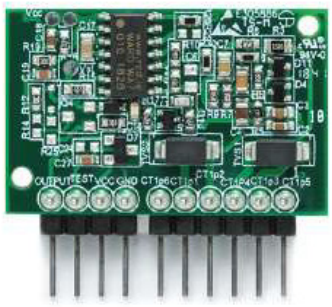
Current Sensor
RCM14-03 System

Ac/Dc Residual Current Monitor, Mode 2



Description

The RCM14-03 System is a Residual Current Monitor designed to detect dc and ac residual currents in Mode 2 EV charging systems under fault conditions. It includes a 14 mm aperture current transformer and a sensor PCB for direct OEM PCB mounting.

The system detects 6 mA dc and 30 mA ac residual currents in dc, single-phase, or three-phase installations.

Fully compliant with IEC 62752 detection requirements.

Features & Benefits

FEATURES	BENEFITS
Operates from a 12-24 V dc supply	Compatibility with common control voltages and redices OEM inventory complexity
External Test Facility	Ability to verify to correct operation of the device
"Fault" Signal Output	Offloads fault detection from the main control system, simplifying and reducing development time

Applications

- Mode 2 EV Charging Stations

Ordering Information

CATALOG #	DESCRIPTION
90136	RCM14-03 System, includes PCB assembly and horizontal mount CT

Specifications

Relevant Product Standard	IEC 62752
Rated Residual Operating Current - (IΔn)	6 mA dc / 30 mA ac
Rated Non-operating Residual Current - (IΔno)	3 mA dc / 15 mA ac
Response Time to residual current fault (time between appearance of fault to output going high)	According to IEC 62752
Dc Supply Voltage (Vcc): **Supply current (no fault present @ 24 V)** **Supply current (fault current >200 mA @ 24 V)**	12-24 V dc ± 10% 4 mA maximum 12.5 mA maximum
Rated Load Current (single or 3 phase)	125 A maximum (the absolute maximum temperature of the conductors through the CT must not exceed 105 °C)
Test Current Limit on Test Function for 12 to 24 V externally applied to Test Pin	0.8mA dc minimum (12 V) 1.6mA dc minimum (24 V)
Fault Signal Output **Drain Current** **Pull up Voltage**	Active High Open Drain 100 mA maximum +24 V dc maximum
Environmental Operating Conditions **Absolute Temperature**	-40 °C to +85 °C
Weight	35 g
Recommended screw type	Self Tapping Screw M2.5 × 6 (2 pcs.)
Surge Current Withstand	3000 A

Environmental Conditions

PARAMETER	MIN.	TYP.	MAX.	UNIT
Operating temperature	-40	-	85	°C
Storage temperature	-40	-	85	°C
Altitude	-	-	3000	m

Electrical Specifications

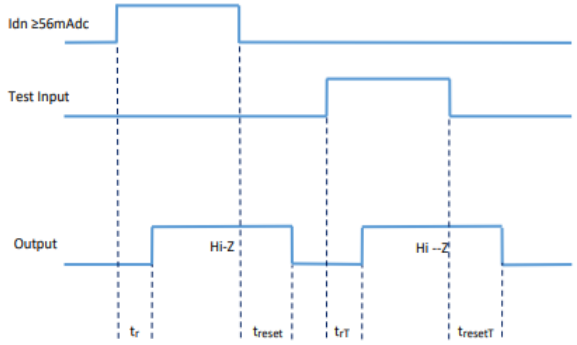
PARAMETER	MIN.	TYP.	MAX.	UNIT
Supply voltage	10.8	12-24	26.4	V
Supply current, no fault current[1]	-	-	3	mA
Supply current, peak >200 mA dc fault current[1]	-	-	9	mA
Dc trip level	-	24	56	mA
Ac 60 Hz trip level	15	-	20	mA ac
Output drain current	-	-	100	mA
Output pull up voltage	-	-	24	V
Test input current @ 12 V dc	-	24	-	mA
Rated load current, single / 3 phase[2]	-	-	125	A

1. Output external pull up current not included.
2. At rated current, the absolute maximum temperature of the conductors through the CT must not exceed 105 °C.

