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**11 Hongfa Philippine Office**

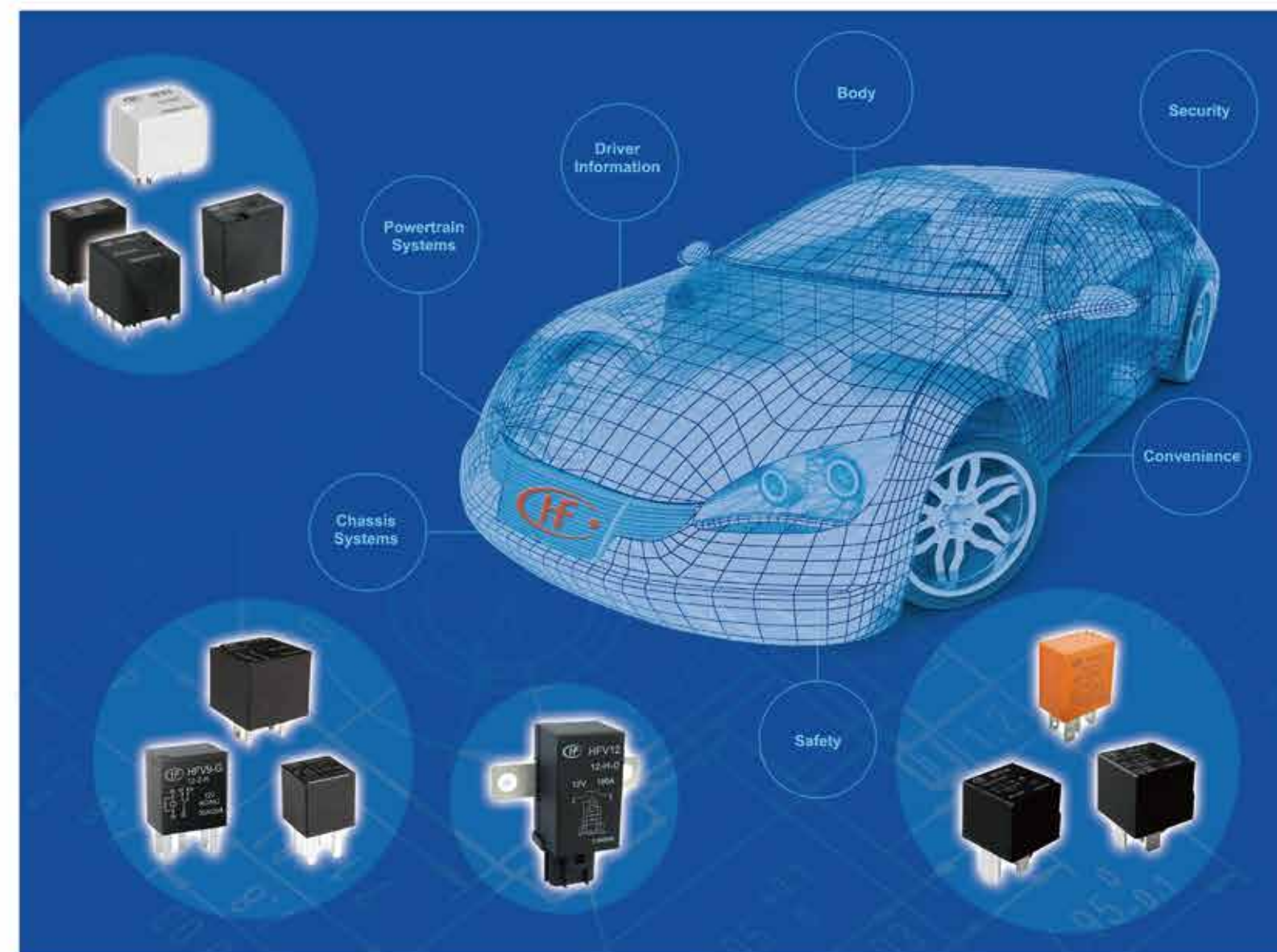
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# HONGFA AUTOMOTIVE ELECTRONICS

## RELAY TECHNOLOGY FOR AUTOMOBILES

ISO/TS16949 ISO14001 OHSAS18001 IECQ QC080000 CERTIFIED



# HF HONGFA RELAY

WWW.HONGFA.COM

**XIAMEN HONGFA ELECTROACOUSTIC CO.,LTD.**

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Scan here for more information.





