

## Melexis Development Kit

MLX91209

Rev 001 – 25/05/18

### 1. Description

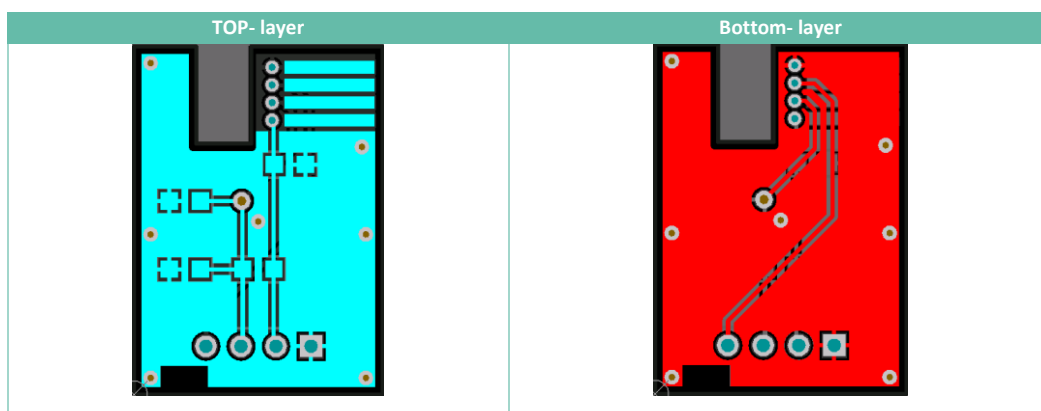
The development kit provides the needed information and components to develop a current sensor based on the MLX91209. The main goal is to show the functionalities and the features of the part in a simple and effective way.

The kit includes:

- 5 samples MLX91209-CA;
- 3 separated bare PCBs;
- 3 ferromagnetic cores (Supra 50 SP);

Datasheet and Application Note can be found on [www.melexis.com](http://www.melexis.com)

### 2. MLX91209 EVB1 Layout

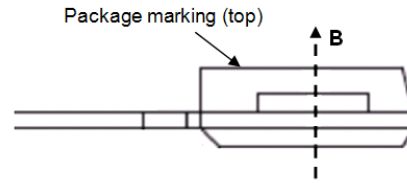


### 3. Sensor sensitivity

# MLX91209 Development Kit

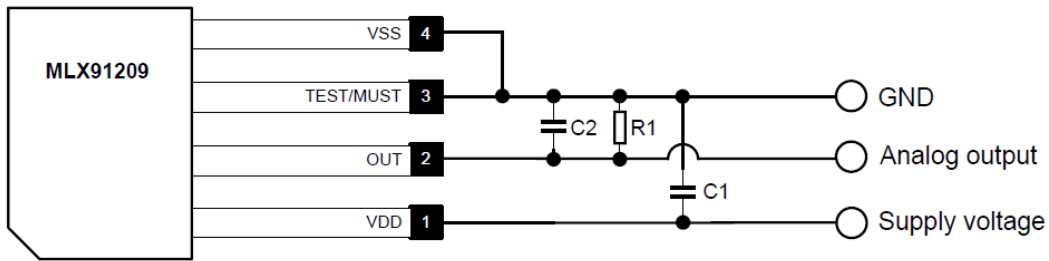
MLX91209-VA current sensors are factory calibrated to a default sensitivity of **50 mV/mT**. MLX91209 is fully programmable at customer level within a range 5-150 mV/mT. The “positive” direction field is from the bottom to the top of the package (see drawing below).

