
# Airbus Crisa

## Use of Selected COTS for Hi-Rel applications

CRISA

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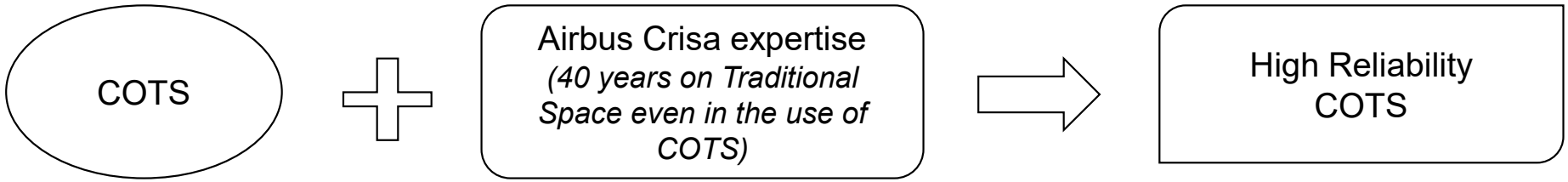
## Why COTS?

# The Evolving Landscape: COTS as Missions Enablers

- Increasing demand for high-performance power electronics.
- Traditional space-grade cycles vs. rapid time-to-market.
- COTS Advantages: Access to terrestrial tech (Medical/Automotive).
- Impact: reduced time-to-market and reduced cost and maintaining reliability







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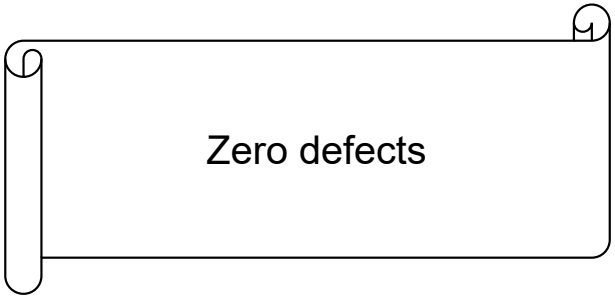
## Airbus Crisa’s Next Space EEE Strategy

# Mission safety, reliability, and availability

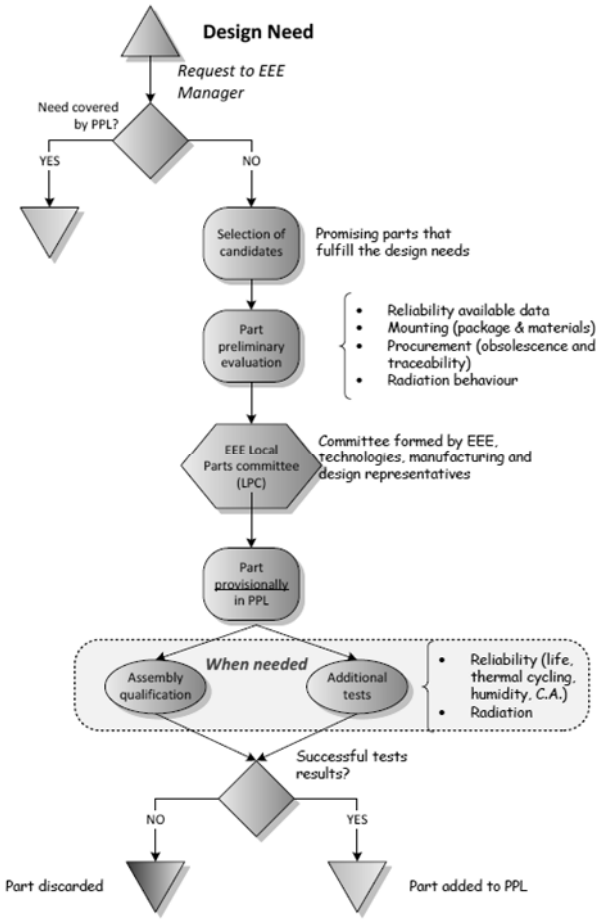
- Part manufacturer shall:
  - ✓ establish and control the specifications performance
  - ✓ configuration and reliability of design, materials and processes
  - ✓ use commercial industry's "Best Practices“ for “zero defects”
- High volume automatic production.
- Standardization via AEC and JEDEC
- When all that is achieved → **ILPM:** Industrial Leading Parts Manufacturer

1. Selecting the right partners
2. High-volume automatic production facilities.
3. Documented proof of technology/process qualification.
4. ISO 16949 certification.




1. Parts quality
2. Parts reliability
3. Workmanship

# Component Selection Process




**PST**
*(Parts Selection Team)*

**LPC**
*(Local Parts Comittee)*

**PPL**

We concentrate our knowledge on the Preferred Parts List:

- To **standardize** the used parts in order to reduce the risk
- To **optimize** the schedule and parts cost in terms of recurring and non-recurring
- **Leverage** "Return of Experience" from previous missions.

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# Risk Management: PCNs and Obsolescence

It is based on ***proactive*** risk monitoring.

**Strategy:**

- Constant monitoring of PCNs and Obsolescence status.
  Monitor changes made by manufacturers. These changes may require:
  – equipment redesigns,
  – additional qualification
- Early detection to avoid schedule impacts.
- Strong relationships with manufacturer roadmaps.




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# Traceability and Quality Control

End – to – End Traceability

**Standards:** AEC and JESD / JEDEC.

**Manufacturer:** periodic reliability tests (usually 2-3 years)

**Manufacturing facilities:** ISO 16949 certified with

**Parts required data:**

- PPAP (Production Part Approval Process)
- Assembly plant & Wafer fab.
- Diffusion lot & Die revision.
- Date code & Trace code.

# Radiation Hardness Assurance (RHA)

## TEST SCOPE

Radiation testing is always performed: *(even if radiation tolerant version is available)*

- SEE
- TID
- TNID

## PROCESS

- Traceability is agreed with manufacturer between lot-to-lot.
- Any discrepancy leads to repeat the tests.

## DESIGN COUNTERMEASURE

- Even though parts are Radiation tested at countermeasures at electronic design level are introduce.
- Introduced when needed:
  - Filters
  - Redundancy
  - Protection: over-current / over-voltage




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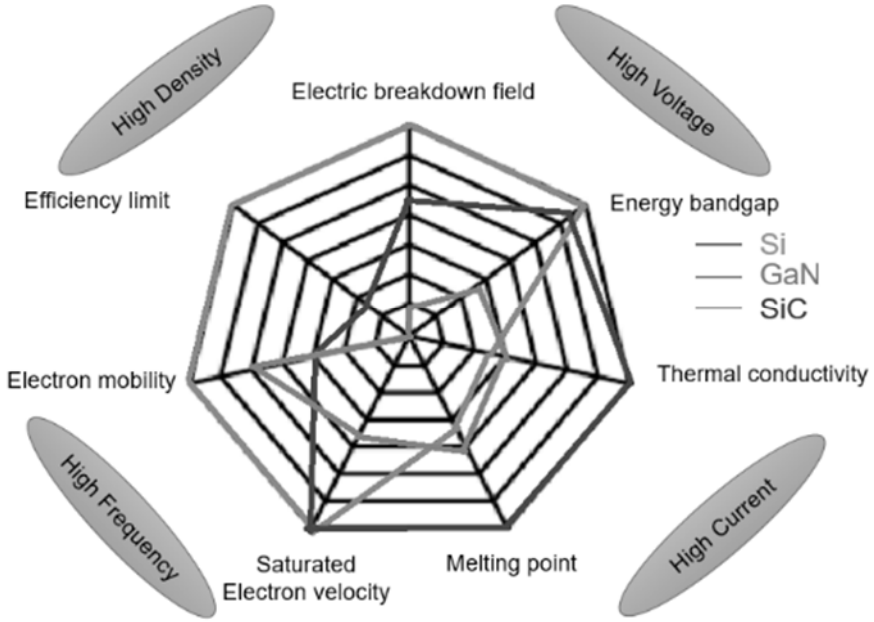
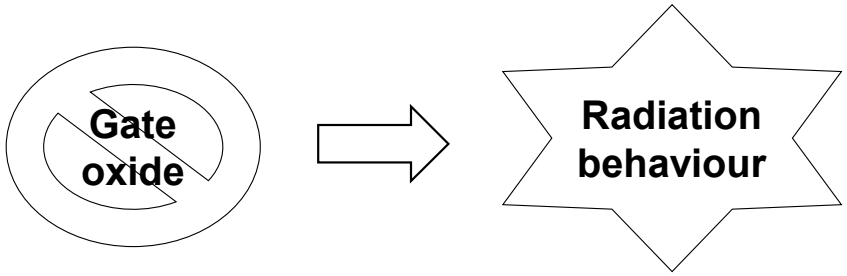
## Successful Use Cases

# Why GaNFET for Power Applications?




# Why GaNFET for Space Applications?







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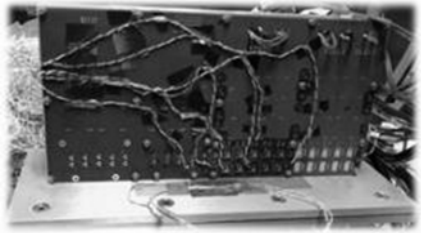
# Quality and reliability → 3-axis test approach

**1st → Static qualification:**

- based on existing manufacturer data and performing additional tests based on nominal silicon qualification applied to GaNFET.
- Radiation: TID, SET, SEB/SEGR.

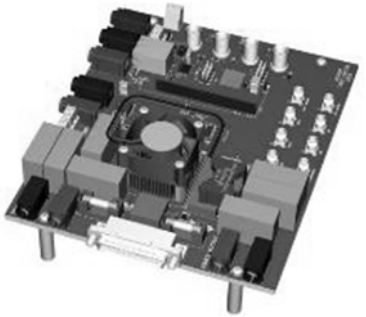


**2nd → Dynamic qualification:**

- Several GaNFET switching at different frequencies
- Parameters tested: Dynamic Rdson,

**3rd → Power Cell qualification:**

- Power Cell: GaNFET + driver + inductor + auxiliary supply
- Waveforms characterization over **Life Test**.



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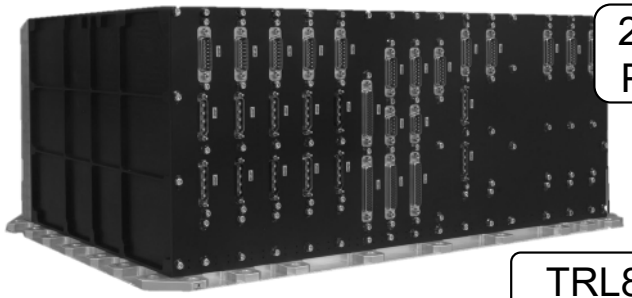
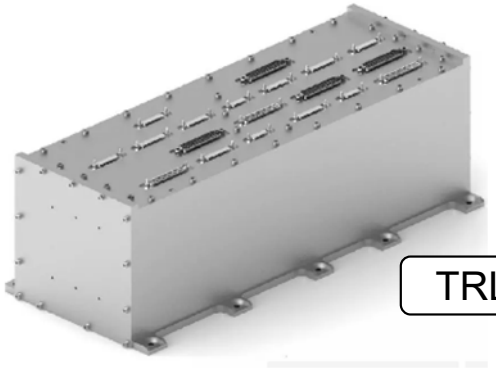
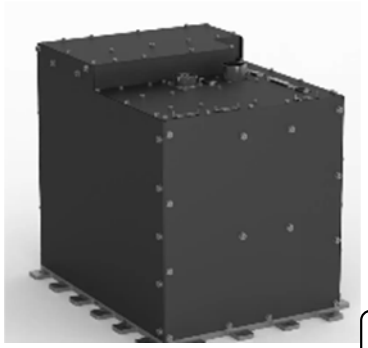
# Two Families of products (COTS based)

| | MV Product Line (Multi-Voltage) | MEGA Product Line |
|---|---|---|
| **MVPCU** |  26 KW PCDU TRL8 |  TRL9 |
| **MVPPU** |  TRL6 | |

**MEGA GEN1:**
> 1200 units flying
> 2500 cumulated years

**MEGA GEN2:**
> 300 units backlog

**MEGA GEN3:** under development

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# Thank you



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