Cobham Gaisler

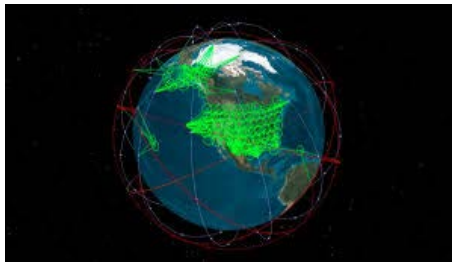
High End Data Processing Technologies and state of the art EEE Components for the Space Segment Work Shop; Technology Suppliers Perspective

1 October 2018

Views on market

How does the outside world change

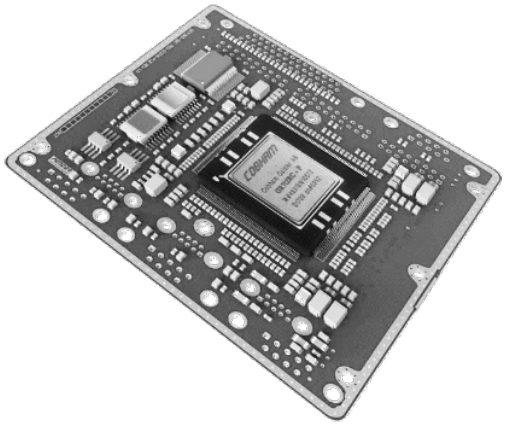
- Change of Mission profiles
  - Traditional GEO market significantly declining
  - Fundamental shift to LEO & MEO including constellations
  - Shift away from GEO architectures and move towards smallsat-based systems
  - User need more diversified



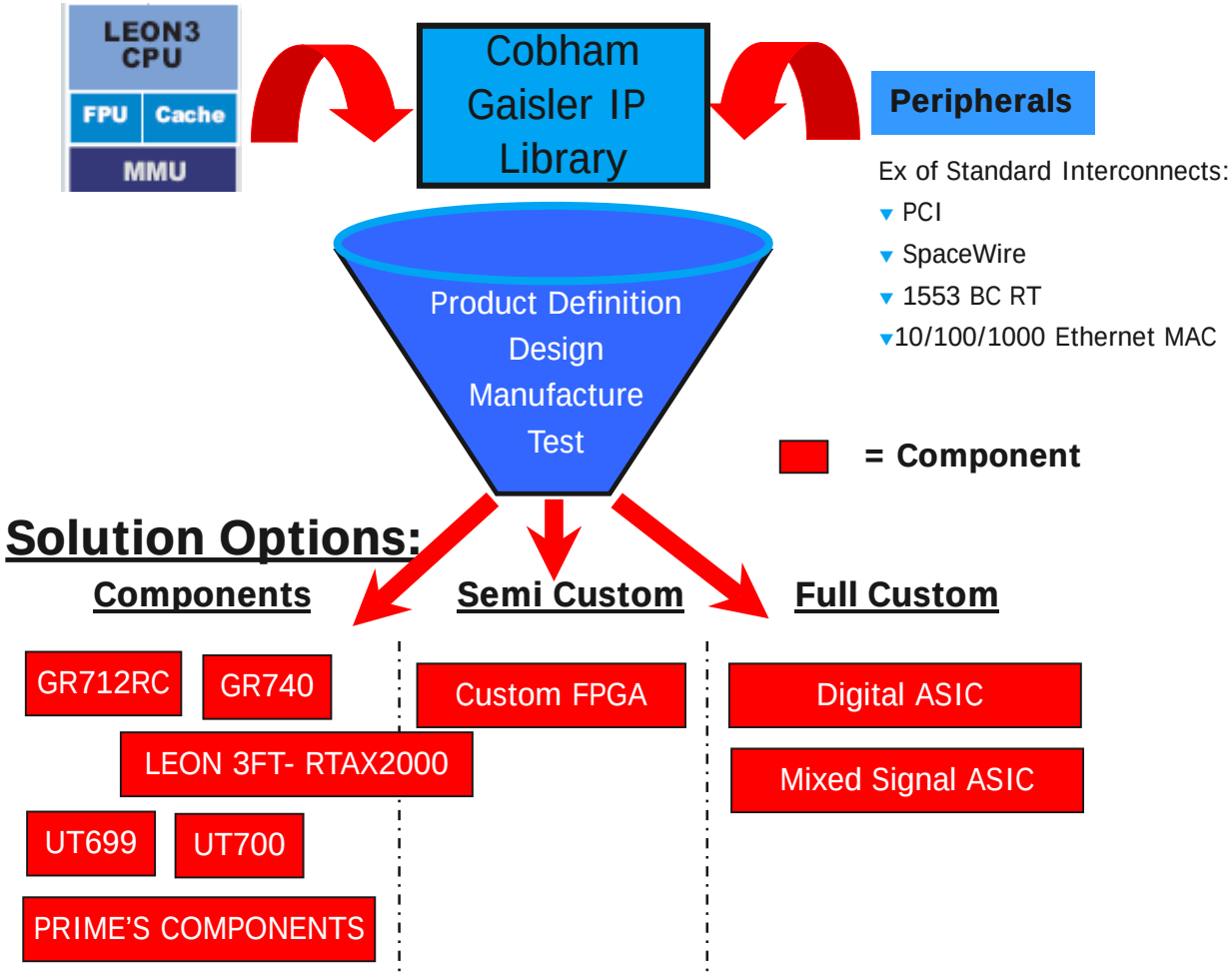
- Unique environmental related space requirements
  - Radiation
  - Vacuum, microgravity and outgassing

No change

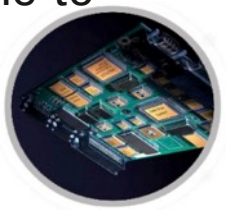
- Customer's trade-off;
  - SWaP
  - Performance
  - Cost
  - Lifetime
  - Time to market
  - Stock strategy



Re-use of IP to reduce design cycles



- As an IP vendor, it is important that customers can adopt new FPGA technologies
- Associated radiation and reliability data is needed at an early stage
- Evaluation support is essential to ensure availability of new technologies
- Work on tailoring of ECSS-Q-ST-60-02C to enable faster time to market



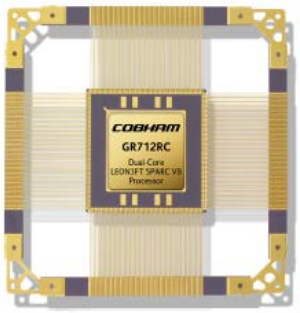
ALL THE SAME SOFTWARE TOOLS – Debug tools, Simulators, Operating Systems, Board Support Packages, Software Drivers

Current status

Mission, Components and Supply Chain

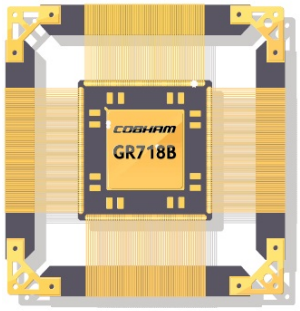
- MISSION: To provide building blocks that enable new scientific missions and allow new ways to utilize space constellations for commercial use.

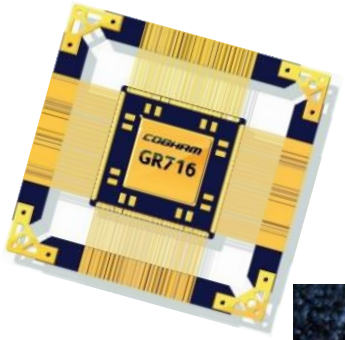
- COMPONENTS:
  - Microsemi FPGAs

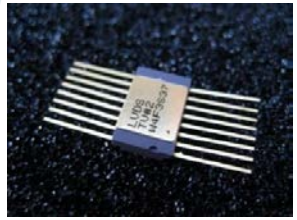


  - GR712RC, Dual Leon3FT
  - GR718B, SpaceWire router
  - GR740, Quad-Core Leon4FT
  - GR716, Microcontroller
  - LVDS, 5 device types

Coming Q4-18







- TODAY´S MANUFACTURING:
  - Fabless; 3 foundries
  - Assembly; 3 sub-contractors
  - Screening & qualification; 4 sub-contractors

Screening and qualification

Lead time drivers and strategy

- Typical lead time drivers;
  - Wafer processing; 3-6 months
  - Wafer sawing, visual, assembly & mechanical screening; 3 months
  - Burn-in + 3T measurements; < 3 months (batch size dependent)
  - Qualification; 3-6 months (pending life time requirement)

- Cobham Gaisler's strategy to shorten delivery times;
  - Maintain strategic stock of wafers
  - Willingness to keep stock of "high volume" components
  - Usage of reputable assembly and test houses where good relationships have been established
    - Always maintain traceability to wafer & assembly lots
    - No uncontrolled material (compare COTS/Q100)
    - SPQ or similar

Screening

Effective alternate concepts

- Reconsider periodical test requirements
- Consider removal of certain tests based on heritage
- Flexibility for various missions and market needs (future challenges)
  - Constellations; Plastic packages? No screening but possibly burn-in.
  - Non-hermetic ceramic packages
  - Flip-chip

web: www.cobham.com/gaisler