

China EV (Electric Vehicle) Motor Controller Industry Report, 2016-2020

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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

Battery, motor and ECU are the three core components of new energy vehicle. EV drive control is one of core technologies for EV. Design of motor controller and development of control algorithm are critical factors determining performance of the whole drive system.

Motor controller prices vary greatly depending on specification and performance, generally RMB30,000-50,000 for large bus and RMB5,000-15,000 for passenger vehicle. PHEV and HEV usually adopt multi-motor architecture, including TM motor and ISG motor, thus resulting in higher costs of motor controller.

Furthermore, the evolution of EV e-drive system to wheel-side motor or wheel hub motor will also increase the cost of motor controller and complicate control strategy.

In such case, China's demand for EV motor controller was 380,000 sets, generating a market size of around RMB6.3 billion (currently concentrated in commercial vehicle field) and, driven by new energy vehicle and conventional hybrid vehicle, estimated to swell to RMB29 billion in 2020 when passenger vehicle will prevail.

In particular, as hybrid vehicles are expected to be mass-produced on a large scale, either Corun Hybrid System Technology (CHS) co-funded by Geely and Hunan Corun New Energy or localization of Toyota THS will expand the market of homegrown motor controller in China.

Currently, the Chinese EV motor controller market is dominated by domestic brands, compared to fractional share of foreign products at the stage of market fostering and early development due to higher prices and other reasons.

BYD became the largest vendor in the Chinese electric passenger vehicle motor controller market with a share of 28.6% by shipment in 2015. The company purchases IGBT modules to assemble motor controllers which are supplied to its own passenger vehicle production bases. Other players with higher market share are Zhongshan Broad Ocean Motor (including Shanghai E-drive), Zhuhai Enpower Electric, Shenzhen Inovance Technology, and UAES.

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China's EV Motor Controller Demand and Market Size, 2015-2020E

	Year	2015	2016E	2017E	2018E	2019E	2020E
Commercial Vehicle	Average Price of Electric Bus Motor Controller (RMB/set)	45,000	42,000	40,000	38,000	36,000	35,000
	Electric Bus Sales (Unit)	96,000	112,000	133,000	159,000	195,000	225,000
	Electric Bus Motor Controller Market Size (RMB bn)	4.3	4.7	5.3	6.0	7.0	7.9
	Average Price of Electric Truck Motor Controller (RMB/set)	7,000	6,600	6,200	5,800	5,500	5,200
	Electric Truck Sales (Unit)	28,000	45,080	72,100	116,000	185,600	295,000
	Electric Truck Motor Controller Market Size (RMB mln)	200	300	400	700	1,000	1,500
Passenger Vehicle	Average Price of Electric Passenger Vehicle Motor Controller (RMB/set)	7,500	7,000	6,600	6,200	6,000	5,800
	Average Price of Electric Passenger Vehicle Multi-motor Controller (RMB/set)	12,000	11,000	11,000	10,000	10,000	9,000
	EV Sales (Unit)	143,492	290,335	475,631	684,703	931,047	1,219,069
	PHEV Sales (Unit)	63,746	124,429	208,730	307,620	408,589	522,458
	HEV Sales (Unit)	13,187	120,000	250,000	450,000	650,000	900,000
	Passenger Vehicle Motor Controller Market Size (RMB bn)	1.8	3.7	6.7	11.4	15.2	19.5
Overall	Overall Motor Controller Market Size (RMB bn)	6.3	8.7	12.4	18.1	23.3	29.0
	YoY (%)		38.5%	42.6%	45.7%	28.4%	24.4%

Note: Passenger vehicle multi-motor controller refers mainly to TM+ISG dual-motor controller, front & rear dual-TM motor controller, or front & rear dual-TM+ISG triple motor controller, etc.

Source: ResearchInChina

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From the perspective of industrial chain, IGBT module is the most core upstream component of motor controller. Global market size of EV IGBT module was about USD1 billion in 2015. Fairchild, Infineon, and ST have an upper hand in automotive IGBT market. However, Chinese BYD now is also engaged in IGBT. China accounts for about 1/3 of global IGBT demand but imports over 90% of its own demand. The IGBT modules produced by local companies are primarily used in low-power fields, such as air conditioner, induction heating, etc.

