厦门华联电子股份有限公司
XIAMEN HUALIAN ELECTRONICS CORP., LTD.

Xiamen Hualian Profile

厦门华联电子股份有限公司
XIAMEN HUALIAN ELECTRONICS CORP., LTD.

Catalogue

厦门华联电子股份有限公司
XIAMEN HUALIAN ELECTRONICS CORP., LTD.

1.0 About HL

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XIAMEN HUALIAN ELECTRONICS CORP., LTD.

1.0 About HL

A Manufacturing Partner You Can Trust!

Xiamen Hualian Electronics Co., LTD., founded in August 1984, was listed on neeQ in August 2017 with the stock code 872122. Since its development in 1984, it has formed a diversified development and health pattern with distinct main business and appropriate relevance. With the mission of "smart green technology, better life", it is committed to becoming a leading enterprise in the field of intelligent controller and Optoelectronic Diveces as a reliable partner worldwide.

1.0 About HL

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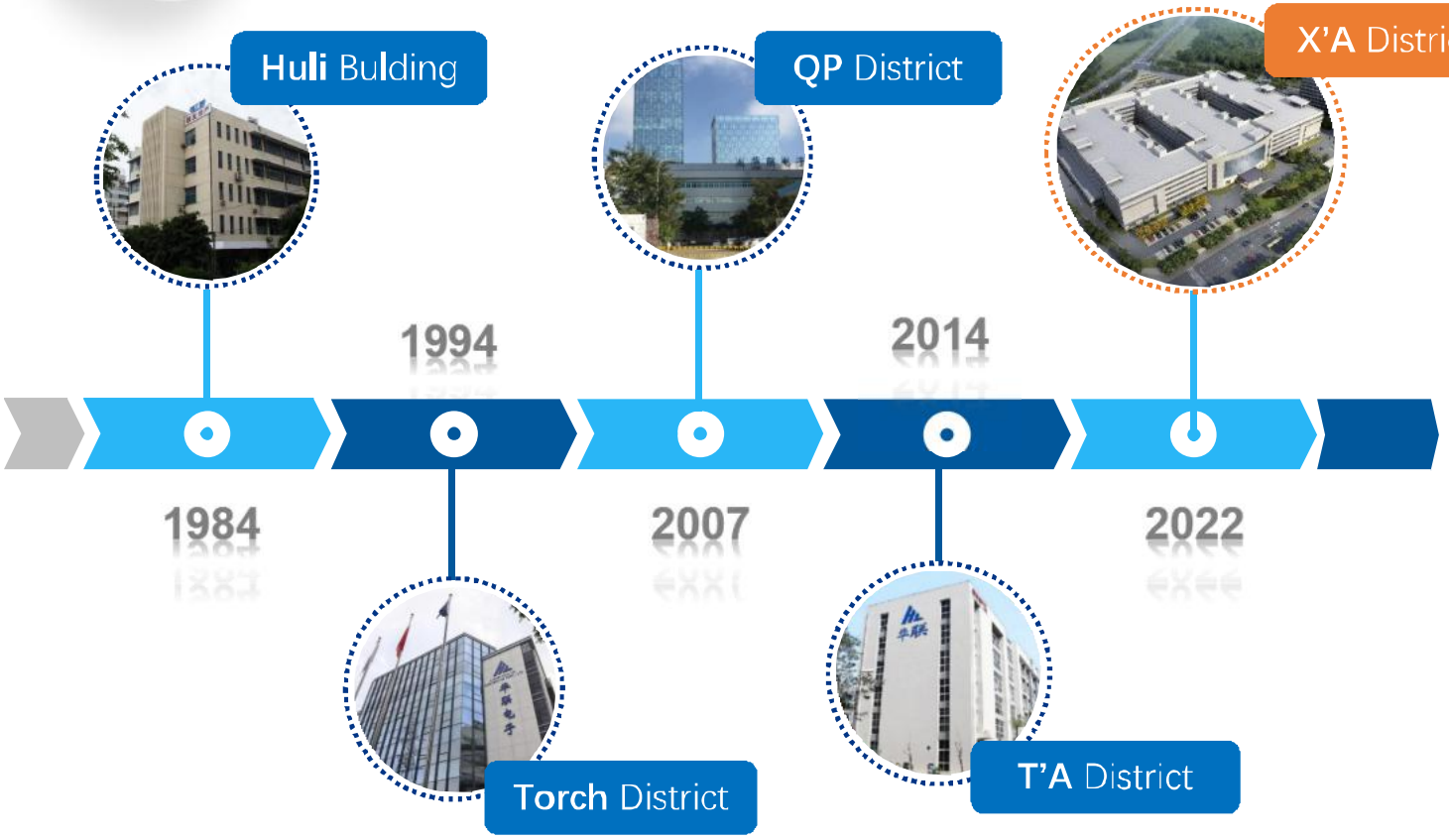

Basic Info

Registered Capital	RMB129 M
Employee	3,600
R&D Engineers	250+
Plant	250,000 sqm
Production Capacity	≥40 million(PCBA) ≥420kk(OED)
Production Line	104 lines
Annual Turnover	RMB2.2 Billion

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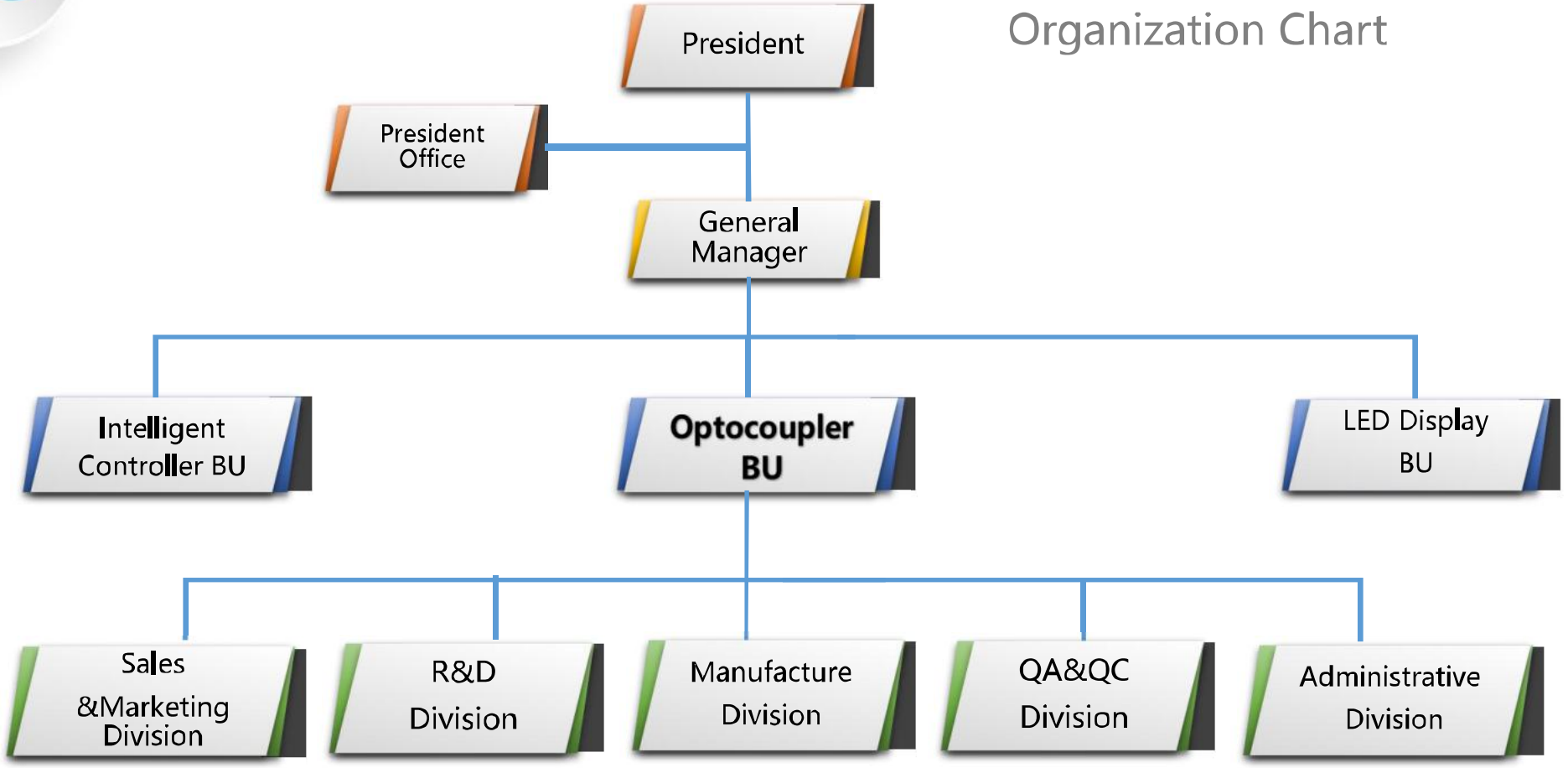
Organization Chart



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System Management Certificate

