Sensor Business Strategy

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Agenda

◆ Sensor Business Strategy
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Matthias Bopp
Established since April 1st, 2017
Global sensor demand forecast (non-optical)

By sensor type

By application

(TDK estimate)

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Business Development with Full Sensor Portfolio

Automotive & Industrial

Non-Magnetic MEMS

Newly acquired

Magnetic

Mobile & IoT

Development of Sensor Fusion and Solutions

Advanced Combo Sensors

Existing sensors

MEMS
- Pressure
- Gas
- NTC / PTC
- Temperature

TMR
- Angle / Linear scale

Hall
- Angle / Current / Gear tooth / Position

Advanced Combo Sensors

MEMS
- Microphone

InvenSense
- MEMS
  - Inertial
  - Microphone
  - Barometric Pressure
  - Ultrasonic

MICRONAS
- MEMS

TDK
- TMR
  - Geomagnetic

trronics
- MEMS

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Materialize Total Value Chain

Be a World No.1 Sensor Solution Provider!

Contribute to culture and industry through Sensing Solutions
Synergy: Business Expansion Strategy

TDK Solutions

Priority Areas

Sophisticated Fusion

Advanced Combo Sensor

Expanded Sensor Portfolio

Safety (Roll-over, ESC)
Efficiency (Current, Pressure)
Comfort (Navigation)

Entertainment (Imaging)
Convenience (Indoor Navi)

Security (Fingerprint)

Entertainment (AR/VR)
Safety (Autopilot)

Comfort (Env. Monitoring)

Automotive

Mobile

IoT/Industrial

Software/Algorithm

Strengthened Business Collaboration with IC Manufactures

TDK Solutions

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### Synergy: Operational Excellence

**Take full advantage from in-house and external resources.**

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#### MEMS
- **In-house**
  - Unique Wafers
  - Unique Packaging
- **External**
  - Standard Wafers
  - Standard Packaging

#### Packaging
- Existing
- Synergy
Agenda

◆ Sensor Business Strategy

Noboru Saito

◆ Magnetic Sensor Business Strategy

Matthias Bopp
Business Expansion Strategy

① Expand business in Automotive market by HALL and TMR technology (and combinations)
② Penetrate ICT market and dominate the presence of the TMR technology in the market.
③ Develop further vertical integration by deploying Modules with TMR and Hall sensors.

Strengthened ASIC Design Capabilities with

FY2021 Market Size Approx. $1.1bil
FY2021 Market Size Approx. $0.3bil
FY2021 Market Size Approx. $0.3bil
FY2021 Market Size Approx. $0.3bil

Hall 2D/3D
Hall Linear
Hall Switches

Sensing Element
1st Level Package
Module

Automotive & Industrial

Stroke Sensor
Current Sensor
Gear Tooth Sensor

Strategic Collaboration

Gear Tooth Sensor
Angle Sensor
Motor Position Sensor
Linear Scale

Current Sensor
Speed Sensor
Encoder/Bearing

GMR Encoder
Indoor Navigation
Camera module

E-Motor Controller

Plus Module add-on

ICT

TMR
Focus Applications for Magnetic Sensors

- Combined technology portfolio enables new applications and offers more flexibility to our customers.
- Long term strategy based on new large platform developments
- Faster penetration of TMR in the automotive market
- Short term growth opportunities in ICT (e.g. sensors for camera modules & indoor navigation)
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