

BRCS02C

Two-in-one Current Sensor (AC/DC residual current + charging current)
for Charging Equipment of Electric Vehicle
(IEC 62955 / IEC 62752)



- Simplified interface for built-in RCD / RDC-DD design at Mode-2/3 EV Chargers
- Built-in current transformer for charging current measurement within 1% tolerance
- Fast residual current detection facilitates broad selection of switching devices
- Cost-effective solution of residual current detection for charging system of Electric Vehicles
- The low height and small footprint help the design of compact Mode-2/3 EV Chargers

Technical Specification Part (1) - residual current sensor

#	Technical Specification	BRCS02C
101	Rated operating voltage in monitoring circuit	230VAC
102	Rated current in monitoring circuit	$\leq 32A$
103	Poles in monitoring circuit	1P+N
104	Frequency in monitoring circuit	50Hz
105	Rated impulse withstand voltage in monitoring circuit	4kV
106	Over-voltage category in monitoring circuit	III
201	Pins used for residual current detection	Vcc, TRIP, GND, CAL, TEST
202	Pins used for charging current measurement	S1, S2
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
308	Power consumption	<500mW

Technical Specification Part (2) - current sensor

#	Technical specification for current transformer	BRCS02C
401	Basic current I_b / Max current I_{max}	16A / 32A
402	Rated output at rated current	16mA
403	Rated transformation ratio	1000/1
404	Max. primary current ($R_L=2ohm$)	40A
405	Saturation voltage @ $R_L=15ohm$	0.6V
406	Insulation voltage	3kV
407	Tolerance	1%
408	Preferred load R_L / Maximal load R_L	2ohm / 15ohm

Residual Current Detection Characteristics

Operating Current

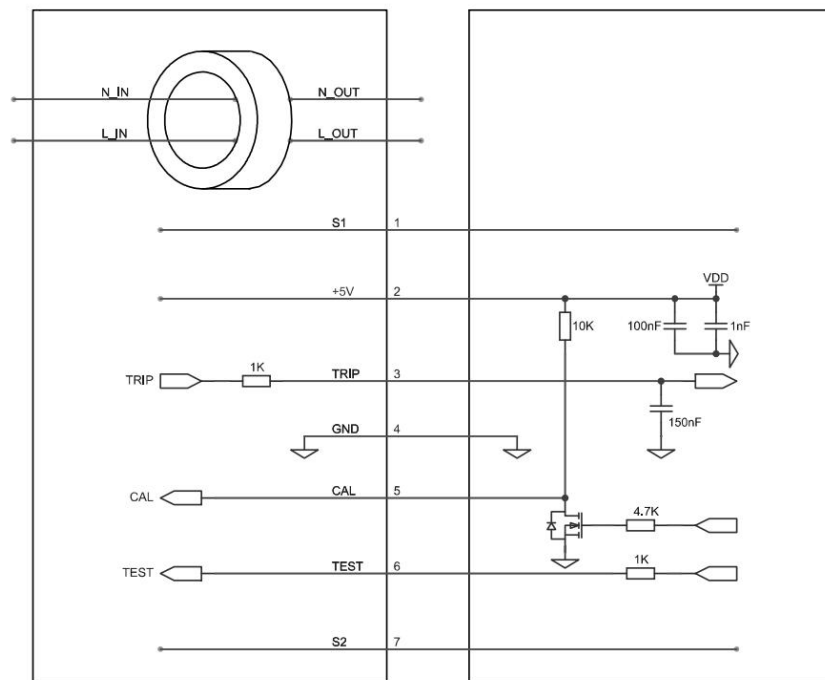
#	Description	BRCS02C
501	Operating current for smooth DC	4.0~6.0 mA
502	Operating current for sinewave AC	22.0~28.0 mA
503	Operating current for A0 pulsating DC	10.5~42.0 mA
504	Operating current for A90 pulsating DC	7.5~42.0 mA
505	Operating current for A135 pulsating DC	3.3~42.0 mA

Operating Time

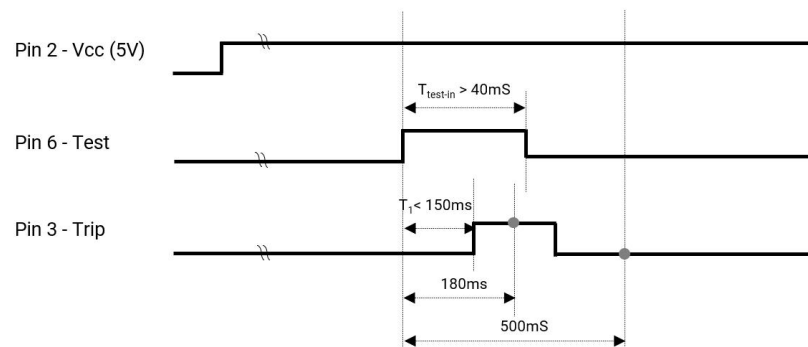
#	Description	BRCS02C
601	Response time for 6mA smooth DC residual current	≤ 500 ms
602	Response time for 60mA smooth DC residual current	≤ 200 ms
603	Response time for 200mA smooth DC residual current	≤ 70 ms
604	Response time for 300mA smooth DC residual current	≤ 20 ms
605	Response time for 30mA AC residual current	≤ 80 ms
606	Response time for 60mA AC residual current	≤ 60 ms
607	Response time for 150mA AC residual current	≤ 20 ms
608	Response time for 5A AC residual current	≤ 20 ms

