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Low-cost 50 A current transducers improve on shunt measurement techniques

Key Points:

- **Open Loop Hall-effect devices measure up to 50A_{RMS} AC, DC or pulsed current**
- **Fast response time and high accuracy, with low offset and gain drifts**
- **Wide temperature range of -40 to +105 °C**
- **Surface-mount or through-hole package design provides high insulation**

Today, at the SPS/IPC/Drives Exhibition (Nuremberg, Germany) LEM introduces its new HLSR series of current transducers, that provide a cost-effective and technically superior alternative to resistive shunt/optocoupler configurations for insulated current measurements up to 50 Amps. The five new HLSR transducers will satisfy application requirements in, for example, industrial inverters and motor drives; switch-mode and uninterruptible power supplies; specialist power supplies such as welding units; air conditioning; home appliances; but also in renewable-energy systems, for example, in solar combiner boxes and in solar inverters to track the maximum-power-point (MPPT).

LEM's HLSR series uses open-loop Hall-effect current sensing technology, to measure AC, DC or pulsed currents with nominal values of 10, 20, 32, 40 or 50 A_{RMS}. LEM's proven expertise in open-loop Hall-effect technology allows these new devices to achieve a response time of only 2.5 µsec, with very low gain and offset drift over their operating temperature range of -40 to +105 °C.

HLSR transducers deliver their output as an analogue voltage proportional to the primary measured current. In most applications, this voltage will be converted to a digital value by an analogue-to-digital converter: LEM has equipped the HLSR with an internal voltage reference of 1.65 or 2.5 V made available on a dedicated pin for use by an external device such as A/D converter, for example, or designers can choose to use an external reference from 0.5 to 2.65 V. The voltage reference is just one feature of the new ASIC (Application-Specific Integrated Circuit) that LEM's designers created for this development, which enables the HLSR series to deliver typical accuracy of ±1% at +25 °C, and ±3.4% at +105 °C, with a bandwidth of 100 kHz (-3 dB). LEM offers versions that operate from either + 3.3 or + 5 V single supplies.

LEM packaged the five models of the HLSR series in an unique, compact and innovative outline that occupies only 387 mm² of PCB area representing less surface than many solutions based on resistive shunts.



Variants of the package cater for either surface-mount or through-hole connection of both primary conductor path and signal/power connections. The low-profile package weighs just 5.5 g, and is less than 12 mm high.

Safe measurements are assured with a high level of insulation between primary and measurement circuitry thanks to long creepage and clearance distances (8 mm as standard and 14 mm on request), and a comparative tracking index (CTI) of 600. HLSR transducers are CE marked, conform to the EN 50178 standard for industrial applications, and are granted of a five-year warranty.

LEM – At the heart of power electronics

LEM is the market leader in providing innovative and high quality solutions for measuring electrical parameters. Its core products - current and voltage transducers - are used in a broad range of applications in drives & welding, renewable energies & power supplies, traction, high precision, conventional and green cars businesses. LEM's strategy is to exploit the intrinsic strengths of its core business, and to develop opportunities in existing and new markets with new applications. LEM is a mid-size, global company. It has production plants in Beijing (China), Geneva (Switzerland), and Machida (Japan). With its regional sales offices close to its clients' locations, the company offers a seamless service around the globe. LEM is listed on the SIX Swiss Exchange since 1986; the company's ticker symbol is LEHN

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For further information please contact:

Stéphane Rollier
Product & MarComs Manager
Tel: +41 22 706 1449
E-Mail: sro@lem.com
Website : www.lem.com

or

Laura West
Napier Partnership Limited
Tel: +44 (0) 1243 531123
E-Mail: laura@napier.co.uk

LC252uk