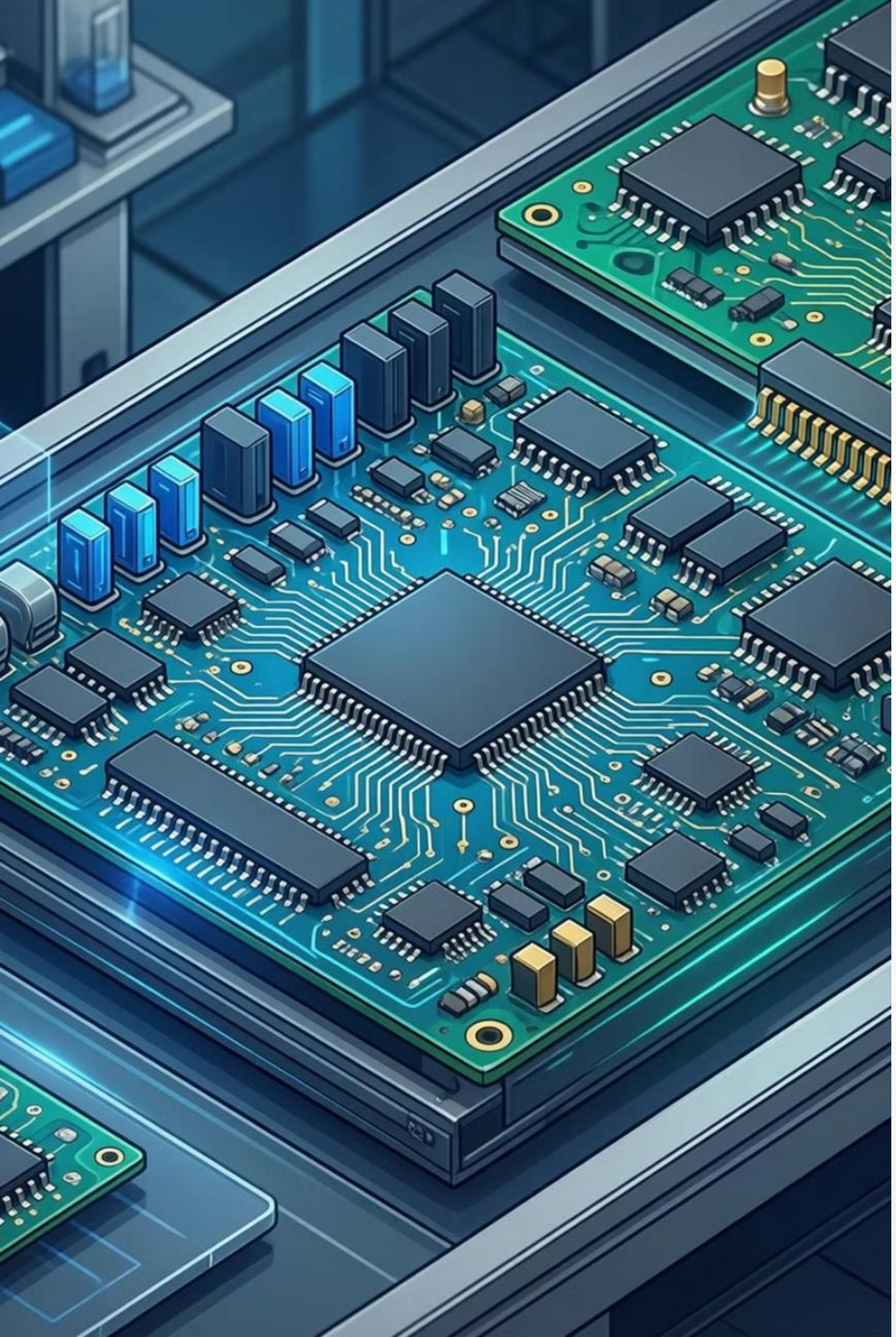


PCBA Prototype to Production

Bridging the Lab-to-Market Gap for Scientific Requirements

Motivation & Context

Why this topic matters

Many PCBA designs work in the lab but fail in production

Transition from proof-of-concept to reliable product is non-trivial

Scientific requirements often challenges manufacturing realities

Lab vs. Market Expectations

Understanding the fundamental differences between prototype and production environments

Lab Prototype

- Functional Validation Focus
- Low Volume: 1–10 Units
- High manual intervention in assembly
- Short-term Testing Cycles
- Meeting design objectives

Production PCBA

- Manufacturable & Testable
- High Volume: 1,000–1M+ Units
- Automated SMT Required
- 5–20 Year Reliability
- Cost, Yield, Compliance-driven

Cost & Time-to-Market

Market Focus

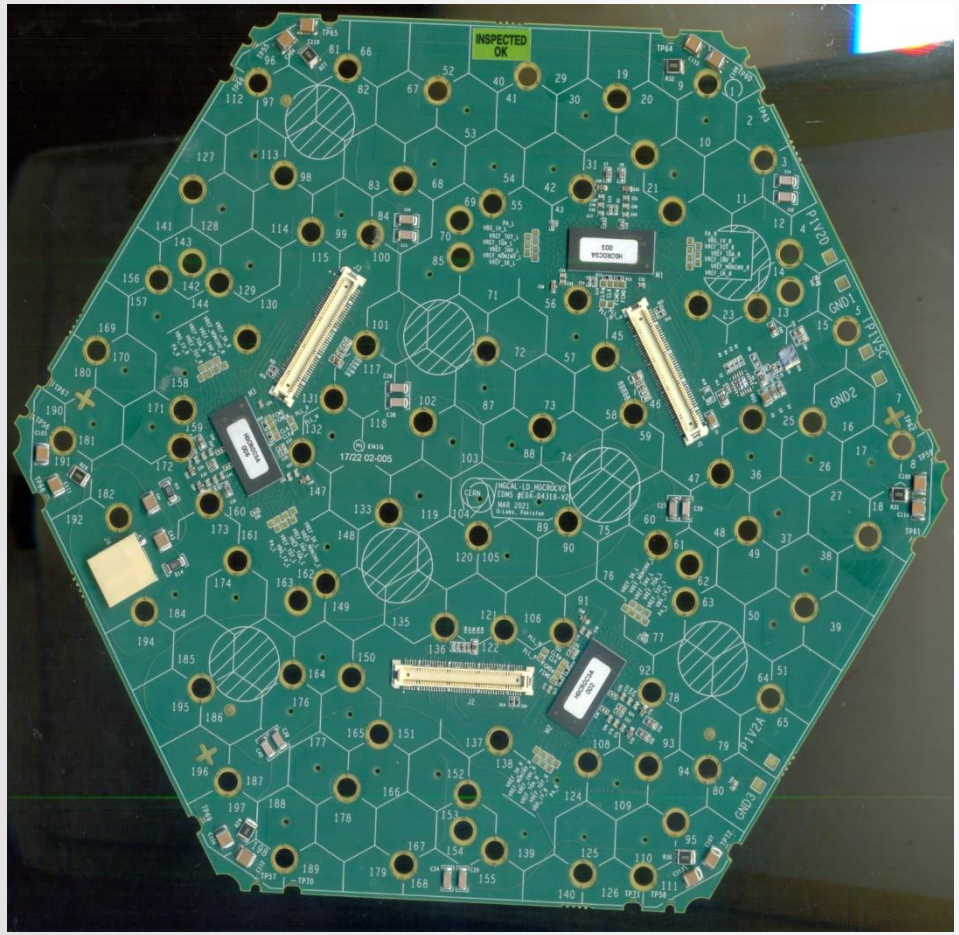
- Bill of Materials (BOM) cost
- High first pass yield
- Low rework and scrap
- Time-to-market Pressure