Application Notes - BRCS02C Integration Example

Typical application diagram

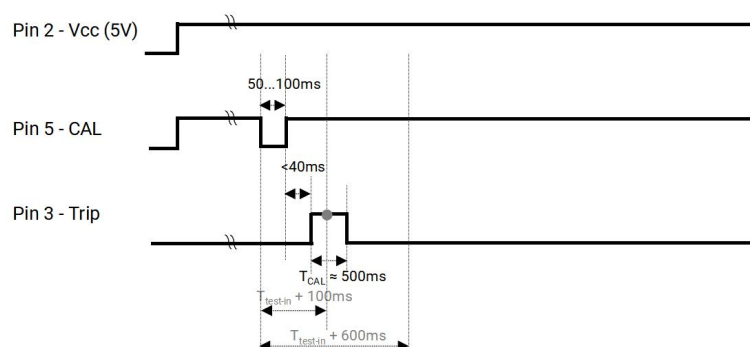


Self-test time chart



A self-test is activated if Pin 6 - Test is connected to a high level for a period above 40ms. t_1 is the response time for internally generated test current.

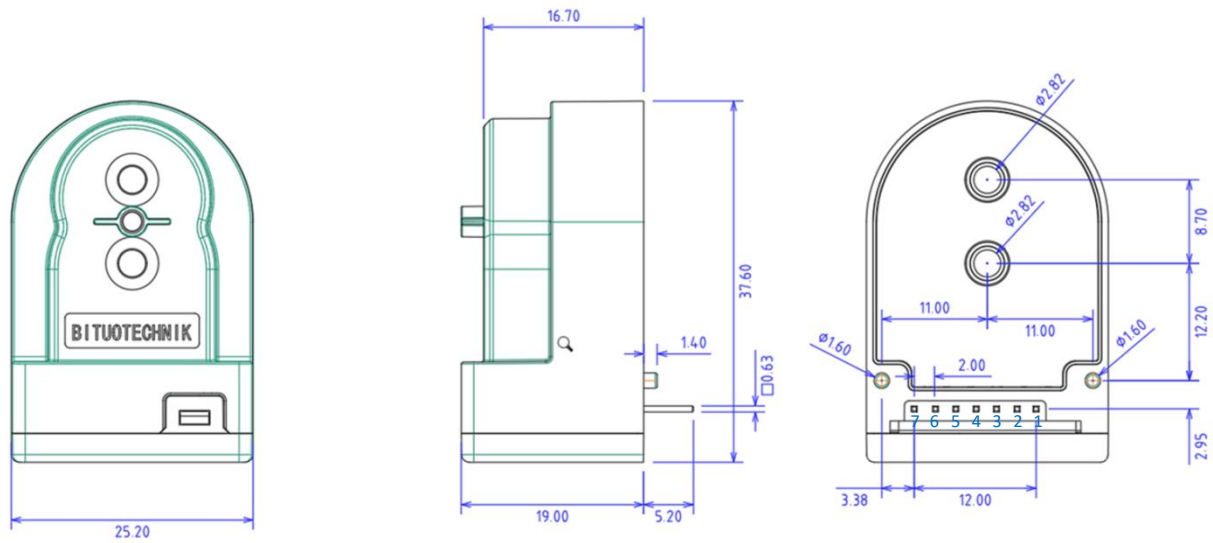
Offset calibration



An offset calibration is activated if Pin 5 - CAL is connected to GND for a period of 50ms..100ms. An offset calibration can be activated at regular intervals (such as startup) or after the occur of certain critical events (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 5VDC $\pm$ 3%.

Mechanical outline (BRCS02C, mm)



Pin 1 - Current transformer output S1 ; Pin 7 - Current transformer output S2

Pin 2 – Vcc; Pin 3 – Fault; Pin 4 - GND; Pin 5 – CAL; Pin 6 – Test

Ordering Information

#	Order Number	Description
1	BRCS02C-ADC-L	BRCS02C Two-in-one Sensor A30+DC6mA, PCB-mounting, 7 Pin, Pitch=2.00 mm

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 exceed 260°C for 10 seconds when soldering the sensors of PCB-mounting versions. This is the maximum heat resistance grade of these sensors.
- Do NOT solder the sensors with the central isolation cross installed. The central isolation cross can be installed after soldering the sensors.
- 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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