

Micropower linear Hall-effect sensor ICs for battery-powered applications

The new A1391 and A1392 linear Hall-effect sensor ICs from Allegro Micro-Systems Europe are micropower devices that feature a power consumption of only 10 mW in active mode. Despite the low power consumption, the features required to produce a highly accurate linear Hall effect IC have not been compromised.

The new products incorporate a user-selectable 'sleep' mode to achieve very low current consumption, making them ideally suited to use in battery-powered portable devices such as mobile phones, digital cameras and portable tools.

Whereas many Hall-effect ICs are unable to achieve sufficient sensitivity levels without consuming more than 3 mA of current, the sleep mode allows the A1391 and A1392 to minimise current consumption to less than 25 μ A. The sensitivities of the devices are 1.25 mV/Gs for the A1391 and 2.5 mV/Gs for the A1392.

The new devices generate a ratiometric voltage output that is directly proportional to an applied magnetic field. Each BiCMOS monolithic circuit integrates a Hall element, improved temperature-compensating circuitry to reduce the intrinsic sensitivity drift of the Hall element, a small-signal high-gain amplifier, and proprietary dynamic offset cancellation circuits. Factory programming allows precise control of device sensitivity and offset.

The high-impedance sleep mode is activated by applying a logic level signal to the device's 'sleep' pin. The outputs of the devices are not valid during sleep mode, but the high-impedance output feature allows the connection of multiple A1391 and A1392 Hall effect devices to a single analogue/digital convertor input.

The quiescent output voltage of these devices is nominally 50% of the ratiometric supply reference voltage applied to the reference pin of the device, but is not ratiometric with respect to the supply pin. The ICs are compatible with 2.5 to 3.5 V power supplies.

The devices are supplied in the MLP micro leaded package, which measures only 2.0 \times 3.0 mm with a 0.75 mm nominal height. The package is lead (Pb) free, with 100% matt tin leadframe plating. They will operate over an ambient temperature range from -20°C to +85°C, and feature ESD protection of greater than 3 kV.
