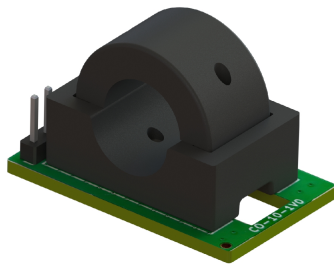


CO-10-SF-A

10[mm] Clamp-On Non-Intrusive Current Sensor Module

1 General Description



The CO-10-SF-A is an analog open loop current sensor module designed for non-intrusive and isolated measurement of electric currents. Thanks to the clamp-on design, the contactless current sensor can be safely installed without the need to interrupt or cut the cable.

The module consists of a PCB including Melexis IMC-Hall[®] planar current sensor, CO-10-SF Clamp-On shield and the necessary components to straightforwardly install and operate.

Supplied with a DC voltage of 5V, the module provides a linear analog output voltage between 500 mV and 4500 mV as a function of the primary input current. Thanks to its properties, CO-10-SF-A offers an excellent linearity error, below 0.5 %FS. Thanks to the integrated Melexis IMC-Hall[®] current sensor, the sensor module provides excellent offset as low as ± 5 mV and sensitivity drift of 1 % over full temperature range.

Applications include DC and AC current sensing up to 30 kHz, motor control, battery monitoring, charge control, white goods, and many more.

2 Features

- Low hysteresis
- High Permeability
- Hall-Sensor Measurement
- High Linearity up to 200 A
- Temperature Range: 10 to 85 °C
- Low Offset drift <5 mV
- Low Sensitivity drift <1 %
- DC and AC (30 kHz)

3 Advantages

- Snap-Fit installation
- Non intrusive sensing
- Small Size, Lightweight
- Excellent output linearity

4 Applications

- IoT
- Industrial
- E-metering
- Photovoltaic

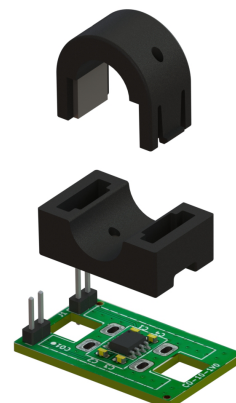


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5 Revision History

Revision/Changes	Page
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- Revision A: initial datasheet all
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6 Ordering Information

CO-10-SF-A(Product) XXX(Option Code)

Option Codes ⇒ Current Range. Current Range defines the peak current value.

Product	Option Code	Typical Sensitivity	Current Range
CO-10-SF-A	100	200.00 mV/A	±10 A
CO-10-SF-A	250	80.00 mV/A	±25 A
CO-10-SF-A	500	40.00 mV/A	±50 A
CO-10-SF-A	101	20.00 mV/A	±100 A
CO-10-SF-A	151	13.33 mV/A	±150 A
CO-10-SF-A	201	10.00 mV/A	±200 A

Contact maglab AG / PML India for a different sensitivity requirement

7 Absolute Maximum Ratings

Non operating conditions

Table 1: Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Positive Supply Voltage	V_{DD}	+10	V
Reverse Supply Voltage	V_{DDREV}	-0.3	V
Positive Output Voltage	V_{OUT}	+10	V
Reverse Output Voltage	V_{OUTREV}	-0.3	V
Positive Output Current	I_{OUT}	+50	mA
Reverse Output Current	I_{OUTREV}	-50	mA
Ambient Temperature	T_A	0 to +120	°C
ESD Human Body Model	ESD_{HBM}	2	kV

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

8 General Electrical Specification

Operating conditions $T_A = 10$ to $+85$ °C, $V_{DD} = 5V \pm 10\%$, unless otherwise specified.

Table 2: Absolute Maximum Ratings

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Nominal Supply Voltage	V_{DD}		4.5	5	5.5	V
Supply Current	I_{DD}	No output load	9	12.5	15	mA
Output Resistive Load	R_L	For high linearity	10	25	200	k Ω
Linear Output Range	V_{OUTLIN}	$R_L \geq 10k\Omega$	10		90	% V_{DD}
Broken GND Ouptut Level		$R_L \geq 10k\Omega$, $V_{DD} = 5V$	96		100	% V_{DD}
Broken VDD Ouptut Level		$R_L \geq 10k\Omega$, $V_{DD} = 5V$	0		4	% V_{DD}
Output Quiescent Voltage	V_{OQ}	$R_L \geq 10k\Omega$, $V_{DD} = 5V$		50		% V_{DD}

9 Analog Output Specification

9.1 Accuracy Specification

Operating conditions $T_A = 10$ to $+85$ °C, $V_{DD} = 5V \pm 10\%$, unless otherwise specified.

Table 3: Accuracy specification

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Thermal Offset Drift	$\Delta^T V_{OQ}$	$T_A = 0$ to 85 °C		± 5		mV
Thermal Sens. Drift	$\Delta^T S$	$T_A = 0$ to 85 °C		± 1		%S
RMS Output Noise	N_{RMS}	NOISE FILTER=0		8		mV_{RMS}
V_{OQ} Ratiometry	$\Delta^R V_{OQ}$	$V_{DD} = 5V \pm 5\%$		± 0.4		% V_{OQ}
Sensitivity Ratiometry	$\Delta^R S$	$V_{DD} = 5V \pm 5\%$		± 0.4		% V_{OQ}

9.2 Timing Specification

Operating conditions $T_A = 10$ to $+85$ °C, $V_{DD} = 5V \pm 10\%$, unless otherwise specified.

