

Corporate Presentation

November 2019



2019 Results (*)

Headline Revenue:
£2,498m

Operating Profit:
£427m

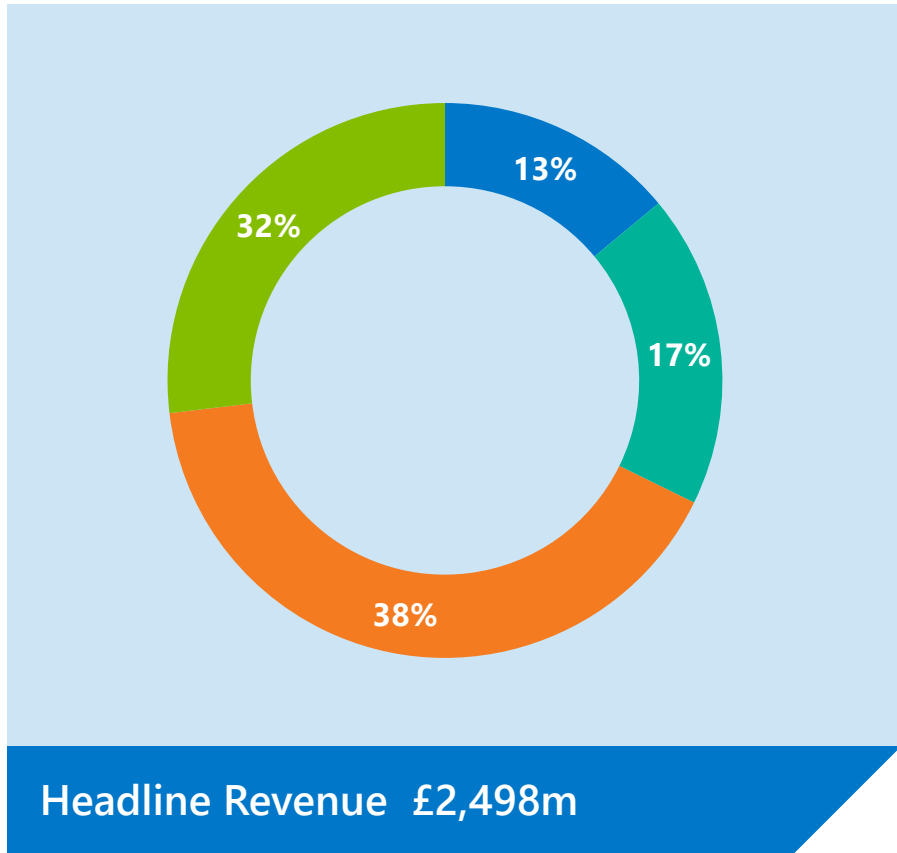
Operating Profit Margin:
17.1%

- Founded in 1851, Smiths Group is a global business listed on the London Stock Exchange – FTSE 100.
- We develop advanced products that meet our customers' evolving needs. Our products and services touch the lives of millions of people every day and help make the world safer, healthier and more productive.
- We do this through five divisions, which employ 22,000 people in more than 50 countries.
- Our vision is to build Smiths Group into one of the world's leading technology companies, with proprietary technology, products and services critical to our customers' operations.
- A market cap of £6bn and a strong balance sheet.



(*) Exclude Smiths Medical which is accounted for as 'discontinued operations – businesses held for distribution to owners', given the intended separation of Smiths Medical by the end of H1 CY2020

Smiths Group: Revenue by Division



■ 13%

Interconnect: Develops electronic components and sub-systems providing signal and microwave solutions.

■ 17%

Flex-Tek: Provides engineered components that heat and move fluids and gases for the aerospace, medical, industrial, construction and domestic appliance markets.

■ 38%

John Crane: Provides engineered products and services to global energy and process industry customers.

■ 32%

Detection: Designs and manufactures technology solutions that detect and identify security threats and contraband.

Medical : Supplies medical devices and consumables that are vital to patient care globally. Intended separation by the end of H1 CY2020.

