



# China EV (Electric Vehicle) Motor Controller Industry Report, 2018-2022

August 2018

## **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

Motor drive control system (including drive motor and motor controller) is an important execution mechanism when an EV runs, and its control & drive properties decide main driving performance indicators. Each battery electric vehicle or hybrid vehicle needs a set of motor drive control system.

Motor controller prices vary greatly depending on specifications and performance requirements. The market price of motor controller for electric bus is usually RMB30,000-50,000/set (around RMB45,000/set on average), of single-motor controller for electric truck RMB6,000-7,000/set or so, of single-motor controller for passenger car RMB7,000/set, and of multi-motor controller for passenger car RMB10,000-12,000/set. As the dual-motor design can simplify plug-in hybrid system and improve driving performance (like BMW 2 Series PHEV, Toyota Prius, BYD Tang, and BYD Yuan), the proportion of EVs (PHEV in particular) carrying dual-motor system will be on a steady rise.

China's demand for EV motor controllers was around 870,000 sets or worth RMB11.7 billion or so in 2017, up 34.6% and 29% year on year, respectively. It is expected that EV motor controller market size will climb to RMB26.7 billion in 2022 with passenger car holding a dominant position, propelled by NEVs and conventional hybrids.

The Chinese EV motor controller market is dominated China-made brands, while foreign brands hold fractional share at the stage of market fostering and early development due to higher prices. Chinese companies fall into two parts: EV makers that produce EV motor controllers generally for its own vehicles; EV parts companies that produce EV motor controllers for specific or non-specific carmakers.

Some automakers may ramp up efforts for R&D of motor electronic control and produce products by themselves after mastering the know-how; however, a great many carmakers without such capability still choose third parties to supply products. Hence, the companies with core technologies, experience in mature products, and good cost control will be main beneficiaries.

Prices will trend down throughout the industry, so does the gross margin of major producers, as the competition in the EV motor controller market is possible to prick up along with a quicker R&D progress & launching of mature products of Chinese EV motor controller producers as well as deep involvement of foreign-funded enterprises. In addition, as subsidies decline, the cost transfer of carmakers will also have a big impact on prices.

## EV Motor Controller Demand and Market Size in China, 2015-2022E

	Year	2015	2016	2017	2018E	2019E	2020E	2021E	2022E
Commercial Vehicle	Average unit price of motor controller for electric bus (RMB/set)	45,000	42,000	40,000	38,000	36,000	35,000	31,000	25,000
	Electric bus sales (unit)	96,000	121,000	146,000	179,000	205,000	235,000	263,470	297,885
	Electric bus motor controller market size (RMB bn)	4.3	5.1	5.84	6.8	7.38	8.23	8.17	7.45
	Average unit price of single-motor controller for electric truck (RMB/set)	7,000	6,600	6,200	5,800	5,500	5,200	5,000	4,700
	Electric truck sales (unit)	28,000	50,000	65,000	85,000	110,000	145,000	173,296	194,756
	Electric truck motor controller market size (RMB mln)	200	330	400	490	605	754	867	915
Passenger Car	Average unit price of single-motor controller for electric passenger car (RMB/set)	7,500	7,000	6,600	6,200	6,000	5,800	5,400	5,000
	Average unit price of multi-motor controller for electric passenger car (RMB/set)	12,000	11,000	11,000	10,000	10,000	9,000	8,500	8,300
	EV sales (unit)	146,719	244,763	448,835	766,573	1,041,047	1,229,069	1,452,317	1,832,796
	PHEV sales (unit)	60,663	80,352	107,573	125,750	318,589	525,458	784,144	926,574
	HEV sales (unit)	13,187	60,168	139,671	343,958	646,297	913,270	1,113,279	1,412,578
	Passenger car motor controller market size (RMB bn)	1.8	3.7	5.5	7.31	9.42	12.14	15.47	18.36
Overall	Motor controller market size (RMB bn)	6.3	9.1	11.74	14.6	17.405	21.124	24.507	26.725
	YoY (%)		44.9%	29.0%	24.4%	19.2%	21.4%	16.0%	9.1%

Note: Passenger car multi-motor controller refers to mainly TM+ISG dual-motor controller, front and rear dual-TM motor controller, or front and rear dual TM+ISG tri-motor controller.

