Denso CASE (Connectivity, Automation, Sharing and Electrification) Research Report, 2020

July 2020

ResearchInChina
www.researchinchina.com

STUDY GOAL AND OBJECTIVES

This report provides the industry executives with strategically significant competitor information, analysis, insight and projection on the competitive pattern and key companies in the industry, crucial to the development and implementation of effective business, marketing and R&D programs.

REPORT OBJECTIVES

- To establish a comprehensive, factual, annually updated and cost-effective information base on market size, competition patterns, market segments, goals and strategies of the leading players in the market, reviews and forecasts.
- To assist potential market entrants in evaluating prospective acquisition and joint venture candidates.
- To complement the organizations' internal competitor information gathering efforts with strategic analysis, data interpretation and insight.
- To suggest for concerned investors in line with the current development of this industry as well as the development tendency.
- To help company to succeed in a competitive market, and

METHODOLOGY

Both primary and secondary research methodologies were used in preparing this study. Initially, a comprehensive and exhaustive search of the literature on this industry was conducted. These sources included related books and journals, trade literature, marketing literature, other product/promotional literature, annual reports, security analyst reports, and other publications. Subsequently, telephone interviews or email correspondence was conducted with marketing executives etc. Other sources included related magazines, academics, and consulting companies.

INFORMATION SOURCES

The primary information sources include Company Reports, and National Bureau of Statistics of China etc.

Abstract

As one of the top three Tier1 suppliers in the world, Denso makes adjustments and deployments during the automotive industry disruption.

Sorting out Denso's existing product lines, up to 200-plus varieties are found, including virtually 70 for CASE (connectivity, automation, sharing and electrification).

Denso's CASE Products (Part)

Driving Environment Recognition Systems - Radar - Lidar - Stereo Vision Sensor - Sonar Sensor - Sonar ECU - Surround Monitoring ECU	**Collision Safety Systems** - Airbag ECU - Airbag Electronic Satellite Sensor - Accelerometer for Airbag System - Pressure Sensor Satellite for Side Airbag System - Passenger Presence Sensor - Pedestrian Collision Detection Sensor - Passenger Presence ECU/Sensor - TPMS Receiver
Visibility Support Systems - Digital Outer Mirror ECU - Rain Sensor - Light Sensor - Stepping Motor for Headlight Leveling - Stepping Motor for Headlight Swivel	**Vehicle Dynamic Control Systems** - DSS ECU - 4WD ECU - Inertia Sensor for ESC - Accelerometer for Suspension - Electric Power Steering Motor - Motor for Skid Control
Cockpit Information Systems - Touch Display - Head-Up Display Unit (HUD) - Instrument Cluster - Remote Touch Controller - TCU (DCM) - On-board Equipment for V2X - ETC/ETC2.0 On-Board Equipment - VICS Antenna	**Information Security Systems** - Central Gateway ECU - Smart ECU **Products of Substation** - Inverter -DC-DC Converter
Other Products - Body ECU - Smart Fob-key -RKE Transmitter -RKE Receiver - Smart Card Key - Touch Sensor - Power Seat Motor - Telescopic Steering Motor - Tilt Steering Motor - Electric Sunroof Motor - Power Slide Door Motor - Door Closer Motor - Power Window Motor	**Products of Power Supply** - Electrical Powertrain Control Unit - Lithium-Ion Battery ECU - Battery Monitoring Unit - Lithium Battery Pack - Battery Current Sensor **Heat Pump Air-conditioning Systems** - Electric Compressor with Gas Injection Function - Outside Heat Exchanger - Electronic Expansion Valve - Heat Pump ECU

The number of auto parts will decrease in the trend towards CASE. In a recent opinion, automotive hardware will be standardized and contribute declining revenue and profits, and future competition lies in the ability to develop software-defined vehicles. Emerging carmakers have late-mover advantages with more software talents.

Another view is that Tier1 suppliers will be marginalized by OEMs (e.g., Tesla and VW) who try to lead research and development of operating system, DCU (or vehicle central computer) and core software and hardware systems.