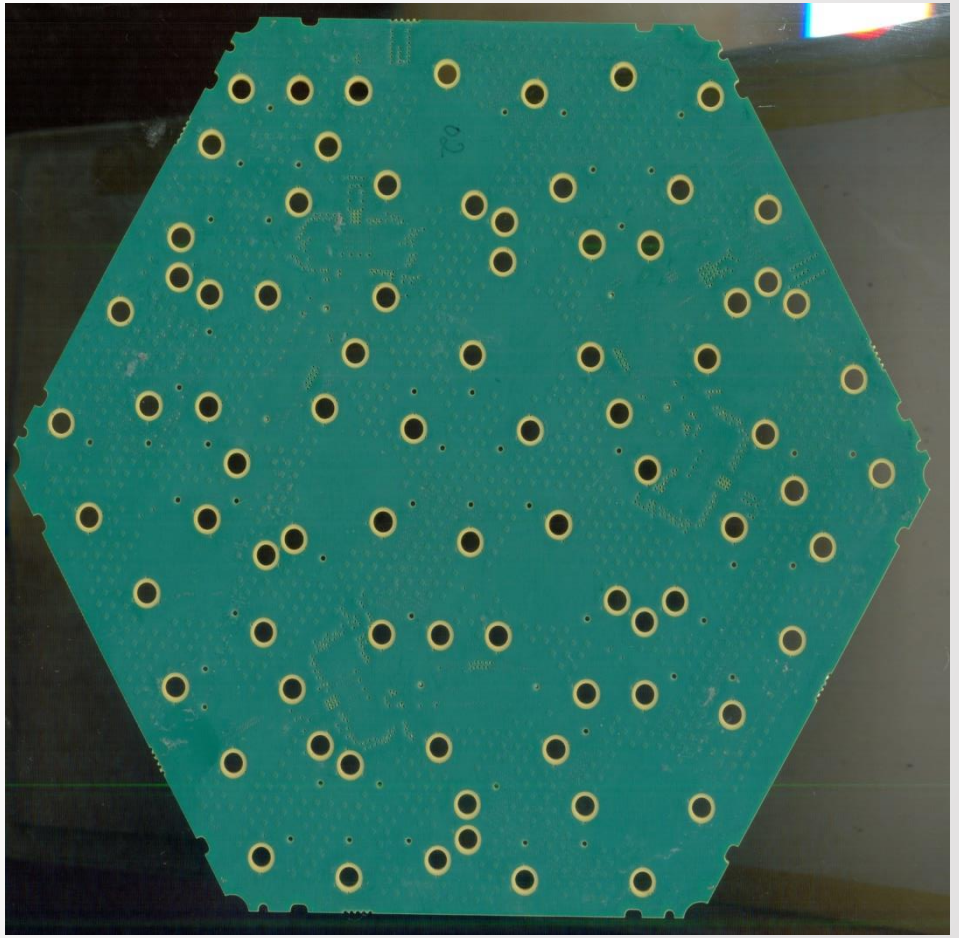
Scientific Focus

- Performance Metrics
  - Reliability
  - Consistency

Boards developed for TIFR / CERN

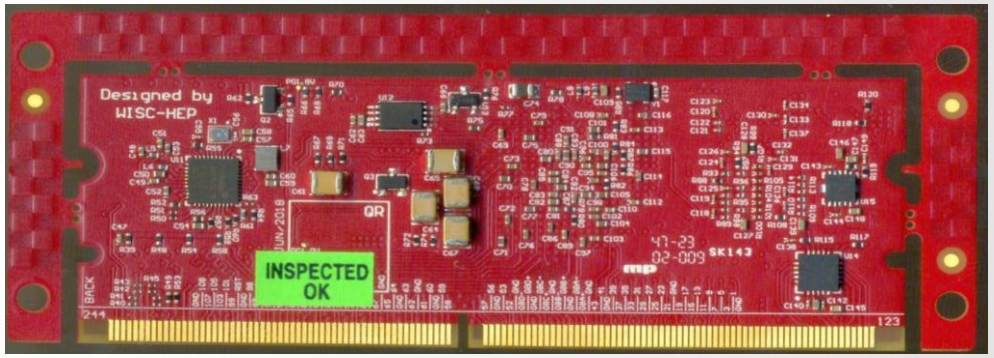
Hex board



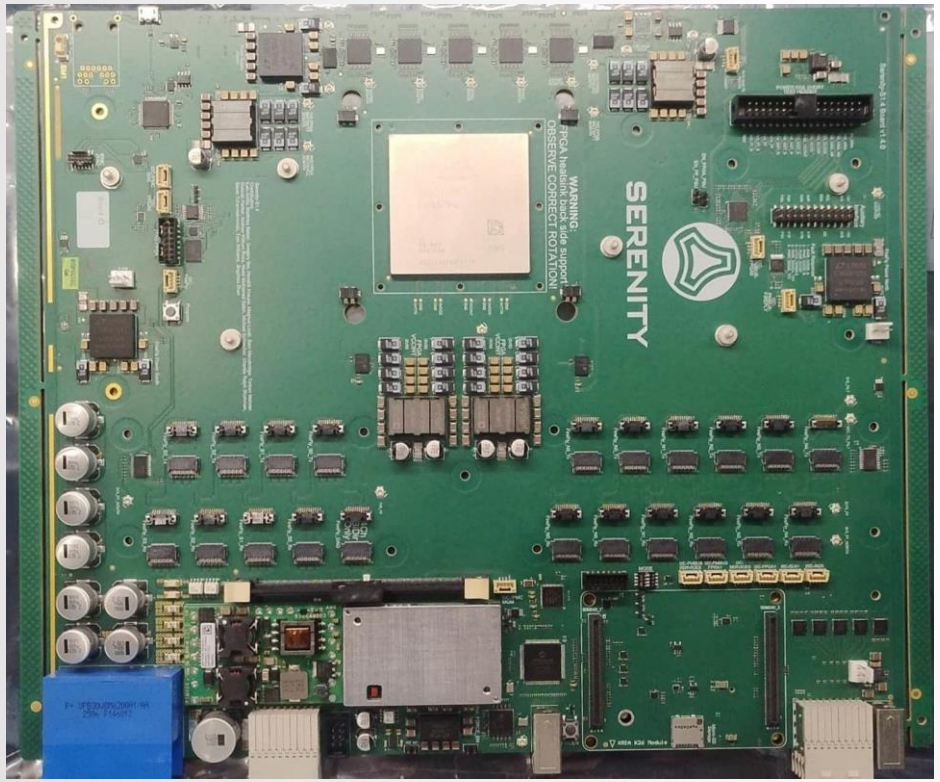


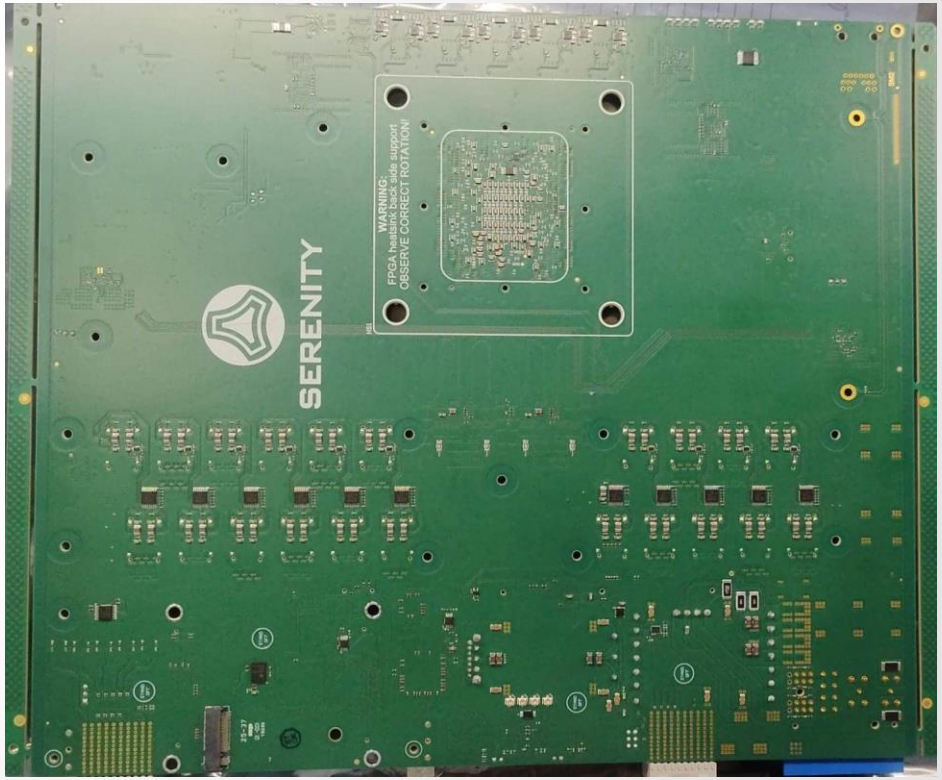
IPMC


ZYNQ
XC7Z014S
ZYNQ-IPMC
