With over 40 years’ experience Aspen offers an extensive range of Analogue, Digital, RF, Microwave and Millimetric Components & Sub-Systems from our approved list of global suppliers. Whatever your requirement we feel confident that our experienced sales team can provide the right solution.

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KEY

Coaxial
Surface Mount
Waveguide

TEL: +44 (0)20 8868 1311
AMPLIFIERS

LOW NOISE AMPLIFIERS
Narrow Band to Ultra-Broadband for standard applications from 10MHz to 40GHz plus Millimetric Models from 40 to 120GHz. Low Temperature Models available for Cryogenic Applications. Noise Figures as low as 0.3dB for Narrow Band, Low Frequency Units.

MEDIUM POWER AMPLIFIERS
Narrow & Broadband Amplifiers with output powers to +33dBm plus.

LIMITING AMPLIFIERS
Featuring a Wide Input Dynamic Range with a Compressed Stable Output. Frequency ranges from 500MHz to 18GHz.

DRIVER AMPLIFIERS
12.5GB/s, 25GB/s & 43GB/s Mach-Zehnder Driver Amplifiers.

DIFFERENTIAL AMPLIFIERS
DC to 9GHz Differential Amplifiers & DC to 10GHz Differential Variable Gain Amplifiers.

TRACK & HOLD AMPLIFIERS
Track & hold to 20GHz.

TRANSIMPEDEANCE AMPLIFIERS
10GB & 40GB Applications.

WIRELESS POWER AMPLIFIERS/GAIN BLOCKS
WLAN 802.11 a/b/g/n, Bluetooth, WiFi, Small Cell PAs, DAS, WCDMA, HSPA, LTE, CDMA, EVDO, GSM, GPRS & WiMAX Applications.

HIGH POWER AMPLIFIERS
Solid State & TWT based High Power Amplifiers for applications up to 40GHz with output powers up to 10kW. Available as Modules or complete 19” Rack Assemblies.

INSTRUMENTATION AMPLIFIERS
Ultra-Broadband (0.01 to 50GHz) Amplifiers, featuring High Gain and Low Noise Figures, ideally suited to ATE and Test Systems use.

GPS AMPLIFIERS
Preamplifiers with Built-In Bandpass Filters for professional GPS Applications.

MILLIMETRIC/WAVEGUIDE AMPLIFIERS
Standard/Custom LNAs & PAs from 40 to 120GHz. P1dB to +30dBm. Noise Figures down to 3.5dB.

ANTENNAS

ANTENNAS & ACCESSORIES

Standard/Custom designs available including Ceramic, Spiral, Omni, Patch, Log Periodic, Discone, Flat Panel, Sector, Collinear, Dipole & Yagi.

STANDARD GAIN HORN ANTENNAS
10, 15 & 20dBi Standard Gain Values. 750MHz to 220GHz (WR975 to WR5). These Antennas are Linearly Polarised, Lightweight & Corrosion Resistant. Accessories include Mounting Brackets & Radome Covers.

Models include: Conical, OMT, Gaussian, Lens, Circular & Dual Polarisation Horn Antennas. Low PIM models available.
ATTENUATORS

Fixed & Variable Attenuators to suit every application.

Coaxial Fixed Attenuators with BNC, N-Type, 7-16, TNC & SMA Connectors for everyday use to 18GHz. High Frequency versions from 30GHz to 65GHz with 3.5mm, 2.92mm (K type), 2.4mm & 1.85mm (V type) Connectors. Low PIM models available.

High Power Attenuators from 10W to 4kW CW, using Aluminium Nitride, Beryllium Oxide and Oil Cooled Technologies.

Waveguide Fixed Attenuators in Waveguide sizes from WR650 to WR28.

Variable Attenuators, including Continuously Variable for Level Setting with Manual or Motor Drive Control. Step Attenuators (both Manual & Remote Controlled) for Test Applications.

PIN Switched and Voltage Controlled Attenuators.

Chip Attenuators for High & Low Power applications to 18GHz.

CAPACITORS

Aspen offers a quality range of Wound Film Capacitors & EMI/RFI Filters for Industrial, Commercial & Defence applications.

The Capacitor range includes Audio, Pulsed Power, Decoupling, Motor Start, Snubber, Sensing, High Voltage & Tuned Circuit Capacitors.

The wound film technology utilises various dielectrics including paper/foil, polycarbonate/foil and paper/plastic. Metallised polyester/polycarbonate wrap and fill as well as High Voltage plastic film, paper/plastic & metallised polyester.