Mission

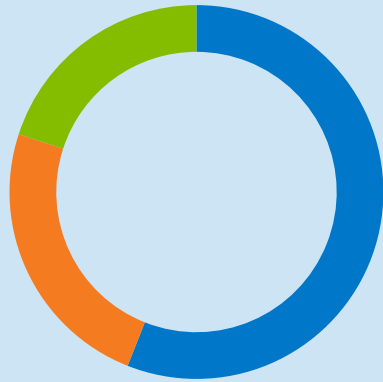
To be the
global
partner for
innovative
connectivity
solutions

Smiths Interconnect offers:

- Technical excellence and vast market experience
- A comprehensive product portfolio providing customers with a single point of supply across multiple markets
- Advanced engineered solutions integrating the combined expertise of our technology brands
 - EMC, Hypertac, IDI, Lorch, Millitech, RF Labs, Sabritec, TECOM, TRAK and HSI
- Optimized quality through first class materials, state-of-the-art development methods, and world class talent
- Robust financial pedigree and reputable heritage of Smiths Group

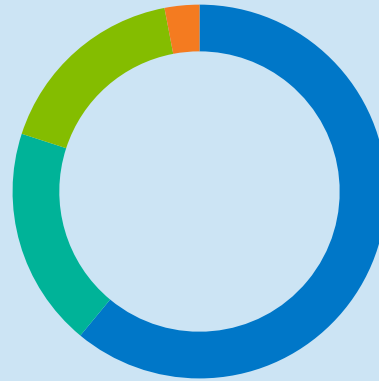
Smiths Interconnect FY19 KPIs

Sales by Market Segment



- 56%** Aerospace & Defense
- 24%** Communications
- 20%** Industrial

Sales by Region



- 61%** Americas
- 19%** Europe
- 17%** Asia Pacific
- 3%** Rest of World

Employees by Region



- 58%** Americas
- 25%** Europe
- 17%** Asia Pacific

Worldwide Locations

- ▲◆ Milpitas **CA**
- ★▲◆ Costa Mesa **CA**
- ★▲◆ Thousand Oaks **CA**
- ★ Tijuana **Mexico**



- South Deerfield **MA** ★
- Hudson **MA** ▲◆
- Northampton **MA** ★▲◆
- Salisbury **MD** ★▲◆
- Kansas City **KS** ★▲◆
- Tampa **FL** ★▲◆
- Stuart **FL** ★▲◆
- Alajuela **Costa Rica** ★



- Dundee **UK** ★▲◆
- Elstree **UK** ▲◆
- London **UK** ■
- Rouen **France** ★▲◆
- Deggendorf **Germany** ★▲
- Genova **Italy** ★▲◆
- Monastir **Tunisia** ★



- Shanghai **China** ▲
- Suzhou **China** ★▲◆
- Mianyang **China** ▲
- Singapore ▲◆

Smiths Interconnect Technology Brands

EMC

- RF devices used to attenuate, level or terminate signals
- Extensive portfolio of commercial and high-reliability components in a variety of packages and footprints



HYPERTAC

- High reliability hyperboloid contact technology
- Platform and custom products providing exceptional performance in critical applications and harsh environments



IDI

- Spring probe contact technology
- Compliant interconnect products ideal for high density, miniature and blind mate applications



LORCH

- RF/Microwave conditioning products with high selectivity using multiple topologies.
- Broad range of applications from 600 kHz to 65 GHz



MILLITECH

- Design, development and manufacturing of millimeter-wave components, assemblies and fully integrated subsystems
- Leading provider of SATCOM, radiometry, radar, and remote sensing components and subsystems



RF LABS

- High performance microwave cable assemblies and coaxial components
- Application specific premium interconnects for durability and harsh environments



SABRITEC

- High speed Quadrax, Twinax, Fiber Optic, Filtered, Coax and Triax connectors, contacts and cable assemblies.
- Custom multi-pin circular, rack and panel connectors.



TECOM

- High performance ground and airborne antenna systems for SATCOM, radio link, radar, telemetry, and high bandwidth connectivity
- Industry-leading technical performance in accuracy, sensitivity and data transmission rates



TRAK

- Integrated microwave subsystems and assemblies, high performance ferrites, and time and frequency systems
- Leading provider for the most advanced radar, EW, SATCOM, data links, public safety, and space applications

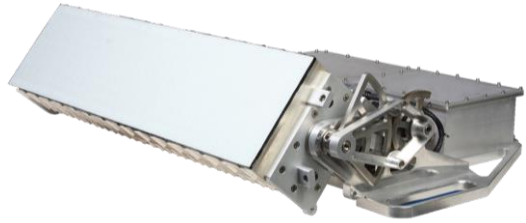


HUAFENG SMITHS INTERCONNECT (HSI)

- Joint venture with Sichuan Huafeng Enterprise Group Co. Ltd, one of the major manufacturers of electronic components in China
- Industry-leading connectivity solutions for commercial aerospace and railway markets in mainland China



Product Portfolio - 10 technically differentiated electronic components and systems product lines



