



RF & Microwave | Test & Measurement

- Components
- Test equipment
- Design and manufacture
- Service and calibration

www.apctech.com

RF & Microwave Components And Sub-Systems



ADSANTEC

Adsantec

- Very high-speed mixed signal ICs to 50GHz/50Gbps
- Multiplexers and demultiplexers
- Clock/data phase shifters and variable delay lines
- Selectors and switches, analogue to digital converters
- Linear, limiting and transimpedance amplifiers (TIAs)
- Track and hold amplifiers, fir filters
- High speed logic, clock processors and signal generators
- PRBS pulse generators from 0.1 to 40Gbps



Alaris Antennas

- Specialised antenna solutions and systems from 9kHz to 18GHz
- Direction finding (DF) with supporting RF electronics
- Monitoring
- High power transmit
- Jamming
- Counter RCIED
- Counter UAS
- Communications
- Multi-channel antenna switching units



AMCOM

- GaN and GaAs MESFET and pHEMT power devices to 10GHz
- Broadband MMICs and modues to 10GGHz/100W
- Custom design of RF front end components and modules



Arance Electronics

- High performance test cables and adaptors for defence, communications and research applications to 67GHz
- VNA test cables to 67GHz
- 50Ω low loss flexible, armoured, semi-flexible and semi-rigid cable assemblies
- NMD 3.5, 2.92, 2.4 and 1.85mm test port adaptors
- Precision mechanical calibration kits and torque wrenches



Bird Technologies

- Terminations and loads from 2W to 80kW including convection and conduction cooled models to 18GHz
- High power, oil, water, and air-cooled loads for digital broadcast applications
- Attenuators from 2W to 4kW
- Splitters, couplers, and signal samplers
- Coaxial adaptors including EIA rigid-line adaptors



CAES

- Phase locked frequency sources to 50GHz
- Free running dielectric frequency sources
- Direct and indirect synthesisers
- Fast switching, broad bandwidths and miniature designs
- Coaxial and crystal oscillators up to 50GHz
- Block up/downconverter modules for satcom applications



Charter Engineering

- Electromechanical coaxial switches from DC to 40GHz
- SPDT, transfer and multi-position SP3T to SP12T switches
- SMA, N-Type, TNC and SC connector options
- Internally terminated and high-power versions
- Low passive intermodulation (PIM) types



Ciao Wireless

- Amplifiers and sub-assemblies from 1MHz to 52GHz
- Low noise, ultra-broadband and multi-octave amplifiers
- Limiting and Ka band amplifiers
- Radial power combiners and dividers to 30GHz
- Space qualified filters, multiplexers, hybrids, and couplers to 65GHz



CrossPoint Technologies

- RF and microwave switching systems for commercial and defence applications including satellite earth stations, signal exploitation, ELINT COMINT, SIGINT, TT and C and test
- Standard products for HF, VHF, UHF, and microwave systems to 18GHz
- Matrix switching systems
- Redundancy switching systems
- Routing/selector switches
- Solid state and electromechanical versions
- Custom designs available



Diamond Antenna and Microwave

- Coaxial and waveguide rotary joints for commercial, satcom, ATC, defence, and space qualified applications
- Single and multichannel versions to 50GHz
- I, L and U style
- Roll-Rings®, slip-ring assemblies and roll-blocks
- Rotary joint repair and refurbishment available



Erzia Technologies

- Microwave and millimeter wave modules up to 110GHz for EW, radar, satcom, scientific, telecom, defence, and space applications
- Space and MIL-STD qualified products
- Solid state high power and low noise amplifiers
- Suspended substrate filters
- Integrated microwave assemblies (IMAs)
- Up-down converters, beamformers, RF front ends, switched filter banks, switching matrices and custom RF modules
- ISO9001 and EN9100 certified



Farran

- Millimeter wave components and systems to 500GHz.
- Frequency extension products for VNAs/PNAs/PNA-Xs, SAs, NFAs and signal generators (40 to 500GHz)
- Low cost mmWave, 2 port VNA test solutions (50 to 75GHz, 60 to 90GHz and 75 to 110GHz)
- Frequency extension controller modules and extender calibration kits (40 to 500GHz)
- Noise sources (40 to 170GHz) and mixers (18 to 500GHz).
- FMCW radar front ends (77GHz)
- Passive imaging front ends (94, 183, 220 and 300GHz)
- LNAs, medium and high-power amplifiers (40 to 120GHz)
- Frequency multipliers (20 to 325GHz)
- Mixers (18 to 500GHz)