The EMI/RFI Electronic filter range includes low pass filters, feed-through capacitor filters, power line filters & commercial filter assemblies.
CERAMIC RESONATORS

Coaxial Resonators made from the latest high performance Ceramic Dielectric materials.

Sizes range from 3mm² to 12mm² with lengths to suit all applications. Available in conventional Tab designs plus a new Tableless design which is ideal for surface mount PCBs subject to solder re-flow.

CIRCULATORS & ISOLATORS

Coaxial, Waveguide, Drop-In, Surface Mount & Microstrip designs for applications from 20MHz to 110GHz.

A wide range of low cost designs from VHF to Microwave offering very high performance in terms of insertion loss and isolation. High Power versions to 4kW plus.

Cryogenic Ferrites available for Ground Based Space Research & High Energy Physics applications.
COAXIAL CABLE ASSEMBLIES, CONNECTORS & ADAPTORS

COAXIAL CABLE ASSEMBLIES

COAXIAL CONNECTORS
Covering Frequencies up to 65GHz, we can supply most connector types, from High Frequency SSMA, 2.92mm, 2.4mm & 1.85mm Coaxial Connectors and from EIA 7/8" to EIA 9-3/16" EIA Rigid Line Connectors. 1.0mm Connectors also available to 110GHz.

COAXIAL CONNECTORS & ADAPTORS
Coaxial Connectors in all styles and for all applications, including APC-7 (7mm), BMA, BMMA, BNC, 75ohm BNC, C-Type, G874, GHV, HN, LC-LT, MC Card, MCX, MHV, MMCX, N-Type, QDS, Mini-QDS, QMA, SMA (to 27GHz), SC, SMB, SMC, SMP (GPO), SMPM (GPPO), SSMA, SSMB, SSMC, TNC, TPS, TRB (Triax BNC), TW34 Twinax, Type 43, UHF, Mini-UHF, 1.0/2.3, 1.6/5.6, 7/16, 4.3-10, 1.85mm(V), 2.4mm, 2.92mm(K), & 3.5mm.

IP67, IP68 & IP69K NEMA 6 Waterproof and Harsh Environment Connectors.

Low PIM Adapters available.

Mil-Spec: M39012-M55339 QPL, Quick Connect, Blind Mate and many custom designs, including Reverse Polarity versions.

NMD 3.5, 2.92, 2.4, & 1.85mm Test Port Adapters.

COAXIAL INTER-SERIES ADAPTORS
For all types of Coaxial Connectors, including BNC, TNC, N-Type, 7/16, HN, C, SMA, SMB, SMC, plus High Frequency SSMA, 3.5mm, 2.92mm, 2.4mm & 1.85mm.

WAVEGUIDE TO COAXIAL ADAPTORS
For Waveguide sizes WR2300 to WR10 plus Double Ridge sizes from WRO250 to WRD180.

TEL: +44 (0)20 8868 1311
CRYSTAL OSCILLATORS

XOs, VCXOs, TCXOs & OCXOs to 2.5GHz. Ultra-Low Phase Noise with <180dBc/Hz Noise Floor. Ultra-Low g-Sensitivity OCXOs & TCXOs. QPL Approved Parts Available.

CRYSTALS
We can supply a wide range of commercial and precision crystals for applications as diverse as Medical, Industrial, Defence, Space, Automotive, Telecoms & Instrumentation. Covering frequencies from 32.768kHz to 360MHz. Parts are available in a wide range of package styles, including cold weld, resistance weld, thru-hole to SMD and in many sizes from HC49 & 7x5mm to 1.6x1.2mm.

CLOCK OSCILLATORS
From low cost, high volume, to specials for Space/Flight applications Aspen can supply an extensive range of crystal clock oscillators to meet your requirements. Frequencies range from 12kHz to 2.5GHz with packages from the ultra small 2.0x1.6mm ceramic package to industry standard 7x5mm and 14pin DIL packages. Outputs include CMOS/TTL, LVPECL, LVDS and sinewave.

VCXOs
Voltage Controlled Crystal Oscillators with frequencies from 100kHz to 2.5GHz. Packages from 14pin DIL to 7x5mm plus the smallest package 2.0x1.6mm. A variety of output types are available.

