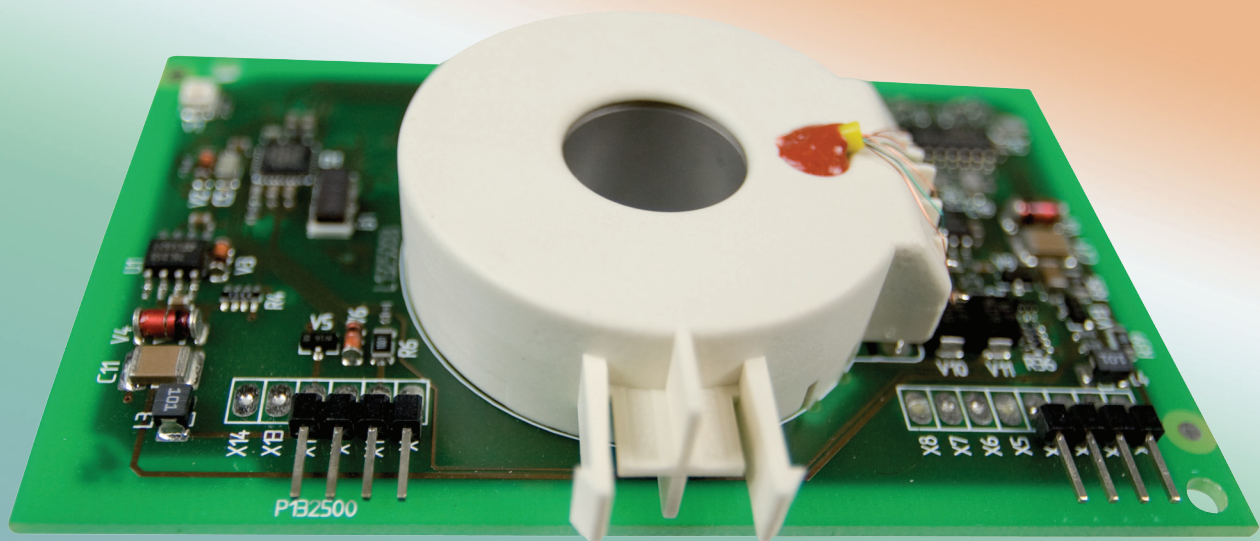


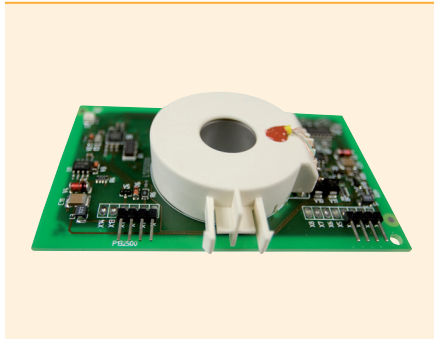
RCMB101

CCID-20 / AC/DC Ground Fault Monitoring Module
For Level 1 and 2 Electric Vehicle (EV) Chargers



RCMB101

CCID-20 AC/DC Ground Fault Monitoring Module For Level 1 and 2 Electric Vehicle (EV) Chargers



RCMB101

Features

- Detects both AC and DC ground fault current
- Designed for integration into level 1 and level 2 electric vehicle chargers
- UL recognized under UL2231-2
- Small, PCB-style form factor
- True RMS reading (AC + DC)
- Frequency range 0...500 Hz
- 0...20 mA measuring range
- Analog voltage output
- CT connection monitoring
- Built-in current transformer with test winding and screening for electrical interference reduction
- RoHS-compliant

Approvals



Description

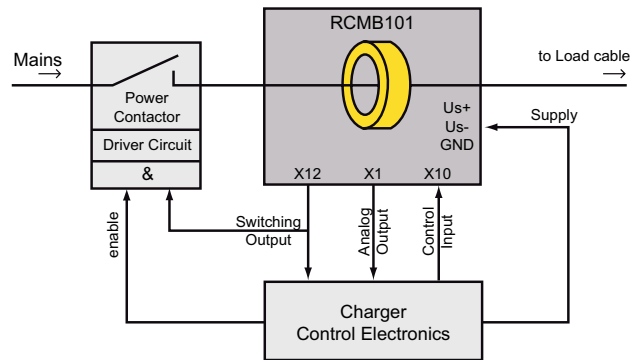
The RCMB101 is a small, PCB-style form factor CCID-20 ground fault monitor which detects both AC and DC ground faults. It is designed to be integrated into level 1 and level 2 electric vehicle charging stations. The RCMB101 is UL recognized under UL2231-2 (File number E193871).