Product Code	Sensitivity Range (Typ.)
MLX91209 CA	5-150 mV/mT (50mV/mT)



## 4. Sensor pin-out and connections

### Diagnostic low



### Diagnostic high

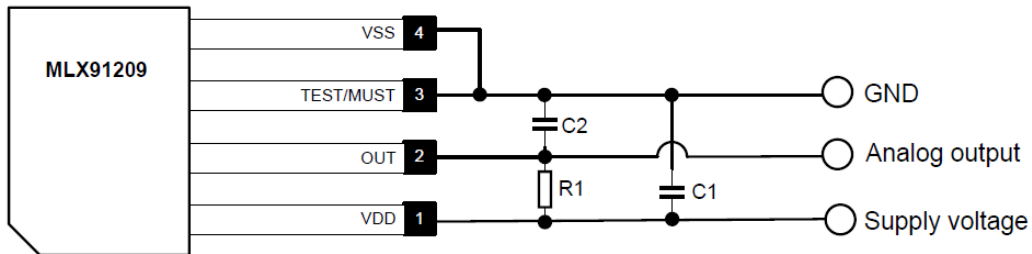


Figure 1: Connections schematics for MLX91209

Pin #	Name	Type	Function
1	VDD	Supply	Supply Voltage
2	OUT	Analog	Current Sensor Output
3	TEST/MUST	Digital	Test and Factory Calibration
4	VSS	Ground	Supply Voltage

Table 1: Pin out description

(1) 10nF is recommended for better EMC and ESD performance

Part	Description	Value	Unit
C1	Supply capacitor, EMI, ESD	100	nF
C2	Decoupling, EMI, ESD	2-10 <sup>(1)</sup>	nF
R1	Pull up or pull down capacitance	6-100	kΩ

Table 2: Capacitors typical values

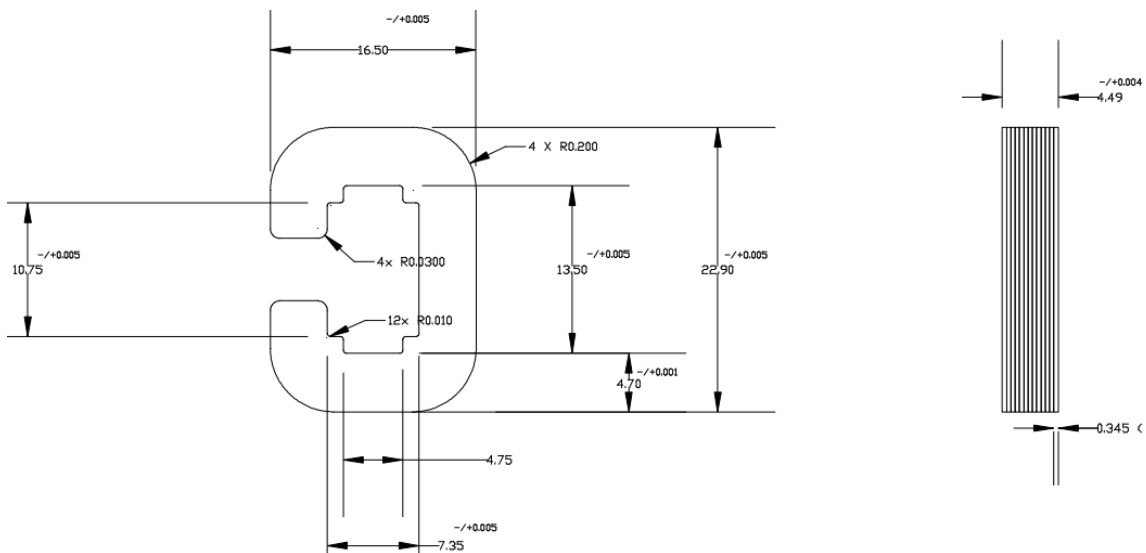
## 5. Ferromagnetic cores specifications

### 5.1. Material properties

- Supra 50 (NiFe 50%)
- Permeability = 100000
- Saturation flux density  $B_s > 1T$
- Hysteresis = 2.8 A/m
- Curie temperature: 450 deg C

### 5.2. Geometry

All dimensions are in mm. Airgap is 5 mm.



