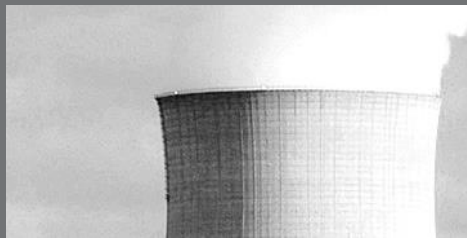
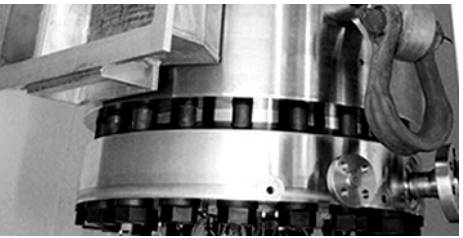
Small is Beautiful:
Emerging Design Trends/Requirements for Rugged Small Form Factor





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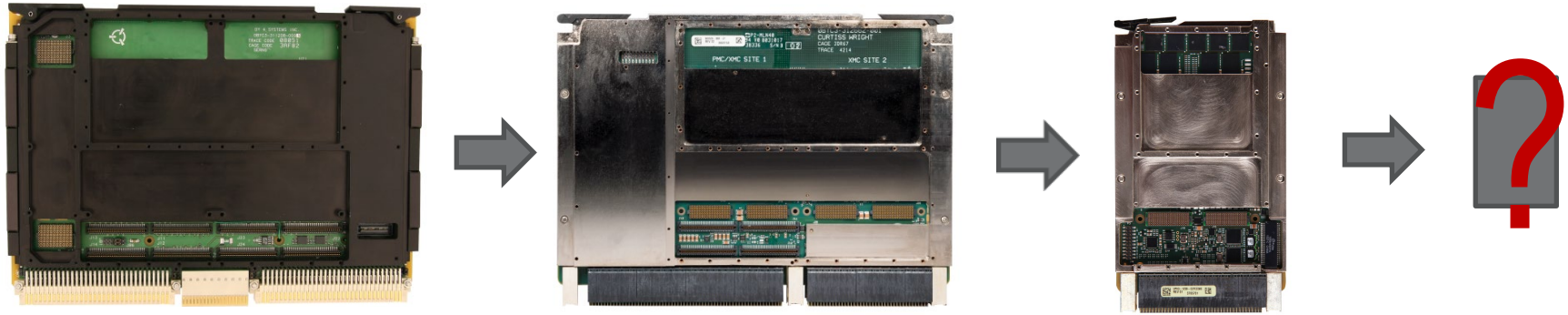
Agenda

- SFF Definition
- Trends
- Use Cases
- Voice of Customer
- Requirements
- Review of VITA SFF Standards
- Summary

Small Form Factor – How small?

- **Certainly, <3U (differentiation, tech trends, packaging flexibility)**
- **Is 100 x 100mm (62.5% of 3U) small enough (i.e. to gain sufficient SWaP-C advantages)?**
  - VITA 75.1 RSFF targeted 90 x 100mm “micro”VPX
- **Target ~30-50% of 3U**
  - With option to go smaller in the future (e.g. “postage stamp”)

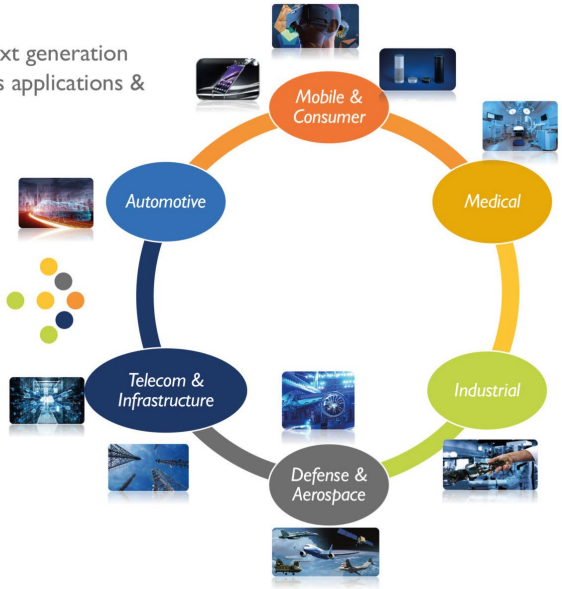


Small Form Factor – How small?

- **System/Subsystem Level**
  - 6U to 3U to ?
  - Backplane to Carrier to ?
  - ATR (& variants) to Custom (or VITA 75) to ?