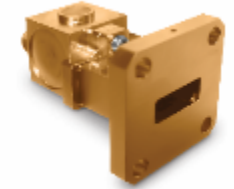
Antenna Systems



Cable Assemblies



Connector Solutions



Ferrite Components & Assemblies



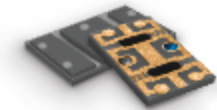
RF Filter Components & Assemblies



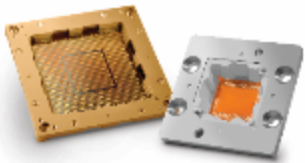
Integrated Microwave Assemblies



Millimeter-Wave Solutions



RF Components



Test Sockets & WLCSP Probe Heads



Time & Frequency Systems

Markets Served



Commercial Aerospace

- Avionics Equipment
- Engine Systems
- Power Distribution
- SATCOM Broadband Connectivity



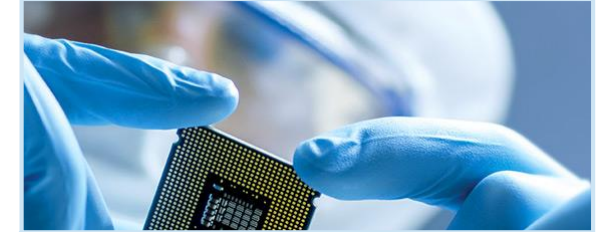
Defense

- Radar
- Electronic Warfare
- Intelligence, Surveillance and Reconnaissance (ISR)
- Communications



Space

- GEO/MEO Satellites
- LEO Satellites
- Launchers
- Manned Space Flight
- Ground Support Equipment



Semiconductor Test

- Area Array Test
- Package on Package Test
- Wafer Level Test
- Peripheral Package Test



Medical

- Surgical and Monitoring Systems
- Imaging Systems
- Disposables



Industrial

- Heavy Equipment / Machinery
- Servo Drives and Encoders
- Factory Automation
- Power Supplies



