Specification for approval

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

Customer P/N（客户）：

ZETTLER P/N（赛特勒）： APR00T0332WT-001

Revision（版本号）： PD1.8

Drafted（编制）： Yanggui Su

Checked（审核）： Arvin Zou

Approved（批准）： Aaron Chen

Rev.	Date	Description	Approved
PD1.8	2024/08/28	Modify the typical application diagram and figure; Modify the electrical specification	Yunmeng Yuan
PD1.7	2024/06/06	Modify the features and typical application diagram; modify the figure and electrical specification; add the PCB footprint	Yanggui Su
PD1.6	2024/02/28	Modify the label and the outline drawing	Yanggui Su
PD1.5	2023/10/24	Modify the specification	Yanggui Su
PD1.4	2023/10/20	Add phosphorus-free logo and organic silicon free logo	Yanggui Su
PD1.3	2023/10/16	Modify the diagram and figure；Modify the specification	Yanggui Su
PD1.2	2023/09/21	Modify the diagram and figure	Yanggui Su
PD1.1	2023/08/14	Modify the typical application diagram and electrical specification	Yanggui Su
PD1.0	2023/08/08	Initial release	Yanggui Su

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

FEATURES（产品特点）

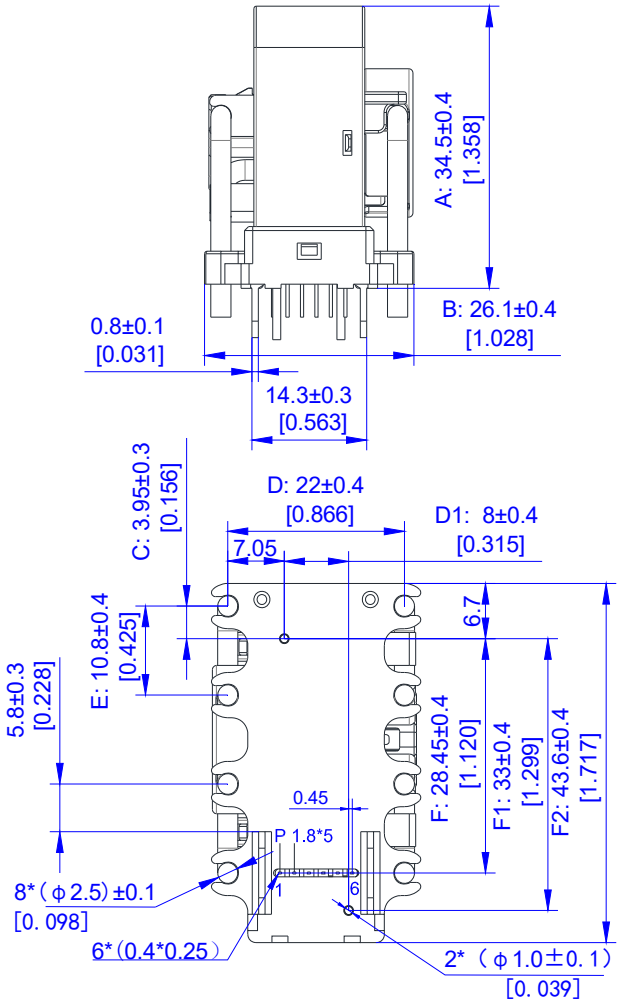
- PCB mounted RCD module
- Excellent accuracy
- Fluxgate current sensor with toroidal core
- Switching push-pull outputs
- Compact design

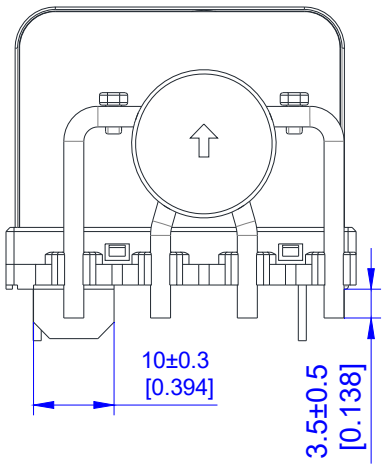
APPLICATIONS（应用）

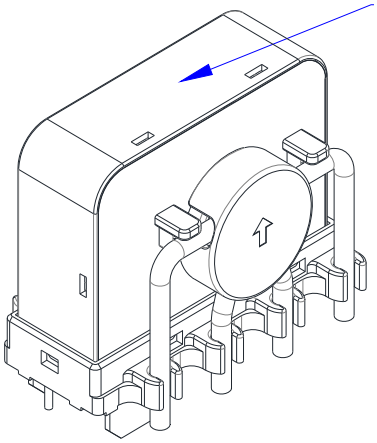
Mainly used for stationary and mobile applications:

- Compliance With IEC62955

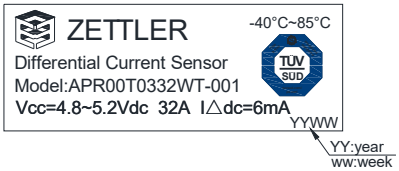
OUTLINE DRAWING （外形图）







Label



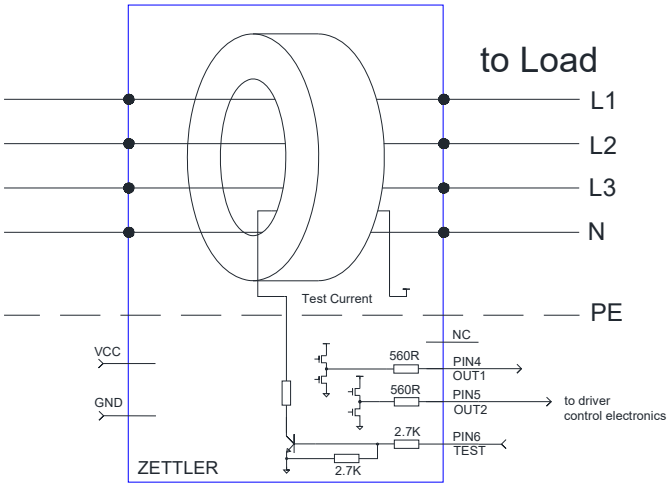
Tolerance：±0.5mm[0.02inch]

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 RDC-MD applications.

The Sensor detects AC and DC fault currents according to IEC62955:2018. In the event of a DC fault current, PIN 4 will change its state from a low level (GND) to high level state (5V). In the event of an AC fault current, PIN 5 will change state from a low level (GND) to a high level state.



OUT1(PIN4)	OUT2(PIN5)	State
GND	GND	Normal condition
High level	GND	>6mADC
GND	High level	>30mArms
High level	High level	DC>6mA and AC>30mA
OUT1 must triggers from Id >= 6mA DC AND may triggers from Id >= 70mA ACrms OUT2 may triggers from Id >30mA ACrms AND must triggers from Id >= 60mA 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 6mA dc and no system fault occur the output on PIN 4 is a low level (GND). In any other case output PIN 4 is in a high level state (5V).
PIN 5 --> OUT2 (push-pull output)	If the residual current is below or equal to the 30mA rms. and no system fault occur the Output on PIN 5 is a low level (GND).
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		3.5	4.2	6	mA DC	
$I_{\Delta N2}$	Rated residual operating current 2		>30(1)		420(2)	mA RMS	(1)f = DC to 150Hz (2) f = 150Hz to 1kHz
Tr	Non-operating time	AC: In=1*IΔN2	No tripping			ms	Interrupting Time according to IEC62955:2018 Table 2 + 3
		AC: In=2*IΔN2	300				
		AC: In=5*IΔN2	80				
	Response time	DC: In=1*IΔN1		600	10000		
		DC: In=10*IΔN1		100	300		
		DC: In=33*IΔN1		2	100		
$I_{\Delta RI1}$	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 5 and6)				50	mA	
U_{MAX}	Maximum rated voltage of primary conductors				440	V	

PCB Footprint:

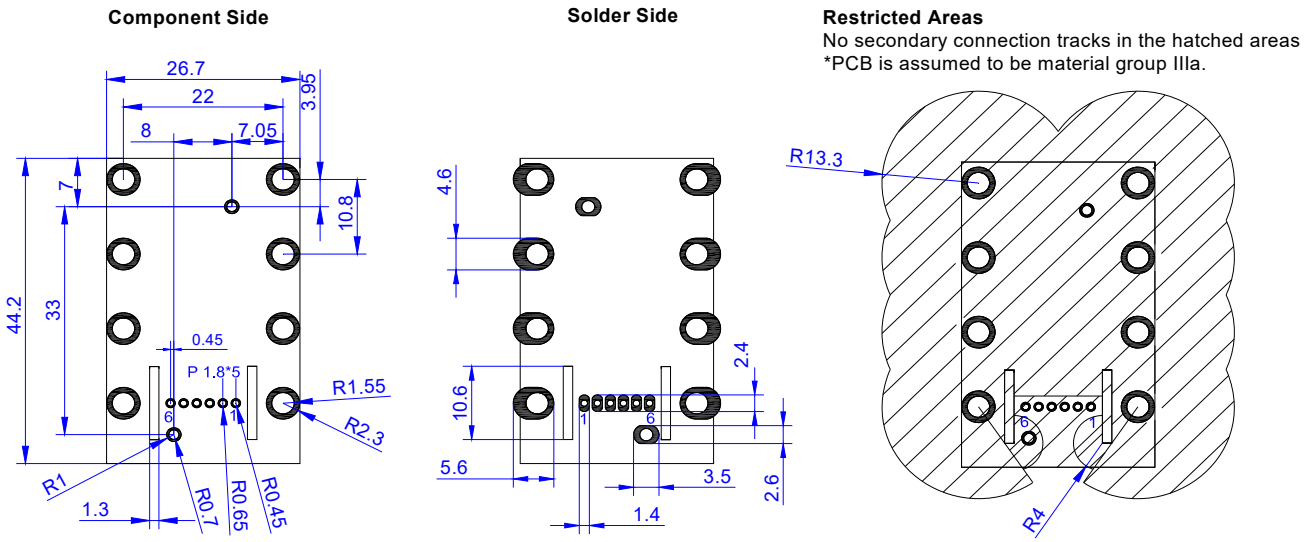
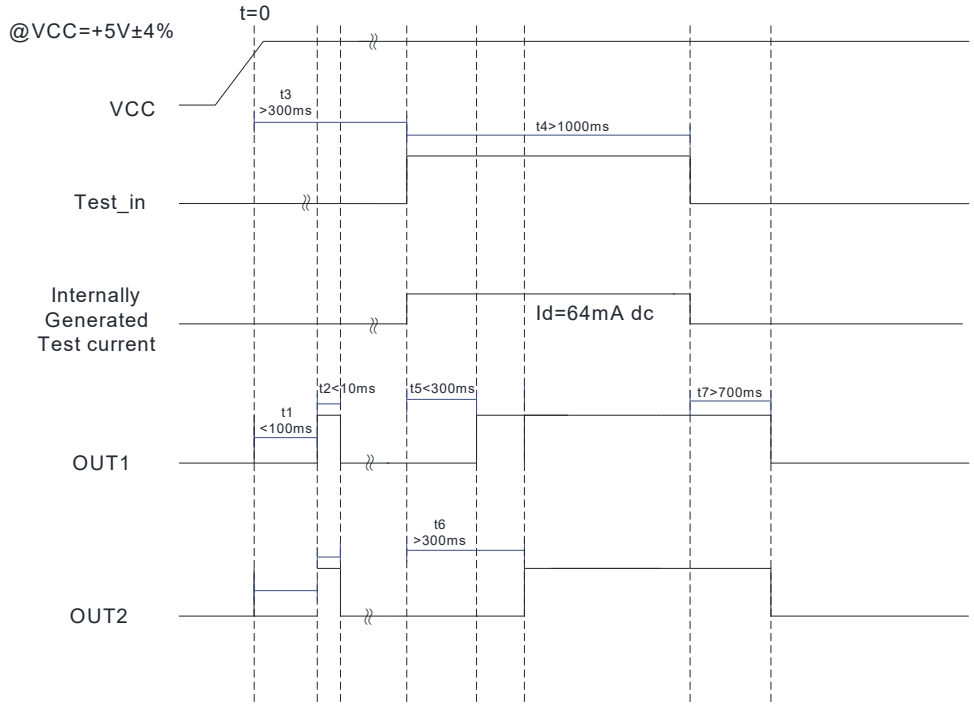


Figure:

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.



Item	Description	Notes	Timing(ms)		
			Min.	Typ.	Max.
t1	Initialization time		-	70	100
t2	Output pin set high	The host could detect the PIN go high at this point	-	2	10
t3	Delay before self-test		300	-	-
t4	Self-test duration		1000	-	-
t5	response time	the response time to self-test current of OUT1	-	100	300
t6	response time	the response time to self-test current of OUT2	300	750	-
t7	Delay time	Response delay after removing the self-test current	700	900	-