



Laboratory



CERTIFICATIONS & ACCREDITATION



**MEDICAL &
HEALTHCARE**

ISO 13485:2016



**RAILWAYS
& TRANSPORTATION**

IRIS ISO / TS 22163:2017



**INDUSTRY &
ENERGY**

ISO 9001:2015



ENVIRONMENTAL

ISO 14001:2015



LABORATORY

ISO/IEC 17025:2017



**PJLA
Testing**

Accreditation #101188

LABORATORY TEST SERVICES

Elemaster group makes its **ILAC** accredited laboratories available for independent third party certification and validation activities

Eletech Labs provide services related to **EMC, radio, safety, EMF, climatic and mechanical** tests

- Definition of Directive applied to the product
- Definition of the test plan
- Identification of technical standards rules to be applied
- Execution of test in accredited laboratories
- Release of Test report
- Supply of technical documentation
- Administration services for homologations
- Support for voluntary product certification
- Legislative updating

Laboratory accreditation (**ISO/IEC 17025:2017** for EMC tests) and certification (**ISO 9001:2015, ISO/TS 22163:2017, ISO 13485:2016**) guarantees suitable processes and training, periodic metrological verification, constant standards updating.

Environmental certification (**ISO14001:2015**) is the clear indication of interest in environmental protection and rational use of resources.



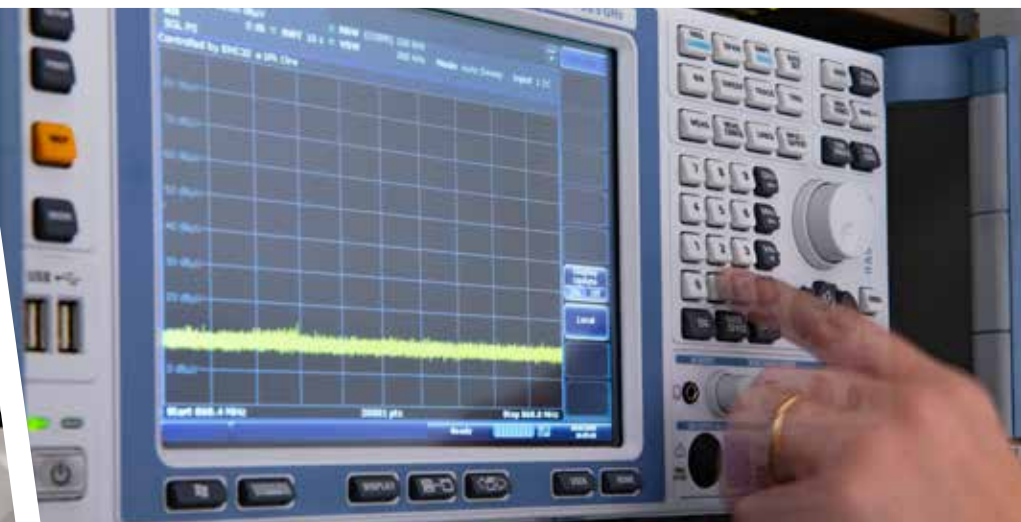
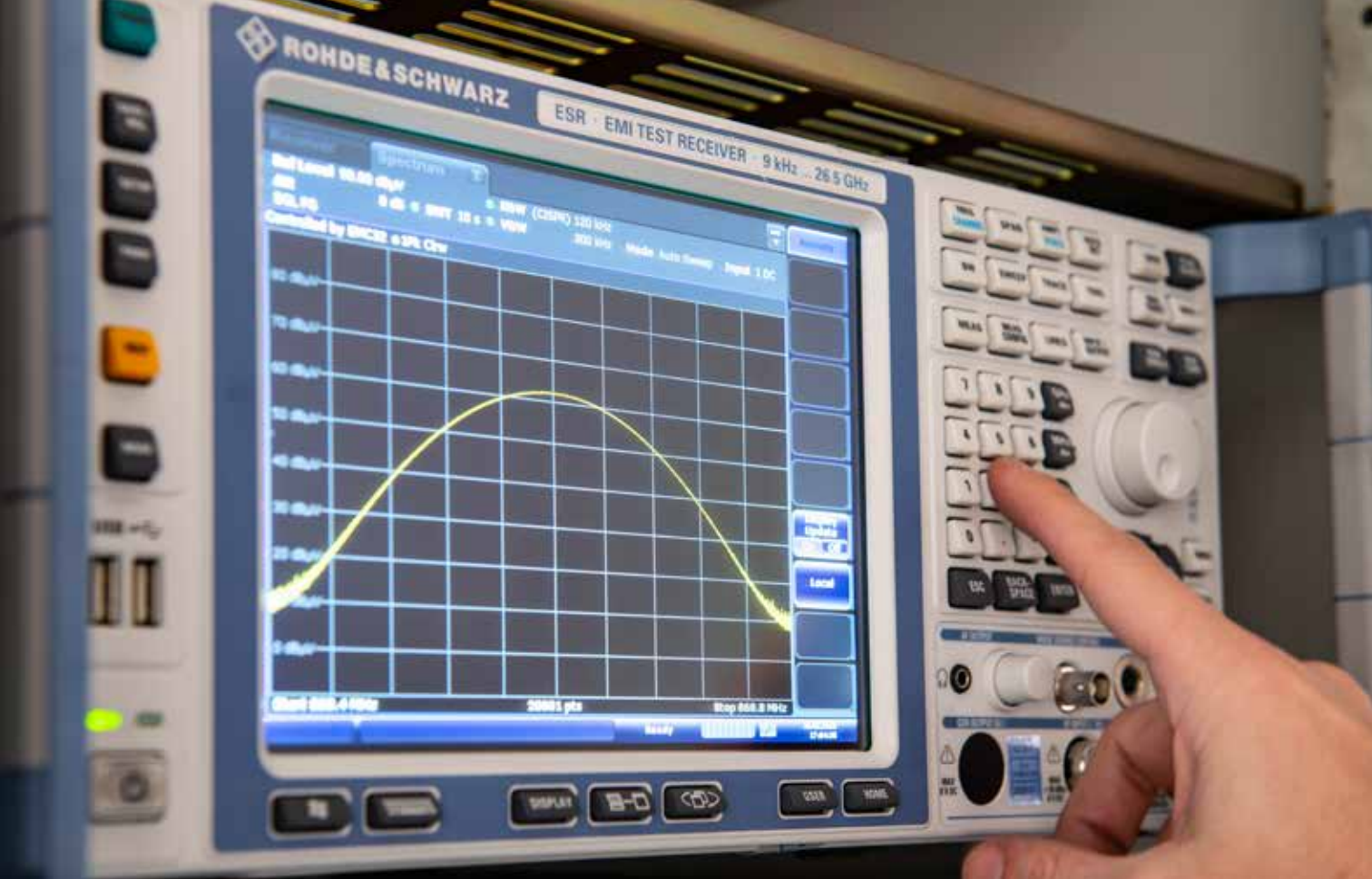


