

AN1V PB21

Current Sensor

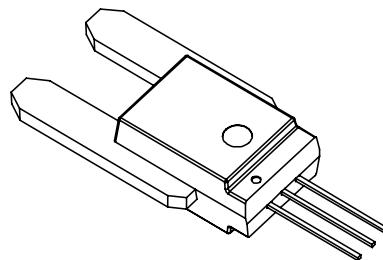
Model Number:

AN1V 50 PB21

AN1V 100 PB21

AN1V 150 PB21

AN1V 200 PB21



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 manufacturer's operating instructions.



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.

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Absolute maximum ratings(not operating)

| Parameter | Symbol | Unit | Value |
|------------------------------------|---------------------------|------|-------|
| Supply voltage | U_S | ± | |
| ESD rating, Human Body Model (HBM) | E_SD , n& | ± | |

- ※ 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 | u | °C | | | | AN1V 50 PB21 AN1V 100 PB21 AN1V 150 PB21 AN1V 200 PB21 |
| Ambient storage temperature | u_h | °C | | | | |
| Primary resistance value | j_g | Ω | | | | |
| Mass | \bar{U} | g | | | | |

Insulation coordination

| Parameter | Symbol | Unit | Value | Comment |
|---|--------|------|-------------------|--|
| Rms voltage for AC insulation test, @50Hz,1min | ± | √± | | According to A ! |
| Plastic case | | | yN ± | |
| Comparative tracking index | ! uA | gN! | | |
| Application example | | | ±j s _n | Reinforced insulation, according to A ! A ! ! ~ uIII, PD2 |
| Application example | | | ±j s _n | Basic insulation, according to A ! A ! ! ~ uIII, PD2 |

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Electrical data

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※ With $V_A = 25^\circ\text{C}$, $X_C = 5\text{V}$, $\bar{U}_L = 10\text{k}\Omega$, unless otherwise noted.

| Parameter | Symbol | Unit | Min | Typ | Max | Comment |
|--|--------------------------|------------------|------------------------|----------------|------------------------|---|
| Electrical data | | | | | | |
| Primary nominal rms current | A_T | - | | | | |
| Supply voltage | \bar{U}_S | \pm | | | | |
| Output voltage | \bar{U}_{ZU} | \pm | $\bar{U}_{ZU} \pm 1\%$ | \bar{U}_{ZU} | $\bar{U}_{ZU} \pm 1\%$ | |
| Electrical offset voltage | \bar{U}_{ZT} | \pm | | \bar{U}_{ZT} | | |
| Theoretical sensitivity | \bar{U}_G | mV/V | | | | |
| Current consumption | I_A | μA | | | | |
| Load resistance | R_N | $\text{k}\Omega$ | | | | |
| Load capacitor | C_L | nF | | | | |
| Power filter capacitor | C_F | nF | | | | |
| Performance data | | | | | | |
| Sensitivity error | \bar{U}_E | | | | | |
| Temperature of G | T_G | | | | | $u \quad {}^\circ\text{C} \quad {}^\circ\text{C}$ |
| Electrical offset current | \bar{U}_{ZL} | μA | | | | $\bar{U}_{ZL} \pm \text{also } A_T$ |
| Electrical offset error of temperature drift | $\bar{U}_{ZL} \bar{U}_T$ | μA | | | | $u \quad {}^\circ\text{C} \quad {}^\circ\text{C}$ |
| Hysteresis offset voltage | \bar{U}_{ZS} | \pm | | | | $\bar{U}_{ZS} \pm \text{after } A_T$ |
| Linearity error | E_N | mV | | | | Exclusive of \bar{U}_{ZL} |
| Accuracy A_T | ϵ | mV | | | | $u \quad {}^\circ\text{C} \quad {}^\circ\text{C}$ |
| Response time of A_T | t_R | ms | | | | $! \quad \text{ms}$ |
| Frequency bandwidth(-3dB) | f_{-3dB} | Hz | | | | $! \quad \text{Hz}$ |
| Output noise | \bar{U}_{UN} | μV | | | | $! \quad \text{Hz}$ |

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Electrical data

AN1V 100 PB21

※ With $V_A = 25$, $X_C = 5V$, $\bar{U}_L = 10k\Omega$, unless otherwise noted.

