Specification for approval

Description（产品类型）： **Differential Current Sensor**

Customer P/N（客户）：

ZETTLER P/N（赛特勒）： APU00T0332WT-001

Revision（版本号）： PD1.0

Drafted（编制）： Yanggui Su

Checked（审核）： Arvin Zou

Approved（批准）： Aaron Chen

PD1.0	2024/07/05	Initial release	Yanggui Su
Rev.	Date	Description	Approved

Approved by Customer（客户确认）：

Friendly Reminder: Please help to sign this Spec when approve , and fax to our company . Or else, we will consider you have accepted it and make future order based on this Spec.

友情提示:请在签字确认后,按封面的传真号码回传给赛特勒磁电有限公司.如无回传,则视为默认,后续的相关订单将以按本承认书的规定为技术要求

ZETTLER MAGNETICS
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FEATURES（产品特点）

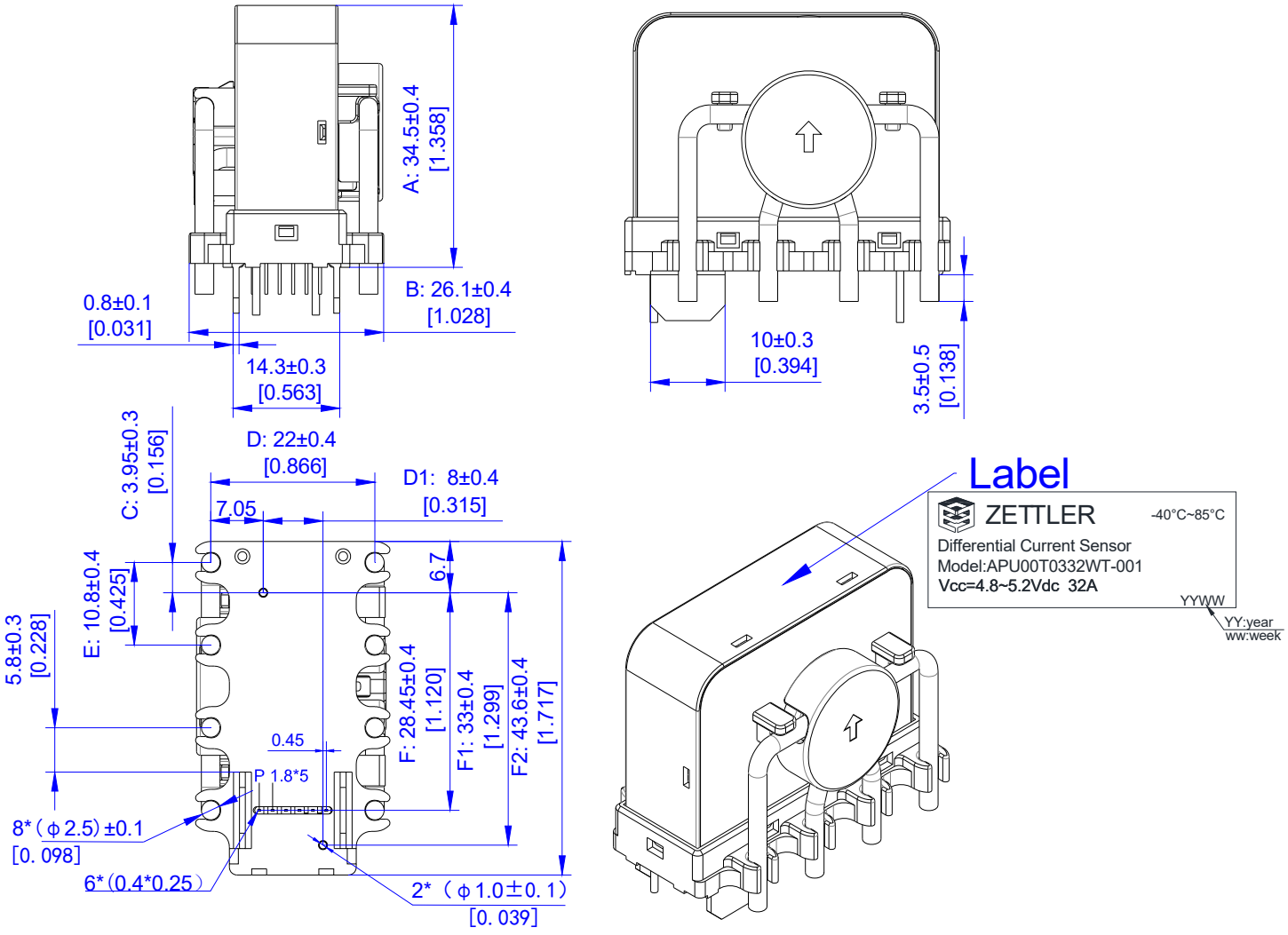
- PCB mounted RCD module
- Excellent accuracy
- Fluxgate current sensor with toroidal core
- Switching push-pull outputs
- Compact design

