

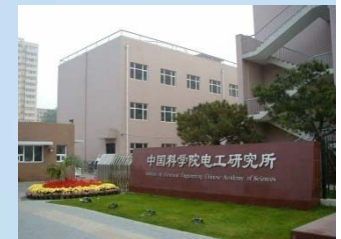


IEECAS Power Semiconductor Testing Lab

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Introduction

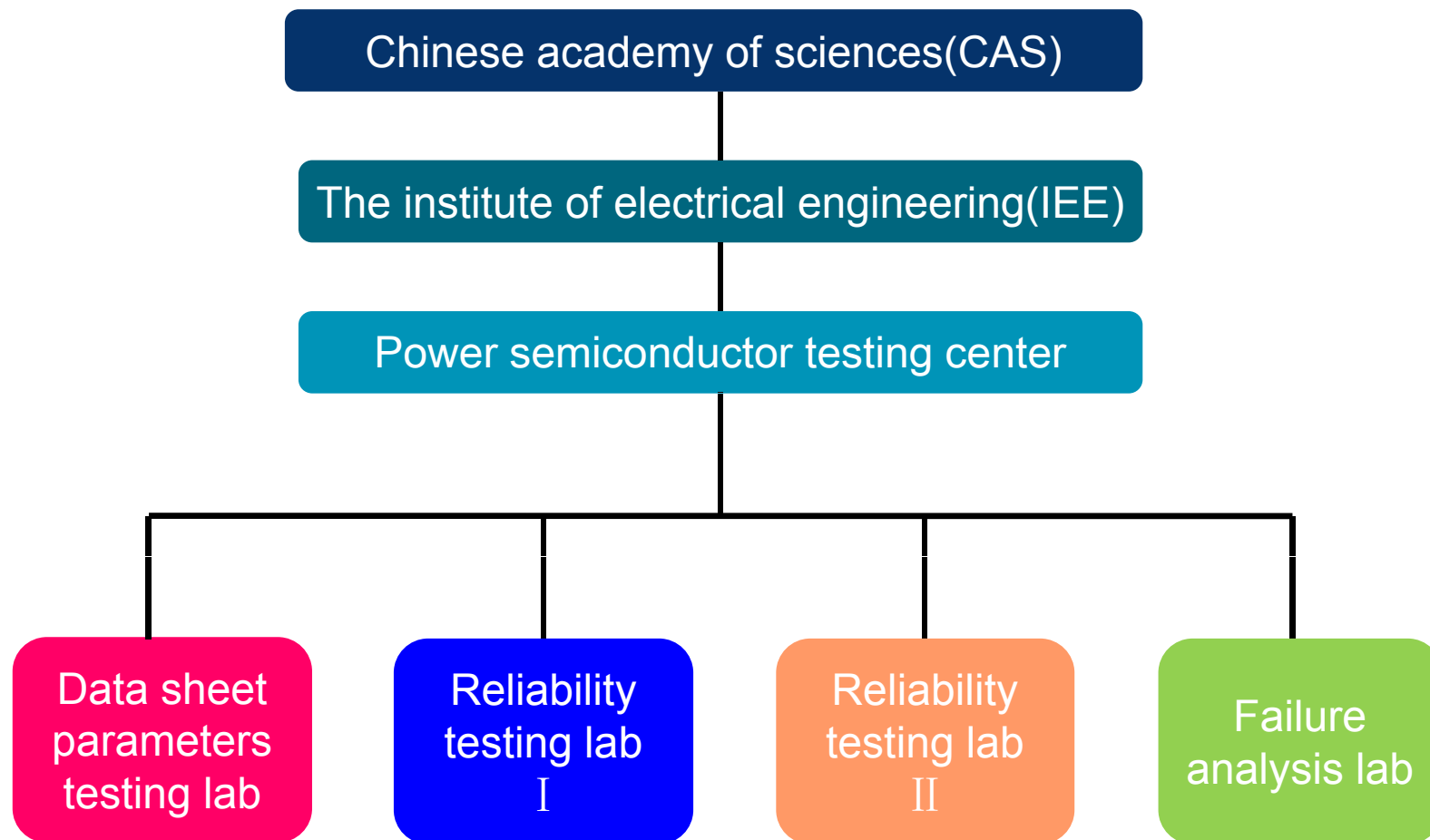


About us

Our testing center was founded in 2013, which is the first third-part integrated testing laboratory that specializes in high power devices. We have nearly thirty special use testing equipments, thus can meet the testing requirements for IGBT, MOSFET, Diode based on Automotive Electronics