IATF16949 SA8000 ESD S20.20 ISO9001 ISO45001 ISO14001

Product Certificate

Management Certificate

☆National technological innovation demonstration enterprise
☆Key high-tech enterprises of the National Torch Plan
☆National Ten Year Achievement Award for High Technology Industrialization

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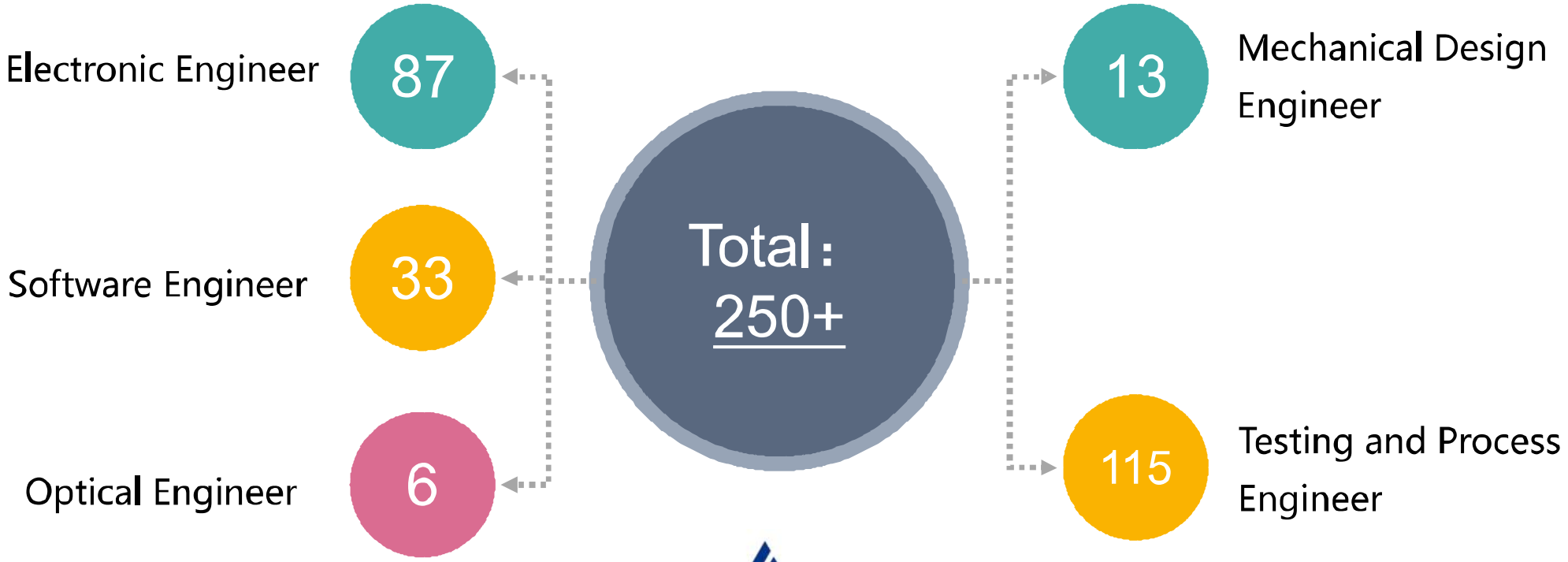
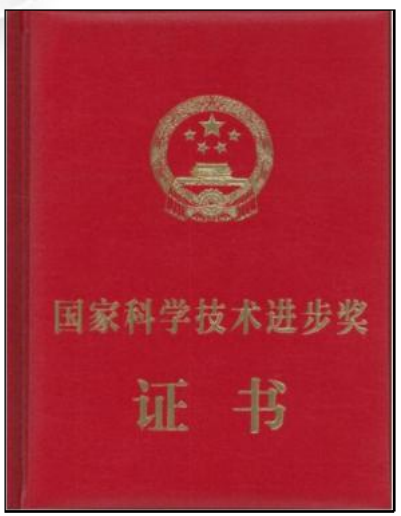
A three-stage Technology System of Postdoctoral Institute+R&D Center+Lab Center(including Testing Lab and FA Lab under qualifing of CNAS) has been formed。

Senior talents

Doctor	Professorate Engineer	Senior Engineer
9	7	40



1.0 About HL



1

1 First Prize of National Science Progress Award

2

1 First Prize of Fujian Province Science and Technology Progress Award

3

1 First prize of Xiamen Science and Technology Progress Award

4

3 Second Prize of Fujian Province Science and Technology Progress Award

5

1 Second Prize of Xiamen Science and Technology Progress Award

National, provincial and municipal projects
51 Items

IPR
202 Items

Participation criteria
25 Items

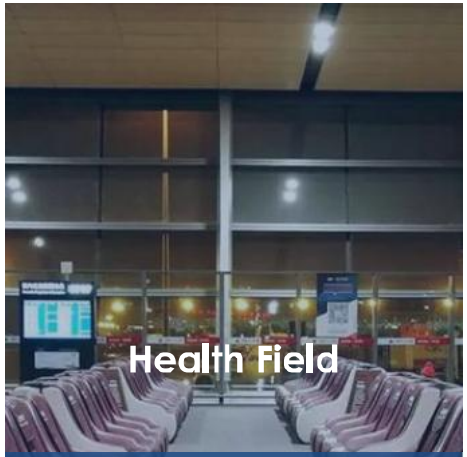
Participated in 2 national key research and development programs, presided over and participated in 5 projects of 863 program, and presided over 2 key technology research projects of the National Development and Reform Commission

28 Invention Patents

4 national standards have been released and 5 are being drafted

1.0 About HL

One Base



Two Cores

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Customer praise

2021 Carrier awarded HL "Delivery excellence award"

2019 Electrolux awarded HL as "Class A Supplier"

2018 Beko awarded HL as "Best Strategic Partner"

2017 JOMOO awarded HL "Delivery Ingenuity Award"

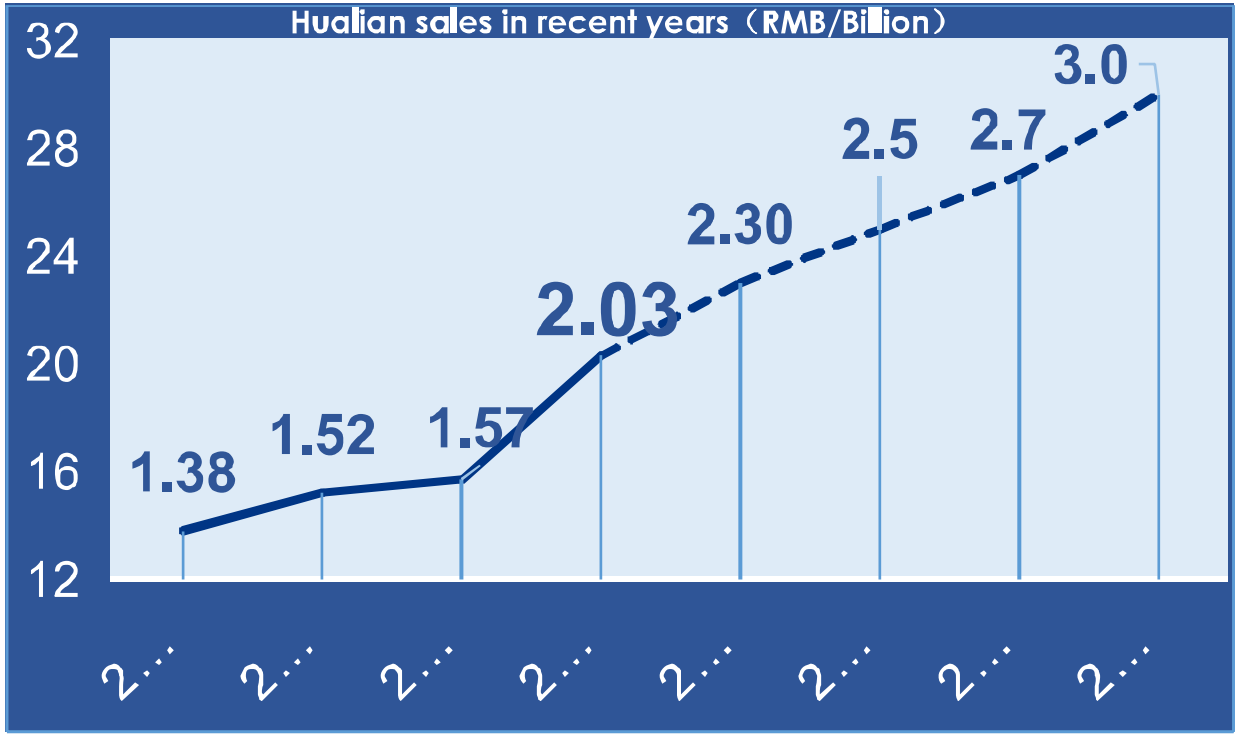
2021 Johnson Control awarded HL as "Excellent Supplier in Asia"

2017 Godrej awarded HL as "Most Valuable Partner"

1.0 About HL

2025 Target sales

RMB 1.5 billion ▶ RMB 3 billion



Through the implementation of the "one base and two cores" development strategy, Hualian aims to exceed 3 billion turnover in 2025, continue to provide customers with innovative products, solutions and quality services, and build a smarter, green, more safe and reliable environment.