Railway

- Rolling Stock
- Signalling
- Infrastructures

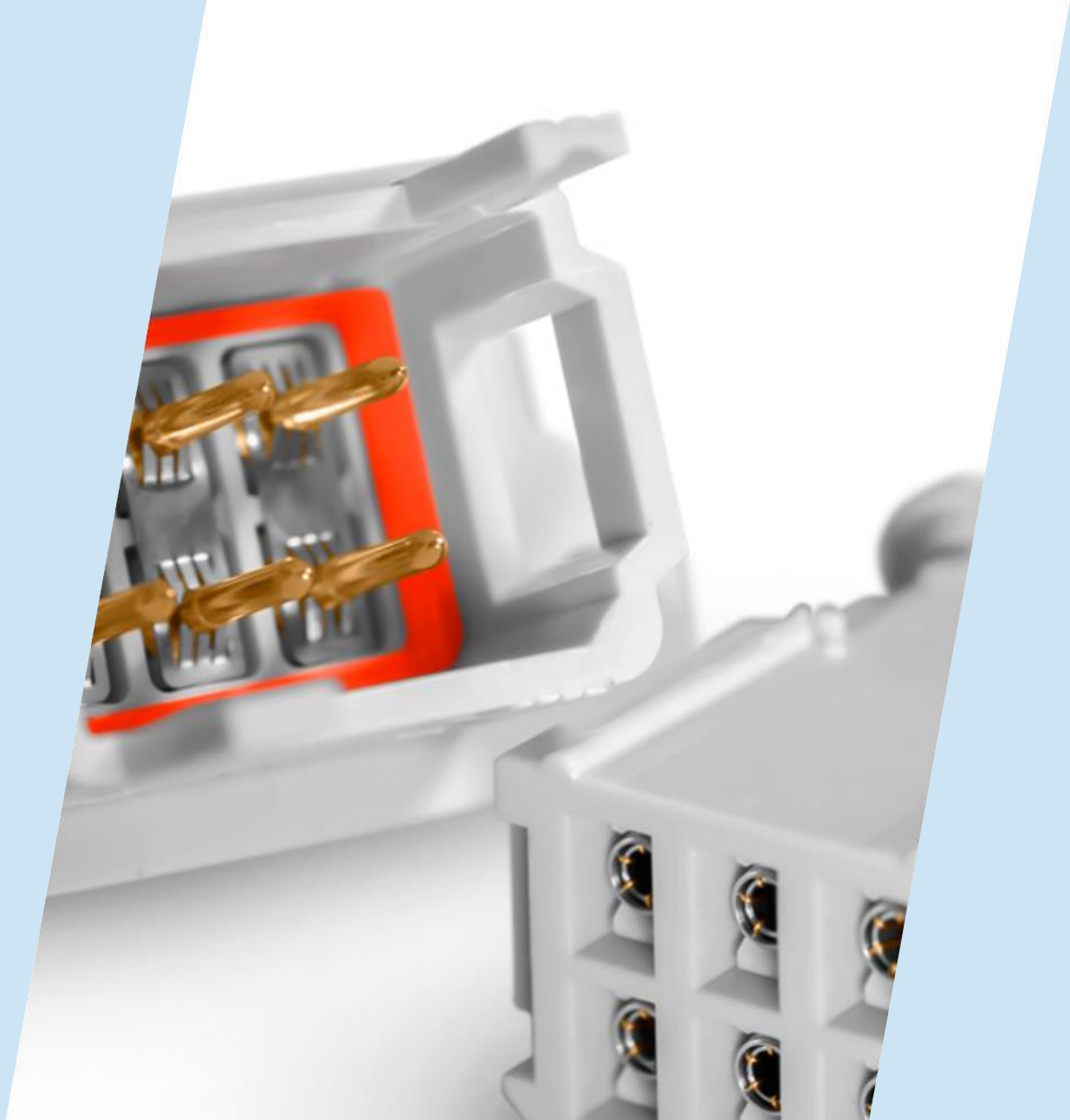


Test & Measurement

- Electronics Testing
- Automotive Testing
- Telecommunications

Products & Technologies

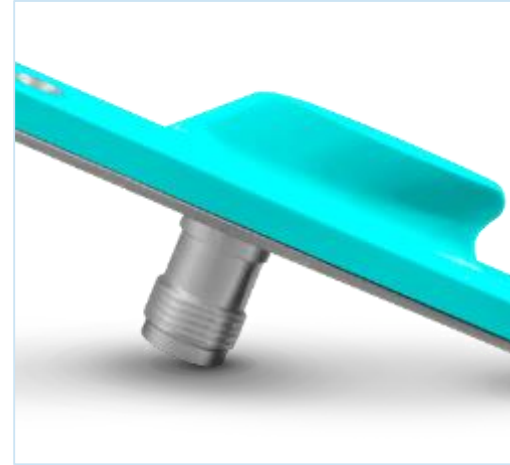
1. Antenna Systems
2. Cable Assemblies
3. Connector Solutions
4. Ferrite Components & Assemblies
5. RF Filter Components & Assemblies
6. Integrated Microwave Assemblies
7. Millimeter-Wave Solutions
8. RF Components
9. Test Sockets & WLCSP Probe Heads
10. Timing & Frequency Systems





Wideband Antennas

- Vast portfolio of wideband and directional antennas
- Frequency range up to 325 GHz
- Directional, omni-directional, and hemispherical types
- Parabolic, El-Par, and CSC2 types of apertures



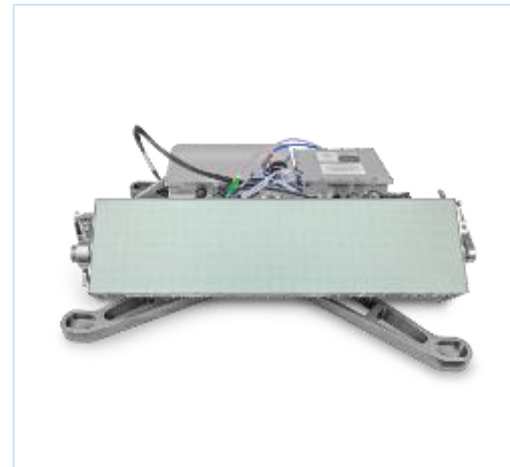
Airborne/Missile/Space

- Broad range of off-the-shelf and build-to-print antenna systems designed to meet program-specific needs
- Combiners facilitate 360° coverage in challenging installations
- Directional, omni-directional, and hemispherical types
- Parabolic, El-Par, and CSC2 types of apertures



Positioners/Controllers

- Frequency range up to 325 GHz
- Turnkey solutions for rugged environments
- Using off-the-shelf TECOM reflector and feed assemblies, from 0.5 to 40 GHz
- Rack mounting or embedded in the pedestal



SATCOM

- Complete line of Inmarsat-certified antennas
- Broadband full duplex fuselage mount antenna systems for in-flight connectivity
- Direct broadcast TV for in-flight entertainment
- Connectivity systems for business jets, commercial airlines and defense

