

Melexis

INSPIRED ENGINEERING

1st/July/2021

James Wang(jaw@Melexis.com)

MLX91218 - MLX91219 Launch

Current sensor ICs for 200-2000+A applications
with High SNR & OCD function



Part 1: Melexis Introduction

Part 2: Current Sensor Application

Part 3: Melexis Current Sensor Solution

Part 4: Summary

Part 1: Melexis Introduction

The Melexis portfolio



Automotive



Transportation



Smart applications



Smart buildings

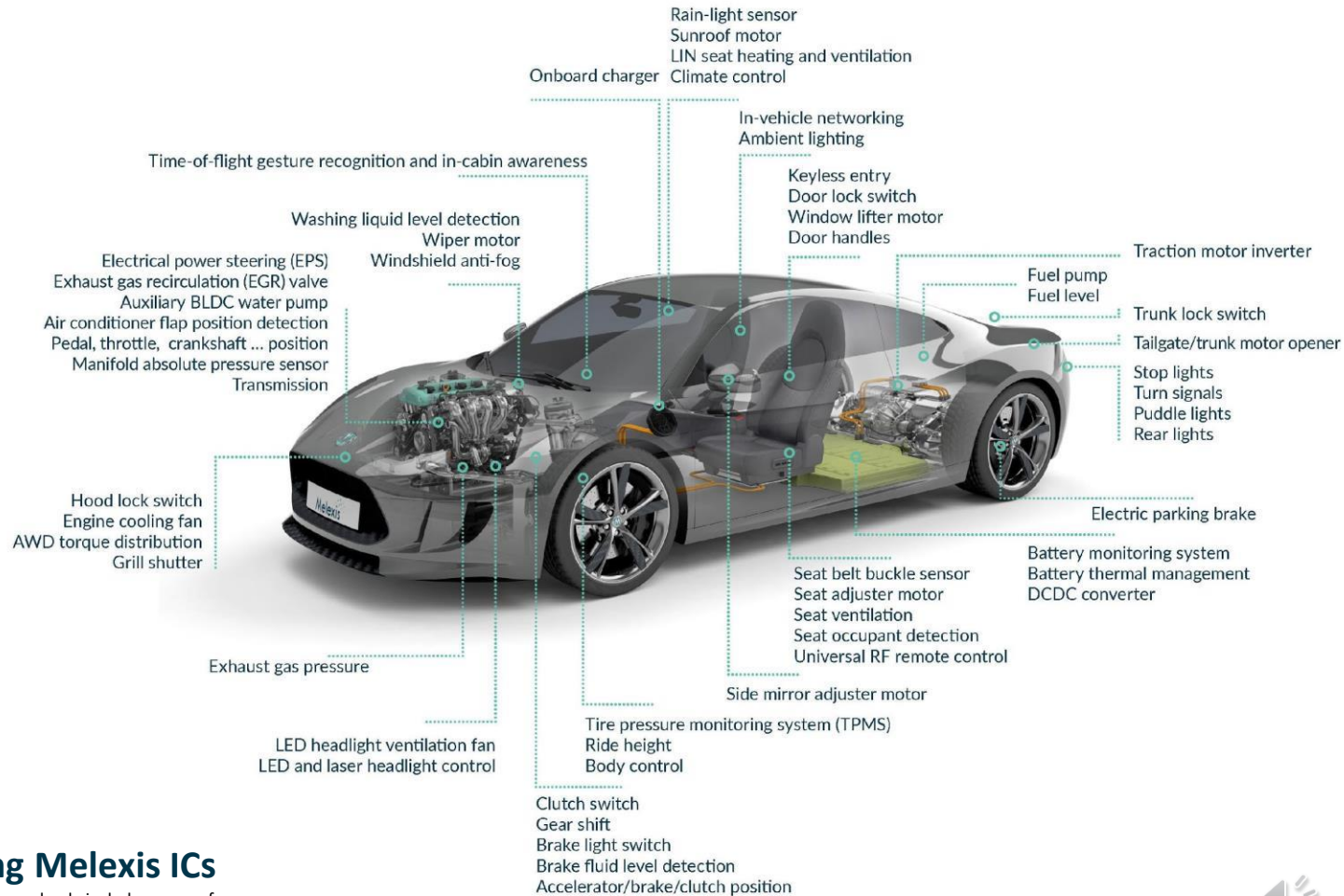


Industry



Medical

13 chips in every new car



Applications containing Melexis ICs

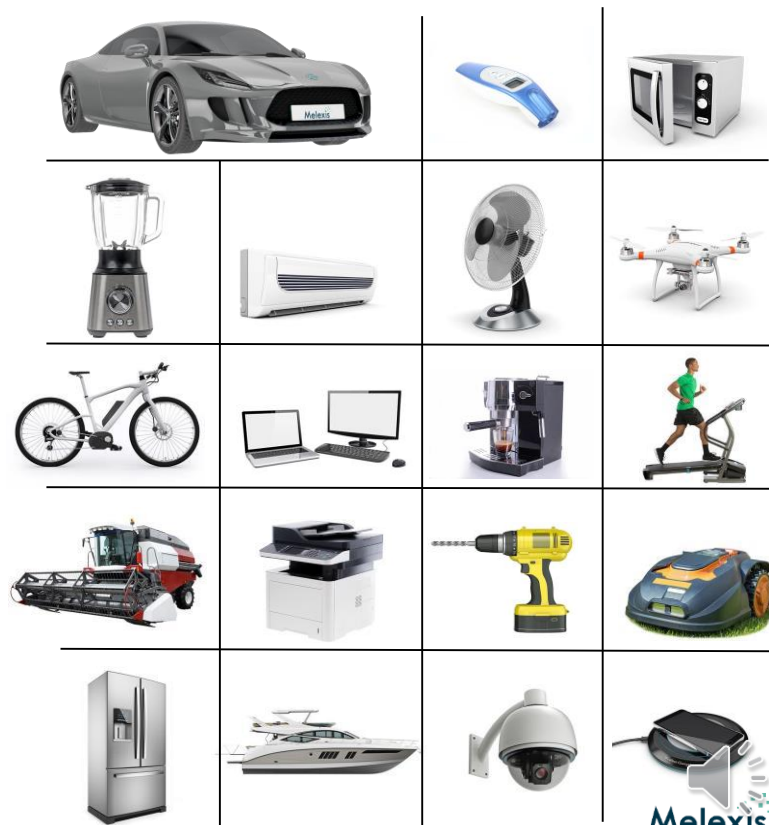
Disclaimer: Please note this list is not exhaustive and only includes some of the most common applications containing Melexis ICs.

The content of this presentation is CONFIDENTIAL & PROPRIETARY. ALL Rights Reserved.

Melexis supplied > 1.3 billion ICs worldwide in 2020



- Magnetic position sensors
- Inductive position sensors
- A** Current sensors
- Latch & switch
- Embedded drivers
- Smart drivers
- Pressure sensors
- Tire monitoring sensors
- Temperature sensors
- Optical sensors
- Sensor interfaces
- Embedded lighting