Timing Specification

PARAMETER	MIN.	TYP.	MAX.	UNIT
Output response time @ 56 mA dc, t_r	-	-	1000	ms
T_{reset} [3]	-	-	800	ms
Switching time of external switching device incl. processing time	-	-	20	ms

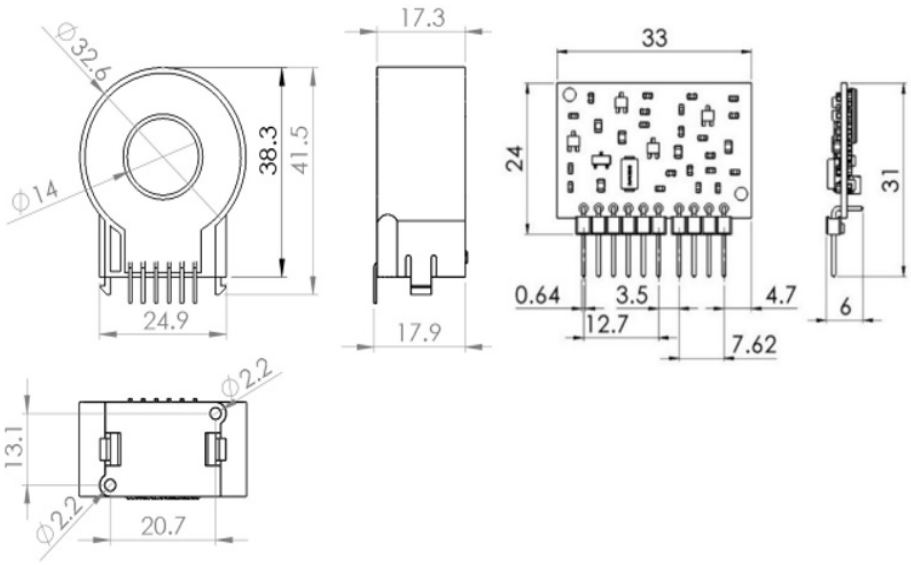
[3]Time taken for fault out to return from Hi-Z state after fault removed.



