

DVK91220 – SOIC8

User Guide

Contents

1. Scope and Development Kit content	1
2. Key features	2
2.1. Sensor	2
2.2. PCB.....	2
3. Hardware.....	3
3.1. PCB layout	3
3.2. PCB characteristics.....	3
3.3. Schematics	4
3.4. Pins Designation.....	4
3.5. Bill of Material.....	5
4. MLX91220KDC-ABF-050	5
4.1. Characteristics.....	5
4.2. Sensor output.....	6
5. Disclaimer.....	8

1. Scope and Development Kit content

The DVK91220 provides all the needed components to evaluate the performances and the functionalities of MLX91220 integrated current sensor family. It includes:

- A ready-to-use evaluation board provided with **MLX91220KDC-ABF-050** for a quick start.
- An evaluation board with no IC to be customized with the reference you need. Please refer to the datasheet for all available product codes.

DVK91220 – SOIC8

User Guide

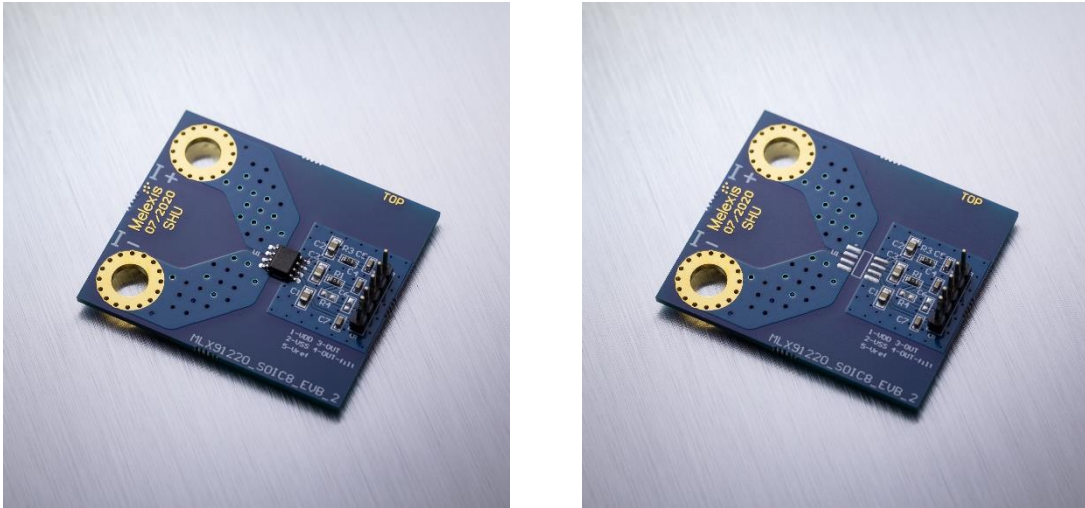


Figure 1: Content of DVK91220-SOIC8: A ready-to use EVB with MLX91220KDC-ABF-050 (left) and a customizable EVB (right)

2. Key features

2.1. Sensor

- Isolated current measurement demonstrator factory calibrated for 50 A
- 5 V of working supply
- $2.4kV_{RMS}$ of voltage isolation
- Stray field immune due to differential measurement
- $< 3 \mu s$ response time

2.2. PCB

- PCB adapted to high current measurements up to 30 Arms continuous
- Ground Layer and decoupling capacitors for high EMC performances
- Placeholder for output filter implementation