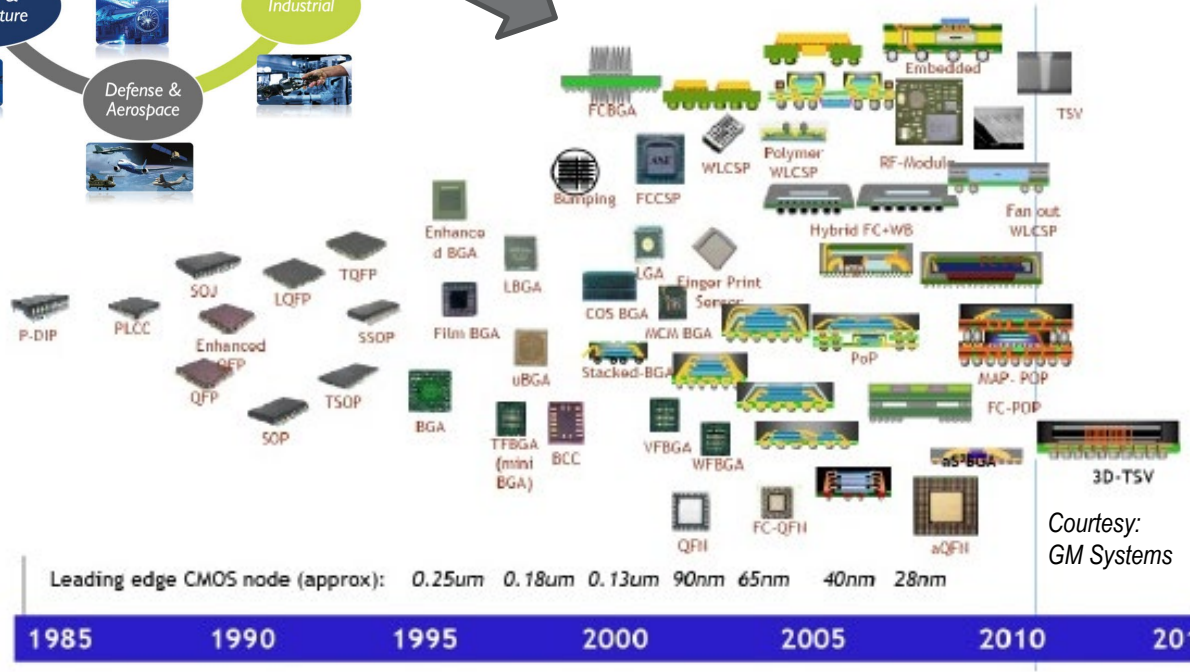
Trends

5G, AI & IoT are 3 key trends driving the next generation semiconductor business, encompassing various applications & devices



Courtesy: Yole Developpement

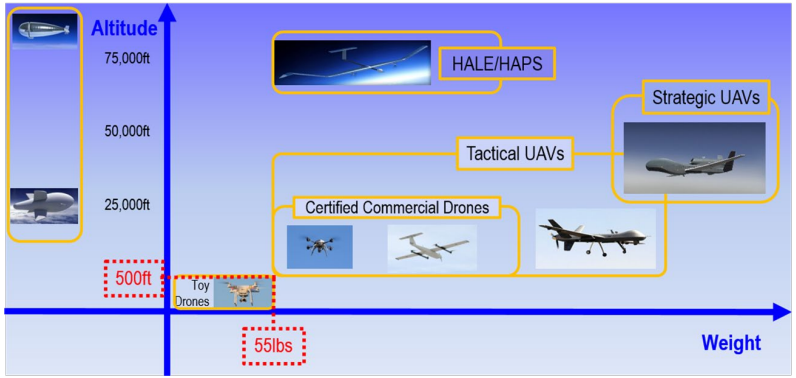
- **Miniaturization**
- **Integration**
- **I/O Density**
- **Functionality**
- **Power/Heat**