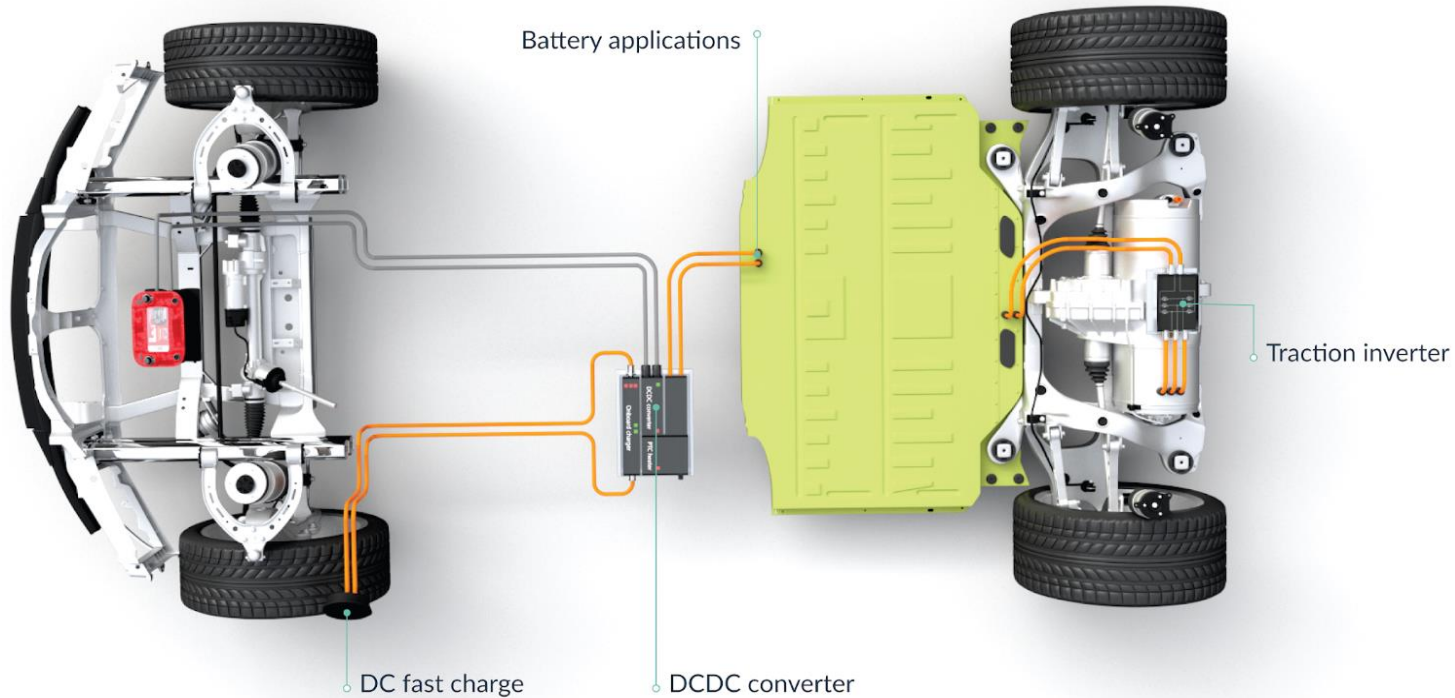


Part 2: Current Sensor Application

Current Sensor Application

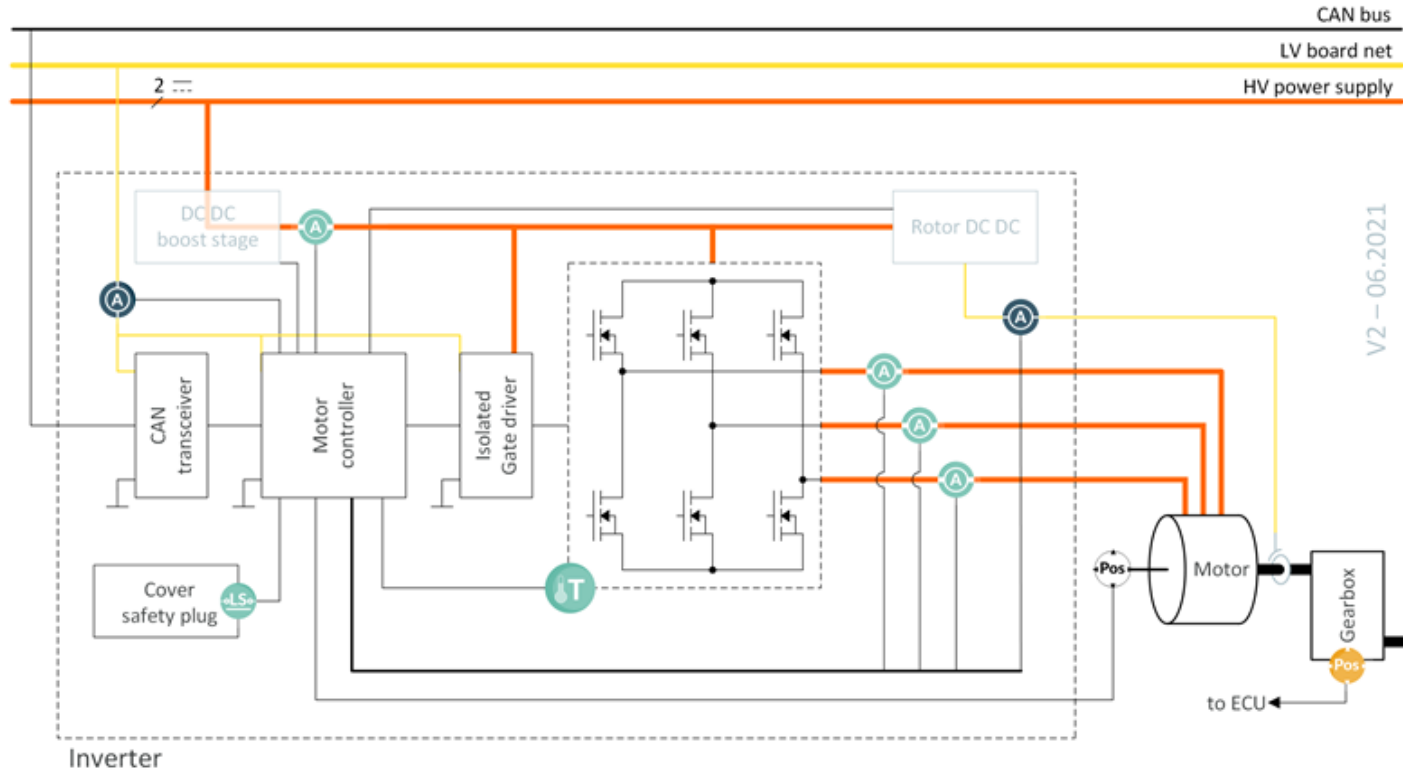


Automotive (H)EV powertrain applications

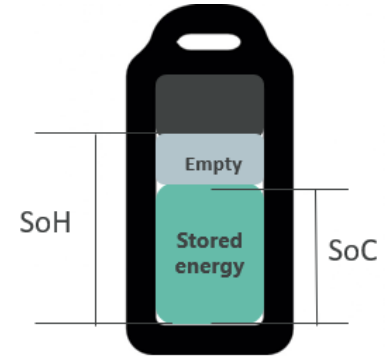
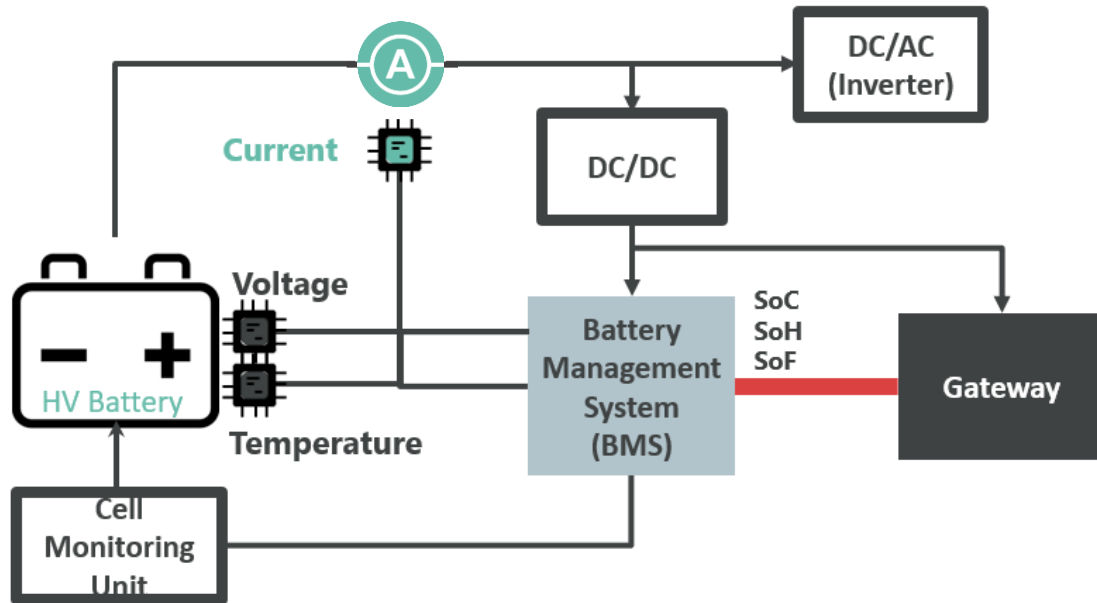


- BMS