HongFa Global Service

# ABOUT HONGFA



Hongfa (Hongfa stock code: SH600885) is a globally famous relay manufacturer with an annual production capability of 1.5 billion units. Hongfa has maintained the largest position in China for two decades in relay research, manufacturing, and exportation. Hongfa's enterprise spirit "Persevere for Progress, Strive for Excellence" with the operational philosophy "Focusing on the market; Winning through Quality" drives our continuous growth. Utilizing our enterprise spirit and operational philosophy, Hongfa became a first-class relay research and manufacturing company with focused 22 subsidiaries located in 9 manufacturing campuses and multiple distribution centers with floor space of more than 710 thousand square meters (~7.64 million square feet). We export relays to more than 100 countries utilizing our local sales, customer service, application engineering, and material planners located in Europe, North America, and Asia. Our local sales and Sales & Distribution Centers work in the local regions to provide the support to our customers' needs. We service customers in the market segments of industry, energy, transportation, communication, household appliances, medical, national defense, etc.

With thirty-years of experience in relay R&D and manufacturing, Hongfa "Strives for Excellence" by embracing our technology. Hongfa focuses on product development while adopting the leading technology in this industry. Hongfa has a national level R&D center with the largest testing laboratory in this industry. Our fully-equipped facility maintains the most advanced technology. Hongfa developed the first Post-doctoral Research Program. Our engineers and scientists push the relay industry and they influence many professional and national standards.

Hongfa's Test Center endorses the Hongfa Spirit "Strive for Excellence" with the largest relay test and analysis laboratory in China. This lab utilizes modern and advanced equipment to maintain our certifications from VDE, UL and CNAS. Our products bear the agency markings of UL/CUL, VDE, TÜV and CQC. We at Hongfa believe that our sustainability and our key to success is our pursuit of exceptional and consistent quality. Our adoption of continuous improvement of our quality management system has strengthened us by conducting quality pre-planning, procedure quality control, supply chain management, etc.

Hongfa has won global quality acknowledgments from our customers because of our continuous pursuit of the enterprise spirit.

Hongfa continues to win national recognition. Since 1995, Hongfa has unremittingly been ranked among China Top-100 Electronic Components Enterprises. Hongfa was awarded the Advanced Hi-Tech Enterprise of Torch Program by the Ministry of Science and Technology. Hongfa was the only relay operation to be awarded the first batch National Export-oriented Enterprise of Automotive Components by the Ministry of Commerce and the National Development and Reform Commission.

In 2012, the successful IPO provided the capital and expectation for rapid development and growth. As Hongfa has positioned itself to be a global leader in the relay industry, we will continuously accelerate our industry technology development, lead the national relay industry, diversify our product portfolio, and improve our products.

Hongfa is visionary to grow with all our global customers worldwide. It is our wish that our customers will benefit from our advancements in technology.

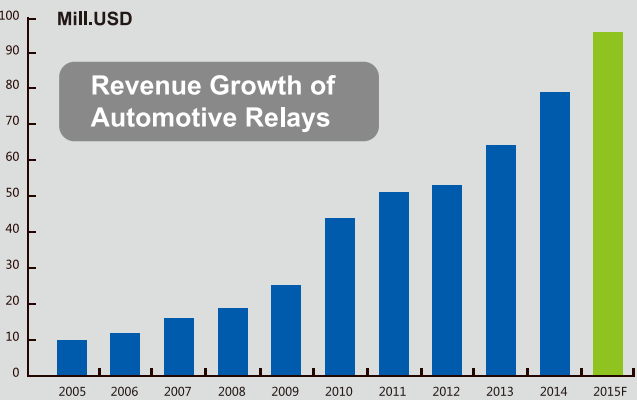


Hongfa Automotive Relay Production Base





# PRODUCT DEVELOPMENT



Hongfa entered the automotive industry more than 20 years ago. Our Automotive R&D and technical staff “Strives for Excellence” by embracing our technology to design and built the best automotive relays in the industry. Our Automotive Group adopted our operational philosophy “focusing on the Market, Winning through Quality” that has enabled us to supply products to a number of global vehicle manufacturers. Our products are found in body control, powertrain control, safety control, vehicle information system, and convenience system, and other applications. Currently, our automotive group contributes to about 10% of the total revenue.

