

RF AND MICROWAVE SIGNAL CONDITIONING AND MANAGEMENT

The logo for apitech, featuring the word "apitech" in a white, lowercase, sans-serif font. Above the letter "i" is a stylized graphic of an atom with three orbiting electrons.



RF & microwave signal conditioning and
electromagnetic spectrum management solutions,
from components to complete subsystems.



Capabilities & Certifications

With state-of-art facilities in the US and Europe, APITech helps customers design and manufacture components for the most complex RF, microwave, and mmW applications. A careful adherence to ISO controlled standard processes guarantees conception to design, development, and into production and final inspection that an APITech team member is providing the proper oversight and monitoring at each stage in the process.

Manufacturing Capabilities

- In-house Thin & Thick Film
- In-house SAW Fabrication
- Laser Sealing for Hermetic & Environmental Integrity
- Precision Machining
- Automated SMT & CCA assembly
- Solder Reflow
- Automated Pick & Place
- Chip on Board
- Ultra High Temp (225°C and above)
- Fluxless Soldering
- In-house Chip & Wire (Hybrid) Technology
- Automated Wirebonding
- Wire Bond Pull Qualification
- Parallel Gap Welding
- Auto Epoxy & Solder Dispensing
- Auto Die Attach
- Void-Free Die Attach
- Manual Wire Bonding & Ribbon Bonding
- Nitrogen Backfill & Pre-Seal Vacuum Bake
- Fine and Gross Leak Hermetic Seal Verification
- Steam Aging & J-STD-001 Solderability Testing
- Low Temperature Co-fired Ceramic (LTCC)
- Glass Microwave Integrated Circuit (GMIC)

Environmental Screening

- Mechanical Shock
- Vibration (Random & Sinusoidal)
- Thermal Cycling & Thermal Shock
- PIND (Particle Impact Noise Detection)
- Passive & DC Biased Burn-In
- Accelerated Life Testing

Certifications

- All Manufacturing Facilities Certified to ISO 9001:2015
- Six Certified AS9100 Facilities
- ANSI 20.20 Compliant Facilities
- Department of State ITAR Compliant
- Cleared Facilities & Personnel
- Six Sigma Greenbelts
- Hybrid Lab certified MIL-PRF-38534 (Class H and K)
- QPL MIL-PRF-15733 & MIL-PRF-28861 (Selected Products)
- MIL-STD 790 (DSCC), MIL-STD 1553 (Data Bus), MIL-STD 883 (Hybrid), MIL-STD 202 (Passive), MIL-STD-810 (Systems), MIL-STD 461 A/B/C/D/E (EMC), MIL-STD 1399 Surge (EMC)
- Solder/Assembly J-STD-001 Class 3 & IPC-A-610
- NEBS Approved (Selected Products)
- RoHS Compliant (Selected Products)





RF/Microwave Components, Assemblies & Subsystem Solutions

AESA Radar Subsystems

- Scalable Active Antenna Array Unit
 - Line-replaceable quad T/R modules contained within modular plank assemblies

Programmable Attenuator, Switch Units and Subsystems

- Multi-Channel Attenuation Subsystems
- Switch Matrices
- Mobile Unit Fading Simulators
- Programmable Attenuators and Controllers

CNI Subsystems

- I Band Transponders
- RRB Receiver for surveillance/navigation radars

Integrated Microwave Assemblies (IMAs) & Subsystems

- Amplifier Based IMAs & Subsystems
 - Up to 3,200 watts output power; frequencies up to 50 GHz; various forms of control & interface
- Frequency Generation IMAs & Subsystems
 - Frequency generation from DC input supply; up to 50 GHz
- Filter Based IMAs
 - DC – 40 GHz, excellent rejection; low loss designs
- Switched Filter Banks
 - 20 – 7,500 MHz; 2 to 7 channels; user-configurable
- IFMs and DFDs
 - 2 – 18 GHz coverage in a single unit

- Up/Down Converters
 - High linearity; low power consumption
- Receiver Front-Ends
 - Low noise; up to 50 GHz

Power Distribution & Conversion

- Switched Power Distribution Unit
 - Single phase up to 30 Amps power; 1U package
- Junction Box
 - 8 VDC output; 150 Amps DC input
- Intelligent Power Distribution Unit
 - Frequency up to 400 Hz; single and 3-phase inputs to 80 Amps
- Tactical Power Supply
 - Ruggedized, portable, COTS; AC/DC/dual input models
- Power Entry and Export Panel
 - +24/28 VDC to 200 Amps; 3-Phase AC to 60 Amp per phase input/output

Differentiators

Advantages in system performance and reliability

Vertical integration utilizing in-house components and multi-disciplined engineering and design expertise.

