

Current sensor

Model Number:

HR1V 50 H01

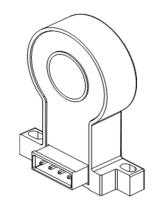
HR1V 100 H01

HR1V 200 H01

HR1V 300 H01

HR1V 400 H01

HR1V 500 H01







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

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 loss
- ♦ Small size
- ♦ Standards:

■ EN50178: 1997 ■ IEC 61010-1: 2000 ■ UL 508: 2010

Applications

- ♦ AC variable speed drives
- ♦ Uninterruptible Power Supplies (UPS)
- Static converters for DC motor drives
- Switch Mode Power Supplies (SMPS)
- ♦ Power supplies for welding applications
- ♦ Battery management
- ♦ Wind energy inverter

Safety

This sensor must be used according to IEC61010-1.

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	± 18
Primary conductor temperature	T _B	$^{\circ}\!\mathbb{C}$	100
ESD rating, Human Body Model (HBM)	V _{ESD}	kV	4

X Stresses above these ratings may cause permanent damage.

Environmental and mechanical characteristics

Parameter	Symbol	Unit	Min	Тур	Max	Comment
Ambient operating temperature	T _A	$^{\circ}$ C	-40		85	
Ambient storge temperature	T _s	$^{\circ}\!\mathbb{C}$	-40		125	
Mass	т	g		44		
Standards	EN 50178, IEC 61010-1, UL 508C					

Insulation coordination

Parameter	Symbol	Unit	Value	Comment
RmsvoltageforACinsulationtest	V_{d}	kV	2.5	
@ 50Hz,1min	Vd	N.V	2.5	
Plastic case	-	-	UL94-V0	
Comparative traking index	CTI	PLC	3	
Application everals	-	-	150V	Reinforced insulation,according to
Application example			CAT III PD2	EN 50178, EN 61010-1
Application evernle	-	-	300V	Basic insulation,according to
Application example			CAT III PD2	EN 50178, EN 61010-1

^{*} Exposure to absolute maximum ratings for extended periods may degrade reliability.



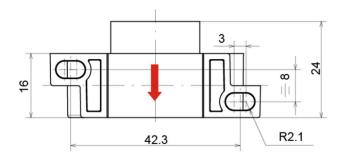
Electrical data

% With T_A = 25°C, V_C = ±15V, R_L = 10k Ω ,otherwise unless noted.