Hongfa is supplying to European, North American, and Asia OEM and Tier 1 customers. Our OEM client list continues to grow but to name a few: GWM, ChangAn, SAIC, SGM, SGMW, Chery, BAIC, Geely, GAC, FAW, ChangAn-Ford, ChangAn-Mazda, FCA, GM (Opel), Ford, IKCO, Volvo, JCB, CLAAS, John Deere, etc. Our relationships and approvals with the OEM's have embraced our expanding list of Tier 1 business relationships: Magneti Marelli, Delphi, Leoni, Lear, Kostal, EKS, and Crouse to name a few.

Hongfa is investing capital on automotive future design and development on automotive products and automation production lines. Our roadmap for new products is following the trend of automotive industry. Our new products are focused on comfort (low noise), energy-saving (latching version – no coli power required after energization), reduction of space utilization (smaller size - sugar cube), and performance (higher current capability). We are expanding our product portfolio and production capacity though our utilization of automation production assembly lines.

## Serviceable Relays (Plug-in)

We carry a full line of 280 and ISO plug-in relays with 20A to 70A rate load capacity. Our products have dust protection, flux proof, and sealed options. Our product portfolio includes Power Mini, Mini ISO, High Current Micro ISO, High Current Micro 280, Micro ISO, Micro 280, and the Ultra Micro 280 (Space Saver).

## High Reliable PCB Relays

Our high reliable PCB relay family is available for wave and reflow soldering with 15A to 70A current load capacity. These products are designed to support central door lock, power doors, power windows, seat modules, sun roof modules, mirror modules, wiper controls, lighting controls, rear window heating, seat heating, speed limit indicators, cooling fan, engineer control, fuel pump, glow plug, fog lamp, headlight, window & mirror defogger, and other applications.

## Battery Disconnect Relay

This high current product is designed to provide a battery disconnect solution.



Hongfa Automotive Electronics

# Product Development

## PCB Relay

### HFKF



**Typical Applications :**  
Central door lock, Power doors and windows, Seat adjustment, Sunroof motor control, Mirror adjustment.

- Features :**
- 25A motor locked load
  - Extremely small relay
  - Change-over contact version
  - Single and twin(H-bridge) version available
  - Coil wire insulation class H (180 °C)
  - HFKF-T (reflow soldering version) available
  - RoHS & ELV compliant

### HFKA



**Typical Applications :**  
Energy management, engine control, ignition, main switch/supply relay, preheating system, quiescent current management.

- Features :**
- 25A motor locked load
  - Extremely small relay
  - Change-over contact version
  - Single and twin version available
  - Coil wire insulation class H (180 °C)
  - HFKA-T (reflow soldering version) available
  - RoHS & ELV compliant

### HFKC



**Typical Applications :**  
Central door lock, Anti-theft lock, Power doors & windows, Lighting, flashlight & indicator lamp control, Wiper control, Instrument control, Rear window and seat heating control.

- Features :**
- Subminiature automotive relay
  - The weight is only 4g for single relay
  - Extended temp. range up to 105 °C
  - The reflow soldering version (open vent hole) available (HFKC-T)
  - RoHS & ELV compliant

### HFKW



**Typical Applications :**  
Central door lock, Power doors & windows, Turning lamp control, Mirror adjustment, Seat adjustment, Speed-limit indicator control, Warm-up control, Wiper control.

- Features :**
- Tight structure and light weight
  - High current contact capacity (Carrying current: 35A/10min 25A/1h)
  - Improved heat resistance
  - Reflow soldering version available
  - RoHS & ELV compliant

### HFKT



**Typical Applications :**  
ABS control, Cooling fan, Engine control, Fuel pump, Heating plug, Hazard warning lamp, Fog lamp & headlight, EPS, window & mirror defogger.

- Features :**
- Max continuous current 40A
  - Max making current 200A
  - Extended temp. range up to 105 °C
  - With highly established reliability
  - Strong resistance ability to shock & vibration
  - Reflow soldering version available
  - RoHS & ELV compliant

### HFKT-L



**Typical Applications :**  
Energy management, engine control, ignition, main switch/supply relay, preheating system, quiescent current management.