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2.0

Hualian Semiconductor Division

2.0 Hualian Semiconductor Division

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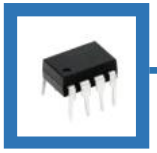
With over 30 years of experience in packaging of photoelectric devices, and mastering core technologies. Mastering R&D technologies in such fields as semiconductor, optics, heat, materials, photoelectric driving etc.; capable of providing customers with technical services and products of integration of optical, electrical, thermal and structural systems; equipped with international advanced professional devices for packaging of semiconductors, such as automatic dicing saw, automatic die bonder, automatic wire banding machine, and automatic packaging equipment; industrialized enough to quickly adapt to market dynamics.



Leading R&D capability and technical services

Strong manufacturing and quality assurance capability

2.0 Hualian Semiconductor Division

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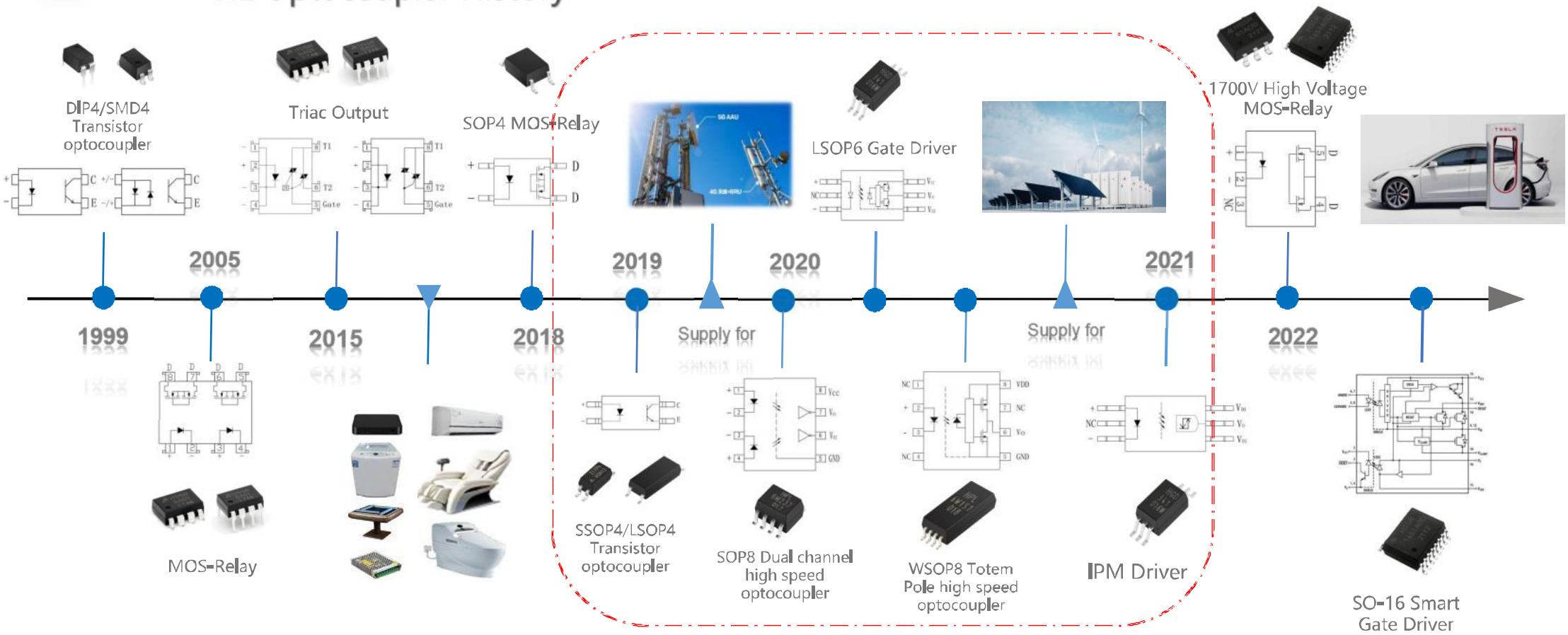
HL Optocoupler History



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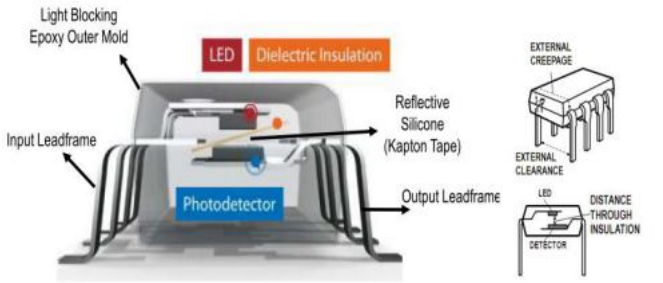
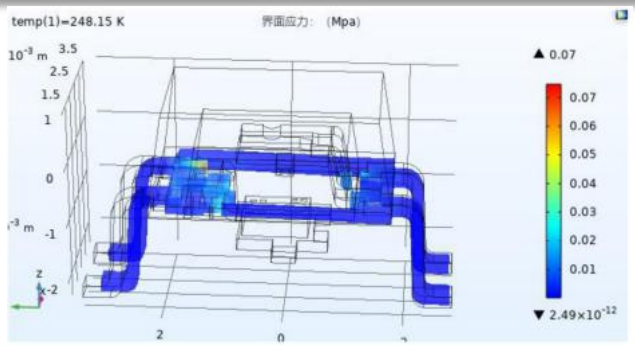
R&D Strength

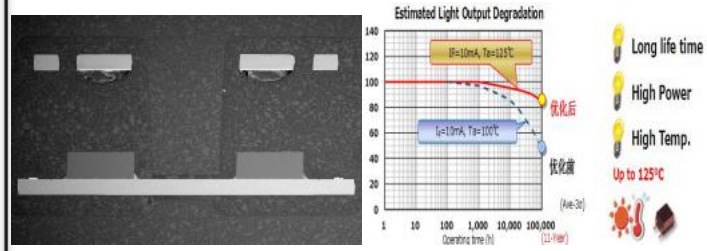
Isolation&Safety Standard Design



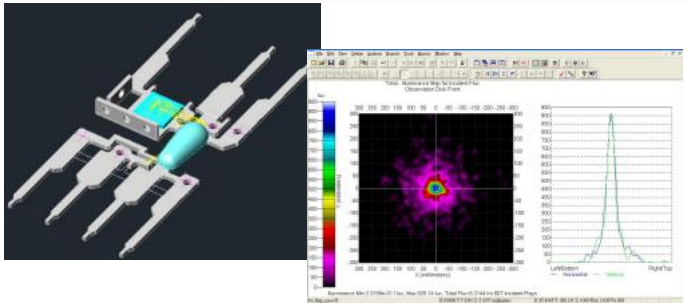
Internal Stress Simulation



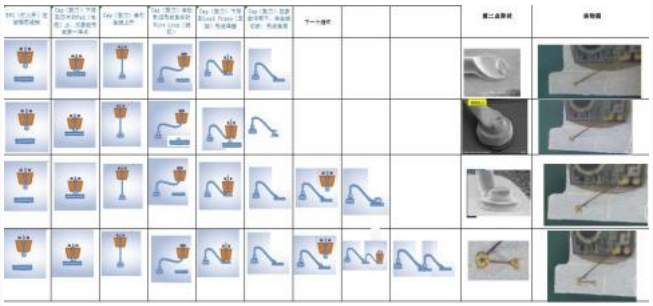
Reliability&Life Design



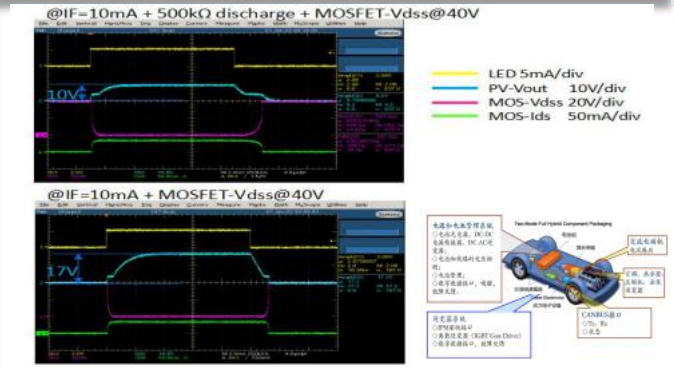
Stuctural design&Optical Simulation



Manufaturing Process Design&DOE



Application&Adaptation Research



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Invention Patent

ZL201110043516.0	ZL201310411508.6
ZL201110241303.9	ZL201610709069.0
ZL201210131398.3	ZL201610770709.9
ZL201210195839.6	ZL201611151842.2
ZL201210338201.3	ZL201710096962.5
ZL201410848132X	ZL201711148175.7
ZL201110241360.7	ZL201810673707.7
ZL201310393909.3	ZL201811059461.0
ZL201210365245.5	ZL201910723623.4