Source: ResearchInChina

China EV (Electric Vehicle) Motor Controller Industry Report 2018-2022 highlights the followings:

- ◆ Main technical routes and development trends of EV motor controller;
- ◆ Upstream IGBT & thin-film capacitor and downstream EV industry (market size, competitive landscape, main policies, etc.);
- ◆ EV motor controller (industrial policy, market size, supply chain, and competitive landscape), global mainstream EV motor electronic control systems;
- ◆ 19 Chinese EV motor controller producers (operation, motor controller business and technology, etc.);
- ◆ 6 global IGBT vendors (operation, business in EV field, etc.);
- ◆ 8 global automotive inverter companies (operation, business in EV field, etc.).

### 1 Overview of Motor Controller

- 1.1 Definition
- 1.2 Operating Principle
- 1.3 Classification of Products
- 1.4 Development History of Main Technical Routes
  - 1.4.1 Si IGBT Motor Controller
  - 1.4.2 SiC IGBT Motor Controller
- 1.5 Technology Trend
  - 1.5.1 Modularization
  - 1.5.2 Intelligence
  - 1.5.3 Integration

### 2 Industry Chain

- 2.1 Upstream IGBT Market
  - 2.1.1 Development of IGBT
  - 2.1.2 Market Size
  - 2.1.3 Competitive Landscape
  - 2.1.4 Supply Chain
  - 2.1.5 EV IGBT
  - 2.1.6 Development Direction of IGBT
- 2.2 Upstream Thin-film Capacitor Market
  - 2.2.1 Market Size
  - 2.2.2 Industrial Chain and Manufacturing Process
  - 2.2.3 Competitive Landscape
  - 2.2.4 EV Thin-film Capacitor
- 2.3 Downstream EV Market
  - 2.3.1 Overall
  - 2.3.2 Electric Passenger Car

- 2.3.3 Electric Commercial Vehicle
- 2.3.4 Main Policies

### 3 EV Motor Controller Market

- 3.1 Policy Environment
- 3.2 Market Size
- 3.3 Industry Profit
- 3.4 Mode of Supply
- 3.5 Competitive Landscape
- 3.6 Development of Major Enterprises
- 3.7 Global Mainstream NEV Motor Electronic Control Systems
  - 3.7.1 Tesla Model S
  - 3.7.2 Nissan Leaf
  - 3.7.3 Mitsubishi Outlander PHEV
  - 3.7.4 BMW i3
  - 3.7.5 Chevrolet Volt
  - 3.7.6 Volkswagen e-Golf
  - 3.7.7 Audi A3 e-tron
  - 3.7.8 Ford Fusion/C-Max
  - 3.7.9 Toyota Prius (PHEV and HEV)

### 4 Chinese EV Motor Controller Manufacturers

- 4.1 Shanghai E-drive Co., Ltd.
  - 4.1.1 Profile
  - 4.1.2 Operation
  - 4.1.3 EV Motor Controller Business
  - 4.1.4 Technical Features

- 4.1.5 Supply Chain
- 4.1.6 Expansion in Lines of Business
- 4.2 Shenzhen Inovance Technology Co., Ltd.
  - 4.2.1 Profile
  - 4.2.2 Operation
  - 4.2.3 EV Motor Controller Operation and Development Strategy
  - 4.2.4 EV Motor Controllers and Technical Features
- 4.3 Shanghai Dajun Technologies, Inc.
  - 4.3.1 Profile
  - 4.3.2 Development History
  - 4.3.3 Operation
  - 4.3.4 Business Model
  - 4.3.5 EV Motor Controllers and Technical Features
  - 4.3.6 Business in EV Field
  - 4.3.7 Development Strategy in EV Field
- 4.4 Tianjin Santroll Electric Automobile Technology Co., Ltd.
  - 4.4.1 Profile
  - 4.4.2 EV Business
  - 4.4.3 EV Power Systems and Technical Features
  - 4.4.4 Development Strategy in EV Field
- 4.5 Zhongshan Broad-Ocean Motor Co., Ltd.
  - 4.5.1 Profile
  - 4.5.2 Operation
  - 4.5.3 EV Motor Controller Business
  - 4.5.4 R&D
  - 4.5.5 Development Strategy
- 4.6 United Automotive Electronic Systems Co., Ltd. (UAES)

