

POWER AMPLIFIER SOLUTIONS



APITech is a leading manufacturer of power amplifier subsystems and integrated amplifier assemblies incorporating multi-band amplifiers, switched harmonic filter banks and high efficiency DC converters with integrated adaptive biasing controls to ensure high reliability.



High Power Amplifiers, Drivers and Power Amplifier Subsystems

APITech is a leading manufacturer of high performance RF and microwave GaN, GaAs, MESFET, E-pHEMT, LDMOS, Class A, Class AB, Class C, broadband, hybrid, fully-modifiable power amplifier modules, drivers, and subsystems. APITech's diverse lineup of power amplifier solutions include broadband models covering DC to 26 GHz in a small, low profile package. Using advanced semiconductor technologies for broader bandwidths, along with proprietary design techniques, our power amplifiers deliver exceptional performance up to 1,000 watts and output power to 500 watts.

Experts at Vertical Integration

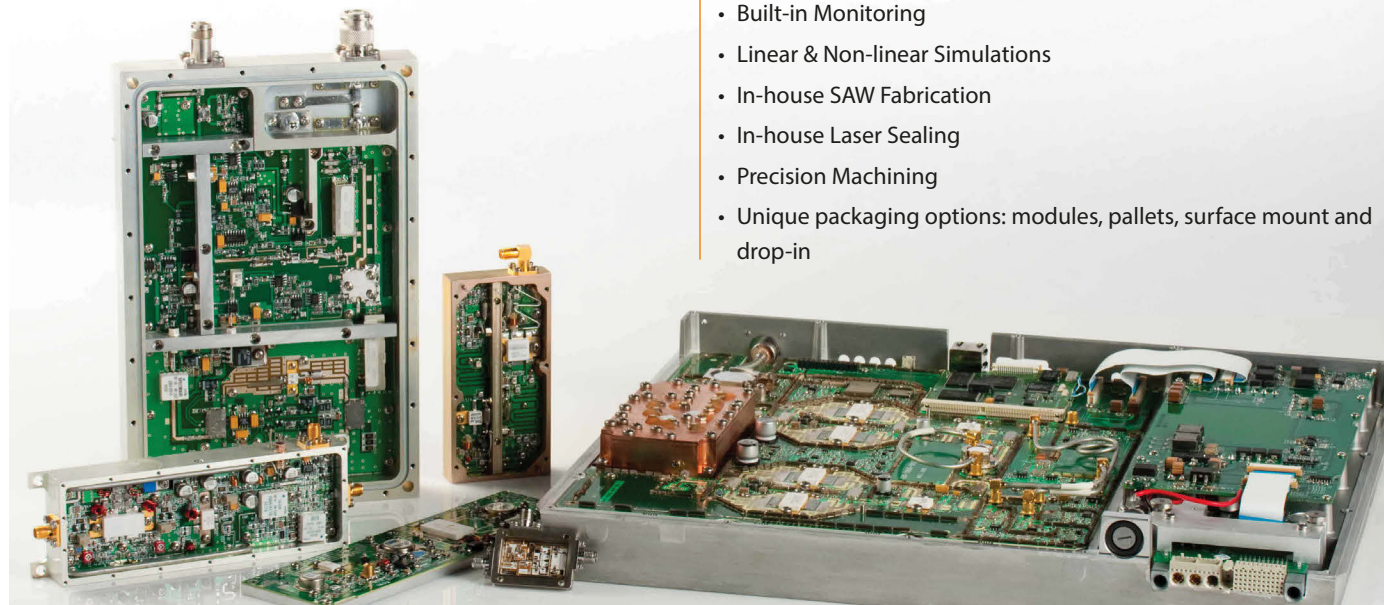
Through commitment to technical innovation and engineering, full product life-cycle involvement, and vertical integration capabilities, our standard and custom-designed high-reliability solutions are designed to address the most complex needs of military and commercial customers.

Complex Designs. Small Footprint.

APITech engineers optimize package configurations to address challenging thermal and environmental conditions, meeting the end customer's system level integration needs in the smallest footprint possible.

