

Magnetic Sensors Report

Richard Dixon, PhD, Principal Analyst Sensors

ACTUALS AND FORECAST

Frequency, Time Period

- 7-year annual forecast
- 4-year historical

Measures

- Revenues
- Shipments
- Component prices
- Market Shares

APPLICATIONS COVERED

- Automotive
- Manufacturing and process automation
- Energy generation and distribution
- Other industrial
- Medical electronics
- Wireless communication
- PC and Mobile PC
- Consumer appliance
- Consumer electronics
- IT peripherals
- Military and aerospace
- Other

TECHNOLOGIES COVERED

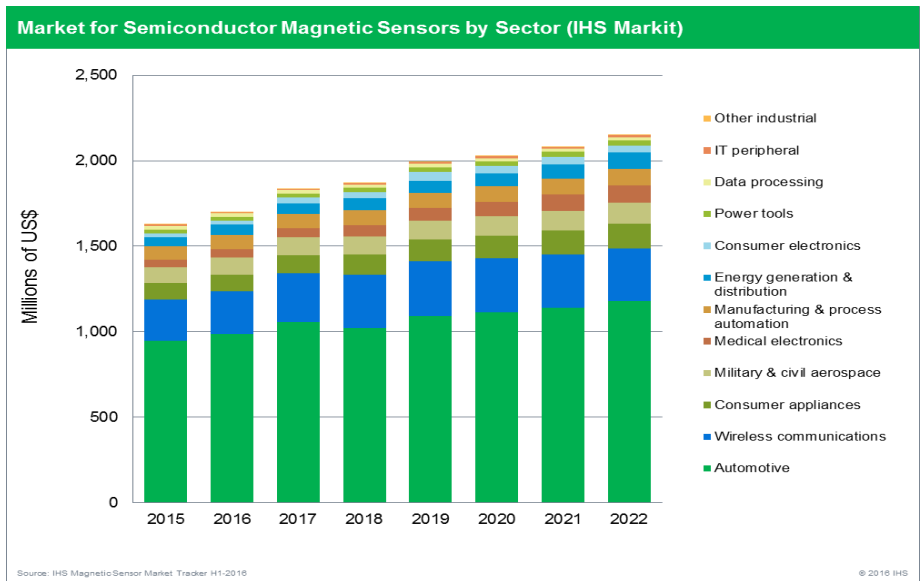
- Hall effect
- AMR
- GMR
- TMR

Consumer compasses drag magnetic market into doldrums

The market for semiconductor-based Hall and magnetoresistive magnetic sensor elements, sensor ICs and switches reached \$1.7 billion in 2016, and will grow to \$2.15 billion in 2022—a CAGR of 3.2%.

For consumer compasses—a key part of the magnetic sensor market in recent years—the “fat years” are already over. AKM, Yamaha, Bosch, STMicroelectronics, ALPS, etc. will need to compete in a mobile market with diminishing returns over the next 4-5 years. Only companies able to leverage high scalability will win out. Meanwhile, the automotive sector will continue in its role as the mainstay market for magnetic sensors, while industrial motors and solar inverters continue to offer interesting opportunities in current sensing and position encoding applications.

This tracker addresses key opportunities, disruptive forces, technology battlegrounds, supply chain and market information for the various semiconductor magnetic sensors including Hall, GMR, AMR, and emerging technologies such as TMR.



Key Issues Addressed

- How will commoditization affect the compass market? Will TMR expand past consumer and industrial applications into automotive?
- How will 3D Hall develop?
- Will MR compasses gain share against Hall compasses? How will highly integrated 9DOF compasses fare vs. discrete 3DOF compasses?
- Which companies are on the way up?

Applicable To

- ODM (tier 1, 2 and 3 suppliers to automotive industry)
- Manufacturers of consumer, medical and industrial products
 - Procurement, R&D
- Foundries
 - Marketing
- Equipment for ASIC and semiconductor manufacturers, packing & testing
 - Sales and marketing

LEAD ANALYST

Richard Dixon, PhD - Principal Analyst, MEMS & Sensors

Richard Dixon is a principal analyst for MEMS and sensors and author of more than 50 MEMS-related consulting and market research studies. He is a world-renowned expert on automotive MEMS and magnetic sensors used in the automotive, consumer electronics and appliances, industrial and energy segments.