ELECTROMAGNETICAL COMPATIBILITY (EMC)

Basic standard	Measure
EN 61000-3-3 EN 61000-3-11	Flicker, until 15kW tree-phase
EN 61000-3-2 EN 61000-3-12	Harmonics, until 15kW tree-phase
EN 61000-4-2	Electrostatic discharge, until 30kV
EN 61000-4-3	Radiated fields
EN 61000-4-4	Burst, Fast transient
EN 61000-4-5	Surge, high energy impulse
EN 61000-4-6	RF fields induced
EN 61000-4-8	Magnetic field
EN 61000-4-9	Impulsive magnetic field
EN 61000-4-11 - EN 61000-4-29	Interruption, ac/dc voltage variation
EN 61000-4-13	Inter-harmonics
CISPR 16	Conducted and radiated emission

Product standard	Field
EN 61326-1	Scientific and laboratory
EN 60601-1-2	Medical devices
EN 55032 EN 55035	Information technology
EN 55015 EN 61547	Illumination
EN 55011	Industrial
EN 61000-6-1 - EN 61000-6-3	Generic for residential areas
EN 61000-6-2 - EN 61000-6-4	Generic for industrial areas
EN 55014-1 EN 55014-2	Domestic appliances
EN 50121-3-2 EN 50121-4 EN 50155 - EN 50121-5	Railway sector
EN 50130-4	Alarm systems
EN 60974-10	Welding equipment





DELTA TYPE TEST FOR RADIO EQUIPMENTS

Standard	Technology	Example
ETSI EN 300 328	Wideband transmission systems	Bluetooth, Zigbee, Wi-Fi
ETSI EN 300 330	Short Range Devices (SRD): 9 kHz to 25 MHz	RFID
ETSI EN 300 220-1 /-2	Short Range Devices (SRD): 25 MHz to 1 000 MHz	868MHz radio modules
ETSI EN 301 511	Global System for Mobile communications	GSM