- DC/DC converter
- On-Board Charger
- PTC Heater
- Traction Inverter

Traction Inverter



Battery Management System(BMS)



Non-Automotive Application



- **DC Fast Charger**

- Made out of multiple 15 ... 30KW chargers
- 45KW(125A), 240KW(400A), 400KW(400A?)



- **AC Wallbox**

- 3.3KW ... 6.6KW(1-Phase)
- 11KW ... 22KW(3-Phase)

Part 3: Melexis Current Sensor Solution

Product Families

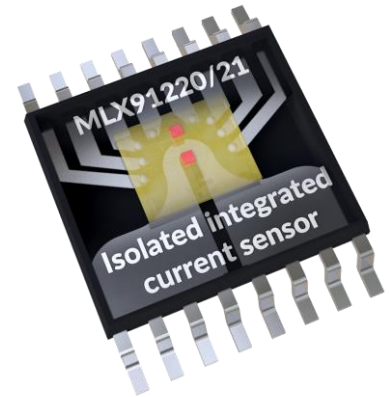
3 Families – New recent addition



Conventional Hall

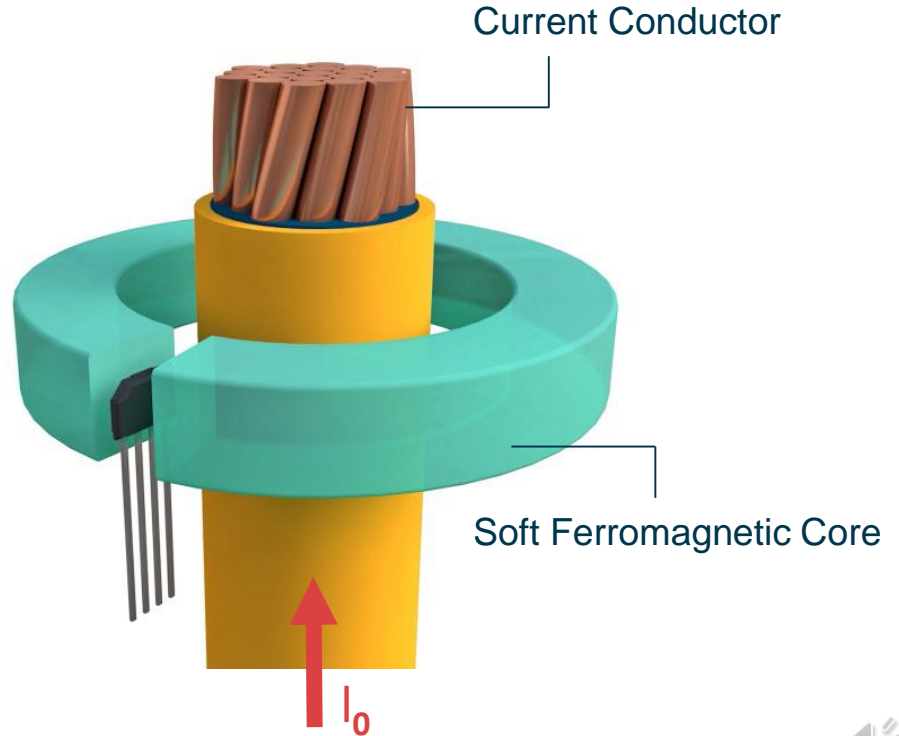
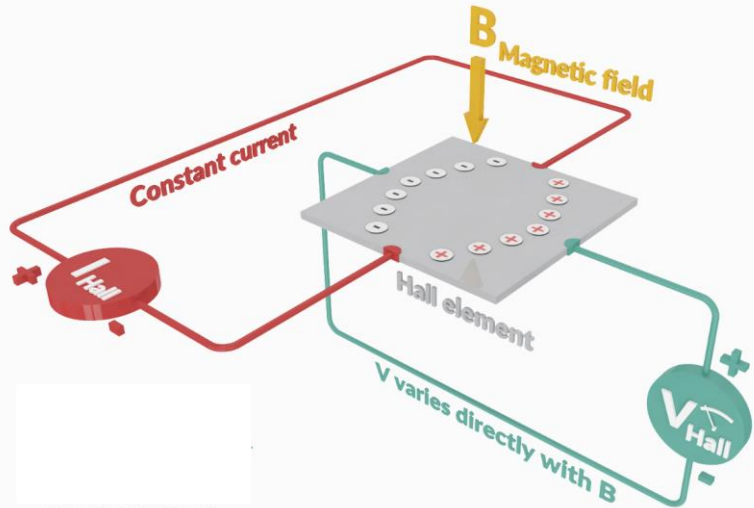