Focus Microwaves

- Active and passive load pull equipment to 140GHz
- Delta tuners for on-wafer measurements, fundamental and harmonic to 67GHz ideal for 5G applications
- Active load pull with the RAPID product line for fast load pull and modulated measurements to 40GHz
- Passive tuners for fundamental and harmonic applications from 10MHz to 140GHz
- Auriga pulsed I-V (current-voltage)/RF characterisation system for active devices including FETs, BJTs, GaN HEMTs, LDMOS, SiC and graphene
- Mesuro behaviour modelling of high frequency transistors through a direct extension from linear s-parameters



GotMIC

- High frequency MMIC chips from 50 to 120GHz
- MMIC receivers, transmitters, and front-end IC solutions to 120GHz
- MMIC amplifiers, mixers, and switches
- MMIC frequency multipliers and detectors
- Evaluation boards available

RF & Microwave Components And Sub-Systems



IF Engineering

- Low frequency, surface mount and coaxial components from 100kHz to 6GHz
- Power dividers and combiners (2 way to 32 way)
- Directional couplers and 90° quad hybrids
- Vector modulators (I/Q)
- Phase comparators and I/Q demodulators
- Multi-couplers and distribution amplifiers



Innovative Power Products

- Broadband passive RF components from DC to 12GHz
- Baluns 20 to 2,500MHz, up to 100W
- 90-degree hybrid couplers 20MHz to 12GHz, up to 1.5kW
- Dividers/combiners 20MHz to 6GHz, up to 2kW
- Directional couplers 20MHz to 6GHz, up to 2kW, SMD, drop-in, tab and connectorised
- RF resistors DC to 6GHz, up to 800W, low capacitance, flanged and flangeless
- Terminations DC to 6GHz, up to 800W, connectorised, flanged and flangeless



Integra Technologies

- High power pulsed RF power transistors to 10GHz for radar and avionics applications
- VHF, UHF, L-Band, S-Band, C-Band and X-Band
- IFF, mode S, A-DME, G-DME and TACAN
- VDMOS up to 300W CW UHF
- Bipolar up to 1.5kW L-Band, 170W S-Band.
- LDMOS up to 1kW L-Band, 180W S-Band
- GaN up to 1.2 kW L-Band and S-Band



Integrated Microwave

- Ceramic filters from 100kHz to 11GHz
- Bandpass and bandstop filters
- Highpass and lowpass filters
- Ceramic coaxial resonators
- Diplexers, duplexers, and multiplexers
- Space qualified solutions



Junkosha

- High performance cable assemblies from 26.5 to 120GHz
- MWX0: High phase stability to 120GHz
- MWX1: Wide temp range and high durability to 26.5GHz
- MWX2: Flexible cables for measurement instruments
- MWX3: High phase stability over temp to 40GHz
- MWX4: Formable and flexible, low insertion loss cable assemblies to 67GHz
- MWX5: Formable semi-flex cable for to 18GHz
- MWX6 Series: High precision skew match cable assemblies to 67GHz
- MWX8 Series: VNA test assemblies to 50GHz
- Aerospace and space qualified cables available



KDS

- Miniature crystal resonators to 80MHz
- Miniature crystal oscillators to 212.5MHz
- Arkh.3G miniature crystal technology
- XOs, VCXOs, TCXOs and OCXOs
- Miniature monolithic crystal filters to 160
- Optical quartz products
- Automotive crystal products to 64MHz



Keysight Technologies

- High reliability electromechanical coaxial switches to 40GHz, providing absolute measurement certainty and long life to 5,000,000 cycles
- Adaptors, amplifiers, and attenuators
- DC blocks and diode detectors
- Directional couplers and bridges
- Power limiters, dividers, and splitters
- Solid state PIN switches



