

General Description:

The PCB-mounted current sensor is designed for accurate measurement of AC, DC and pulsed DC currents, offering reliable galvanic isolation between the primary and secondary circuits. It comes pre-calibrated to simplify integration and ensure consistent performance across a wide range of applications.

Features:

- PCB mount
- Pre-calibrated
- AC and DC current measurement
- Compact and cost efficient design
- Fast response
- Good electrical Isolation
- RoHS & REACH compliant

Advantages:

- Excellent measurement accuracy
- Low magnetic and electrical offset
- Good linearity
- Low sensitivity drift
- Easy installation (PCB mount)
- Low power consumption
- Light weight
- Robust Design

Application:

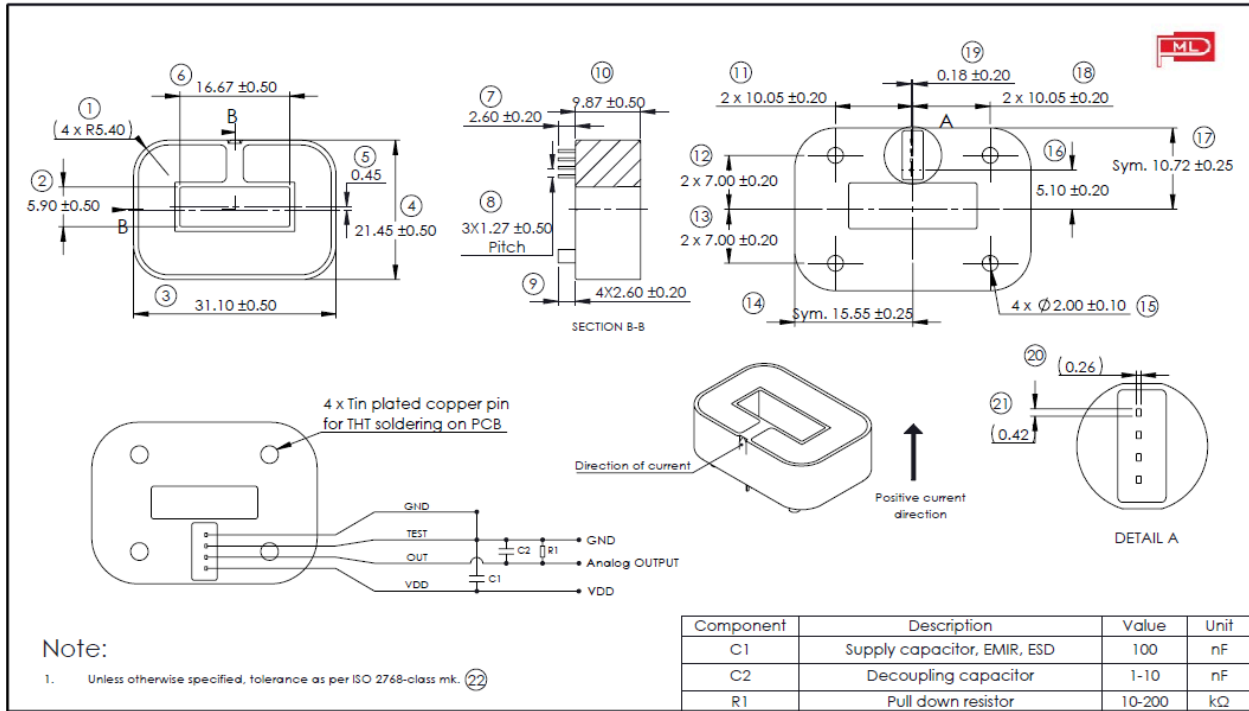
- Motor Control Units (MCUs) for Electric Vehicles
- Inverters for Electric Vehicles
- DC-DC Converters for Electric Vehicles
- Charging Systems for Solar and Electric Vehicles
- Battery Management and Monitoring Systems

Absolute Maximum Ratings:

Parameter	Symbol	Value	Unit
Positive Supply Voltage (overvoltage)	V_{DD}	+10	V
Reverse Voltage Protection	$V_{S_{REV}}$	-0.3	V
Positive Output Voltage	V_{OUT}	+10	V
Output Current	I_{OUT}	+70	mA
Reverse Output Voltage	$V_{O_{REV}}$	-0.3	V
Reverse Output Current	$I_{O_{REV}}$	-50	mA
Operating Ambient Temperature Range	T_A	-40 to +150	°C
Storage Temperature Range	T_S	-55 to +165	°C
Magnetic Flux Density	$I_{P_{MAX}}$	±10	kA
ESD – Human Body Model	ESD_{HMB}	2	kV

Note: Exceeding the absolute maximum ratings may cause permanent damage. Exposure to absolute maximum-rated conditions for extended periods of time may affect the sensor reliability.