User Guide

3. Hardware

3.1. PCB layout

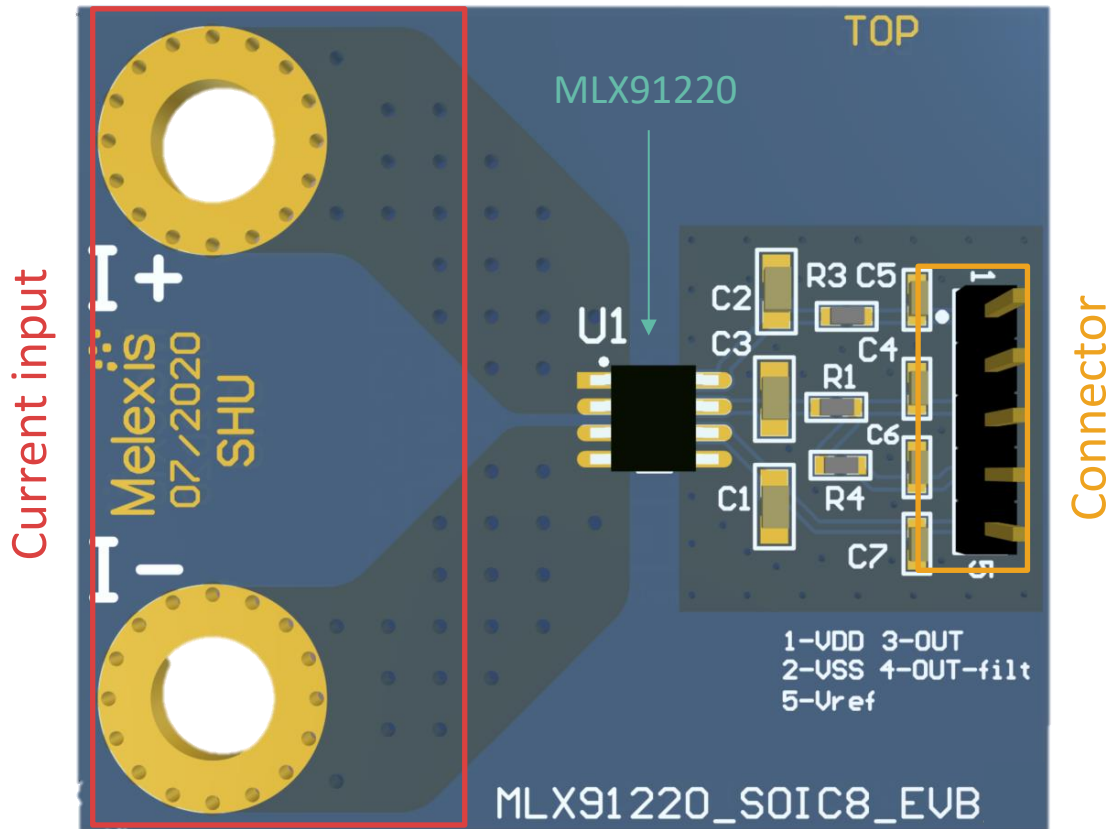


Figure 2: Layout of the EVB91220 SOIC8

3.2. PCB characteristics

The MLX91220_SOIC8_EVB is manufactured with two 105 μm copper layers and an ENIG Surface finishing.

Please note that the revision 2 of the board (MLX91220_SOIC8_EVB_2) has two 70 μm copper layers and no ENIG surface finishing. This version can still be used for 35 Arms continuous current at 25°C but the thermal management will be less efficient.

User Guide

3.3. Schematics

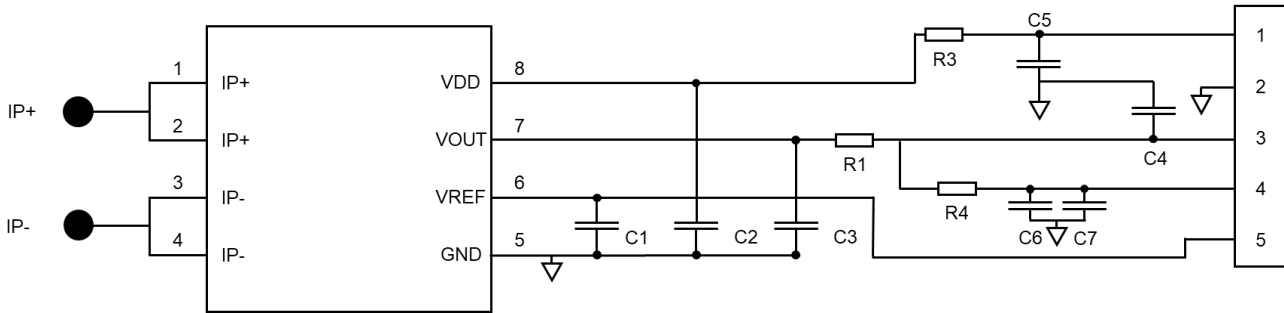


Figure 3: Schematics of the EVB91220 - SOIC8

3.4. Pins Designation

Table 1: MLX91220 pin designation

PIN	Pin	Function	Type
1	IP+	Primary Current Path Input	Analog
2			
3	IP-	Primary Current Path Output	Analog
4			
5	V _{SS}	Ground Voltage	Ground
6	V _{REF}	Reference Voltage	Analog
7	V _{OUT}	Output Voltage	Analog
8	V _{DD}	Supply Voltage	Supply