Koaxis

- RF coaxial cable assemblies for defence, tele-communications, and cable TV applications to 60GHz
- 50Ω, 75Ω (CATV), hand-formable, semi-rigid, flexible RG assemblies and VNA cables
- K-Flex™.047, .086, .120 and .141 flexible alternatives to semi-rigid
- Low loss, phase-tracking, phase and delay matched cables
- 1.85mm, 2.4mm, 2.92mm, MCX, MMCX, MMPX, Type N, SMA, SMP, SMPM, SSMA, SSMB, SSMC, TNC, VITA 67 and size 8 connector options



KVG Quartz Crystal Technology

- Standard and precision ceramic crystals to 300MHz
- Crystal oscillators: XOs, VCXOs, TCXOs and OCXOs to 2.5GHz
- Ultra-low phase noise with < 180dBc/Hz noise floor
- Ultra-low g-sensitivity OCXOs and TCXOs
- Crystal filters: MCF, discrete and discriminators to 200MHz
- ESCC qualified parts list for space applications
- Custom quartz crystal products available



Marki Microwave

- Passive and active components to 130GHz
- MMIC double and triple balanced mixers, bare die and modules to 130GHz
- T3 high linearity mixers to 40GHz
- Legacy double and triple balanced mixers to 50GHz.
- I/Q, image reject/SSB special function mixers
- LO drive amplifiers, gain blocks, baluns and transformers to 67GHz
- Bias tees, DC blocks, SMD and coaxial to 65GHz
- Couplers and 3dB quad hybrids to 67GHz
- Multipliers including doublers and quadruplers to 125GHz
- NLTL comb generators to 85GHz
- Filters including bandpass, lowpass and highpass
- Diplexers, gain equalisers and limiters
- Resistive, Wilkinson, 2, 3 and 4-way power dividers to 65GHz



Micro Lambda Wireless

- YIG tuned products from 500MHz to 50GHz
- YIG oscillators
- YIG retrofits and equivalents for Avantek™
- Miniature YIG oscillators including surface mount and T-08
- YIG bandpass and band reject filters
- Frequency synthesisers and multipliers
- Bench test boxes, YIG drivers and controllers
- Harmonic generators and integrated products



Millimeter Wave Products

- Millimeter wave products, microwave technology components and assemblies to 325GHz
- Waveguide transitions and adaptors
- Waveguide to coaxial adaptors
- Flexible, square, and double ridge waveguide
- Straights, E and H plane bends and twists
- Ferrite components
- Antennas, couplers, filters, loads and terminations
- Amplifiers, attenuators, detectors, mixers, and switches



Quantic Coven

- Precision quartz crystal resonators
- AT, FC, IT and SC-Cut crystals from 1 to 360MHz
- Low phase noise and low ageing
- Cold weld and resistance weld holders
- QPL approved since 1967 per MIL-PRF-3098H
- Rapid prototyping capability
- Extensive inventory of samples

Ask our team to arrange a technical demonstration or to discuss your projects

RF & Microwave Components And Sub-Systems

Quantic TRM

Quantic TRM

- Power dividers/combiners 2 to 24 way covering DC-26.5 GHz, connectorised, flatpack, drop-in and surface mount
- Directional couplers, 3 and 4 port to 26.5GHz, connectorised and flatpack packages
- Hybrids high power cellular, PCS and dual band models, connectorised, flatpack, drop-in and surface mount packages
- Space qualified and custom solutions available

Quasar

Quasar Microwave Technology Limited

Quasar Microwave Technology

- Passive waveguide components and sub-systems to 40GHz
- WG10/WR284 through to WG22/WR28 inclusive
- Rigid and flexible waveguide components and assemblies
- High power loads and fixed/variable attenuators
- Low, medium, and high-power terminations and shorts
- Broadwall, crossguide and loop couplers
- WG to coaxial adaptors, (N, SMA, K, APC7, TNC, 7-16)
- Waveguide taper transitions
- Double ridge waveguide components
- Splitters, phase shifters and line stretchers
- Horn antennas from WR975 to WR28
- Filters and diplexers, switching networks and OMTs
- Waveguide hardware, flanges, gaskets, shims and spacers, clamps and hangers, bulkhead feedthroughs, quick disconnects, pressure windows and pressurisation sections
- Calibration kits

