

# Shenzhen Maspower Semiconductor Co., Ltd.

## Industrial Power Supply Semiconductor

STRONGLY HIGH-PERFORMANCE CHIPS SELECTING MASPOWER

# 01

## Company Introduction

### ISO9001 Certification, National High-tech Enterprise

Maspower is a leading semiconductor power device chip R&D and solution provider, recognized as a National High-tech Enterprise specializing in innovation, refinement, and uniqueness. The company is headquartered in Shenzhen, with R&D centers in Shanghai and Shenzhen. Ultra-high voltage MOSFETs, IGBTs and FRDs are the main products.

The main focus of Maspower is the development of ultra-high voltage MOSFET segments with voltages ranging from 800V to 4700V, addressing customers' core shortage problems. Maspower mainly serves industries such as industrial power supply, photovoltaic energy storage, instrumentation, medical power supply, and State Grid power supply.



Industry  
Experience



Mature  
Technology



Extensive  
Product  
Coverage



### Company Vision

To be a first-class supplier of industrial power semiconductor devices.

### Company Mission

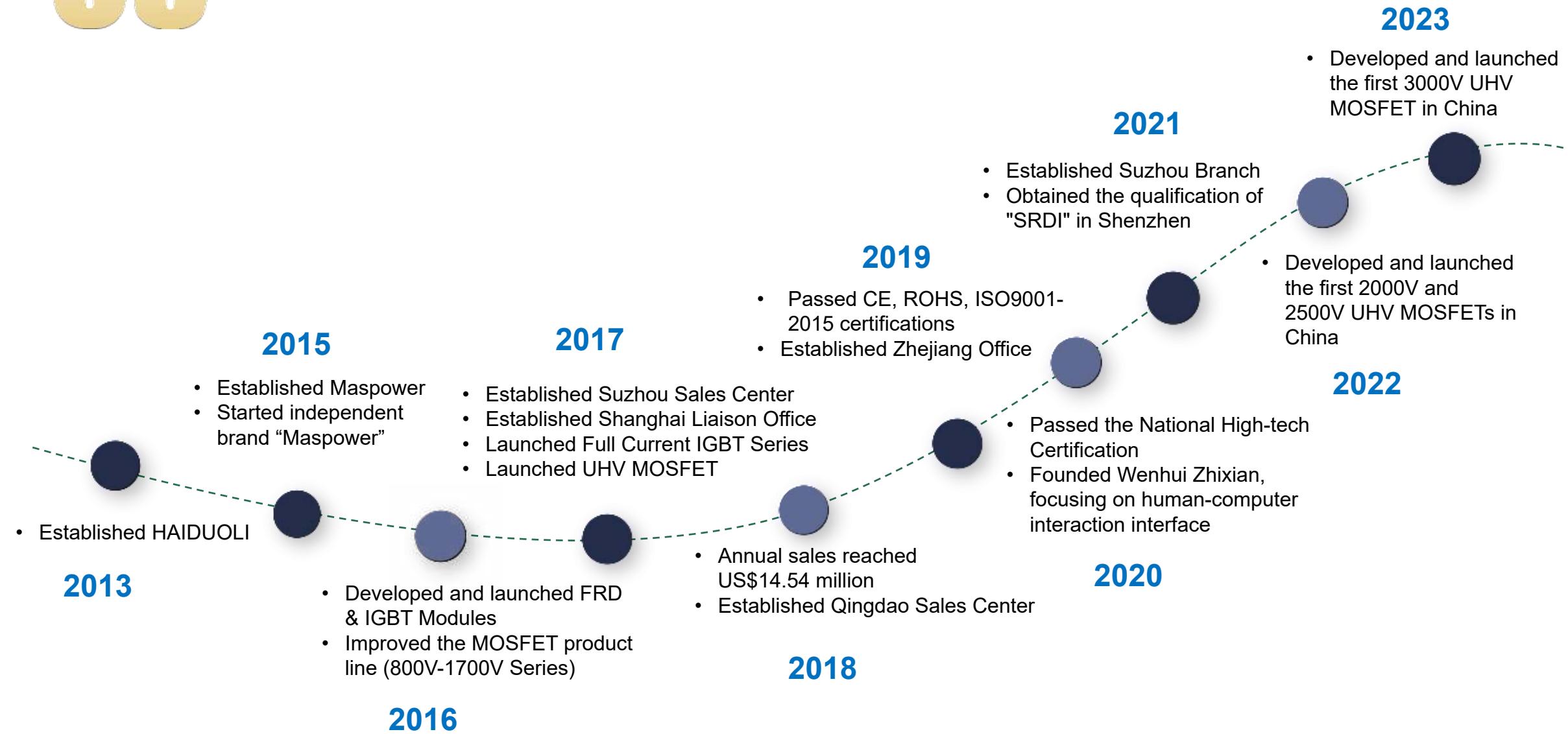
Work hard for customers to no longer be restricted in the field of component procurement, and build a platform for employees to realize the value of life.