| Parameter | Symbol | Unit | Min | Typ | Max | Comment |
|--|----------------------|---------------|-----------------|-----------------|-----------------|---|
| Electrical data | | | | | | |
| Primary nominal rms current | A_T | - | | | | |
| Supply voltage | \bar{U}_1 | \pm | | | | |
| Output voltage | \bar{U}_{zyu} | \pm | \bar{U}_{zyu} | \bar{U}_{zst} | \bar{U}_{yGW} | \bar{U}_{AW} |
| Electrical offset voltage | \bar{U}_{zst} | \pm | | \bar{U}_{zst} | | |
| Theoretical sensitivity | \bar{U}_g | $\bar{U} \pm$ | | | | |
| Current consumption | A | \bar{U} | | | | |
| Load resistance | j_N | $k\Omega$ | | | | |
| Load capacitor | C_L | μF | | | | |
| Power filter capacitor | C_{PF} | μF | | | | |
| Performance data | | | | | | |
| Sensitivity error | ε | | | | | |
| Temperature of G | u_G | | | | | $u \quad {}^\circ C \quad {}^\circ C$ |
| Electrical offset current | \bar{U}_{zL} | $\bar{U} \pm$ | | | | $\bar{U}_{zL} \quad \pm \quad {}^\circ C \quad A_g$ |
| Electrical offset error of temperature drift | $u_{\bar{U}_{zL}}$ | $\bar{U} \pm$ | | | | $u \quad {}^\circ C \quad {}^\circ C$ |
| Hysteresis offset voltage | \bar{U}_{zs} | $\bar{U} \pm$ | | | | $\bar{U}_{zs} \quad \pm \quad \text{after } A_T$ |
| Linearity error | ε_N | $\bar{A} A_T$ | | | | Exclusive of \bar{U}_{zL} |
| Accuracy A_{gT} | ε | $\bar{A} A_T$ | | | | $u \quad {}^\circ C \quad {}^\circ C$ |
| Response time of A_T | t_R | μs | | | | $t_R \quad \mu s$ |
| Frequency bandwidth f_Z | f_Z | Hz | | | | $f_Z \quad Hz$ |
| Output noise | $\bar{U}_{\bar{U}a}$ | $\bar{U} \pm$ | | | | $\bar{U}_{\bar{U}a} \quad \bar{U} \pm$ |

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Electrical data

AN1V 150 PB21

※ With $V_A = 25$, $X_C = 5V$, $\ddot{U}_L = 10k\Omega$, unless otherwise noted.

| Parameter | Symbol | Unit | Min | Typ | Max | Comment |
|--|------------------|----------------|------------------|------------------|------------------|---|
| Electrical data | | | | | | |
| Primary nominal rms current | A_T | - | | | | |
| Supply voltage | \ddot{U}_1 | \pm | | | | |
| Output voltage | \ddot{U}_{zyu} | \pm | \ddot{U}_{zyu} | \ddot{U}_{izt} | \ddot{U}_{yew} | \ddot{U}_{AW} |
| Electrical offset voltage | \ddot{U}_{izt} | \pm | | \ddot{U}_{ii} | | |
| Theoretical sensitivity | \ddot{U}_{yc} | $\ddot{U} \pm$ | | | | |
| Current consumption | A | \ddot{U}^- | | | | |
| Load resistance | j_N | $k\Omega$ | | | | |
| Load capacitor | C | μF | | | | |
| Power filter capacitor | C_f | μF | | | | |
| Performance data | | | | | | |
| Sensitivity error | ϵ | | | | | |
| Temperature of G | u_G | | | | | $u \quad {}^\circ C \quad {}^\circ C$ |
| Electrical offset current | \ddot{U}_{iz} | $\ddot{U} \pm$ | | | | $\ddot{U}_{ii} \quad \pm$ also A_{iT} |
| Electrical offset error of temperature drift | u_{iz} | $\ddot{U} \pm$ | | | | $u \quad {}^\circ C \quad {}^\circ C$ |
| Hysteresis offset voltage | \ddot{U}_{zs} | $\ddot{U} \pm$ | | | | $\ddot{U}_{ii} \quad \pm$ after A_T |
| Linearity error | ϵ_N | $\pm A_T$ | | | | Exclusive of \ddot{U}_{iz} |
| Accuracy A_T | ϵ | $\pm A_T$ | | | | $u \quad {}^\circ C \quad {}^\circ C$ |
| Response time of A_T | τ_R | μs | | | | $! \quad \mu s$ |
| Frequency bandwidth(-3dB) | f_{-3dB} | Hz | | | | $! \quad Hz$ |
| Output noise | \ddot{U}_{oN} | $\ddot{U} \pm$ | | | | $! \quad \mu V$ |