Council(AEC), the International Electro technical Commission(IEC) and Chinese national standards.



Organization



Our staff



X.H. Wen
(Lab chief)



J. Zhang
(Technical director)



L.L. Zeng
(Quality director)



Z.J. Qiu
(Chief inspector)



W. Su
(Inspector)



E.X. Zhang
(Inspector)



J. Wang
(Sample organizer)



P.Q. Ning
(Equipment manager)



L.Zhu
(Document manager)

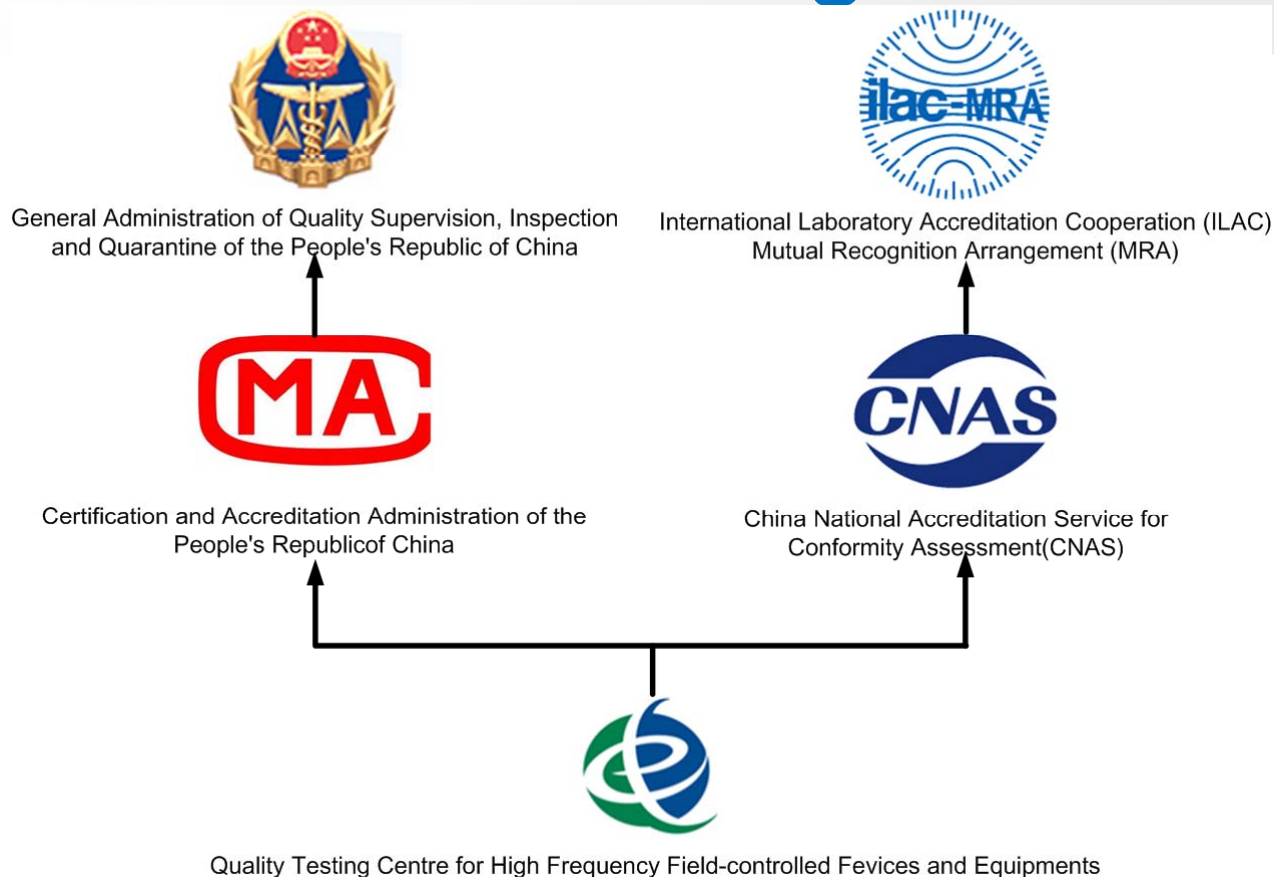
Our lab is accredited in accordance with **ISO/IEC 17025**



