reference voltage	V_{REF}	V	1.63	1.65	1.67	
Reference voltage	V_{OUT} -V_{REF}	V	-1.15		1.15	
Electrical offset voltage	V_{OE}	mV	-5		5	V_{OUT} -V_{REF}@ I_P=0A
Temperature coefficient of V_{OE}	TCV_{OE}	mV	0.4		6	@T_A=-40℃~105℃
Theoretical sensitivity	G_{th}	mV/A		28.75		
Temperature of G	TCG	%	-1.6		1.6	@T_A=-40℃~105℃
Linearity	ε_L	% of I_{PN}	-0.5		0.5	Exclusive of V_{OE}
Linearity	ε_L	% of I_{PM}	-0.5		0.5	Exclusive of V_{OE}
Hysteresis offset voltage	V_{OM}	mV	-5		5	@V_C=3.3V, After ±I_{PN}
Accuracy @ I_{PN}	X	% of I_{PN}	-1		1	
Accuracy @ I_{PN}	X	% of I_{PN}	-2.5		2.5	@T_A=-40℃~105℃
Response time @ 90% of I_{PN}	t_r	μs		2.5		@C_L=1.0nF
Frequency bandwidth(-3dB)	BW	kHz		250		@C_L=1.0nF
Output noise	Vno	mV_{RMS}		3		@C_L=1.0nF

Electrical data

AN3V 20 PB30

※ With T_A = 25℃, V_C = 3.3V, R_L = 10kΩ, unless otherwise noted.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal rms current	I_{PN}	A	-20		20	
Primary current,measuring range	I_{PM}	A	-50		50	
Supply voltage	V_C	V	3.135	3.3	3.465	
Current consumption	I_C	mA		6.5	11	
Primary coil resistance@T_A =25℃	R_P	mΩ		0.21		
Primary coil resistance@T_A =105℃	R_P	mΩ		0.29		
Load resistance V_{OUT}	R_L	kΩ	5.1			
Load resistance V_{REF}	R_{REF}	kΩ	5.1			
Load capacitor V_{OUT}	C_L	nF		1.0	10	
Load capacitor V_{REF}	C_{REF}	nF			1	
Reference voltage	V_{REF}	V	1.63	1.65	1.67	
Reference voltage	V_{OUT} -V_{REF}	V	-1.15		1.15	
Electrical offset voltage	V_{OE}	mV	-5		5	V_{OUT} -V_{REF}@ I_P=0A
Temperature coefficient of V_{OE}	TCV_{OE}	mV	0.4		6	@T_A=-40℃~105℃
Theoretical sensitivity	G_{th}	mV/A		23		
Temperature of G	TCG	%	-1.6		1.6	@T_A=-40℃~105℃
Linearity	ε_L	% of I_{PN}	-0.5		0.5	Exclusive of V_{OE}
Linearity	ε_L	% of I_{PM}	-0.5		0.5	Exclusive of V_{OE}
Hysteresis offset voltage	V_{OM}	mV	-5		5	@V_C=3.3V, After ±I_{PN}
Accuracy @ I_{PN}	X	% of I_{PN}	-1		1	
Accuracy @ I_{PN}	X	% of I_{PN}	-2.5		2.5	@T_A=-40℃~105℃
Response time @ 90% of I_{PN}	t_r	μs		2.5		@C_L=1.0nF
Frequency bandwidth(-3dB)	BW	kHz		250		@C_L=1.0nF
Output noise	Vno	mV_{RMS}		2		@C_L=1.0nF

Electrical data

AN3V 32 PB30

※ With T_A = 25℃, V_C = 3.3V, R_L = 10kΩ, unless otherwise noted.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal rms current	I_{PN}	A	-32		32	
Primary current,measuring range	I_{PM}	A	-80		80	
Supply voltage	V_C	V	3.135	3.3	3.465	
Current consumption	I_C	mA		6.5	11	
Primary coil resistance@T_A =25℃	R_P	mΩ		0.21		
Primary coil resistance@T_A =105℃	R_P	mΩ		0.29		
Load resistance V_{OUT}	R_L	kΩ	5.1			
Load resistance V_{REF}	R_{REF}	kΩ	5.1			
Load capacitor V_{OUT}	C_L	nF		1.0	10	
Load capacitor V_{REF}	C_{REF}	nF			1	
Reference voltage	V_{REF}	V	1.63	1.65	1.67	
Reference voltage	V_{OUT} -V_{REF}	V	-1.15		1.15	
Electrical offset voltage	V_{OE}	mV	-5		5	V_{OUT} -V_{REF}@ I_P=0A
Temperature coefficient of VOE	TCV_{OE}	mV	0.4		6	@T_A=-40℃~105℃
Theoretical sensitivity	G_{th}	mV/A		14.375		
Temperature of G	TCG	%	-1.6		1.6	@T_A=-40℃~105℃
Linearity	ε_L	% of I_{PN}	-0.5		0.5	Exclusive of V_{OE}
Linearity	ε_L	% of I_{PM}	-0.5		0.5	Exclusive of V_{OE}
Hysteresis offset voltage	V_{OM}	mV	-5		5	@V_C=3.3V, After ±I_{PN}
Accuracy @ I_{PN}	X	% of I_{PN}	-1		1	
Accuracy @ I_{PN}	X	% of I_{PN}	-2.5		2.5	@T_A=-40℃~105℃
Response time @ 90% of I_{PN}	t_r	μs		2.5		@C_L=1.0nF
Frequency bandwidth(-3dB)	BW	kHz		250		@C_L=1.0nF
Output noise	Vno	mV_{RMS}		2		@C_L=1.0nF

