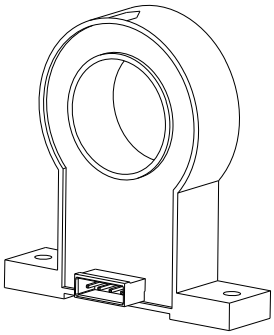
FR5V H00 SERIES

Current Sensor

Model Number:

FR5V 0.01 H00
FR5V 0.02 H00
FR5V 0.05 H00
FR5V 0.10 H00



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

Features

- Current sensor based on fluxgate technology
- Output Voltage
- Insulating plastic case recognized according to UL 94-V0（Black）
- High linearity
- Very low zero temperature drift
- Standards:
  - IEC 60664-1:2020
  - IEC 61800-5-1:2022
  - IEC 62109-1:2010

Applications

- Residual current measurement
- Photovoltaic inverter (no transformer type) leakage current measurement
- Leakage protection of photovoltaic arrays
- Detects leakage of stacked DC power supplies
- Wide range of single or three phase current detection (DC or AC, up to ±100A)
- Failure mode detection of current sources
- Symmetrical fault detection (e.g. at inverter output)

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	±18
Primary conductor temperature	T_B	℃	100

※ 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	℃	-10		70	
Ambient storage temperature	T_S	℃	-40		70	
Mass	m	g		TBD		

Insulation coordination

Parameter	Symbol	Unit	Value	Comment
Rms voltage for AC insulation test @50Hz,1min	V_d	kV	3.6	
Clearance(Pri.-sec.)	d_{Cl}	mm	8.5	
Creepage distance(Pri.-sec.)	d_{Cp}	mm	8.5	
Plastic case	-	-	UL94-V0	
Comparative traking index	*CTI*	PLC	3	
Application example	-	-	300V	Reinforced insulation,according to IEC 61800-5-1, IEC 62109-1CAT Ⅲ, PD2
Application example	-	-	600V	Basic insulation,according to IEC 61800-5-1, IEC 62109-1CAT Ⅲ, PD2

Electrical data

FR5V 0.01 H00

※ With T_A = 25℃, V_C = ±15V,unless otherwise noted. Output voltage reference R_L=10kΩ.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal residual current effective value	I_{PN}	mA		±10		
Primary residual current measuring range	I_{PM}	mA	-15		15	
Supply voltage	V_C	V	±12		±15	@5%
Current consumption	I_C	mA			20	@ I_{PN}=0A
Nominal output voltage	V_{OUT}	V		±5		
Measuring resistance	R_L	kΩ	2			
Resolution ratio	R_{ES}	μA		10		
Theoretical sensitivity	G_{th}	V/A		500		@-10℃~70℃
Temperature of G	TCG	mV/k		±1.5		
Electrical offset voltage	V_{OE}	mV	-50	±20	50	
Temperature coefficient of V_{OE}@I_P = 0	TCV_{OE}	mV/k		±1.5		@-10℃~70℃
Linearity error 0…I_{PN}	ε_L	%	-1	±0.5	1	
Accuracy@ I_{PN}	X	%	-1	±0.5	1	
Response time@ 90% of I_{PN}	t_r	ms		500		
Frequency bandwidth	BW	kHz		DC		

Electrical data

FR5V 0.02 H00

※ With T_A = 25℃, V_C = ±15V,unless otherwise noted. Output voltage reference R_L=10kΩ.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal residual current effective value	I_{PN}	mA		±20		
Primary residual current measuring range	I_{PM}	mA	-30		30	
Supply voltage	V_C	V	±12		±15	@5%
Current consumption	I_C	mA			20	@ I_{PN}=0A
Nominal output voltage	V_{OUT}	V		±5		
Measuring resistance	R_L	kΩ	2			
Resolution ratio	R_{ES}	μA		20		
Theoretical sensitivity	G_{th}	V/A		250		@-10℃~70℃
Temperature of G	TCG	mV/k		±1.5		
Electrical offset voltage	V_{OE}	mV	-50	±20	50	
Temperature coefficient of V_{OE}@I_P = 0	TCV_{OE}	mV/k		±1.5		@-10℃~70℃
Linearity error 0…I_{PN}	ε_L	%	-1	±0.5	1	
Accuracy@ I_{PN}	X	%	-1	±0.5	1	
Response time@ 90% of I_{PN}	t_r	ms		500		
Frequency bandwidth	BW	kHz		DC		

Electrical data

FR5V 0.05 H00

※ With T_A = 25℃, V_C = ±15V,unless otherwise noted. Output voltage reference R_L=10kΩ.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal residual current effective value	I_{PN}	mA		±50		
Primary residual current measuring range	I_{PM}	mA	-75		75	
Supply voltage	V_C	V	±12		±15	@5%
Current consumption	I_C	mA			20	@ I_{PN}=0A
Nominal output voltage	V_{OUT}	V		±5		
Measuring resistance	R_L	kΩ	2	2		
Resolution ratio	R_{ES}	μA		50		
Theoretical sensitivity	G_{th}	V/A		100		@-10℃~70℃
Temperature of G	TCG	mV/k		±1.5		
Electrical offset voltage	V_{OE}	mV	-50	±20	50	
Temperature coefficient of V_{OE}@I_P = 0	TCV_{OE}	mV/k		±1.5		@-10℃~70℃
Linearity error 0…I_{PN}	ε_L	%	-1	±0.5	1	
Accuracy@ I_{PN}	X	%	-1	±0.5	1	
Response time@ 90% of I_{PN}	t_r	ms		500		
Frequency bandwidth	BW	kHz		DC		

