

IR DAY 2020

**MinebeaMitsumi**  
*Passion to Create Value through Difference*

# Our Technologies and Strength – INTEGRATION

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December 3, 2020

**Hiroshi Aso**

Director, Managing Executive Officer  
Chief of INTEGRATION Promotion  
Headquarters



## Generating synergies through the INTEGRATION

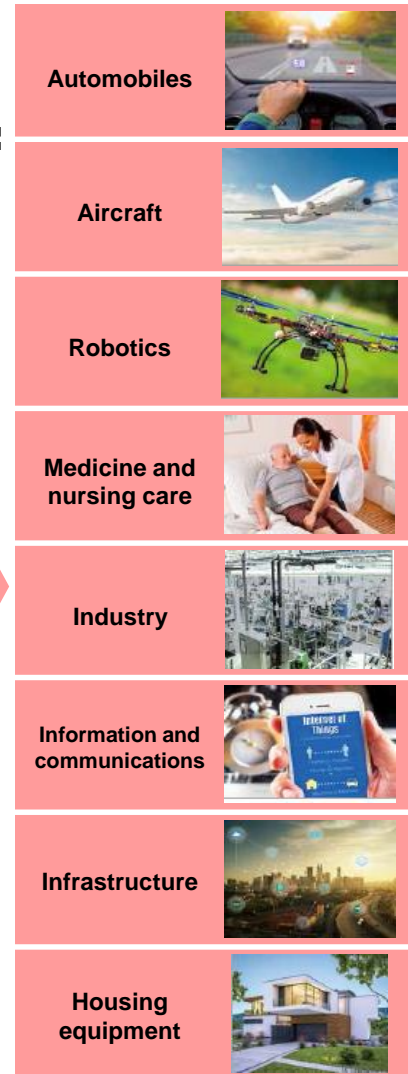
We will combine and utilize ten **core technologies** refined by MinebeaMitsumi, such as ultra-precision machining technology and large-scale production technology, to evolve each of the **Eight Spear products** and create new business opportunities through **the INTEGRATION and recombination** of the evolved products.

For example, by modularizing added value, such as sensors and wireless technologies with miniature and small-sized ball bearings, for which we have the largest global market share, we will provide unique products and services that have no equivalent anywhere in the world to play a part in the IoT society, where things are connected.

We generate synergies through an INTEGRATION, combining our ten core technologies and products among our new Eight spear products

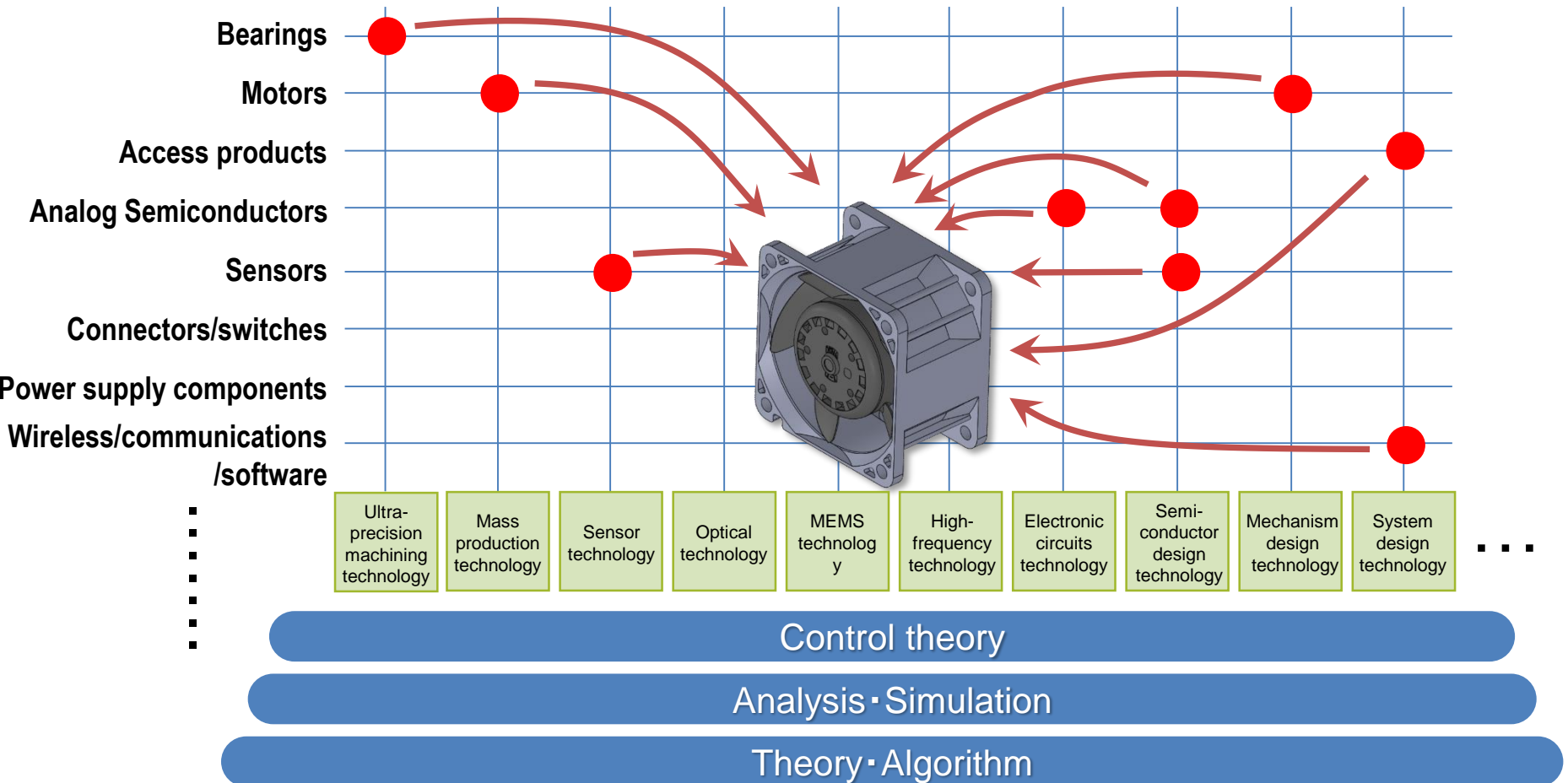
	Bearings	Motors	Access Products	Analog Semiconductors	Sensors	Connectors/Switches	Power supply components	Wireless/communication/software
Bearings	●	○	○	○	○	○	○	○
Motors	○	●	○	○	○	○	○	○
Access products	○	○	●	○	○	○	○	○
Analog semiconductors	○	○	○	●	○	○	○	○
Sensors	○	○	○	○	●	○	○	○
Connectors/switches	○	○	○	○	○	●	○	○
Power supply components	○	○	○	○	○	○	●	○
Wireless/Communication/Software	○	○	○	○	○	○	○	●

**We will continue organic growth for sales and business expansion through the INTEGRATION activity with sales and manufacturing division as well as engineering and business division**