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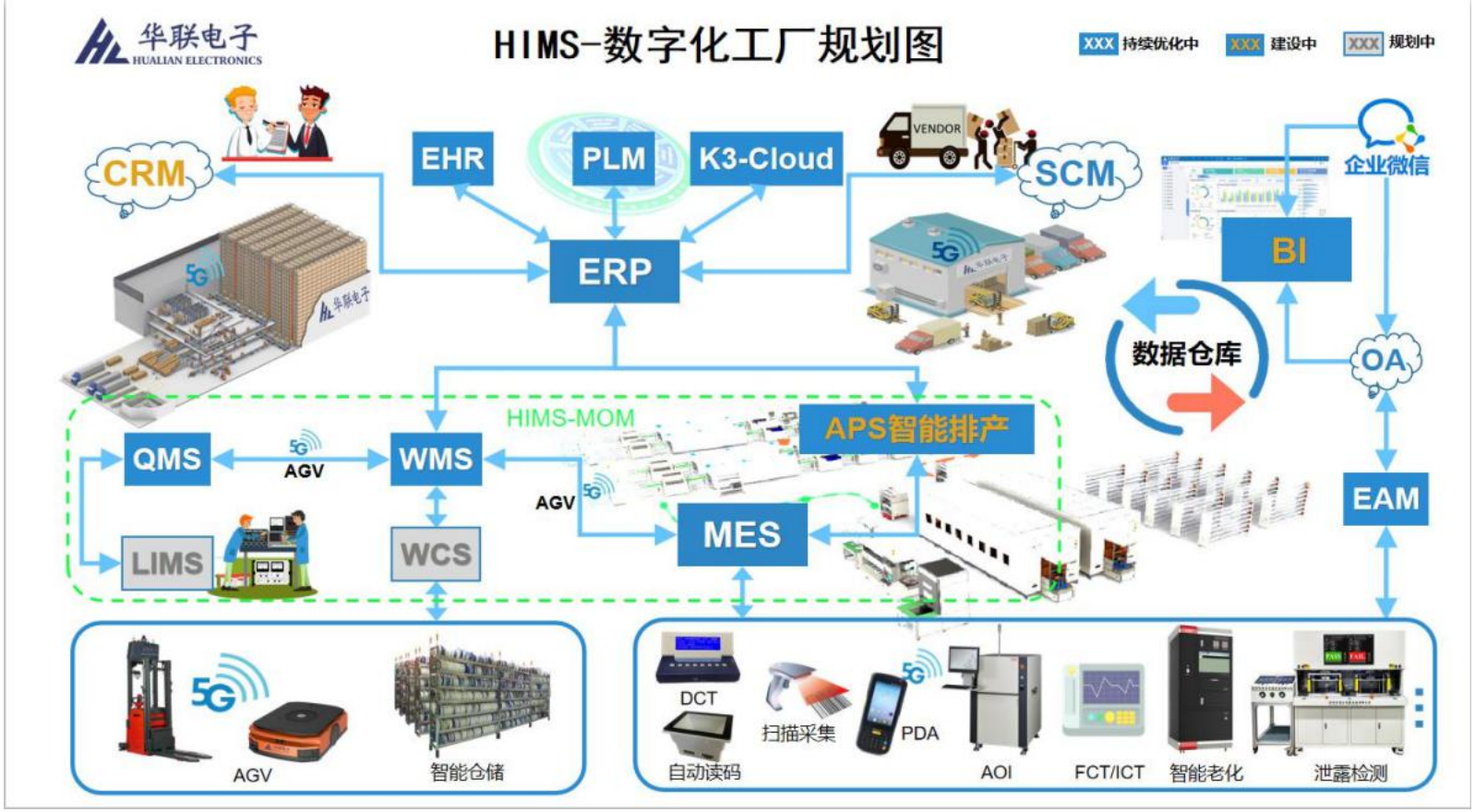
Digitalized Factory



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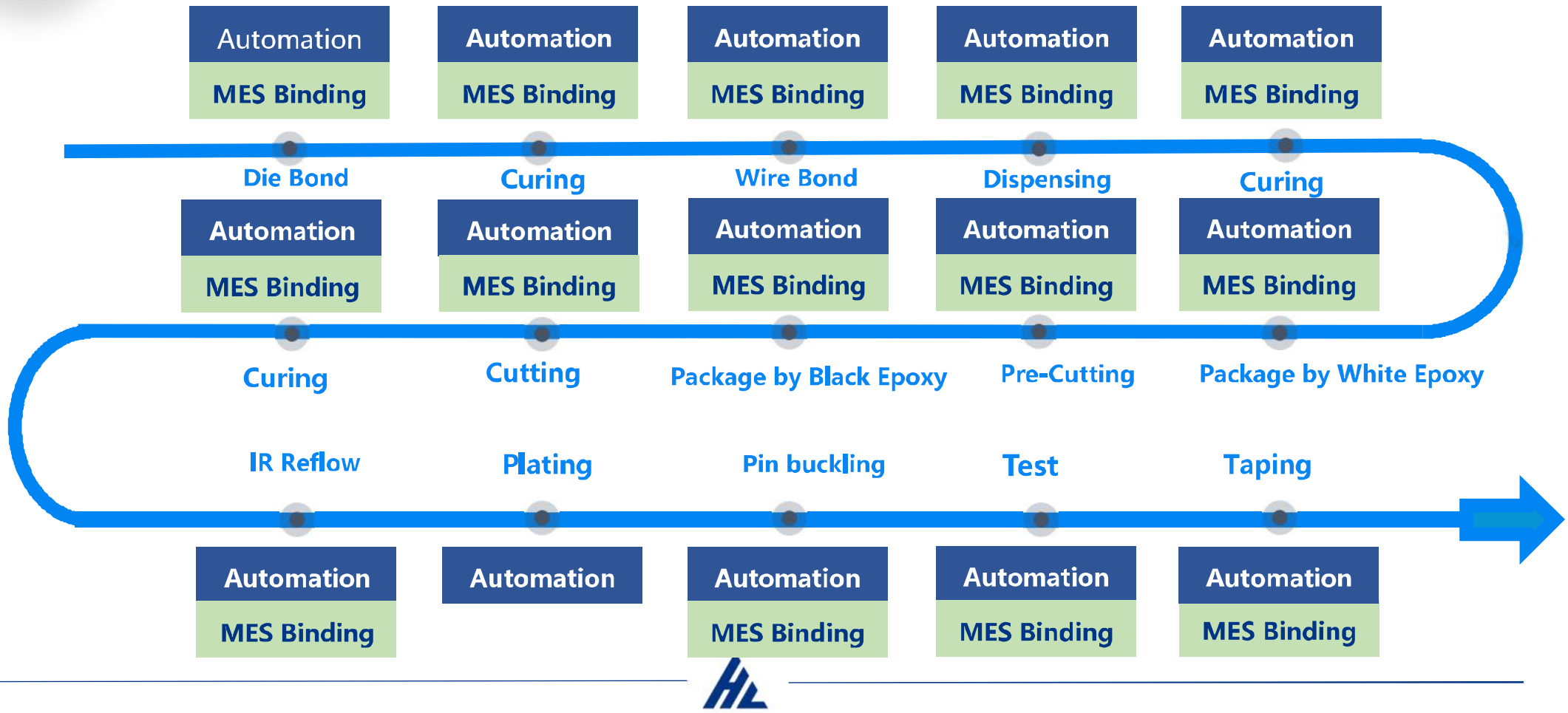

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Main Production Equipments

Die Bond	Wire Bond	Dispense	AOI Testing
			

Molding	Cutting	Pin buckling	Test+Taping
			

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Quality Assurance

Design and validation prior to expected failure

MTTF: Mean Time To Failure

☆Reliability measurement, representing the operating time before the first failure of the device

FIT: Failure In Time

☆Estimated number of failures per billion hours of work

☆1 FIT=10^9device failure 1 time in working hours

$$AF = \left(\frac{J_{acc}}{J_{norm}}\right)^2 \exp\left(\frac{E_a}{K}\left\{\frac{1}{T_{norm}} - \frac{1}{T_{acc}}\right\}\right)$$

