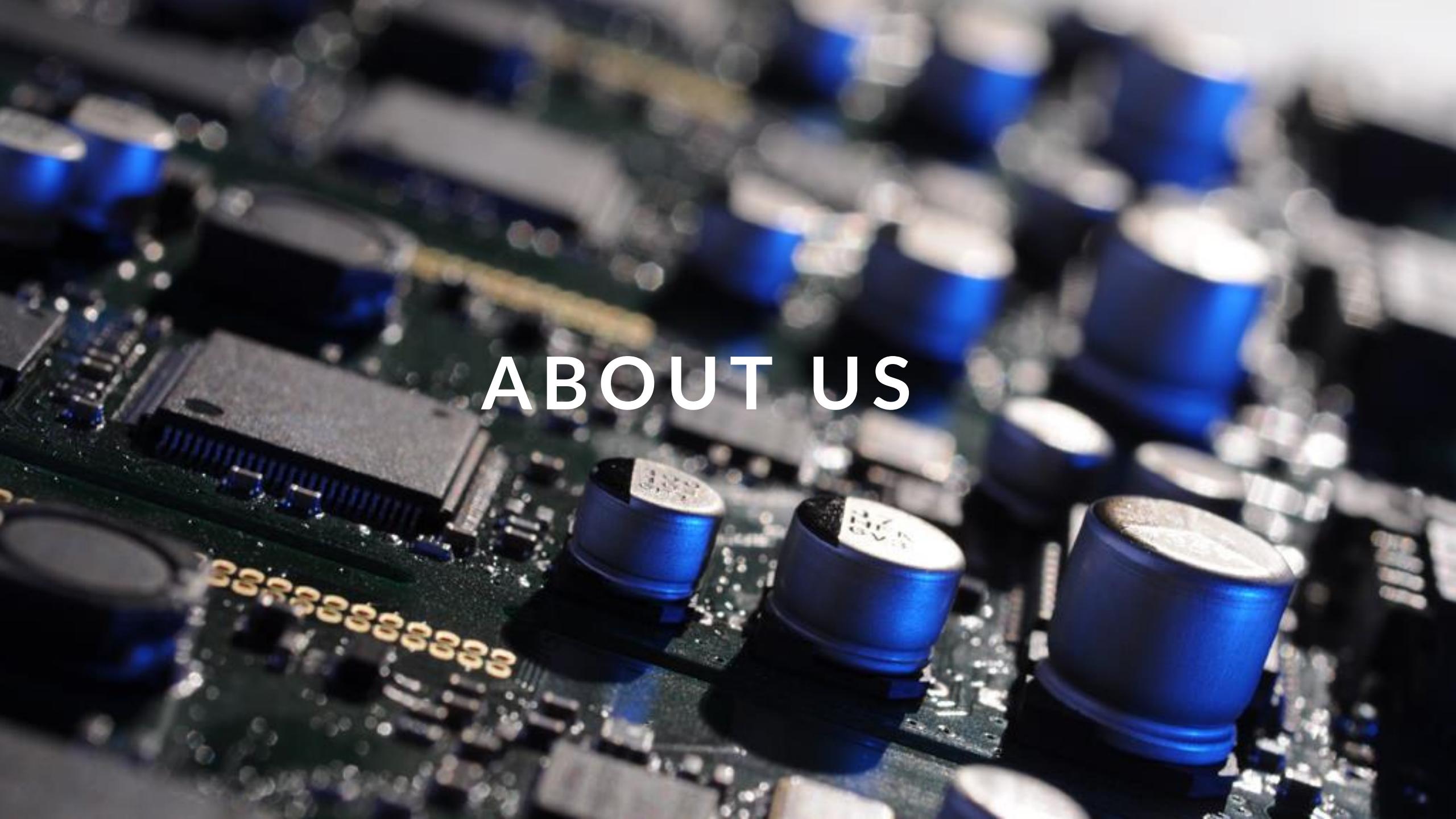




W E L C O M E T O
ALL CIRCUITS



Comment passe-t-on de la preuve du concept à un produit fabricable, testable et reproductible ?



ABOUT US

KEY FIGURES

1st

EMS company in France
& global top 50*



5

facilities on three
continents



58,000 m²

of manufacturing
worldwide



2 000

dedicated team
members**



25

Years of automotive
excellence



40

Years of experience in
telecommunications



28

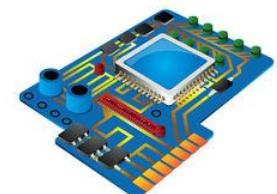
SMT lines



More than

300 000

PCBAs manufactured daily



* MMI Insider 2018

** direct + temps

CHOOSE THE OFFER THAT SUITS YOU



R&D

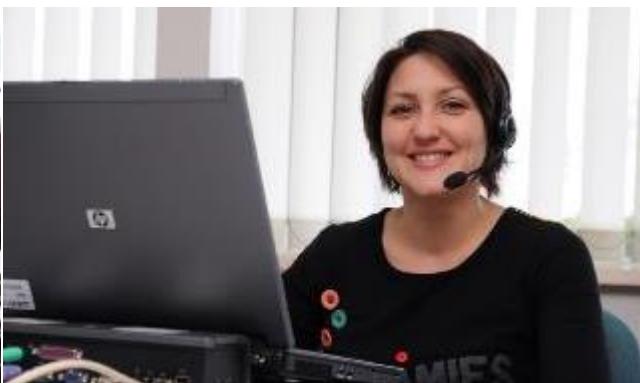
- Feasibility studies
- Specifications, architecture
- Design to cost
- Conception through partnerships
- Qualification
- Assistance in certification

MATERIALS

- Global purchasing
- Supplier selection
- Local procurement
- Shipment

INDUSTRIALIZATION

- Design of test equipment
- Collaborative design
- Dfx
- BOM review
- Prototype



SMT ASSEMBLY

- Large number of specialised SMT lines



PRODUCT ASSEMBLY

- Automation
- Process design
- Automotive excellence
- Customization & pre-provisioning

LOGISTICS

- Inventory management
- SAP, OEA
- CTO & fulfillment
- Multiple point delivery

POST PROD SUPPORT

- Repair
- Warranty
- Reverse logistics



you can have it all

Activities

Let us build the electronic solutions of tomorrow together: whatever the market, we apply our zero defect culture to your projects to meet the most stringent quality requirements.



Automotive & transportation



Industry & Energy



Communication & IoT



Medical

Solutions

As one of the world leaders in electronic subcontracting with the automotive vector in its genes, ALL Circuits has set itself the mission of designing, industrializing and producing quality electronics.



R&D



Engineering



Production



Supply Chain



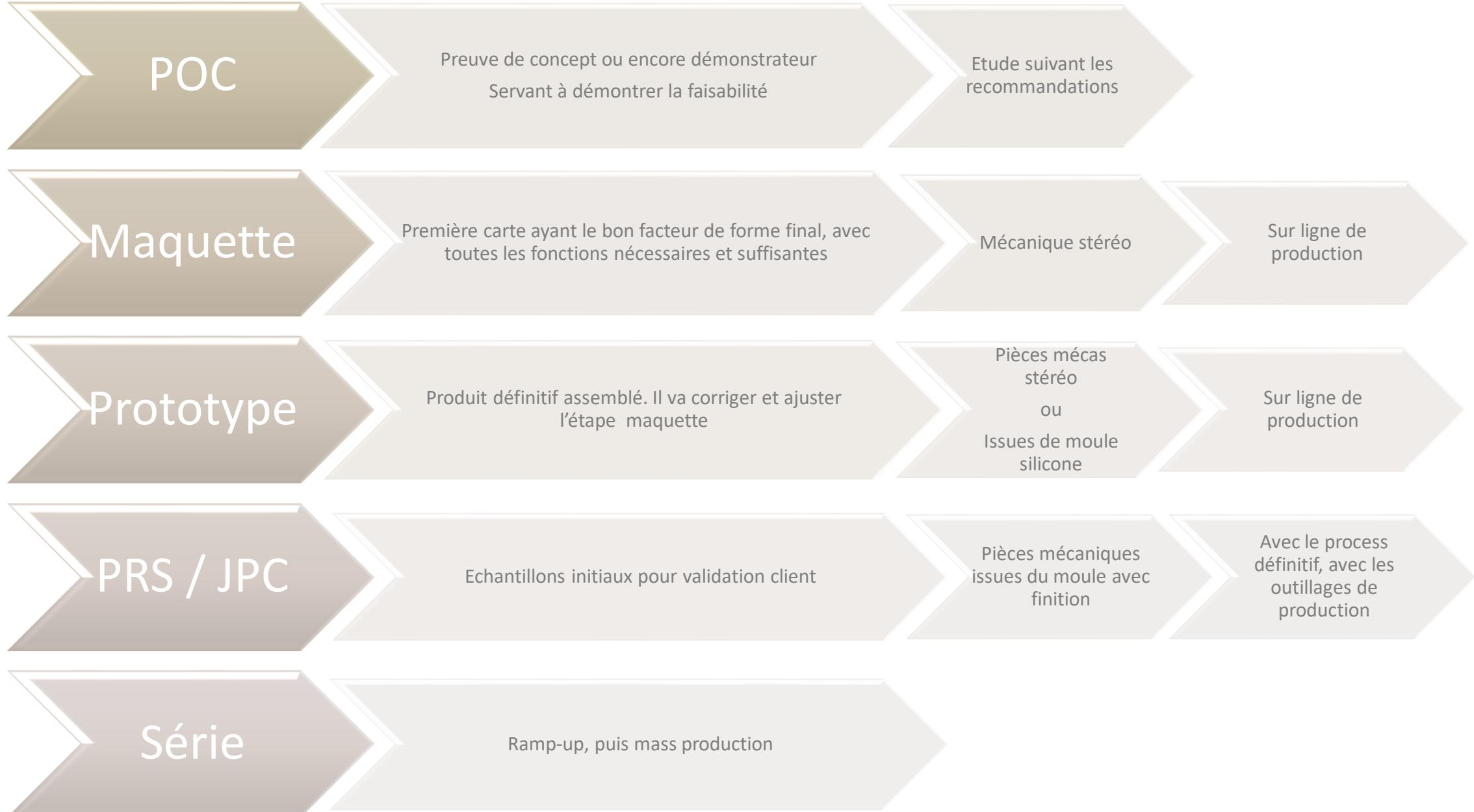
Du POC à la série, approche DFx
adaptée au projet ET Business Case

Know your product !

- Features
- Form Factor
- Design
- Key Technical Points
- Constraints
- Issues
- Normative context

Know your business case !!

- Lifetime
- Volume
- Market type (B2B, B2C, B2B2C...)
- Market Zone (Country)
- Warranty / Support
- Revenues (One off, recurrent...)



- Design For x (DFx) Approach adapted to your product/Business :

- x=Cost : DFC
 - 60% to 80% of product price depends on components
 - Components price depend on volume ! (Ratio up to 10)
 - Some architecture are good for low volume, some for high volumes (modules vs chips)
- x=Test : DFT
 - Normative context
 - After sales impact (replacement, exchange, support)
 - Test coverage, Test mode
 - Test tools cost....custom to your product (high, good coverage), generic (lower, lower coverage)
- x=Procurement/Purchasing : DFP
 - Some components disappear after 2 years (consumer market)
 - Long life components are more expensive
 - Some supplier disappear, abandon their products, M&A, some products are not available in EU/US/APAC
- x=Manufacturing : DFM
 - Product adaptation to production machines and line setup for low volume, the opposite for high volumes
 - Process : 1 side or 2, SMT and/or wave, laminar or selective, potting, product assembly, manual/automated ?
 - Panelisation / Depanelisation (punching, milling, ... ?)
- x=Logistic, x=Repair,

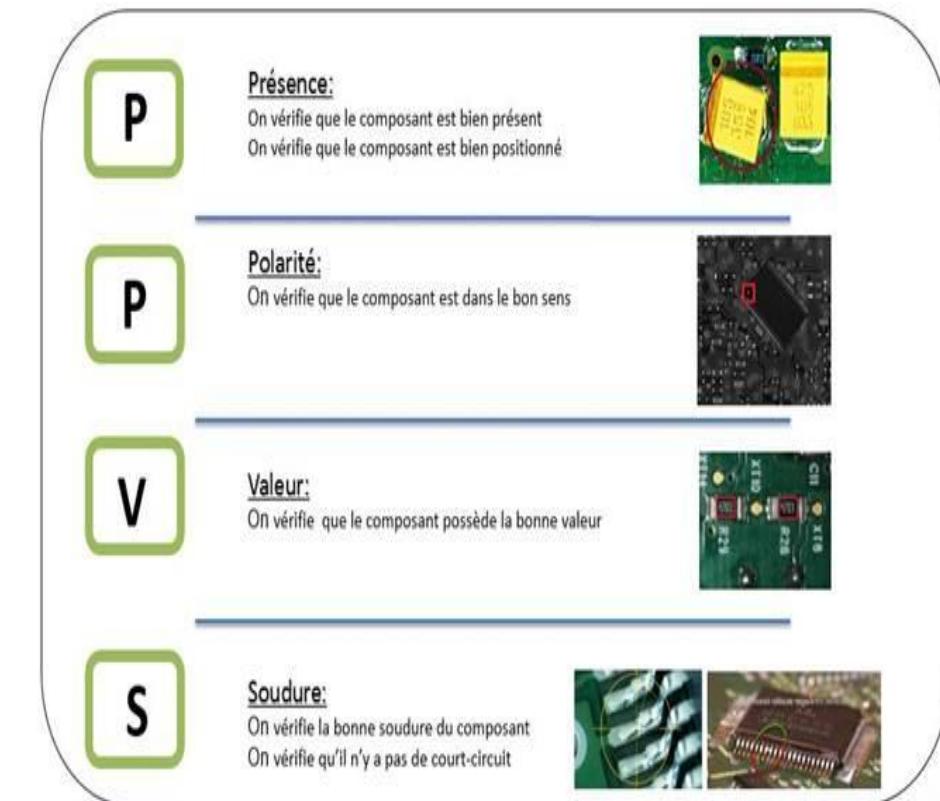
Design For Manufacturing

- La DFM consiste à intégrer la notion de fabricabilité dès la phase de conception
- Elle s'appuie sur des règles de fabricabilité de l'industriel:
 - respect des normes IPC ou clients
 - vise à adapter au mieux le produit aux équipements de fabrication de cartes électroniques.
 - *Objectifs:*
 - ↓ les opérations manuelles
 - ↑ la qualité de brasure
 - ↑ la compatibilité aux équipements
 - *Eviter d'approcher les limites techniques de process*
 - *Eviter les inversions d'assemblage (polarité, détrompage, ...)*
 - *Leviers sur design:*
 - Composants électroniques et pièces plastiques
 - Flux de production (*simple refusion, ...*)
 - PCB (*mise en flan, finition, marquage*)
 - *Placement*
 - *Routage*

Design For Test

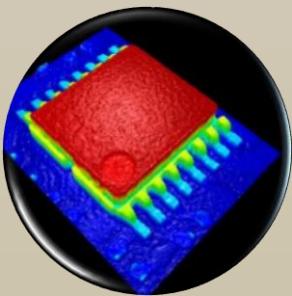
- La DFT consiste à intégrer la notion de testabilité dès la phase de conception
- La définition de la stratégie de test optimale passe par des compromis entre:
 - qualité du produit (\uparrow taux de couverture, \downarrow risque de défauts)
 - coûts d'investissement (temps de cycle)
 - résolution de diagnostic

- *Objectifs:*
 - \uparrow la couverture de test
 - \uparrow l'accessibilité
 - \uparrow le temps masqué
 - \downarrow les temps de test
 - \downarrow les opérations manuelles
 - \downarrow les coûts d'investissement
- *Leviers sur le design:*
 - Accessibilité
 - Commandabilité
 - Indexation



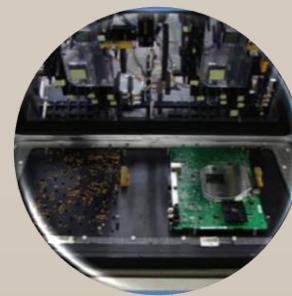
Design For Test

Exemples de systèmes de test standards



AOI

- 2D
- 3D



In Situ, avec interfaces

- Sur base de Keysight 3070
- Sur base de Keysight i-3070
- Sur base IFR4220 Marconi



In Situ, à sondes mobiles

- TAKAYA

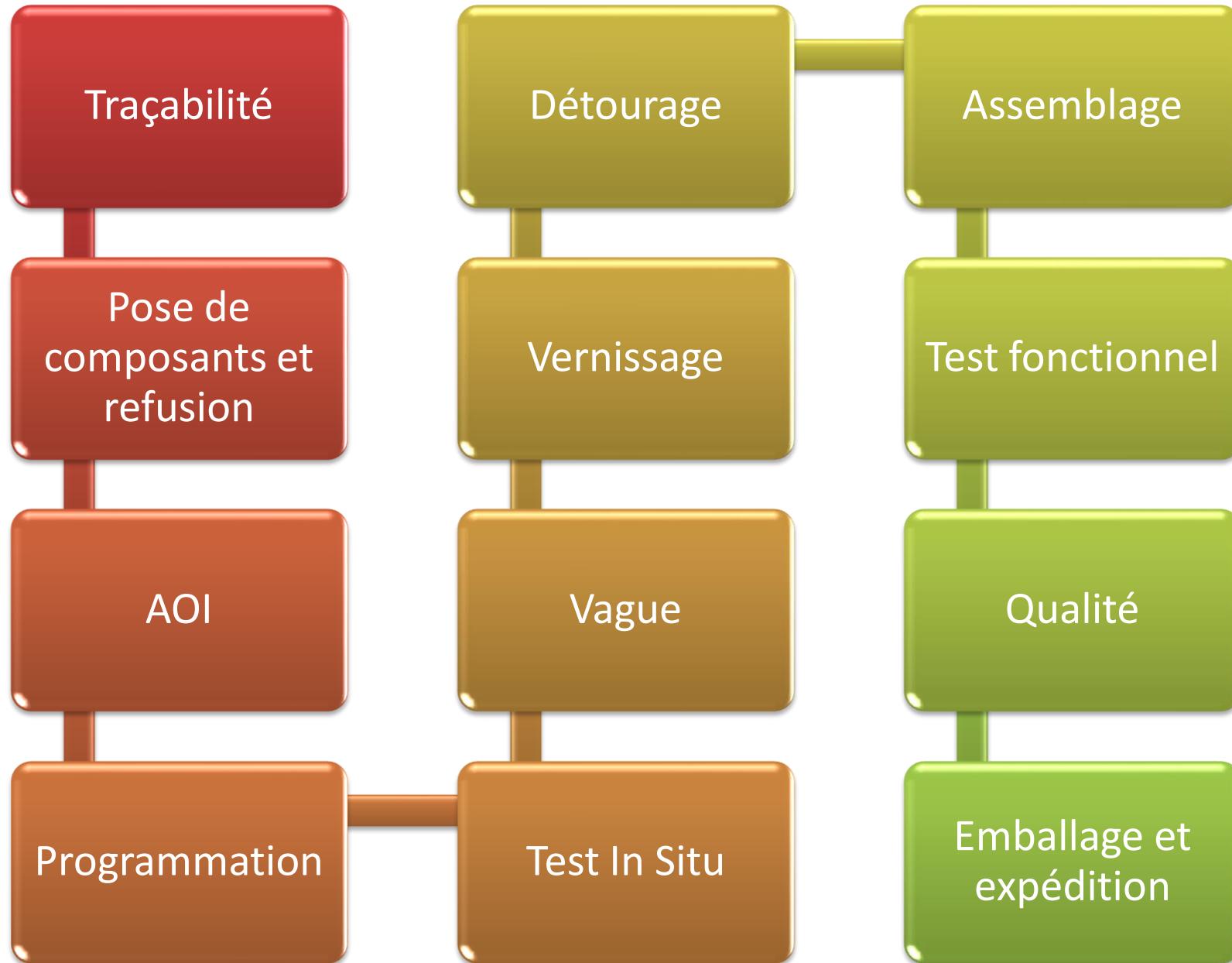


Fonctionnel

- En flan
- En carte
- En boitier

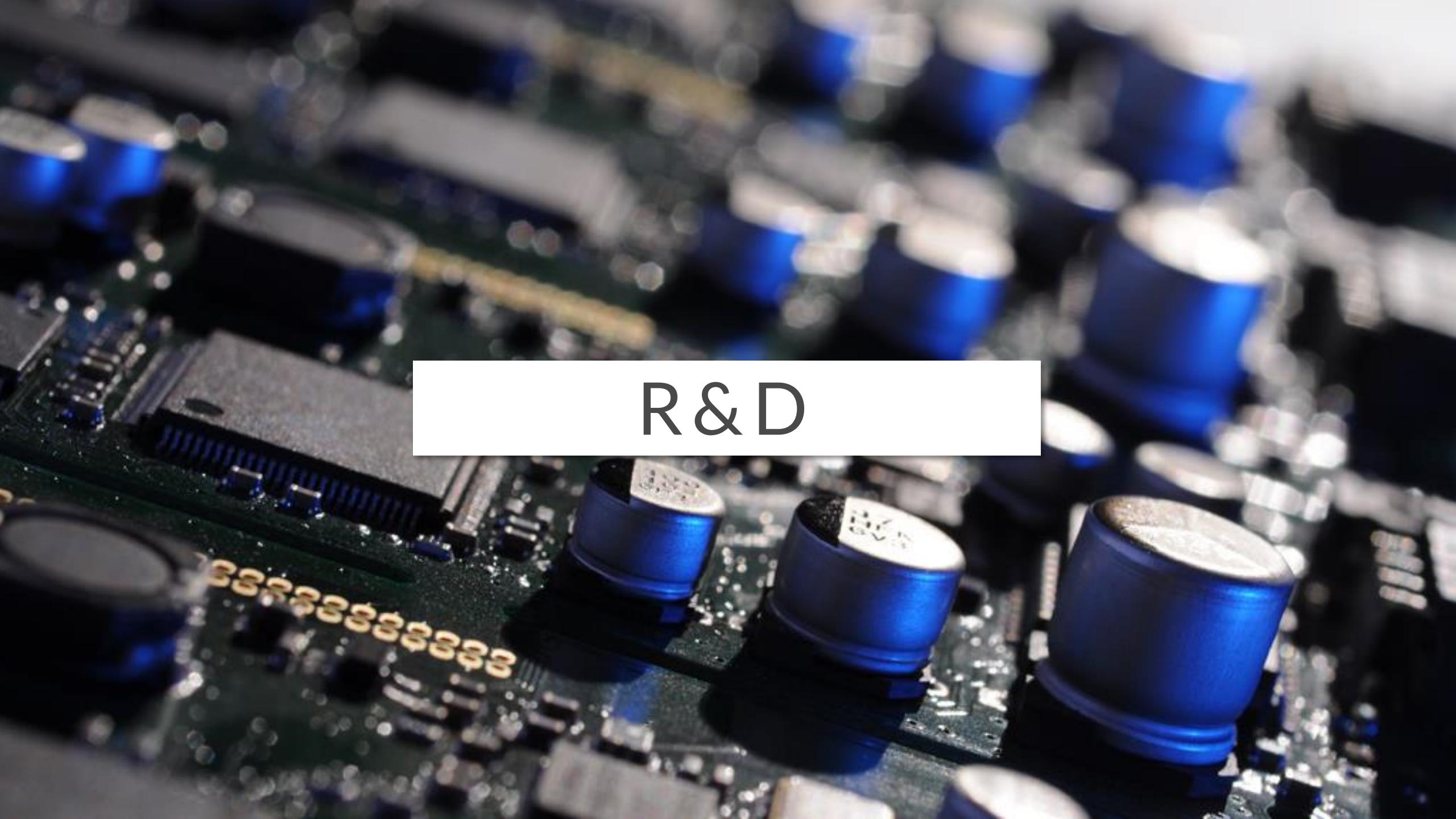


Les étapes clés



La ligne CMS





R & D

ELECTRONIC PRODUCT DESIGN OFFICE



Automotive &
transportation



Industry &
Energy



Services
Infrastructures



Medical



Research



Electronics



Communication & IoT



4 centres of expertise
dedicated to your projects:

- **Architecture and systems**
- **Mechanical design**
- **Electronics**
- **Software**

ELECTRONICS & FIRMWARE

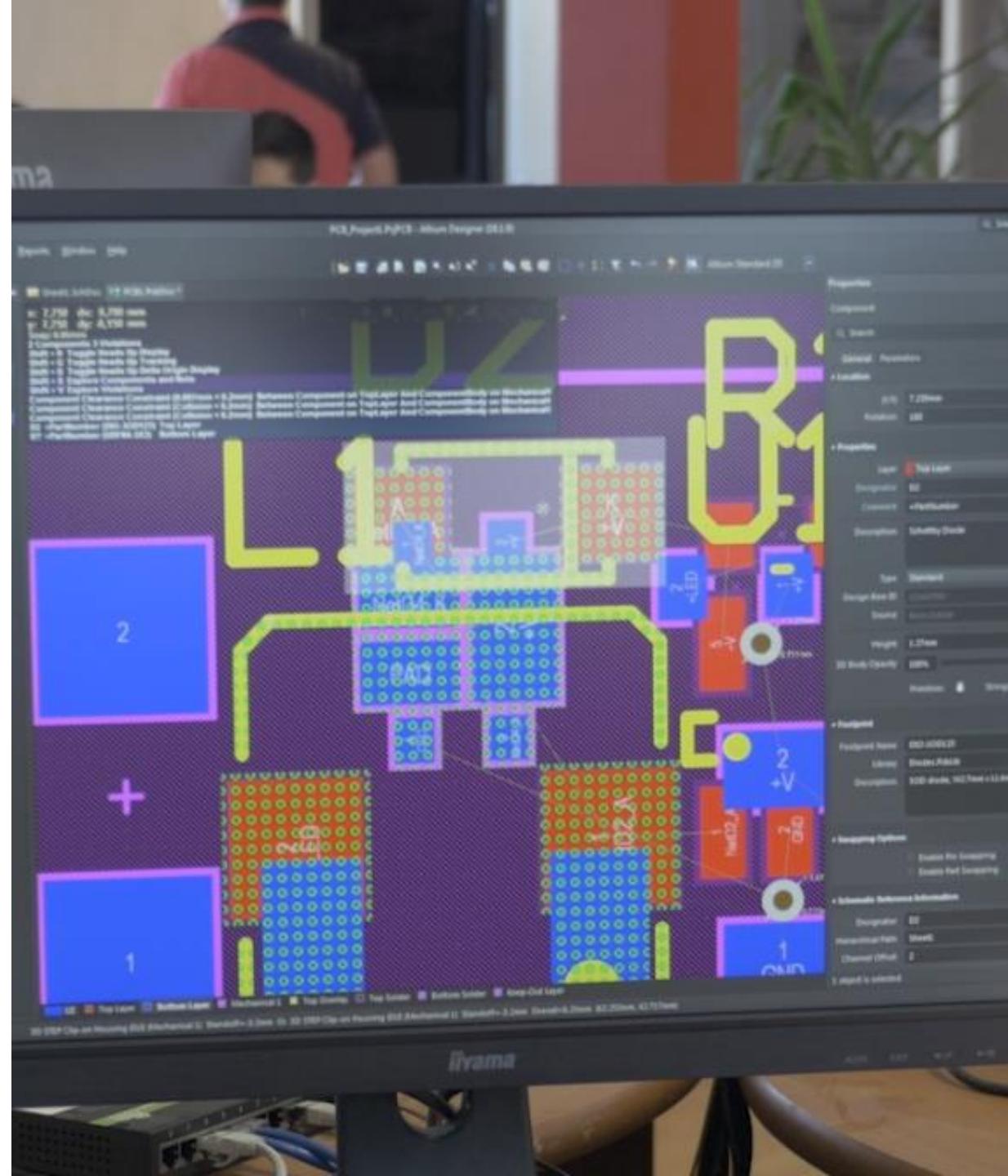
Hardware

- Analog / Digital design
- Layout
- µC 8/16/32 bits, ARM (Cortex A et M)
- Display and touch screens
- Low power
- Connectivity (Wifi, BLE, Cellular, LPWAN, ...)
- Antennas / RF (433Mhz, 868Mhz, GPS, ...)
- Manufacturing : DFC, DFT, DFM, ...



Firmware and Embedded software

- Drivers, Bootloader , BSP, SDK...
- Bare Metal or OS
 - Low footprint state machines
 - NuttX, FreeRTOS, Linux, ...
- Software optimization (Performance, footprint, CPU scale down...)



IOT & CONNECTIVITY



- **Wireless / RF electronic design :**
 - LPWAN : Sigfox, Lora
 - Sub GHz : 433Mhz, 868Mhz, ...
 - Bluetooth / BLE
 - Wifi
 - Zigbee
 - GNSS / GPS
 - Cellular : 2G, 3G, 4G, LTE, NB-IoT, Cat M1
- **Contactless :** RFID, NFC
- **Wired / Buses :**
 - USB
 - I2C, SPI
 - CAN, LIN
 - RS485, RS232, RS422