SAFETY TEST

Test	Characteristics
Absorption measure	0÷600 V 0÷100 A C, 10Hz ÷ 100kHz
Accessibility test	Different Test gauges and probes
Residual voltage measure	Oscilloscope
Temperatures measure in normal / fault condition	Thermocouple or thermo camera
Leakage currents measure	0÷270V 2kW 0,01÷20mA
Ground resistance measure	1÷40A 1÷300mΩ
Insulation resistance measure	500/1000 Vdc 0,1÷2000MΩ
Dielectric strength test	0÷6kV ac/dc
Insulation distances measure	With hundredth gauge and CAD system
Glow wire test	Max 950°C
Generic test	With 20N sphere, 500g sphere, Dynamometer, dynamometric screwdrivers

Used standards

EN 61010-1, EN 60335-1, EN 60730-1, EN 62368-1
EN 60601-1, EN 60204-1, EN 61131-2

EMF TEST

Human exposure to electromagnetic Fields

Reference standard	Test
EN 62479	Electronic Appliances
EN 62311	Electronic Appliances
EN 62233	House hold appliances
EN 62493	Lighting equipments



WAV 2D 3D 4D XREF CxT RULES WAN QMT QAS

ARCHIVE REVIEW PHYSIO PLEX VTR R

EXAM REVIEW BIOPSY GAIN ADJUST CLEAR ALL B

OA ADM B-REF HREF

ADM SETUP FILTER 65 Hz SV SIZE 3.0 mm ANGLE 0° AUDIO 7 NEXT PREVIOUS

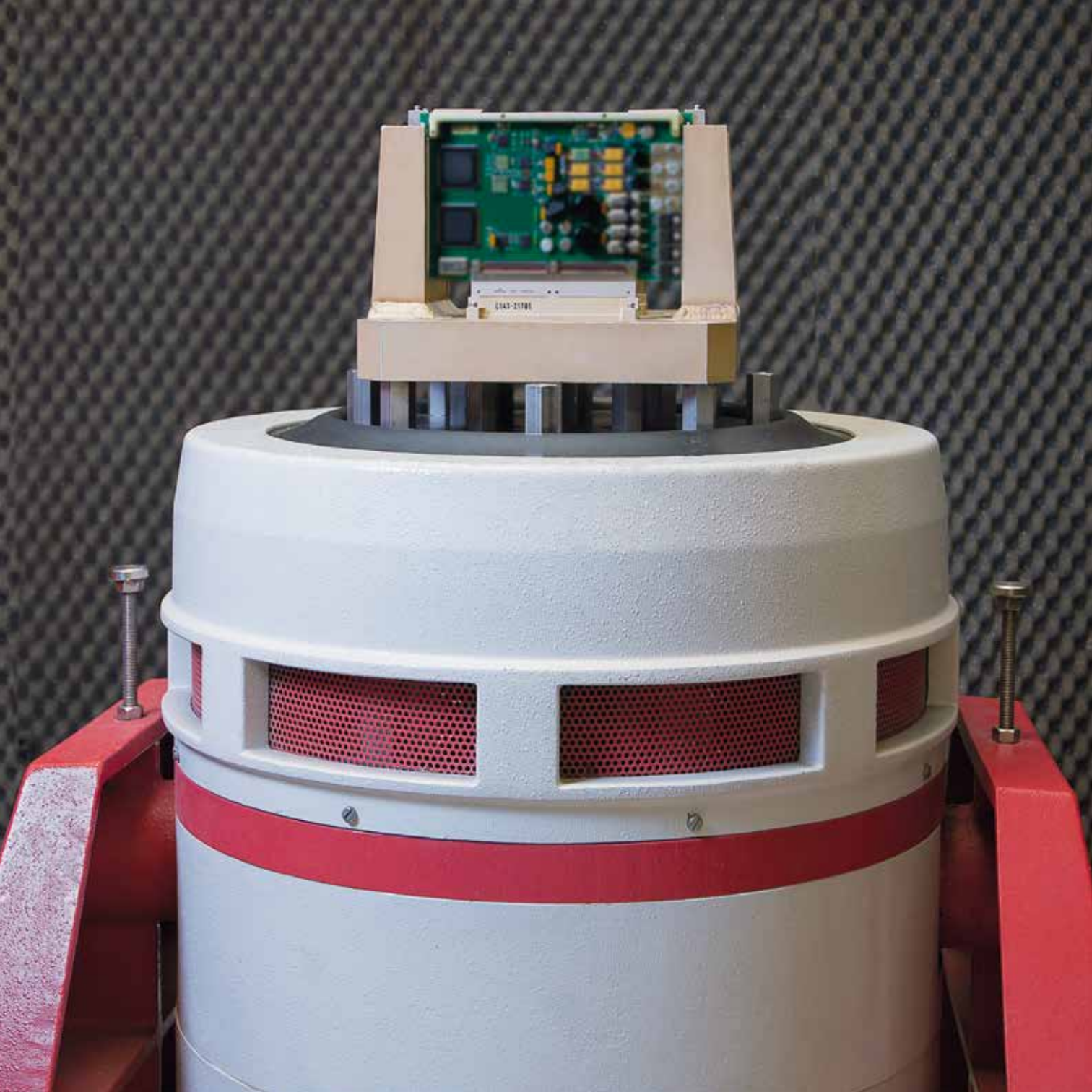


ENVIRONMENT AND RELIABILITY TEST

Reference standard	Test
EN 60068-2-1	A test: cold
EN 60068-2-2	B test: dry hot
EN 60068-2-14	N test: Temperature change
EN 60068-2-30	Db test: Damp heat cyclic
EN 60068-2-38	Z/AD test: combined temperature/humidity cyclic test
EN 60068-2-78	Cab test: damp heat steady state

Temperature range:	-70 ÷ +180°C
Humidity range:	10÷98%
Max temperature gradient:	10°C/min
Maximum humidity gradient:	3%/min
Maximum burn-in test room:	3x3x h 2 m

EN 60068-2-11	Ka test: saline mist 800x800x500mm
EN 60529	IP degrees of protection, from IP11 to IP68





MECHANICAL TEST

Reference standard	Test	
EN 60068-2-6	Fc Test: Vibration	Sinusoidal vibration
EN 60068-2-27	Ea Test: Shock	Half-sinusoidal, trapezoidal, triangular, saw-tooth
EN 60068-2-64	Fh Test: Vibration	Random broadband (numeric control)
EN 61373	Mechanical test	Railway field

Max dimensions in EUT: 60x60x60 cm

Max weight in EUT: 130 kg

	Vibration test	Shock test
Max force:	8896 N	26600 N
Frequency range:	2 ÷ 3000Hz	/
Shock time	/	0,5-1-6-11-18-25 msec
Max peak acceleration	60 g peak	180 g peak
Max displacement	± 25,4 mm	± 25,4 mm





THERMOGRAPHY

Thermography is a technical system that allow the possibility (using a colour map) to detect the thermal energy released by a body.