4.6.1 Profile	4.10.7 Development Strategy of Motor Controller Business	4.18 JEE Automation Equipment Co., Ltd.
4.6.2 Production and R&D	4.11 Fujian Fugong Power Technology Co., Ltd.	4.18.1 Profile
4.6.3 EV Motor Controller Business	4.11.1 Profile	4.18.2 EV E-drive Business
4.7 Hunan CRRC Times Electric Vehicle	4.11.2 Cooperation with Overseas Partners	4.19 Shandong Deyang Electronics Technology
4.7.1 Profile	4.11.3 NEV Drive Assembly Business	4.19.1 Profile
4.7.2 Operation	4.11.4 Capacity Planning	4.19.2 EV E-drive Business
4.7.3 EV Controller Business	4.12 Chroma ATE Inc.	4.20 Beijing Siemens Automotive E-Drive System
4.7.4 Dynamics of Drive System Business	4.12.1 Profile	4.21 Prestolite E-Propulsion Systems (Beijing) Limited
4.8 BYD	4.12.2 Operation	
4.8.1 Profile	4.12.3 EV Motor Controller Business	<b>5 IGBT Suppliers</b>
4.8.2 Operation	4.12.4 Development Strategy in EV Field	5.1 Fuji Electric
4.8.3 EV Motor Controller Business	4.13 Delta Electronics	5.1.1 Profile
4.9 Zhuhai Enpower Electric Co., Ltd.	4.13.1 Profile	5.1.2 Operation
4.9.1 Profile	4.13.2 Operation	5.1.3 Business in EV Field
4.9.2 Revenue and Costs	4.13.3 Business in EV Field	5.1.4 Development Strategy in EV Field
4.9.3 Sales Model	4.14 Jing-Jin Electric Technologies (Beijing) Co., Ltd.	5.2 Infineon
4.9.4 Major Customers	4.14.1 Profile	5.2.1 Profile
4.9.5 EV Motor Controller Business	4.14.2 EV Motor Controller Business	5.2.2 Operation
4.9.6 R&D	4.15 DEC Dongfeng Electric Machinery Co., Ltd.	5.2.3 Business in EV Field
4.9.7 Development Strategy of Motor Controller Business	4.15.1 Profile	5.2.4 Development Strategy in EV Field
4.10 Shenzhen V&T Technologies Co., Ltd.	4.15.2 EV Controller Business	5.3 Denso
4.10.1 Profile	4.16 Nidec (Beijing) Drive Technologies Co., Ltd.	5.3.1 Profile
4.10.2 Revenue and Costs	4.16.1 Profile	5.3.2 Operation
4.10.3 Sales Model	4.16.2 Operation	5.3.3 Business in EV Field
4.10.4 Major Customers	4.16.3 EV Motor Controller Business	5.4 ROHM
4.10.5 EV Motor Controller Business	4.17 Time High-Tech Co., Ltd.	5.4.1 Profile
4.10.6 R&D	4.17.1 Profile	5.4.2 Operation
	4.17.2 EV Motor Controller Business	5.4.3 Business in EV Field