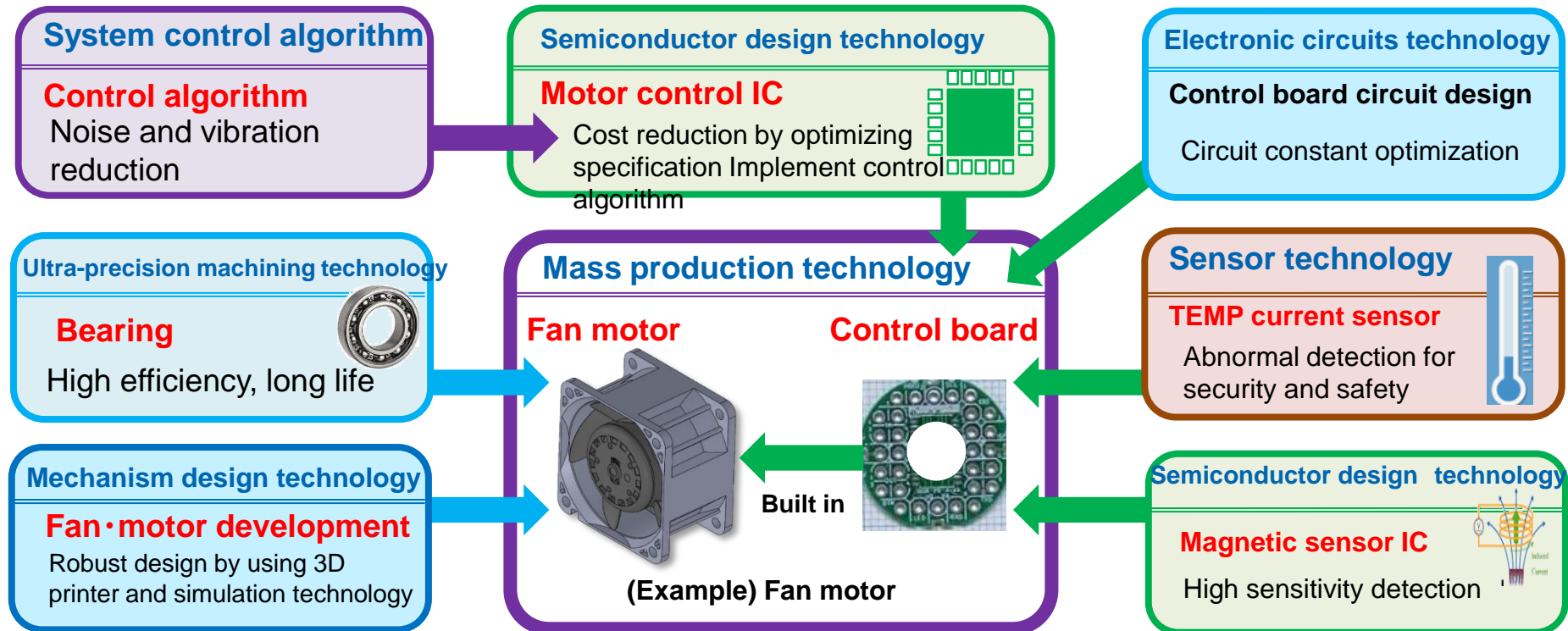
## The INTEGRATION product to pursue “usability” and high added value

Development of self manufacture products to meet market demand by INTEGRATING all MinebeaMitsumi technology



## The INTEGRATION product to pursue “usability” and high added value

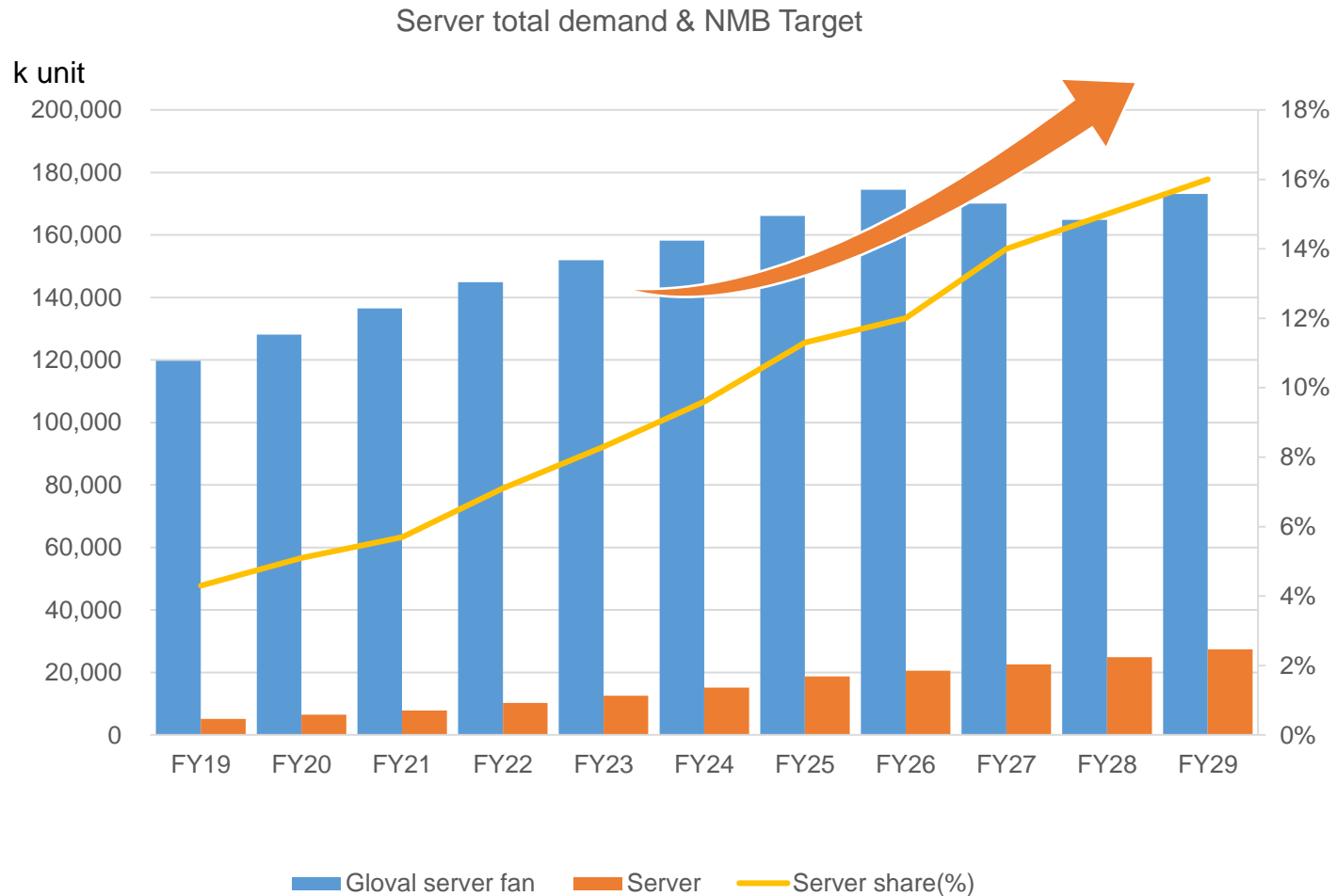
Developing SPEC compliant **in-house component** and implementing in motor system  
Performance and added value improvement, Cost reduction, Rise in competitive



**Significant accurate fan-motor control through the INTEGRATION activity**  
**Low noise · Low vibration · High efficiency · High reliability**

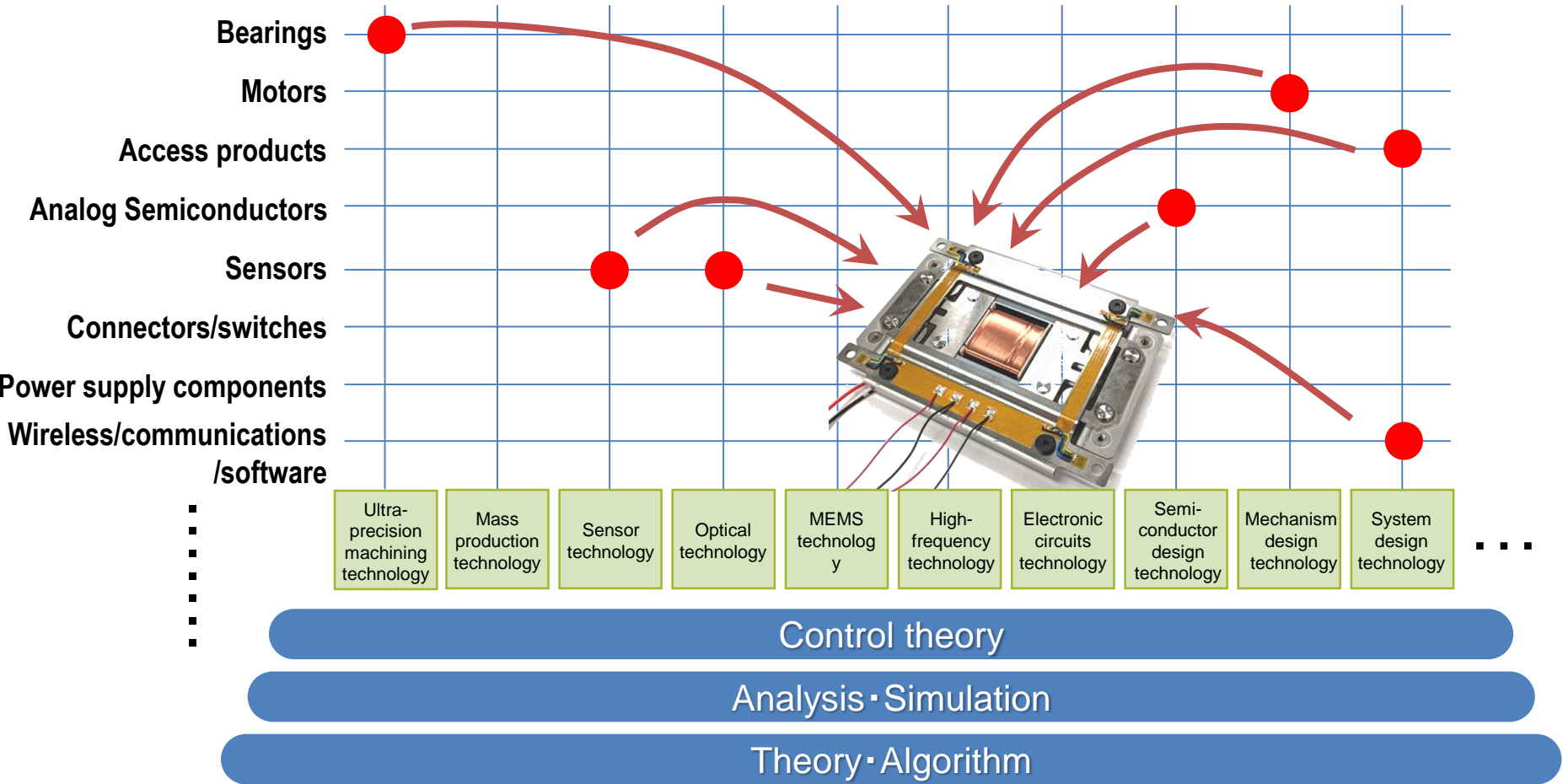
## The INTEGRATION product to pursue “usability” and high added value

