**Integrated Hall Magnetic Angle Sensors**

Invited Paper

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***Abstract*−A magnetic angle sensor is a matched combination of a permanent magnet, affixed to a rotating shaft, and a magnetic field sensor. The magnet part of the angle sensors is configured so as to create either a magnetic field with an angle-dependent component perpendicular to the chip surface; or two angle-dependent components parallel with the chip surface. The magnetic field component perpendicular to the sensor dice is measured by planar Hall devices. The two in-plane magnetic field components are measured either by a combination of planar Hall devices and an integrated magnetic flux concentrator (IMC-Hall), or by vertical Hall devices. The IMC-Hall is the most used technology for implementing a compass in mobile telephones. The circular vertical Hall device is most suitable for high-speed rotation angle sensing. The major performance-limiting factors of magnetic angle sensors are non-uniformity of magnets, non-uniformities in the integrated magnetic sensor IC, and thermal drift.The magnetic sensing part of contemporary magnetic angle sensors isa CMOS IC, incorporating Hall devices, biasing circuit, amplifiers and other analog signal conditioning circuits, analog-to-digital convertors, and digital circuits for angle retrieval and correction of errors.**