Product Drawing:



Ordering information:

Part Number: T-CR-052-R1

Note: HNRB-1000 comes factory calibrated for 1000A_{PK} DC. PML also supports HNRB-1000 calibrated for other current ratings.

General Electrical Specification:

Operating conditions $T_A = 25^\circ\text{C}$, $V_{DD} = 5V \pm 0.05\%$, unless otherwise specified.

Parameter	Symbol	Test condition	Min	Typ	Max	Unit
Nominal Supply Voltage	V_{DD}		4.5	5	5.5	V
Nominal Supply Current	I_{DD}			12.5	15	mA
Output Impedance	R_{OUT}	$V_{OUT} = 50\% V_{DD}$		1	5	Ω
Output Capacitive Load	C_L		1		10	nF
Output Resistive Load	R_{LOAD}	Output resistive load for high linearity and diagnostic band.	10	25	200	k Ω
Linear Output Range	$V_{O_{LIN}}$	Pull-down $\geq 10\text{k}\Omega$	10		90	$\%V_{DD}$
Sensitivity	S			2.00		mV/A
Primary current ⁽¹⁾	I_P	DC	-1000		1000	A_{PK}
		AC	-707		707	A_{RMS}

⁽¹⁾HNRB-1000 comes factory calibrated for $1000A_{PK}$. PML also supports HNRB-1000 calibrated for other current ratings.

Accuracy Specification:

Operating conditions $T_A = 25^\circ\text{C}$, $V_{DD} = 5V \pm 0.05\%$, unless otherwise specified.

Parameter	Symbol	Test condition	Min	Typ	Max	Unit
Electrical Offset Voltage	V_E			± 2	± 5	mV
Magnetic Offset Current	I_{MO}				± 0.3	$\%I_P$
Sensitivity error @ I_P	S_M				± 0.35	$\%S$
Linearity error 0... I_P	NL				± 0.24	$\%I_P$
Measurement error 0... I_P	E_M				± 1	$\%I_P$

Timing Specification:

Operating conditions $T_A = 25^\circ\text{C}$, $V_{DD} = 5V \pm 0.05\%$, unless otherwise specified.

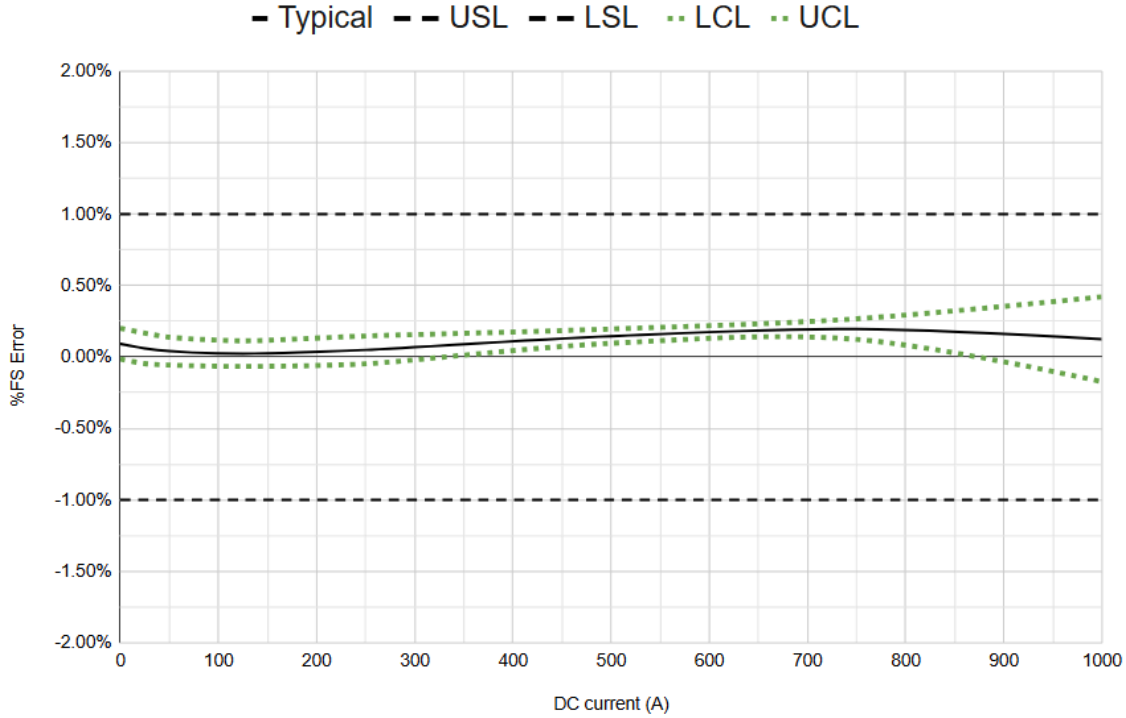
Parameter	Symbol	Test condition	Min	Typ	Max	Unit
Power on Delay	T_{POD}	$V_{OUT} = 100\% \text{ of F.S.}$			1	ms
Refresh rate	T_{RR}		0.8	1	2	μs
Step Response Time ($C_L = 10\text{nF}$)	T_R			6		μs
Bandwidth	BW			100		kHz

