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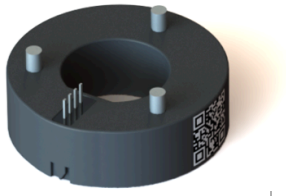
Product Data Sheet

HNCB - 500



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:

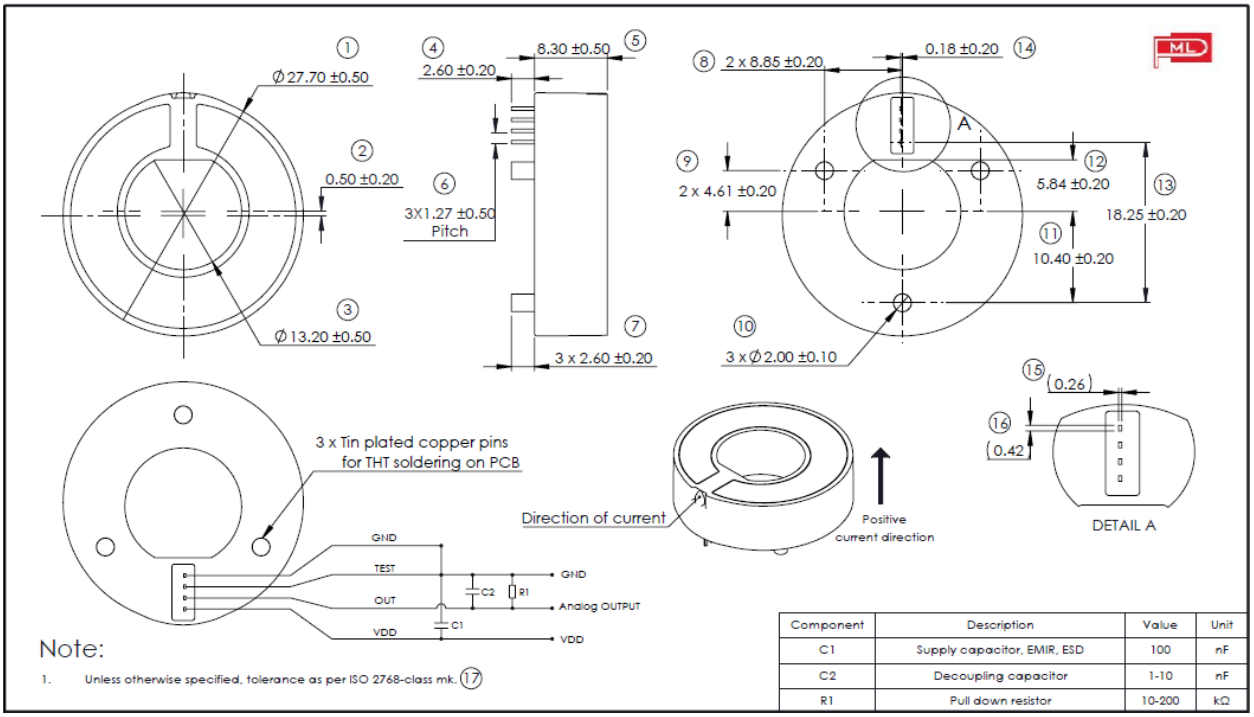
- Motor Control Units (MCUs) for Electric Vehicles
- Inverters for Electric Vehicles
- DC-DC Converters for Electric Vehicles
- Charging Systems for Solar and Electric Vehicles
- Battery Management and Monitoring Systems

Absolute Maximum Ratings:

Parameter	Symbol	Value	Unit
Positive Supply Voltage (overvoltage)	V_{DD}	+10	V
Reverse Voltage Protection	VS_{REV}	-0.3	V
Positive Output Voltage	V_{OUT}	+10	V
Output Current	I_{OUT}	+70	mA
Reverse Output Voltage	VO_{REV}	-0.3	V
Reverse Output Current	IO_{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_{PMAX}	±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:



Component	Description	Value	Unit
C1	Supply capacitor, EMIR, ESD	100	nF
C2	Decoupling capacitor	1-10	nF
R1	Pull down resistor	10-200	kΩ

Ordering information:

Part Number: *T-CR-047-R1*

Note: *HNCB-500 comes factory calibrated for 500A$_{PK}$. PML also supports HNCB-500 calibrated for other current ratings.*

General Electrical Specification:

Operating conditions T_A = 25°C, VDD = 5V±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}	VOUT = 50% VDD		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	kΩ
Linear Output Range	VO_{LIN}	Pull-down ≥ 10kΩ	10		90	$\%V_{DD}$
Sensitivity	S			4.00		mV/A
Primary current [1]	I_P	DC	-500		500	A_{PK}
		AC	-353.5		353.5	A_{RMS}

[1] *HNCB-500 comes factory calibrated for 500A_{PK}. PML also supports HNCB-500 calibrated for other current ratings.*

Accuracy Specification:

Operating conditions T_A = 25°C, VDD = 5V±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				±0.4	%S
Linearity error 0…I_P	NL				±0.3	$\%I_P$
Measurement error 0…I_P	E_M				±1	$\%I_P$

Timing Specification:

Operating conditions T_A = 25°C, VDD = 5V±0.05%, unless otherwise specified.