Cable Assemblies



ASR Precision Test

- Precision VNA test port assemblies
- ASR maintains its mechanical configuration
- Available with 2.4 and 2.92 mm NMD connectors
- Individual or phase matched pairs
- Frequencies up to 50 GHz



Lab-Flex[®] Family

- Field proven up to 65 GHz
- Low loss, up to 40% reduction
- Custom braids for strength
- Shielding < 90 dB
- Stranded center conductor version available



Semi-rigid, Conformable & Flexible

- High frequency
- High isolation: Up to >100 dB
- Copper or aluminium jackets
- Range of protective coverings available



Lab-Flex[®] AF & Q

- Flexible cable qualified for space flight
- Meets NASA/ESA outgassing and radiation specifications
- Frequency capabilities DC-40 GHz
- Hermetic connectors and robust cable for harsh terrestrial environments



Titan-Flex Test

- Robust solder termination
- Crush resistant and durable
- Superior electrical performance
- Optimized to 18 GHz



Lab-Flex[®] S

- Frequency performance to 65 GHz
- Excellent performance in harsh environmental and mechanical conditions
- Designed to exceed 500K flexure cycles
- 30% lower loss than comparable solid dielectric cables

Connector Solutions



High Power

- Rugged, single and multi-way formats
- Power up to 700 Amps
- Suitable for harsh environmental conditions
- High number of mating cycles



High Speed

- Low profile, high compliance ratio
- Z-axis compliance
- Blind mate engagement
- Low, stable resistance with long cycle life



Spring Probe

- Intermateable and interchangeable with standard non-filter connectors
- C, L and Pi style EMI filters
- TVS protection meeting the requirements of TCA D160 section 22 up to level 5



EMI/EMP Filter

- Available in metal and plastic shells
- Crimp and solder terminations
- Easy environmental sealing and rugged mechanical performance
- Push/pull latching mechanism
- Color coding options available



Circular

- Configure signal, power, RF, twinax, triax, quadax and fiber optic contacts into a single connector
- Guided hardware for blind mating
- Signal connectors for hand held and docking stations



Modular/Rectangular

- Low, medium and high density connectors with long life cycle
- Signal, power, coaxial and high speed configurations
- Board to board, cable to board, cable to cable and stacking



PCB

- Standard 100 and 150 Ω quadax and twinax contacts
- Formats: MIL-DTL-38999, ARINC 600, MIL-DTL-83527 and D-Subminiature
- Fibre Channel, Ethernet Firewire, USB, DVI and InfiniBand protocols

Ferrite Components & Assemblies



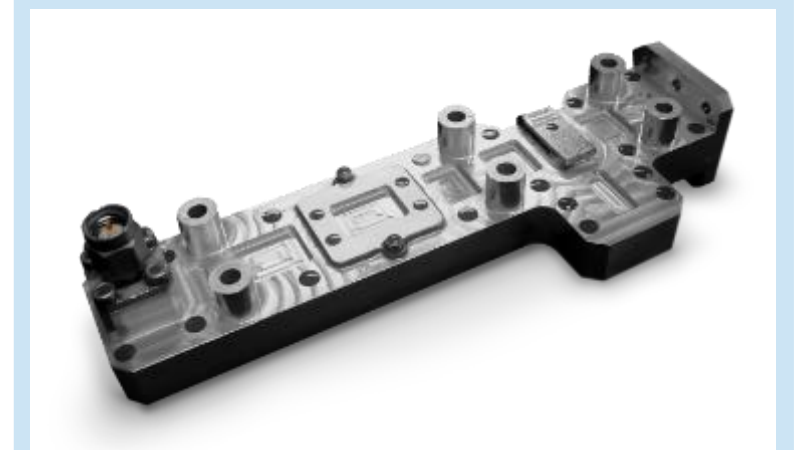
Coaxial

- Wide range of isolators, circulators, loads, terminations, and attenuators
- Operating from 300 MHz to 240 GHz
- Most coaxial ferrite products feature unique solid connectors; available in female and male orientations in SMA, TNC and SMP styles
- Male/female connector barrel machined to be integral with housing
- All products are optimized for thermal and dynamic operational environments



Microstrip, Surface Mount & Stripline

- Isolators and circulators
- Operating from 400 MHz to 31 GHz
- Microstrip offers a unique blend of broad band operation, low mass and low profile
- Surface Mount and Stripline suitable for pick and place and reflow soldering
- Optimized for operational power and thermal environments



