

BRCM01C

AC/DC Residual Current Monitor for Charging Equipment of Electric Vehicles

- DC 6mA (IEC 62955)
- Type A 30mA and DC 6mA (IEC 62752; IEC61008-1/IEC60947-2-(M) + IEC 62955)



- 12V DC interfaces facilitating compatible integration to EV charging controllers
- Two fault signal pins for solely DC 6mA and Type-A 30mA +DC 6mA alarming
- Cost-effective solution of built-in residual current device for AC EV charger
- Fast response time facilitating a broad selection of switching devices
- Compact design with 17mm through-hole for charging cable up to 3P+N 32A

Technical Specification

#	Technical Specification	BRCM01C-12-H1
101	Rated operating voltage in monitoring circuit	230/400VAC
102	Rated current in monitoring circuit	$\leq 32A$
103	Poles in monitoring circuit	1P+N / 3P+N
104	Frequency in monitoring circuit	50Hz
105	Rated impulse withstand voltage in monitoring circuit	6kV
106	Over-voltage category in monitoring circuit	III
201	Rated operating voltage in control circuit, Vcc	12VDC \pm 20%
202	Power consumption	<500mW
203	Pin 1	GND
204	Pin 2	+12VDC
205	Pin 3	Test
206	Pin 4	DC fault signal
207	Pin 5	AC&DC fault signal
208	Pin 6	-
301	Rated DC residual operating current $I_{\Delta dc}$	6mA
302	Rated DC residual non-operating current $I_{\Delta ndc}$	3mA
303	Rated AC residual operating current $I_{\Delta n}$	30mA
304	Rated AC residual non-operating current $I_{\Delta nc}$	15mA
305	Electrical endurance	20,000
306	Rated operating temperature	-40~85 °C
307	Pollution degree	2

Residual Current Detection Characteristics

Operating Current

#	Description	AC&DC fault signal	DC fault signal
401	Operating current for smooth DC	4.0~6.0 mA	4.0~6.0 mA
402	Operating current for DC rectified from 2 phases	4.0~7.0 mA	4.0~7.0 mA
403	Operating current for DC rectified from 3 phases	4.0~6.2 mA	4.0~6.2 mA
404	Operating current for sinewave AC	22.0~28.0 mA	-
405	Operating current for A0 pulsating DC	10.5~42.0 mA	-
406	Operating current for A90 pulsating DC	7.5~42.0 mA	-
407	Operating current for A135 pulsating DC	3.3~42.0 mA	-