- Features :**
- Max. continuous current 50A
  - Max. making current 200A
  - Extended temp. range up to 125 °C
  - With highly established reliability
  - Strong resistance ability to shock & vibration
  - No change of switching state version at breakdown of battery voltage
  - Reflow soldering version available

### HFKP



**Typical Applications :**  
Central door lock, Anti-theft lock, Power doors & windows, Turning lamp, dangerous signal & scram lamp control, Seat adjustment, Air-conditioning, Fuel pump control, Low temperature control, Sunroof motor control, Audio system, Rear window defoggers, Starter solenoid switches.

- Features :**
- 45A switching capability
  - PCB terminals
  - Two pin layout choices
  - 1 Form A & 1 Form C contact arrangement
  - RoHS & ELV compliant

# Product Development



## HFV15-P

**Typical Applications :**  
Fog lamp & headlight control, Rear window defogger, Air-conditioning, Fuel pump control, Cooling fan control, Battery disconnection device, Star / stop control.

- Features :**
- 40A switching capability
  - 1 Form A & 1 Form C contact arrangement
  - RoHS & ELV compliant



## HFV16-P

**Typical Applications :**  
Fog lamp & headlight control, Rear window defogger, Air-conditioning, Fuel pump control, ABS, Traction control system, Cooling fan control, Battery disconnection device, High speed fan control.

- Features :**
- 70A switching capability
  - Extended temp. range up to 125 °C
  - 1 Form A contact arrangement
  - RoHS & ELV compliant

## ISO Relay



## HFV6V (Micro-Low Noise)

**Typical Applications :**  
Lighting control, Heaters (front/rear windows), Front/rear fog lamp control.

- Features :**
- Noise level≤50dB(A)
  - 30A switching capability
  - Ambient temp. range up to 125 °C
  - 1 Form A contact arrangement
  - RoHS & ELV compliant



## HFV6 (Micro)

**Typical Applications :**  
Lighting control, Headlight control, Electromagnet control, Air-conditioning, Heaters (seat, front/rear windows), Fan motors control, Fuel pump control, Wiper motors control.

- Features :**
- 30A switching capability
  - Ambient temp. range up to 125 °C
  - 1 Form A & 1 Form C contact arrangement
  - Plastic sealed and dust protected types available
  - RoHS & ELV compliant



## HFV6-G (High Current Micro)

**Typical Applications :**  
Heaters (seat, front/rear windows), Fan motors control, Fuel pump control, Wiper motors control, Headlight control, Air-conditioning, Lighting control, Electromagnet control, Start / Stop control.

- Features :**
- 35A switching capability
  - Ambient temp.: range up to 125 °C
  - 1 Form A & 1 Form C contact arrangement
  - Plastic sealed and dust protected types available
  - RoHS & ELV compliant



## HFV15 (Mini)

**Typical Applications :**  
Fog lamp & headlight control, Rear window defogger, Air-conditioning, Fuel pump control, Cooling fan control, Battery disconnection device, Star / stop control.

- Features :**
- 40A switching capability
  - 1 Form A & 1 Form C contact arrangement
  - RoHS & ELV compliant



## HFV16 (Power Mini)

**Typical Applications :**  
Fog lamp & headlight control, Rear window defogger, Air-conditioning, Fuel pump control, ABS, Traction control system, Cooling fan control, Battery disconnection device, High-speed fan control.

- Features :**
- 70A switching capability
  - Extended temp. range up to 125 °C
  - 1 Form A contact arrangement
  - RoHS & ELV compliant



## HFV16-L (Power Mini Latching)

**Typical Applications :**  
Power outlet switch off, Energy management.

- Features :**
- 70A switching capability
  - 1 Form A contact arrangement
  - Ambient temperature -40 °C ~ 125 °C
  - Continuous carrying current 80A at 23 °C, 60A at 85 °C, 35A at 125 °C

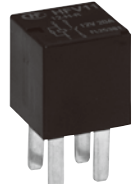


## HFV9-G (High Current Micro)

**Typical Applications :**  
Headlight control, Fuel pump control, Horn control, A/C compressor clutch, Star / stop control.