Reduced material costs across the supply chain

Standard products and common integration platforms.

Reduced size and weight

Multiple RF and function components integrated in a single housing.



Passive & Active RF/Microwave Components

Attenuators

- Convection and conduction cooled
- Fixed DC – 26.5 GHz; 2 – 1,000 watts
- Variable DC – 4 GHz; cycle life up to 10,000 cycles
- Manual Step DC – 6 GHz; up to 2 watts
- DC – 10 GHz low PIM designs

Terminations and Loads

- Convection and conduction cooled
- Fixed DC – 26.5 GHz; 2 – 1,000 watts
- DC – 20 GHz low PIM designs; 25 – 500 watts
- Convection cooled flat packs DC – 40 GHz; 50 – 550 watts
- 0.01 – 20 GHz; voltage 50 – 200 (high voltage options from 900-3,000)

DC Blocks

- Inner, outer, inner-outer
- 0.01 – 20 GHz; 50 – 200 volts
- High voltage options 900 – 3,000 volts

Mechanical Phase Shifters

- DC – 26.5 GHz; 10 – 50 watts

Power Dividers and Splitters

- 2- and 4-way dividers
- DC – 40 GHz; 0.5 – 2 watts

Bias Tees

- General purpose, high power, high current, pulsed
- 75 Ohm and broadband options
- 0.1 – 50 GHz; 16 – 100 volts

Gain Equalizers

- Broadband; narrowband
- Negative and positive slope and ripple options
- DC – 40 GHz

Adapters and Connector Systems – Planar Blindmate®

- Threaded and threadless connectors
- DC – 40 GHz and DC – 800 MHz

Delay Lines

- BAW, SAW, lumped constant, steel dispersive, & coaxial topologies

Rotary Joints

- MA, N, TNC and 2.92 connectors; wideband; miniature designs

Phase Shifters

- Coaxial; DC to 40 GHz; Trombone & trough line designs

Power Divider/Couplers

- Quadrature hybrid
- Multi-octave broadband
- 1,000 watts



Mixers

- 0.5 MHz – 26.5 GHz; double and triple balanced; SMT, drop-in and connectorized

Switches

- PIN diode, connectorized and GaAs; frequencies up to 22 GHz

Limiters

- Waveguide and Receiver Protector; GMIC Limiters; RF Limiters & Limiting Amps

Detectors

- Analog and threshold detectors; 10 MHz – 16 GHz

Variable Attenuators

- Surface Mount; DC – 2 GHz

A/D & D/A Converters

- MOS or TTL compatible; +5 volts or +15 volts

Patch Antennas

- Ceramic, off-the-shelf; cable or SMA connector

Diodes

- Space-screened; frequency multiplier, tuning varactor, and PIN silicon diodes

Differentiators

System integration solutions

Broad portfolio of components spanning a wide variety of systems and applications.

Large selection of ITAR-free solutions

Manufactured in the U.K.

Design flexibility

Products available in standard, configurable or as customizable models.