### 5.3. Shielding performance

Simulation	Recommendation
	<ul style="list-style-type: none"> <li>• An external stray field (1mT) along the horizontal axis is applied.</li> <li>• The flux lines are deviated through the bottom part of the shield</li> <li>• The parasitic field seen at the sensor location is <b>&lt; 5 uT</b></li> <li>• This implies that the shielding factor is <b>&gt;200</b></li> </ul>

## 5.4. Ferromagnetic core supplier

Melexis partnered with MagLab and PML India for ferromagnetic material supply.



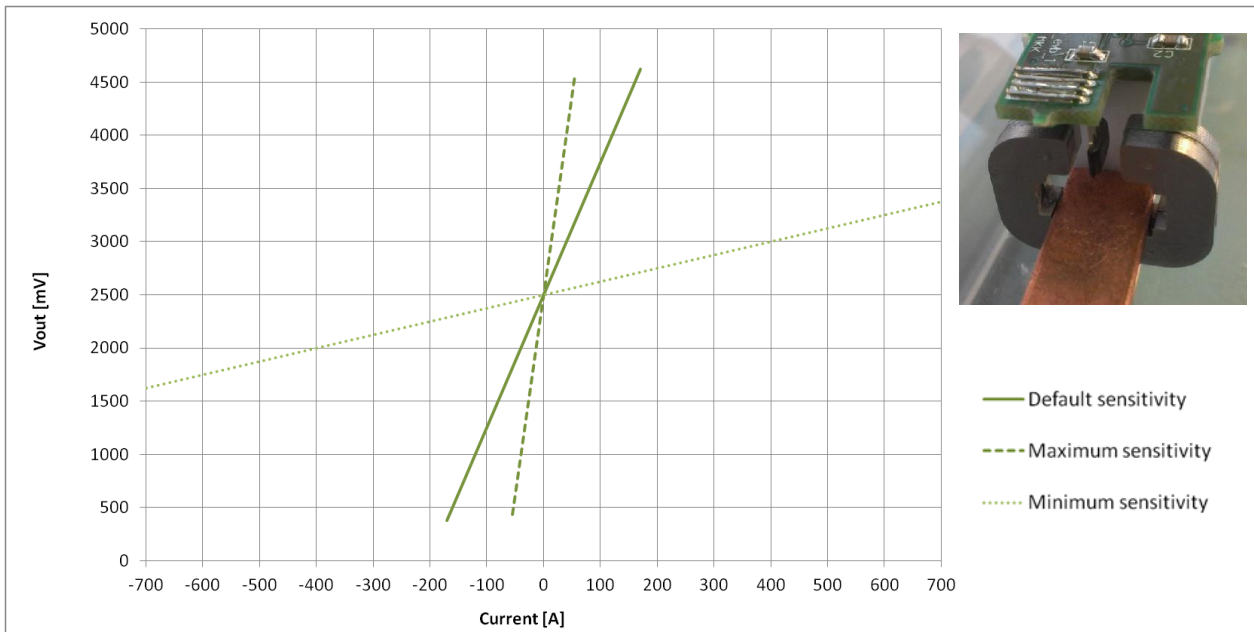
[www.maglab.ch](http://www.maglab.ch)



[www.pmlindia.com](http://www.pmlindia.com)

Recently, PML and maglab signed an exclusive collaboration in the field of contactless current sensing. This cooperation between maglab and PML offers an efficient and cost-effective solution for customers requiring magnetic cores. Maglab takes care of the engineering side, while PML manufactures the products to our specifications.

## 6. Typical output



	Core air gap (5 mm)			
	<b>91209CA</b> default sensitivity 50 mV/mT	<b>91209CA</b> calibrated with max sensitivity 150 mV/mT	<b>91209CA</b> calibrated with min sensitivity 5 mV/mT	<b>91209CA</b> Typical inverter application 10 mV/mT
Sensitivity [mV/A]:	13	40	1.25	2.5
Current range [A]:	+/- 160	+/- 50	+/- 1600*	+/- 800

\* The 5 mm magnetic core starts to saturate at 700A => use larger airgap for higher currents.