Table 4: Timing Specification

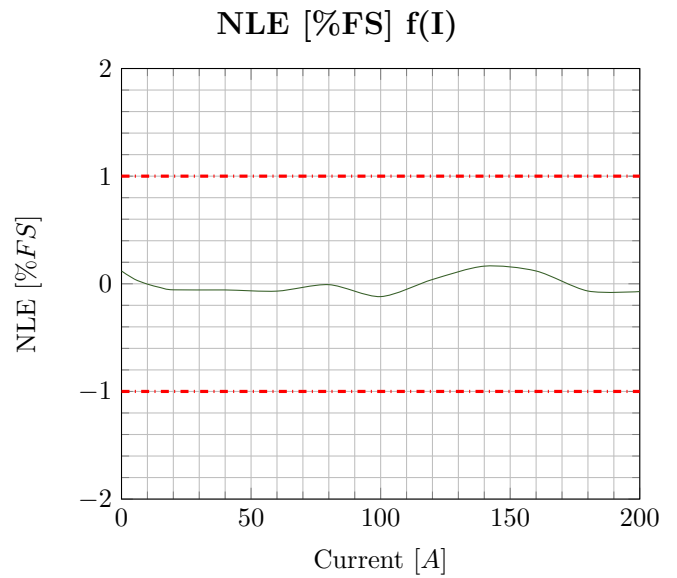
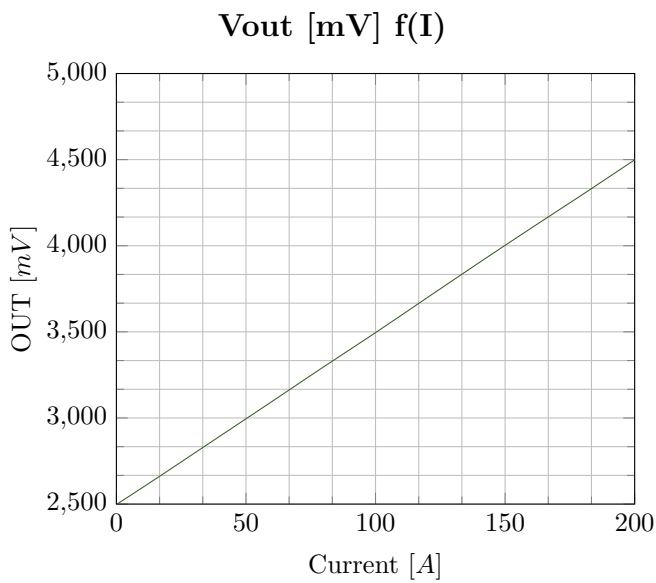
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Refresh Rate	T_{RR}			1		μs
Step Response Time	T_R			2		μs
Bandwidth	BW			30		kHz

10 Application Diagram



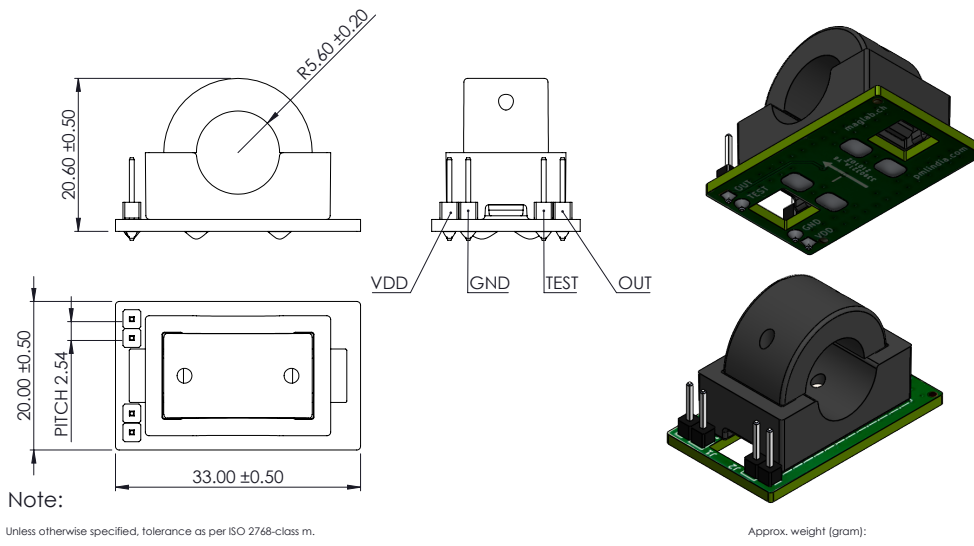
11 Typical Performance

11.1 CO-10-SF-A-201



12 Dimensions

Dimensions are expressed in [mm]



13 Disclaimer

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