5.5 IR	6.5.2 Operation
5.5.1 Profile	6.5.3 Business in EV Field
5.5.2 Operation	6.6 Delphi
5.5.3 Business in EV Field	6.6.1 Profile
5.6 Semikron	6.6.2 Operation
5.6.1 Profile	6.6.3 Business in EV Field
5.6.2 Operation	6.7 Robert Bosch
5.6.3 Business in EV Field	6.7.1 Profile
	6.7.2 Operation
<b>6 Inverter Manufacturers</b>	6.7.3 Business in EV Field
6.1 Hitachi Automotive Systems	6.8 Continental
6.1.1 Profile	6.8.1 Profile
6.1.2 Operation	6.8.2 Operation
6.1.3 Business in EV Field	6.8.3 Business in EV Field
6.2 Mitsubishi Electric	
6.2.1 Profile	
6.2.2 Operation	
6.2.3 Business in EV Field	
6.3 Meidensha	
6.3.1 Profile	
6.3.2 Operation	
6.3.3 Business in EV Field	
6.4 Toshiba	
6.4.1 Profile	
6.4.2 Operation	
6.4.3 Business in EV Field	
6.5 Hyundai Mobis	
6.5.1 Profile	



- Principle of EV Motor Controller
- Classification of EV Motor Controllers
- IGBT Power Module and Motor Controller for 2nd-generation Prius
- Structure of Hitachi's 1st-generation Motor Controller
- Structure of Hitachi's 2nd-generation Motor Controller
- Hitachi's Double-sided Pin-Fin IGBT Module and 3rd-generation Motor Controller
- Bosch's 3rd-generation Automotive IGBT Power Module
- Bosch's Motor Controller - INV2CON
- Bosch's Motor Controller - INVCON2.3
- Continental's EPF2 Series Motor Controllers
- Continental's New-generation Motor Controllers
- SiC (Left) and Si (Right) Motor Controllers Co-developed by Toyota and Denso
- Meidensha's SiC Motor Controller and Motor AIO (All-In-One)
- Application of IGBT by Voltage
- IGBT Technology Evolution and Players Involved
- Development History of 1st-6th-generation IGBT Technologies
- Technology Roadmaps of Global Major IGBT Vendors, 2017-2025
- Global IGBT Market Size by Application, 2016-2022E
- Selling Price, Shipments, and Market Size of IGBT, 2014-2020E
- Chinese IGBT Market Size, 2014-2020E
- Market Shares of Global Major IGBT Vendors, 2017
- Ranking of Global IGBT Vendors by Power Range, 2017
- Market Shares of Major IGBT Vendors in China, 2014
- Global Major EV IGBT Vendors
- Global IGBT Industry Supply Chain by Power Range

- China's IGBT Industry Supply Chain
- Major Local Companies in China's IGBT Industry Chain and Their Products
- Global Downstream Markets of IGBT Module by Field, 2014
- Global Downstream Markets of IGBT Module by Field, 2020E
- Global EV IGBT Market Size, 2014-2020E
- Max. Voltage and Current of Controllable Power Semiconductor on the Market
- Levels of Power Module Integration
- Comparison of Parameters between Major Materials and Silicon Material
- Physical Parameters of Different Semiconductor Materials
- SPT+ IGBT Structure
- Diagrams of Trench-gate IGBT and CSTBT
- Structure of an RC-IGBT from ABB
- Global Capacitor Market Size, 2009-2019E
- Chinese Capacitor Market Size, 2009-2019E
- China's Film Capacitor Output and Sales Volume, 2010-2014
- Film Capacitor Industry Chain
- Film Capacitor Manufacturing Process and Barriers
- Major Film Capacitor Vendors at Home and Abroad
- Sales Volume of Electric Passenger Vehicle in Major Countries/Regions, 2013-2017
- Monthly Sales Volume of New Energy Vehicle (EV&PHEV) Worldwide, 2014-2017
- Ranking of World's NEV Makers by Sales Volume, 2017
- Global Sales Volume of Electric Passenger Vehicle, 2012-2020E
- Monthly Sales Volume of Electric Vehicle in the United States, 2014-2017
- Monthly Sales Volume of Electric Vehicle in Europe, 2014-2016
- Automobile Ownership, Output and Sales Volume in China, 2010-2018

