

2019

## ELECTRONIC MANUFACTURING SERVICES

THICK FILM ON ALUMINA

THICK FILM ON ALUMINIUM NITRIDE

THICK FILM ON ALUMINUM

SMT MANUFACTURING SERVICE

INSULATE METAL SUBSTRATE

POWER RESISTORS ON STAINLESS STEEL

CHIP & WIRE BONDING



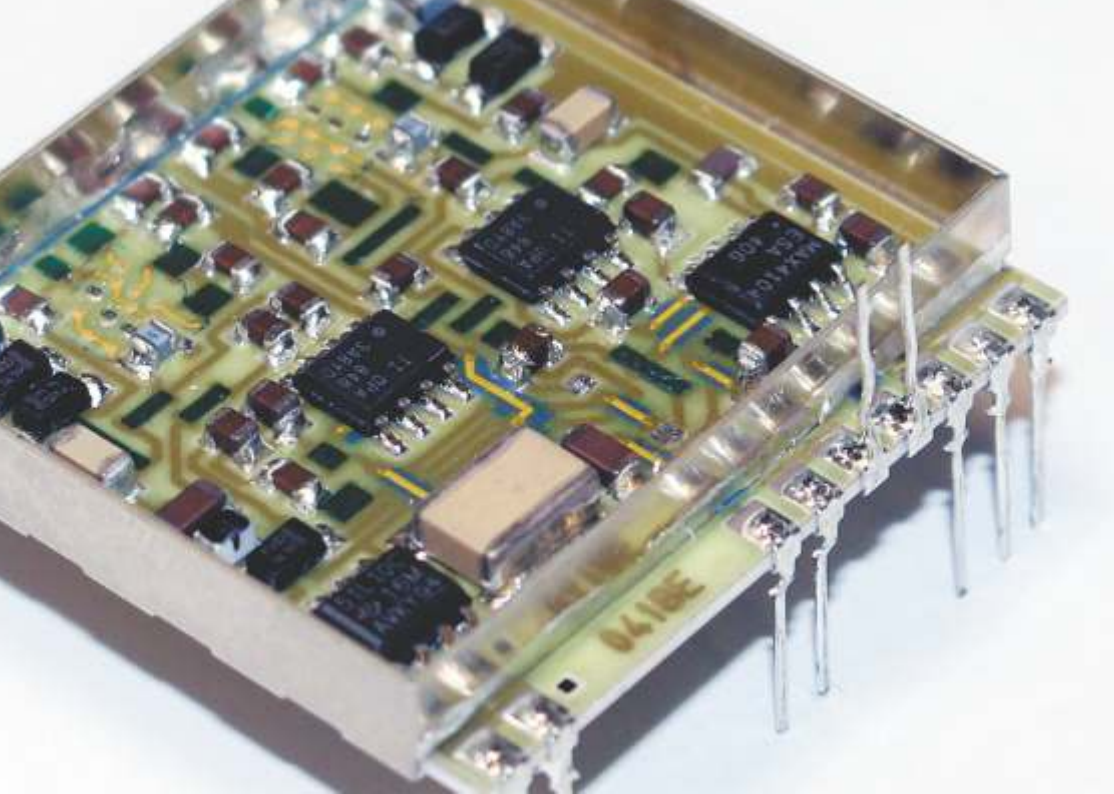
## **MISSION**

Support customers with our expertise in electronic design and manufacturing for industrialization of tailored made solutions to be marketed in massive production with highest level of reliability.

## **KNOW HOW**

In the last decades, AUREL has developed new technology for high power management (heat dissipation through metal substrates) adapting thick film production lines to applications of screen printing on top of aluminum / steel substrates.





## ELECTRONIC MANUFACTURING SERVICES

AUREL offers to his customers an electronic manufacturing service for:

- Thick film hybrid circuits on Alumina
- Thick film hybrid circuits on Aluminum Nitride
- Thick film on Aluminum (THIFAL)
- SMD manufacturing service
- Insulated metal substrate circuits (IMS)
- Chip & Wire circuits
- Power resistors
- Braking resistors

[www.aurel.it](http://www.aurel.it)