### Company Values

Customer-oriented, quality-oriented, survival by superiority.

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## Development History



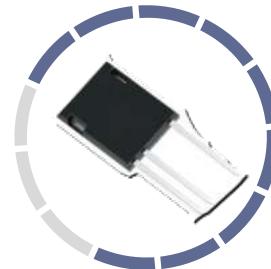
# 04

## Product Introduction



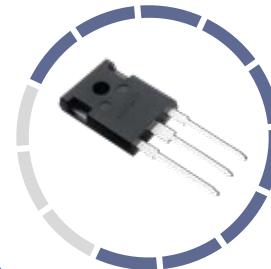
### MOSFET

-60V-4700V  
SJ MOS, HV MOS, LV MOS  
1200V Sic MOS



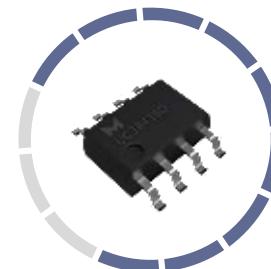
### Fs-Trench IGBT

330V-3000V  
NPT-IGBT, FS-IGBT, RC-IGBT



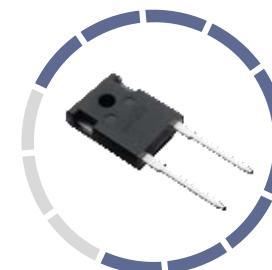
### PWM, AC-DC

10W-100W  
AC-DC Flyback Power Supply



### FRD

200V-2000V  
Fast Recovery Diodes, Ultra Fast Recovery Diodes



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## Product Development Planning

|        | 2015 | 2018  | 2019   | 2020  | 2021 | 2022                            | 2023 | 2024 |
|--------|------|---|--|---|------|---------------------------------|------|------|
| MOSFET |      | Planar Si Mosfet 1000-4700V<br>(2500V has been mass-produced) |  |   |      |                                 |      |      |
|        |      | Groove Si Mosfet 30V-500V                                     |  |   |      |                                 |      |      |
|        |      |   | Shielding gate trench Si Mosfet 30V-500V                       |   |      |                                 |      |      |
|        |      |   |  | Superjunction Si Mosfet 30V-500V                          |      |                                 |      |      |
|        |      |   |  |   |      | Silicon carbide Mosfet 30V-500V |      |      |
| IGBT   |      | Planar IGBT 330V 650V 1200V                                   |  |   |      |                                 |      |      |
|        |      |   | Enhanced planar IGBT 60A-180A high current single tube package |   |      |                                 |      |      |
|        |      |   |  | Trench gate field cut-off IGBT 30KHZ-80KHz high frequency |      |                                 |      |      |

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## Core Technology



Integrated circuits based on Maspower high power, high frequency process, MOSFET, IGBT, FRD products.



Based on SC multi-layer chip technology, high integration, low loss, small size, power conversion chip.



Based on SiC high efficiency and high voltage integrated circuit, MOSFET Diode.

## Technology Advantages



## Welding Equipment

AC ARC Welding  
DC Welding  
TIG, MIG, SMAW  
Cutting Machine



## Renewable Energy

PV Inverter  
BMS  
Energy Storage  
Wind Power Generation



## Power Supply

Electric Power Supply  
Communication Power  
High Frequency Heating  
RF Generator  
UPS



## Power Solutions



## Industrial Control Automation

Frequency Converter  
Industrial Robot  
Servo Driver  
Electronic Load

## Electric Vehicle

Rail Transit  
Charging Pile  
Motor Drive  
Power Inverter  
Range Extender



## Medical Equipment

AED  
CT



MS50N100HGF4, MS170N65HGF4  
MS170N25HGF4 etc.