- China's Output and Sales Volume of Electric Vehicles, 2011-2017
- China's Sales Volume of Electric Vehicles (EV&PHEV), 2014-2022E
- China's Sales Volume of Conventional Hybrid Electric Vehicles (HEV), 2012-2022E
- China's Sales Volume of Electric Vehicles (EV&PHEV), 2014-2022E
- Sales of TOP10 Battery Electric Passenger Vehicle Makers in China, 2017
- Electric Passenger Vehicle (EV&PHEV) Sales Volume in China, 2016-2017
- Ranking of New Energy Passenger Vehicle Models by Sales Volume, 2017
- Top 30 New Energy Passenger Car Models by Output in China, 2016-2017
- Top 20 Energy-saving and New Energy Passenger Car Models by Monthly Sales, 2016-2017
- China's Output of Electric Commercial Vehicles, Jan-Dec 2015
- China's Monthly Output of New Energy Commercial Vehicles, 2016-2017
- China's Output of New Energy Commercial Vehicles by Model, 2016-2017
- China's Output of Electric Bus, Jan-Dec 2015
- China's Output of New Energy Buses by Model, 2016-2017
- China's Output of Battery Electric Trucks, Jan-Dec 2015
- China's Output of Battery Electric Trucks, 2016-2017
- China's Sales Volume of Electric Commercial Vehicles, 2014-2022E
- Comparison of Subsidy Standards (Central Finance) for Electric Bus in China, 2018
- Changes in Subsidy Standards (Central Finance) for Electric Vehicle in China, 2016-2018
- Subsidy Standards for Full-cell Vehicle in China, 2018
- List of Cities or Regions for New Energy Vehicle Promotion and Application (1st Batch)
- List of Cities or Regions for New Energy Vehicle Promotion and Application (2nd Batch)
- Comparison of Taxes on ICE and EV in China
- Models among 4th-17th Batches of Purchase Duty-Free Catalog Approved by MIIT, 2015-2017
- Policies on EV Motor Controller in China

- EV Motor Controller Demand and Market Size in China, 2015-2022E
- Gross Margins of Shenzhen Inovance Technology, Shenzhen V&T Technologies and Zhuhai Enpower Electric's Motor Controller Business, 2012-2017
- Supply Modes of EV Motor Controller in China
- Market Shares of Major Manufacturers of Electric Passenger Car Motor Controller in China, 2015
- Market Shares of Major Manufacturers of Electric Passenger Car Motor Controller in China, 2016
- Market Shares of Major Manufacturers of Electric Passenger Car Motor Controller in China, 2017
- Top10 Electric Passenger Car Motor Controller Manufacturers by Installment in China, 2017
- TOP10 Electric Passenger Car Motor Manufacturers by Installment in China, 2017
- Motor and Controller Suppliers of Major Electric Bus Manufacturers in China
- Motor and Controller Suppliers of Major Passenger Car Manufacturers in China
- Motor and Controller Suppliers of Major Electric Logistics Vehicle Manufacturers in China
- Major EV Motor Controller Manufacturers in China
- Tesla Front-drive Motor Controller
- Tesla Rear-drive Motor Controller
- Tesla Rear-drive Powertrain
- Nissan Leaf E-drive System FF
- Nissan Leaf E-drive Assembly
- Nissan Leaf Supply System
- Architecture of Mitsubishi Outlander PHEV
- BMW i3 Drive Motor and Inverter Assembly
- Voltec E-drive System
- Volkswagen e-golf "Electric Engine Room" (Electric Motor (Middle), Motor Controller (Left))
- Architecture of Audi A3 etron
- Audi A3 etron Motor Controller (Integrating DCDC)