Waveguide

- Isolators, circulators, combiners, transitions, terminations, couplers, loads, and multi-function assemblies
- Operating from 1.0 GHz to 53 GHz
- All products are optimized for thermal and dynamic operational environments
- Designed for specific applications and optimized to handle an appropriate amount of RF power
- High power devices are supplied as junction or differential phase shift types
- Low power devices use traditional junction technology; either single or multiple junctions

RF Filter Components & Assemblies



Cavity

- 30 MHz to 40 GHz
- Bandwidth: 3 dB from 0.5 to 66%
- High "Q", low loss
- High power
- Helical, combline, interdigital & waveguide



Ceramic

- 400 MHz to 6000 MHz
- Bandwidth: 0.5 to 10%
- Surface mount, PC mount, connectorized options
- Stand-alone or diplexed



Discrete

- 5 MHz to 7.5 GHz
- Bandwidth: 3 to >100%
- Bandpass, lowpass, highpass or notch
- Surface mounts, pins or connectors
- Monotonic and elliptic responses



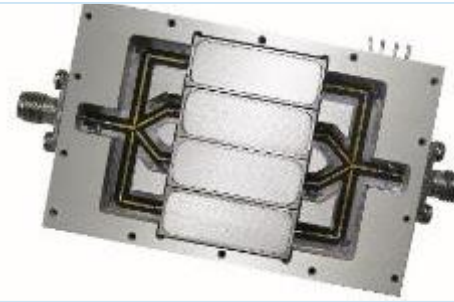
Tunable

- 24 MHz to 4000 MHz
- Direct readout
- Octave tuning
- High power
- Digital controlled available



Waveguide

- Frequency range 2 GHz to 325 GHz
- 2 through 20 sections
- W/G, flange or connectorized
- Stand alone filters or diplexed
- WR-159 to WR-03
- Band-pass, low-pass, high-pass, notch filters



Integrated Assemblies

- 500 MHz to 18 GHz
- 2 to 9 channels Available
- Use of both MIMIC or Solid State Switching
- Connector or RF pin launch
- Hermetic seal available

Integrated Microwave Assemblies



Frequency Multipliers & Comb Generators

- SRD-based & NLTL-based comb generators
- Active & passive multiplier chains
- Up to full waveguide bandwidths
- Standard models available through 305 GHz



Frequency Sources

- Low phase noise
- Low spurious
- Synthesized and direct



Up/Down Converters & Receivers

- Radiometer and RADAR front ends
- Single and multi-channel
- Control at high dynamic range
- Phase and gain matching
- Through 325 GHz



Receiver Protectors

- Communication and RADAR receiver protectors
- Incorporating: discrete diode & MMIC limiters, LNA, receiver filter, T/R blanking switch, ferrite isolators



Transceivers

- Communication and RADAR
- Integrated BDC/ BUC, power supply, 10 MHz reference, 25W power amplifier



Master Oscillators

- Ultra-low phase noise
- Crystal based
- Ovenized and non-ovenized



Switched Filter Banks

- Shunt series & discrete N-throw switches
- Comb selector filters
- High power handling and fast switching options
- C to KA Band



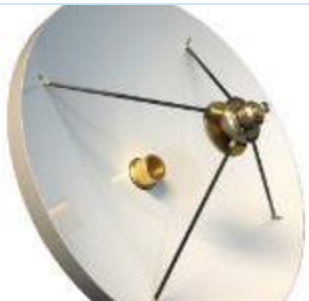
Amplifiers

- Broad array of power amplifier (AMP), and low noise amplifier (LNA) solutions
 - Power combined amplifiers up to 16-way
- Standard models from 18 to 110 GHz
- Custom variations of standard MMW components, as well as multi-components assemblies and solutions
- GaN, GaAs, InP, SiGe Technologies



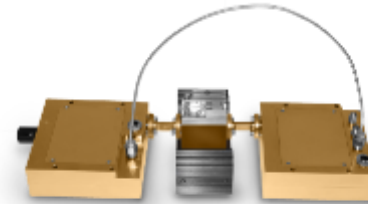
Passive Components

- Full waveguide band isolators and circulators
- High power waveguide circulators for protecting TWTs
- Standard models from 18 to 260 GHz
- Low-pass, band-pass, and high-pass waveguide filters
- Waveguide diplexers and triplexers
- Notch filters