EV motor controller now employs mainly silicon-based IGBT module. However, SiC-dominated wide bandgap semiconductor devices have overcome the limitations of silicon-based semiconductor devices in terms of withstand voltage level, operating temperature, switching loss, and switching speed. For example, Nissan's Leaf has integrated motor, speed reducer, and controller. This represents a trend in which the product can be more compact and standardized.

Another aspect of system integration is functional integration. EV may serve as an energy storage element of new energy grid in future, requiring bidirectional correlation of vehicle and grid (V2G). Vehicle-mounted motor control inverter can also be used as the inverter between battery and grid for charging and grid feedback, thus realizing integration of motor drive and bidirectional charger.

China EV (Electric Vehicle) Motor Controller Industry Report, 2016-2020 by ResearchInChina highlights the followings:

- Main technology roadmaps 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 system;
- 19 Chinese EV motor controller enterprises (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.)

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Table of contents



1 Overview of Motor Controller

- 1.1 Definition
- 1.2 Operating Principle
- 1.3 Classification
- 1.4 Development History of Main Technology Roadmaps
- 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 Intelligentization
- 1.5.3 Integration

2 Industrial 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 Dynamics 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 Vehicle
- 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 Supply Mode
- 3.5 Competitive Landscape
- 3.6 Development of Major Enterprises
- 3.7 Global Mainstream New-energy Vehicle 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)

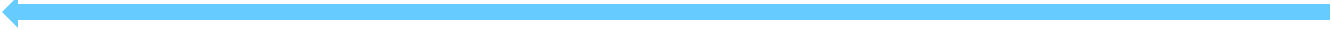
4 Chinese EV Motor Controller Enterprises

- 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
- 4.2 Shenzhen Inovance Technology Co., Ltd.
- 4.2.1 Profile
- 4.2.2 Operation
- 4.2.3 EV Motor Controller Operation and Development Strategy

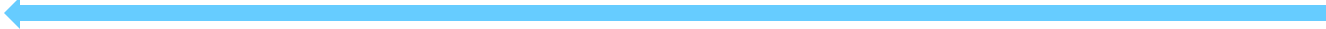
- 4.2.4 EV Motor Controllers and Technical Features
- 4.3 Shanghai Dajun Technologies, Inc.
- 4.3.1 Profile
- 4.3.2 Development History
- 4.3.2 Operation
- 4.3.3 Business Model
- 4.3.4 EV Motor Controllers and Technical Features
- 4.3.5 Business in EV Field
- 4.3.6 Development Strategy in EV Field
- 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
- 4.6.2 Production and R&D
- 4.6.3 EV Motor Controller Business
- 4.7 Hunan CRRC Times Electric Vehicle Co., Ltd.
- 4.7.1 Profile
- 4.7.2 Operation
- 4.7.3 EV Controller Business
- 4.7.4 Dynamics of Drive System Business

