

Smiths Interconnect (SINT), Microwave products

ESTEC, October 2018

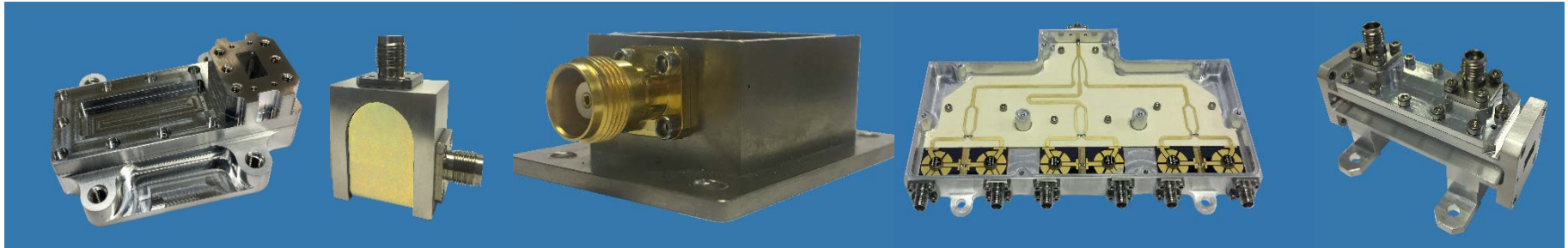
Alan A McNeill, VP Business Development EMEA

No Licence Required



Smiths Interconnect (SINT) Microwave passive components

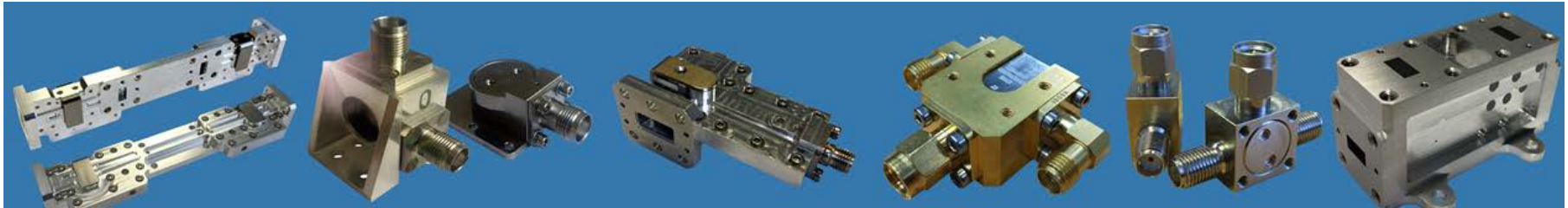
- Facilities are based in Dundee, Scotland (TRAK), Northampton, Mass. (Millitech), Stuart, Florida (EMCT) & Salisbury, Maryland (Lorch) each specialising in the design & production of passive components and/or sub-systems for the commercial and institutional established reliability community.
- Currently, Space products and variations are introduced at a rate of 1 per week and increasingly these are as a result of our passive component product roadmaps.
 1. Very high power waveguide isolators, circulators, transition, hybrids and test couplers etc.
 2. Q & V-band: focused on in house capability to support development, test & screening
 3. Integrated signal combining & splitting: realised in stripline/coax and waveguide
 4. Accessible solutions for GEO and "*new space*"; constellation applications



New in the past 12 months: Ku-Band termination, S-Band circulator, Ku-Band TNC load, isolated combiner and Ka-band test coupler

Space roadmap features

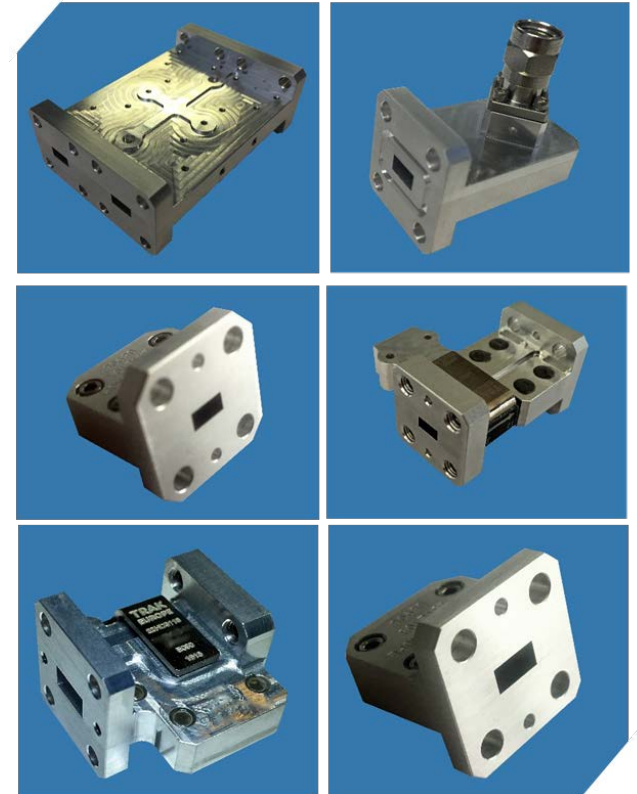
- “Space” is attracting significant internal investment & senior management attention within SINT. The roadmap features provides direction and alignment within the business. It also features
- **Force multiplier:** Building on the capabilities of the 4 sites in the SINT family
- **Accessibility:** Focused on developing and qualifying suites of broader band products. Potentially lower costs e.g. using, where appropriate, SINT LCM . IITAR free
- **Simplification:** e.g. no precious metal plating and no tuning e.g. broader band in preference to ultimate performance
- **Capability** All testing and screening undertaken using internal capabilities
- **Scale:** The ability to industrialise from GEO to constellation volumes are being addressed
- **Structure:** A methodology to approach the next products, bands etc. e.g. E & W-Bands