Operating Time

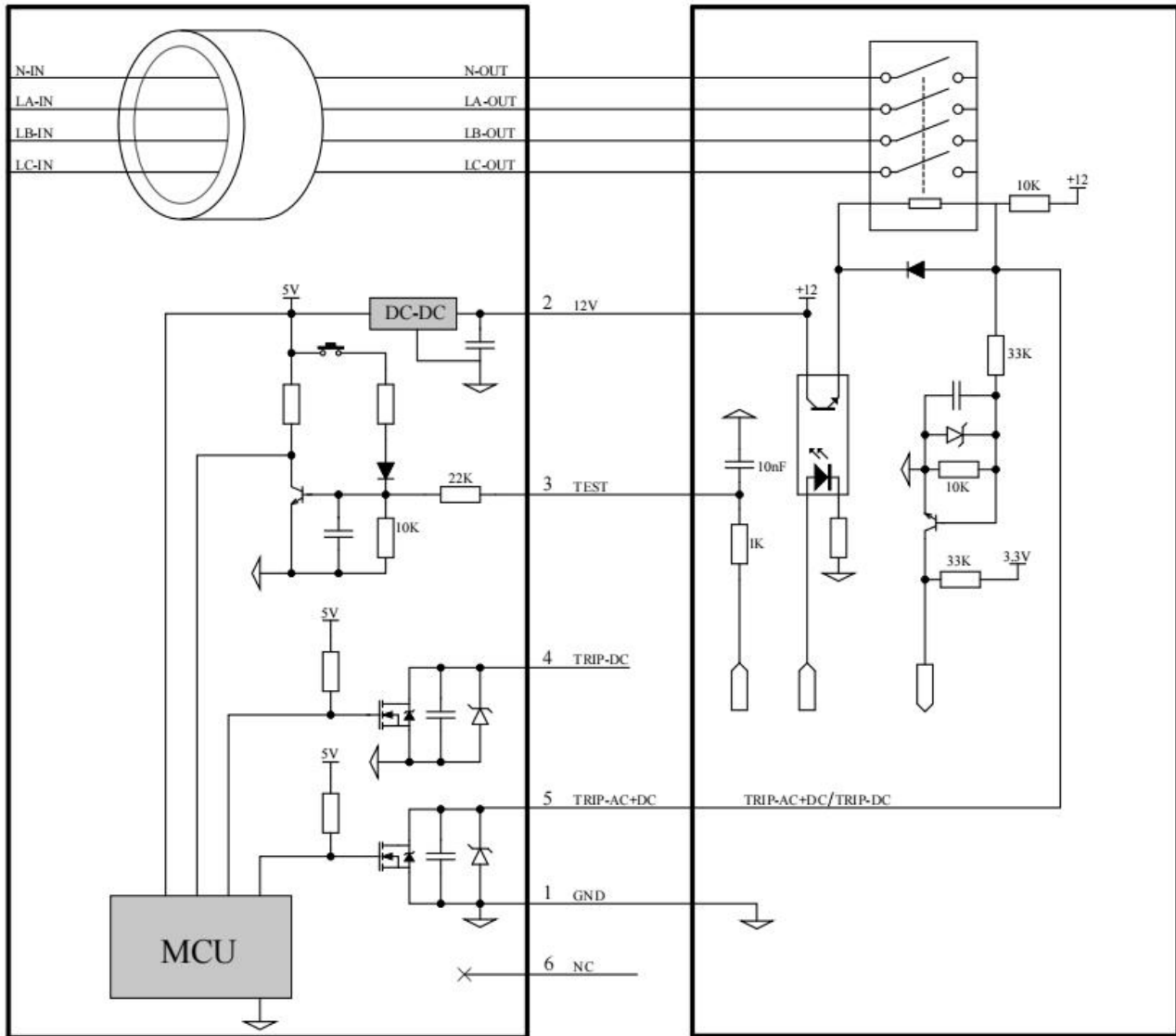
#	Description	AC&DC fault signal	DC fault signal
501	Response time for 6mA smooth DC residual current	≤ 500 ms	≤ 500 ms
502	Response time for 60mA smooth DC residual current	≤ 200 ms	≤ 200 ms
503	Response time for 200mA smooth DC residual current	≤ 70 ms	≤ 70 ms
504	Response time for 300mA smooth DC residual current	≤ 20 ms	-
505	Response time for 60mA DC rectified from 2 phases	≤ 200 ms	≤ 200 ms
506	Response time for 200mA DC rectified from 2 phases	≤ 70 ms	≤ 70 ms
507	Response time for 300mA DC rectified from 2 phases	≤ 20 ms	-
508	Response time for 60mA DC rectified from 3 phases	≤ 200 ms	≤ 200 ms
509	Response time for 200mA DC rectified from 3 phases	≤ 70 ms	≤ 70 ms
510	Response time for 300mA DC rectified from 3 phases	≤ 20 ms	-
511	Response time for 30mA AC residual current	≤ 80 ms	> 10000 ms
512	Response time for 60mA AC residual current	≤ 60 ms	> 300 ms
513	Response time for 150mA AC residual current	≤ 20 ms	> 80 ms
514	Response time for 5A AC residual current	≤ 20 ms	> 80 ms