VCOs
Voltage Controlled Oscillators operating in bands to 6.0GHz. VCOs are available in industry standard surface mount or SMA connectorised packages. Low phase noise and low power consumption plus a wide operating frequency range are the main features. For applications from 7GHz to 110GHz we can offer mechanically tuned Gunn diode based VCOs with waveguide or coaxial output.

TCXOs & VCTCXOs
Temperature Controlled Crystal Oscillators and Voltage Controlled TCXOs with output frequencies from 3kHz to 1.3GHz. Packages include the incredibly small 2.1x1.7mm & 2.0x1.6mm plus industry standard 7x5mm & CO-08. SMD packaged (14x9mm) tight stability VCTCXOs & TCXOs to Stratum 3 specifications.

OCXOs
Oven Controlled Crystal Oscillators with output frequencies from 1MHz to 2.5GHz using either AT or SC cut crystals. Product highlights include super low phase noise OCXOs for Instrumentation & Radar applications. Surface mount 19x15mm OCXOs for high stability applications such as GPS or 4G Femtocell.

EMAIL: SALES@ASPEN-ELECTRONICS.COM  WWW.ASPEN-ELECTRONICS.COM
DIVIDERS, SPLITTERS & COMBINERS

Coaxial and Surface Mount Power Dividers, Splitters & Combiners for High & Low power applications. 2-Way, 4-Way, 8-Way & 16-Way, SMA/2.92mm designs to 65GHz plus. 75ohm designs for low frequency and Coaxial Resistive Splitters for DC-65GHz applications. 3dB Hybrid Waveguide Dividers & Combiners to 110GHz. Low PIM models available.

We also offer High Power Multi-Way, Radial Combiners for special applications, where a number of Solid State Power Amplifiers (SSPAs) need to be combined into one High Power output.

TEL: +44 (0)20 8868 1311
Our extensive range of RF & Microwave Filters covers the frequency range from 100kHz to 110GHz. We can supply all the usual variants including Low Pass, Band Pass, High Pass, Band Reject & Notch filters as well as Diplexers, Duplexers, Triplexers & Switched Filter Banks. Typical technologies include Lumped Element, Cavity, Interdigital, Combline, Ceramic, Crystal, SAW & Waveguide.

CAVITY FILTERS
Frequency range from 30MHz to 40GHz. High “Q”, Low Insertion Loss, High Power Rating. Helical, Combline & Interdigital designs available.

CERAMIC FILTERS
Utilising one or more Miniature Ceramic Block Resonators, these Filters & Duplexers give excellent performance in a very small footprint, ideal for Surface Mount applications. Covering a frequency range from 200MHz to 11GHz, Ceramic Filter designs can give bandwidths from 0.5% to 25%. The high “Q” response & low insertion loss make them an ideal choice for low cost commercial applications.

CRYSTAL FILTERS
Covering the frequency range from 6 to 180MHz, Crystal Filters offer very high “Q” performance over a narrow bandwidth. Crystal Filters with standard IF frequencies of 10.7MHz, 21.4MHz & 45MHz are available in a range of off the shelf designs, using either Discrete Crystal or Monolithic Crystal designs.

DISCRETE COMPONENT/LC FILTERS
Using Discrete “L” and “C” components, Miniature Discrete Component Filters are designed to give optimum performance where small size is required. Covering the frequency range 5MHz to 10GHz and with bandwidths from 1% to >100%, these Filters are available in a wide range of packages including SMA connectorised, PC Mount Pins, Drop-In and Surface Mount.

SAW FILTERS
Surface Acoustic Wave (SAW) Filters are available with centre frequencies ranging from 30MHz to 2.65GHz and insertion losses as down to 1.5dB. With the smallest package size of just 2mm x 1.4mm, SAW Filters are ideal for applications where the smallest size possible is required.

SWITCHED FILTERS BANKS
For systems such as ECM and ELINT where broadband frequency coverage is required, a Switched Filter Bank is an ideal solution. The combination of a number of High “Q” Band Pass Filters and high speed PIN diode switches, results in a Sub-System that allows the user to filter a specific signal in milliseconds.

WAVEGUIDE FILTERS
Standard and Custom Designs to 110GHz.
With more than 40 years’ experience of RF & Microwave Components & Systems, plus a well-equipped service facility, Aspen is able to Design, Manufacture & Test “special to type” RF & Microwave Sub-Systems & Instrumentation products.

Typically in 19” rack mount chassis and with capability to 40GHz we are able to configure systems to your specification, supplying associated power supplies and control electronics as appropriate.