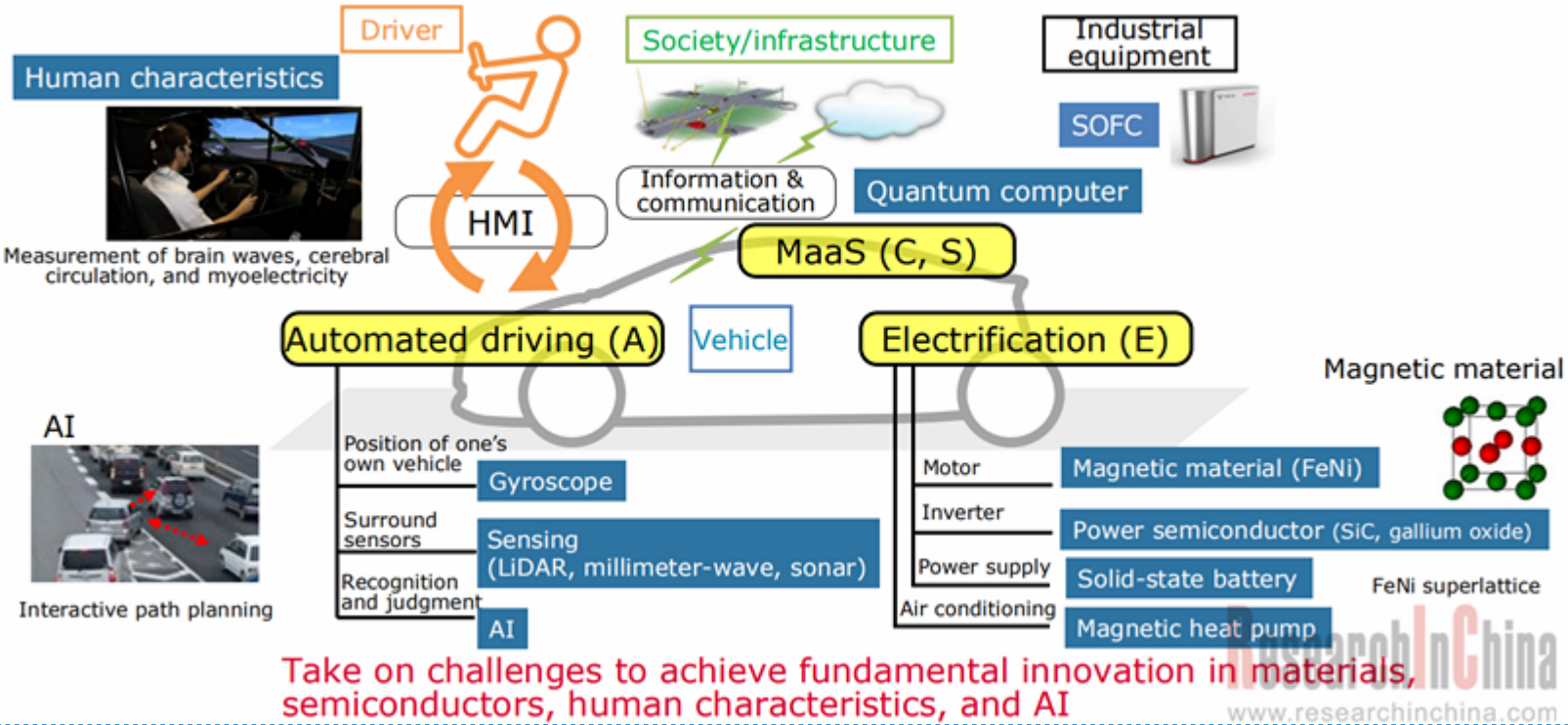
It can be seen from Denso's CASE layout that the supplier not only makes deployments in all aspects of hardware but spends on software not less than IT-backed firms.

Denso's Investment in Hardware

The US government's crackdown on Chinese high-tech companies shows that just developing software and applications at the upper layer is not enough, and holding basic materials, core components and basic software is the only way to be free of others.

Denso lavishes heavily on core fundamental technologies, including magnetic materials, power semiconductors, solid-state batteries, magnetic heat pumps, human-computer interaction, AI, sensors, and quantum computing.

In 2018, Denso invested FLOSFIA and collaborated with the latter on developing a next-generation power semiconductor material (α-Ga2O3) for vehicle application. Schottky Barrier Diode (SBD), Flosfia's α- Ga2O3 material, can work under 600V and 10A, with rated power of 100W-1kW, outperforming SiC products in both efficiency and cost. SBD is expected to be spawned in 2020. Theoretically, SBD material is seven times more efficient than GaN in low frequency and doubles GaN in high frequency or more.



Denso has been devoted to researching automotive semiconductor technology since its IC Laboratory was set up in 1968, having made improvements in ECU, sensor and other products. In September 2017, Denso founded a subsidiary -- NSITEXE, a developer of next-generation high-performance semiconductors. DFP (data flow processor) independently developed by NSITEXE, differs totally from CPU and GPU. For practical use of DFP, Denso and NSITEXE then invested Blaize and quadric.io, two semiconductor start-ups. Blaize, founded by former workers at Intel in 2012, builds software and process architectures from the underlying layer for better AI computing. NSITEXE helps to develop an autonomous driving technology which makes instant judgment in extreme scenarios, by combining DFP and EPU from quadric.io.