Table 2: Connector pins designation

Pin	Function
1	Supply Voltage
2	Ground Voltage
3	Output Voltage
4	Filtered Output Voltage (not populated)
5	Reference Voltage

User Guide

3.5. Bill of Material

Part	Description	Value
C1	Reference pin decoupling capacitor EMI, ESD	47 nF
C2	Supply capacitor, EMI , ESD	47 nF
C3	Output pin Decoupling capacitor EMI, ESD	4.7 nF
C4, C5, C7	Decoupling capacitor EMI, ESD	1 nF
R1, R3	Connection to header	0 Ω
R4, C6	Extra RC filter	TBD

4. MLX91220KDC-ABF-050

4.1. Characteristics

The Development Kit contains two PCBs. One is not populated. Please refer to the datasheet of MLX91220 or MLX91221 to find the adapted product for your application.

One PCB is populated with MLX91220KDC-ABF-050. Table 3 describes its configuration. Please refer to the datasheet for the full specifications. Figure 4: Output of MLX91220KDC-ABF-050

DVK91220 – SOIC8

User Guide

Table 3: MLX91220KDC-ABF-050 configuration

Product code	Legend
MLX91220	5V Supply Integrated Current Sensor
K	- 40°C to 125°C ambient temperature
DC	SOIC-8 NB (Narrow Body – 150mils) package
A	Die version
B	Bipolar sensing. The sensor provides a symmetrical output around the 0A point which is set at V_{ref}
F	Fixed mode output
50	50 A at Full Scale current measurement (corresponding to 2V excursion from VOQ). Corresponds to a sensitivity of 40 mV/A

4.2. Sensor output

Figure 4 displays the expected output of the sensor and V_{ref} value. The measured current can be retrieved by the following formula:

$$I = \frac{V_{out} - V_{ref}}{S}$$

Where $S = 40 \text{ mV/A}$.

Output of MLX91220 [V]