Increase production volume every year by improving the performance of fan motor.  
Establish further expansion capability by upgrading the functions through the INTEGRATION activity.



## The INTEGRATION product to support “next generation HMI”

High level sensing technology to detect operational position, force and direction  
High power resonant device to realize operational feeling



## The INTEGRATION product to support “next generation HMI”

The INTEGRATION product as the package solution of complicated system to realize haptic feedback

Contribute to design innovation for the next generation automotive interior

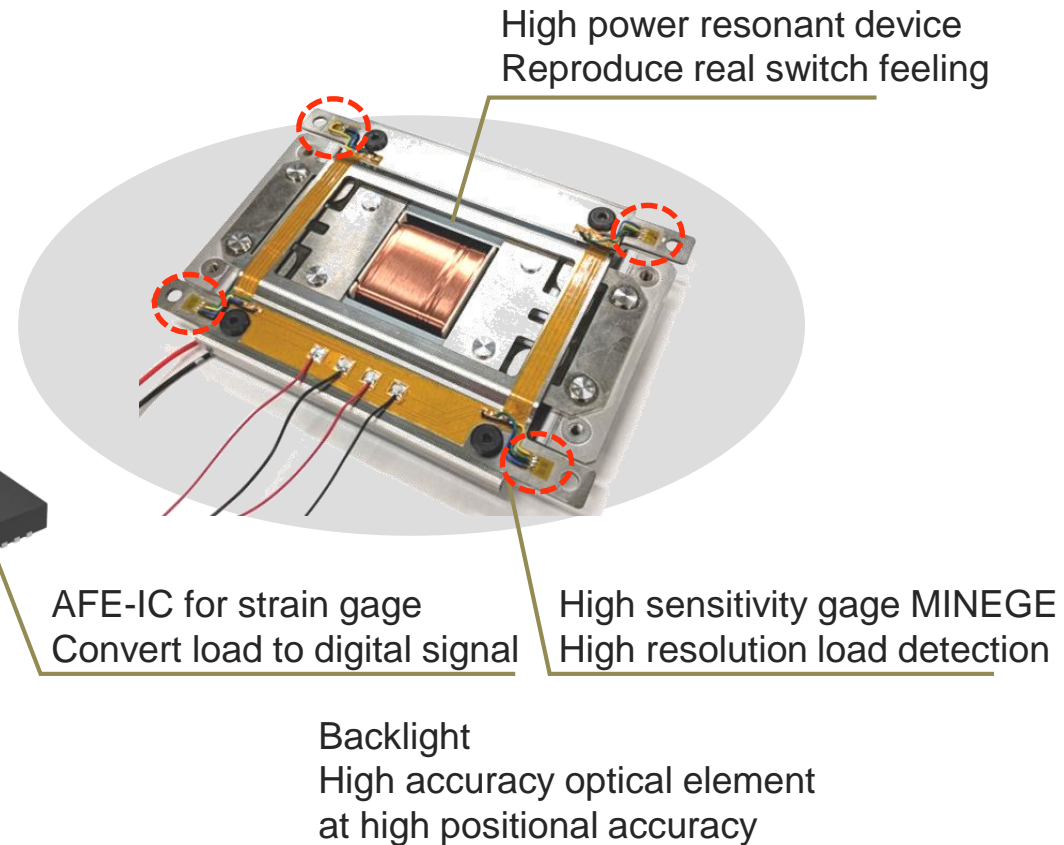
### Market Trend

Car interior moving toward seamless design  
Haptic feedback touch panel becomes popular

### Our integration product strengths

High quality feeling by using original know how  
One stop solution to provide modules

### Composition of the INTEGRATION product



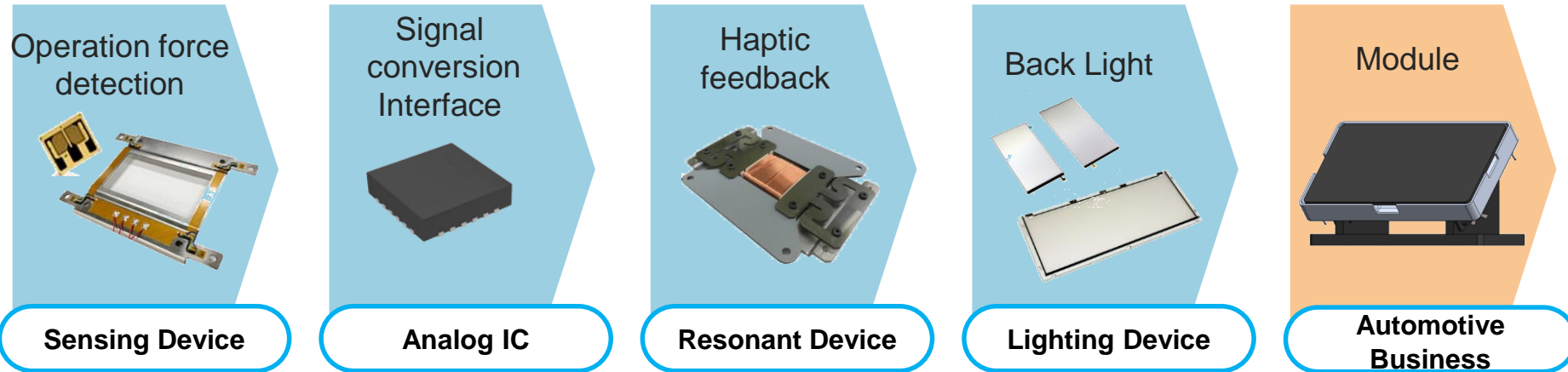




## The INTEGRATION product to support “next generation HMI”

Operation force detection, signal conversion using sensing device and analog IC  
Realize desired switch feedback feeling using resonant device

