NUVOTRONICS

NASA SBIR/STTR Technologies

3D High Density mmWave Interconnects

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SBIR STTR

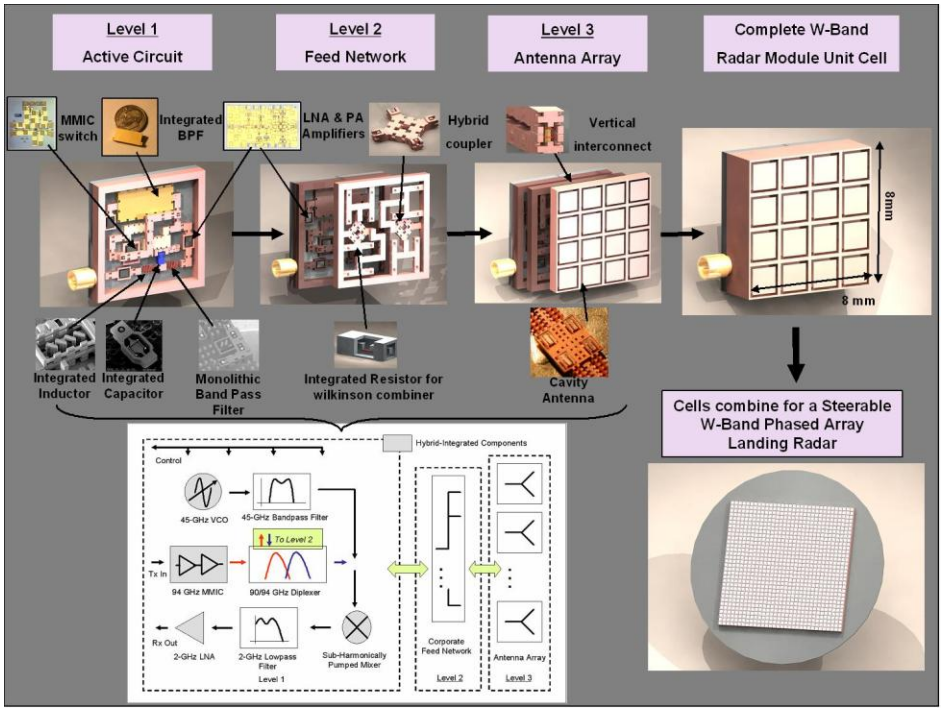
Identification and Significance of Innovation

- PolyStrata™ metal MEMS process for the fabrication of intricate microwave and millimeter-wave (MMW) devices. Devices have been demonstrated with the following characteristics:
  - insertion loss **5 to 10 times lower** than traditional planar circuits
  - **isolation better than 60dB** for lines that share separating walls
  - multiple levels of **densely-packed** coaxial circuits
  - **low-parasitic attachment** to active devices and traditional circuit boards
  - Polystrata structures have previously passed initial space vibration testing
- Develop high density low-loss millimeter backplane circuits to package and interconnect components of future NASA MMW radars
- **Achieve reduction of system size, weight and loss** in MMW radars.
- Provide high-density MMW interconnection system for NASA applications in radar and communications systems.
- Miniature platform for future W and G band radars, batch processing creates over 100 phased array modules at a time

TRL at beginning: TRL-1
End of PhI contract: TRL-3-4

Technical Objectives and Work Plan

- ***Objective 1: Demonstrate low loss interconnections.***
- ***Objective 2: Demonstrate component reliability for space environments.***
- ***Objective 3: Verify assembly process and interconnection concepts for MMW radar systems.***
  - Reviewed and defined space qualification metrics
  - Developed MMW interconnection backplane concepts
  - Designed W and G band recta-coax and waveguides
  - Initiated fabrication and tested sample devices
  - Performed environmental testing on select devices
  - Designed concepts for full scale MMW radar interconnections



NASA Applications

- MMW radars for advanced cloud and precipitation measurements **Aerosol/Cloud/Ecosystems (ACE) Mission**
- Mars landing radars for **Mars Exploration Program**
- NASA unmanned aerial vehicles communications and radar systems
- Satellite communication systems

Non-NASA Applications

- DOD communications and radar systems
- High frequency communication systems driven by future needs in moblile backhaul, WiMax, public safety networks, and WirelessHD
- Future high frequency radars for collision avoidance on DOD UAV/UGV and commercial automotive platforms

Contacts

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