New in the past 12 months: Integrated functionality and structure, C-Band circulator, K-Band filtered iso-adapter, miniature SMA isolators, 15dB coupler

Roadmap focus 2: QV Band passive components

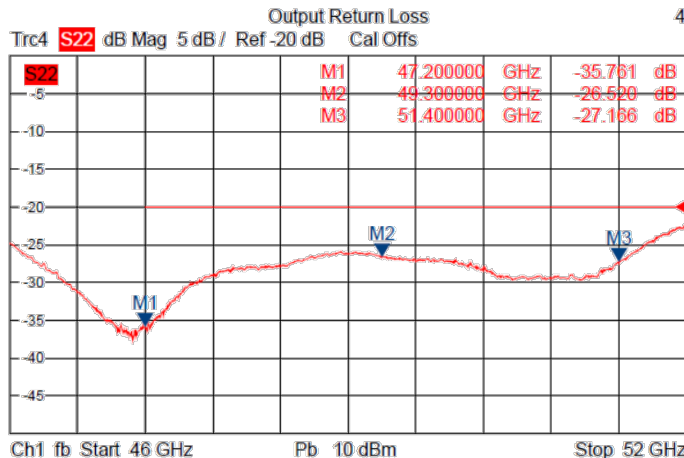
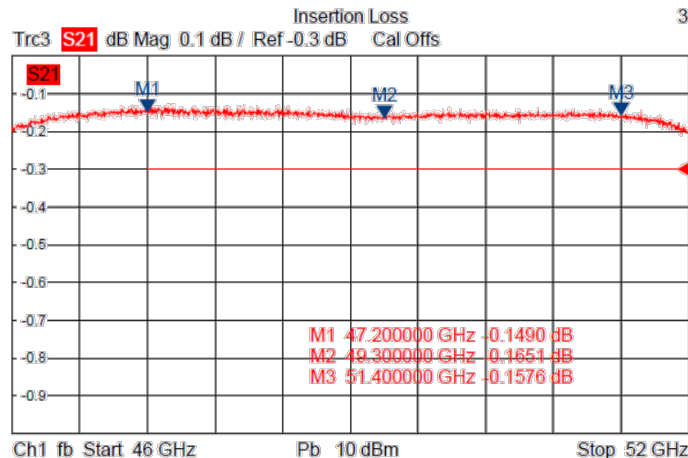
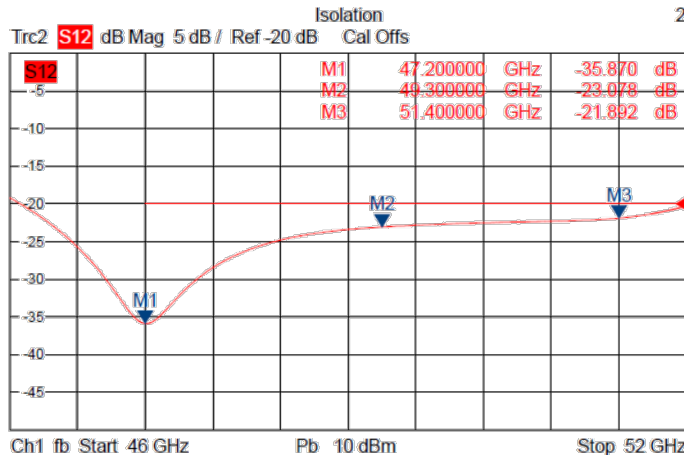
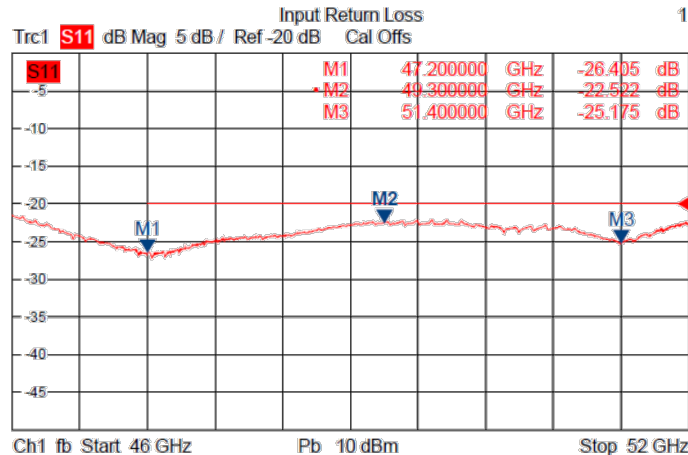
- SINT is investing in products and crucially, in screening capability, for GEO & constellation payloads (e.g. a 250W Q-Band RF test source and an expanded TVAC facility in Dundee).
- **Q-Band: WR22:** (but also non standard WR)
 - Low Loss Isolators (37.5-42.5 GHz) Heritage
 - Full band 2W terminations (30.0-50.0 GHz) Heritage
 - 3dB hybrids (37.5-40.0 GHz) Heritage
 - 2.92 and 2.4mm transitions (37.5-42.5 GHz) *Qual 'n / Dev't**
 - *Isolated combiners/splitters (37.0-40.0 GHz)* Qualified
 - *High power Circulators and remote loads* *Development**
 - *Signal combination and band filtering* *Development**
- **V-Band: WR19:** (but also non standard WR)
 - Low Power Isolators (47-52 GHz) Heritage
 - Full band terminations (40-60 GHz) Heritage
 - *Signal splitting and combining* *Development ***
 - *"1.8mm" transitions (47-54 GHz)* *Development ***
- This feeds into the integration arm of the roadmap