Table of contents

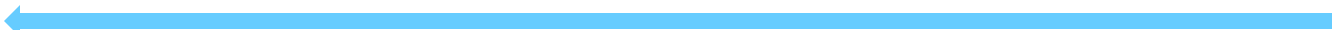
4.8 BYD	4.13.1 Profile	5.2 Infineon
4.8.1 Profile	4.13.2 Operation	5.2.1 Profile
4.8.2 Operation	4.13.3 Business in EV Field	5.2.2 Operation
4.8.3 EV Motor Controller Business	4.14 Jing-Jin Electric Technologies (Beijing) Co., Ltd.	5.2.3 Business in EV Field
4.9 Zhuhai Enpower Electric Co., Ltd.	4.14.1 Profile	5.2.4 Development Strategy in EV Field
4.9.1 Profile	4.14.2 EV Motor Controller Business	5.3 Denso
4.9.2 Revenue and Costs	4.15 DEC Dongfeng Electric Machinery Co., Ltd.	5.3.1 Profile
4.9.3 Sales Model	4.15.1 Profile	5.3.2 Operation
4.9.4 Major Customers	4.15.2 EV Controller Business	5.3.3 Business in EV Field
4.9.5 EV Motor Controller Business	4.16 Nidec (Beijing) Drive Technologies Co., Ltd.	5.4 ROHM
4.9.6 R&D	4.16.1 Profile	5.4.1 Profile
4.9.7 Motor Controller Development Strategy	4.16.2 Operation	5.4.2 Operation
4.10 Shenzhen V&T Technologies Co., Ltd.	4.16.3 EV Motor Controller Business	5.4.3 Business in EV Field
4.10.1 Profile	4.17 Time High-Tech Co., Ltd.	5.5 IR
4.10.2 Revenue and Costs	4.17.1 Profile	5.5.1 Profile
4.10.3 Sales Model	4.17.2 EV Motor Controller Business	5.5.2 Operation
4.10.4 Major Customers	4.18 JEE Automation Equipment Co., Ltd.	5.5.3 Business in EV Field
4.10.5 EV Motor Controller Business	4.18.1 Profile	5.6 Semikron
4.10.6 R&D	4.18.2 EV E-drive Business	
4.10.7 Motor Controller Development Strategy	4.19 Shandong Deyang Electronics Technology Co., Ltd.	6 Inverter Manufacturers
4.11 Fujian Fugong Power Technology Co., Ltd.	4.19.1 Profile	6.1 Hitachi Automotive Systems
4.11.1 Profile	4.19.2 EV E-drive Business	6.2 Mitsubishi Electric
4.11.2 Cooperation with Overseas Partners	4.20 Beijing Siemens Automotive E-Drive System Co., Ltd.	6.3 Meidensha
4.11.3 New-energy Vehicle Drive Assembly Business	4.21 Prestolite E-Propulsion Systems (Beijing) Limited	6.4 Toshiba
4.11.4 Capacity Planning		6.4.1 Profile
4.12 Chroma ATE Inc.	5 IGBT Suppliers	6.4.2 Operation
4.12.1 Profile	5.1Fuji Electric	6.4.3 Business in EV Field
4.12.2 Operation	5.1.1 Profile	6.5 Hyundai Mobis
4.12.3 EV Motor Controller Business	5.1.2 Operation	6.6 Delphi
4.12.4 Development Strategy in EV Field	5.1.3 Business in EV Field	6.7 Bosch
4.13 Delta Electronics	5.1.4 Development Strategy in EV Field	6.8 Continental

- 
- Principle of EV Motor Controllers
 - Classification of EV Motor Controllers
 - IGBT Power Module and Motor Controller for 2nd-generation Prius
 - IGBT Power Module and Motor Controller for 3rd-generation Prius
 - Structure of Hitachi 1st-generation Motor Controller
 - Structure of Hitachi 2nd-generation Motor Controller
 - Hitachi 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 of 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
 - Global IGBT Market Size by Application, 2014-2016
 - Selling Price, Shipments, and Market Size Change of IGBT, 2014-2020E
 - Chinese IGBT Market Size, 2014-2020E
 - Market Share of Global Major IGBT Vendors, 2015
 - Market Share of Major Enterprises in China's IGBT Industry, 2014
 - Global Major EV IGBT Vendors
 - Global IGBT Industry Supply Chain
 - China's IGBT Industry Supply Chain

Selected Charts

- 
- Local Companies in China's IGBT Industry Chain and Their Products
 - Global Downstream Market of IGBT Module by Field, 2014
 - Global Downstream Market of IGBT Module by Field, 2020E
 - Global EV IGBT Market Size, 2014-2020E
 - Maximum Voltage and Current of Controllable Power Semiconductor on the Market
 - Level of Power Module Integration
 - Comparison of Parameters of Major Materials and Silicon
 - Physical Parameters of Different Semiconductor Materials
 - SPT+ IGBT Structure
 - Diagram 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
 - Comparison of Electric Passenger Vehicle Sales Volume Worldwide (Major Countries/Regions), 2013-2015
 - Monthly Sales Volume of New Energy Vehicles (EV&PHEV) Worldwide, 2014-2015
 - Comparison of Global Top20 Electric Passenger Vehicles by Sales Volume, 2013-2015
 - Sales Volume of Electric Passenger Vehicles (EV&PHEV) Worldwide, 2011-2020E
 - Car Ownership, Output and Sales Volume in China, 2010-2018E
 - China's Output and Sales Volume of Electric Vehicles, 2010-2015
 - China's Output of Electric Vehicles (EV&PHEV), Jan-Dec 2015
 - China's Sales Volume of Electric Vehicles (EV&PHEV), 2011-2020E