AF=Accelerating Factor Ea=Activation Energy

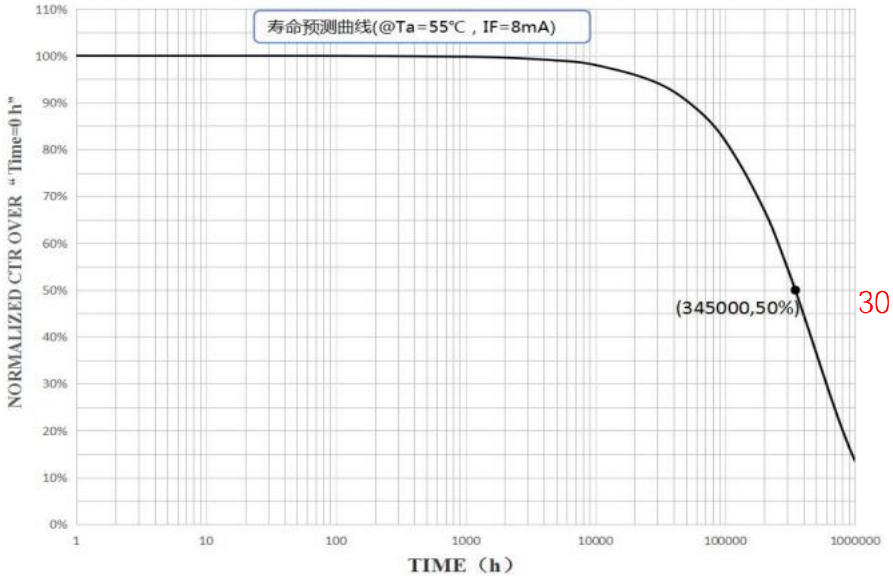
Jacc=HTOL Test LED Current

K=8.62×10^{-5}eV/K Boltzamn Constant

Jnorm=100% duty cycle applied Operating Current

Tnorm=Applied operating ambiet temperature

Tacc=HTOL test temperature



30+ Years

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Quality Assurance-Information assurance of whole processes

Tracking

- 2018: Material Tracking system
- Aug., 2019: Use traceability system for consumables
- Jan., 2020: Personnel management: IT - oriented and anti-dull
- Feb., 2020: Silver, Silicon gel unfreezing and life monitoring system

Informatization

- Nov., 2020: IT return process, Quality auto warning/quality billboard
- Sept., 2020: IT management of packaging label
- May, 2020: IT analysis of DPA profile
- Mar., 2020: SPC control IT - oriented

Automation

- Dec., 2020: *OCAP process exception handling system
  *Temperature control device data traceability system
- Apr., 2020: Inspection records IT - proof
  Check NG automatic warning
  Automatic braid tension test
- Jul., 2020: IT- oriented abnormal equipment, replacement, and parts inspection

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Quality Assurance- Introduction of reliability testing

Test type	Test No.	Test Item	Transistor	Traic	AQH	Logic	Mosfet	Gate Driver
A. Terminal quality	A1	End strength - tension	✔	✔	✔	✔	✔	✔
	A2	End strength - Play it	✔	✔	✔	✔	✔	✔
	A3	Weldability of terminal	✔	✔	✔	✔	✔	✔
	A4	25H salt spray test (iron lead-frame)	✔					
	A5	48H salt spray test (copper lead-frame)	✔	✔	✔	✔	✔	✔
	A6	The corrosion resistance	✔	✔	✔	✔	✔	✔
B. Resistance to welding heat	B1	Resistance to welding heat - dip welding resistance						
	B2	Extreme resistance to welding heat - dip welding	✔	✔	✔	✔	✔	✔
	B3	Resistance to welding heat - soldering iron	✔	✔	✔	✔	✔	✔
	B4	Resistance to welding heat - reflow welding once						
	B5	Resistance to welding heat- reflow welding for three times	✔	✔	✔	✔	✔	✔
	B6	Resistance to welding heat- wave soldering three times	✔	✔	✔	✔	✔	✔
C. MSL	C1	Humidity sensitivity grade test	✔	✔	✔	✔	✔	✔
D. Air tightness	D1	96H high pressure cooking	✔	✔	✔	✔	✔	✔
	D2	The fluorescence solution was permeated for 0.5H						
	D3	The fluorescent solution was permeated for 2H	✔	✔	✔	✔	✔	✔
	D4	After three reflow welding, the fluorescent solution penetrates for 0.5H	✔	✔	✔	✔	✔	✔
	D5	After the first wave welding, the fluorescent solution penetrates for 0.5H	✔	✔	✔	✔	✔	✔

2.0 Hualian Semiconductor Division

Notice: (1) "✔" for the items that must be tested and passed,
(2) "C" For projects where tests have to be arranged but the results are for reference only;
(3)Resistance is preferred for resistive load, AC motor for inductive load and ceramic capacitor for capacitive load.
Specific parameters shall be confirmed according to product specifications.

. type	Test No.	Test Item	Transistor	Traic	AQH	Logic	Mosfet	Gate Driver
E. Environment	E1	300 cycles of high and low temperature						
	E2	1000 cycles of high and low temperature	C	C	C	C	C	C
	E3	High and low temperature cycles were followed by three wave soldering for 300 times	✔	✔	✔	✔	✔	✔
	E4	MSL followed by 300 cycles of high and low temperature	✔	✔	✔	✔	✔	✔
	E5	1000H high temperature storage	✔	✔	✔	✔	✔	✔
	E6	Low temperature storage at 1000H	✔	✔	✔	✔	✔	✔
	E7	1000H dual 85 storage	✔	✔	✔	✔	✔	✔
F. Electrical aging	F1	Electrical endurance of normal temperature on-state, DC						
	F2	Electrical endurance of high temperature on-state, DC	✔				✔	
	F3	Electrical endurance of Dual 85 on-state, DC						
	F4	Electrical endurance of normal temperature off-state, DC						
	F5	Electrical endurance of high temperature off-state, DC	✔				✔ less than 200V	
	F6	Electrical endurance of dual 85 off-state, DC					C less than 200V	✔
	F7	Electrical endurance of normal temperature on-state, AC			✔			
	F8	Electrical endurance of high temperature on-state, AC		✔				
	F9	Electrical endurance of Dual 85 on-state, AC						
	FA	Electrical endurance of normal temperature off-state, AC						
	FB	Electrical endurance of high temperature off-state, AC					✔ more than 200V	
	FC	Electrical endurance of dual 85 off-state, AC		✔	✔		C more than 200V	
	FD	Electrical endurance of normal temperature on-off-state			Resistive load Inductive load			
	FE	Electrical endurance of high temperature on-off-state				Resistive load	Resistive load	Capacitive load
	FF	Electrical endurance of dual 85 on-off-state						
G. Application	G1	ESD	✔	✔	✔	✔	✔	✔
	G2	Single pulse current shock			✔			

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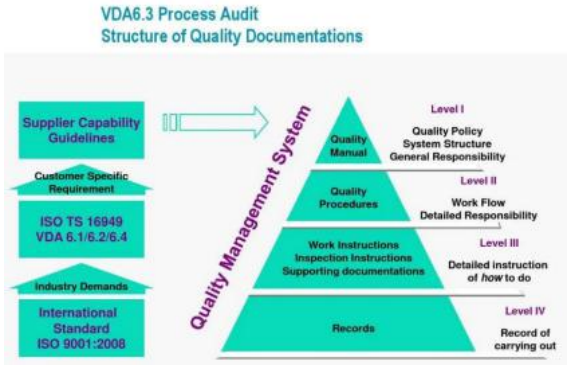
Establish AECQ standard production lines

VDA6.3 Customer audit standard training



AEC-Q101 product testing certification

GRGTEST
广州广电计量检测股份有限公司

元器件筛选及失效分析实验室报价单

委托单位（甲方）：厦门华联电子股份有限公司　　服务单位（乙方）：广电计量检测（杭州）有限公司

联系人：段荣　手机：15959204107　　联系人：钟江　手机：18668881130

序号	测试项目	缩写	样品数/批	批数	执行标准	附加条件	基本费	单价	金额	备注
1	Pre- and Post-Stress Electrical and Photometric Test	TEST	所有应力试验前后均进行测试		用户规范或供应商的标准规范	在室温下根据合适的应力参考条件进行测试	0	10/样/次	¥25,000	应力前后电测试
2	Pre-conditioning	PC	SMD产品在7、8、9和10试验前预处理		AEC-Q101、AE-CQ102	1、仅在试验#7,8,9和10之前在表面贴装部件（SMD）上执行； 2、PC前后TEST； 3、任何器件更换均须报备	0	20000/批	¥20,000	不包含SAT费用
3	External Visual	EV	每项试验前后均进行测试		AEC-Q101、AE-CQ102	产品外观检查（结构、标识、工艺）	0	5/样/次	/	
4	Parametric Verification	PV	26	3	AEC-Q101、AE-CQ102	广电只能完成产品室温下的光电参数，建议由客户完成，则可实现规格书中规定的不同温度下的光电参数	0	100/样	¥7,800	
5	High Temperature	HTRB	77	3	AEC-Q101	1、试验周期：1000H； 2、根据规格书或用户规范施加最大反向额	0	30/小时	¥30,000	Mos管，温度是否为150℃

Bureau Veritas Certification

认证证书

授予

厦门华联电子股份有限公司（前埔工厂）

中国福建省厦门市思明区前埔路502号,邮编：361008

Bureau Veritas Certification 确认上述组织的质量管理体系已经过审核并符合下列要求

IATF 16949 - 第一版

以及适用的顾客特定要求

范围

设计和制造

允许的删减

无

交付的产品

光耦合器

证书生效日期: 08-08-2022

证书失效日期: 07-08-2023

IATF证书号: 455437

必维认证证书号: CN041567-2- IATF　　版本:1

For Bureau Veritas Certification Holding, Le Triangle de l'Arche, 8 Cours du Triangle - 92800 Puteaux - France
(The official document is in English. Any translations of this document shall be used for reference only.)