Primary nominal rms current Inn A	Parameter	Symbol	Unit	Min	Тур	Max	Comment
Primary nominal rms current I _{PN} A -200	Primany naminal rms current	I _{PN}	А	-50		50	HR1V 50 H01
Primary normal rms current Primary normal rms current Primary normal rms current Primary current, measuring range Primary current, measuring ran				-100		100	HR1V 100 H01
-300				-200		200	HR1V 200 H01
Primary current, measuring range I _{PM}	Timary nominarims current			-300		300	HR1V 300 H01
Primary current, measuring range I _{FM}				-400		400	HR1V 400 H01
Primary current, measuring range I _{PM}				-500		500	HR1V 500 H01
Primary current, measuring range I _{PM} A -400 -600 -600 -600 +600 +600 +600 +600 +6		,	А	-100		100	HR1V 50 H01
Primary current, measuring range Primary current, measuring range Primary current, measuring range Primary current, measuring range Primary current Primary curre				-200		200	HR1V 100 H01
Comparison Co	Primary current measuring range			-400		400	HR1V 200 H01
Supply voltage	Trimary danterit, moderning range	Г РМ		-600		600	HR1V 300 H01
Supply voltage				-800		800	HR1V 400 H01
Current consumption Ic mA 27 Load resistance R _L kΩ 10 Output voltage (Analog)@ I _{PN} V _{OUT} V ± 4.950 ± 5.050 Electrical offset voltage V _{OE} mV -20 20 Temperature coefficient of V _{OE} TCV _{OE} mV/K -1.5 1.5 HRIV 50 H01 HRIV 50 H01 HRIV 50 H01 HRIV 100 -500 H01 HRIV 200 H01 HRIV 200 H01 HRIV 200 H01 HRIV 300 H01 HRIV 300 H01 HRIV 400 H01 HRIV 400 H01 HRIV 50 H01 HRIV 50 H01 HRIV 50 H01 HRIV 500 H01 HRIV 50 H01 Temperature of G TCG mV/K -1.5 1.5 HRIV 50 H01 Temperature of G TCG mV/K -1.5 1.5 HRIV 50 H01 Linearity error 0I _{PN} E _L % of I _{PN} -1 1 Exclusive of V _{OE} Hysteresis offset voltage@ I _P =0 after 1 × I _{PN} V _{OM} mV -20 20 Response time@ 90% of I _{PN} tr μs 5				-900		900	HR1V 500 H01
Load resistance R_L KΩ 10	Supply voltage	V c	V	± 12		± 15	@ 5%
Output voltage (Analog)@ I _{PN} V _{Out} V ± 4.950 ± 5.050 Electrical offset voltage V _{OE} mV -20 20 Temperature coefficient of V _{OE} TCV _{OE} mV/K -1.5 1.5 HRIV 50 H01 HRIV 50 H01 HRIV 100-500 H01 HRIV 200 H01 HRIV 200 H01 HRIV 200 H01 HRIV 200 H01 HRIV 300 H01 HRIV 400 H01 HRIV 500 H01 Sensitivity error E _G % -0.5 0.5 Exclusive of V _{OE} Temperature of G TCG mV/K -1.5 1.5 HRIV 50 H01 Linearity error 0I _{PN} E _L % of I _{PN} -1 1 Exclusive of V _{OE} Hysteresis offset voltage@ I _P =0 siter 1 × I _{PN} V _{OM} mV -20 20 20	Current consumption	<i>I</i> c	mA		27		
Electrical offset voltage V_{OE} mV -20 20 Temperature coefficient of V_{OE} TCV_{OE} mV/K -1.5 1.5 HRIV 50 H01 HRIV 100-500 H01 HRIV 50 H01 HRIV 50 H01 HRIV 200 H01 HRIV 200 H01 HRIV 300 H01 HRIV 300 H01 HRIV 400 H01 HRIV 500 H01 Sensitivity error \mathcal{E}_G % -0.5 0.5 Exclusive of V_{OE} Temperature of G TCG mV/K -1.5 1.5 HRIV 50 H01 Linearity error 0 I_{PN} \mathcal{E}_L % of I_{PN} -1 1 Exclusive of V_{OE} Hysteresis offset voltage@ $I_P = 0$ after 1 × I_{PN} V_{OM} mV -20 20 Response time@ 90% of I_{PN} I_r μs 5	Load resistance	R_{L}	kΩ	10			
Temperature coefficient of V _{OE} TCV _{OE} TCCG TCCCC	Output voltage (Analog)@ I _{PN}	$V_{ ext{OUT}}$	٧	± 4.950	± 5.000	± 5.050	
Temperature coefficient of V _{OE}	Electrical offset voltage	V_{OE}	mV	-20		20	
Theoretical sensitivity Gh Theoretical sensitivity Gh Theoretical sensitivity Gh Theoretical sensitivity Gh Theoretical sensitivity Theoretical sensitivity Gh Theoretical sensitivity	Tomporature coefficient of \/	TCV _{OE}	mV/K	-1.5		1.5	HR1V 50 H01
Theoretical sensitivity G_{th} W/A S_{th} W/A S_{th} S_{\text	remperature coefficient or v_{OE}			-1		1	HR1V 100-500 H01
Theoretical sensitivity G_{th} mV/A 16.67 16.67 $HRIV 200 H01$ $HRIV 300 H01$ $HRIV 500 H01$ $HRIV 50 H01$ $HRIV 50 H01$ $HRIV 100-500 H01$ $HRIV 100-500 H01$ $HRIV 100-500 H01$ $HRIV 100-500 H01$ HV HV HV HV HV HV HV HV		$G_{ m th}$	mV/A		100.0		HR1V 50 H01
Theoretical sensitivity G_{th} mV/A 16.67 12.5 16.67 12.5 10.0					50.0		HR1V 100 H01
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Theoretical sensitivity				25.0		HR1V 200 H01
Sensitivity error \mathcal{E}_{G} % -0.5 0.5 Exclusive of V_{OE} Temperature of G TCG mV/K -1.5 1.5 HR1V 50 H01 Linearity error 0 I_{PN} \mathcal{E}_{L} % of I_{PN} -1 1 Exclusive of V_{OE} Hysteresis offset voltage@ I_{P} =0 after 1 × I_{PN} V_{OM} mV -20 20 Response time@ 90% of I_{PN} t_{r} μ s 5	Theoretical sensitivity				16.67		HR1V 300 H01
Sensitivity error \mathcal{E}_{G} % -0.5 0.5 Exclusive of V_{OE} Temperature of G TCG mV/K -1.5 1.5 $HR1V$ 50 H01 Linearity error 0 I_{PN} \mathcal{E}_{L} % of I_{PN} -1 1 Exclusive of V_{OE} Hysteresis offset voltage@ I_{P} =0 after 1 × I_{PN} V_{OM} mV -20 20 Response time@ 90% of I_{PN} I_{r} μ s 5					12.5		HR1V 400 H01
Temperature of G TCG mV/K -1.5 1.5 $HR1V 50 H01$ $HR1V 100-500 H01$ 1 $HR1V 100-500 H01$ 1 1 1 1 1 1 1 1 1					10.0		HR1V 500 H01
Temperature of G TCG mV/K -1 1 $HR1V 100-500 H01$ Linearity error $0I_{PN}$ \mathcal{E}_L % of I_{PN} -1 1 Exclusive of V_{0E} Hysteresis offset voltage@ $I_{P}=0$ after $1 \times I_{PN}$ V_{0M} mV -20 20 Response time@ 90% of I_{PN} t_r μs 5	Sensitivity error	$\mathcal{E}_{\scriptscriptstyle{G}}$	%	-0.5		0.5	Exclusive of V_{0E}
Linearity error 0 I_{PN} \mathcal{E}_L % of I_{PN} -1 1 Exclusive of V_{0E} Hysteresis offset voltage@ I_{P} =0 after 1 × I_{PN} V_{0M} mV -20 20 Response time@ 90% of I_{PN} t_r μ s 5	Temperature of G	TCG	mV/K	-1.5		1.5	HR1V 50 H01
Hysteresis offset voltage @ I_P =0 after 1 × I_{PN} V_{OM} mV -20 20 Response time @ 90% of I_{PN} t_r μs 5				-1		1	HR1V 100-500 H01
Response time@ 90% of I _{PN} t _r μs 5	Linearity error 0/PN	\mathcal{E}_{L}	% of I _{PN}	-1		1	Exclusive of V_{0E}
	Hysteresis offset voltage \bigcirc $I_P = 0$ after 1 \times I_{PN}	V _{OM}	mV	-20		20	
Frequency bandwidth(-1dB) BW kHz 20	Response time@ 90% of I _{PN}	t _r	μs			5	
	Frequency bandwidth(-1dB)	BW	kHz	20			