Leading Tier1 suppliers from Japan and Germany often adopt IDM model and have their own chip fabrication plants, compared with IC designers focusing on prevailing FABLESS model in China. Denso Hokkaido is Denso's key manufacturing site of semiconductor sensors. To meet the robust demand from electrification and autonomous driving markets, Denso plans expansion of its Hokkaido plant. The expansion project will break ground in July 2020 and be completed in June 2021. The number of employees will expectedly rise to about 1,150 in 2025.

Denso's Investment in Software

In 2025, Denso will boast 12,000 software talents worldwide; it will have more than 1,000 staffs and over 1,100 patents in autonomous driving field.

In addition to workforce enlargement for independent development, Denso also invests quite a few software firms.

Investee	Way of Investment	Main Products & Services
NDIAS	Denso invested with NRI Secure	Cybersecurity
Dellfer	Denso led the first funding round	Cybersecurity
Airbiquity	Denso invested $5 million	OTA
eSOL	Denso acquired 2% equities	Real-time embedded software solutions
Morpho	Denso acquired shares worth RMB64 million	AI, deep learning
FotoNation	Denso invested and cooperated with it to develop DSM (Driver Status Monitoring) software	Driver monitoring system
ZongMu Technology	Denso invested RMB100 million	Low speed automated driving, AVP
Bond Mobility	Denso made a capital contribution	Shared mobility service
Ridecell	Denso made a capital contribution	Autonomous MaaS
ActiveScaler	Denso made an investment	Managed MaaS fleet management
Maas Global	Denso made a capital contribution	Multi-modal subscription transport service for cities worldwide
InfiniteKey	Denso acquired it.	"Phone-as-a-Key" technology
Peloton	Denso made a capital contribution	Truck platooning

Denso's Big Competitive Edges in an Age of CASE

From Denso's alliance, acquisitions and investment map as below as well as the Abstract of this report, it can be seen that Denso is sinking to research and development of core technologies and parts.

DENSO's Business Alliance Strategy

Room 2-626, 6th Floor, No.1, Shanyuan Street, Haidian District, Beijing, 100080
Phone: +86 10 82600828 ● Fax: +86 10 82601570 ● www.researchinchina.com ● report@researchinchina.com

Tier1 suppliers once gave an impression that they were suppliers of integrated systems for OEMs. As OEMs more set foot in system integration, Denso has turned to research and development of more basic core technologies. Weighed by new entrants from all walks of life, Denso still stays competitive on the strength of its across-the-board product matrices, economies of scale, and software and hardware synergy.

For example, Denso's cockpit systems integrated with HMI and air-conditioning technologies will offer better user experience. This is an impossibility for the majority of companies who fail as well in high integration at the underlying layer.