IMC-Hall®



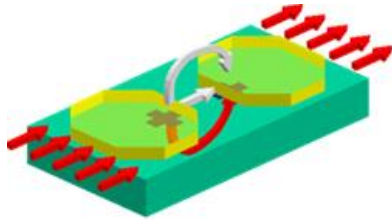
Integrated

Conventional Current Sensor Solution



Conventional Hall Current sensors IC, with Hall plate

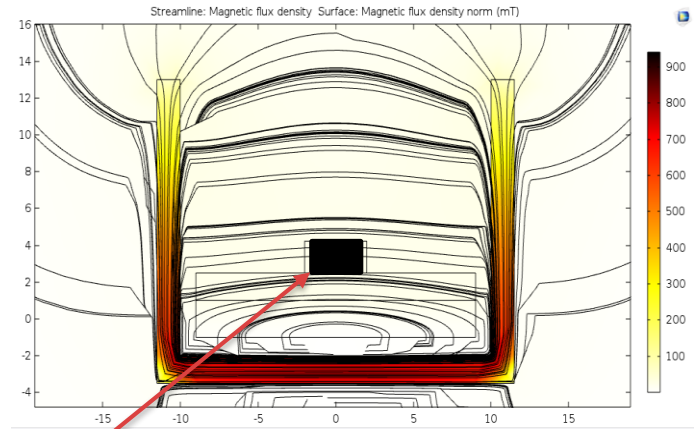
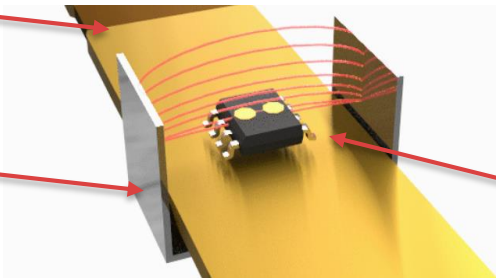
IMC-HALL® Current Sensor Solution



IMC-Hall®

Bus Bar

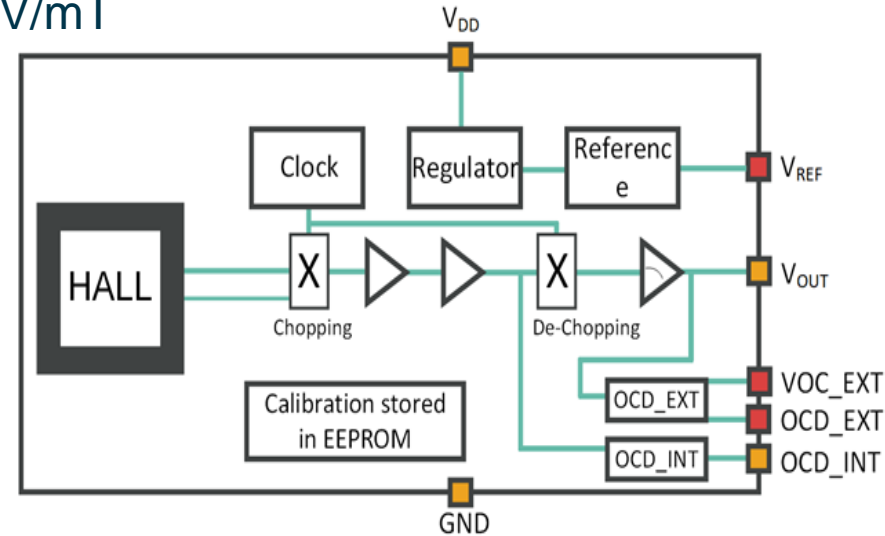
U-shield



Melexis Current Sensor Location

MLX91219 Features

- Factory selected 5V or 3.3V supply
- Measurement range from ± 12 to 500mT
- Programmable sensitivity from 4 to 105mV/mT
- High speed AC and DC current sensing
 - 400KHz bandwidth
 - 2 μ s response time
- Very low thermal drift for wide range
 - Offset drift (<5mV)
 - Sensitivity drift (<1%)
- High linearity down to $\pm 0.5\%$ full scale
- Fast dual overcurrent detection
 - Internal threshold
 - External threshold(Only SOIC8)
- AEC-Q100 – Grade 0 Automotive Qualification