Our lab is accredited in accordance with

1. International Standard ISO/IEC 17025:2005
2. China Metrology Accreditation (CMA) Qualification accreditation criteria

We offer reliable testing service



Our test results are recognized by:

1. Chinese government
2. Global accreditation bodies who have signed mutual recognition arrangements (MRAs)

Our test ability

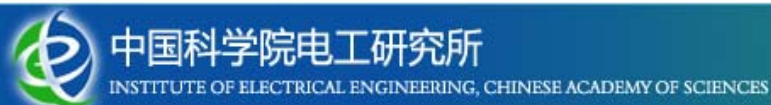
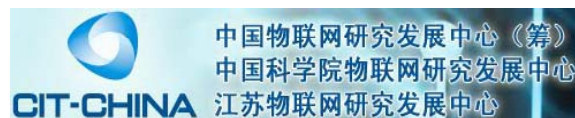
Test type	Test description	Test Name	Equipment	Standard
Datasheet parameters test	Static test	$V_{CES}, V_{GES}, I_{CES}, V_{GE(th)}, I_{GES}, V_{CESat}, V_F$	LEMSYS TRs4070	IEC60747-9 IEC60747-2
	Dynamic test	td(on),tr,td(off),tf,Eon ,Eoff,trr,Qrr,Erec	LEMSYS TRd4045	IEC60747-9 IEC60747-2
	Parasitic parameters test	Cies, Coes, Cres	AGILENT E4980A	IEC60747-9
	Thermal characteristic test	Static & transient thermal resistance	MICRED T3ster	JESD51-14
	Isolation test	Isolation voltage	KIKUSUI TOS5300	GB/T 17045
	Surge current test	I_{FSM}, \hat{I}_t	DBC-101-10KA	IEC60747-2
Reliability test	Climate reliability test	Low temperature storage	ESPEC EW0470	GB/T 2423.1
		High temperature storage	ESPEC PV221	GB/T 2423.2
		High temperature high humidity	ESPEC CW0670P1W5	GB/T 2423.3 GB/T 2423.4
		Temperature cycling	GIANT FORCE ECT-225-70	IEC60068-2-14
	Operating reliability test	Thermal shock	ESPEC TSG-71S-A	IEC60749-25
		Salt corrosion	ATLAS CCX2000	SAE J2334 GB/T 2423.18
		High temperature reverse bias	HIREL HTRB-IGBT-6KV	IEC60747-9
		High temperature gate bias	HIREL HTGB-IGBT-30V	IEC60747-9
		High temperature & high humidity bias	HIRFI H3TRB201	IEC60749-5
		Power cycling (sec)	HIREL PC2400A-IGBT	IEC60747-9
Mechanical reliability test	Power cycling (min)	HIREL PC500A-IGBT	IEC60749-34	
	Highly accelerated stress test	HIRAYAMA PC-422R8	IEC60749-4	
	Mechanical variation	STI DC-1000-15	GB/T 2423.10 GB/T 2423.56	
	Mechanical shock	KING DESIGN DP-201-60	GB/T 2423.5 GB/T 2423.39	
Failure analysis	HALT/HASS	HANSE VCT-1.5	N.A.	
	X-ray test	Soldering voids	GE Micromex	N.A.
	SAM test	Soldering delimitation	SONOSCAN D9600	IEC60749-35
	Thermography test	Temperature distribution	INFRATEC ImageIR 8325	N.A.
Soldering strength test	Shear & pull strength	XYZTEC Conder 150HF	IEC60749-19 IEC60749-22	