 - Ethernet
 -



MECHANICAL DESIGN

Analysis

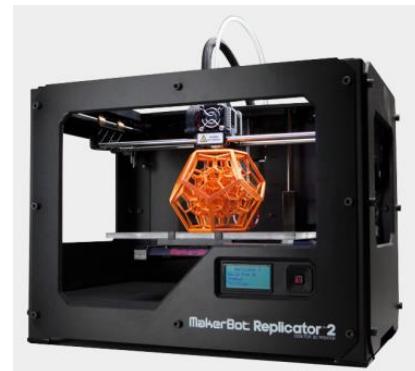
- Environments & constraints
- Functionnal
- Ergonomy

Concept design

- Design proposal
- Concept prototypes

Mechanical conception

- CAO / 3D / 2D
- Prototypes



Plastic injection industrialization

- Pré-série
- Séries



 AUTODESK®
FUSION 360™

 AUTODESK®
INVENTOR®

IT & CLOUD

Design & Development

- M2M & IoT applications & servers
- Data exchange & communication solutions
- Web servers (front-end & backend)
- Database & distributed systems

System & Network Integration

Cloud Deployment & Management

Programming Language

- NodeJS, Java
- AngularJS
- SQL and NoSQL Databases





ALL
CIRCUITS

you can have it all

WHY COMPROMISE WHEN YOU CAN HAVE IT ALL?

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FRANCE



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