- Ford C-Max Motor Controller
- 4th-generation Prius Electronic Control PCU
- Equity Structure of Shanghai E-drive (Before/After Being Acquired)
- Operation System of Shanghai E-drive (After Being Acquired)
- Major Clients of Zhongshan Broad-Ocean Motor and Shanghai E-drive
- Financial Indices of Shanghai E-drive, 2009-2017
- Main Products of Shanghai E-drive
- Production Base Construction of Shanghai E-drive
- Installment of Shanghai E-drive's EV Motor Controller Systems, 2013-2017
- Core Patented Technologies of Shanghai E-drive
- Top5 Clients of Shanghai E-drive, 2014-2015Q1
- Top5 Suppliers of Shanghai E-drive, 2014-2015Q1
- Revenue and Net Income of Shenzhen Inovance Technology, 2009-2018Q1
- Gross Margin of Shenzhen Inovance Technology, 2009-2017
- Revenue of Shenzhen Inovance Technology by Product, 2014-2017
- Gross Margin of Shenzhen Inovance Technology by Product, 2012-2017
- Partners of Shenzhen Inovance Technology's Automotive Electronics Business
- Shenzhen Inovance Technology's System Solutions for Plug-in Hybrid Bus
- Shenzhen Inovance Technology's Main EV Motor Controllers and Their Applications
- Business Performance of Shanghai Dajun Technologies, 2012-2017
- Main Materials Purchased by Shanghai Dajun Technologies
- Technical Parameters of Shanghai Dajun Technologies' N110WSA Motor Controller
- Technical Parameters of Shanghai Dajun Technologies' A360140J Motor Controller
- Output and Sales Volume of Shanghai Dajun Technologies' Motor Drive System, 2012-2016
- Subsidiaries of Shanghai Dajun Technologies

- Equity Structure of Tianjin Santroll Electric Automobile Technology
- Main Financial Indices of Tianjin Santroll Electric Automobile Technology, 2014-2016
- Revenue of Tianjin Santroll Electric Automobile Technology by Product, 2015-2016
- Structure of Santroll IV-generation Plug-in Hybrid System
- Ratio of Battery Electric to CCBC in Typical Chinese Cities
- Proportion of Actual Battery Electric Duration of Battery Electric Bus 803 in Tianjin
- Santroll 5th-generation ECU
- Equity Structure of Zhongshan Broad-Ocean Motor
- New Energy Vehicle Powertrain Revenue of Zhongshan Broad-Ocean Motor, 2012-2016
- Zhongshan Broad-Ocean Motor's 30KW Motor (YTD030W04) + Controller (KM6025W05) Drive Motor System
- Zhongshan Broad-Ocean Motor's New Energy Vehicle E-drive System Projects under Construction
- Zhongshan Broad-Ocean Motor's Presence in New Energy Vehicle Market
- 10-year Development Strategy of Zhongshan Broad-Ocean Motor
- Production Bases and R&D Centers of UAES
- UAES' E-drive Product Line
- Test Equipment for UAES' E-drive Business
- UAES' Planning for Power Electronic Controllers
- UAES' R&D Capability for Power Electronic Controllers
- Structure and Specifications of UAES' Single-motor Control Products
- Structure and Specifications of UAES' Dual-motor Control Products
- Financial Indices of Hunan CRRC Times Electric Vehicle, 2011-2015
- Motor Controllers of Hunan CRRC Times Electric Vehicle
- BYD's Workforce, 2007-2017
- Automobile Output and Sales of BYD, 2010-2016
- Revenue, Net Income & Gross Margin of BYD, 2007-2018Q1

- Revenue of BYD by Product, 2009-2017
- Gross Margin of BYD by Product, 2009-2017
- Bidirectional Inverter Charging/Discharging Drive Motor Controller
- BYD's Bidirectional Inverter Charging/Discharging Technology
- BYD's Competence in Motor Controller Process
- Main Motor Controller Production Lines and Key Equipment of BYD
- Revenue of Zhuhai Enpower Electric by Product, 2013-2017
- Zhuhai Enpower Electric's Purchases for Main Raw Materials, 2013-2016
- Major Suppliers and Procurement of Zhuhai Enpower Electric, 2016
- Motor Controller Partners of Zhuhai Enpower Electric
- Major Customers and Sales of Zhuhai Enpower Electric, 2013-2016
- Capacity, Output, and Sales Volume of Zhuhai Enpower Electric's Main Products, 2013-2017
- Average Prices of Zhuhai Enpower Electric's Motor Controllers, 2013-2017
- Zhuhai Enpower Electric's R&D Programs
- Zhuhai Enpower Electric's Projects with Funds from IPO
- Revenue and Net Income of Shenzhen V&T Technologies, 2012-2018Q1
- Revenue of Shenzhen V&T Technologies by Product, 2014-2017
- Procurement and Purchase Prices of Main Raw Materials for Motor Controller of Shenzhen V&T Technologies, 2012-Jan-Sept 2015
- Product Sales Model of Shenzhen V&T Technologies, 2011-2014
- Top5 Customers of Shenzhen V&T Technologies, 2011-2014
- Major Customers for Shenzhen V&T Technologies' EV Motor Controllers
- Average Unit Price of Shenzhen V&T Technologies' EV Motor Controllers, 2012-2017
- EV Motor Controller Capacity and Capacity Utilization of Shenzhen V&T Technologies, 2012-2015
- EV Motor Controller Sales of Shenzhen V&T Technologies, 2012-2017
- Shenzhen V&T Technologies' Core Technologies for Motor Controller