1/2

2.0 Hualian Semiconductor Division

Test equipment

Advanced testing equipment

The range of experiments is complete

More than **30** kinds of testing methods for hardware and software, structure, to ensure product safety and reliability

More than **100** advanced testing instruments and equipment

2022 Xiang 'an New District **5000m2** experimental site planning

High reliability, from the continuous improvement of experimental detection capability

2500X Ultra high depth of field Microscope	Metallographic Grinder	X-RAY	DSC Tester	Ultrasonic scanning Microscope	SEM&EDS
					
KEYENCE	Weiyi	Scienscope	Netzsch	PVA	HITACHI
Model number: VHX-7000 Magnification: 100 ~ 2500 times	Model: Mopao 2S Grinding and polishing of objects with different precision	Model: View x2000 S:410×450cm2 Angle: left and right rotation ±60 degrees Geometric magnification: 125 times	Model number: DSC-20 Thermal analysis instrument to measure glass transition temperature and monitor material properties	Model: TePla Autofocus; Frequency: 1 ~ 2000MHz; Maximum resolution: 0.2um; Repetition accuracy: 0.05um, scanning speed: 2000mm/s	Model number: SU5000 Excellent low vacuum (10-300 PA) imaging performance; Maximum sample size: Φ200mm×80mmH Microanalysis: EDS, WDS, EBSD, etc

We have completed the introduction of basic FA techniques, including nondestructive testing, physical dissection and chemical opening, embedding and secting capabilities. We are equipped with: X-RAY, ultra depth of field microscope, SEM&EDS, ultrasonic scanning microscope and other high-end chip analysis equipment. We have a number of long-term cooperation third-party analysis institutions, which can provide customers with more timely and professional FA services.

2.0 Hualian Semiconductor Division

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Main Customers

H客户 | 阳光电源 SUNGROW | GROWATT 古瑞瓦特 | Voltronic Power | 禾望电气 Hopewind | Firstack

CATL 宁德时代 | 比亚迪汽车 | Ford | 中国中车 CRRC | 长安新能源 CHANGAN EV | SUNWODA 欣旺达

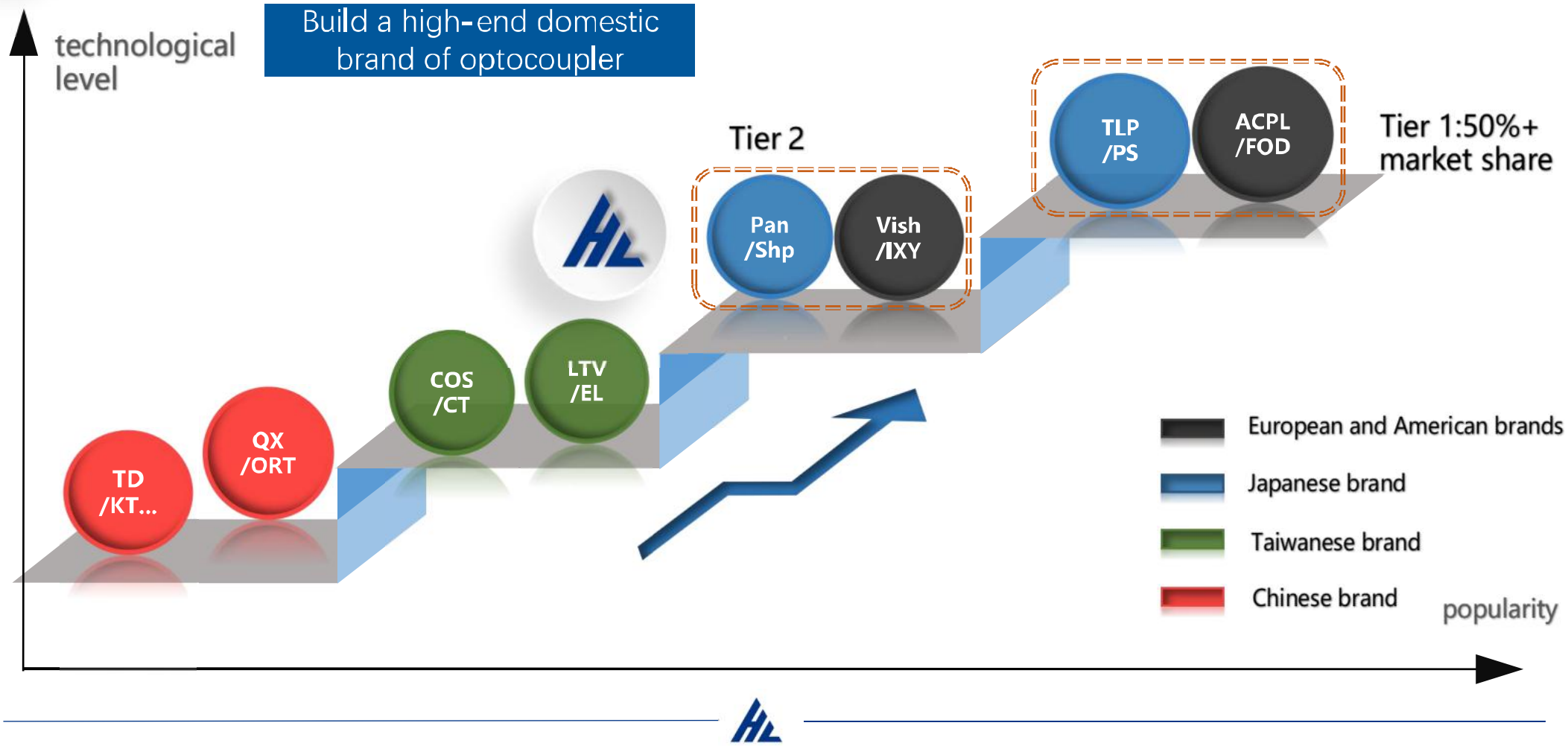
INOVANCE 汇川技术 | TURCK | 雷赛智能 Leadshine | 中控 SUPCON | HollySys | 上海三菱电梯 SHANGHAI MITSUBISHI ELEVATOR

NARI | SAC 国电南自 | 四方 | 许继集团 | CYG深瑞 | Sieyuan®

Panasonic | GREE | Midea | Electrolux | Whirlpool | BOSCH SIEMENS

2.0 Hualian Semiconductor Division

厦门华联电子股份有限公司
XIAMEN HUALIAN ELECTRONICS CORP., LTD.



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2.1 Prouduct Lines

2.1 Product Lines

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Household

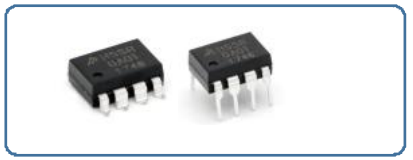
EV

Telecom

Security

Power

Industry

Opto-Coupler	
IR Receiver	
IR/PD Divice	
Opto Sensor	
IR Light Source	

2.1 Product Lines

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线性 Linear						HPC300				
栅极驱动 Gate Drive		HGD152				HGD3120		HGD341P/W HGD314P/W HGD343P/W	HGD313H	HGD332J
MOS 继电器 MOS-Relay	HSSR-41A01 HSSR-41A04 HSSR-41A05 HSSR-41A06 HSSR-41A08	HSSR-S1A01-2 HSSR-S1A04-2 HSSR-S1A05-2 HSSR-S1A08-2			HSSR-61A01 HSSR-61A04 HSSR-61A05 HSSR-61A06 **HSSR-61A0D**	HSSR-DA01 HSSR-DA04 HSSR-DA05 HSSR-DA06 HSSR-DA08				**HSSR-16S1A0D-2**
高速 High Speed		HPL6S135/136 HPL6S137 HPL6S138/139 HPL6S157				HPL6N135/136 HPL6N137 HPL6N138/139 HPL6N157	HPL6M235/236 HPL6M237 HPL6M238/239 HPL6M257	HPL6L135/136 HPL6L137 HPL6L138/139 HPL6L157 HPL6L148P/W	HPL6W135/136 HPL6W137 HPL6W138/139 HPL6W157	
可控硅输出 Triac Output	HPC2022 HPC2053	HPC3022-MS HPC3052-MS HPC3053-MS			HPC3022 HPC3053 HPC3063 HPC3083					
光敏达林顿 晶体管输出 Photo Darlington Transistor Output	HPC815 HPC852 HPC952	HPC355 HPC352 HPC952-MS		HPC215	HPC961 HPC962					
光敏晶体管输出 Photo Transistor Output	HPC814 HPC851 HPC816 HPC817	HPC354 HPC351 HPC356 HPC357	HPC101	HPC214 HPC217 HPC217xh	HPC931 HPC932	HPC942 HPC827				