Dimensions (in mm. 1 mm = 0.0394 inch)



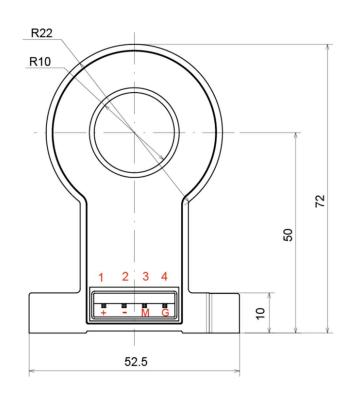
Pin definition

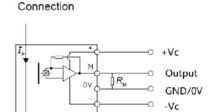
1: +Vc

2: -Vc

3: M

4: 0V





Mechanical characteristics

♦ General tolerance

±1mm

Connection of secondary

JK2EDG-5.08-4P

 \diamond

♦ Primary hole

Ф20mm

♦ Sensor

2рс Ф4.0 mm through hole 2рс M4 metal screws

Recommended fastening torque

2.1 N·m (±10%)

Remarks

- v_{OUT} and I_P are in the same direction, when I_P flows in the direction of arrow.
- ♦ Temperature of the primary conductor should not exceed 100°C.
- Dynamic performances (di/dt and response time)are best with a single bar completely filling the primary hole.

This is a standard model. For different applications (measurement, secondary connections...), please contact CHIPSENSE.

 Doc Ref.: 1800 000 00981
 08/08/2023
 www.chipsensor.cn