Amongst the many systems we have provided are a 40GHz Phase Locked Source with Phase and Amplitude Control and a 3GHz Signal Generation & Conditioning System.

Whatever your requirement, our dedicated and experienced design team are here to help provide the right solution for you.

Focussing on the frequency range of 40GHz and above we can supply a wide range of Millimeter Wave Components including:
- Frequency Extension Solutions for Spectrum Analysers & Signal Generators to 325GHz.
- Noise Sources to 170GHz.
- 77GHz FMCW and Passive Imaging Front Ends.
- Low Noise, Medium & High Power Amplifiers to 120GHz.
- Fundamental, Harmonic & Sub-Harmonic Mixers.
- Active & Passive Frequency Multipliers.

Other products include Filters, Detectors, Oscillators, Switches, Antennas, MMICs, Ferrites and many more millimetric waveguide and coaxial components for test and system integration.

TEL: +44 (0)20 8868 1311
MISCELLANEOUS PRODUCTS

BALUNS
Broadband, RF & Microwave Baluns and Balun transformers for Test & Measurement and high speed analogue to digital interface applications. 1:1 transmission line transformer and power divider-inverter Baluns in SMD and connectorised packages available in the range 200kHz to 67GHz.

BIAS TEES
A Bias Tee is in principle a diplexer with an extremely low crossover frequency offering low/flat insertion loss. Available in SMD or connectorised packages they offer extremely broadband performance in the range 4kHz to 65GHz.

DC BLOCKS
Bi-Directional DC Blocks in Inner, Outer & Inner/Outer configurations for applications up to 65GHz. SMA, N-Type, 2.9mm & 2.4mm connectors available.

DETECTORS
Coaxial Diode Detectors for applications up to 50GHz, including: Zero-Bias Schottky, High Sensitivity Zero Bias Schottky, Tunnel Diode & Biased Schottky designs. Connector options include BNC, N-Type, SMA & APC-7 versions.

GAIN EQUALISERS
Parabolic or Negative Slope gain equalisers for correcting system losses/attenuation.

LIMITERS
Pin Diode Limiters for systems up to 18GHz.

LOW FREQUENCY SIGNAL PROCESSING COMPONENTS
Power Dividers/Combiners, Directional Couplers, 90° Quadrabrdes, Vector Modulators, Phase Comparators, I&Q Demodulators, Multi-Couplers, Distribution Amplifiers and more from 100kHz to 6GHz.

LOW PIM PRODUCTS
Adaptors, Antennas, Attenuators, Couplers, Loads, Electromechanical Switches & Power Dividers/Combiners to 3GHz with PIM performance typically better than -153dBc.

TEST FIXTURES/JIGS
Custom built RF & Microwave connectorised test fixtures to 18GHz

SPACE/QPL QUALIFIED PRODUCTS

YIG TUNED PRODUCTS
Standard & Miniature Oscillators, Band Pass & Band Reject Filters. Frequency Synthesizers & Multipliers, Bench Test Filters & Synthesizers. YIG Drivers & Controllers, Harmonic Generators & Integrated Products ranging from 500MHz to 50GHz. We also offer YIG retrofits and equivalents to Avantek.

THERMAL JUMPERS
A new Surface Mount Ceramic Chip product designed to channel excess heat from one part of a circuit to another.

EMAIL: SALES@ASPEN-ELECTRONICS.COM  WWW.ASPEN-ELECTRONICS.COM
MIXERS

Aspen offers a wide range of RF & Microwave Mixers to 65Hz & Millimeter Wave to 500GHz. Surface Mount, Microlithic, MMIC, Coaxial & Waveguide package styles are available. Standard models include T3 High Linearity, Double & Triple Balanced, Image Reject, IQ Special Function, Harmonic & Sub-Harmonic Mixers.

TEL: +44 (0)20 8868 1311

NOISE SOURCES

Noise generation products for applications up to 110GHz including SMD & Axial Lead Noise Diodes, Noise Modules for BITE applications, Broadband Amplified Noise Modules for Instrumentation & System Applications.

Microwave RF Noise Source Generators & Microwave ENR Noise Generators are available in bands from 10MHz to 40GHz. Microwave Noise Generators can be used in a variety of applications including Noise Figure Measurement, Jamming & Self-Test for Radar Systems.