Our customers



国家电网
STATE GRID

中国电力科学研究院
CHINA ELECTRIC POWER RESEARCH INSTITUTE



Our target

1. Quality first, customers supreme; always take the public position, to provide customers with the most efficient, the most high quality testing services.
2. Research the power device test methods and test standards, guide the development of high voltage & high power semiconductor and wide band gap power semiconductor packaging and testing technology.
3. Training the development, testing and management personnel of China power semiconductor industry.



Data sheet parameter testing lab

Data sheet parameter testing lab



Static and transient parameter test



Equipment	Model	Application
Static-transient parameter test equipment	LEMSYS TRds4045-4070 (Switzerland)	Static and transient I-V test and switching test (up to 7000 V , 4000 A)
Probe station (semi-auto)	Wentworth S200 (UK)	Wafer level I-V test up to 8inch
Bench-top thermal chamber	ESPEC MT3065 (China)	Heating and environmental chamber

LCR meter



Equipment	Model	Application
LCR meter	Agilent E4980A (US)	Parasitic inductance, parasitic capacitance test

Thermal impedance test



Equipment	Model	Application
Thermal impedance test meter	MicRed T3ster (Hungary)	Static and transient thermal impedance test

High voltage isolation test



Equipment	Model	Application
High voltage test meter	Kikusui TOS5300 (Japan)	Insulating material breakdown test, leakage current test (up to 5500 VAC)

Reliability testing lab I

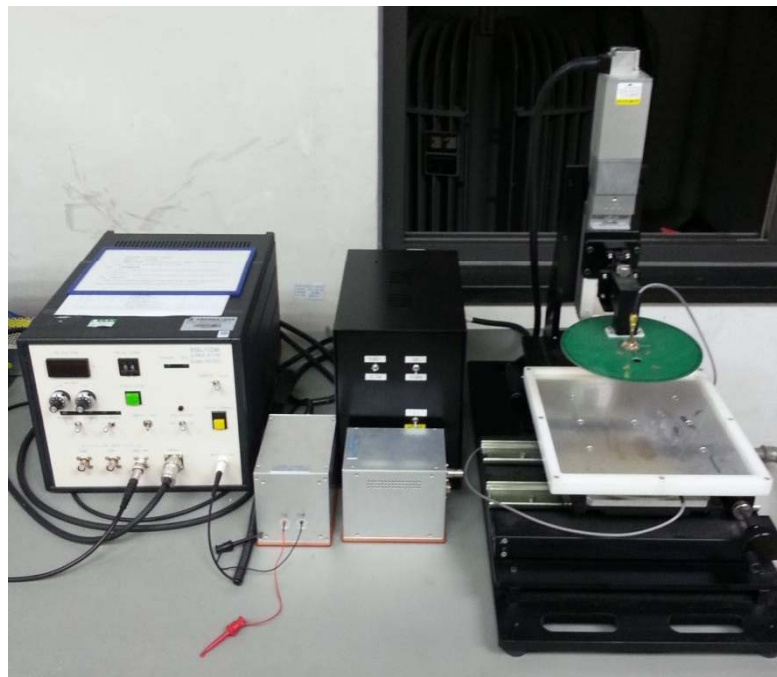


Diode surge current test



Equipment	Model	Application
Surge current test equipment	RHEE DBC-101-10KA (China)	Diode forward maximum surge current IFSM test, I ² t test, peak current up to 10kA , duration time 10ms)