- Shenzhen V&T Technologies' Projects with Funds from IPO
- Major Cooperative Enterprises of Fujian Fugong Power Technology
- Main Financial Indices of Fujian Fugong Power Technology, 2014-Oct 2015
- Architecture of CHS Dual-mode Hybrid System
- Diagram of Internal CHS Hybrid Transmission Case
- Auto Models with CHS Hybrid System
- R&D Center Architecture of Fujian Fugong Power Technology
- Global Presence of Chroma ATE Inc.
- Financial Indices of Chroma ATE Inc. (Group's Consolidation), 2010-2016
- Revenue (by Division) of Chroma ATE Inc., 2016-2017
- CR Series Motor Controller Product Line of Chroma ATE Inc.
- Key Technical Parameters of CR Series Motor Controller of Chroma ATE Inc.
- Financial Indices of Delta Electronics, 2011-2017
- Capacity, Output and Output Value of Delta Electronics' Power Supply and Components, 2015-2017
- Sales Volume of Delta Electronics' Power Supply and Components, 2016-2017
- Jing-Jin Electric Technologies' R&D of Key Equipment
- Performance Parameters of PII Automotive Motor Controller of Jing-Jin Electric Technologies
- Performance Parameters of Four-in-One Automotive Motor Controller of Jing-Jin Electric Technologies
- EV Motor Controllers of DEC Dongfeng Electric Machinery Co., Ltd
- New Energy Vehicle SRD Motor of China Tex MEE
- Battery Electric Power & Control System Assemblies of Time High-Tech
- EV Power Control System Composition Solution of Time High-Tech
- Key Technical Parameters of EV Motor Controller of Time High-Tech
- Financial Indices of Fuji Electric, FY2012-2018
- Revenue and Operating Income of Fuji Electric (by Business), FY2013-2017



- Revenue (by Region) of Fuji Electric, FY2013-2017
- Revenue of Fuji Electric's Power Device Division, FY2016-FY2020E
- IGBT and SiC R&D Planning of Fuji Electric, 2015-2021
- Power Device Expansion Plan of Fuji Electric
- 7th-generation IGBT Product Planning of Fuji Electric, 2016-2018
- New IGBT Mass Production Plan of Fuji Electric
- Industrial IGBT / SiC Loss Comparison, 2015-2017
- Automotive Power Module Development Roadmap of Fuji Electric, 2005-2025E
- Global Rankings of Infineon's Three Major Businesses, 2017
- Global Rankings of Infineon's Automotive Electronics Businesses, 2017
- Infineon's Revenue (by Region), FY2017-FY2018
- Infineon's Revenue (by Division), FY2017-FY2018
- Infineon HybridPACK? Family IGBT Modules
- Denso's Revenue and Profits, FY2017-FY2018
- Denso's Revenue and Operating Income (by Region), FY2017-FY2018
- Denso's Revenue (by Product), FY2017-FY2018
- Denso's Client Structure, FY2017-FY2018
- Power Electronics Projects of Japanese NEDO
- ROHM's Financial Indices, FY2013-FY2018
- ROHM's Revenue (by Business), FY2014-FY2019
- ROHM's Revenue (by Region), FY2014-FY2019
- ROHM's Revenue (by Application), FY2018
- Main Technical Parameters of ROHM's Automotive IGBT Module
- Structure of ROHM IGBT-IPM
- Loss Comparison of Conventional IGBT-IPM and ROHM MOS-IPM