** Development underway and qualification expected to be completed by Q2 FY 2019*

*** development planned to commence within the coming 6m*

Roadmap 2 example: WR19 low power isolator

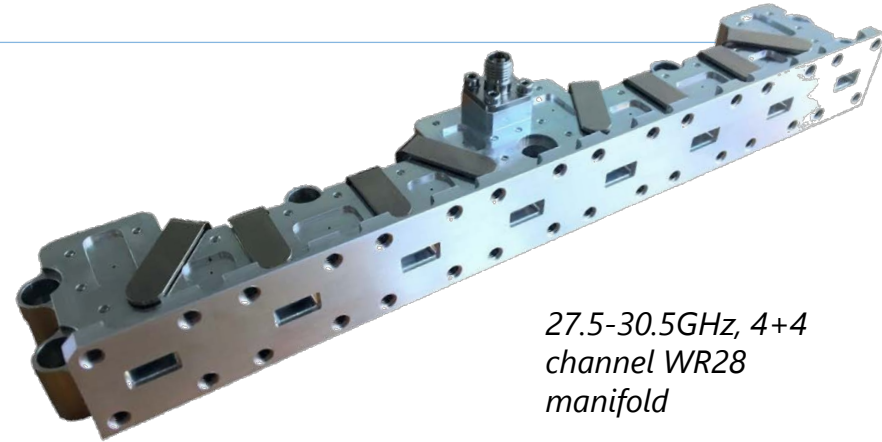


- LNA/Receiver application.
- Novel, tuneless internal structure
- No precious metal plating – passivated Aluminum
- Performance achieved over a 100C operating window
- Qualified and flown 2017



Development: Integration, & Power – SPACE NXT©

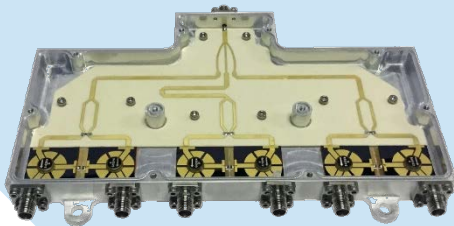
SPACE NXT© is SINT's demonstration of its commitment to the space industry. It is an initiative to fund capability and the development and qualification of a range of next generation products including many of those featured in the roadmap.



*27.5-30.5GHz, 4+4
channel WR28
manifold*

Integrated microwave assemblies

- Manifolds in K and Ka-Bands
- Low cost Q-Band isolated/filtered combiners
- Isolating combiners & splitters



*S-Band 6 channel phase
and delay matched
isolated splitter*

High Power Passive products

- 400W CW, WR112 circulator, remote termination, hybrid and test coupler – in qualification
- 300W CW, WR75 circulator and remote termination and hybrid - qualified
- 200W CW, WR51 & 100W Q-Band circulator and remote termination, – in development

[more > smithsinterconnect.com](#)