Selected Charts

- 
- China's Sales Volume of Conventional HEV, 2012-2020E
 - China's Sales Volume of Electric Passenger Vehicles (EV&PHEV), 2011-2020E
 - China's Sales Volume of Electric Passenger Vehicles (EV&PHEV), Jan-Dec 2015
 - China's Output of New Energy Passenger Vehicles (EV&PHEV) by Model, Jan-Dec 2015
 - China's Output of Electric Commercial Vehicles, Jan-Dec 2015
 - China's Electric Vehicle Promotion Schemes, 2014-2015
 - China's Output of Electric Bus, Jan-Dec 2015
 - China's Output of Battery Electric Truck, Jan-Dec 2015
 - China's Sales Volume of Electric Commercial Vehicles (EV&PHEV), 2011-2020E
 - Subsidy Standard for Electric Passenger Vehicle in China, 2013-2020E
 - Subsidy Standards for Electric Bus in China, 2016
 - Subsidy Standards for Electric Bus in China, 2014-2015 (Central Finance)
 - Subsidy Standards for Full-cell Vehicle in China, 2016
 - Models among the Catalogue of Recommended Models for New Energy Vehicle Promotion and Application (New Version) (1st-2nd Batches)
 - Carmakers among the Catalogue of Recommended Models for New Energy Vehicle Promotion and Application (New Version) (1st Batch)
 - Carmakers among the Catalogue of Recommended Models for New Energy Vehicle Promotion and Application (New Version) (2nd Batch)
 - Models among 1st Three Batches of Purchase Duty-Free Catalog Approved by MIIT
 - Comparison of Taxes on ICE and EV in China
 - Catalogue of New-Energy Automobile Models Exempt from Vehicle Purchase Tax (1st Batch)
 - Catalogue of New-Energy Automobile Models Exempt from Vehicle Purchase Tax (2nd Batch)
 - Catalogue of New-Energy Automobile Models Exempt from Vehicle Purchase Tax (3rd Batch)
 - Policies on EV Motor Controller in China
 - EV Motor Controller Demand and Market Size in China, 2015-2020E

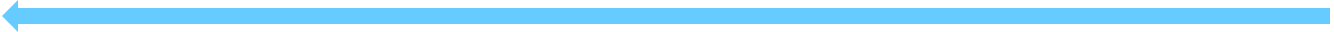
Selected Charts

- 
- Gross Margin of Shenzhen Inovance Technology and Shenzhen V&T Technologies' Motor Controller Business, 2011-2015
 - Supply Modes of EV Motor Controller in China
 - Market Share of Major Electric Passenger Vehicle Motor Controller Manufacturers in China, 2015
 - Motor and Controller Suppliers of Major Electric Bus Manufacturers in China
 - Motor and Controller Suppliers of Major Passenger 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 (Right))
 - 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 Customers of Zhongshan Broad-Ocean Motor and Shanghai E-drive
 - Financial Indices of Shanghai E-drive, 2009-2016
 - Main Products of Shanghai E-drive