FRONT

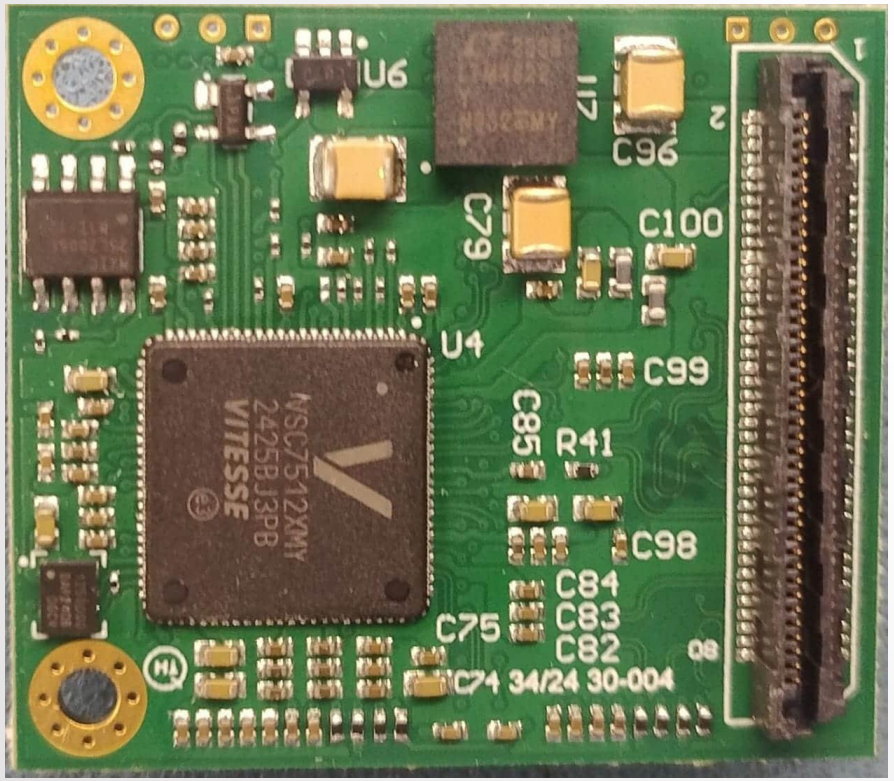

Designed by
WISC-HEP
INSPECTED
OK
BACK

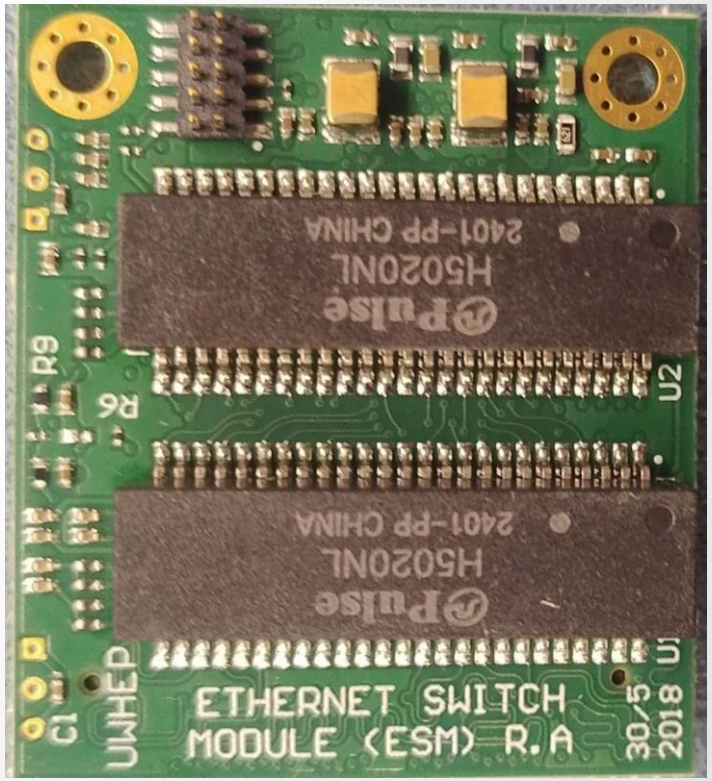
SERINITY


SERENITY
WARNING:
FPGA heatsink requires airflow support
OBSERVE CORRECT ROTATION!


SERENITY
WARNING:
FPGA heatsink requires airflow support
OBSERVE CORRECT ROTATION!