Electro-static discharge test



Equipment	Model	Application
Electro-static discharge meter	Tokyo Electron ECDM800E (Japan)	Human body discharge emulation (up to 8000 V), non-human discharge emulation (up to 800 V)

High temperature aging test



Equipment	Model	Application
High temperature chamber	Espec PV221 (China)	High temperature storage and operation stability test (up to 200° C, 80cm×110cm×70cm)

Low temperature aging test



Equipment	Model	Application
Low temperature chamber	Espec EW0470 (China)	Low temperature storage and operation stability test (low to -70° C, 80cm×110cm×70cm)

High temperate and high humidity test



Equipment	Model	Application
High temperate and high humidity test chamber	Espec EW0470 (China)	High temperature storage and operation stability test (up to $-70\sim 150^{\circ}\text{C}$, 10~98% relative humidity, 80cm \times 110cm \times 70cm)

Power cycling test (air cooled)



Equipment	Model	Application
Power cycling chamber <i>n</i> minutes per cycle	Hirel PC500A-IGBT (China)	Power cycling test for DBC, soldering assembly (up to 500 A)

HTRB



Equipment	Model	Application
High temperature reverse blocking test chamber	Hirel HTRB-IGBT-6kV (China)	High temperature reverse blocking test, leakage current for power module (up to 6000 V , 200° C)

HTGB



Equipment	Model	Application
High temperature gate blocking test chamber	Hirel HTGB-IGBT-30V (China)	High temperature gate blocking test, leakage current for power module (up to ± 30 V, 200° C)

H3TRB



Equipment	Model	Application
High temperature high humidity reverse blocking test chamber	Hirel H3TRB201 (China)	High temperature high humidity reverse blocking test for power module (up to 600 V , -20~150° C, 25~98%RH)

HAST



Equipment	Model	Application
Highly accelerated stress test chamber	Hirayama PC422-R8 (Japan)	High temperature, high humidity test, high air pressure environment (up to 120 V, Φ 42cm \times 65cm, 105~130° C, 65~100%RH)