**FRD**  
EST60BN120SN, EST100BN120SN etc.

**RF Generators**

# 08

## Industrial Application

### LV MOS

MS50N20FC, MS20N50FC,  
MS100N20FC etc.



### HV MOS

MS9N150H, MS12N100FC etc.



## DC Electronic Loads

# 08

## Industrial Applications

### IGBT

MSG40T120FH, MSG60T65HHC0  
etc.



### MOSFET

MS5N100, MS4N1350, MSN4688 etc.



### FRD

ESTF80D22U, ESTF100SS60S,  
ESQ100QN60SN etc.

## Welding Machines

# 08

## Industrial Applications

**IGBT**

650V, 1200V etc.



**FRD**

600V, 1200V, 1500V etc.



**MOSFET**

1000V etc.

**Digital Generators**

**IGBT**

MSG15T120FQC, MSG25T120FPC,  
MSG40T120FQC, MSG15T65FL,  
MSG20T65FQS, etc.

**MOS**

MS5N100S, MS4N1350, MS10N100FB etc.

**FRD**

ESTF45D60UHB etc.

**BJT**

MSJ8N08FD, MSJ8P08FD etc.

**Frequency Converters**

# 08

## Industrial Applications

**IGBT**

650V, 1200V etc.



**MOSFET**

MS5N100S, MS6N120FT,  
MS8N120FT, MS4N1350,  
MS9N120H1, MS5N170FC etc.

**FRD**

600V, 1200V etc.

**PV Inverters**

# 08

## Industrial Applications

MOSFET

2000V, 2500V etc.



AED



**UPS**  
IGBT, MOS, etc.



**Servo Motor**  
IGBT, MOS, MCU etc.



**Charging Pile**  
MOS, FRD etc.

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## R&D Test Production



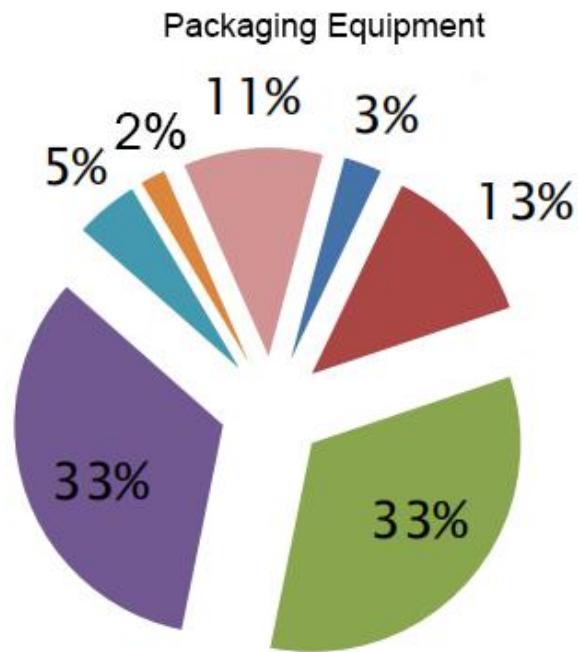


## Stable and Reliable Power System

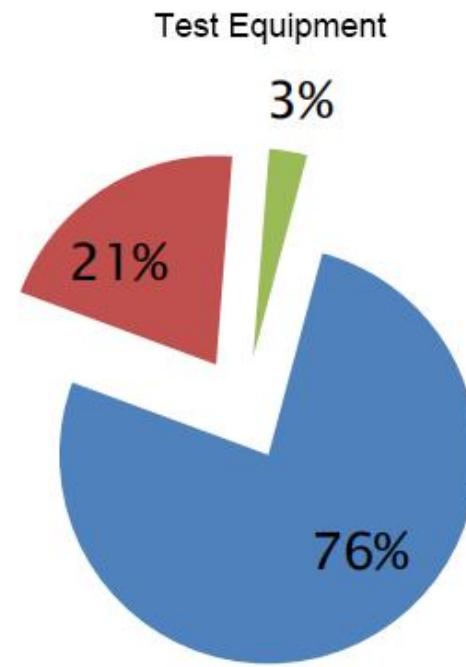
- Ultrapure Water System
- Completely oil-free air compression equipment
- Nitrogen hydrogen mixture for liquid ammonia decomposition

# Production Equipment

The company has introduced in Japan, South Korea, Taiwan, Singapore, Switzerland, the United States, Germany and other leading manufacturers, set the international forefront of mechatronics technology polishing of semiconductor device production equipment.