- Development History of ROHM's SiC Products
- SiC-based Power Device Lineup of ROHM
- IR's Revenue (by Division), FY2012-FY2014
- Operation of Semikron
- Key IGBT Brands of Semikron
- Product Portfolio of SEMIKRON's SKiM modules
- Key Features of SEMIKRON's SKiM modules
- Product Portfolio of SEMIKRON's SKiiP IPM
- Key Features of SEMIKRON's SKiiP IPM
- Structure of SEMIDRON's SKAI Power Electronic Platform
- Product Portfolio of SEMIKRON's SKAI Power Electronic Platform
- Key Features of SEMIKRON's SKAI Power Electronic Platform
- Revenue of Hitachi Automotive Systems, FY2012-FY2016
- Workforce of Hitachi Automotive Systems, FY2012-FY2016
- Revenue Planning of Hitachi Automotive Systems by Business, FY2015-FY2020E
- Hitachi Automotive Systems' Major Customers for Its EV Inverters
- Financial Indices of Mitsubishi Electric, FY2013- FY2018
- Revenue Percentage of Mitsubishi Electric by Business, FY2009-FY2018
- EV J1-Series Power Modules EVPM of Mitsubishi Electric
- Lineup and Packaging Structure of J1-Series Power Modules EVPM
- Mitsubishi Electric's Major Customers for Its EV Inverters
- Meidensha's Financial Indices, FY2014- FY2018
- Meidensha's Revenue (by Division), FY2016-FY2017
- Meidensha's Major Customers for Its EV Inverters
- Toshiba's Revenue and Net Income, FY2014- FY2018

- Toshiba's Revenue Structure (by Business), FY2017- FY2018
- Toshiba's Major Customers for Its EV Inverters
- Global Distribution of Hyundai Mobis' Customers
- Revenue Plan of Hyundai Mobis (by Business), 2018-2025E
- Revenue and Operating Margin of Hyundai Mobis, FY2006- FY2016
- Hyundai Mobis' Major Customers for Its EV Inverters
- Delphi's Financial Indices, 2014-2017
- Delphi's Major Customers and Regional Distribution
- Delphi's Major Customers and Revenue Contribution Rates, 2017
- Delphi's Products in EV Field
- Technical Features of Delphi's EV Inverters
- Delphi's Viperv Double-sided Heat Dissipation Structure
- Major Customers for Delphi's EV Inverters
- Bosch's Revenue and EBIT, 2011-2017
- Bosch's Revenue Structure (by Division), 2012-2017
- Revenue and EBIT of Bosch Automotive Division, 2012-2017
- Bosch's Revenue Structure (by Region), 2012-2017
- Bosch's Sales in Major Countries, 2016-2017
- Major Customers for Bosch's EV Inverters
- Continental's Revenue and EBIT, 2011-2017
- Major Customers for Continental's EV Inverters

You can place your order in the following alternative ways:

1. Order online at [www.researchinchina.com](http://www.researchinchina.com)
2. Fax order sheet to us at fax number: +86 10 82601570
3. Email your order to: [report@researchinchina.com](mailto:report@researchinchina.com)
4. Phone us at +86 10 82600828

<b>Party A:</b>			
Name:			
Address:			
Contact Person:		Tel	
E-mail:		Fax	

<b>Party B:</b>			
Name:	Beijing Waterwood Technologies Co., Ltd (ResearchInChina)		
Address:	Room 801, B1, Changyuan Tiandi Building, No. 18, Suzhou Street, Haidian District, Beijing, China 100080		
Contact Person:	Liao Yan	Phone:	86-10-82600828
E-mail:	<a href="mailto:report@researchinchina.com">report@researchinchina.com</a>	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
<i>Total</i>		

Choose type of format

- PDF (Single user license) .....3,400 USD
- Hard copy ..... 3,600 USD
- PDF (Enterprisewide license)..... 5,000 USD

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

### About ResearchInChina

ResearchInChina ([www.researchinchina.com](http://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](http://www.researchinchina.com)

For any problems, please contact our service team at: