

Novel Contactless Current Sensor

The drive for green power and mobility demands next generation current sensor technology. Melexis' introduction of its MLX91206 custom programmable IMC-Hall-Sensor provides an ideal solution.

Melexis takes a next step into driving green solutions by opening new opportunities for contact-less current sensing in renewable energy applications, Hybrid Electric Vehicle (HEV) and Electric Vehicle (EV). The **MLX91206** is a customer programmable monolithic Sensor IC featuring the Triaxis™ Hall technology. The MLX91206 enables the user to construct **small, economical** current sensor solutions with fast **response times**. The chip directly monitors the current flowing in an external conductor such as a bus bar or PCB track.

The novel contact-less current sensor MLX91206 consists of a CMOS Hall integrated circuit with a thin ferromagnetic layer structured on its surface. The integrated ferromagnetic (IMC) layer is used as a magnetic flux concentrator providing a high magnetic gain significantly increasing the signal to noise ratio of the sensor. The sensor is particularly appropriate for DC and/or AC current measurements up to 90kHz with ohmic isolation, very low insertion loss, fast response time, small package size and low assembly cost requirements.

The MLX91206 meets the demand for widespread use of electronics in automotive applications, renewable power conversion (solar and wind power), power supplies, motor control, and overload protection. Typical uses are found in Battery Current Monitoring, in Solar Power Converters and automotive inverters driving the traction motor in Hybrid Vehicles HEV/EV. The MLX91206 features over-voltage and reverse voltage protection including broken track diagnostics and can be used as a "stand-alone" current sensor connected directly to a cable.

The MLX91206 senses current by converting the magnetic field generated by currents flowing through a conductor to a voltage, proportional to the field. There is no upper limit to the measurable level of current because the output level is dependant on the conductor size and distance from the sensor.

The transfer characteristic of the MLX91206 is fully customer programmable (offset, gain, clamping levels and more). The output is selectable between analog and PWM. The linear analog output permits use where a very fast response of <10 μsec is required. The PWM output where low speed but high output signal robustness is required. A thermometer output signal monitors ambient temperature.

The custom calibration can be performed after the sensor is fixed with respect to the current conductor. Typical accuracy is better than +/-1% at room temperature or +/-2.5% over the full temperature range from (-40..125 deg C).

Product versions, Packaging and availability

Two product versions are available. The MLX91206CAL is suitable for a **low** magnetic field range of +/- 10mT, whereas the MLX91206CAH is suitable for **high** magnetic field range of up to +/-25mT. The 91206CA is packaged in a SOIC8, RoHS compliant, lead-free package for SMD assembly. The device is available for high volume production with engineering samples available on request.

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