### Functions of the INTEGRATION products in total system

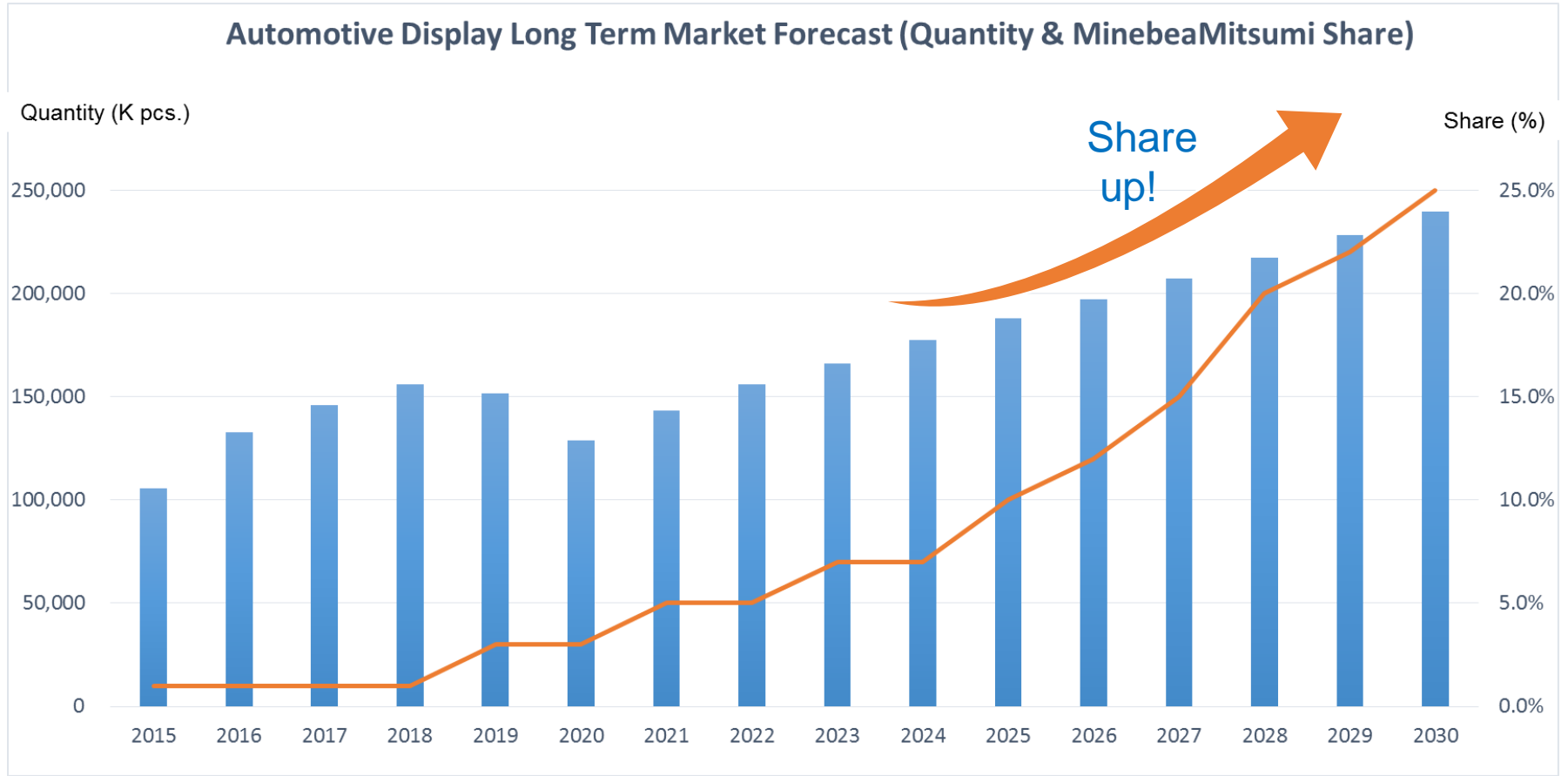


### Remarks

- High accuracy force detection, sophisticated interface protocol
- Mechanical switch equivalent less than 10msec quick response
- Powerful haptic feeling

Providing one stop solution by integrating core technology

## Automotive display market size prediction

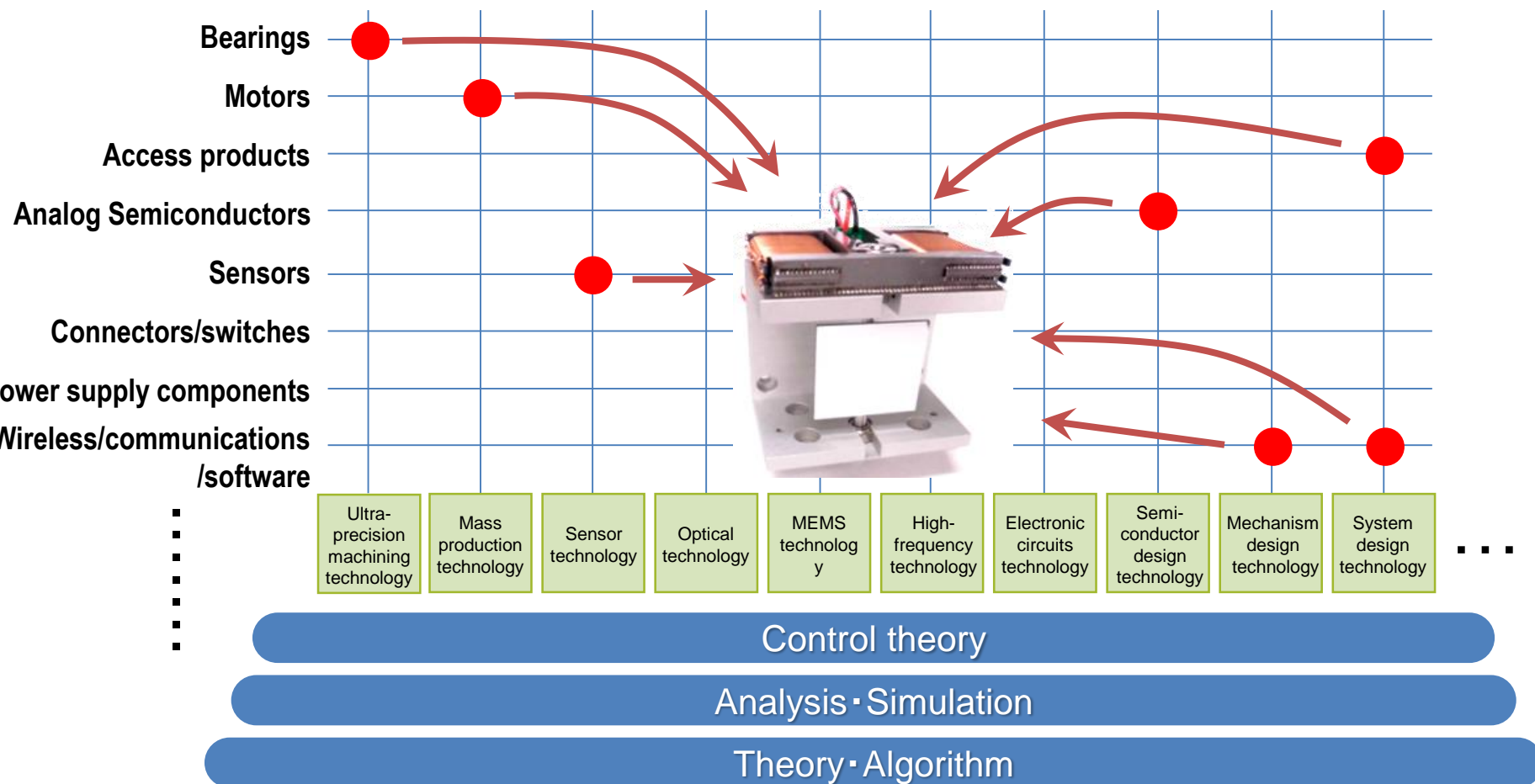


Source:TSR

## The INTEGRATION product to innovate “3D sensor” image quality for autonomous driving

Innovative quick response reciprocal actuator device

Unrivalled product based on bearing technology and leading-edge simulation technology



## The INTEGRATION product to innovate “3D sensor” image quality for autonomous driving

“LATM”, new scanner product to realize Lv.4 autonomous driving

Developed by using high performance bearing and leading edge simulation technology