RFbeam Microwave GmbH

RFbeam Microwave

- Radar sensors/Doppler devices, transceivers, and systems to 86GHz for range and distance detection
- Doppler sensors for indoor automation, movement detection and speed measurement
- Applications including automatic light activation, traffic movement/flow and security systems
- Analogue and digital processing output versions
- Doppler transceivers and simulators
- Radar signal processors, test, and measurement systems
- Antennas and custom designs available

SAFRAN

Safran

- High-end crystal, rubidium and integrated GPS/GNSS clocks and oscillators for telecom, defence, navigation, broadcast, instrumentation, and space applications
- SmarTiming+® disciplining with advanced holdover performance
- iSource+® range of crystal and rubidium sources for precise performance applications
- iSync+® range of synchronisation OCXO and rubidium oscillators and reference clocks



Signal Microwave

- Precision millimetric connectors from 40 to 110GHz
- Edge launch connectors 1.0mm (110GHz), 1.85mm (67GHz), 2.4mm (50GHz) and 2.92mm (40GHz)
- Field replaceable connectors 2.92mm (40GHz)
- Vertical launch connectors 2.92mm (40GHz)
- Test boards for edge launch connectors (40 and 70GHz)
- Broadband test verification boards (40 and 70GHz)
- Adaptors 1.85mm (70GHz)

smiths interconnect

Smiths Interconnect

- RF and microwave filters to 40GHz
- Cavity, ceramic, discrete, tubular and waveguide filters
- Manual and digital tuneable filters
- Duplexers and switched filter banks
- Manual, digital and voltage-controlled phase shifters
- Voltage controlled attenuators

sonoma

SCIENTIFIC

Sonoma Scientific

- Isolators, circulators, iso-adaptors, and hybrids from 40MHz to 40GHz with power handling to 4kW plus
- Surface mount, drop-in, microstrip, coaxial and waveguide
- Phase matched and low IM products
- Cellular, satcom, tetra, inmarsat, microwave radio, radar, and custom applications

TRIAD

RF SYSTEMS

Triad RF Systems

- Bi-directional amplifiers for high performance data and communications links
- Standard products from 20MHz to 8GHz
- TX output powers of 2, 5, 10 or 20W with error vector magnitude (EVM) of 4% typ
- Rx LNA has 11dB of gain and NF less than 2.5dB typ
- GaN and LDMOS technologies as applicable
- TX/RX switching times < 1µ sec typ
- Platforms include UAVs, UGVs and drones
- Dual and quad configurations for MIMO applications

vaunix

Vaunix Technology Corp

- Lab Brick™ RF and microwave test equipment to 40GHz
- Digital attenuators, signal generators and RF Switches SPDT, SP4T & SP8T to 40GHz
- Phase shifters to 12GHz, power dividers to 7.25GHz and USB Hubs
- Custom matrix attenuators and handover test systems
- Portable USB-powered devices that are tough, versatile and affordable
- Perfect for the lab or in the field

All of the technologies and components you need in one place

Through our global network of leading manufacturers, we have a vast range of specialist technologies, electronic components and complimentary services.

See all of the products and services we offer online, with detailed specifications and access to the latest data sheets.



Test & Measurement Equipment



APM Technologies

- Price competitive, high efficiency, programmable DC power supplies for automotive, aerospace, industrial, scientific, defence and medical applications
- Rack mount DC programmable power supplies including low noise linear designs
- Rack mount AC programmable power supplies



Bird Technologies

- The "Original and Best" ThruLine® wattmeters
- Handheld spectrum analysers, antenna and cable testers
- Wafer fab specific, high accuracy 1% RF power sensors and non-50 ohm diagnostic systems
- Handheld analogue and digital RF power meters and wattmeters
- Broadcast power measurement and monitoring systems
- Loads up to 80kW, attenuators up to 4kW
- Precision mismatch loads
- RF transfer standards for calibration
- Radio, transmission line, combiner and antenna monitoring systems for LMR and critical comms



Cleverscope

- PC-based mixed signal oscilloscopes
- 2 analogue and 8 digital inputs
- 4 isolated channel USB oscilloscopes
- Lifetime warranty