- Taiwan
- Japan
- Switzerland
- Singapore
- America
- Germany
- South Korea
- China



- Japan
- South Korea
- China

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## Production Equipment





Die Saw



Die Attach



Wire Bond(Au/Cu)



Molding



Plating



Tendon-Cut



Test



Braid



Reliability

| Test Items                    | Reference Standard Number | Test Conditions  | Test Time                     |
|-------------------------------|---------------------------|--|-------------------------------|
| Temperature-Humidity Test     | JESD22-A101               | T <sub>a</sub> =85°C&RH=85°C                                 | 96 , 168, 500, 1000.....Hrs   |
| Pressure Cooker Test          | JESD22-A102               | T <sub>a</sub> =121±2°C                                      | 96 , 168, 500, 1000.....Hrs   |
| High Temperature Storage Test | JESD22-A103               | T <sub>a</sub> =150°C  | 96 , 168, 500, 1000.....Hrs   |
| Temperature Cycling Test      | JESD22-A104               | -55°C→25°C→+150°C  | 100 , 200, 500, 1000.....Cycs |
| High Temperature Reverse Bias | JESD22-A108               | T <sub>a</sub> =150°C<br>V=0.8*BV                            | 96 , 168, 500, 1000.....Hrs   |
| Solder-ability Test           | JESD22-B102               | T <sub>a</sub> =245±5°C(HTH)<br>T <sub>a</sub> =215±5°C(TMT) | T=5±0.5s                      |

Failure Information  
Acquisition

01

Open Short Circuit  
UI-JT Test

02

Electrical Parameter  
Measurement  
Manual and Automatic  
Testing

03

Non-destructive  
Inspection:  
X-ray, Ultrasonic

04

Decapsulation

01

Internal Inspection  
Die surface Inspection,  
Bonding, Defect Inspection,  
SEM

02

Failure Location  
Liquid Crystal Analysis  
Photon Analysis

03

Delayering  
Dry Corrosion  
Wet etching

04

Failure Analysis  
Probe Test  
Focused Ion Beam  
(FIB) Analysis

01

Failure Mechanism  
Comprehensive Evaluation  
Confirmation of  
Failure Mechanism

02

Failure Analysis Report  
Need for Improvement  
Improvement Mechanism  
Optimization

03

Follow-up Service  
Continuous Optimization Plan  
Confirmation of Improvement  
Mechanism

04

Customer Requirements

Product Change Requirements

Market

Process Requirements

Engineering  
(Product Specification)  
Changes

New Sample

Engineering Testing  
Specification Changes

Engineering

Engineering Gap  
Analysis Report

Feasibility  
Assessment Report

Custom

Customer Confirmation

REFUSE

Prohibit Changes

ACCEPT

Engineering

Product Changes

Control  
Center

Issue Engineering Change Notice

Release Testing SOP changes

Quality  
Assurance

SOP Document Issuance

IPQC inspection



The company has a leading semiconductor product design platform, cooperates with many scientific research institutions and universities at home and abroad, and has a mature and reliable semiconductor product packaging design team.

At the same time, it has advanced epitaxial products, BIC MOS, SGT, SJ Process, NPT, Field-Stop, and other manufacturing processes, as well as its own reliability testing and failure analysis capabilities.