### Market Trend

Acceleration of autonomous LiDAR development

Scanner is the key device for high quality 3D imaging

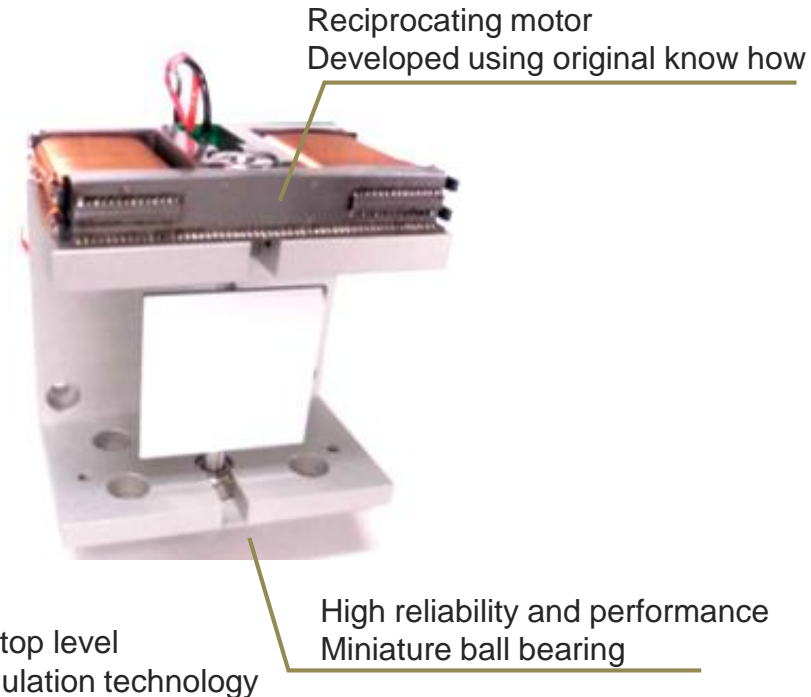
### Our INTEGRATION product strengths

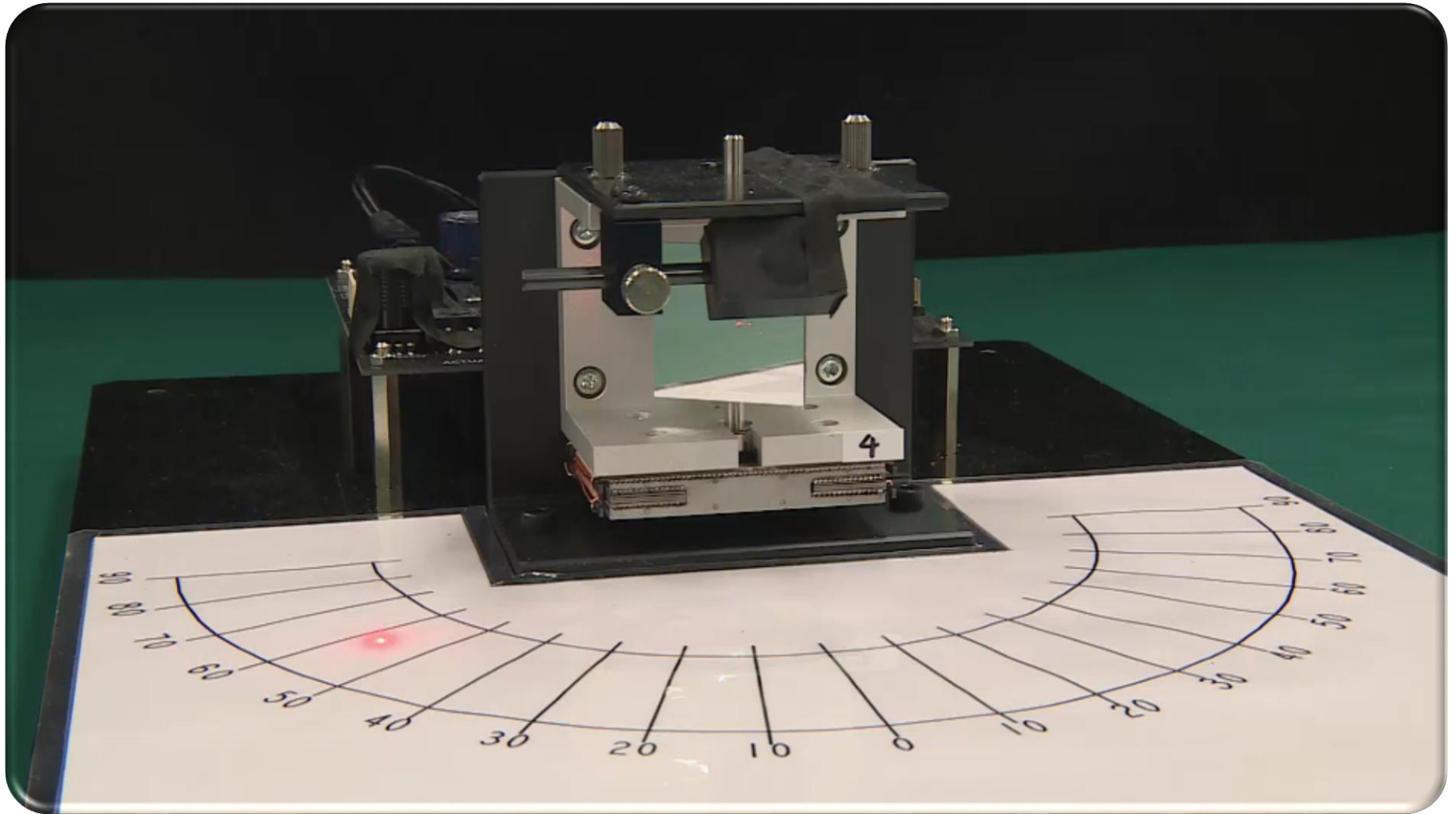
High reliability, high performance bearing for automotive reliability

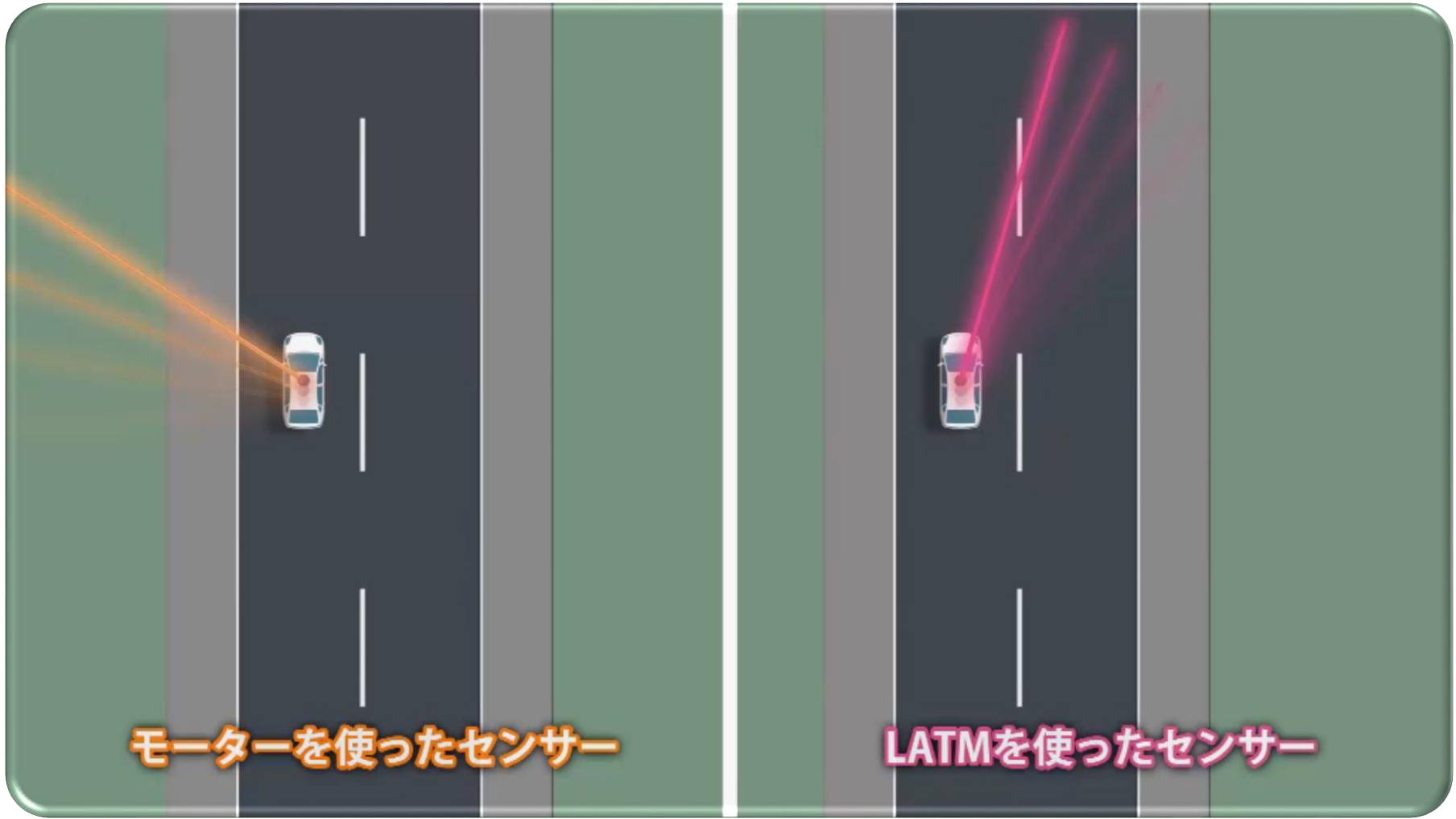
CAE simulation technology to ensure design quality