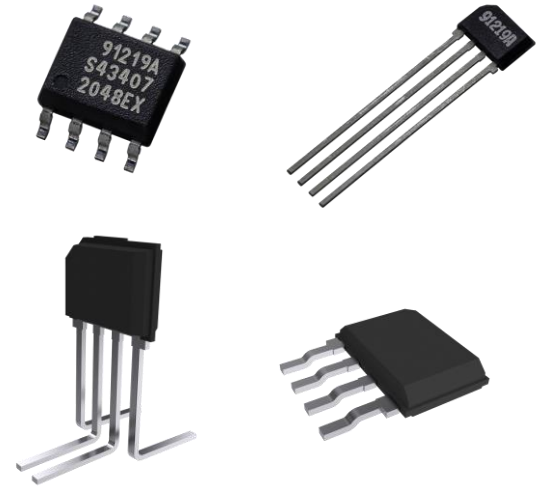


■ SOIC8 only

■ SOIC8 & SIP4-VA

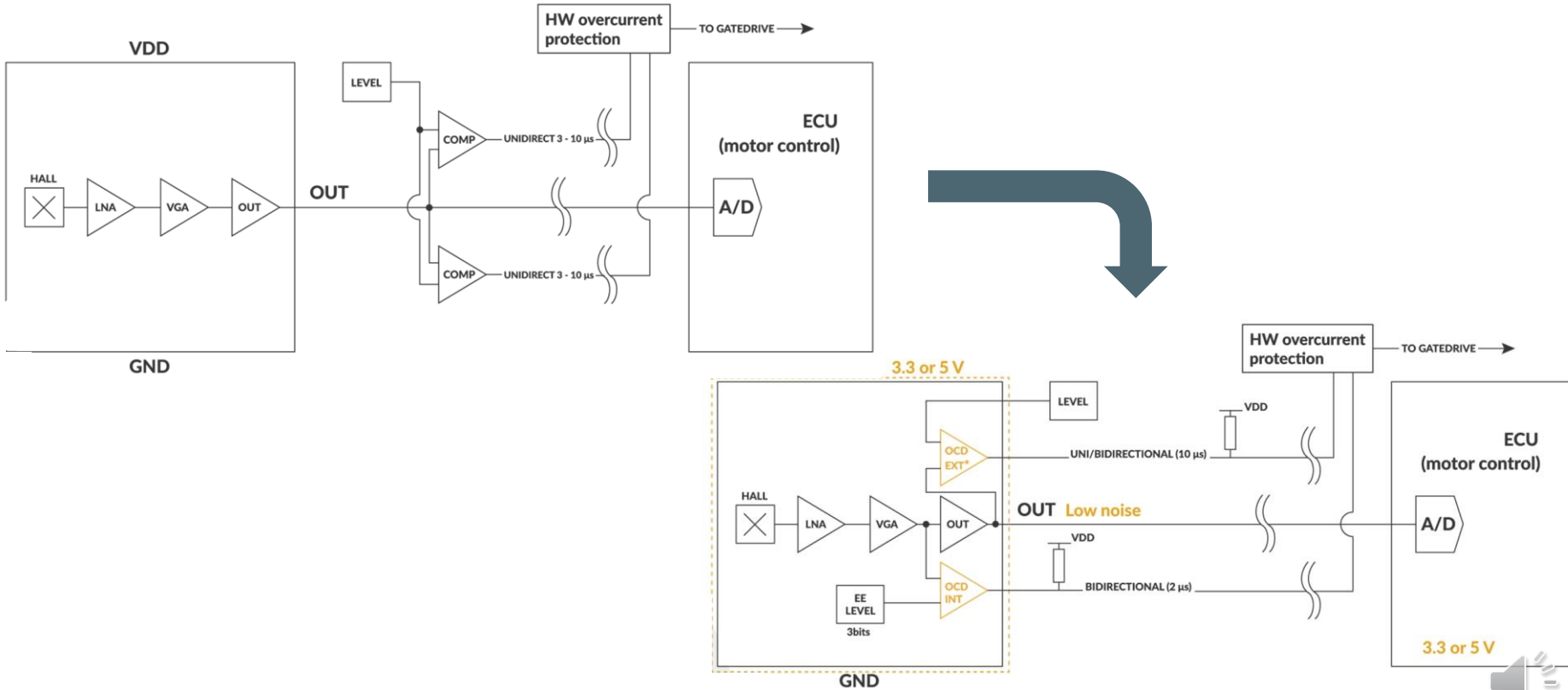
MLX91219 Package Information

- Package Code
 - VA for SIP-4 package
 - DC for SOIC-8 package – coming soon
- Option code for MLX91219 Trim and Form
 - xxA-xxx for straight leads
 - xxR-xxx for 2x 90deg lead bending, 5.34mm height PCB to dambar
 - xxS-xxx for 2x 90deg lead bending, 3.7mm height to dambar
 - xxZ-xxx for Z-shape