Environmental Stress Systems

- Thermal platforms (hot/cold plates)
- Mechanical (MRPT), nitrogen (LN2) or liquid carbon dioxide (LCO2) controlled platforms
- Cryogenic metal treatment systems
- Biomedical/pharmaceutical thermal platforms
- Liquid recirculating chillers
- Cascade condensers



Farran

- Frequency extension products for VNAs/PNAs/PNA-Xs, SAs, NFAs and signal generators (40 to 500GHz)
- Low cost mmWave, 2 port VNA test solutions (50 to 75GHz, 60 to 90GHz and 75 to 110GHz)
- Frequency extension controller modules and extender calibration kits (40 to 500GHz)



Focus Microwaves

- Active and passive load pull equipment to 140GHz
- Delta tuners for on-wafer measurements, fundamental and harmonic to 67GHz ideal for 5G applications
- Active load pull with the RAPID product line for fast load pull and modulated measurements to 40GHz
- Passive tuners for fundamental and harmonic applications from 10MHz to 140GHz
- Auriga pulsed I-V (current-voltage)/RF characterisation system for active devices including FETs, BJTs, GaN HEMTs, LDMOS, SiC and graphene
- Mesuro behaviour modelling of high frequency transistors through a direct extension from linear s-parameters



GW Instek

- Compact, touch screen oscilloscopes
- Oscilloscopes from 70 to 500MHz
- AC and DC power supplies
- Waveform, function, and arbitrary waveform generators
- Spectrum analysers
- Benchtop DMMs to 6½ digits
- Component testers and electrical safety testers



Keithley

- Keithley high resolution touch screen graphical DMMs, four-quadrant precision V and I load source measure units (SMUs) and electrometers
- Keithley fully customisable parametric test systems for high-speed production, semiconductor process control monitoring, TEG test and die sort



Keysight Technologies

- Digital oscilloscopes for all applications and budgets from 70MHz to 6GHz with touch screen operation and a wide range of decode software option models available
- Benchtop and handheld DMMs, LCR meters, current clamps, cable/antenna testers, spectrum analysers, portable and handheld models available
- Power supplies and electronic loads with ultra-high precision and low noise models
- Frequency counters
- Data acquisition and signal switching systems
- Function and arbitrary waveform generators
- RF power meters and sensors to 110GHz. Benchtop and portable VNAs and eCal calibration tools



Tektronix

- Class leading oscilloscopes from 2 to 8 channels, up to 64 digital channels and up to 70GHz bandwidth
- 1GHz to 26.5GHz portable and desktop real-time spectrum analysers
- High performance SCS parameter analysers for IV and CV measurement
- Arbitrary waveform generators up to 8 channels, 50GS/s for high-speed serial, optical communications, and radar test applications
- Tektronix software solutions including:
 - Tekscope PC analysis software
 - Keithley Kickstart instrument control
 - SignalVu RSA measurement software



Wavecontrol

- Handheld electromagnetic and magnetic RF field meters (for human exposure assessment and legislative compliance)
- Radio frequency, electromagnetic and magnetic field wearable personal monitors (for worker safety)
- Continuous electromagnetic and magnetic field monitors (for indoor and outdoor environments)
- Large area electromagnetic mapping solutions
- Calibration of electromagnetic and magnetic field probes in Wavecontrol's ILAC and ISO 17025-accredited laboratory



X-Com

- RF capture, recording and playback systems
- Spectro-X spectrum playback and analysis software
- RF editing and creation software
- Multi-channel, independently programmable, broadband signal generators
- Customised solutions for interference analysis, covert surveillance, radar signal analysis and wireless systems