HALT

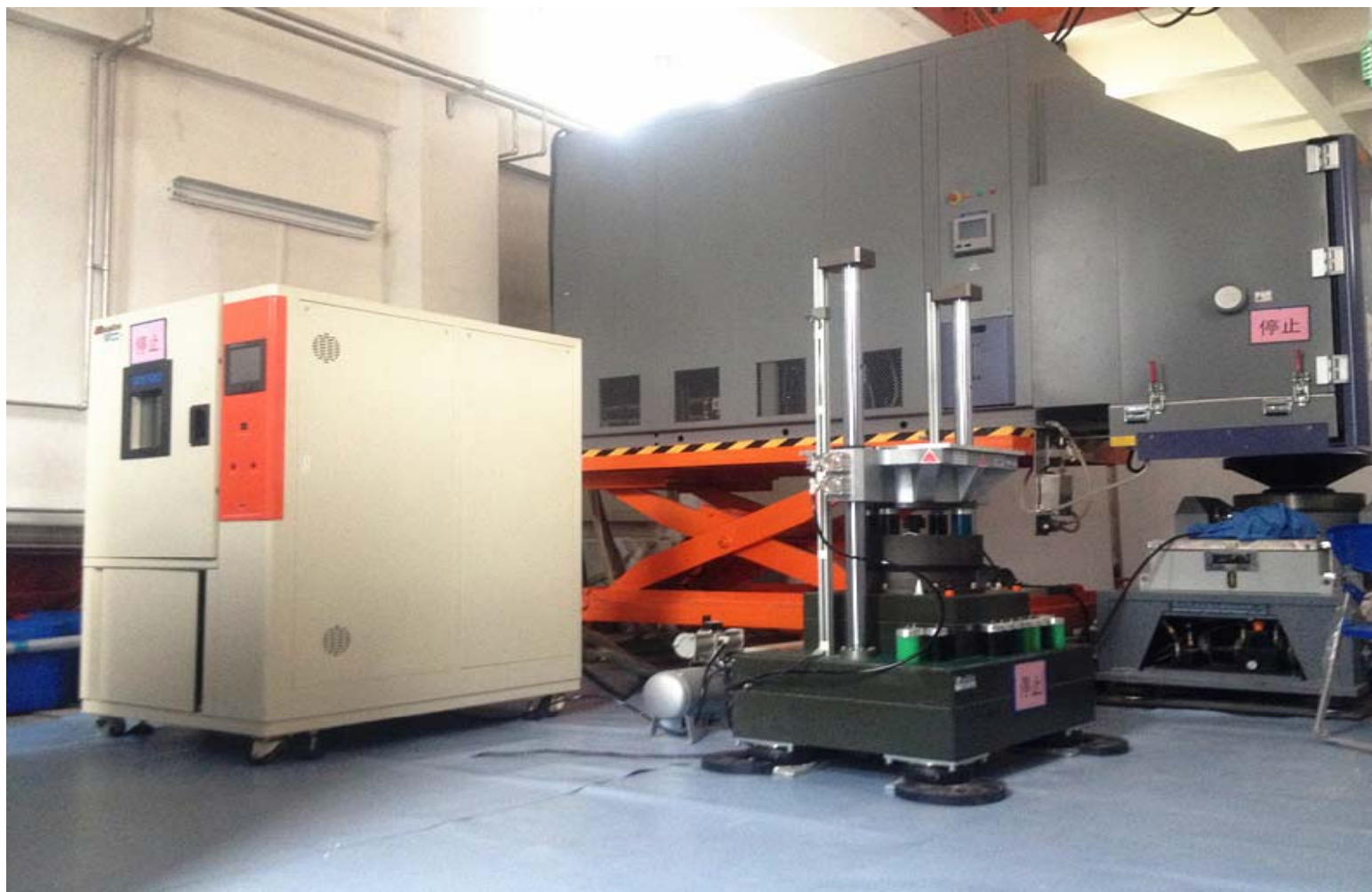


Equipment	Model	Application
Highly accelerated life test chamber	HANSE VCT-1.5 (US)	High/Low temperature, high humidity test, 6-axis vibration (-70~200°C, 100°C/min, 80g max)

Reliability testing lab II



Reliability testing lab II



Mechanics shocking test



Equipment	Model	Application
Bumping/shocking test machine	King design DP-201-60 (China)	bumping test to emulate automobile environment (shocking: 15~100g, 6~18ms, bumping: 0~40g, 6~16ms, up to 60 times/min)

Thermal cycling test



Equipment	Model	Application
Thermal cycling chamber	Giant force ECT-225-70 (China)	Thermal cycling test for DBC, soldering assembly (-70~180°C, up to 15°C/min , 50cm×75cm×60cm)

Thermal shock test



Equipment	Model	Application
Thermal shock chamber	Espec TSG-71S-A (China)	Thermal shock test for DBC, soldering assembly (-70~200°C)

Power cycling test (water cooled)



Equipment	Model	Application
Power cycling chamber <i>n</i> seconds per cycle	Hirel PC2400A-IGBT (China)	Power cycling test for DBC, soldering assembly (up to 2400 A)

Mechanical vibration test



Equipment	Model	Application
Vibration test machine	ChinaSTI DC-1000-15 (China)	mechanical vibration stability test for packaging assembly (acceleration up to 30g , force up to 1000 kg, 5~1500Hz)

Salt spray environment test



Equipment	Model	Application
Salt spray environment test chamber	Atlas CCX2000 (US)	Corrosion environment emulation (humidity controlled)