MLX91219 Package Family

MLX91219 OCD Function



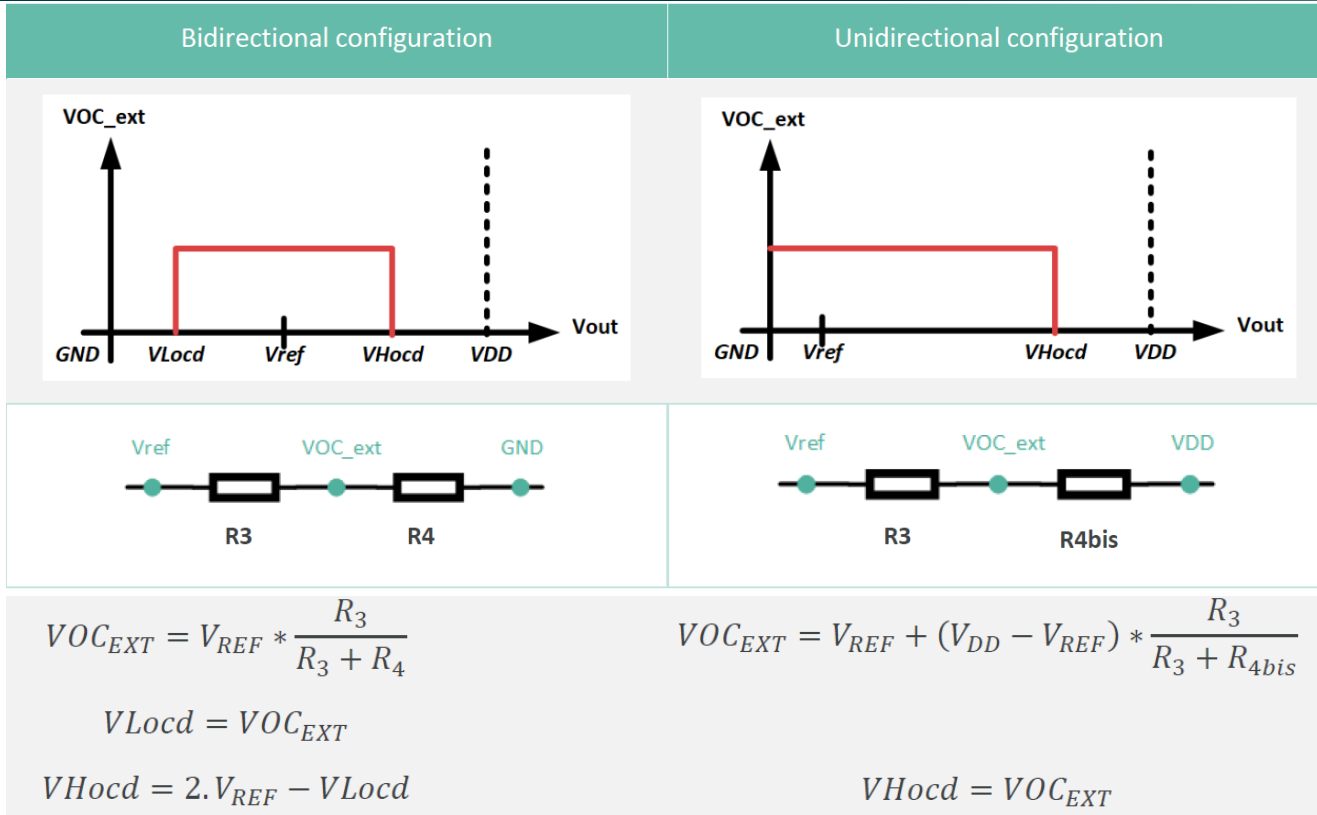
MLX91219 OCD Function Features

Parameter	OCD _{INT}		OCD _{EXT}
Overcurrent effect	OCD _{INT} pin active low (falling edge)		OCD _{EXT} pin active low (falling edge)
Polarity	Bidirectional OCD		Unidirectional or bidirectional
Availability	SIP4 VA, SOIC8 package		SOIC8 package only
Threshold definition	EEPROM (internal)		Resistive divider on VOC _{EXT}
Threshold range (4bits)	20 .. 200%FS		10 .. 100%FS
Accuracy	~±10%		~±7%
Response time	1.4μs	2.1μs	~10μs
Setup time	~1μs		>10μs
Hold time	7μs	14μs	~10μs

MLX91219 Internal Overcurrent Detection Principle

Ordering Code	Sensitivity [mV/mT]	OCD _{INT} Factory trimmed Threshold Level [%FS]	OCD _{INT} Factory trimmed Threshold Level [mT]
MLX91219LVA-AAA-500	7	128 %FS	366 mT
MLX91219LVA-AAA-501	10	128 %FS	256 mT
MLX91219LVA-AAA-502	15	128 %FS	170 mT

MLX91219 External Overcurrent Detection Principle



MLX91218 Features

- Factory selected 5V or 3.3V supply
- Measurement range from ± 200 to $>2000A$
- High speed AC and DC current sensing
 - 400KHz bandwidth
 - 2 μ s response time
- Very low thermal drift for wide range
 - Offset drift (<5mV)
 - Sensitivity drift (<1%)
- High linearity down to $\pm 0.3\%$ full scale
- Fast dual overcurrent detection
 - Internal threshold
 - External threshold(Only SOIC8)
- AEC-Q100 – Grade 0 Automotive Qualification
- SOIC-8

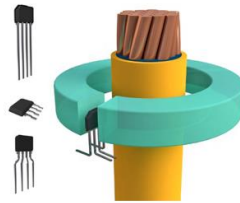


The background of the slide is a light gray circuit board pattern with various traces, pads, and component footprints. A dark teal horizontal bar is positioned in the lower-middle section of the slide, containing the text 'Part 4: Summary'.