Electrical data

FR5V 0.1 H00

※ With T_A = 25℃, V_C = ±15V,unless otherwise noted. Output voltage reference R_L=10kΩ.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal residual current effective value	I_{PN}	mA		±100		
Primary residual current measuring range	I_{PM}	mA	-150		150	
Supply voltage	V_C	V	±12		±15	@5%
Current consumption	I_C	mA			20	@ I_{PN}=0A
Nominal output voltage	V_{OUT}	V		±5		
Measuring resistance	R_L	kΩ	2			
Resolution ratio	R_{ES}	μA		100		
Theoretical sensitivity	G_{th}	V/A		50		@-10℃~70℃
Temperature of G	TCG	mV/k		±1.5		
Electrical offset voltage	V_{OE}	mV	-50	±20	50	
Temperature coefficient of V_{OE}@I_P = 0	TCV_{OE}	mV/k		±1.5		@-10℃~70℃
Linearity error 0…I_{PN}	ε_L	%	-1	±0.5	1	
Accuracy@ I_{PN}	X	%	-1	±0.5	1	
Response time@ 90% of I_{PN}	t_r	ms		500		
Frequency bandwidth	BW	kHz		DC		

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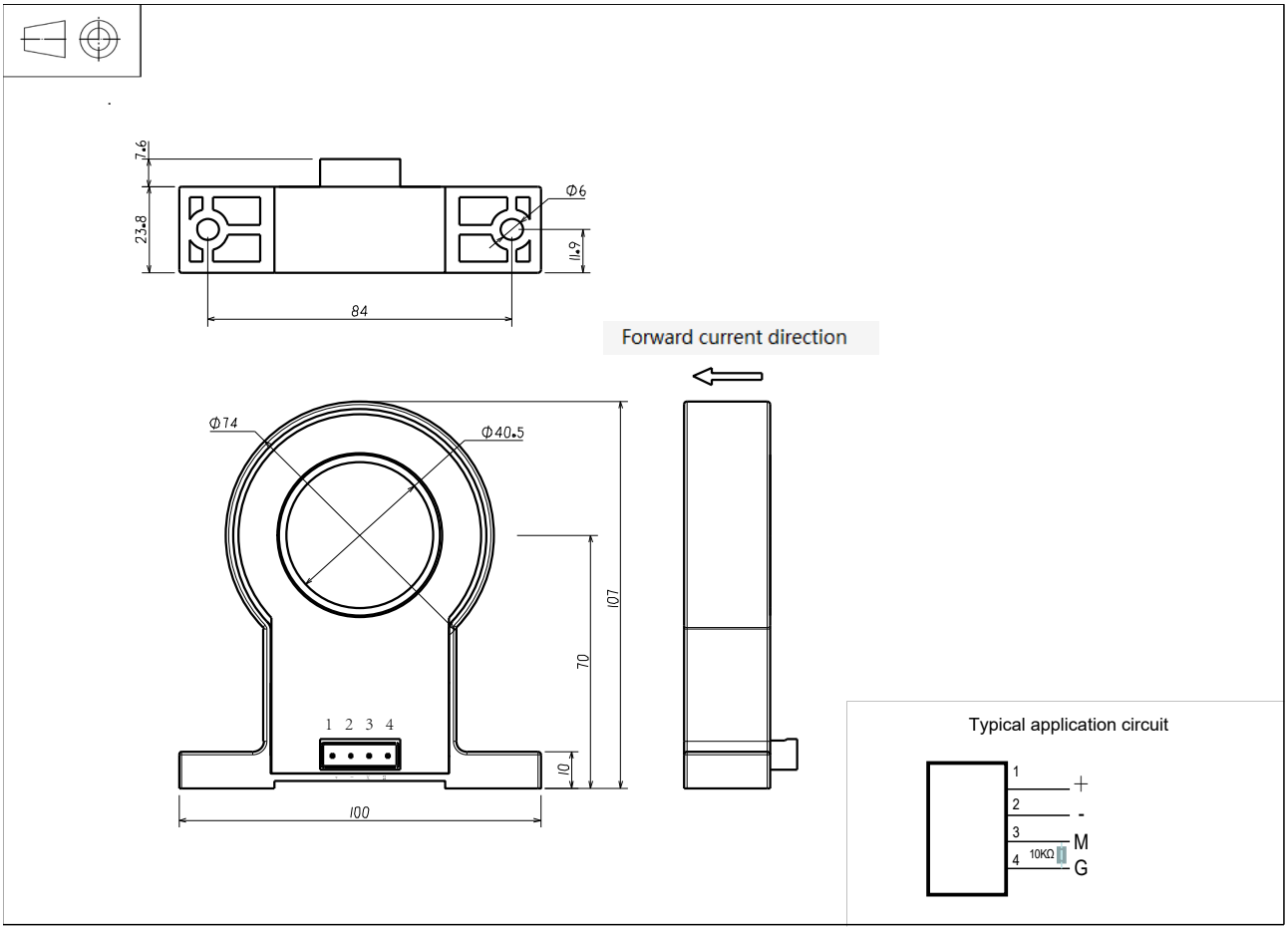
Dimensions（in mm. 1 mm = 0.0394 inch）



Mechanical characteristic

✧ General tolerance	±0.3mm
✧ Connection of secondary	JK2EDG-5.08-4P
✧ Primary hole	Φ40.5mm
✧ Sensor	2pc Φ6.0 mm through hole 2pc M6 metal screws
Recommended fastening torque	1.8 N•m (±10%)

Remarks

✧ When I_P flows in the direction of the arrow, V_{OUT} increase.

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