Electrical data

AN3V 40 PB30

※ With T_A = 25℃, V_C = 3.3V, R_L = 10kΩ, unless otherwise noted.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal rms current	I_{PN}	A	-40		40	
Primary current,measuring range	I_{PM}	A	-100		100	
Supply voltage	V_C	V	3.135	3.3	3.465	
Current consumption	I_C	mA		6.5	11	
Primary coil resistance@T_A =25℃	R_P	mΩ		0.21		
Primary coil resistance@T_A =105℃	R_P	mΩ		0.29		
Load resistance V_{OUT}	R_L	kΩ	5.1			
Load resistance V_{REF}	R_{REF}	kΩ	5.1			
Load capacitor V_{OUT}	C_L	nF		1.0	10	
Load capacitor V_{REF}	C_{REF}	nF			1	
Reference voltage	V_{REF}	V	1.63	1.65	1.67	
Reference voltage	V_{OUT} -V_{REF}	V	-1.15		1.15	
Electrical offset voltage	V_{OE}	mV	-5		5	V_{OUT} -V_{REF}@ I_P=0A
Temperature coefficient of VOE	TCV_{OE}	mV	0.4		6	@T_A=-40℃~105℃
Theoretical sensitivity	G_{th}	mV/A		11.5		
Temperature of G	TCG	%	-1.6		1.6	@T_A=-40℃~105℃
Linearity	ε_L	% of I_{PN}	-0.5		0.5	Exclusive of V_{OE}
Linearity	ε_L	% of I_{PM}	-0.5		0.5	Exclusive of V_{OE}
Hysteresis offset voltage	V_{OM}	mV	-5		5	@V_C=3.3V, After ±I_{PN}
Accuracy @ I_{PN}	X	% of I_{PN}	-1		1	
Accuracy @ I_{PN}	X	% of I_{PN}	-2.5		2.5	@T_A=-40℃~105℃
Response time @ 90% of I_{PN}	t_r	μs		2.5		@C_L=1.0nF
Frequency bandwidth(-3dB)	BW	kHz		250		@C_L=1.0nF
Output noise	Vno	mV_{RMS}		1.5		@C_L=1.0nF