ESM BOARD

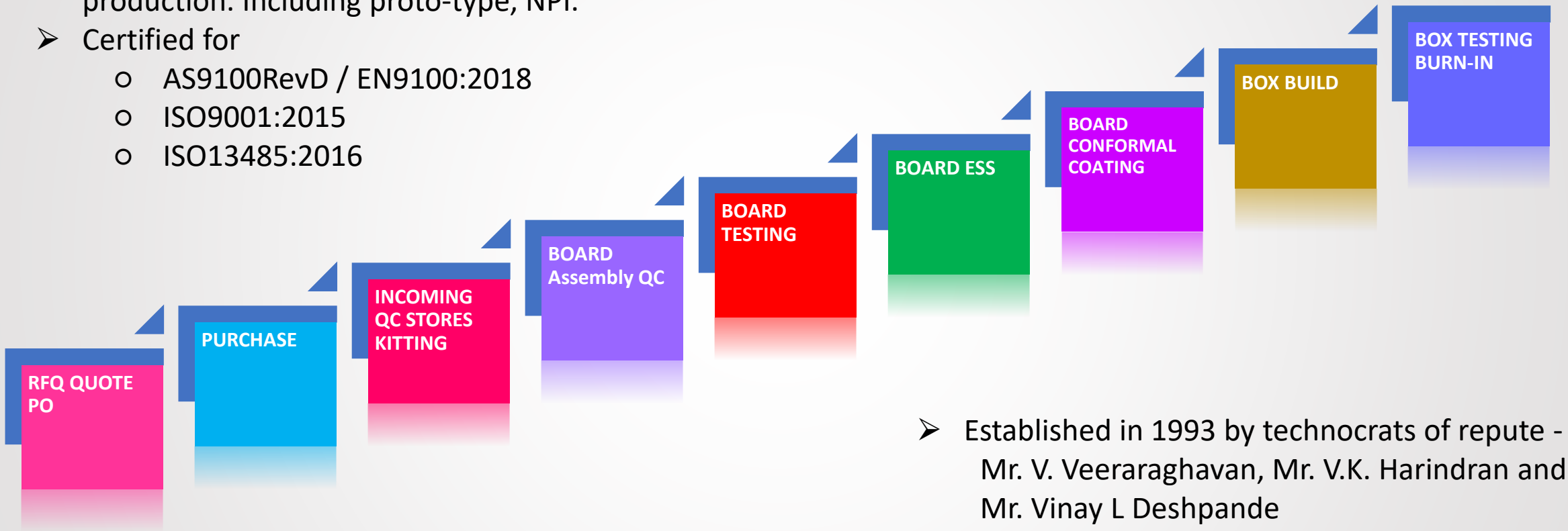

U6
C96
C79
C100
U4
C99
C85
R41
C98
C84
C83
C75
C82
C74
34/24 30-004
VITESSE


H5020NL
Pulse
R9
R6
U2
C1
UWHEP
ETHERNET SWITCH
MODULE (ESM) R.A
30/5
2018
U1

How Peninsula Electronics Can Help You Bring Your Product to Market

About Us

- 30+ years of experience in low volume production. Including proto-type, NPI.
- Certified for
  - AS9100RevD / EN9100:2018
  - ISO9001:2015
  - ISO13485:2016

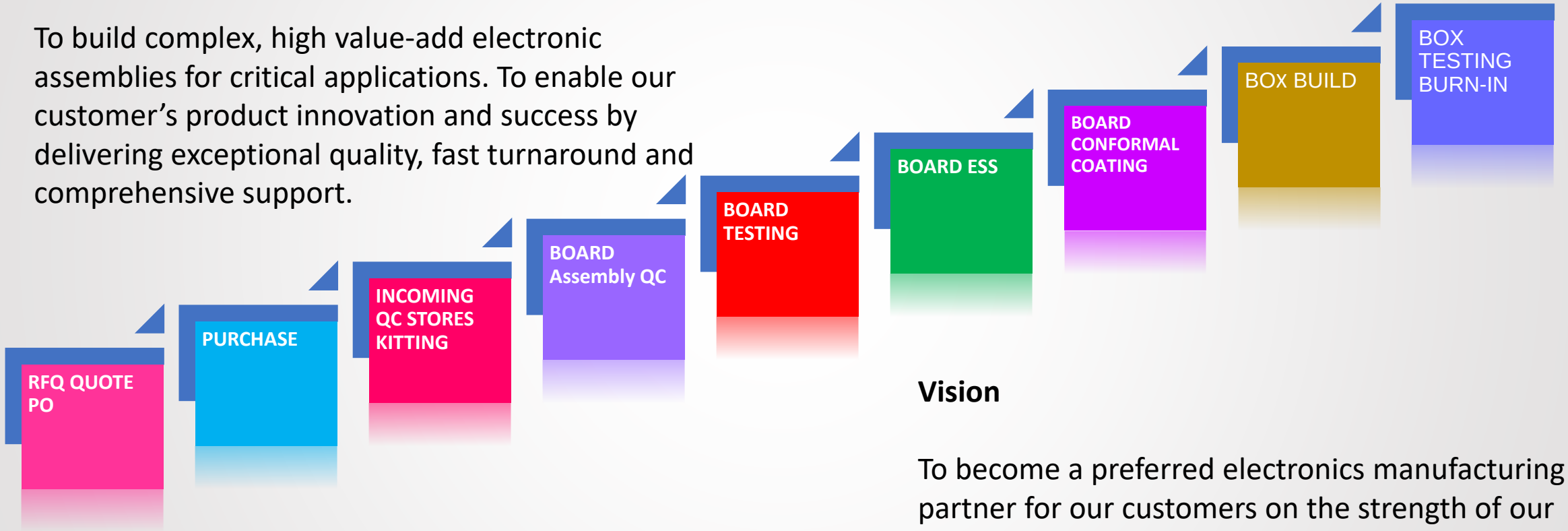


- Established in 1993 by technocrats of repute - Mr. V. Veeraraghavan, Mr. V.K. Harindran and Mr. Vinay L Deshpande
- Two units - EOU and DTA
- Operates on turn-key and job work basis

About Us

Mission

To build complex, high value-add electronic assemblies for critical applications. To enable our customer's product innovation and success by delivering exceptional quality, fast turnaround and comprehensive support.

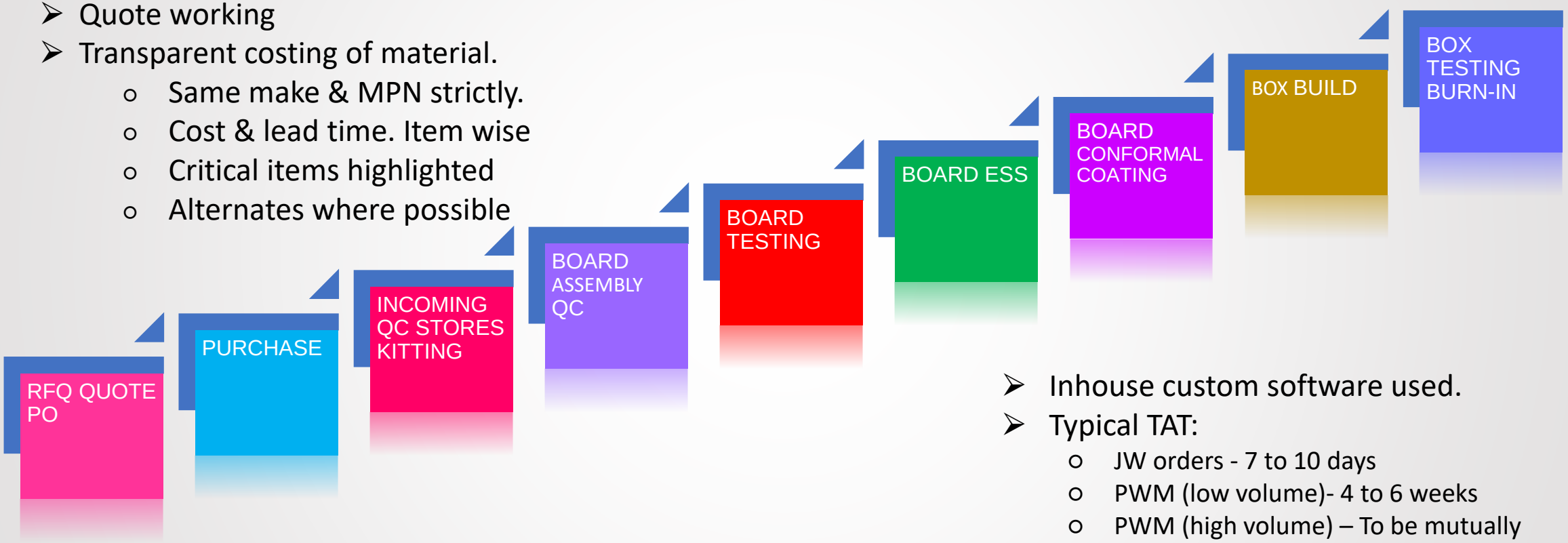


Vision

To become a preferred electronics manufacturing partner for our customers on the strength of our knowledge and commitment to excellence. We will do it right first time and complete on time every time.