In-House Capabilities

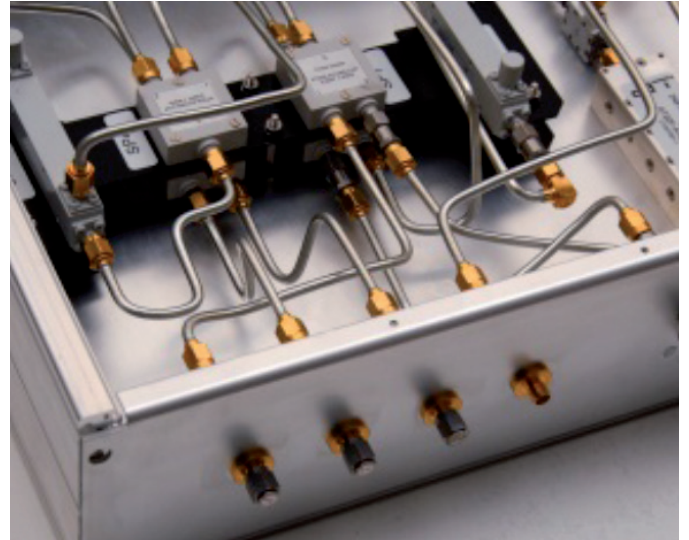
Design and test to 40GHz, power generation and power measurement to 1kW with 3% accuracy.

APC Technology Group's test equipment and calibration team has been working with Bird Technologies since it first started in business over 40 years ago. As the Bird Technologies' dedicated European Service Centre, we service, repair and calibrate the majority of Bird products at our West London facility. Our primary work is the calibration of RF power, plus the repair and refurbishment of high power loads and attenuators.

To ensure we offer the best service possible, we recently invested in high power amplifiers, plus associated equipment to ensure we are able to generate spur free, high power RF signals, vital for good calibration.

Power measurements are made using our high accuracy, high repeatability, Bird Technologies metrology grade RF wattmeters as transfer standards, plus very high accuracy broadband RF calorimeters as primary standards. In addition, we use a variety of 'special to type' test instruments to ensure your Bird wattmeter is in optimum operating condition.

With additional equipment such as spectrum analysers, network analysers and many other instruments, APC Technology Group is able to calibrate a wide range of RF and microwave equipment. This facility also gives us the ability to support many of the RF and microwave components and sub-systems we offer.

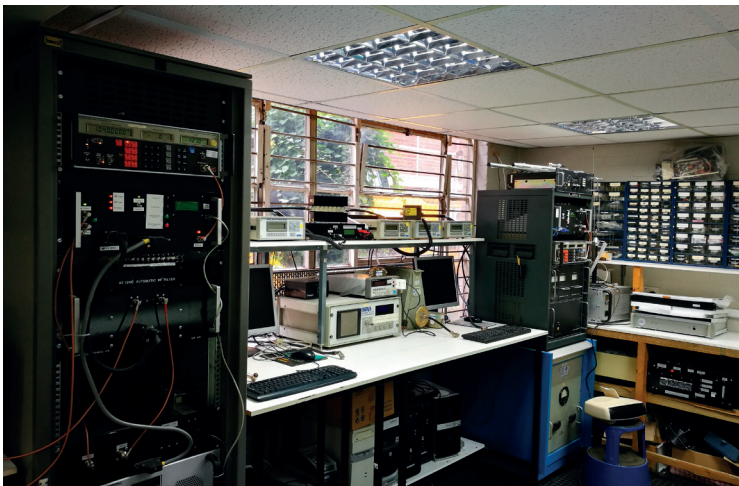
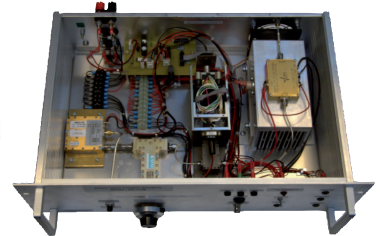


Design and Manufacture

With more than 40 years' experience of RF and microwave components and systems, plus a well-equipped service facility, APC Technology Group is able to design, manufacture and test 'special to type' RF and microwave sub-systems and instrumentation products.

A 3GHz signal generation and conditioning system (above). A high power (2W), 40GHz phase locked source with phase and amplitude control (right).

These represent just some of the products we have built to customer specifications. Whatever your requirements, our dedicated and experienced design team are here to help provide the right solution for your needs.



Specialist electronic components and systems, delivered with technical expertise

For over 40 years, APC has provided the design, specification and distribution of specialist electronic components and systems. Our specialist teams, each expert in their own field, can advise and support on a wide range of components, systems and services, with extensive design-in knowledge and technical insight.

OUR ACCREDITATIONS