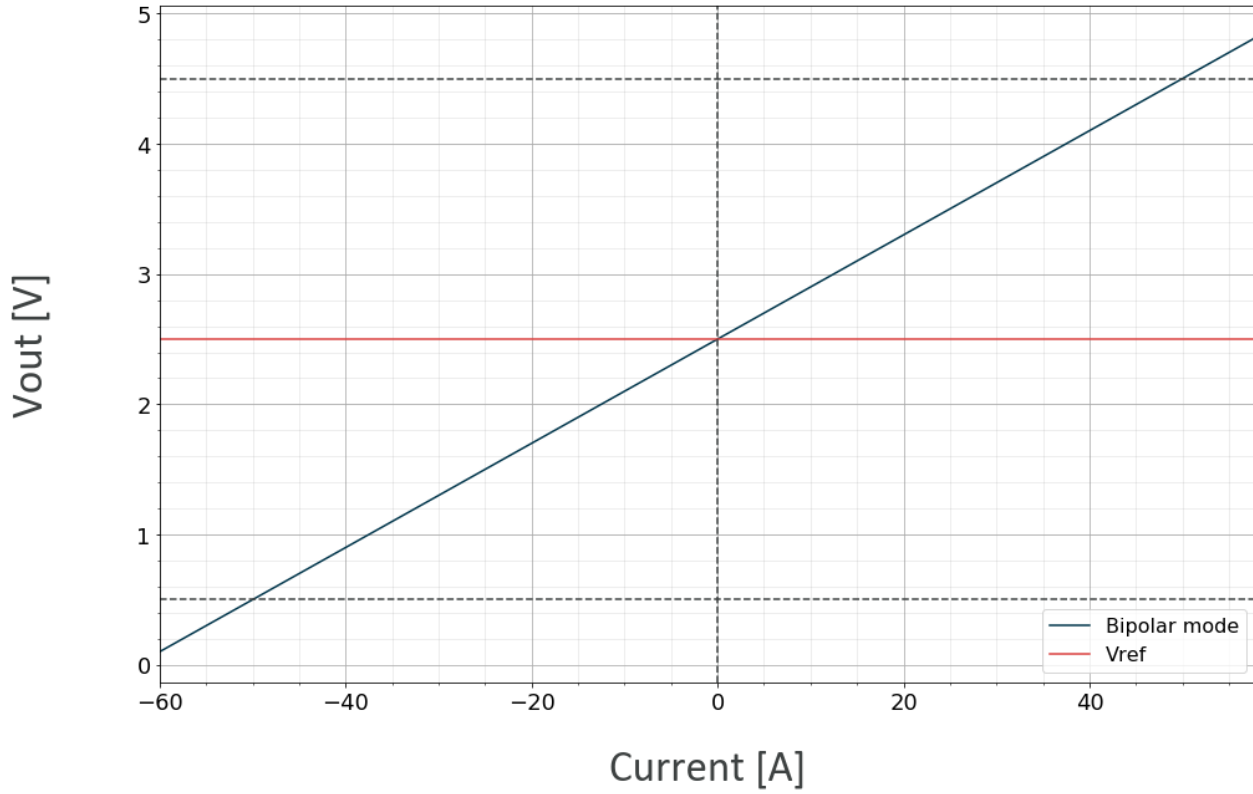


Figure 4: Output of MLX91220KDC-ABF-050

User Guide

5. Disclaimer

The content of this document is believed to be correct and accurate. However, the content of this document is furnished "as is" for informational use only and no representation, nor warranty is provided by Melexis about its accuracy, nor about the results of its implementation. Melexis assumes no responsibility or liability for any errors or inaccuracies that may appear in this document. Customer will follow the practices contained in this document under its sole responsibility. This documentation is in fact provided without warranty, term, or condition of any kind, either implied or expressed, including but not limited to warranties of merchantability, satisfactory quality, non-infringement, and fitness for purpose. Melexis, its employees and agents and its affiliates' and their employees and agents will not be responsible for any loss, however arising, from the use of, or reliance on this document. Notwithstanding the foregoing, contractual obligations expressly undertaken in writing by Melexis prevail over this disclaimer.

This document is subject to change without notice, and should not be construed as a commitment by Melexis. Therefore, before placing orders or prior to designing the product into a system, users or any third party should obtain the latest version of the relevant information. Users or any third party must determine the suitability of the product described in this document for its application, including the level of reliability required and determine whether it is fit for a particular purpose.

This document as well as the product here described may be subject to export control regulations. Be aware that export might require a prior authorization from competent authorities. The product is not designed, authorized or warranted to be suitable in applications requiring extended temperature range and/or unusual environmental requirements. High reliability applications, such as medical life-support or life-sustaining equipment or avionics application are specifically excluded by Melexis. The product may not be used for the following applications subject to export control regulations: the development, production, processing, operation, maintenance, storage, recognition or proliferation of:

- 1. chemical, biological or nuclear weapons, or for the development, production, maintenance or storage of missiles for such weapons;*
- 2. civil firearms, including spare parts or ammunition for such arms;*
- 3. defense related products, or other material for military use or for law enforcement;*
- 4. any applications that, alone or in combination with other goods, substances or organisms could cause serious harm to persons or goods and that can be used as a means of violence in an armed conflict or any similar violent situation.*

No license nor any other right or interest is granted to any of Melexis' or third party's intellectual property rights.

If this document is marked "restricted" or with similar words, or if in any case the content of this document is to be reasonably understood as being confidential, the recipient of this document shall not communicate, nor disclose to any third party, any part of the document without Melexis' express written consent. The recipient shall take all necessary measures to apply and preserve the confidential character of the document. In particular, the recipient shall (i) hold document in confidence with at least the same degree of care by which it maintains the confidentiality of its own proprietary and confidential information, but no less than reasonable care; (ii) restrict the disclosure of the document solely to its employees, agents, professional advisors and contractors for the purpose for which this document was received, on a strictly need to know basis and providing that such persons to whom the document is disclosed are bound by confidentiality terms substantially similar to those in this disclaimer; (iii) use the document only in connection with the purpose for which this document was received, and reproduce document only to the extent necessary for such purposes; (iv) not use the document for commercial purposes or to the detriment of Melexis or its customers. The confidentiality obligations set forth in this disclaimer will have indefinite duration and in any case they will be effective for no less than 10 years from the receipt of this document.

This disclaimer will be governed by and construed in accordance with Belgian law and any disputes relating to this disclaimer will be subject to the exclusive jurisdiction of the courts of Brussels, Belgium.

The invalidity or ineffectiveness of any of the provisions of this disclaimer does not affect the validity or effectiveness of the other provisions. The previous versions of this document are repealed.

Melexis © - No part of this document may be reproduced without the prior written consent of Melexis. (2022)

IATF 16949 and ISO 14001 Certified

**For the latest version of this document, visit
www.melexis.com/DVK91220**