Know how to develop original actuator

### Composition of the INTEGRATION product







モーターを使ったセンサー

LATMを使ったセンサー

Motor scanning sensor

LATM scanning sensor

## The INTEGRATION product to innovate “3D sensor” image quality for autonomous driving

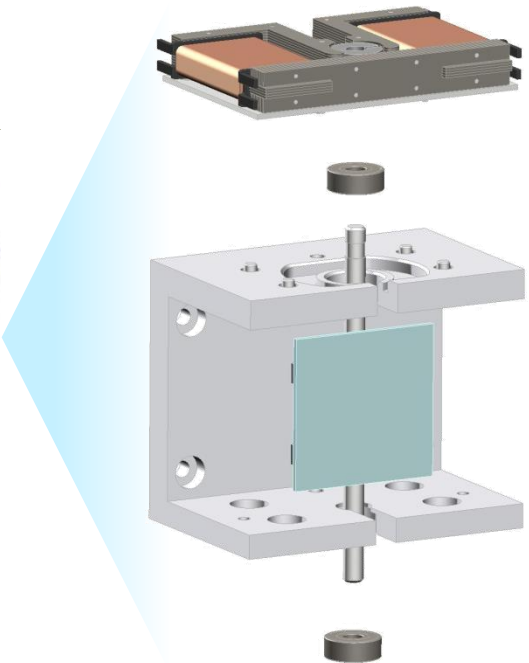
Creating new product by integrating core technology based on CAE technology  
Offering unique actuator by creating new added value

### An example of INTEGRATION product using core technologies

Bearing, Motor Control, Sensor

Magnetic field simulation

Vibration • Intensity • Mechanism simulation



Actuator

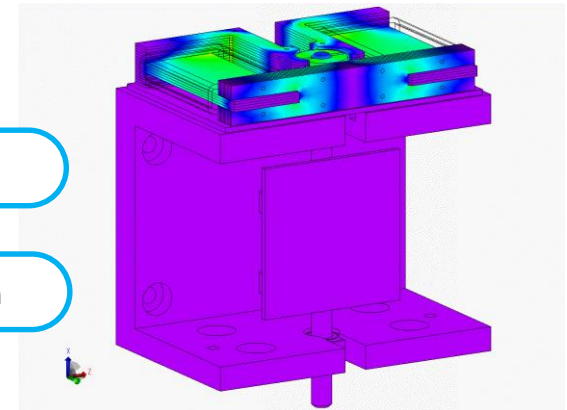
+

CAE Simulation

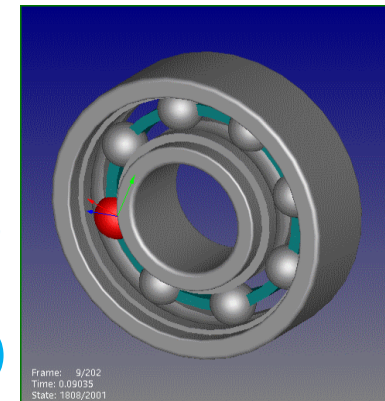
Ball Bearing

+

CAE Simulation



Magnetic circuit simulation

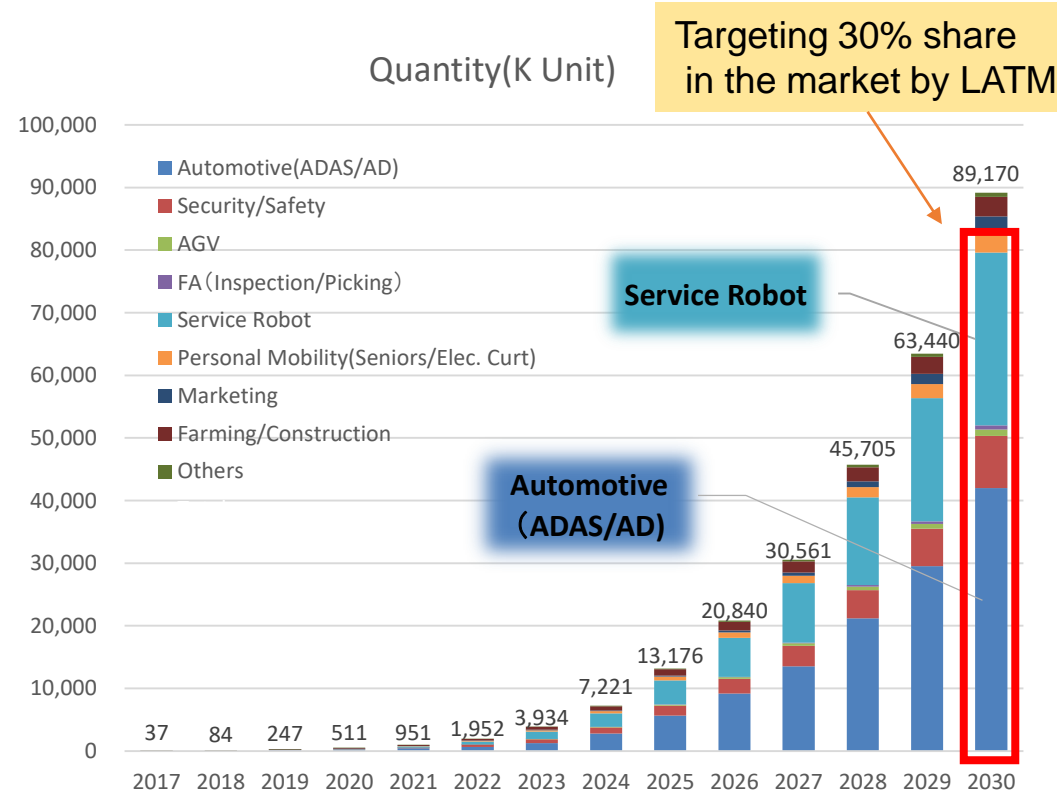


Mechanism simulation

## The INTEGRATION product to innovate “3D sensor” image quality for autonomous driving

### Object form recognition

Market growth is expected in service robot segment other than automotive segment  
Approximate range : few meters ~ 300m