## Certification



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## Main Partners

**INOVANCE**  
汇川技术

**JINGCE**  
ELECTRONIC 情测电子

**VAPEL**  
VAPEL  
Leading Global Power Solution Provider

**Leadshine**  
雷赛智能

**GROWATT**  
古 瑞 瓦 特

**JASIC**

**V-GUARD**  
Bring home a better tomorrow

**DELIXI**  
ELECTRIC  
德力西电气

**ITECH**  
YOUR POWER TESTING SOLUTION

**Fronius**

**invt** 英威腾

**Sieyuan** 思源电气

**SINEE**

**CHNT**



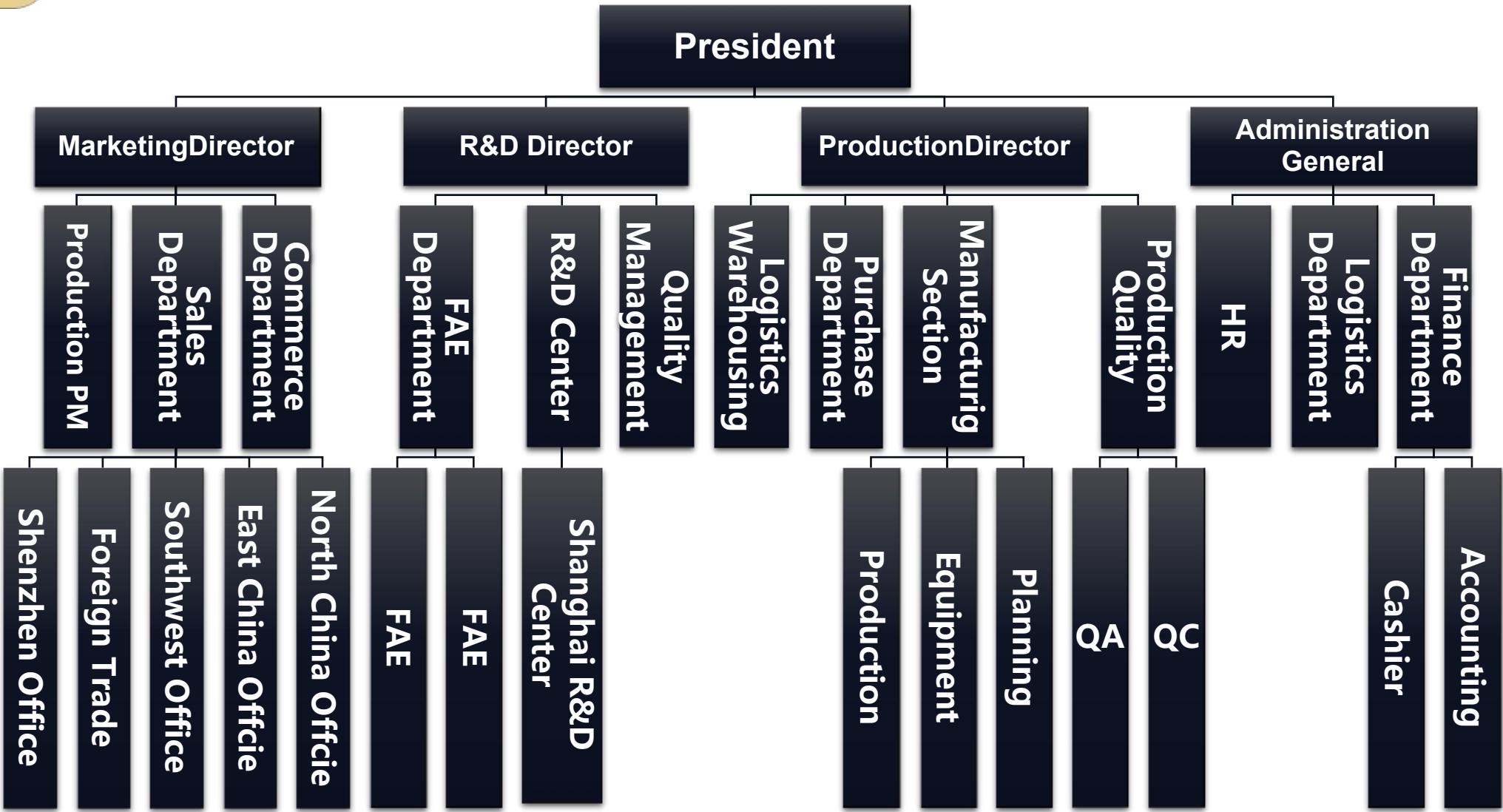
**KONE**

**YUYUE**  
鱼跃医疗

**XIN FENG GUANG**  
**FGI**

**SENCI** ®

**Voltronic Power**  
Advancing Power





THANKS

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