RFQ QUOTE PO

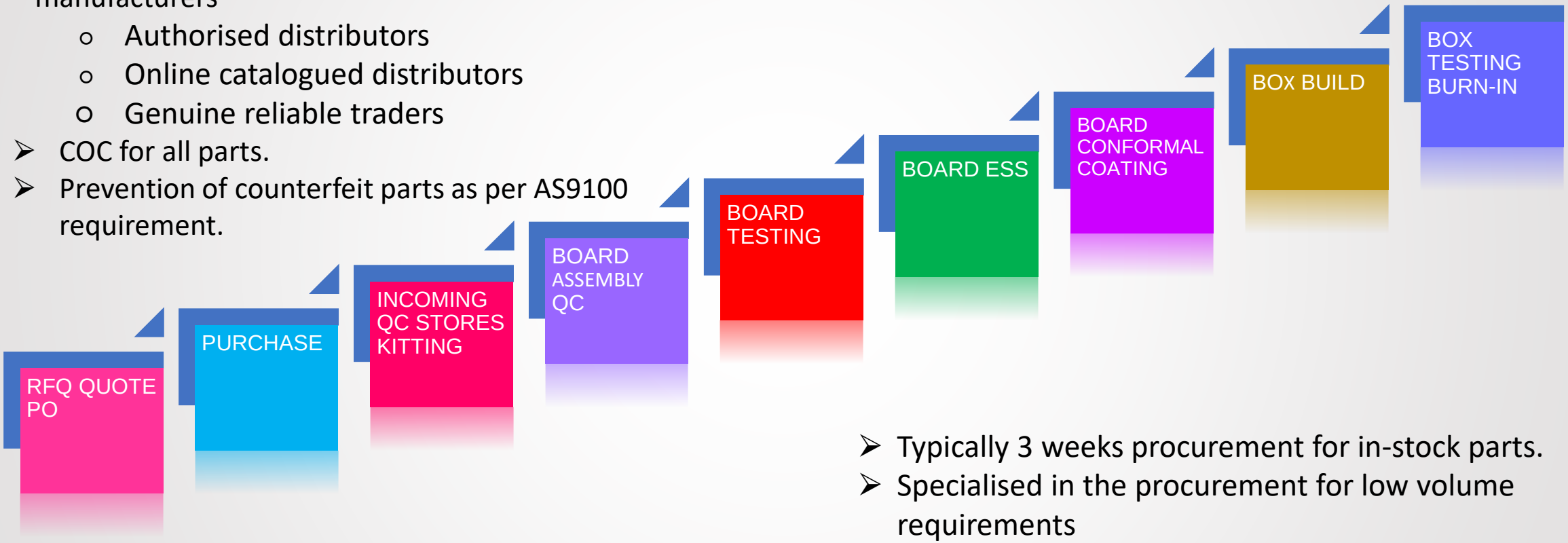
- Feasibility check.
- SPoC
- Quote working
- Transparent costing of material.
  - Same make & MPN strictly.
  - Cost & lead time. Item wise
  - Critical items highlighted
  - Alternates where possible



- Inhouse custom software used.
- Typical TAT:
  - JW orders - 7 to 10 days
  - PWM (low volume)- 4 to 6 weeks
  - PWM (high volume) – To be mutually agreed

PURCHASE

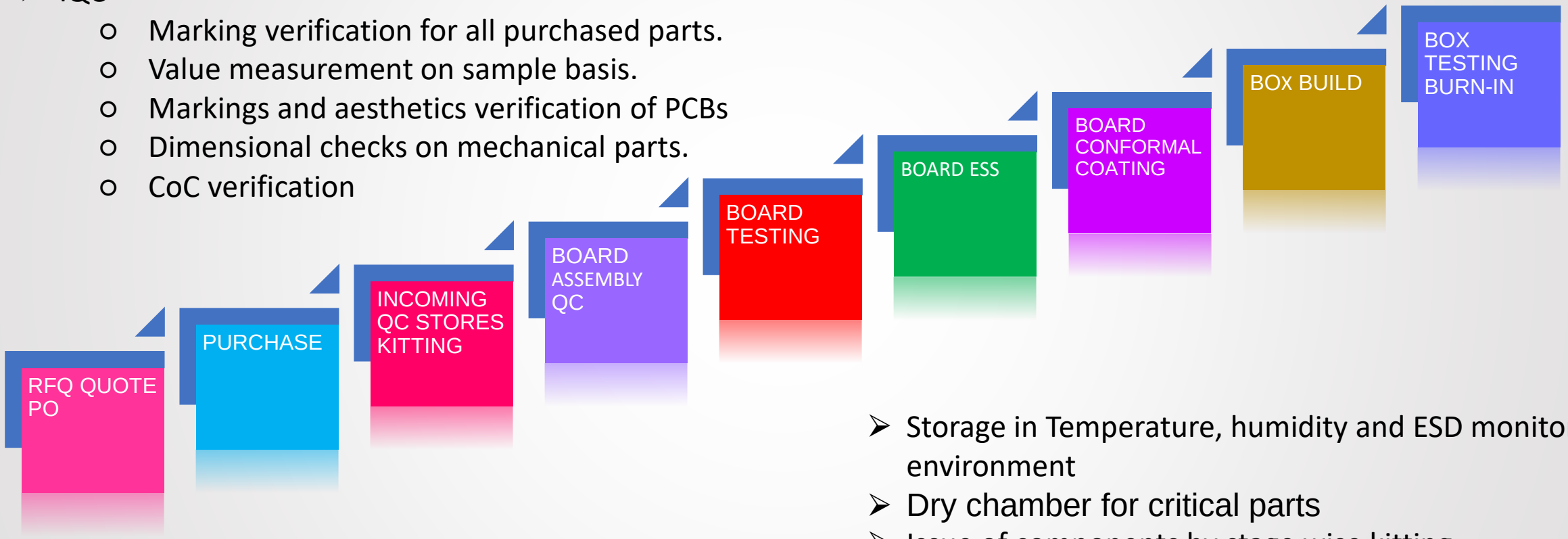
- Purchase restricted to direct supply chain from manufacturers
  - Authorised distributors
  - Online catalogued distributors
  - Genuine reliable traders
- COC for all parts.
- Prevention of counterfeit parts as per AS9100 requirement.



- Typically 3 weeks procurement for in-stock parts.
- Specialised in the procurement for low volume requirements
- Multiple PCB vendors to suit the requirement
- Quality supply chain for sheet metal parts, plastic parts including 3D printing.