- Features :**
- Extended temp. range up to 125 °C
  - 1 Form A & 1 Form C contact arrangement
  - 2.8mm QC terminals
  - RoHS & ELV compliant

## 280 Relay



## HFV11 (Ultra Micro)

**Typical Applications :**  
Headlight control, Fuel pump control, Horn control, A/C compressor clutch.

- Features :**
- Miniaturized package: (15.6 x 15.2 x 16.4) mm
  - Extended temperature range: -40 °C to 125 °C
  - 1 Form A contact arrangement
  - 2.8mm QC terminals available
  - RoHS & ELV compliant



## HFV9 (Micro)

**Typical Applications :**  
Headlight control, Fuel pump control, Horn control, A/C compressor clutch.

- Features :**
- Extended temp. range up to 125 °C
  - 1 Form A & 1 Form C contact arrangement
  - 2.8mm QC terminals
  - RoHS & ELV compliant



## HFV12

**Typical Applications :**  
Battery disconnection in order to prevent fire caused by short circuits during an accident, Energy-management.

- Features :**
- Battery Disconnect Relay (Energy-management)
  - 2 coils latching automotive relay
  - Continuous current of 190 A at 85 °C
  - Load terminal connection: screw connection (M8 bolt)
  - Coil terminal connection: 4-pin connector (AMP 0.070 series)
  - Weight: Approx.210g



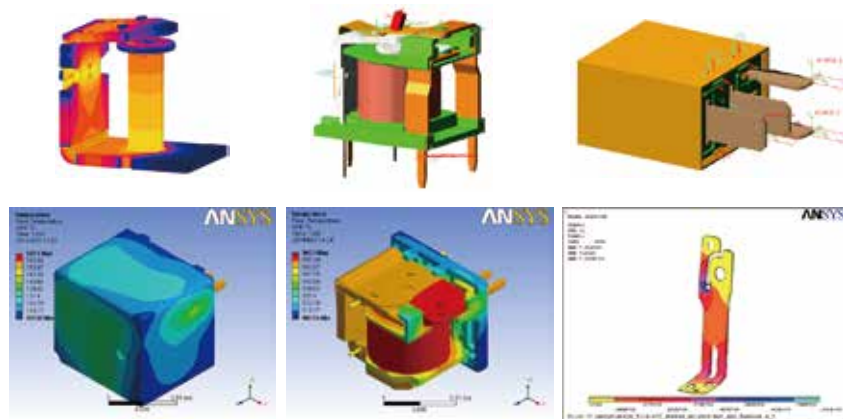
Hongfa Automotive Electronics

# R & D

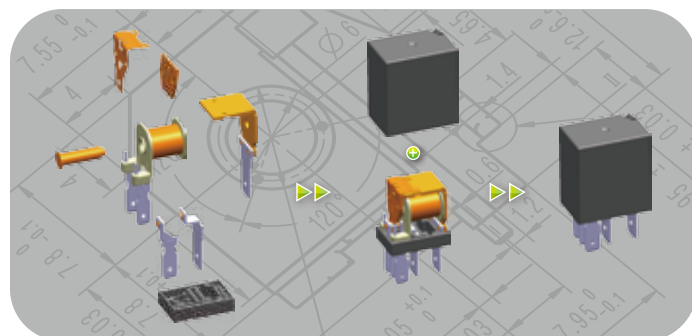
Hongfa is focused on product development while adopting leading technology.

- Awarded 338 patents with 125 pending as of July, 2015.
- Major contributors in professional and national standards for multiple relays (i.e. national standards for six types of signal relays, equivalent to IEC61811-50 or IEC61810-1).
- Champions a Post-doctoral Research Station since 2004, the first one in the industry.
- State-accredited Technical Center.

## CAE



Our world class product development and technical management system provides the tools for advanced research and development. Our technical teams utilize many advanced tools during the product development process such as CAD, CAE, DOE, Quality Engineering, DFSS, and High Speed Camera. These advanced tools allow our technical team to perform the analysis during the product development phase. Our technical staff optimizes the conceptual models to evaluate the sample validation to assure the product design meets the target quality and to shorten the product development cycle. Our technical team assures that our products meet Hongfa the operational philosophy goal "Focusing on the market; Winning through Quality".



Hongfa Automotive Electronics

# Testing



The test center was approved by CNAS (China National Accreditation Service) as IEC17025 test lab and also got the GP10 approval from SGM.