Application Notes

Typical application diagram

BRCM01C 12V version

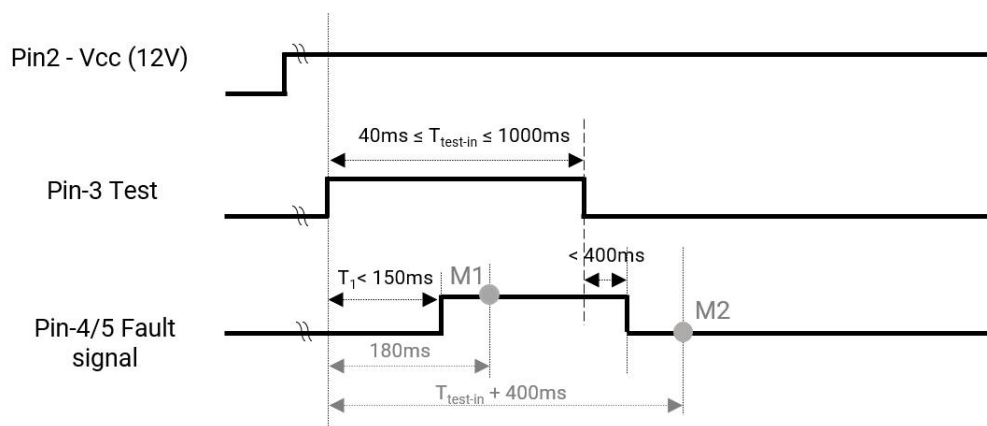
EV charging controller



Additional information

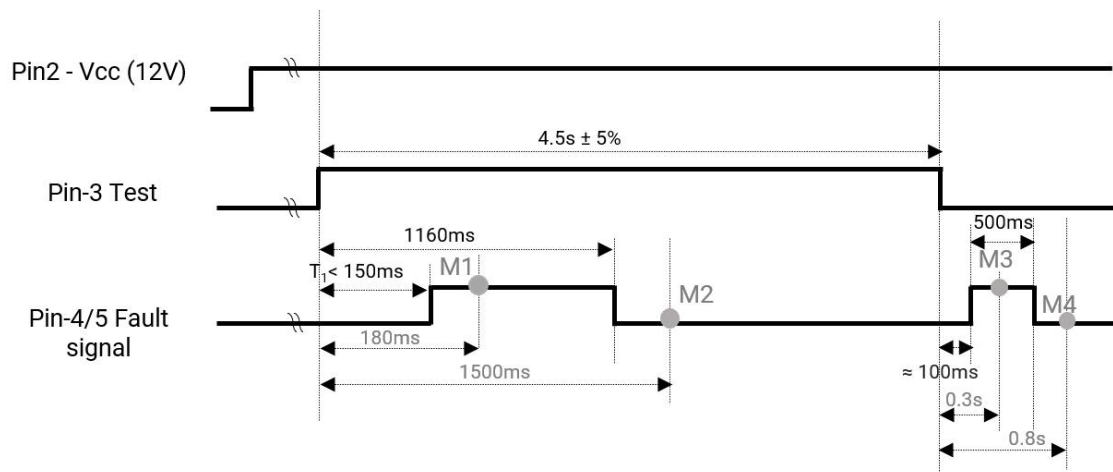
- **Attention:** A Mosfet is built in the 12V DC sensor to switch the connection to signal V- as normal using. The maximum switching current of the 12V DC sensor is 500mA.
- **Attention:** Pin 6 is only for internal use by the sensor. It shall be kept floating (not connected).

Self-test time chart



A self-test excluding offset calibration is activated if Pin 3 - Test is connected to a high level for a period of 40ms to 1000ms. t_1 is the response time for internally generated test current.

Offset calibration time chart



An offset calibration is activated if Pin 3 - Test is connected to a high level for a period of $4.5\text{s} \pm 5\%$. An offset calibration can be activated at regular intervals (such as startup) or after the occur of certain critical events (such as short circuit).

Attention: During the offset calibration, NO leakage current or any other current may flow through the sensor and the switching devices must be open. Also, the power supply voltage at Pin 2 Vcc must be stay at $12\text{VDC} \pm 20\%$