AN1V PB21

Electrical data

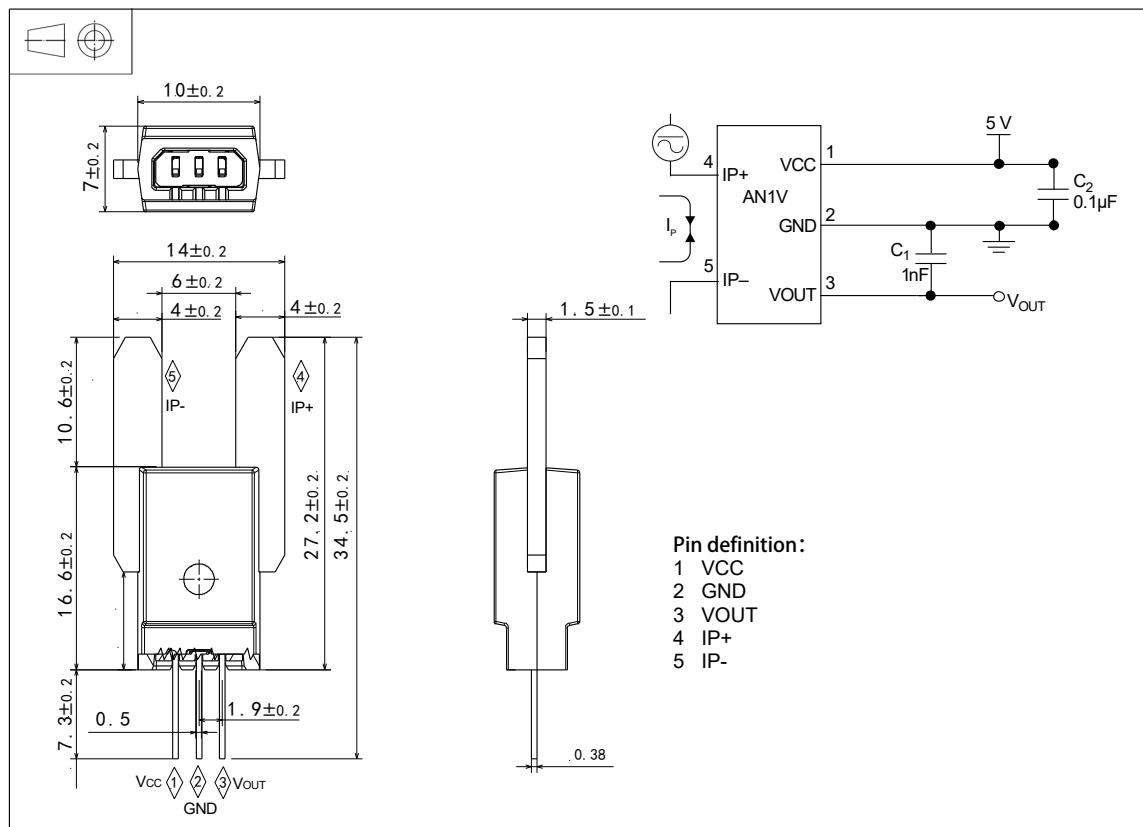
AN1V 200 PB21

※ With $V_A = 25$, $X_C = 5V$, $\bar{U}_L = 10k\Omega$, unless otherwise noted.

| Parameter | Symbol | Unit | Min | Typ | Max | Comment |
|--|-----------------|----------------------------|-------------------|-------------------|-----|---|
| Electrical data | | | | | | |
| Primary nominal rms current | A_T | - | | | | |
| Supply voltage | U_1 | \pm | | | | |
| Output voltage | U_{ZU} | \pm | $\pm 1.5 \pm 1\%$ | $\pm 1.5 \pm 1\%$ | | |
| Electrical offset voltage | U_{ZT} | \pm | | ± 1 | | |
| Theoretical sensitivity | ε | 0.1°C^{-1} | | | | |
| Current consumption | I_A | 0 | | | | |
| Load resistance | R_N | $k\Omega$ | | | | |
| Load capacitor | C_L | μF | | | | |
| Power filter capacitor | C_F | μF | | | | |
| Performance data | | | | | | |
| Sensitivity error | ε | | | | | |
| Temperature of G | U_G | | | | | $u \quad ^\circ\text{C} \quad ^\circ\text{C}$ |
| Electrical offset current | I_Z | $0 \pm$ | | | | $\pm 1 \quad \pm \text{also } A_T$ |
| Electrical offset error of temperature drift | U_{ZT} | $0 \pm$ | | | | $u \quad ^\circ\text{C} \quad ^\circ\text{C}$ |
| Hysteresis offset voltage | U_{ZS} | $0 \pm$ | | | | $\pm 1 \quad \pm \text{after } A_{gT}$ |
| Linearity error | ε_N | $\pm A_T$ | | | | Exclusive of I_Z |
| Accuracy A_T | ε | $\pm A_T$ | | | | $u \quad ^\circ\text{C} \quad ^\circ\text{C}$ |
| Response time@ 90% of I_{PN} | t_{90} | μs | | | | $! \quad \mu\text{s}$ |
| Frequency bandwidth(-3dB) | f_{-3dB} | Hz | | | | $! \quad \text{Hz}$ |
| Output noise | U_{Oa} | $0 \pm$ | | | | $! \quad \mu\text{V}$ |

AN1V PB21

Dimensions(Unit mm)



Mechanical characteristics

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

Remarks

- ◊ When Q flows in the direction of pin4 to pin5, Xout increase.