- Reliability Test:  
Complete test ability to ensure the requirement for product development, quality control and customer request.  
Test items include: Electrical performance, Endurance, Mechanical, Environment, EMC and Chemicals, etc.  
Own the ability to develop test equipment and with profound experience to test under GM, Ford, FIAT, Volvo, Volkswagen etc.
- Test for RoHS hazardous material:  
Own the ability of speedy analysis and precise test. The test could be done at the process of material approval, incoming inspection and process control.  
Own the professional test engineers and test equipment such as: XRF, ICP, GC-MS and UV.  
Keep developing test method to meet new environmental requirement such as REACH.



CNAS approval certificate GP10 approval certificate

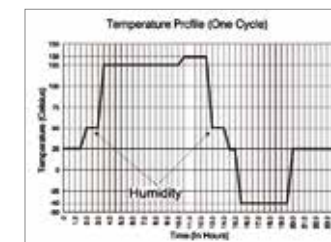


Test equipment combines vibration together with environmental and electrical test.

## Endurance test



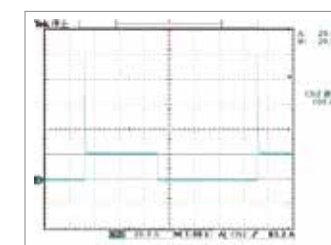
DAQ electrical endurance monitor system



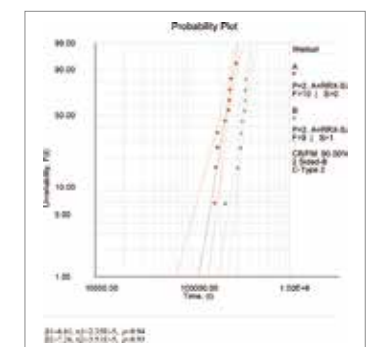
Electrical endurance temperature curve



Samples



Lamp load electrical endurance load curve



WEIBULL Chart

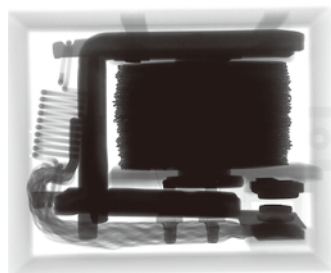


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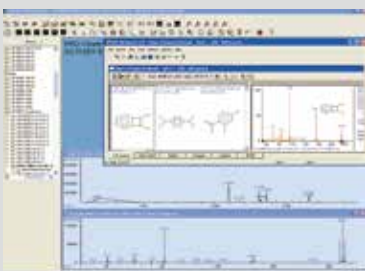
# Analysis

Professional team is doing research on material analysis, failure analysis, product analysis and other fundamental project to improve product performance.

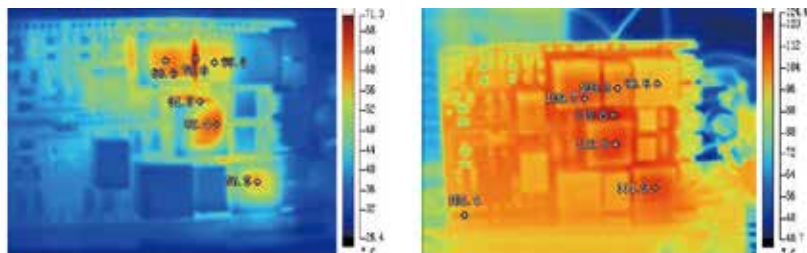
- Anti-arc contact material research.
- Analysis the components of polymer gas to prevent organic silicon contamination during manufacturing process.
- Use X-ray, Infra-red and high speed camera technology to do design validation.
- Use SEM, EDX and FT-IR to analysis the particles inside relay.