Low-pressure altitude test



Equipment	Model	Application
Altitude Chambers	GWS VH0770W (China)	Simulation of high-altitude conditions like might be found in mountainous regions. Simulation of altitude up to 100,000 feet Temp. range: 30°C to 160°C

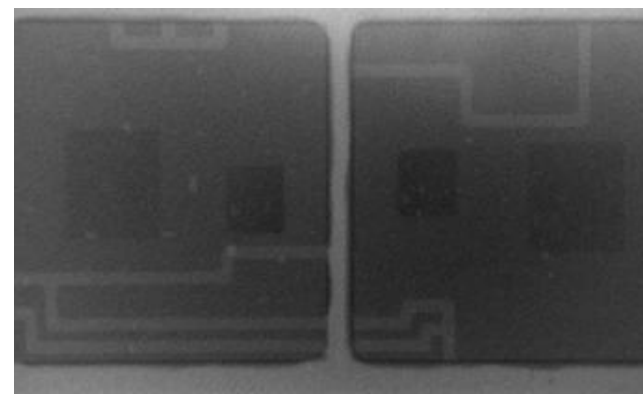
Failure analysis lab



Failure analysis lab

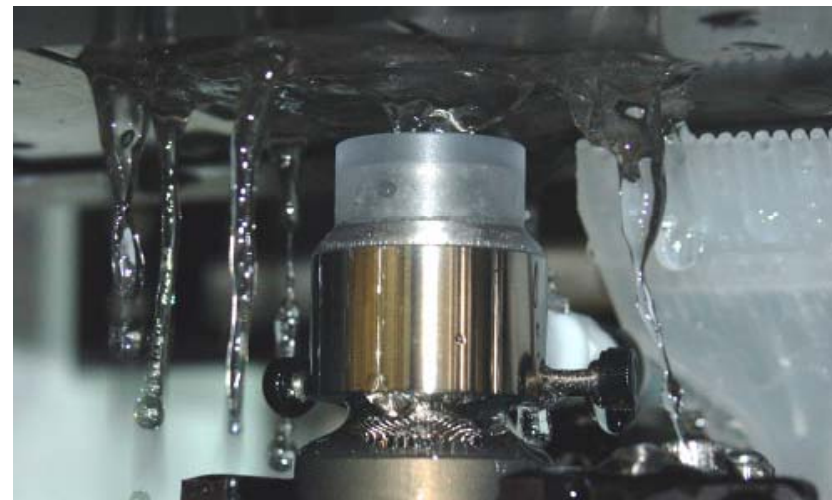


X-Ray test



Equipment	Model	Application
X-ray test machine	GE Microme (US)	Power module, soldering assembly quality analysis (tube voltage maximum 180kV, 2-D, 3-D scanning)

Scanning acoustic microscope test



WaterPlume scanning

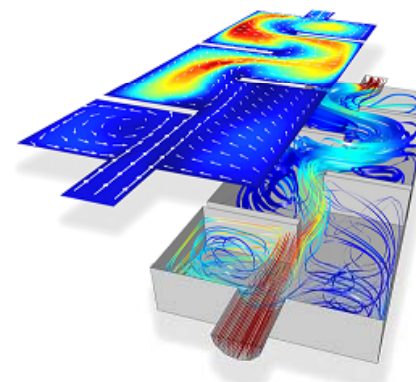
Equipment	Model	Application
Scanning acoustic testmachine	Sonoscan D9600 (US)	Solder layer quality test (WaterPlume scanning mode avoid the samples in the water)

Push/Pull test (Die and wirebond test)



Equipment	Model	Application
Push/pull test machine	XYZTEC Conder150-3HF (Holland)	Die soldering shear stress, wirebond strength (up to 500 kgf)

Real time temperature monitoring



Equipment	Model	Application
High speed infrared camera	Infracam 8325 (Germany)	Real time temperature monitoring (up to 640X512 pixel, 0.2°C resolution, 1200 Hz frame)

Thanks !