Courtesy: GM Systems

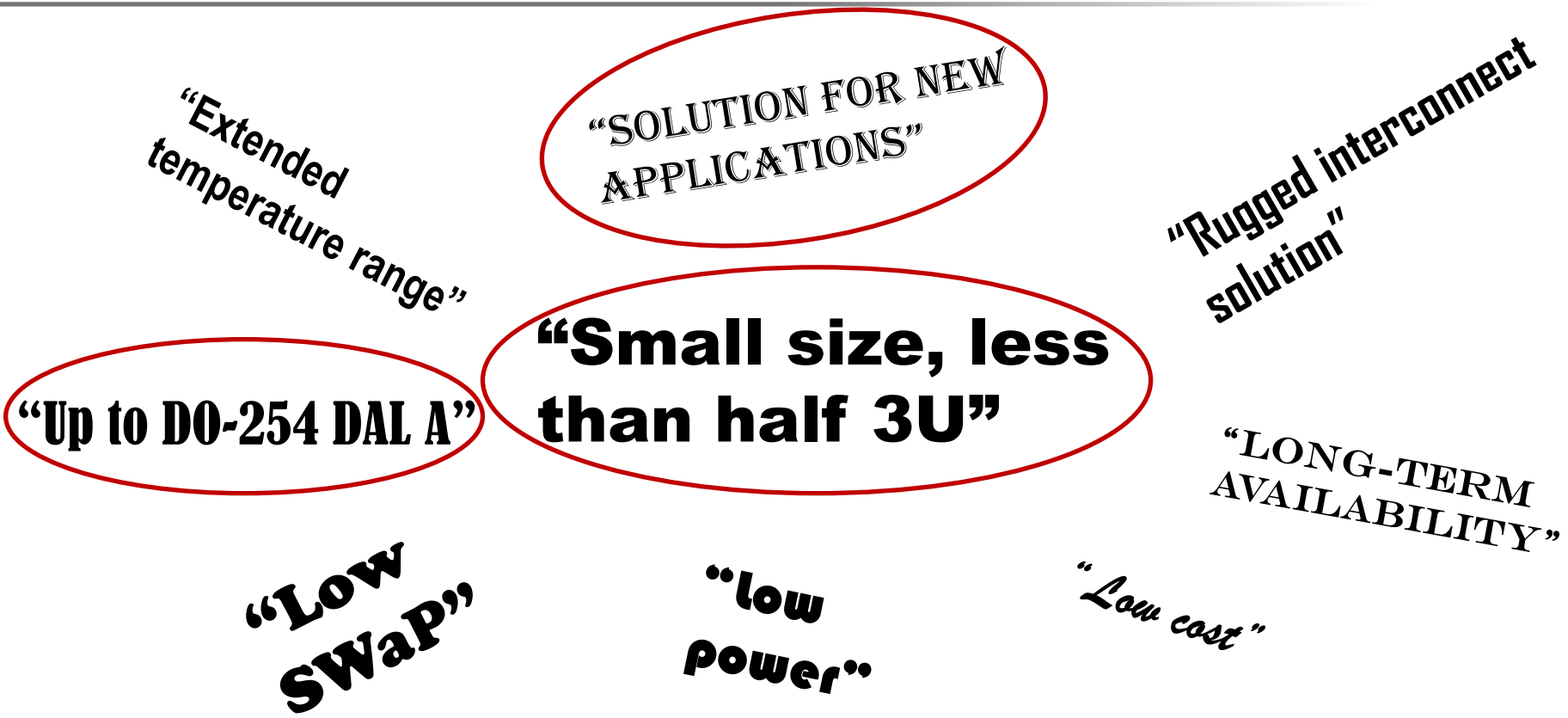
Use Cases

FAA Regulations (Dec-15) require UAVs > 55lb and operated >500ft to be certified to FAR Part 91



Safety Cert is a Key Driver for Rugged SFF

Voice of Customer



SFF Requirements

- **Module size ~30-50% of 3U**
- **Safety certifiable (up to DO-254 DAL A)**
- **Mil COTS ruggedness and reliability, e.g.**
  - -40 to 85+°C
  - VITA 47
  - VITA 72 vibration
- **Other “ilities” (e.g. availability, maintainability, supportability)**
- **Rugged interconnect solution (rugged connector)**
- **Flexible packaging approach (e.g. mezzanine, backplane, cabled)**

Current VITA SFF Standards

- **VITA 73 – VDSTU (VITA Draft Standard for Trial Use) in 2013; 3 WG members**
  - PCB size: 101.5mm x 71mm
  - Connector: TBD
- **VITA 74 – ANSI approved in 2017; 22 WG members**
  - PCB size: 84mm x 73mm (12.5mm module)
  - Connector: 200-pin (12.5mm module) or 400-pin (19mm module)
- **VITA 75 – VDSTU in 2012; 25 WG members**
  - PCB size: Agnostic or 100mm x 90mm (VITA 75.1)
  - Connector: Agnostic or VPX connector (VITA 75.1)

Summary

- **Use case and technology trends are driving a need for a SFF module size of 30-50% of 3U**
- **Diversity of use cases demands flexibility in SFF packaging**
- **Safety certifiability (DO-254, up to DAL A) is required**
  - Ruggedness and reliability are a must
- **There is a need for a new SFF module and standard**
  - Curtiss-Wright will be announcing a solution in 2020

Thank You

[redacted]