APPLICATIONS（应用）

Mainly used for stationary and mobile applications:

- Compliance With UL2231-2

OUTLINE DRAWING （外形图）



Tolerance：±0.5mm[0.02inch]

TYPICAL APPLICATION DIAGRAM:（应用图）

General description of sensor function:

The Sensor is sensitive to AC and DC current and can be used for fault current detection in Charging systems acc. to UL2231.

The Sensor detects AC and DC fault currents according to UL2231-2. In the event of an AC fault current (5mA rms), PIN 4 will change its state from a low level (GND) to high level state (5V). In the event of an AC fault current (20mA rms), PINs 4 and 5 will change state from a low level (GND) to a high level state.

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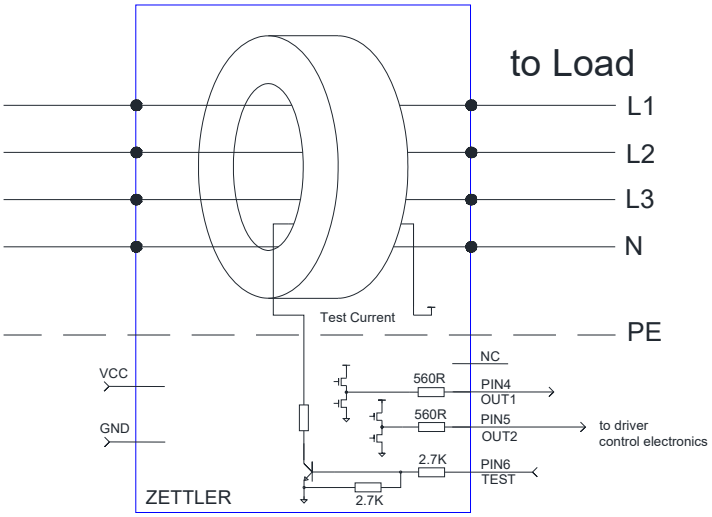


OUT1(PIN4)	OUT2(PIN5)	State
GND	GND	Normal condition
High level	GND	>5mA rms
High level	High level	>20mA rms
OUT1 triggers from Id >= 5mA AC rms AND >= 30mA DC OUT2 triggers from Id >=20mA AC rms AND >=56.56mA DC		

PIN description:	
PIN no.	Description
PIN 1 --> VCC	Positive supply voltage 5V
PIN 2 --> GND	Ground connection
PIN 3 --> N.C.	Not Connected
PIN 4 --> OUT1 (push-pull output)	If the residual current is below 5mA rms and no system fault occur the output on PIN 4 is a low level (GND). In any other case PIN 4 is in a high level state (5V). If PIN 5 is high level, PIN 4 will also be set to high level. This PIN is for the CCID5 applications.
PIN 5 --> OUT2 (push-pull output)	If the residual current is below 20mA rms and no system fault occur the output on PIN 5 is a low level (GND). In any other case PIN 5 is in a high level state (5V). This PIN is for the CCID20 applications.
PIN 6 --> TEST(refer to figure)	A function test is activated if this PIN is connected to high level. **Attention:** During the functional test no differential current shall flow. If a push-pull switch is used, the voltage range must be 0V…5V.
PIN 9 -- PIN16	For primary wires connection