Note: The accuracy specifications are defined for the factory calibrated sensitivity. The HNRB-1000 accuracy may vary from above specifications based on the user application.

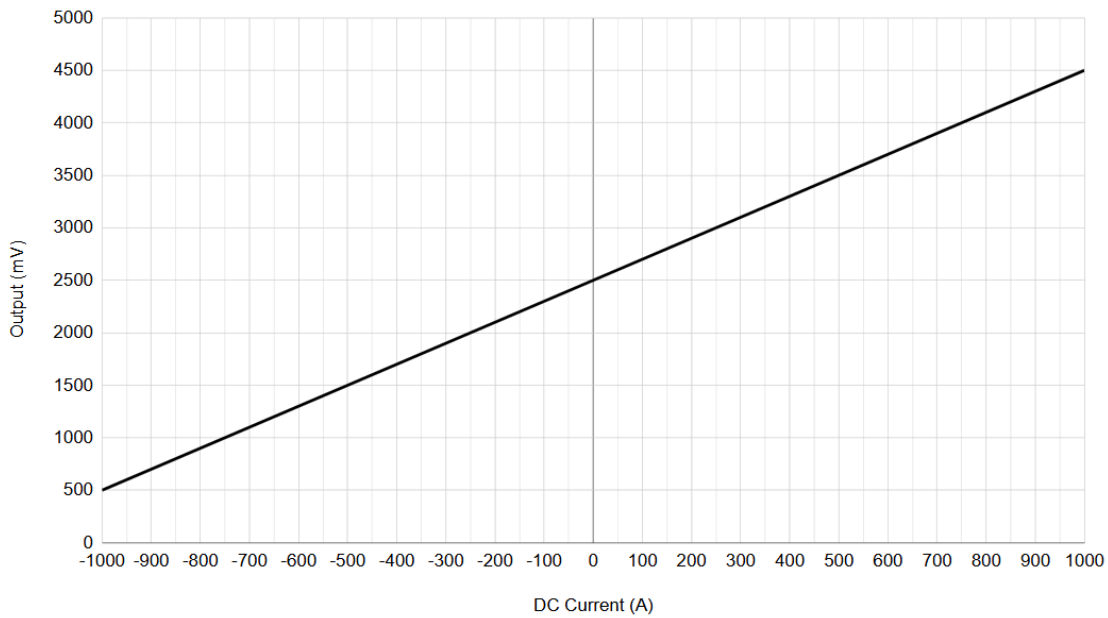
Typical Performance:

Operating conditions $T_A = 25^\circ\text{C}$, $V_{DD} = 5V \pm 0.05\%$, unless otherwise specified.

DC current (A) vs %Fs Error



DC current (A) vs Output(mV)



Disclaimer:

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