INCOMING QC STORES KITTING

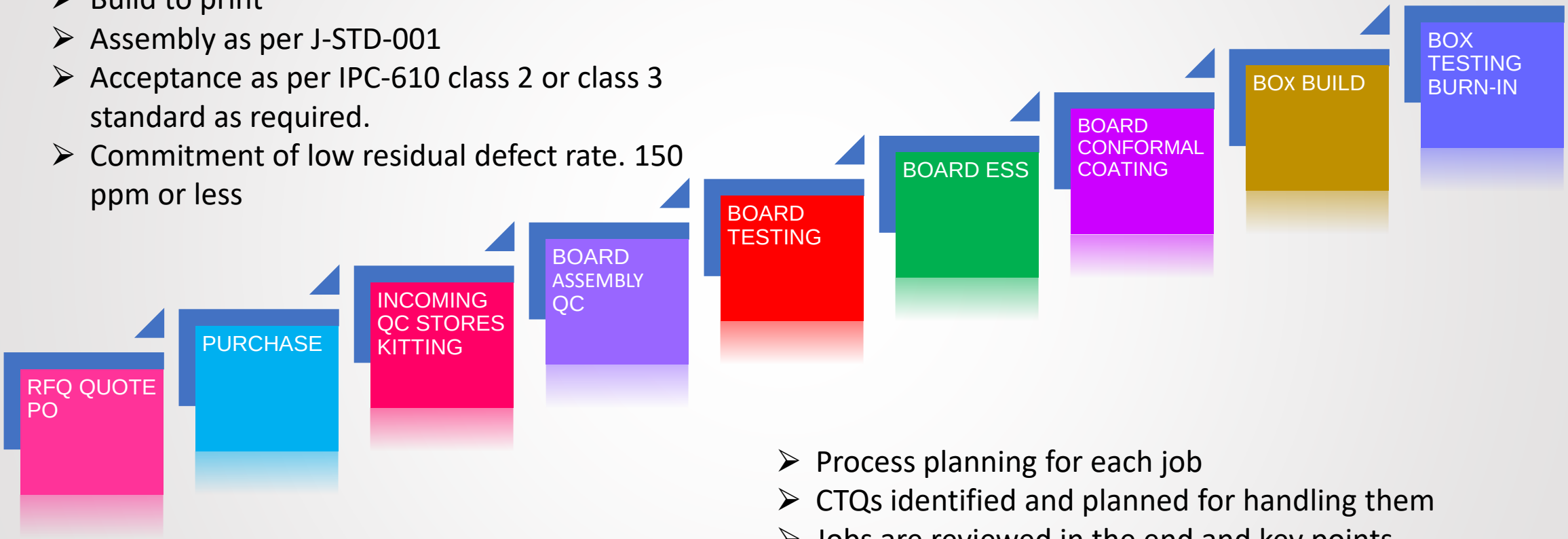
- IQC
  - Marking verification for all purchased parts.
  - Value measurement on sample basis.
  - Markings and aesthetics verification of PCBs
  - Dimensional checks on mechanical parts.
  - CoC verification



- Storage in Temperature, humidity and ESD monitored environment
- Dry chamber for critical parts
- Issue of components by stage wise kitting
- ESD safe trays for handling components

BOARD PRODUCTION

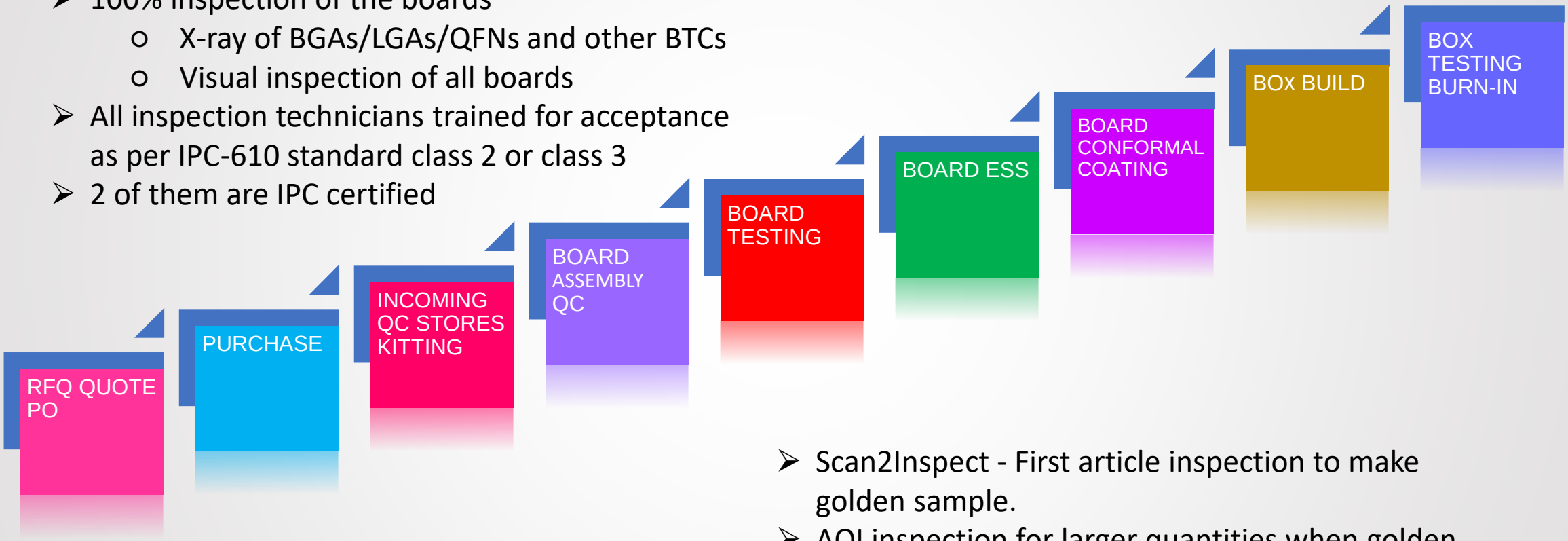
- Build to print
- Assembly as per J-STD-001
- Acceptance as per IPC-610 class 2 or class 3 standard as required.
- Commitment of low residual defect rate. 150 ppm or less



- Process planning for each job
- CTQs identified and planned for handling them
- Jobs are reviewed in the end and key points updated for next use
- 3 IPC certified technicians
- PointEZ - in house software for manual placement assist

BOARD QC

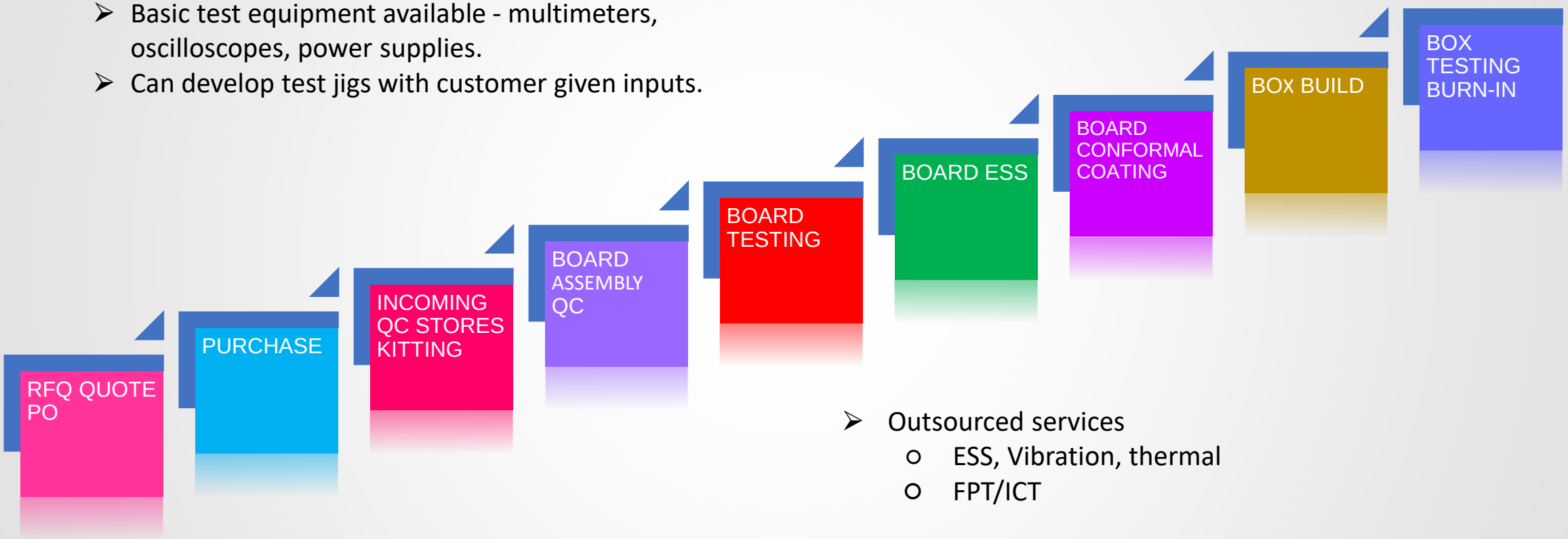
- 100% inspection of the boards
  - X-ray of BGAs/LGAs/QFNs and other BTCs
  - Visual inspection of all boards
- All inspection technicians trained for acceptance as per IPC-610 standard class 2 or class 3
- 2 of them are IPC certified