Powerfilm® Surface Mount Resistive Products

Flange Attenuators

- 0.5 – 4.0 GHz; 10 – 100 watts

Chip Attenuators

- 0.5 – 30 GHz; 0.75 – 100 watts
- Temperature variable option

Flange Terminations

- 0.4 – 7 GHz; 20 – 800 watts

Chip Terminations

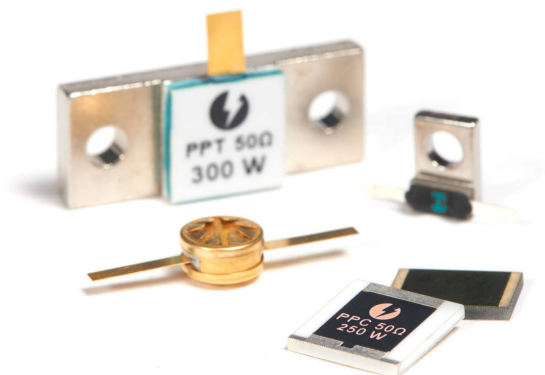
- 0.5 – 18 GHz; 0.5 – 600 watts

Flange Resistors

- 0.4 – 4.0 GHz; 10 – 800 watts

Chip Resistors

- 0.4 – 18 GHz; 0.05 – 800 watts



Differentiators

MIL-SPEC quality

Standard in-house screening.

Dedication to quality

Highest quality surface mount attenuator, termination and resistor chips in the industry.

Variety of substrates and wrap options

Thin and thick film technologies.

Filters

Bandpass, Lowpass, Highpass, Band Reject

Lumped Element, Cavity, Tubular, Ceramic, Suspended Substrate, Waveguide

Multiplexers, Triplexers, Diplexers

- DC to 40 GHz; contiguous and non-contiguous; mixed topologies

Differentiators

Integration expertise

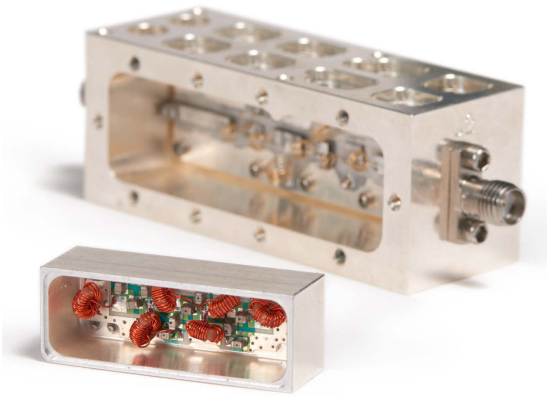
Multiple and mixed topologies integrated in a single unit to optimize system performance.

Market-driven solutions

Space, wireless telecom, co-location and defense.

Smallest footprint possible

State of the art design and simulation software utilized to produce the highest performance, custom filter products.



Amplifiers & Power Amplifiers

High Power

- Frequencies to 26 GHz; Broadband; Class A, Class AB; linear; operating

Pulsed Power

- Pulsed, solid state power amplifier technology

GaN Solid State Power

- 1kw output power; ideal for TWT replacement

High Frequency

- 4– 50 GHz; no NRE charges on most designs

High Linearity

- Performance up to IP2 values of +120 dBm

Low Noise

- Noise figure values as low as 0.8dB

Low Phase Noise

- 181 kHz at 10kHz performance

Automatic Gain Control Amps

Power Amp Drivers & Gain Blocks

Filtered GPS LNAs

- COTS-based; 1.8 dB typical noise figure

Differentiators

Technology expertise

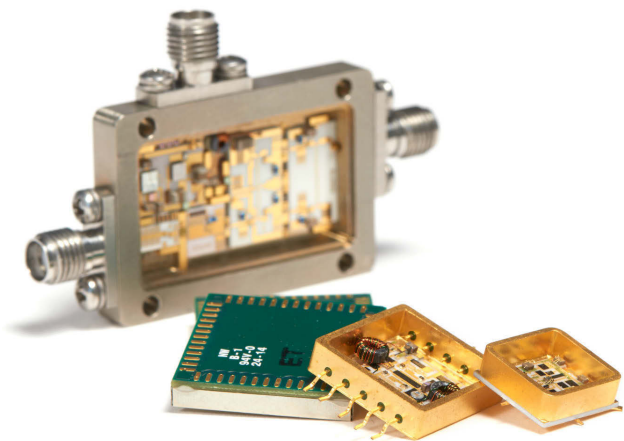
Hybrid thick and thin film, chip and wire, and SMT processes with leading edge semiconductor technologies.

In-house machining

Expertise in ceramic, metal, plastic and hermetically sealed packaging.

Design flexibility

Custom solutions without NRE charges on most standard amplifiers.