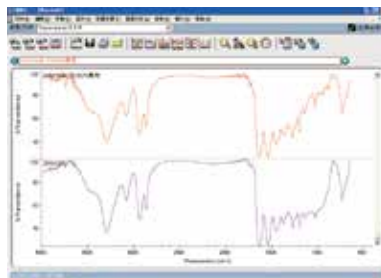
GC-MS



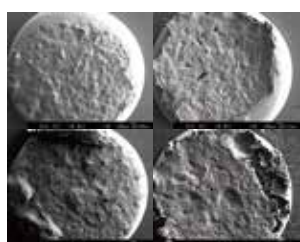
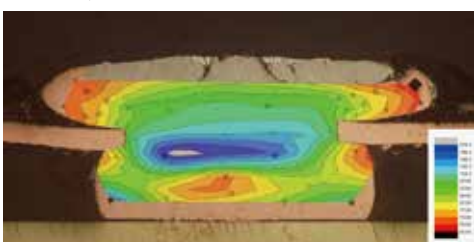
Infra-red imaging



FT-IR



Analysis of contact



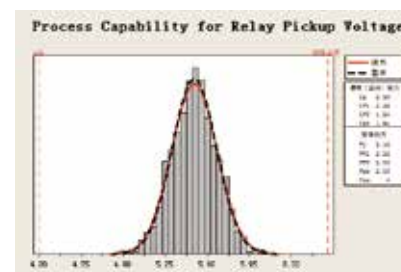
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# Quality Assurance

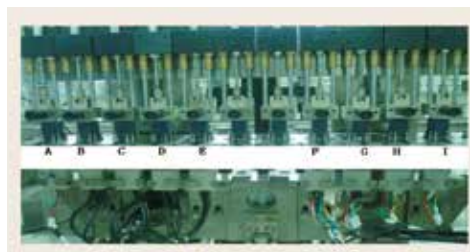
- Quality management system is based on the ISO/TS16949 and customer's specific requirements. Hongfa's enterprise spirit "Persevere for Progress, Strive for Excellence" with the operational philosophy "Focusing on the market; Winning through Quality" drives our values:
  - Strong Customer Support with Fast Response
  - Control of Non-Conformance Product
  - Risk (RPN) Reduction
  - Standard Operator Training
  - Standardized Work Instructions
  - System Audit, Process Audit & Product Audit
  - Error Proofing Verification – "Red Rabbit"
  - Lessons Learned for Continuous Improvement
  - FIFO & Traceability

- World Class Product and Process Development: Drives our origination "Winning through Quality" by utilizing DFSS (Design for Six Sigma).

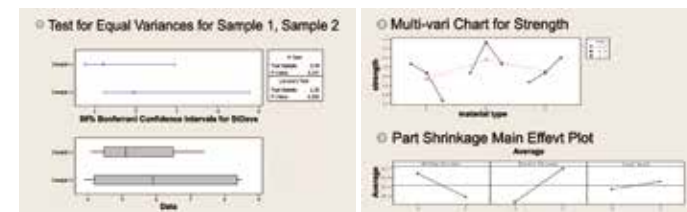
- Advanced process capability to monitor the key characteristics.



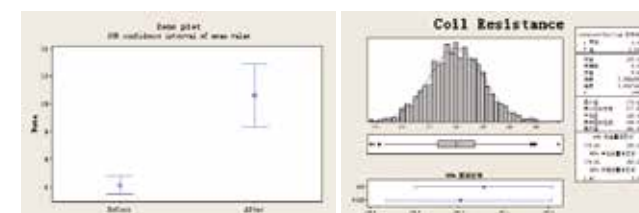
- Automation assembly lines with error-proof test devices and fixtures to minimize defect fall-out.



- Employs modern problem solving process and continuous improvement systems: PDCA cycle, DMAIC, defect concentration diagram, ANOVA, multivariate chart, DOE, 5 Why, 8D and traditional QC tools.



- Applies Minitab software to provide robust analytical data analysis capability.



- Implemented innovative particle control into design and manufacture process from our "Lessons Learned Process".



Hongfa Automotive Electronics

# Tooling & Components

Hongfa Automotive Electronics

# Automated Assembly

Leading Mold Designing and Manufacturing Capacity in Chinese Relay Industry.



Plastic Injection via Central Feeding System



Three-dimensional measuring machine



LWEDM



Coordinate Measuring Machine



CNC



High-precision, High-speed Punch Press

"Winning through Quality" with our world class Design and Manufacture of Automation Equipment for our relay production.

The advanced automation production equipment is designed and manufactured by our experts within the Hongfa Group. This allows our team of experts to implement error prevention by conducting online data collection, data analysis, and foreign material eradication. All of this allows our team to strive for our goal of Zero Defect.





# MULTI-APPLICATIONS