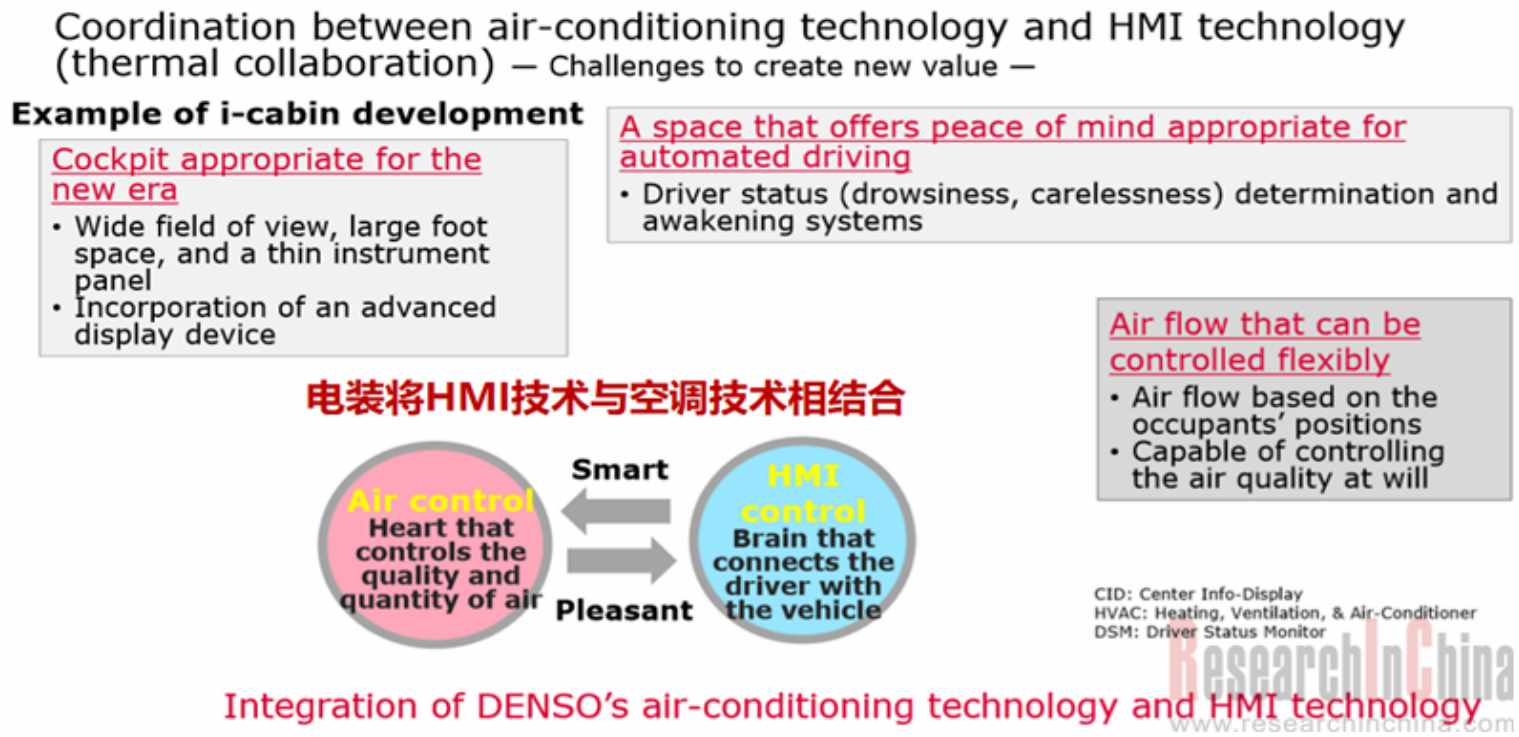


Table of contents

Table of contents

Table of contents

ResearchInChina

The Vertical Portal for China Business Intelligence

How to Buy

You can place your order in the following alternative ways:

1.Order online at www.researchinchina.com

2.Fax order sheet to us at fax number:+86 10 82601570

3. Email your order to: report@researchinchina.com

4. Phone us at +86 10 82600828

Party A:			
Name:			
Address:			
Contact Person:		Tel	
E-mail:		Fax	

Party B:			
Name:	Beijing Waterwood Technologies Co., Ltd (ResearchInChina)		
Address:	Room 2-626, 6th Floor, No.1, Shanyuan Street, Haidian District, Beijing, 100080		
Contact Person:	Liao Yan	Phone:	86-10-82600828
E-mail:	report@researchinchina.com	Fax:	86-10-82601570
Bank details:	Beneficial Name: Beijing Waterwood Technologies Co., Ltd Bank Name: Bank of Communications, Beijing Branch Bank Address: NO.1 jinxiyuan shijicheng,Landianchang,Haidian District,Beijing Bank Account No #: 110060668012015061217 Routing No # : 332906 Bank SWIFT Code: COMMCNSHBJG		

Title	Format	Cost
Total		

Choose type of format

PDF (Single user license) ……..3,200 USD

Hard copy …… 3,400 USD

PDF (Enterprisewide license)…..... 4,800 USD

※ Reports will be dispatched immediately once full payment has been received. Payment may be made by wire transfer or credit card via PayPal.

ResearchInChina

www.researchinchina.com

About ResearchInChina

ResearchInChina (www.researchinchina.com) is a leading independent provider of China business intelligence. Our research is designed to meet the diverse planning and information needs of businesses, institutions, and professional investors worldwide. Our services are used in a variety of ways, including strategic planning, product and sales forecasting, risk and sensitivity management, and as investment research.

Our Major Activities

- ***Multi-users market reports***
- ***Database-RICDB***
- ***Custom Research***
- ***Company Search***

RICDB (http://www.researchinchina.com/data/database.html), is a visible financial data base presented by map and graph covering global and China macroeconomic data, industry data, and company data. It has included nearly 500,000 indices (based on time series), and is continuing to update and increase. The most significant feature of this base is that the vast majority of indices (about 400,000) can be displayed in map.

After purchase of our report, you will be automatically granted to enjoy 2 weeks trial service of RICDB for free.

After trial, you can decide to become our formal member or not. We will try our best to meet your demand. For more information, please find at www.researchinchina.com

For any problems, please contact our service team at:

Room 2-626, 6th Floor, No.1, Shanyuan Street, Haidian District, Beijing, 100080
Phone: +86 10 82600828 ● Fax: +86 10 82601570 ● www.researchinchina.com ● report@researchinchina.com