maglab Application Example

UCR5.5-T

Closed U-Shape Ni-Fe Soft Ferromagnetic Shield for Contactless Current Sensing

Features

- ±50Amps Current Range
- Highly Linear
- Very Low Hysteresis
- Up to Ø 6mm Conductor

Applications

- Contactless Current Sensing
- Smart Metering
- Power Converters
- Solar Industry
- Battery Management
- Hybrid Electric Vehicle

1 Description

The UCR5.5-T is a soft ferromagnetic shield for use in conjunction with a contactless current sensor i.e. IMC-Hall current sensor. It shields the sensor from parasitic magnetic fields caused by nearby conductors or other magnetic field sources while at the same time it enhances sensitivity and signal-to-offset ratio of the sensor.

The linear range of conductor current is ±50Amps. Saturation starts at |I| >100Amps.

Superior material characteristics and annealing process leads to very high linearity NL<0.5%FS.

2 Illustration

3 Magnetic Characteristics

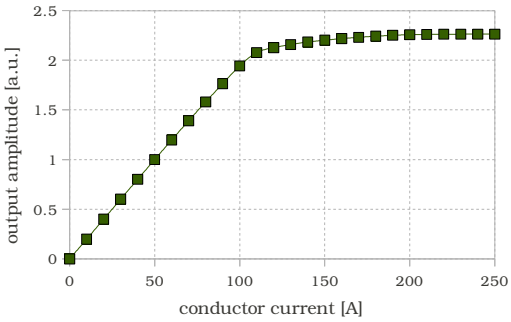
Parameter	Condition	Min	Typ	Max	Unit
Conductor Current	Inside shield	±5	±15	±50	A
Non-Linearity	±15A FS	0	0.5	1	%FS
Saturation Current			100		A
Current Hysteresis	±20A excitation ±15A FS		0.04 0.15		A %FS
Magnetic Hysteresis	±100A excitation		±50	±120	uT
Saturation Flux Density			1.1		T
Stray Flux Suppression	In sensitive direction	36	40	50	dB

4 Absolute Maximum Ratings

Parameter	Value
Storage Temperature Range	-150degC...250 degC
Operation Temperature Range	-40degC...150degC
Magnetic Flux Density	2 T

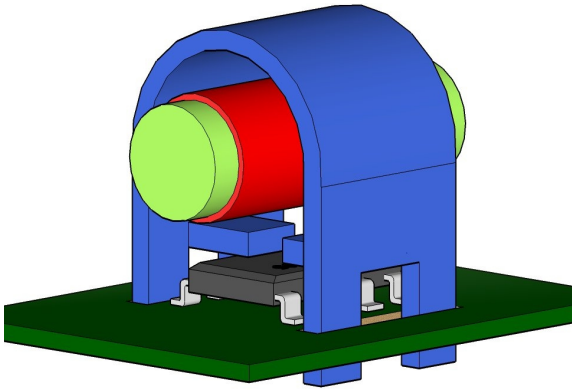
5 Typical Performance Graphs

Shield Saturation



6 Application Example

Current Sensing with the Melexis MLX91206CAL Hall Sensor:



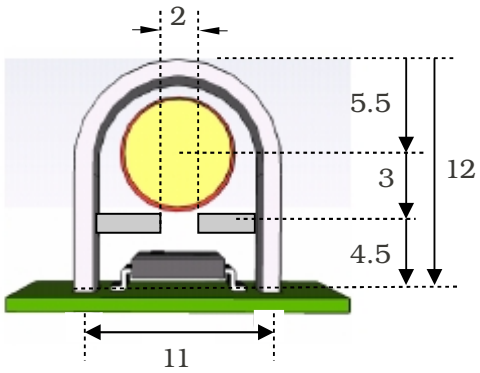
6.1 Specification

Parameter	Value
Conductor Current Range	±10 … ±50 (*) Amps
Supply Voltage	5 V
Sensitivity	40 … 200 (*) mV/A
Output Voltage	±2V
Non-Linearity	±0.3%FS

(*) in reference to the programmable sensitivity of Melexis MLX91209CAL Hall sensor

7 Mechanical Specification

Unit: mm



Material Thickness = 0.8 mm
Material Composition: Ni / Fe

8 Revision History

Rev.	Author	Date	Comments
001	HBR	31 May 2011	Initial creation
002	HBR	3 July 2013	Minor update
003	HBR	15 July 2013	Minor update