## RADIOFREQUENCY MODULES

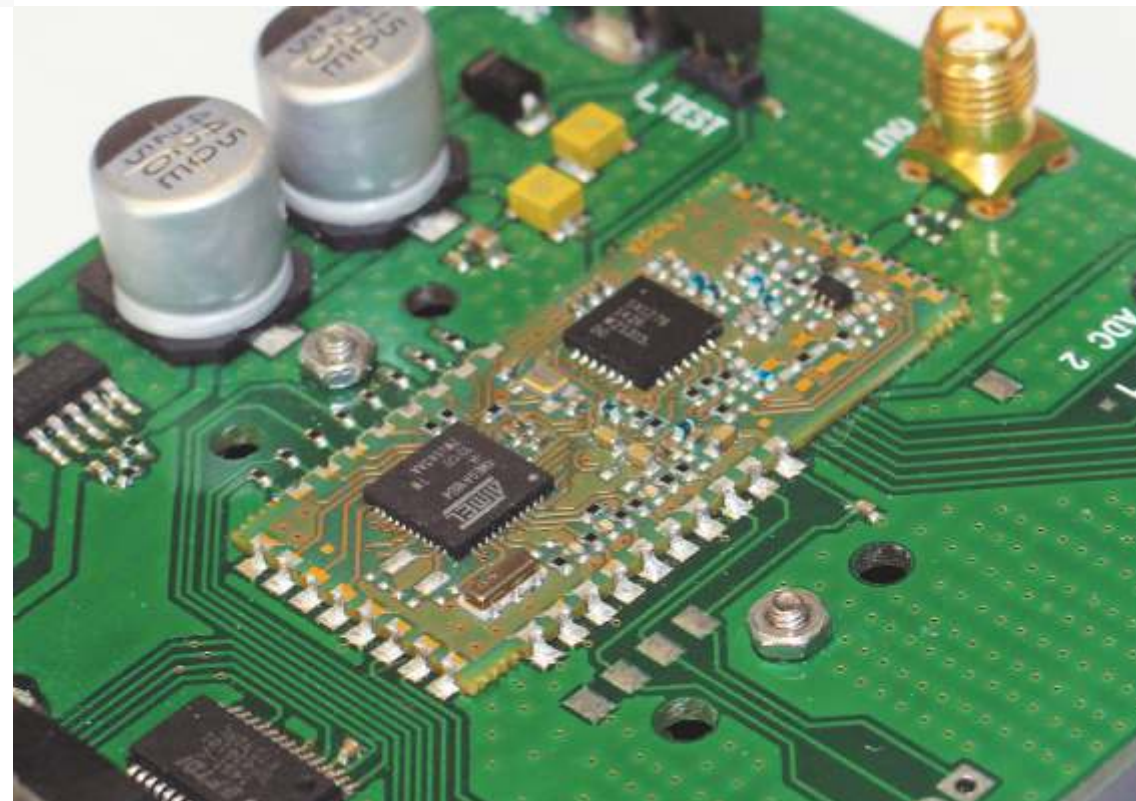
AUREL has more than **forty years of expertise** in the design, industrialization, production of wireless radio solutions.

A full line of standard RF solution on free-license frequencies in 433 MHz, 868 MHz and 2.4 GHz compliant with the European Normative and FCC regulations (for US market) is available.