Selected Charts

- 
- Production Base Construction of Shanghai E-drive
 - EV Drive Motor System Shipments of Shanghai E-drive, 2013-2015Q1
 - Core Patented Technologies of Shanghai E-drive
 - Top5 Customers of Shanghai E-drive, 2014-2015Q1
 - Top5 Suppliers of Shanghai E-drive, 2014-2015Q1
 - Revenue and Net Income of Shenzhen Inovance Technology, 2009-2016
 - Gross Margin of Shenzhen Inovance Technology, 2009-2016
 - Revenue of Shenzhen Inovance Technology by Product, 2012-2015
 - Gross Margin of Shenzhen Inovance Technology by Product, 2012-2015
 - Progress of Shenzhen Inovance Technology's EV Motor Controller Projects, 2016Q1
 - Partners of Shenzhen Inovance Technology's Automotive Electronics Business
 - Shenzhen Inovance Technology's System Solutions for Plug-in Hybrid Bus
 - Main EV Motor Controllers and Their Applications of Shenzhen Inovance Technology
 - Business Performance of Shanghai Dajun Technologies, 2012-2015
 - 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
 - Motor Drive System Output and Sales Volume of Shanghai Dajun Technologies, 2012-2015
 - Subsidiaries of Shanghai Dajun Technologies
 - Equity Structure of Tianjin Santroll Electric Automobile Technology
 - Main Financial Indices of Tianjin Santroll Electric Automobile Technology, 2014-2015
 - 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 V-generation ECU

Selected Charts

- 
- Equity Structure of Zhongshan Broad-Ocean Motor
 - New Energy Vehicle Powertrain Revenue of Zhongshan Broad-Ocean Motor, 2012-2015
 - 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
 - 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, 2007-2014
 - Car Output and Sales Volume of BYD, 2010-2015H1
 - Revenue, Net Income & Gross Margin of BYD, 2007-2016Q1
 - Revenue Breakdown of BYD by Product, 2007-2015
 - Gross Margin of BYD by Product, 2008-2015
 - Revenue Breakdown of BYD by Region, 2008-2015H1
 - Bidirectional-inversion Charging/Discharging Drive Motor Controller
 - BYD's Bidirectional-inversion Charging/Discharging Technology
 - BYD's Process Capability for Motor Controller

Selected Charts

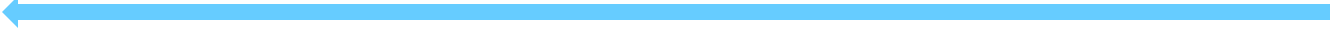
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- Main Motor Controller Production Lines and Key Equipment of BYD
 - Revenue and Net Income of Shenzhen V&T Technologies, 2011-2015
 - Revenue of Shenzhen V&T Technologies by Product, 2011-2015
 - Procurement and Purchase Prices of Main Raw Materials 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, 2011-2014
 - Average Unit Price of Shenzhen V&T Technologies' EV Motor Controllers, 2012-2015
 - EV Motor Controller Capacity and Utilization of Shenzhen V&T Technologies, 2012-2015
 - EV Motor Controller Sales Volume of Shenzhen V&T Technologies, 2012-2015
 - Shenzhen V&T Technologies' Core Technologies for Motor Controller
 - Shenzhen V&T Technologies' Projects with Raised Funds via IPO
 - 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
 - Global Presence of Chroma ATE Inc.
 - Financial Indices of Chroma ATE Inc. (Group's Consolidation), 2009-2015
 - Revenue Breakdown (by Division) of Chroma ATE Inc., 2014-2015
 - 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, 2009-2015
 - Capacity, Output and Output Value (by Product) of Delta Electronics, 2013-2015
 - Sales Volume (by Product) of Delta Electronics, 2014-2015
 - Jing-Jin Electric Technologies' R&D of Key Equipment