Electrical data

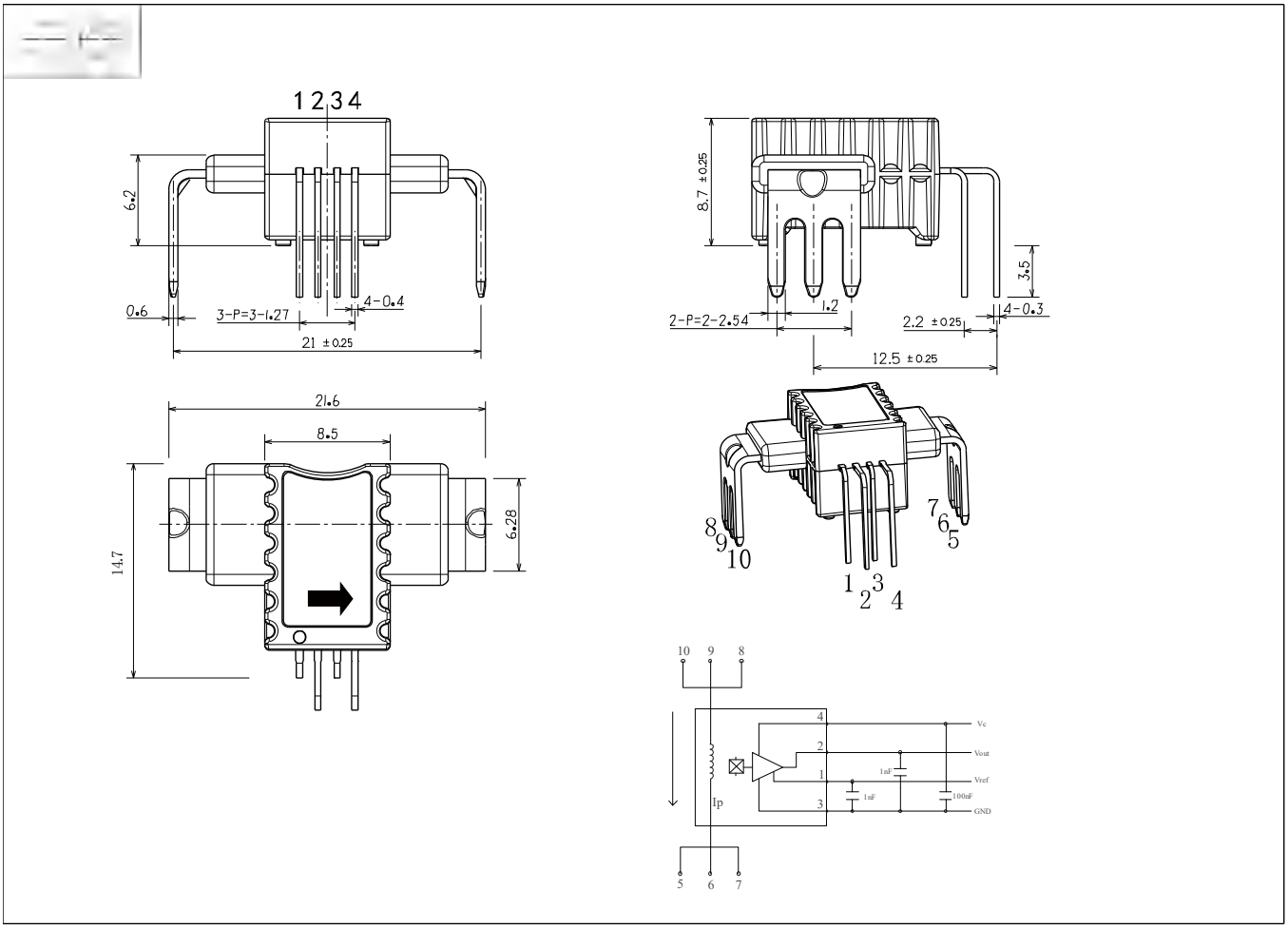
AN3V 50 PB30

※ With T_A = 25℃, V_C = 3.3V, R_L = 10kΩ, unless otherwise noted.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal rms current	I_{PN}	A	-50		50	
Primary current,measuring range	I_{PM}	A	-125		125	
Supply voltage	V_C	V	3.135	3.3	3.465	
Current consumption	I_C	mA		6.5	11	
Primary coil resistance@T_A =25℃	R_P	mΩ		0.21		
Primary coil resistance@T_A =105℃	R_P	mΩ		0.29		
Load resistance V_{OUT}	R_L	kΩ	5.1			
Load resistance V_{REF}	R_{REF}	kΩ	5.1			
Load capacitor V_{OUT}	C_L	nF		1.0	10	
Load capacitor V_{REF}	C_{REF}	nF			1	
Reference voltage	V_{REF}	V	1.63	1.65	1.67	
Reference voltage	V_{OUT} -V_{REF}	V	-1.15		1.15	
Electrical offset voltage	V_{OE}	mV	-5		5	V_{OUT} -V_{REF}@ I_P=0A
Temperature coefficient of VOE	TCV_{OE}	mV	0.4		6	@T_A=-40℃~105℃
Theoretical sensitivity	G_{th}	mV/A		9.2		
Temperature of G	TCG	%	-1.6		1.6	@T_A=-40℃~105℃
Linearity	ε_L	% of I_{PN}	-0.5		0.5	Exclusive of V_{OE}
Linearity	ε_L	% of I_{PM}	-0.5		0.5	Exclusive of V_{OE}
Hysteresis offset voltage	V_{OM}	mV	-5		5	@V_C=3.3V, After ±I_{PN}
Accuracy @ I_{PN}	X	% of I_{PN}	-1		1	
Accuracy @ I_{PN}	X	% of I_{PN}	-2.5		2.5	@T_A=-40℃~105℃
Response time @ 90% of I_{PN}	t_r	μs		2.5		@C_L=1.0nF
Frequency bandwidth(-3dB)	BW	kHz		250		@C_L=1.0nF
Output noise	Vno	mV_{RMS}		1.3		@C_L=1.0nF

AN3V PB30 SERIES

Dimensions（in mm. 1 mm = 0.0394 inch）



Mechanical characteristics

✧	General tolerance	±0.3 mm
✧	Primary coil	Red copper with tin plating

Remarks

✧ When I_P flows in the direction of the arrow, V_{OUT} - $V_{REF} > 0$