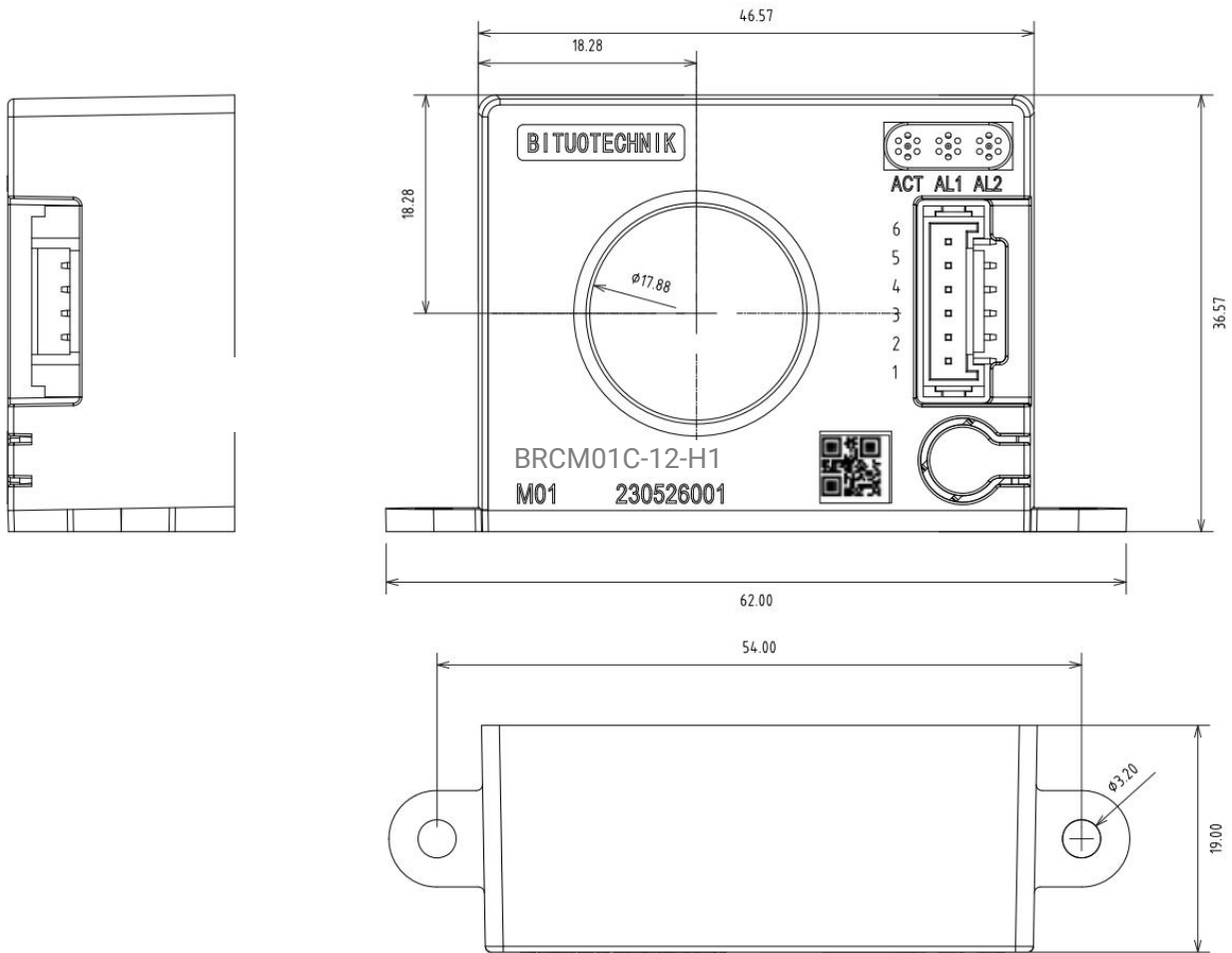
Possible Output States

Status	PIN 4 Output (DC Trip)	PIN 5 Output (AC & DC Trip)
Normal condition	GND	GND
$I_{\Delta} \geq 6 \text{ mA DC}$	High impedance	High impedance
$I_{\Delta} \geq 30 \text{ mA AC}$	GND ¹⁾	High impedance
$I_{\Delta} \geq 30 \text{ mA AC} \ \& \ I_{\Delta} \geq 6 \text{ mA DC}$	High impedance	High impedance

A change from GND to High impedance is allowed, as long as such a change is compliant with IEC 62955.

Mechanical outline

BRCM01C-12-H1:



	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6
BRCM01C-12-H1	GND	+12V DC	TEST	DC Trip	AC & DC Trip	NC

Ordering information

#	Order Number	Description
1	BRCM01C-12-H1	BRCM01C Residual Current Sensor 12V DC Interface, Hanging around main cable (Flexible) Type A 30 mA+DC6mA / DC6mA, 32A, 1P+N / 3P+N HY 2.0 -6 pin

Additional Notes

- Do NOT allow strong static electricity near the sensor, because static electricity can cause damage to the ICs inside the sensor. Take static electricity precautions when handling.
- Do NOT drop the sensor or apply any other mechanical stress to the sensor, as such stresses may change performance characteristics.
- Please place the sensor with an appropriate distance from components that can generate high magnetic fields, such as relays or contactors, to ensure accurate residual current detection.
- Please refer to the product standards of RCD/RDC-DD (Residual Current Device / Residual Direct Current Detection Device) , when designing built-in RCD/RDC-DD for mode-2/3 Electric Vehicle Supply Equipment with the sensor.



The sensor is susceptible to be damaged from an ESD event and the personnel should be grounded when handling it.

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