- Scan2Inspect - First article inspection to make golden sample.
- AOI inspection for larger quantities when golden sample is made available.

BOARD TESTING

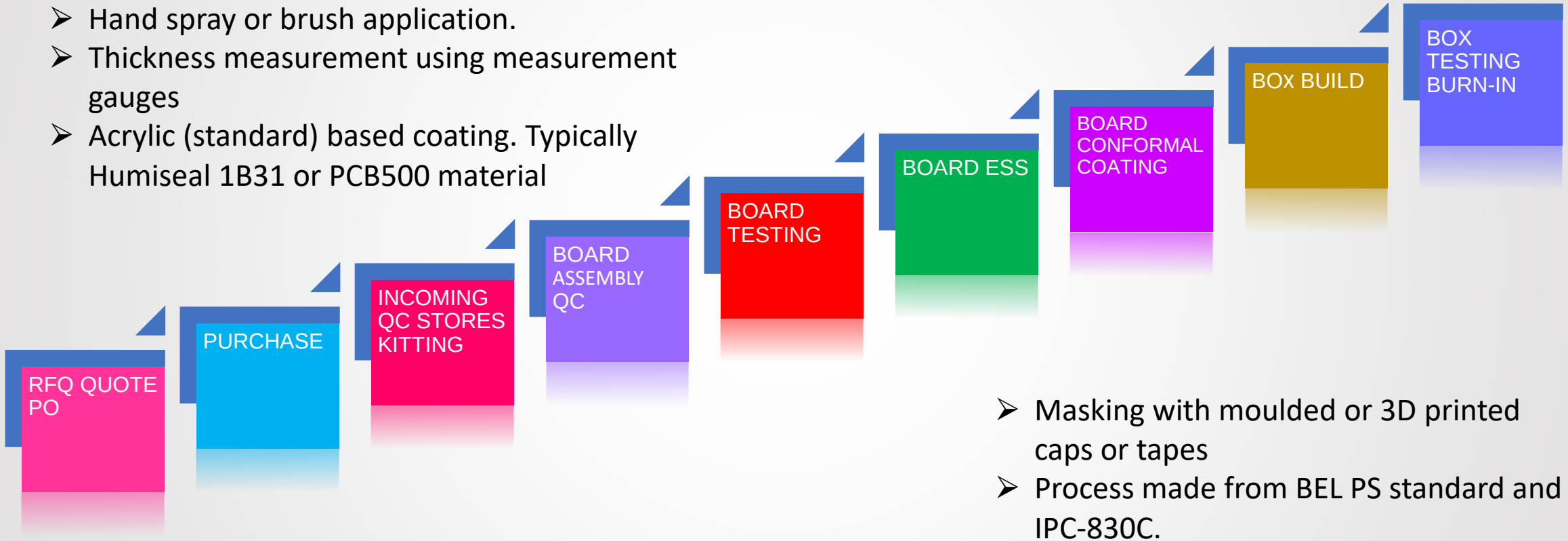
- Functional testing with customer supplied jigs/SW
- Basic test equipment available - multimeters, oscilloscopes, power supplies.
- Can develop test jigs with customer given inputs.



- Outsourced services
  - ESS, Vibration, thermal
  - FPT/ICT

BOARD CONFORMAL COATING

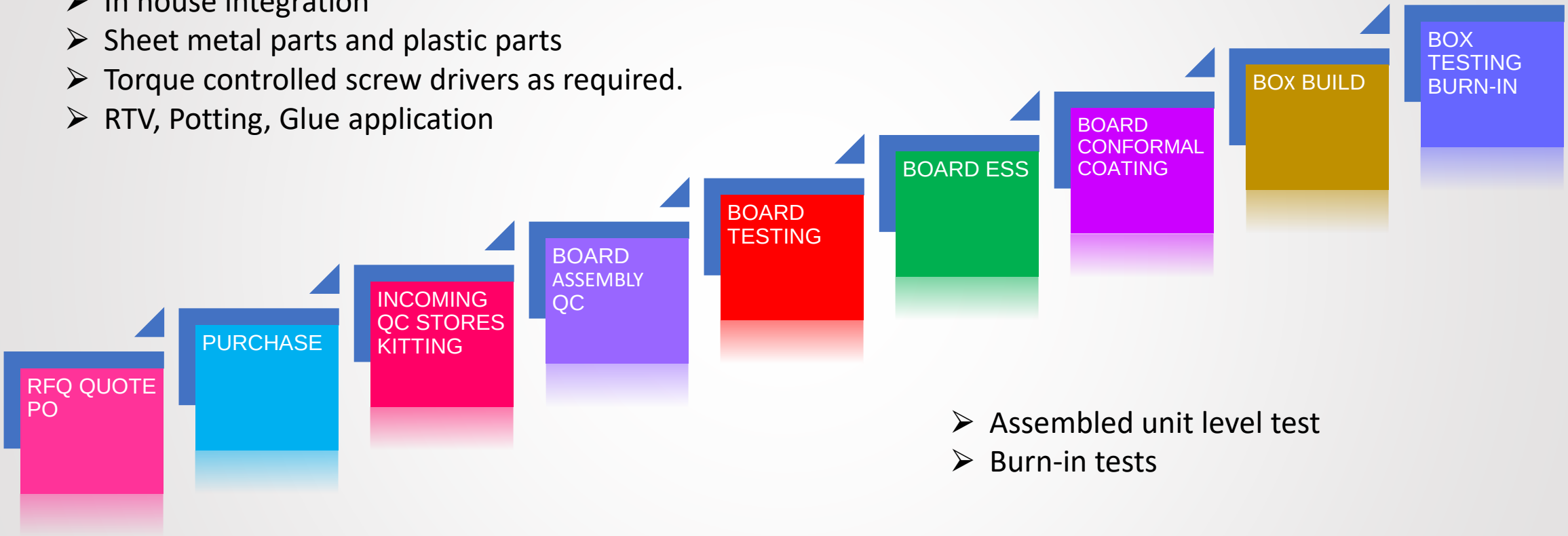
- Hand spray or brush application.
- Thickness measurement using measurement gauges
- Acrylic (standard) based coating. Typically Humiseal 1B31 or PCB500 material



- Masking with moulded or 3D printed caps or tapes
- Process made from BEL PS standard and IPC-830C.