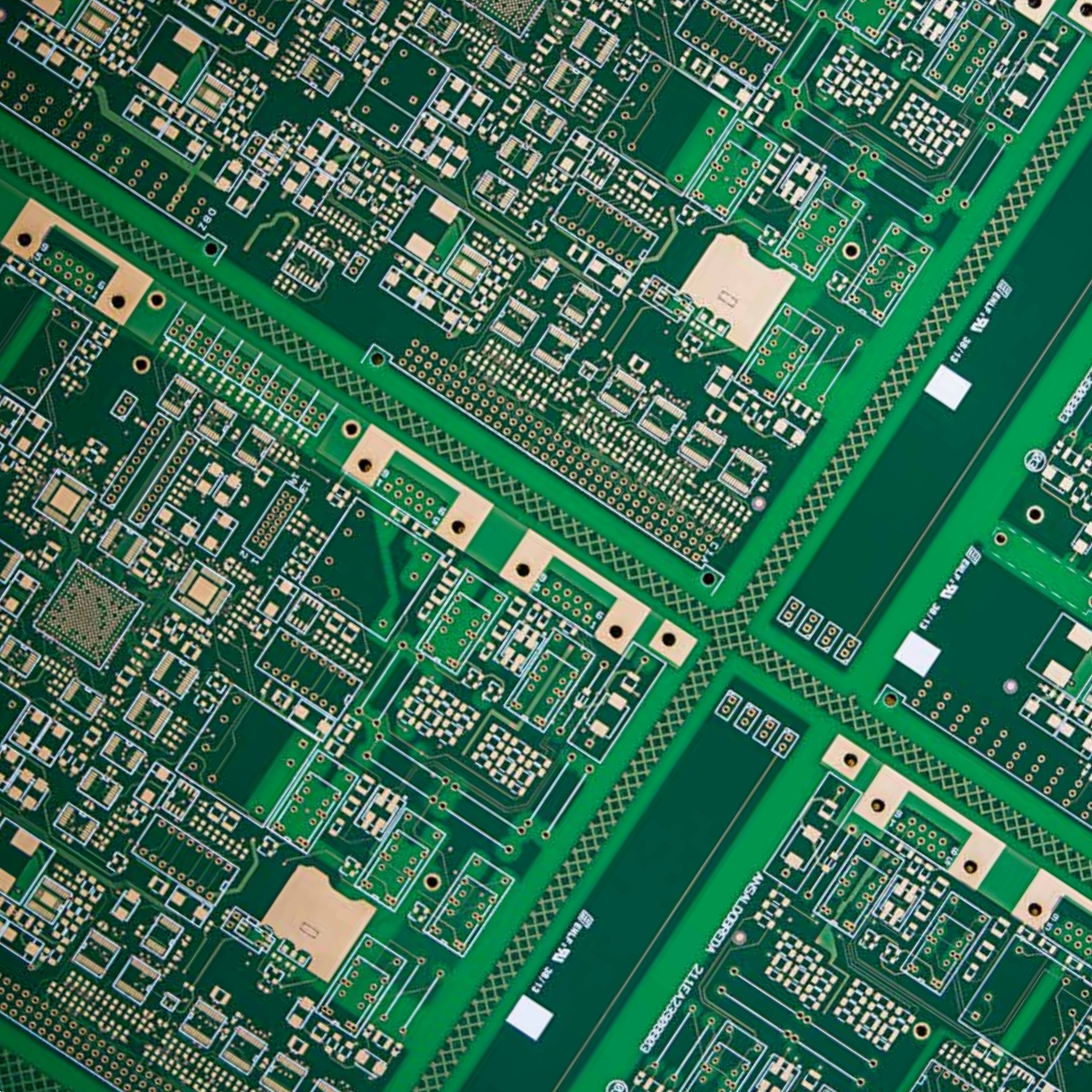
Thanks to a digital camera (thermo-camera) with a particular sensor, the thermal energy can be recognized by infrared field coming from the surfaces, it can help during check test to reduce timing and risks of damages on the components.

- Heat distribution measures
- Non-destructive test
- Machines and equipments thermodynamic
- Fault finding on printed circuits
- Fault finding
- Thermal monitoring during mechanical fatigue test
- Thermal monitoring during electric test
- Thermal monitoring during tests and safety / failure test
- Predictive maintenance



X-RAY INSPECTION

Equipment available and IPC trained inspectors to perform production monitoring and detailed analysis vs. IPC and/or Customer requirements.



ANALYSIS OF PCBs

Elemaster can provide further services, dedicated to the **analysis of PCBs**, through its own laboratory located in **Eleprint**, the company of the group whose core business is the Printed Circuit Boards production

The test lab in a PCB manufacturer is one of the most important things, as in this way we can guarantee the highest level of quality to all our Customers, performing several kinds of test on your products:

Chemical tests

To check your circuits, we can do:

- Qualitative data analysis of organic substances concentration by water spectrophotometric test.
- Analysis for check and management of production lines.
- Analysis of organic substances in electrolytic line by CVS.

Thermo-mechanical PCB analysis

To offer you the best choice among different options, setting the ideal material which you will need to reach the exact performance that you want, and to check PCB construction and reliability, by TMA we can define:

- TG
- Delta TG
- TTD

Electric and electronic PCB analysis

To keep high frequency signal integrity, we can perform:

- Electric/Electronic PCB Analysis
- PCB Impedance Control by CITS Polar instrument

Non destructive tests for surface coating measure and hole copper thickness

To ensure the best level of quality on your products, we can do:

- Non-destructive thickness measure on finishing coating chemical nichel-gold, tin-HAL, by Fischerscope X-Ray
- Non-destructive measure of copper thickness in the holes (by CMI, Eddy current instrument)
- Quality acceptance evaluation provided by Certified IPC Specialists – IPC-A-600.

All tests are performed by Certified IPC Specialists (CIS), who are able to define the suitability of all samples according to the standards IPC-A-600, class II or class III. Our internal IPC trainer CIT ensures us a high standard for all the inspections performed by operators.



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Contacts

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