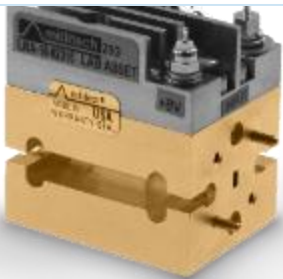
Antenna & Quasioptical

- Full range of MMW antenna products and technologies including aperture, reflector, and lens based antennas
- Standard models from 18-325GHz
- Availability of custom designed antenna arrays
- Also offering polarizers, orthomode transducers, monopulse comparators, and waveguide rotary joints



Test & Measurement

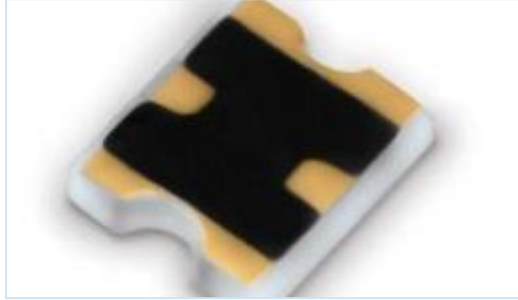
- Metrology grade lab assets
- VNA extenders
- Direct reading and motorized rotary vane attenuators



Active Components

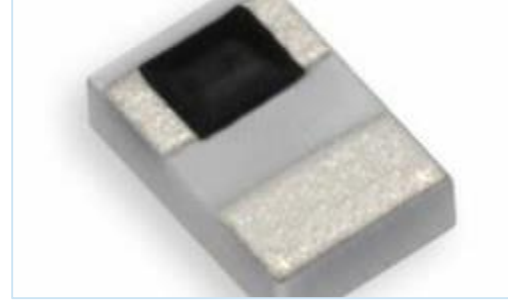
- Full waveguide band balanced mixers and models use the following:
 - Fundamental, harmonic, biased, and I/Q models available
 - Active and passive multiplier chains
 - SPDT and PDT switches
 - PIN diode based attenuators
- Standard models from 18 to 325 GHz

Radio Frequency Components



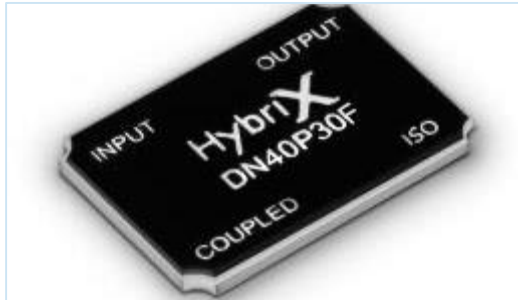
Attenuators

- Fixed and temperature variable to 50 GHz
- Totally passive with no signal distortion
- Superior broadband performance
- Space and military qualified
- Many dB values



Resistors

- Optimized to minimize parasitic capacitance
- Wide range of resistance value
- RoHS, non-magnetic & low PIM versions
- Designs up to 1K and 40 GHz
- SMT Chips, tab and cover, flange mounted and rod



Signal Distribution

- Hybrid, directional and Doherty
- SMT couplers > 8 GHz
- Available in all mobile frequencies
- Multi-octave models for wideband application



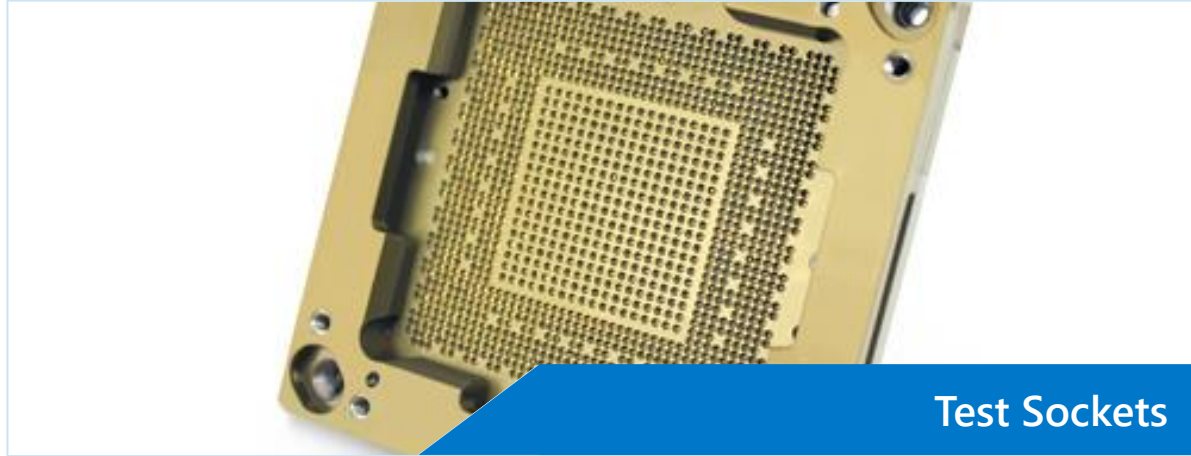
Terminations

- Tuned circuits for lowest VSWR
- Designs up to 1K and 40 GHz
- Diamond, Alumina, BeO and ALN substrates
- Large selection of chip styles, planar and SMT