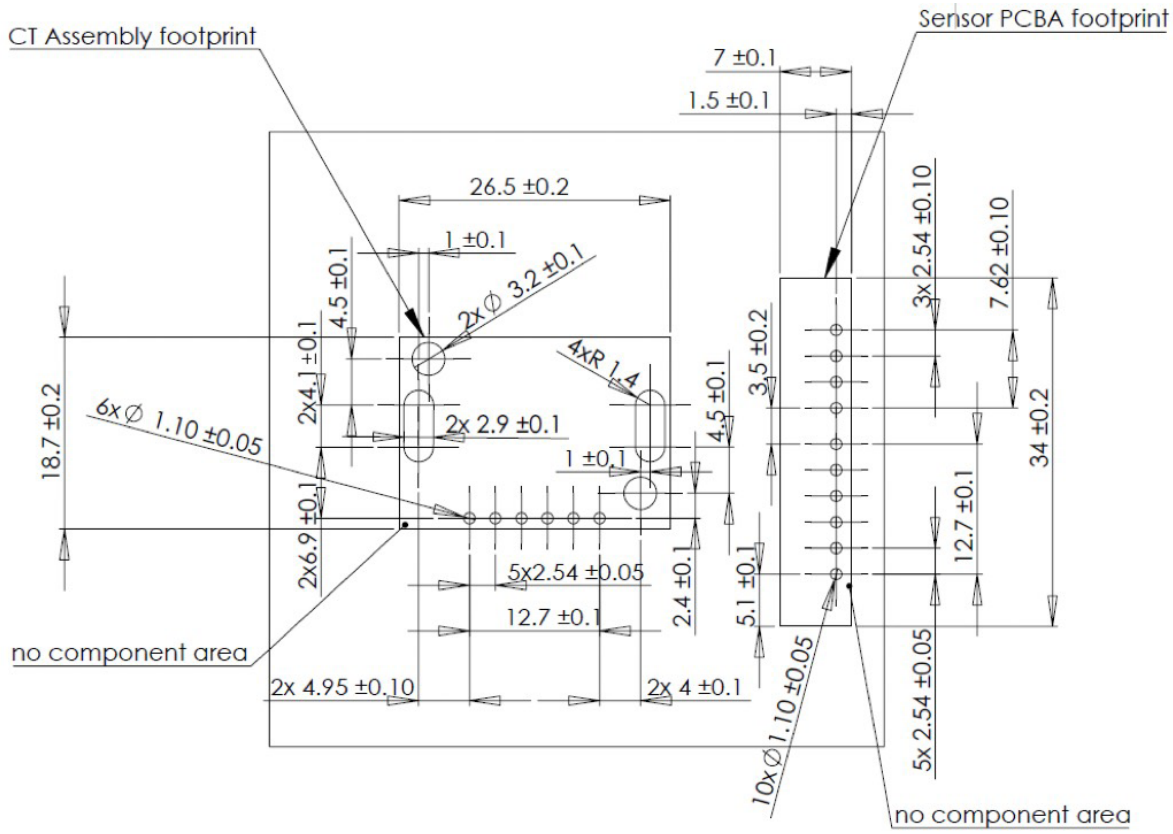
Other

PARAMETER	MIN	TYP.	MAX	UNIT
Overvoltage category		III		-

Product Dimensions (Millimeters)



PCB Layout Requirements



Handling Instructions

Care should be taken to ensure the correct connection of the RCM14-03 System. Miswiring the product may cause permanent damage.

ESD Caution

PCBA contains ESD (electrostatic discharge) sensitive devices. Damage may occur on devices subjected to high-energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