TEL: +44 (0)20 8868 1311
PHASE SHIFTERS

MECHANICAL
Mechanically adjustable Phase Shifters available in bands from DC-110GHz in Coaxial & Waveguide package styles. Options include Digital Counting & Direct Reading Dials plus Remote Controllable Motor Driven versions. A range of 180° or 360° Voltage Controlled Phase Shifters is also available with PCB Mount or Coaxial Packages. Operating Frequencies range from 10MHz to 1500MHz.

ELECTRONIC
Digital Phase Shifters offering 0° to 360° Phase Shift with up to 8-bit resolution & integral TTL drivers. Motor Drive & Continuously Variable Phase Shifters.

Radar Sensors/Doppler Devices, Transceivers and Systems to 86GHz for Movement, Range and Distance Detection.

Aspen offers a standard range of 24GHz movement and industrial sensors for speed detection, security and lighting applications.

Planar Radar sensors, K-band measuring Equipment, low cost Doppler Transceivers and Simulators.

Radar Signal Processors, Test and Measurement Systems and Antennas. Custom solutions to 86GHz are available.

Typical applications include security alarms, traffic movement detectors, traffic lights and pedestrian controlled crossings, perimeter security, industrial sensors and analyser systems, sports measurement equipment and many more.

EMAIL: SALES@ASPEN-ELECTRONICS.COM   WWW.ASPEN-ELECTRONICS.COM
RESISTORS, ATTENUATORS & TERMINATION CHIPS

RF & Microwave Chip Resistors, Attenuators & Terminations from DC to 40GHz & 2W to 2kW. Standard and custom designs including High and Low Power Chip, Chip & Tab, Chip on Flange, Rod & Disc and Coaxial models. Substrate materials include Alumina, Aluminium Nitride (AlN), Beryllium Oxide (BeO) and the latest CVD “Diamond” substrate for the very best in thermal performance.

ROTARY JOINTS & ROLL-RINGS®

Coaxial & Waveguide Rotary Joints in Single & Multi-Channel designs to 40GHz.


REPAIR & REFURBISHMENT

We also offer a complete Repair & Refurbishment service to help maintain the serviceability of your Rotary Joint assets. Please contact us with your requirements.
SEMICONDUCTORS - HIGH SPEED, RFICs & MMICS

High speed mixed signal integrated circuits for applications in high speed telecoms, plus analogue and digital signal processing. Products include: Amplifiers, Attenuators, Detectors, Gain Blocks, Mixers, Phase Shifters & Switches.

Serializers/Deserializers, Broadband Delay Lines, Amplifiers, High Speed Logic to 50GBps, Clock Processors plus ADCs (analogue to Digital Converters) and SHA (Sample & Hold/Track & Hold Amplifiers)

Monolithic Microwave Integrated Circuits (MMICs) from DC-120GHz in GaAs, GaN, InP, InGaP HBT as die / chips and in ceramic & plastic packaging.

Applications include wireless and wired communications, satellite, radar systems, cellular infrastructure, instrumentation, aerospace & CATV.

Amplifiers (Distributed, Driver, LNA & Ultra LNA, Power), Attenuators, Detectors, Frequency Multipliers, Front End Modules (FEMs), Gain Blocks, Mixers, Multifunction Chips, Phase Shifters, Switches to 40GHz.

Semiconductor Diodes and Chips in Silicon, Silicon Nitride/Oxide for switches, attenuators, phase-shifting, DC protection, RF bypassing or fixed tuning applications. Products Include:- Pin Diodes, Limiter Diodes, Chip Capacitors, Thin Film Resistors & Fixed Attenuator Pads.

EMAIL: SALES@ASPEN-ELECTRONICS.COM    WWW.ASPEN-ELECTRONICS.COM
**SIGNAL SOURCES / OSCILLATORS**

We supply Fixed and Variable Frequency RF & Microwave Signal Sources from 500MHz to 100GHz utilising DRQ, PCRO, YIG, Rubidium & Crystal based technologies.

Phase Locked, Free Running Sources plus Direct & Indirect Synthesizers.

Our product range includes:

**PHASE LOCKED OSCILLATORS**
The three main designs of phase locked oscillators are:
- Crystal (5 to 200MHz)
- Ceramic Resonator (300MHz to 3GHz)
- Dielectric Resonator (3 to 50GHz)

Models are available with internal, low phase noise reference oscillators or for use with an external frequency reference.

We stock a wide range of PDROs for quick delivery.