BOX BUILD

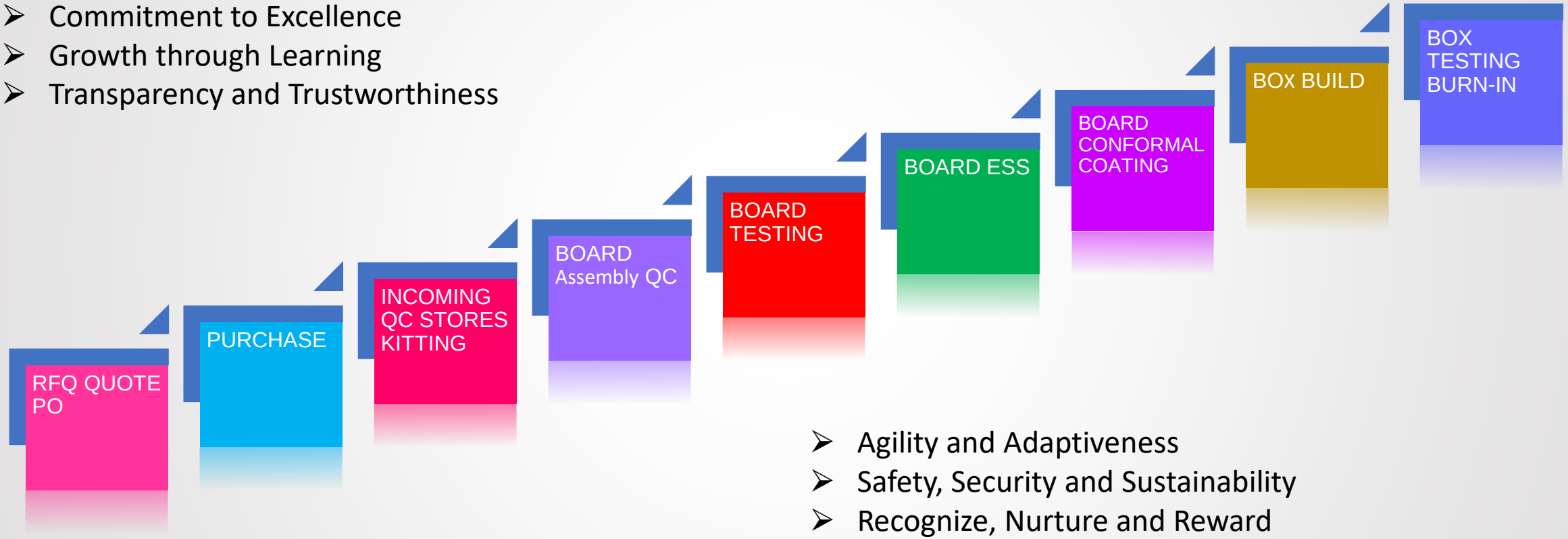
- In house integration
- Sheet metal parts and plastic parts
- Torque controlled screw drivers as required.
- RTV, Potting, Glue application



- Assembled unit level test
- Burn-in tests

Why Peninsula Electronics

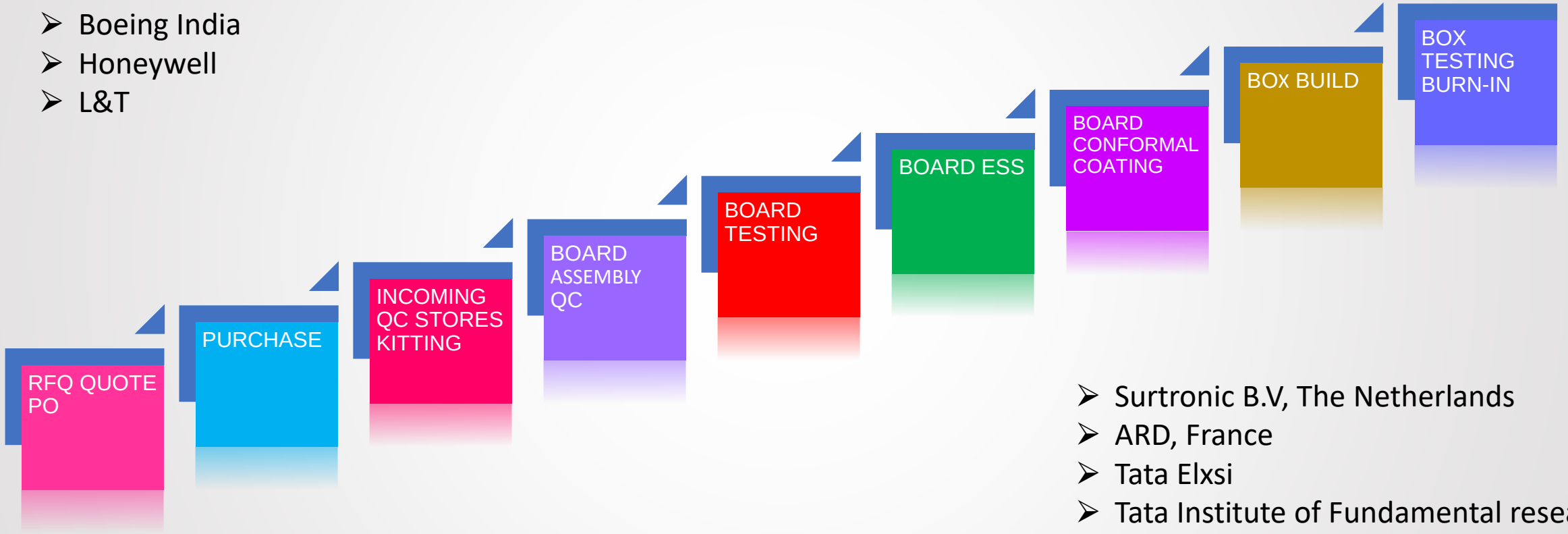
- Reliability
- Putting Customer first
- Commitment to Excellence
- Growth through Learning
- Transparency and Trustworthiness



- Agility and Adaptiveness
- Safety, Security and Sustainability
- Recognize, Nurture and Reward

Major Customers

- Bharat Electronics
- Boeing India
- Honeywell
- L&T



- Surtronic B.V, The Netherlands
- ARD, France
- Tata Elxsi
- Tata Institute of Fundamental research
- CERN, Switzerland

Machineries

- DEK screen printer (Automatic and semi automatic)
- Yamaha YS12 chip shooter
- Topaz PA131402 Pick & place machine
- Konark 10 zone reflow
- Yamaha YS12i – AOI
- Nordson jade 2.5D X-ray
- Baking oven
- Dry chamber
- Press fit connector pneumatic hand press tool
- Conformal coating UV curing chamber
- Conformal coating UV inspection booth

Capabilities

- Board size upto 600mm X 300mm
- Minimum component size – 1005 onwards
- Maximum component size – 56mm
- BGA – from 0.3mm pitch onwards
- BGA / LGA / QFN – All BTC components
- All types of PCB surface finish like ENIG, HASL etc.
- Conformal coating material – Acrylic based (Humiseal 1B31, Alpha coatings – MAC25, PCB500)

Thank You

“Coming together is the beginning, staying together is progress and working together is success”
-Hendry Ford