DIP4/SMD4


SOP4/SOP5


LSOP4


1.27SOP4


DIP6/SMD6


DIP8/SMD8


SOP8


LSOP6


WSOP8


SOP16

2.1 Product Lines

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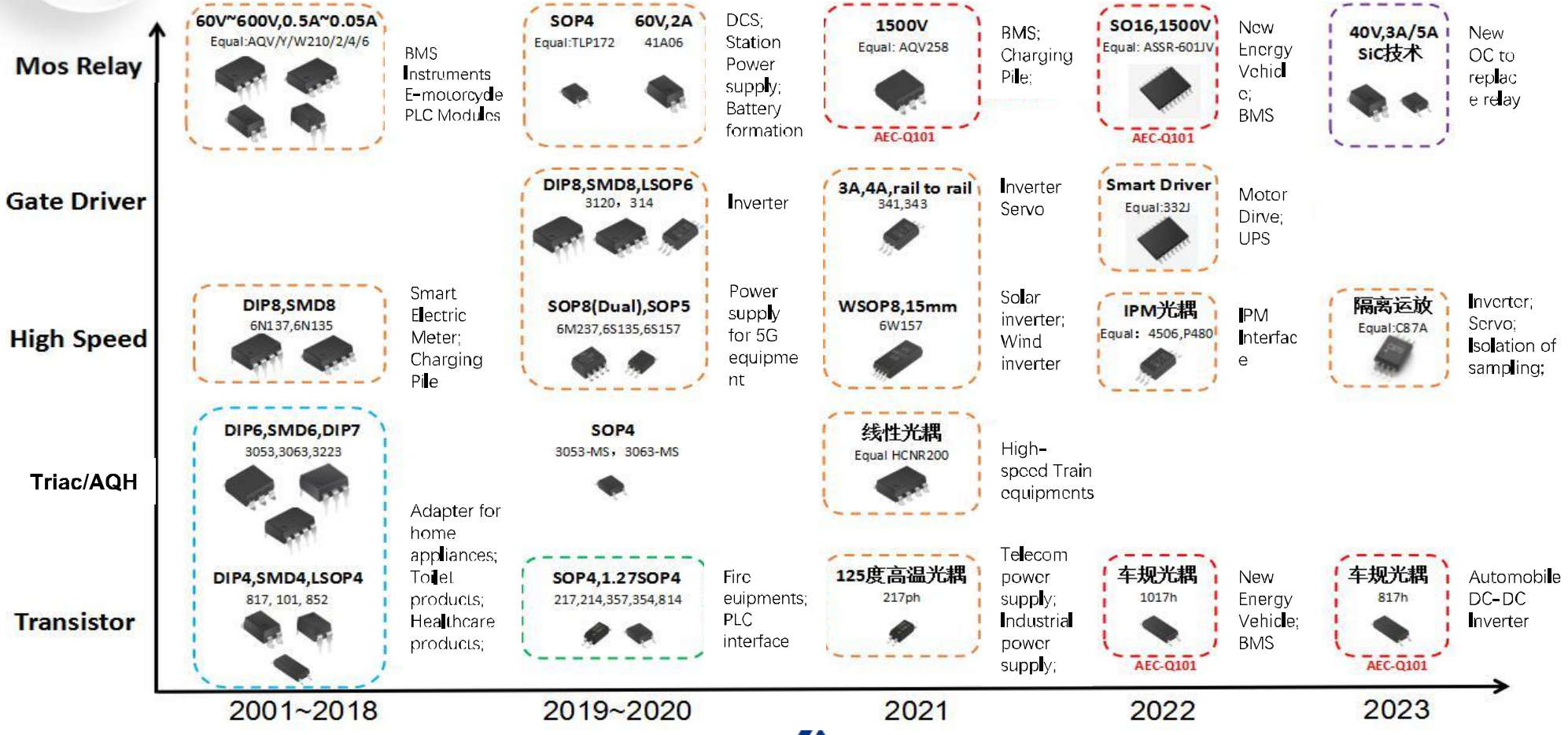

2.1 Product Lines

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Actively layout emerging markets, gradually form competitive advantages.

Product Planning	Industry layout
3300V ultra-high voltage optocoupler	Fast charging system above 800V; New generation battery system management
Ultra-long creepage distance optocoupler	Photovoltaic and wind power
Large load current optocoupler	Alternative electromagnetic relays for high current applications
Ultra-high sealing optocoupler	Special application field
Ultra-low power optocoupler	5G, 6G base station, portable equipment, etc Applications with high energy efficiency requirements
High reliability and stability isolation devices for vehicle class and medical class	
New isolation devices such as gate drive for high frequency and high power devices of Gen.3	


新能源


风电


光伏


储能


轨道交通


医疗

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Intelligent Controller Division

3.0 Intelligent Controller Division

Automatic programming equipment

Automatic solder paste machine

High-speed chip mounter

Laser marking machine

Automatic labeling machine

3D SPI

3.0 Intelligent Controller Division

Multi-temperature zone nitrogen filled reflow welding

RI-- Auto Radial Inserter: Panasonic

AI--Auto Axial Inserter: Panasonic / Universal

3D AOI

JUKI heteromorphic plug in

Automatic plug in machine

Plug-in AOI automatic detection machine

3.0 Intelligent Controller Division

Automatic cutting machine

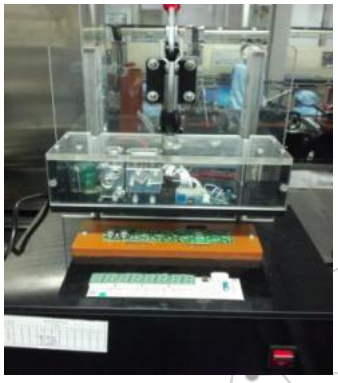
On-line double-sided automatic coating

Class A multifunctional FCT test equipment

Online/offline ICT automatic testing machine

Automatic potting

Class B customized FCT test kit



3.0 Intelligent Controller Division

Application of frequency conversion control technology

Refrigeration compressor frequency control, fan frequency control, water pump frequency control, oil pump frequency control, power tools frequency control

Refrigerator integral frequency conversion controller	***Livestock Fan frequency conversion controller***	***Dishwasher pump controller***	***Industrial agitator frequency conversion controller***
Compressor drive and refrigerator system control integration, FOC vector control, single resistance sampling, discrete IGBT, power 300W, speed 720~4500RPM, accuracy 10RPM	FOC vector control, isolated drive, IPM module, busbar film capacitor, three resistance sampling, low speed and high torque dynamic control, weak magnetic control, torque compensation, power 2KW	FOC vector control, three resistance sampling, discrete IGBT, internal or external driver board, 90W power, 900-3600rpm	Industrial agitator, FOC vector control. No hall, smooth start, fast response, high efficiency
			

3.0 Intelligent Controller Division

Central electrical Control box(ODM)

- Equipped with multiple types of relays, fuses, diodes, etc
- High commutability
- Dustproof and corrosion resistant

Pump Variable Frequency Controller (ODM)

- Frequency conversion software and hardware design to meet the EU certification requirements
- Pump constant pressure, proportional pressure and other fuzzy control algorithms
- Shell industrial design and heat dissipation design

Industrial mixing controller(ODM)

- Inverter software and hardware design, no electrolysis inverter driving software underlying algorithm
- Anti-corrosion and heat dissipation design
- Wireless data acquisition

Industrial Fans frequency Conversion Control (ODM)

- 180° sine wave frequency conversion control
- Sensorless vector control
- With active PFC
- Distributed multi-machine communication

3.0 Intelligent Controller Division

Energy storage and inverter technology

Power inverter

The precision of voltage regulation is high and the waveform distortion is small. Input 10.5V~14.6V, output 220Vac±1%, 50Hz, 600W, efficiency ≥90%

Energy Storage

Lithium battery pack charge and discharge management, support PD2.0/PD3.0, Qualcomm QC2.0/QC3.0, Huawei FCP,MTK PE2.0 and other fast charging protocols. SOC algorithm, power inverter.