Selected Charts

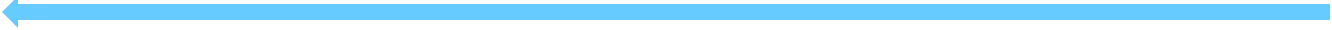


- Performance Parameters of 150KW Vehicle-used Motor Controller of Jing-Jin Electric Technologies
- EV Motor Controllers of DEC Dongfeng Electric Machinery Co., Ltd
- New Energy Vehicle SRD Motor of China Tex MEE
- Battery Electric Power & Control System Assemblies of Time High-Tech
- EV Power Control System Composition Solution of Time High-Tech
- Key Technical Parameters of EV Motor Controller of Time High-Tech
- Fuji Electric's Financial Indices, FY2010-FY2016
- Fuji Electric's Revenue and Operating Income (by Business), FY2013-FY2016
- Fuji Electric's Revenue Breakdown (by Region), FY2011-FY2016
- IGBT and SiC R&D Planning of Fuji Electric, 2015-2021
- 7th-generation IGBT Product Planning of Fuji Electric, 2016-2018
- Industrial IGBT / SiC Loss Comparison, 2015-2017
- Automotive Power Module Development Roadmap of Fuji Electric, 2005-2025
- Global Rankings of Infineon's Three Major Businesses, 2013
- Infineon's Revenue (by Region), FY2013-FY2015
- Infineon's Revenue (by Division), FY2013-FY2015
- Infineon EiceDRIVER? Family IGBT Modules
- Denso's Workforce, FY2011-FY2015
- Denso's Sales and Profits, FY2013-FY2015
- Denso's Operating Income and Net Income, FY2011-FY2015
- Denso's Revenue Structure (by Division), FY2013-FY2015Q1
- Denso's Revenue Breakdown (by Division), FY2013-FY2015Q1
- Denso's Sales and Operating Income (by Region), FY2013-FY2015
- Denso's Revenue Breakdown (by Customer), FY2010-FY2014
- Denso's Client Structure, FY2013-FY2014

Selected Charts

- 
- Power Electronics Projects of Japanese NEDO
 - ROHM's Financial Indices, FY2010-FY2015
 - ROHM's Revenue Breakdown (by Business), FY2012-FY2017
 - ROHM's Revenue Breakdown (by Region), FY2012-FY2017
 - ROHM's Revenue Breakdown (by Application), FY2012-FY2017
 - Main Technical Parameters of ROHM's Vehicle-used IGBT Module
 - Development History of ROHM's SiC Products
 - SiC-based Power Device Lineup of ROHM
 - IR's Revenue Breakdown (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 Semikron'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, FY2011-FY2015
 - Hitachi Automotive Systems' Major Customers for Its EV Inverters
 - Mitsubishi Electric's Financial Indices, FY2010-FY2015
 - Mitsubishi Electric's Revenue (by Business), FY2015
 - Mitsubishi Electric's Major Customers for Its EV Inverters
 - Meidensha's Financial Indices, FY2012-FY2016
 - Meidensha's Revenue and Profits (by Division), FY2014-FY2015

Selected Charts

- 
- Meidensha's Major Customers for Its EV Inverters
 - Toshiba's Revenue and Net Income, FY2011-FY2015
 - Toshiba's Revenue Structure (by Business), FY2011-FY2015
 - Revenue of Toshiba's Electronic Devices & Components Division, FY2011-FY2015
 - Toshiba's Major Customers for Its EV Inverters
 - Revenue and Operating Margin of Hyundai Mobis, FY2006-FY2015
 - Hyundai Mobis' Major Customers for Its EV Inverters
 - Delphi's Workforce, 2011-2015
 - Delphi's Revenue and Gross Margin, 2004-2015H1
 - Delphi's Financial Indices, 2013-2015
 - Delphi's Revenue Structure (by Division), 2011-2015
 - Delphi's Gross Margin (by Division), 2010-2015
 - Main Growth Fields of Delphi's Divisions, 2013-2016
 - Delphi's Revenue Breakdown (by Region), 2010-2014
 - Delphi's Major Customers and Regional Distribution
 - Delphi's Major Customers and Revenue Contribution Rates, 2015
 - Delphi's Product Distribution in EV Field
 - Technical Features of Delphi's EV Inverters
 - Major Customers of Delphi's EV Inverters
 - Bosch's Workforce, 2010-2015
 - Bosch's Revenue and EBIT, 2010-2015
 - Bosch's Revenue Structure (by Division), 2012-2014
 - Revenue and EBIT of Bosch Automotive Division, 2012-2014
 - Bosch's Revenue Structure (by Region), 2012-2014
 - Bosch's Sales in Major Countries, 2012-2014

Selected Charts



- Bosch's Major Customers for Its EV Inverters
- Continental's Workforce, 2009-2014
- Continental's Revenue and EBIT, 2009-2015H1
- Continental's Revenue Structure (by Division), 2008-2013
- Continental's Revenue Structure (by Region), 2008-2013
- Continental's Major Customers for Its EV Inverters

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