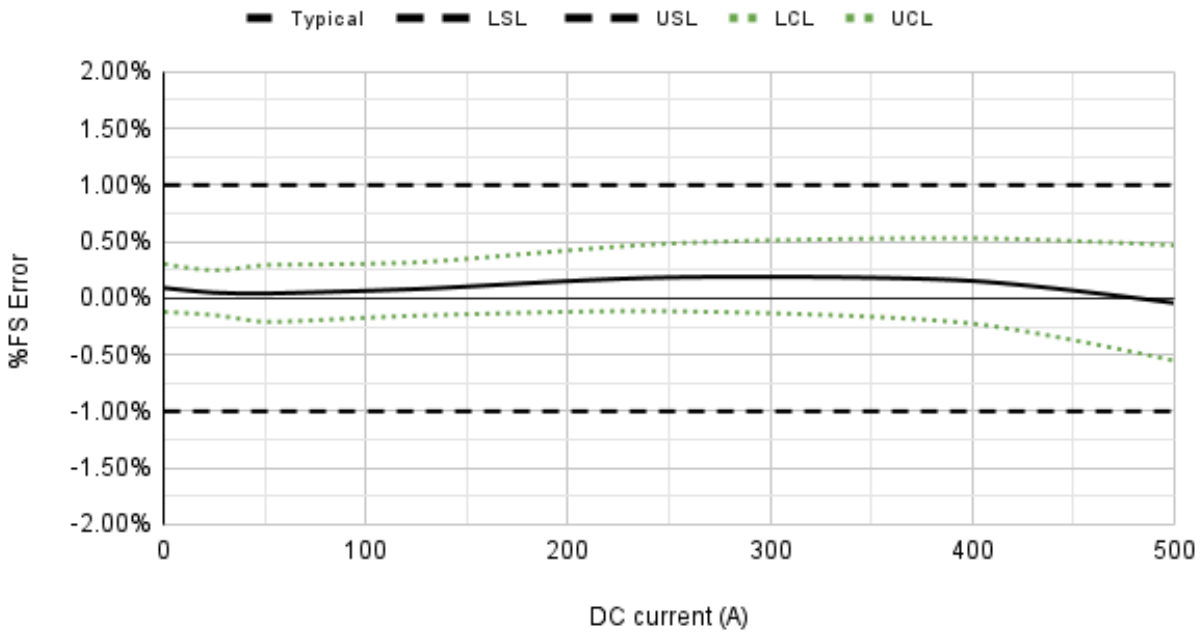
Parameter	Symbol	Test condition	Min	Typ	Max	Unit
Power on Delay	T_{POD}	V_{OUT} =100% of F.S.			1	ms
Refresh rate	T_{RR}		0.8	1	2	µs
Step Response Time (C_L=10nF)	T_R			6		µs
Bandwidth	BW			100		kHz

Note: *The accuracy specifications are defined for the factory calibrated sensitivity. The HNCB-500 accuracy may vary from above specifications based on the user application.*

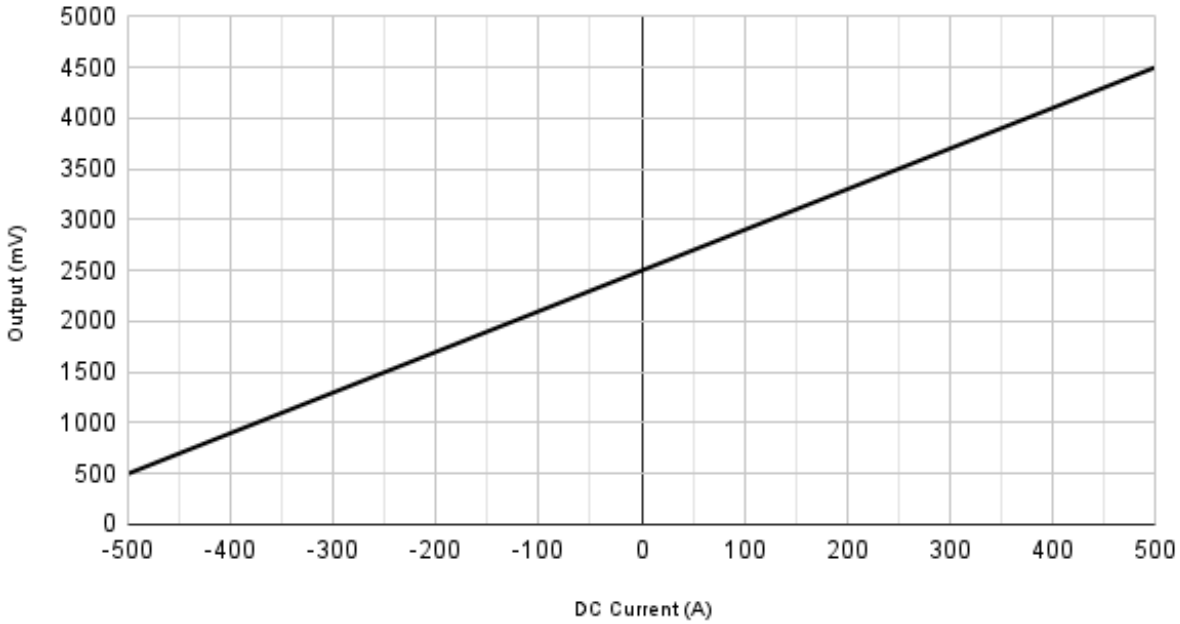
Typical Performance:

Operating conditions T_A = 25°C, VDD = 5V±0.05%, unless otherwise specified.

DC current (A) vs %Fs Error



DC current (A) vs Output(mV)



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