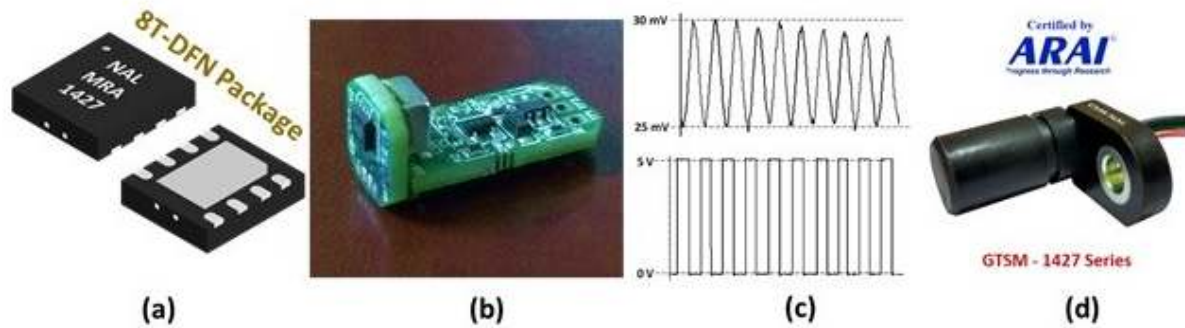


STEINBEIS TECHNOLOGY DOCUMENT

GIANT MAGNETORESISTANCE (GMR) BASED MAGNETIC SENSORS AND SPEED SENSOR MODULE

The MRA 1427/1426 magnetic sensor utilizes Giant magneto-resistive (GMR) technology, where highly sensitive unshielded GMR elements are configured in a form of single Wheatstone bridge. The Wheatstone bridge generates a differential output voltage with respect to magnetic field gradient along the sensor's sensitive direction. Each resistor has 4-5 k Ω nominal resistance and output of the bridge is purely ratiometric with the power supply voltage. Due to our unique technology and design, MRA 1427 is highly sensitive and has the ability to detect signals at the wide air gap. The excellent thermal and voltage stability makes it suitable for challenging environments.

The MRA 1427 GMR sensor available in 8T-DFN package with dimensions 3 mm x 3 mm x 0.75 mm.



Salient Technical Features

- ◆ **Chip type** : 8T DFN package
- ◆ **Sensing element configuration** : Wheatstone bridge configuration
- ◆ **Bridge resistance** : 6.4 \pm 5% k Ω
- ◆ **Input voltage** : 1-30 V
- ◆ **Field Range** : 5-100 G, unipolar
- ◆ **Saturation of GMR Sensor Elements** : \pm 300 G
- ◆ **Single Resistor Sensitivity** : 0.033%/G
- ◆ **Temperature Coefficient of Resistance** : 0.033 Ω /oC
- ◆ **Temperature dependence of GMR** : 0.03%/oC
- ◆ **Operating Temperature Range** : 70 to 130 oC

Application / Uses

- ◆ Gear tooth speed sensing
- ◆ Direction and motion sensing
- ◆ Linear and rotary speed sensing
- ◆ Linear and rotary position sensing

Major Plant Equipment and Machinery Required

- ◆ Class 1000 clean room, Industrial sputtering system for sensor deposition, Photolithography equipments and Mask aligner.

Major Raw Materials to be Utilized

- ◆ High purity targets of CoFe and Cu, Si wafers, gases, photolithography chemicals.

Available in Market

- ◆ Available with Jayashree Electron Pvt. Ltd. For automobile applications

Commercialization and Type of License (exclusive or non-exclusive): Ready for commercialization

Level/Scale of Development: TRL-8; Scaled to 4 inch Si wafer

Techno-Economics

As per the market analysis, the overall magnetic revolution sensor market revenue would be 279 million US\$ with a corresponding volume of 1347 million units by the year 2016.

Year of Development: 2010-2016

IPR Status: Patent filed in India, 3689/DEL; 1221/DEL; 449/DEL