ELECTRICAL SPECIFICATION（电性能参数）

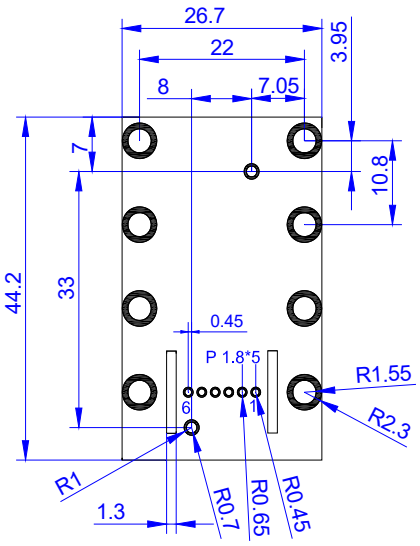
Symbol	Parameter	Condition	min.	typ.	max.	Unit	remark
I_P	Primary rated current (1phase / 3phase)			32	40	A	
$I_{\Delta N,max}$	Measuring range (peak)		-300		300	mA	
f_{BW}	Frequency range		DC		1	kHz	
$I_{\Delta N1}$	Rated residual operating current 1		4	5	6(1) 12(2)	mA rms	(1)f = 60Hz (2) f = 70Hz to 1kHz
$I_{\Delta N2}$	Rated residual operating current 2		15	20	20(1) 50(2)	mA rms	(1)f = 60Hz (2) f = 70Hz to 1kHz
Tr	Response time	AC: In=1*IΔN2		150	1000	ms	Interrupting Time according to UL2231-2 Tr=(20/In)^1.43
		AC: In=2*IΔN2		40	371		
		AC: In=5*IΔN2		20	100		
	Response time	AC: In=1*IΔN1		600	7260		
		AC: In=2*IΔN1		200	2690		
		AC: In=5*IΔN1		80	560		
$I_{\Delta RI1}$	Hysteresis recovery current level for IΔN1 (absolute value dc)			2.5		mA	OUT1 will remain in their states until IΔ is below the recovery threshold IΔRI1
$I_{\Delta RI2}$	Hysteresis recovery current level for IΔN2 (absolute value rms)			10		mA	OUT2 will remain in their states until IΔ is below the recovery threshold IΔRI2
V_{CC}	Supply voltage		4.8	5	5.2	V	
I_{CC}	Consumption current			10	30	mA	
T_A	Ambient operation temperature		-40		85	°C	

Absolute maximum ratings

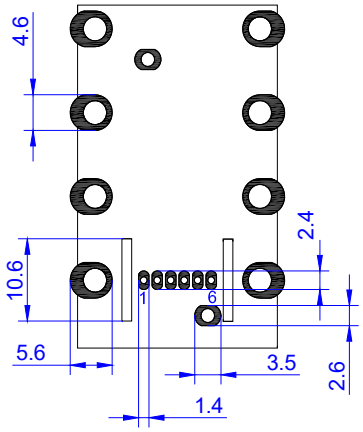
Symbol	Parameter	Condition	min.	typ.	max.	Unit	remark
V_{PIN}	Voltage on pins with respect to GND (PINs 1, 4, 5 and 6)				5.5	V	
I_{PIN}	Current on pins (PINs 1, 4 and 5)				50	mA	
U_{MAX}	Maximum rated voltage of primary conductors				440	V	

PCB Footprint:

Component Side



Solder Side



Restricted Areas

No secondary connection tracks in the hatched areas

*PCB is assumed to be material group IIIa.

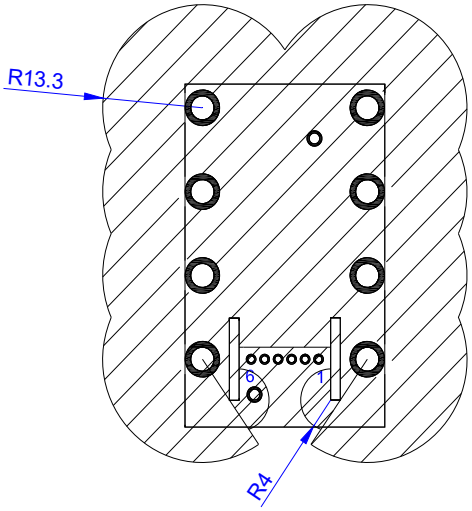


Figure:

After activating the test sequence, the end product has to monitor the correct state of the switching outputs being used at the following points in time.