Wiring Diagram

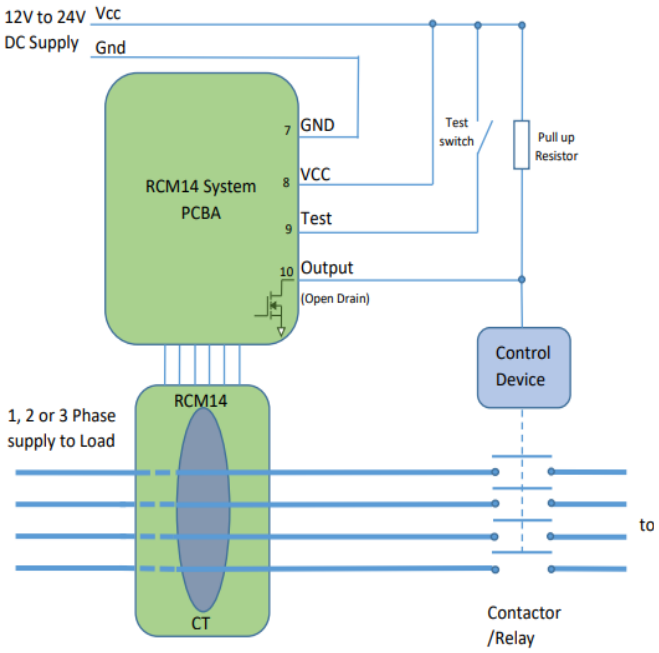


Figure 1: Wiring Diagram

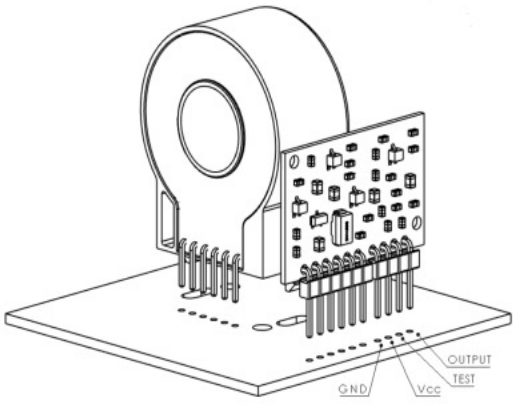


Figure 2(a): PCBA Connections

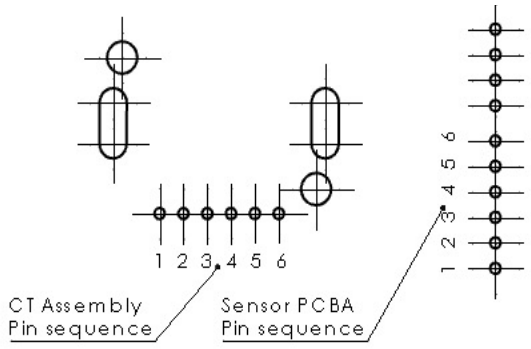


Figure 2(b): PCBA to CT Connection Order

PIN NO.	NAME	DESCRIPTION
1-6	CT Connections	6 connections should be made between RCM14 System PCBA and CT assembly in the order shown in Figure 2(b)
7	GND	Ground, 0 V
8	Vcc	12 V to 24 V dc
9	Test	Used to verify correct device operation. Apply Vcc to this pin to activate the test function. When active, Pin 10 (Fault Out) will go HIGH if the test is successful. Once Vcc is removed, Fault Out returns to LOW. This pin should remain disconnected when the test function is not in use. The test switch shown in Figure 1 is illustrative only—Vcc can also be applied by the control device
10	Fault Signal Output	Open-drain output; requires connection to an external pull-up resistor to the desired signal level (e.g., Vcc). ***LOW State (low impedance):** Indicates no fault and test function inactive. ***HIGH State (high impedance):** Triggered when ac or dc residual current exceeds the trip threshold, or when the test function is active. ***Reset Behavior:** Fault Out returns to LOW once the fault is cleared and the test function is inactive. To prevent contactor or relay chatter, do not connect this pin directly to such devices. It is recommended that the control system latches the signal in hardware or software to ensure reliable fault handling.

Standards Conformity & Certifications

Product Safety Certifications

Products tested, compliant and certified to the following standards that states the requirements for electrical products to ensure they are safe for consumers to use.

CERTIFICATION BODY MARK	CERTIFICATION BODY NAME	CERTIFICATION DESCRIPTION	STANDARDS COVERED BY THE CERTIFICATION
IEC	IEC	Conformity with the European safety, health, and environmental protection requirements for ac and dc fault current detection requirements of IEC 62752 In-Cable Control and Protection Device for mode 2 charging of electric road vehicles (IC_CPD)	**IEC 62752**

Environmental Compliance

Products comply to the following environmental standard requirements for electrical products to ensure they are safe for consumers to use.

-	STANDARD NAME	STANDARD DESCRIPTION	STANDARD NUMBER
RoHS	RoHS	Conformity with the European Restriction of Hazardous Substances in electrical and electronic products	European Union RoHS 2 Directive 2011/65/EU
REACH	REACH	Conformity with the Registration, Evaluation, Authorization and Restriction of Chemicals regulation to ensure safe use of chemicals	European Directive 1907/2006

Intended Use

The RCM14-03 System is designed to be integrated with the appropriate switching device, e.g. relay or contactor, to provide the 6 mA dc and 30mA ac detection requirements defined by IEC 62752 for use in Mode 2 electric vehicle charging.

No special start-up procedures or calibration is required for the RCM14-03 System. Once powered the system is ready to detect residual faults to IEC 62752.

Related Products

RCM14-01 SYSTEM	6 mA dc Detection to IEC 62955, 14 mm CT Aperture
RCM14-03	6 mA dc / 30 mA ac Detection to IEC 62752, 14 mm CT Aperture
RCM14-04 System	56 mA dc / 20 mA ac Detection to UL 2231-2, 14 mm CT Aperture
RCM01-02	6 mA dc / 30 mA ac Detection to IEC 62752, 9 mm CT Aperture