Function

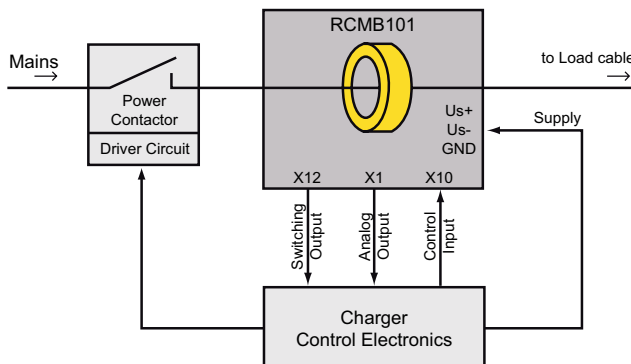
Ground fault monitoring is carried out via the built-in current transformer. The RMS value is calculated by summing the DC components included in the leakage current, as well as the AC components that are below the cut-off frequency. An analog voltage output is generated at output X1. Values outside the measuring range are signaled by the switching output X12. The control input X10 determines whether the RCMB101 will reset.

Application Information

1. Switching output X12 is used as hardware enable signal for the power contactor. Contactor is controlled by charger electronics software. Switching output X12 and analog output X1 are monitored by the charger to verify that X1 and X12 show consistent information, as well as that the behavior after a test (initiated with X10) is correct.



2. Contactor controlled by charger electronics software. Switching output X12 and analog output X1 are monitored by charger to verify that X1 and X12 show consistent information, as well as that the behavior after a test (initiated with X10) is correct.



Important Note: Select a relay and a relay driver circuit with a release time of less than 10 ms under nominal load condition of the charger.

Technical data

Voltage supply

$U_S + (X11)$	+ 12 V (\pm 1 V)
$U_S - (X2)$	-12 V (\pm 1 V)
Ripple at U_S	\leq 100 mV
Power consumption	\leq 1 W

Measuring circuit

Operating characteristics	UL2231-2 and IEC 60755 Type B
Frequency range	0...500 Hz
Measuring range	0...20 mA
Relative uncertainty	0...-25 %
Max. nominal current	50 A / 45...65 Hz

Response value

Rated residual operating current $I_{\Delta n}$	20 mA
Detection circuit acc. to UL2231	CCID 20

Inputs

Control input X10:	
High level	4.5...5.5 V
Low level	0...0.5 V

Outputs

Output voltage range	DC 0.15 V...4.85 V
Sensitivity analogue output	1 V / 10 mA
Tolerance at 1.5...10 mA	0...-20 % / \pm 1 mA
Tolerance at 10...50 mA	0...-20 %
Tolerance at 0.15 V	+50 mV / - 0 mV
Tolerance at 4.85 V	-150 mV / + 50 mV
Output resistance at the measurement output X1	1 k Ω (short-circuit proof)
Switching behavior switching output X12 (Open Collector)	
Low:	values within the permissible measuring range
High:	values outside the permissible measuring range
Max. switching voltage X12	+ 24 V
Max. switching current X12	DC 10 mA

Test winding

Output voltage at X1 with a test current of 22.4 mA after 800 ms	4.85 V
Output voltage at X1 with a test current of 11 mA / 400 Hz	\geq 1.1 V

Specified time

Operating time on X12 t_{ae} for $I_{\Delta n}$	$<$ 990 ms
Operating time for chosen relay under nominal load	\leq 10 ms
Recovery time t_b	\leq 2 s

Environmental conditions

Without solar radiation, precipitation, water, icing. Condensation possible temporarily:	
Classification of climatic conditions acc. to IEC 60721:	
Stationary use (IEC 60721-3-3)	3K5
Transport (IEC 60721-3-2)	2K3
Long-time storage (IEC 60721-3-1)	1K4
Classification of mechanical conditions acc. to IEC 60721:	
Stationary use (IEC 60721-3-3)	3M6
Transport (IEC 60721-3-2)	2M2
Long-time storage (IEC 60721-3-1)	1M3
Deviation from the classification of climatic conditions:	
Ambient temperature, during operation	-25 °C...+ 80 °C
Ambient temperature, during transport	-40 °C...+ 80 °C
Ambient temperature, during long-time storage	-25 °C...+ 80 °C
Relative humidity	10...90 %
Air pressure	70...106 kPa

Connection

PCB plug connectors, single-row	0.65 mm x 0.65 mm
Possible counter piece for plug-in connector	Samtec: BCS-104-L-S-TE or 3M: 960104-6202-AR
Contact spacing	2.54 mm

Other

Operating mode	continuous operation
Position of normal use	any
Software version	D359 V2
Weight	\leq 2.3 oz (65 g)

Ordering information

Type	Measuring range	Frequency range	Art. No.
RCMB101	0...20 mA	0...500 Hz	B 9404 2098



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