Frequency Sources

Synthesizers

- Wide bandwidth; multiple step size; fast switching; low phase noise

Configurable Surface Mount Synthesizers

- Full octave designs; excellent phase noise performance; standard designs to 6 GHz

Comb Generators

- Step recovery diode (SRD) generates very narrow voltage spikes

Frequency Multipliers

- Low signal degradation and multiple frequency options

Dielectric/Coaxial Resonator Oscillators (DRO / CRO)

- 500 MHz – 21.5 GHz

Phase Locked Oscillators (PLO)

- High reliability; excellent phase noise performance

Master Reference Oscillators

- 0 – 480 MHz; Output power level +20 dBm

Voltage Controlled Oscillators (VCO)

- Up to 7 GHz; gold substrates; low junction temperature

Differentiators

Extensive design library

Custom and standard building blocks of low phase noise frequency sources.

Optimized performance

Combining various technologies such as hybrid chip and wire for maximum component density and heat dissipation.

Microelectronics

PIN Diode Drivers

- Output current of 10 – 50 mA; switching speeds as fast as 6 ns

Thin Film

- Plated through and filled interconnects; metallization options

Thin Film Chip Resistors

- Silicon or alumina substrate; resistor tolerance 0.1%

Thick Film

- Ceramic and LTCC

Optoelectronics

- 20 Mbps to 12.5 Gbps data rates; ultra-low power consumption
- Protocol-agnostic optical transceivers and optical media converters
- ITAR-free solutions



High Temperature Electronics

- Hybrid modules, data processors, sensor/ motor controls
- Extreme/harsh environments
- Extended lifetime at 225°C continuous

SAW Filters

- 20 – 2,600 MHz; Insertion loss as low as 1.2 dB

SAW Oscillators

- 100 MHz – 4,000 MHz; low phase noise performance to -124 dBc/Hz at 1 kHz offset

SAW Delay Lines

- 20 MHz – 2,000 MHz; 1 µsec to 10 µsec delay

Multi-Chip Modules (MCMs) & Hybrid Microcircuits

- Multi-layer interconnects; chip and wire; wire bonding; ultra-high temperature

Substrate Printing

- LTCC, HTCC, thick film, KQ fine line, BeO

A/D & D/A Converters

- High resolution, high speed, small packages; ability to operate over extended temperatures

High Power DC/DC Converters

PCBa, Box Manufacture and Assembly

Differentiators

Broad technology competencies

Mixed signal and power, optoelectronics, thin film and SAW fab with proficiencies in advanced thermal and packaging techniques.

Harsh environment solutions

High reliability electronics for ultra high temperature and extreme environments.

Most rigorous requirements

Products designed and manufactured in MIL-PRF-38534 Class H & Class K certified facilities.

Program heritage

Deep space, scientific, military and satellite communications and commercial.





Who We Are

Value-added Integration from Components to Subsystem Solutions

APItech provides rugged, reliable, and efficient subsystems, assemblies, and components for use in the most mission critical defense and military applications, supporting government programs throughout the world. With diverse program experience and preferred supplier status with some of the industry's top premier contractors, our precision-engineered MIL-grade products are ideal for applications where uncompromised reliability and uninterrupted performance is required. APItech is the Electromagnetic Spectrum Innovator at Tier 2.5-4 in the supply chain.

SYSTEMS INTEGRATION
SYSTEM PRIME



F-35

MISSION/INTEGRATED SYSTEMS
TIER 1



Radar or
Communications

INTEGRATED SUBSYSTEMS & BOXES
TIER 2



Radio or Interface
Assembly

MODULES
TIER 3



IMAS

COMPONENTS
TIER 4



Passive
COAX

The Electromagnetic Spectrum Innovator

APItech is an innovative designer and manufacturer of high performance systems, subsystems, assemblies and components for technically demanding RF, microwave, millimeterwave, electromagnetic, power, and security applications. A high reliability technology pioneer with over 70 years of heritage, APItech's products are used by global defense, industrial, and commercial customers in applications spanning radar, electronic warfare, unmanned systems, missile defense, harsh environments, space, communications, medical, test and instrumentation, and more.

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