In addition to supporting the overall activities of the MEMS and sensors group, his responsibilities include the development of databases that forecast the markets for more than 20 types of silicon-based measurements in over 150 applications. In addition, he has supported organizations with business development for sensors and has supported many custom projects for companies in the automotive and industrial supply chain.

As part of his duties he has supported organizations with custom studies, e.g. future scenarios for car sensors or analyzing the automotive supply chain. Prior to IHS Markit, Richard was a senior analyst at iSuppli with responsibility for MEMS sensors in automotive, industrial, aerospace and medical sectors.

Prior to his work as an analyst, Richard worked as a journalist in the semiconductor industry, and also has five years of experience as a technology transfer professional providing among others support for early stage NASA technologies.

Richard graduated from North Kent University with a degree in materials science and earned a doctorate from Surrey University.

He speaks English and German.

Sample Table of Contents

Market overview

- Shipments
 - Average selling price
 - 5-year market forecast
- ### Market by key segments
- Market by end application
 - Market by technology
 - Market by type
 - Supply chain changes
 - Changes vs. last report, assumptions

APPENDIX (includes following)

Introduction

- Magnetic sensors and switches
 - Definitions
 - Technology comparisons
- #### Automotive applications
- Powertrain
 - Safety and control
 - Comfort and convenience
 - Infotainment (navigation)
 - Trends in automotive magnetic sensing, i.e. Hall vs. MR, Hall vs. Reed for switches, Hall vs. differential Hall, 3D hall applications

Consumer and mobile handset compasses

- Market by applications: Mobile handsets, tablets
- Review of suppliers
- Specifications: hardware and software
- Integration trends: discrete versus 6 and 9 axis multi-sensor modules

Industry

- Position sensing (encoders) in industrial motors, level sensors, flow meters

Welding (current sensors)

Energy

- Current sensors for inverters, motors and motor drives
- Wind turbine, solar panel systems, uninterruptable power supplies

Other applications

- Compass for gaming, cameras, other consumer applications, aerospace and military compasses
- Hearing aids, dispensing cabinets, pipetting arm position, BLDC motors for ventilation and dialysis machines, centrifuges...
- Switches for mobile phone display, linear sensors for OIS, MP3
- Fans for laptops
- Commutation switches for optical drive motors in PCs, mobile PCs and servers
- Consumer appliances
- Security, marine industry...

Applications/Products Covered

Automotive powertrain sensors

- Crank- and camshaft
- Engine, transmission
- Throttle position (throttle-by-wire)
- EGR position, current sensors
- Brushless DC motor encoders
- Oil, brake, fluid level...

Automotive Safety

- Chassis height
- Strut and suspension position
- Wheel speed
- Steering wheel angle, electronic assisted power steering
- Passenger occupation, acceleration pedal position

Automotive Body

- HVAC motor, Seat belt presence
- Window lifters, air intake flap, seat and headrest position, electric roof motor
- Door latches, sunroof position

Infotainment

- Navigation compass

Digital Still Cameras & Camcorders

- Display open / close
- Image stabilization controllers
- Motor commutation

Mobile phone

- Display open / close
- Auto-focus, OIS
- Electronic compass

Personal computer & laptop

- DVD spindle motors
- PC fans

White goods

- Washing machines, dishwasher
- Coffee machines, microwave ovens
- Cooker hood
- Instant water heaters, power showers...

Office products

- Fax machines (door close)
- Copiers (paper level)

Industrial and Energy

- LV motor drives and motor inverters
- Brushless DC motors
- Solar and wind inverters
- HVAC position sensor
- Welding equipment

Medical

- Motors in ventilation equipment, centrifuges
- Pacemakers & hearing aids
- Smart pills, fluid level in drug delivery
- Automated lab equipment

Marine industry

- Anchor, rudder, hatch position
- Wind speed and direction

Military & aerospace

- Navigation compass

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