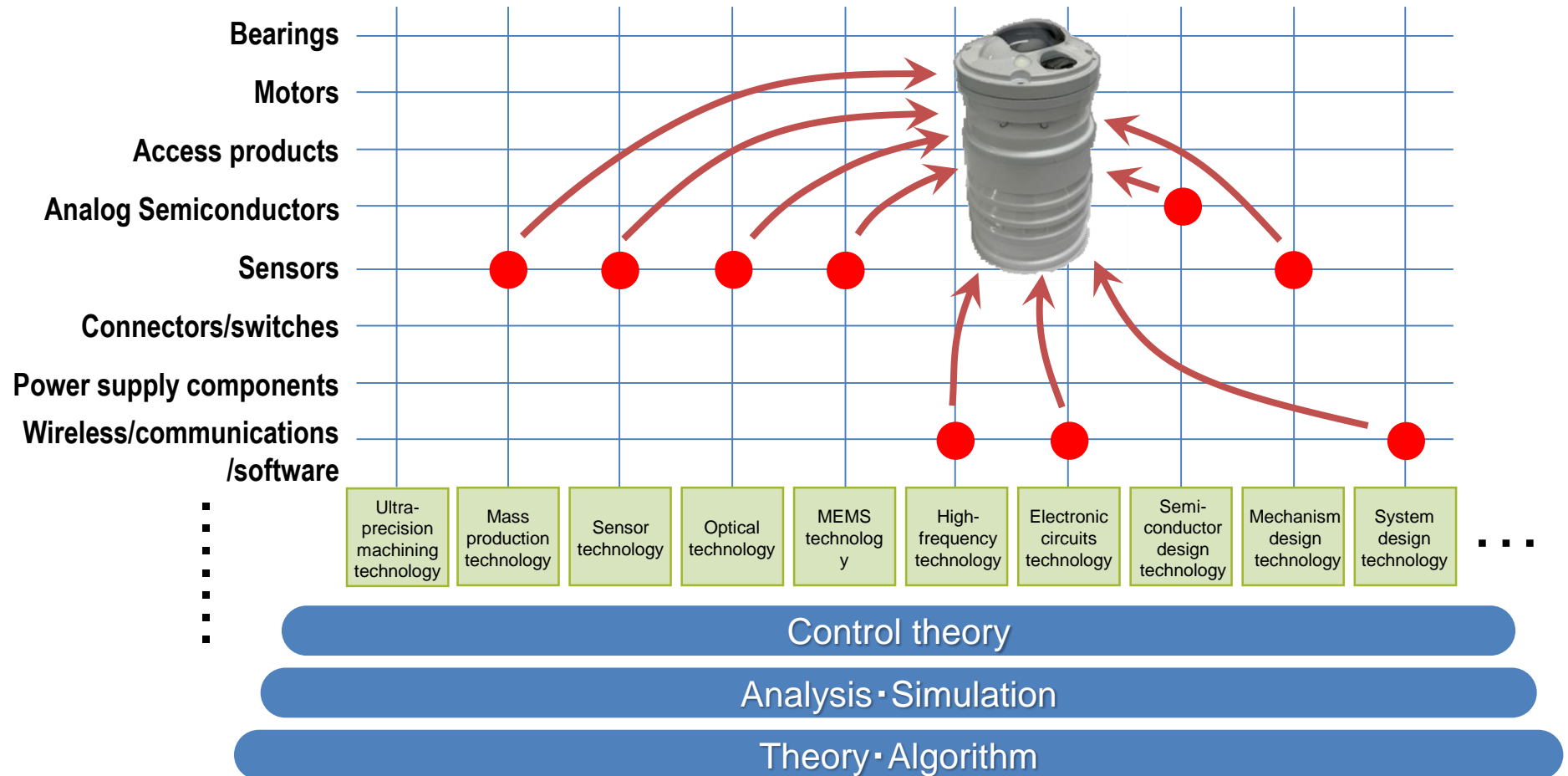
Source:TSR

Automotive	AG CONSTR Machinery	Personal mobility	FA
ADAS/Autonomous driving, moving direction and surround obstacle detection of vehicle	Autonomous driving for agriculture and construction machinery	Surround obstacle detection, autonomous driving	Form recognition of picking target, tray content monitoring, product inspection
Service robot	AGV	Marketing	Security Safety
Obstacle detection for self moving, location estimation	Surround sensor to support autonomous moving of AVC such as in factory	Crowd flow detection, count and analysis	Intruder surveillance



## The INTEGRATION product to visualize “weather data” in real time

Integrate weather indicator in pocket size  
Culmination of MinebeaMitsumi’s high reliability technology

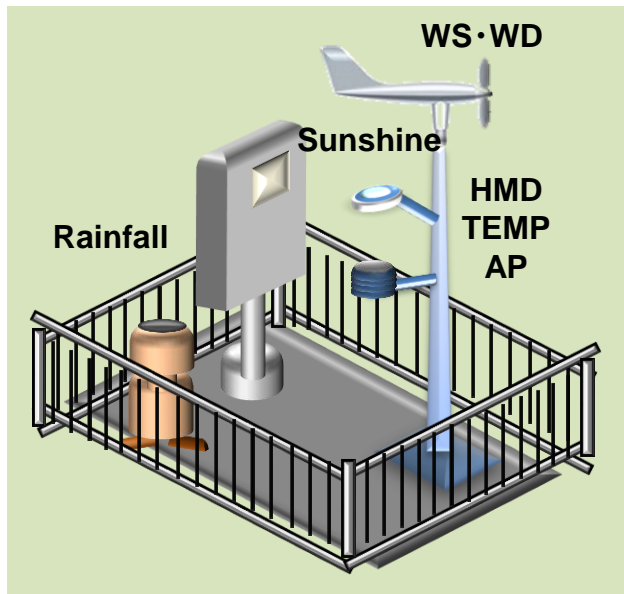


## The INTEGRATION product to visualize “weather data” in real time

Temperature(TEMP), Humidity(HMD), Atmosphere pressure(AP), Ambient light, Wind speed(WS), Wind direction(WD), Rainfall, UV and Acceleration Sensing  
World smallest integrated environment sensor