Non-isolated or isolated type, input 40V~100V, output 13V50W, efficiency 85%

Electric forklift BMU power supply unit

DC/DC converter

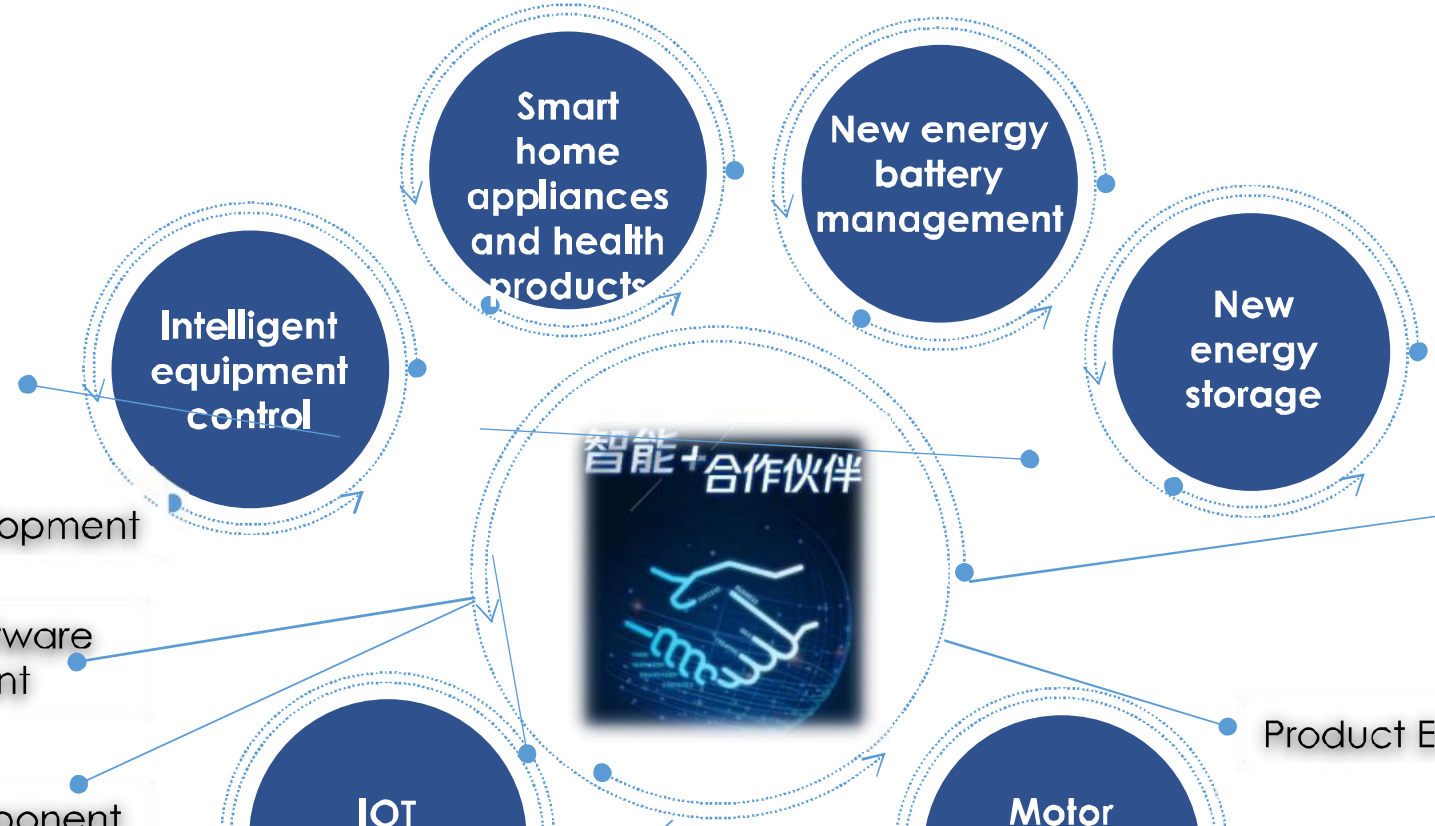
AC-DC converter

Water purifier power adapter

Input 176Vac~264Vac, output 36V120W, efficiency 88%

Power aging test system, glue filling, ultrasonic welding and air tightness test

3.0


Smart home appliances and health products
New energy battery management
Intelligent equipment control
New energy storage
智能+合作伙伴
Hardware Development
Supply Chain Resources
Embedded Software Development
Intelligent Manufacturing Collaboration
Product Engineering Optimizer
Structural Component Design
IOT products
Motor drive control
Electronic Component Testing Device
Electronic Components Test Verification

3.0 International Cooperation Cases

Electrolux 伊莱克斯

- The cooperation history is more than 15 years
- Provide ODM/OEM services
- Annual supply of over 20 million sets
- Global cooperation
- Direct supply to German factories
- The business scale exceeded RMB 300 million

Johnson Controls

- The cooperation history is more than 10 years
- Provide ODM/JDM/OEM services

Carrier

- The cooperation history is more than 10 years
- Provide ODM/OEM services

B/S/H/

- The cooperation history is over 5 years
- Provide ODM/OEM services
- Global cooperation
- Direct supply to German headquarters

KION GROUP

- 2020 to establish cooperation
- Provide ODM/JDM/OEM services
- Global system supplier
- Mass production
- Hualian longs for deep strategic cooperation

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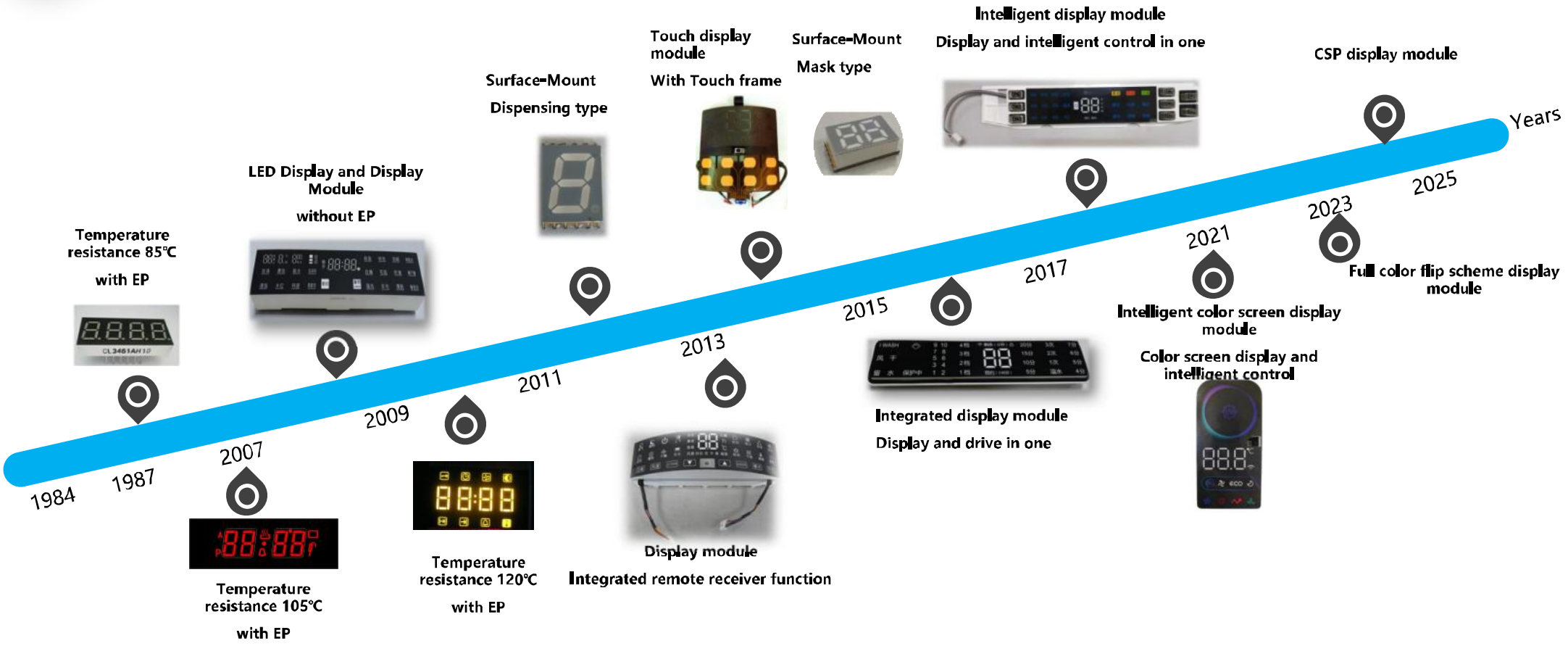
4.0

LED Display Division

4.0 LED Display Division

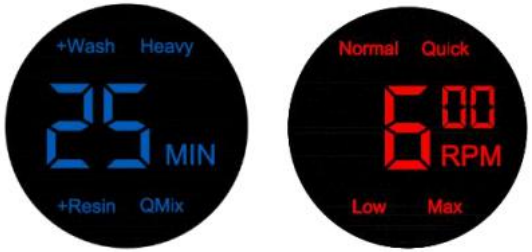


4.0 LED Display Division

Two-color dual display knob integrated display module

Two-color and two-pattern display

Supports different colors to display different patterns
Save module space design, realize personalized UI interface or secondary menu UI display design



Knob encoder integrated into one

Integrated poleless knob encoder,
Respond to clockwise and counterclockwise rotation signals
Display part is integrated in the encoder structure design

Buzzer integration

Integrated buzzer to realize the feedback sound when rotation or other signal input, support feedback of different frequency band sound.

Integrated LED driver function

Drive with high current LED switch
Integrated PWM module, support LED brightness adjustment
Support key scanning

Integrated microcontrol unit

Integrated main control MCU, realizing and analyzing rotary signal of knob encoder, controlling LED, driving buzzer, etc
The specified signal can be outputted for signal transmission with other components of intelligent household appliances.

4.0 LED Display Division

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Suitable for air conditioning control panel, air purifier, washing machine, water heater, induction cooker, range hood, kettle, wall breaking machine, microwave oven, smart speaker and other kinds of intelligent electrical appliances

4.0 LED Display Division

厦门华联电子股份有限公司
XIAMEN HUALIAN ELECTRONICS CORP., LTD.

4.0 LED Display Division

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Thank You!

HL Opto-Coupler Division