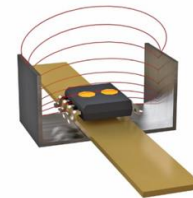
Part 4: Summary

Summary

The MLX91218 (IMC-HALL®) and the MLX91219 (Conventional Hall) are high-speed high-accuracy current sensor simplifying automotive inverter/converter module designs with an integrated dual overcurrent detection (OCD) functionality, a flexible supply 3.3V/5V and an improved SNR.



Conventional Hall

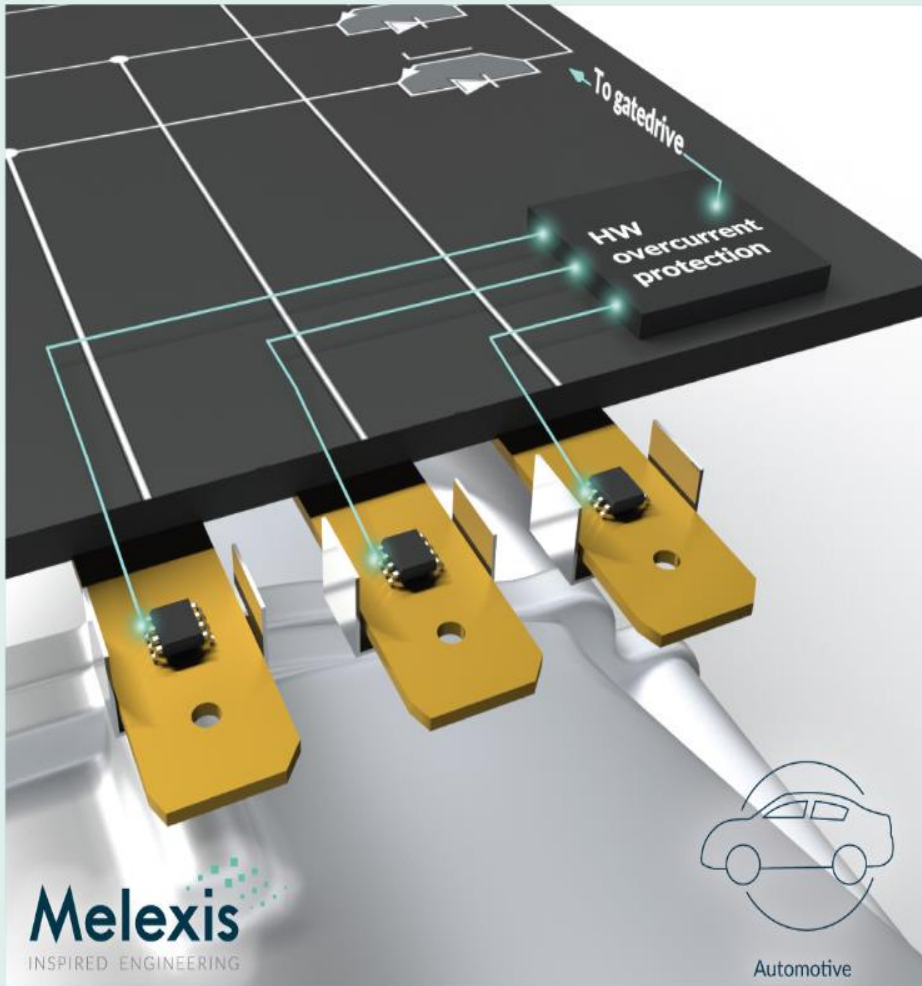


IMC-Hall®



Integrated





- Dual overcurrent detection
- Flexible supply voltage
- High speed
- Low noise

400 kHz CURRENT SENSOR IC WITH DUAL OVERCURRENT DETECTION



MLX91218
IMC-HALL®



MLX91219
CONVENTIONAL HALL



Melexis

INSPIRED ENGINEERING

The information contained herein is proprietary and/or confidential information of Melexis and the information or the use of such information does not grant, explicitly or implicitly, to any party any patent rights, licenses, or any other intellectual property rights, whether with regard to such information itself or anything described by such information.

The information is believed to be correct and accurate. Melexis disclaims (i) any and all liability in connection with or arising out of the furnishing, performance or use of the technical data or use of the product(s) as described herein (ii) any and all liability, including without limitation, special, consequential or incidental damages, and (iii) any and all warranties, express, statutory, implied, or by description, including warranties of fitness for particular purpose, non-infringement and merchantability.

Products sold by Melexis are subject to the terms and conditions as specified in the Terms of Sale, which can be found at

Melexis NV © - No part of this document may be reproduced without the prior written consent of Melexis. (2021)