Diamond RF Resistives®

- Highest power and frequency, smallest size
- Very low parasitic capacitance
- Footprints from 0402 (20W) to 1320 (125W)
- Size and weight reduction in space & hi-rel applications
- Easy-to use packages: chips, flange and tabbed



Test Sockets

- Extensive portfolio of spring probe and other contact technologies
- Verification tools and design standards to ensure simultaneous engagement and alignment to both sides of the package
- Products may feature Silmat[®], a patented, low profile contact
- High speed signal integrity



WLCSP Probe Head

- Utilizing spring probe technology
- High site to site test parallelism
- Superior signal integrity and high speed / RF testing capability
- Stable contact resistance over 750K cycles

Time & Frequency Systems



Distribution Systems

- Stand-alone and modular solutions
- Pulse Rates, Reference Frequencies and Time Codes
- Redundant and non-redundant configurations
- Low phase noise reference frequency distribution



GPS Clocks

- High performance, cost-effective, small form factor
- High stability ovenized oscillator or optional rubidium oscillator
- AC and DC power inputs
- Ethernet and RS-232 for remote configuration and monitoring



Network Time Protocol (NTP)

- Using IRIG-B for network synchronization
- Accepts a fiber optic or wireline IRIG-B time code
- Time Synchronization of SIPRNET and NIPRNET
- Ethernet and RS-232 for remote configuration and monitoring



Tactical Global Positioning Systems (GPS)

- Compact, rugged enclosure
- Rubidium oscillator and low phase noise clean-up oscillator
- Standard C/A-Code GPS or optional SAASM GPS
- Ethernet and RS-232 for remote configuration and monitoring



Time Code Processors

- Modular construction with over 100 module options
- Standard C/A-Code GPS or optional SAASM GPS
- Wide variety of outputs available
- Remote configuration and monitoring available through Ethernet and RS-232



Time & Frequency Systems

- Dual-redundant modular system
- For high reliability applications requiring uninterruptable 24-7 service
- Redundant GPS RX high stability OCXO or Rubidium, Time and Frequency generator and NTP Servers
- Six, 4-channel distribution module providing 24 outputs - expansion shelf available

In-house capabilities encompassing design, development, manufacturing and testing to anticipate market needs, respond quickly and accurately to customers, and provide the most reliable connectivity solutions.



Engineering

- 3D EM Modelling
- Advanced RF & System Modelling
- CAD/CAM & Solid Modelling
- Finite Element Analysis
 - Thermal Analysis
 - Shock & Vibration Analysis
- Reliability Analysis



Prototyping

- CNC Turning & Milling Centres
- Cabling/Prototype Assembly
- 3D Printing
- Ceramic Grinding
- EDM
- Circuit Board Routing



Manufacturing

- Precision Machine Shops
- Connector, Contact & Cable Assembly
- Automated PCB Assembly & Inspection
- Automated Hybrid Assembly
 - Die Placement
 - Wedge & Wire Bonding
 - Gap Welding
- NASA Certified Soldering
- Automated Test & Tune
- System Integration
- Validation Testing



Test/Qualification

- Electrical Acceptance & LOT Test
- RF Test Capability, up to 325 GHz
- High Speed Digital
- Anechoic Chamber Testing
- ESS Environmental Qualification
- ESS Temperature, Shock & Vibration
- Metallurgical
- Real Time X-Ray
- Near Field/Compact Antenna Range
- Thermal Vacuum
- High Power RF Testing

Facility Certifications

ISO 9001:2015

- General International Standard for Quality Management System

AS9100D

- Aerospace Standard for Quality Management System Certification Specific to Aerospace Industry Requirements

ISO 14001:2015

- International Standard for Environmental System Management

ISO 13485

- International Standard for Quality Management System Certification Specific to Manufacturers for Medical Devices

OHSAS 18001:2007

- International Standard for Occupational Health and Safety Management Systems

IRIS

- International Railway Industry Standard

NADCAP

- Industry Standard for Aerospace Engineering, Defense and Related Industries

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