**PLL MODULES**
Phase Locked Loop Oscillators in SMD packages from 30MHz to 6GHz. Available in Integer N and Fractional N designs.

**SYNTHESIZERS**
Frequency Synthesizers in bands covering the frequency range of 50MHz to 50GHz. A variety of designs are available for all types of applications, including High Data Rate, Point to Point, Point to Multi-Point Digital Radios, Telecommunications, Cellular Radio, Satellite Communications & Instrumentation/Test Systems.

Direct Synthesizers offer the very best in Ultra-Fast Switching & Ultra-Low Phase Noise performance ideal for EW Simulation & Radar/Antenna ATE. Frequencies range from 0.01 to 40GHz in 1Hz steps.

For less demanding test applications our YIG based Signal Sources provide a low cost alternative to Wideband Signal Generators. With frequency ranges from 1GHz to 50GHz and full control via your PC these systems are designed specifically to meet your requirements.

**SWITCHES & SWITCHING SYSTEMS**

Electromechanical Coaxial Relay Switches, Switching Systems, PIN Diode & MMIC Switches from DC to 67GHz plus.

SMA, N-Type, TNC, SC, 2.92mm, 2.4mm & 1.85mm connector options and SMD packages available. Actuation/control voltages from 5V to 28VDC with TTL control. SPDT, Transfer, Bypass & Multiposition SP3T to SP12T variants. Low PIM Electromechanical Switches available.

RF & Microwave Switch Matrices & Redundancy Switching Systems for Test & System applications with GPIB, USB, LAN & PXI control options. Solid State & Electromechanical versions available.

TEL: +44 (0)20 8868 1311
TERMINATIONS & LOADS

RF High Power Terminations from 0.5W to 80kW for test and system applications with a wide range of input connectors from coax to rigid line sizes up to 6-1/8” EIA. Waveguide Models to 220GHz.

Coaxial Loads & Terminations for RF & Microwave test and system applications to 50GHz. Rectangular Waveguide & Double Ridge Waveguide options.

Low PIM versions with better than -153dBc available.

Many different design types are available from conventional “finned” products to Conduction Cooled, Forced Air & Water Cooled.

For circuit design we offer a range of Chip, Chip & Tab, Chip on Flange and Rod & Disc. Substrate materials include Alumina, Aluminium Nitride (AlN), Beryllium Oxide (BeO) and the latest CVD “Diamond” substrate for the very best in thermal performance.

RUBIDIUM SOURCES
A wide range of products from PCB Mount Modules to complete Rubidium System Sources & Test Sets. Low Power, Small Size & Weight, “MiniRB” Atomic Rb Clock for low cost applications. Space Qualified Rubidium & Maser Sources upon request.

SYNCHRONISED RB SOURCES
Synchronised Clocks are based upon Rubidium Synchronised Reference Oscillators (SROs) or Rubidium Synchronised Crystal Oscillators (SXOs) and can be used as references for GPS, Galileo, GLONASS, LORAN-C, Cesium & E1/T1. Available as board level products including Plug & Play Demo/Engineering Kits, System Modules & System Solutions. 1” High Rack Mount versions with Portable Battery Powered options are available.

REFERENCE FREQUENCY DISTRIBUTION SYSTEMS
Amplified Frequency Distribution Systems that utilise either Coax or Fibre for the distribution of Frequency Reference Signals to multiple locations, with distances of up to 2km.
Aspen offers an extensive range of Solid & Flexible Waveguide Components & Assemblies to 220GHz. Rectangular Waveguide sizes from WR2300 to WR10, Double Ridge Waveguide from WRD250 to WRD180 and Coaxial Adaptor sizes from 7/8” to 6-1/8” EIA including SMA, Type N, SC, TNC and 7/16”.

**Waveguide straights.**
Bends & Mitres with 30, 45, 60 & 90° E & H plane twists.

**Waveguide hardware**
such as flanges, gaskets, shims, clamps, hangers & fixing kits. Bulkhead feed-throughs, pressure windows & pressurisation sections.

**High Power Arc Detectors in Waveguide sizes from WR284 to WR28.** Shorting plates & sliding shorts.

**Waveguide transitions**
and waveguide to coaxial adaptors including right angle, end launch and custom designs from WR2300 to WR10.

**Waveguide “Quick” Connect/Disconnect Clamps** for quick and easy connection of waveguide system components.

Extra lightweight waveguide Assemblies in regular, half height & quarter height designs plus custom flange designs for space & airborne applications.

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