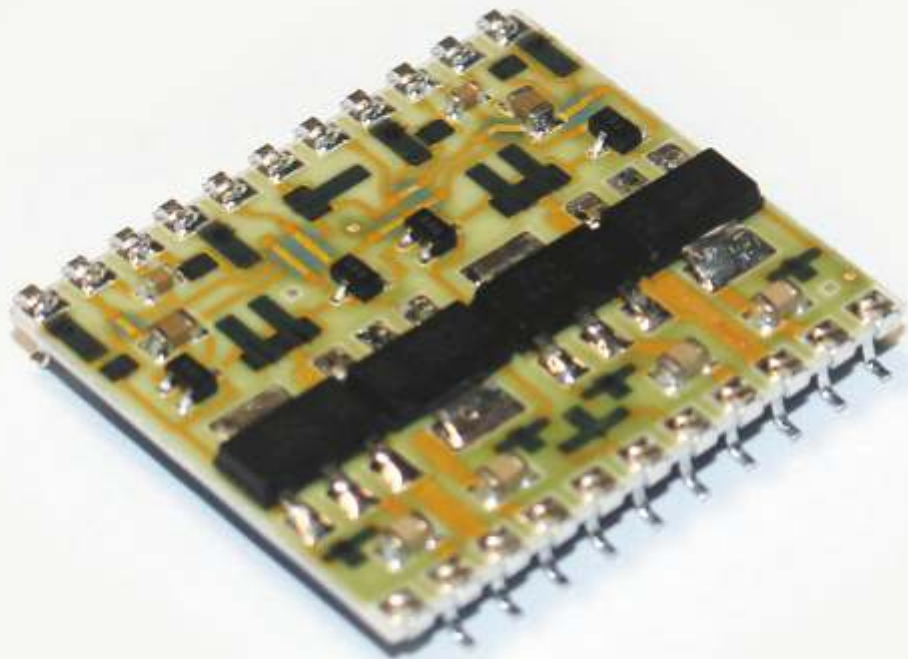
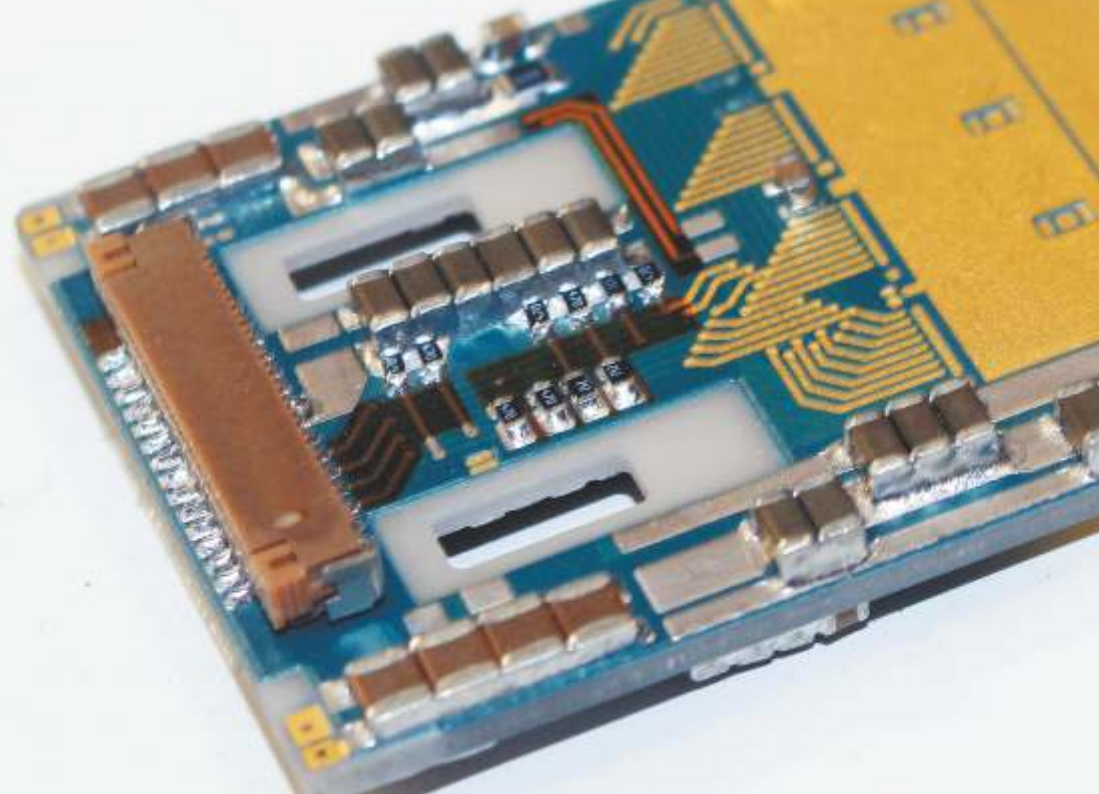
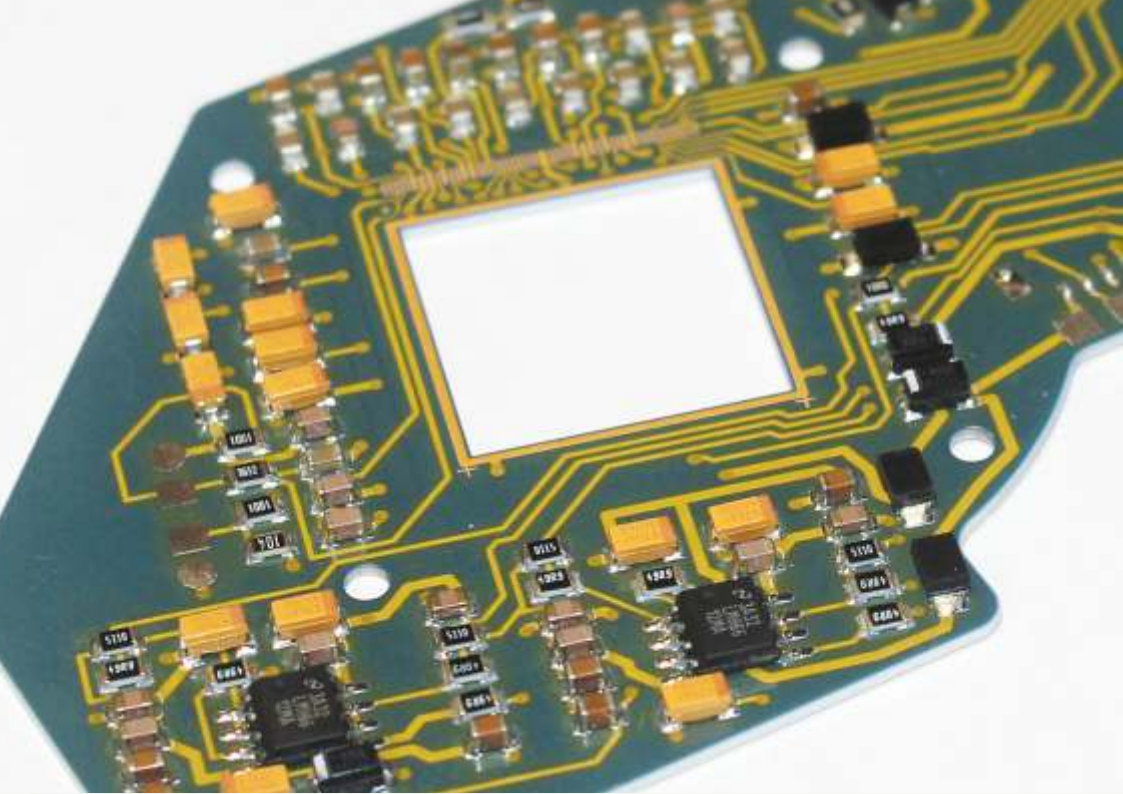
### APPLICATIONS

- Security alarm system
- Tubular motor control
- Cooking hoods
- Heating system control
- Gate/garage opener
- Automatic driver recognition system
- Street lighting
- Tarpaulin systems

[www.aurelwireless.com](http://www.aurelwireless.com)







## THICK FILM ON ALUMINA & ALUMINUM NITRIDE

AUREL has long expertise in design and production of different hybrid circuits types on alumina or aluminum nitride substrates, with complex lay-out and through hole metallization.

The technology allows a high degree of integration, multilayer structures and laser trim.

### APPLICATIONS

- Biomedical
- Automotive
- Sensors
- Avionic

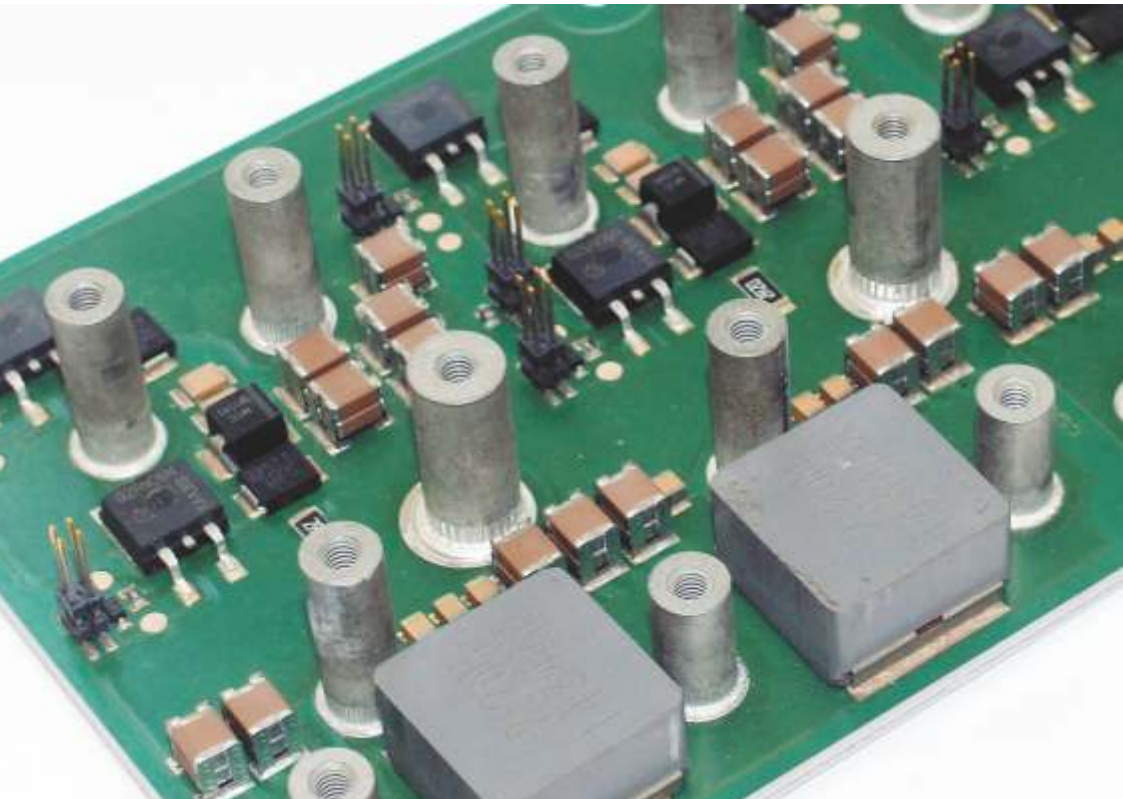
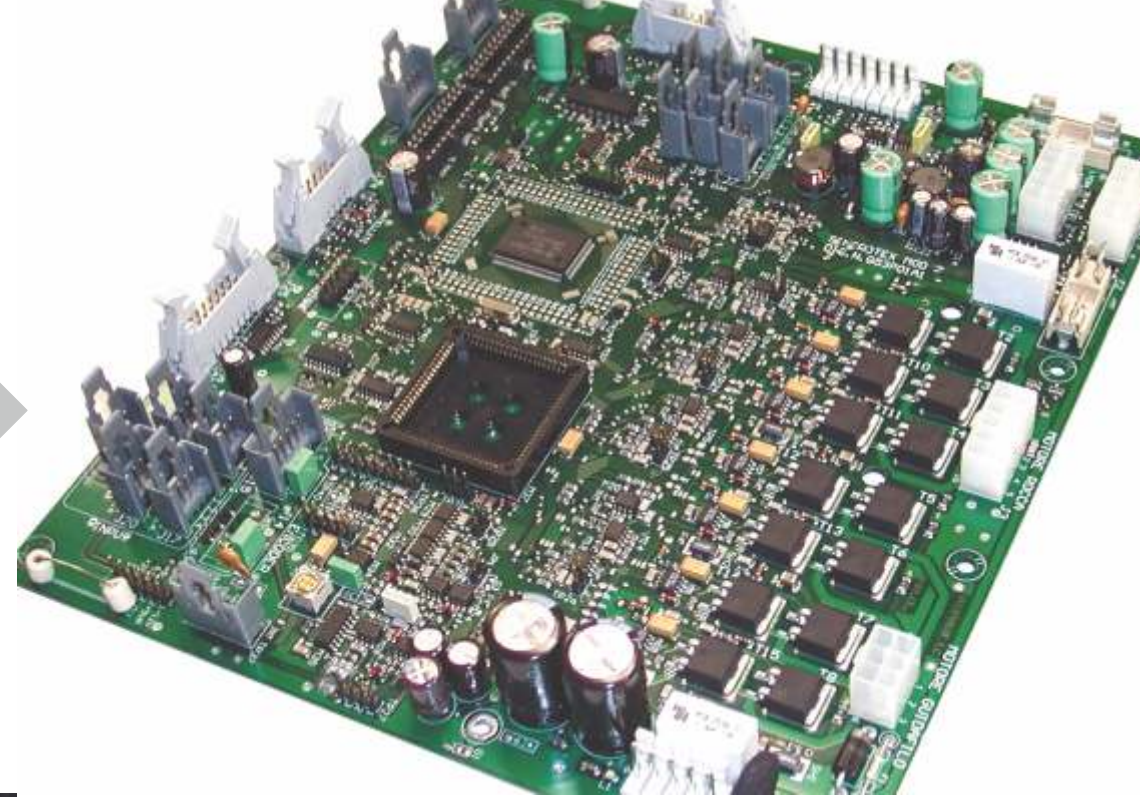


## SMT MANUFACTURING SERVICE

AUREL assembles electronic boards in SMT technology with also PTH components on PCB multilayer, rigid-flexible or metal cores substrates with cases until 0201 dimension, BGA and micro BGA also on the 2 sides.

The quality is assured via AOI, X-ray inspection, functional testing.

AUREL is also able to offer auxiliary services as custom packaging of the product.



## INSULATED METAL SUBSTRATE (IMS)

IMS Technology is suited for applications where it is requested to increase thermal dissipation in high wattage surface mount design.

This technology limits the need to use multiple parts while achieving maximum insulation (> 2 kV) for modules 100% tested and ready for production.

### APPLICATIONS

- INDUSTRIAL (power suppliers, inverters, soldering machines)
- AUTOMOTIVE (ignition, electronic control units, lamp gears, fan controls)
- LIGHTING (light sources, street lights, power leds, power lighting)
- SOLAR ENERGY (inverters, concentration units)

## POWER RESISTORS ON STAINLESS STEEL & CERAMICS SUBSTRATES

Heating elements and power resistors are realized by printing on top of Stainless Ferritic or Austenitic steel/ceramics substrates, an electrically insulating, but thermally conductive, ceramic dielectric layer.

On top of it are subsequently printed conductive and resistive layers to obtain the desired power value.

A major advantage of this technology is the maximum speed in terms of heat transfer.

### APPLICATIONS

- Tea kettles
- Domestic food processors
- Milk frothers
- Humidifiers
- Professional braising pans
- Coffee machines
- Food steamers



## THICK FILM ON ALUMINUM (THIFAL)

AUREL has developed a proprietary technology for the deposition of dielectric and conductive layers directly on top of the aluminum heat sink, eliminating the need of further substrates as metal core, alumina or FR4.

### APPLICATIONS

- Car head lamps
- Entertainment lamps
- Spot lights
- Electric drives

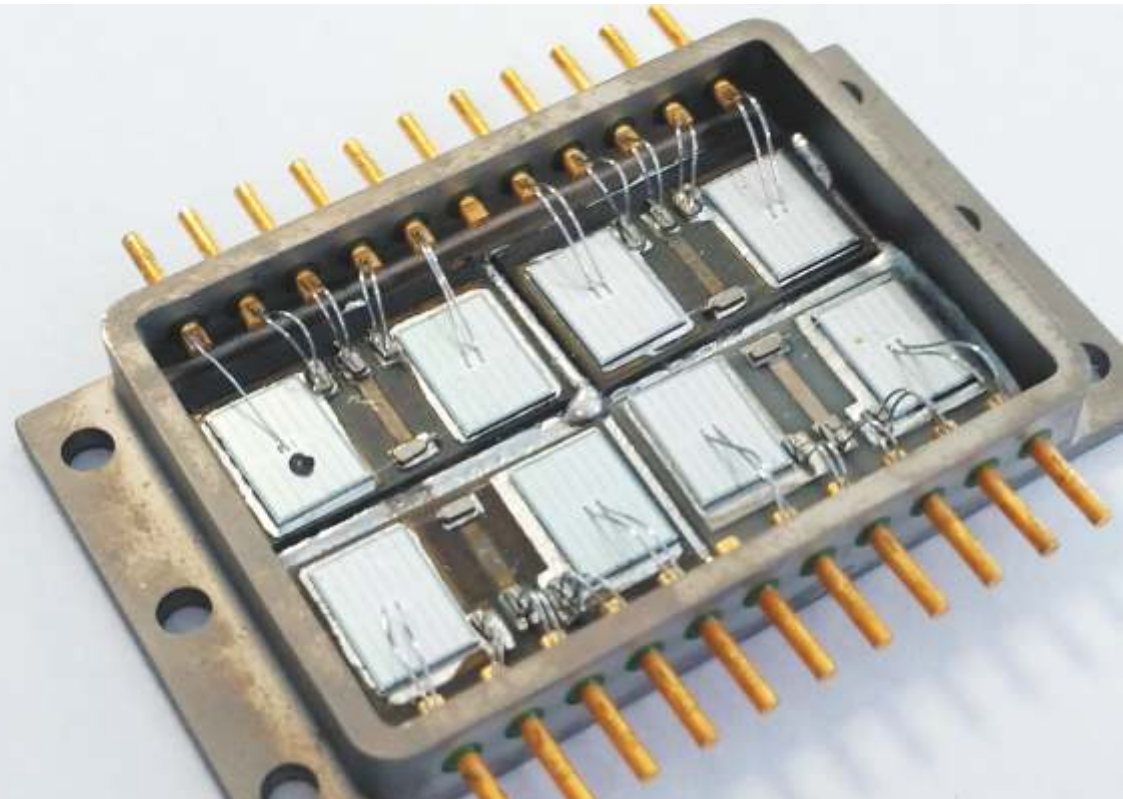
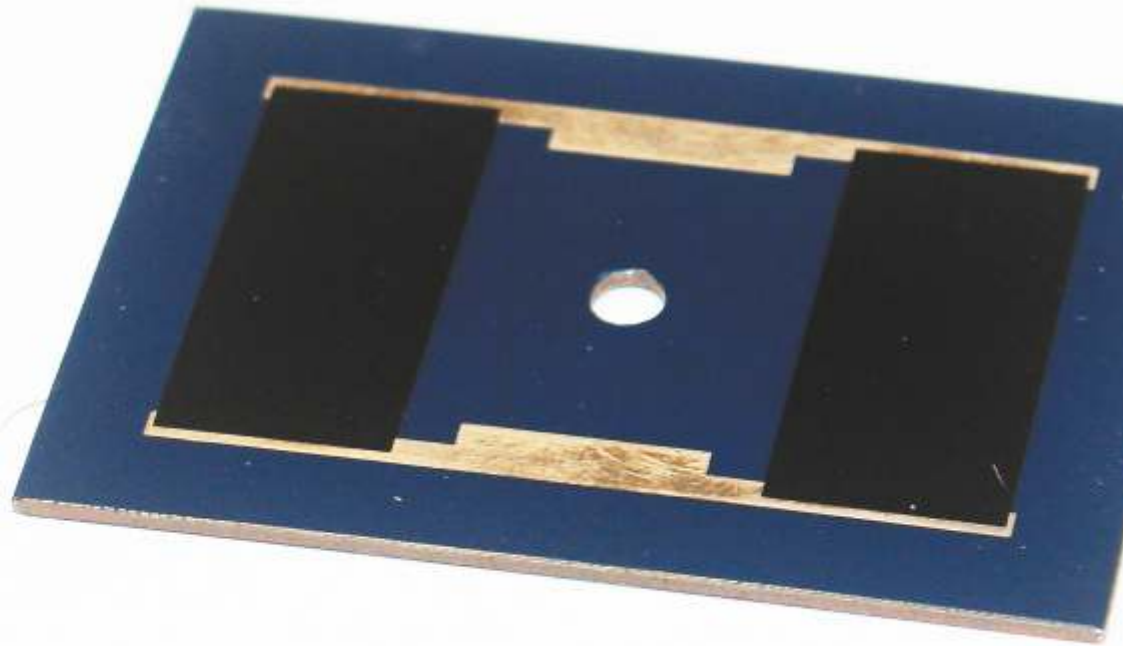


## BRAKING RESISTORS ON STAINLESS STEEL

Braking resistors printed on stainless steel are an ideal solution to sink the peak heat generated by variable frequency drives.

### APPLICATIONS

- Variable frequency drives



## CHIP & WIRE (CLEAN ROOM ISO 7)

Chip on Board (C.O.B) technology consists of die directly attached to its substrate.

C.O.B. assemblies allow to achieve high density and better performances due to shorter interconnection paths.

Wire bonds in Au (25  $\mu\text{m}$  thick) are used.

AUREL boasts a clean room (class ISO 7) with automatic die attach and wire bonding machines.

### APPLICATIONS

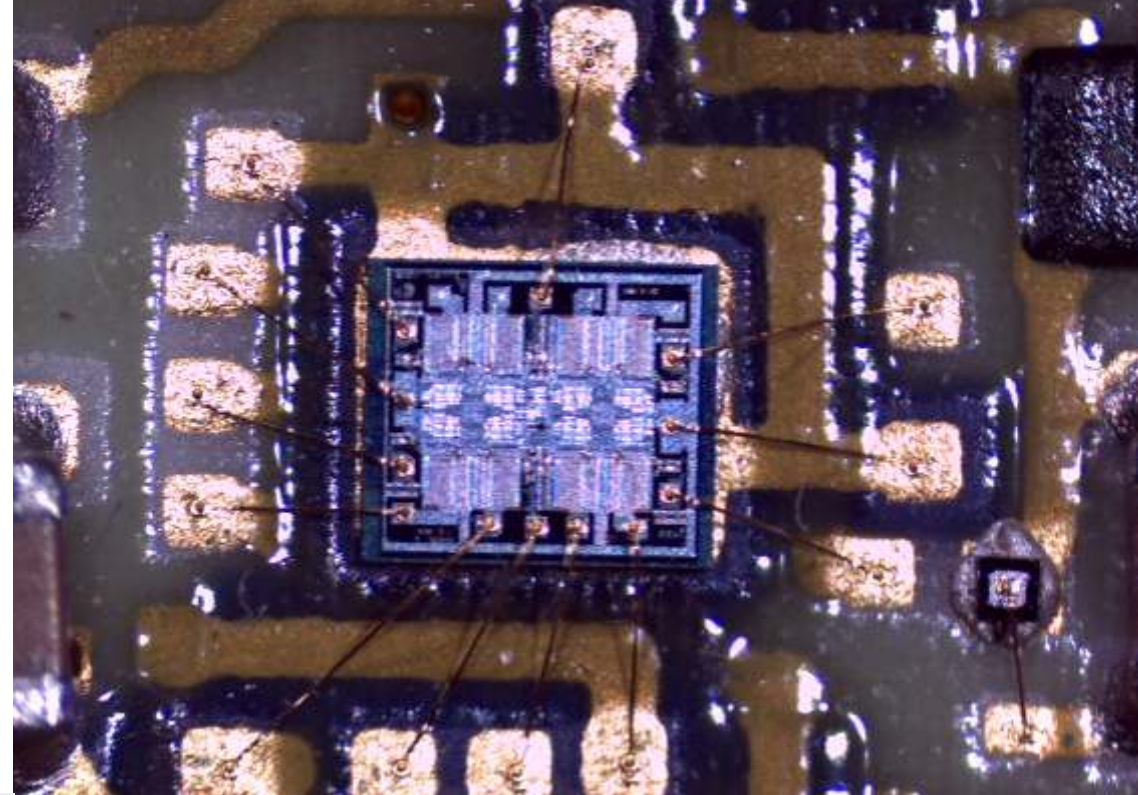
- Automotive
- Proximity sensors
- Avionic



## QUALIFIED PROCESSES

- Screen printing on  $Al_2O_3$
- Through-hole metalization
- Component Assembling with Sac 305 solder paste
- Wire bonding with 25  $\mu m$  Al wire
- Die attach with H20 o K2000 epoxy
- Parts assembling with high strength adhesives

Above processes are qualified with MIL 883 standard



## EQUIPMENT FOR QUALIFICATION

AUREL is also able to carry out qualified test using the following equipments:

- Climatic chambers
- Thermo stream
- X-Ray machine
- Gros & fine leak
- Pind test
- Constant acceleration up to 5.000g
- Shear strength
- Shocks and vibration





# APPLICATIONS



UPS SYSTEM



LIGHTING



WALL BOILER



ECG



COFFEE MACHINE



RADAR

## AUREL AUTOMATION DIVISION

Since 1970, Aurel Automation has been **designing** and **producing machines** and **automations** for electronic and microelectronic production.

The wide product range includes machines for manufacturing **hybrid circuits** in thick film technology, SMT, **printed electronic** on flexible (RFID, biosensors, organic solar cells, etc), **heaters on steel**, either flat and cylindrical supports, assembly and inspection of the state-of-the-art sensors and power circuits.

Aurel Automation machines are designed either as **stand alone** and **in-line configuration** with automatic handling systems and standard interfaces to be integrated in the existing line. Traceability data systems are available to connect the machine to the enterprise networks (Industry 4.0 ready).



VS1520A Screen Printer



C920 Screen Printer



## HIGH PRECISION SCREEN STENCIL PRINTERS

The new series VS and C920 screen-stencil printers use highly advanced mechanical and electronic solutions to guarantee superior quality in **fine-line printing** of Thick Film, Solar Cell, LTCC, PWB, Wafers, Glass, Metal and many other applications.

The **Automatic Vision System** ensures resolutions better than 2 microns.

All the machine's movements are motorized and programmed by an user friendly menu on touch screen panel.

The **new print head** moving on high precision slides represents the latest **state-of-the-art design** with motorized and programmable axes for fine teaching and adjustment of the print parameters.



## SENSOR MANUFACTURING MACHINES

Aurel Automation designs and produces fully automatic lines for **sensors manufacturing**, from the **screen printing** of the **sensitive element** on ceramic or metal substrates up to the **final calibration and test** of the sensor assembly.

The calibration can be achieved by **resistor laser trimming** (ohmical or functional) and analogic or digital compensation by **ASIC programming**.

The line can be equipped with transport system for indexing the pallets with an array of devices, **heating and cooling zones** with programmable climatic chambers, testing areas under pressure, gas humidity or other custom requirements.

All the datas can be recorded locally or sent/retrieved to/from a server in order to integrate the line into the enterprise **network traceability system**.

Typical products are: pressure and force sensors, proximity switches, biosensors, RFIDs, position sensors, piezo and ultrasonic ceramics, photocells.



ALS300 Laser Trimmer



Example of Aurel Fully Automatic Line



## THE NEW FLEXIBLE WORK STATION: SERIES XCEL

The new series XCEL is a **flexible X-Y work station** in which a **multiple head** is moved by means of high precision fast linear motors over a max work area of **550 x 600 mm**.

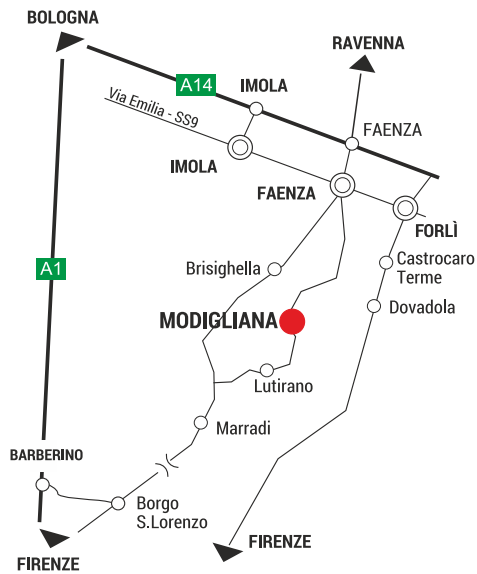
Up to 4 different heads can be installed working in parallel and controlled by the software of the machine.

Main applications are, for example, paste and resin **dispensing**, spray-coating, ink and paste jet, functional or aesthetic AOI, assembly, **laser micromachining**. All these works are fully programmable and can be combined together to **work in sequence**.

What is most striking is the variety and the wide panorama of contexts in which these machines can fit: from **prototype production for Labs**, passing through small/medium companies that use semi-automated XCEL systems to achieve the maximum efficiency in processes that were previously run manually, up to large industrial companies that integrate XCEL machines into **high volume production** lines that work on three shifts per day.

## ABOUT US

Established	1970
Employees	71
Engineers	15
Turnover (2017)	13.5 Million of euro
Dimensions	4.600 mq (3.500 covered)
Certification	ISO 9001



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