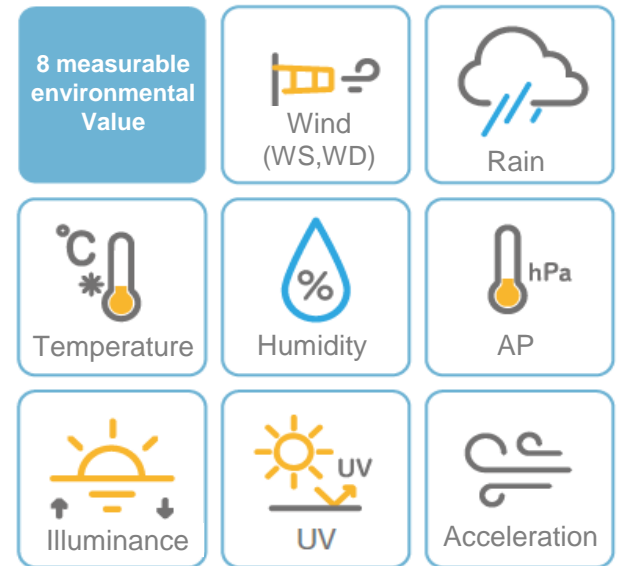
### Conventional equipment

Extensive, Expensive



### Environmental sensor

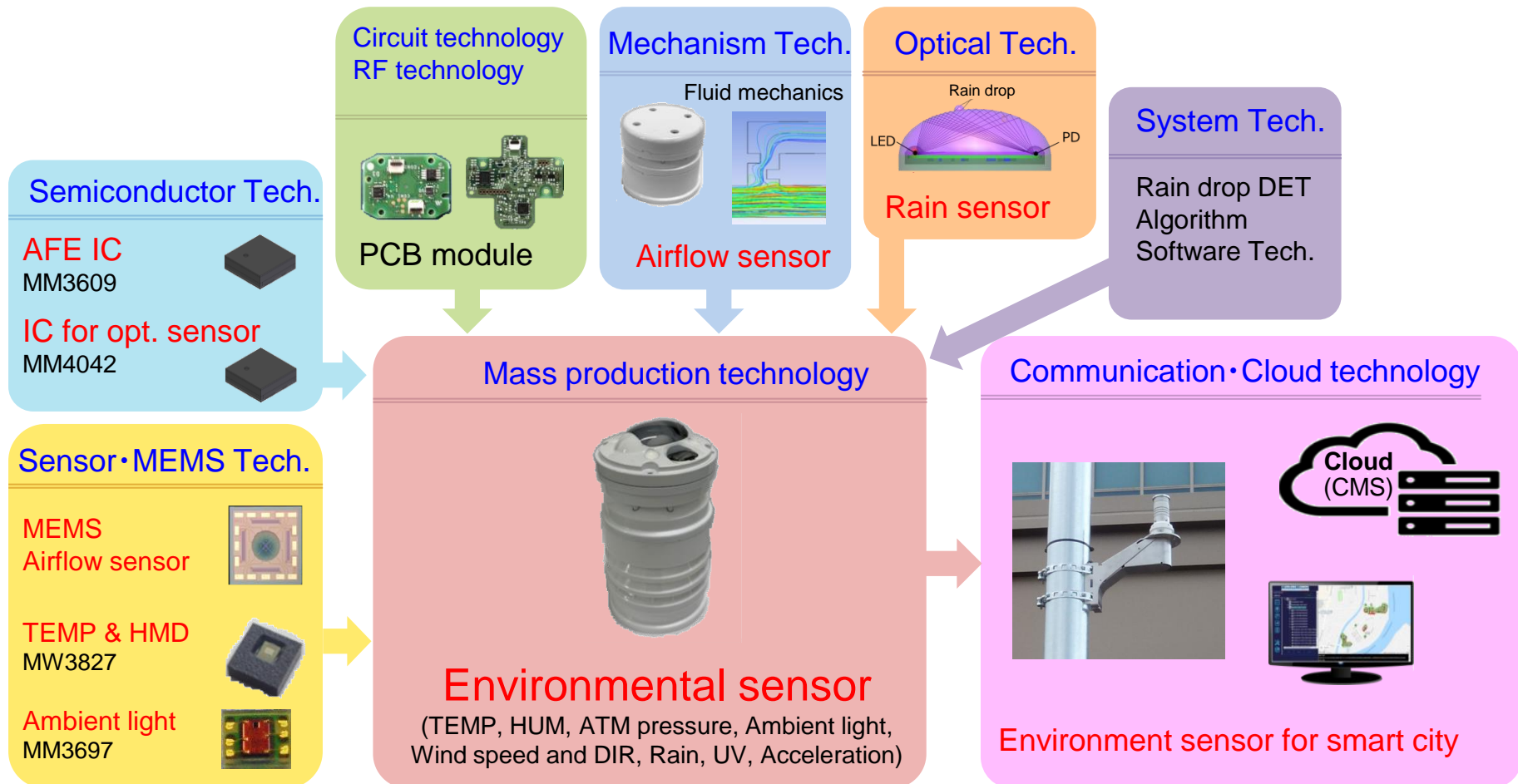
Compact, Simple, All-in-one design



## The INTEGRATION product to visualize “weather data” in real time

New product which integrating simulation and software technology based on MEMS sensor and semiconductor

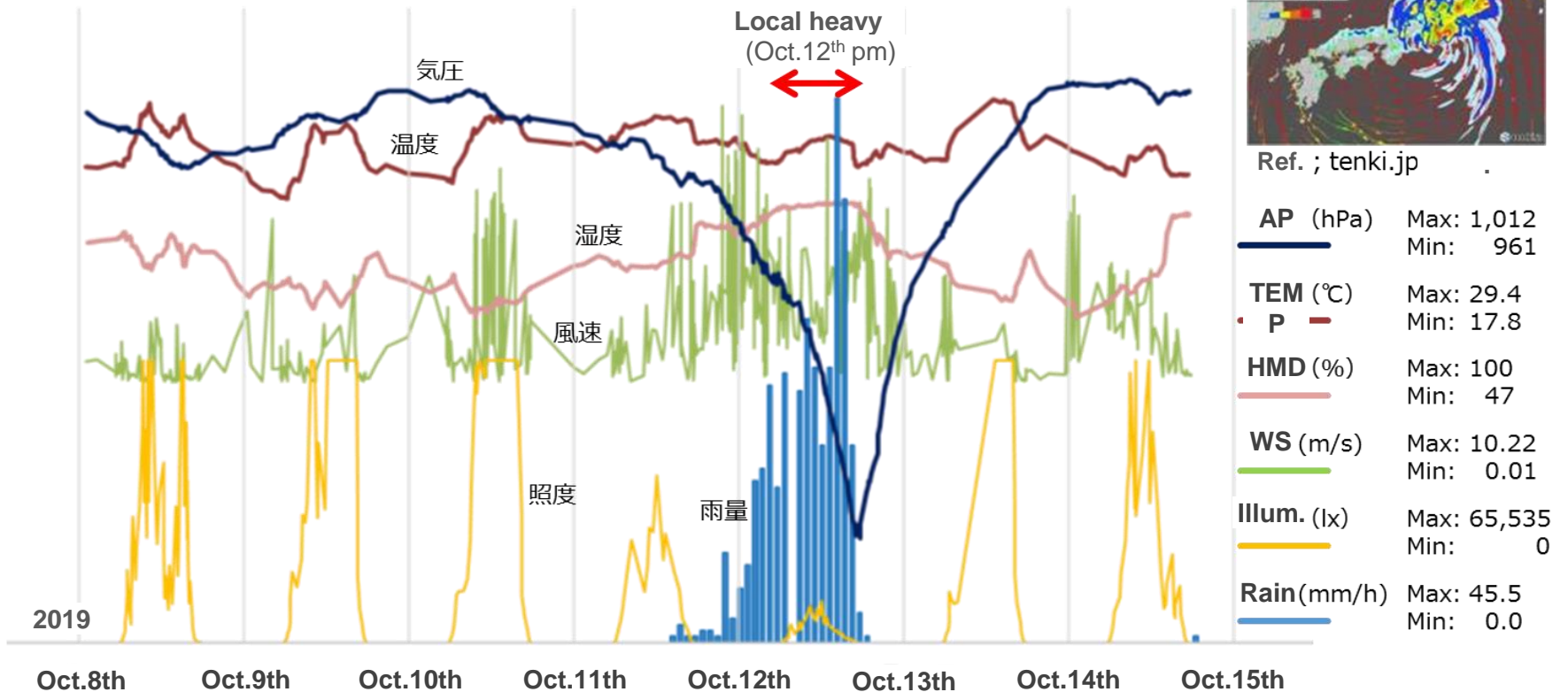
Contribute by improving safety and economic efficiency for weather monitoring, agriculture, safety drone operation, market prediction



## The INTEGRATION product to visualize “weather data” in real time

TEMP, HMD, AP, Ambient light, WS, WD, Rainfall, UV and Acceleration Sensing  
World smallest integrated environmental sensor

Actual environmental data when typhoon No.19 passing near Hamamatsu factory

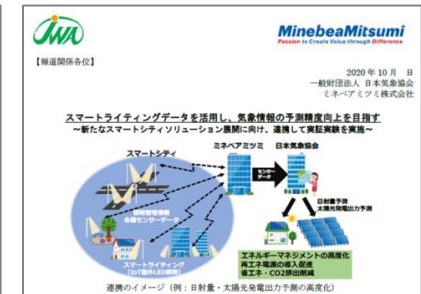


## Demonstration experiment case with

- ▶ Japan weather association for output prediction of solar power generation
- ▶ Weathernews Inc. for IoT sensor using environmental sensor
- ▶ Osaka prefecture for smart city solution
- ▶ Iwasaki Electric Co., Ltd. for IoT street light project in Suginami city



From our website

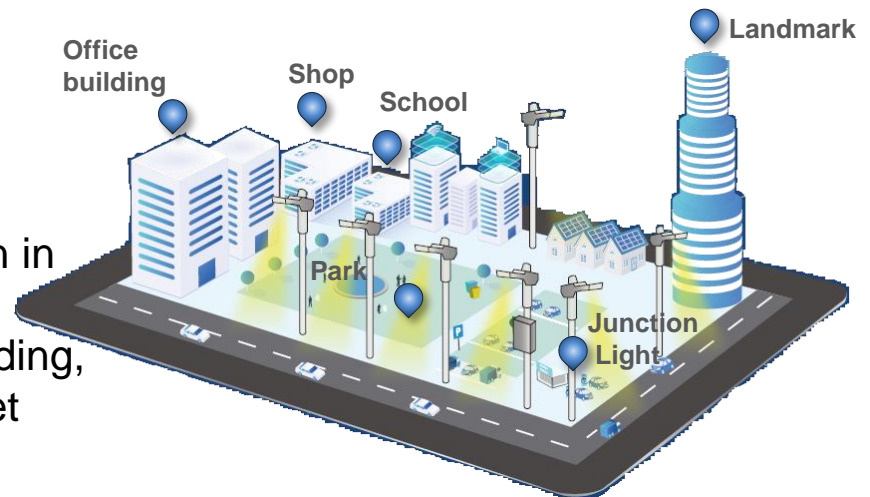


## Target market

- ▶ High density installation concept

New market creation

Installing environmental sensor over the town in every few km to collect high density data  
Multiple installation in every block, every building, every shop, every school, junctions and street lights





Any statements in this presentation which are not historical are future projections based on certain assumptions and executive judgments drawn from currently available information.

Please note that actual performance may vary significantly from any particular projection due to various factors.

Factors affecting our actual performance include but are not limited to: (i) changes in economic conditions or demand trends related to MinebeaMitsumi's business operations; (ii) fluctuation of foreign exchange rates or interest rates; and (iii) our ability to continue R&D, manufacturing and marketing in a timely manner in the electronics business sector, where technological innovations are rapid and new products are launched continuously.

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