Features & Core Competencies

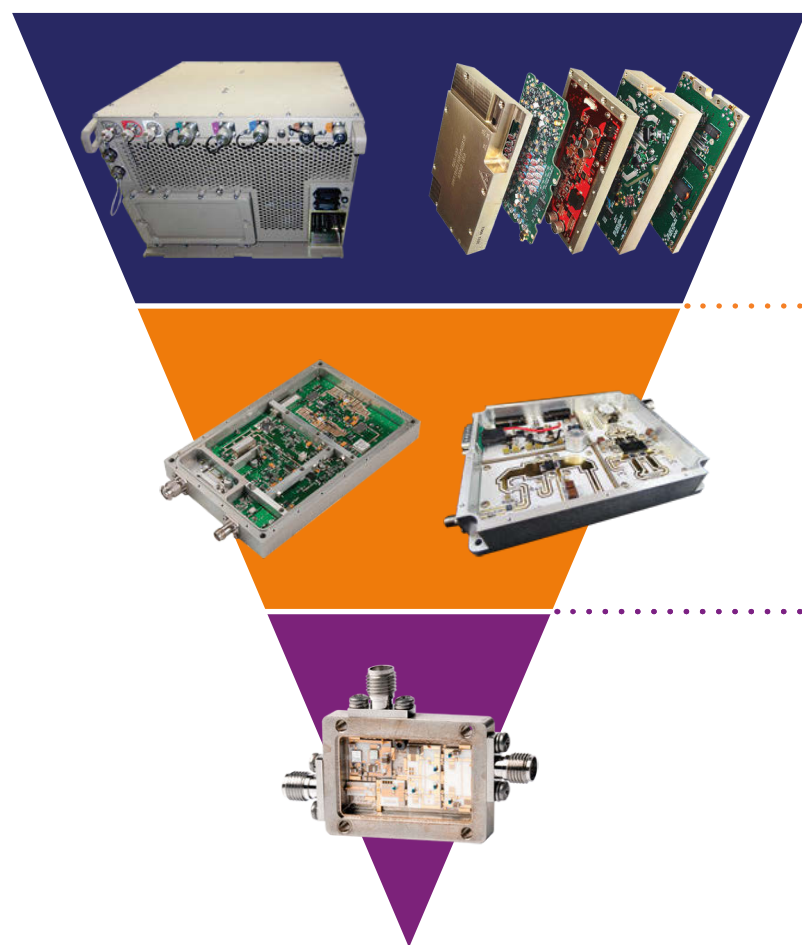
- RF Jamming
- Broad Pulsed Power Capabilities
- Built-in User Control Interfaces
- High Input Protection Circuitry
- Thermal Temperature Compensating Circuits
- Fault Monitoring
- In-house Thin and Thick Film Fabrication
- In-house Chip & Wire (Hybrid) Technology
- SMT Manufacturing
- Void Free Die Attach Process
- Thermal Simulation
- Built-in Monitoring
- Linear & Non-linear Simulations
- In-house SAW Fabrication
- In-house Laser Sealing
- Precision Machining
- Unique packaging options: modules, pallets, surface mount and drop-in





Power Amplifiers Reaching Next Levels of Integration

From Gain Blocks, Drivers and Single-Function Modules to Fully Integrated High Power Amplifier Assemblies and Subsystems Designs



Multi-Function Power Amplifier Subsystems

- Integrated LNA, Filtering, Switching Functions
- Integrated Power Supplies & Cooling Features
- Digital Control Capabilities
- Rack Mount Sub-Assembly and Chassis Design
- GaN-Based Solid State Power Amplifier Technology

Power Amplifier Modules

- Broadband Jamming & EW Solutions
- GaN Solid State Pulsed Power
- TWT Amplifier Replacement
- Radar & Communications Applications
- Wireless & Co-Site Solutions

Power Amplifier Drivers & Gain Blocks

- Multi-Stage Amplifier Solutions
- Internal Voltage Regulation
- Radar and Jammer Applications
- Balanced Output Stage
- Filtered Input
- GaN-Based Standard Designs

Reduced Size & Weight

Integrating multiple RF and function components in a single housing reduces package housing size and weight while optimizing heat transfer.

Improved Performance

Improvements to overall system performance across the block diagram as the result of the optimization of integrated components.

Cost Savings

Reductions in overall material costs across the supply chain and improvements to accuracy and repeatability through manufacturing process controls.



Diverse Power Amplifier + Component Integration Capabilities

APITech Components	Integration Applications
Small Signal Linear Amplifiers	Power Amplifier Driver Stages
Filters	Harmonic and Spurious Suppression of Power Amplifiers
Switches and Phase Shifters	Beam Steering of Electronically Steerable Array Radars
Couplers, Detectors, and Digital Circuitry	Built-In Test and Smart Biasing Capabilities of Power Amplifiers

High Power Amplifier Modules, Assemblies and Subsystems

Narrow, Broadband and Band-Specific. Rack Mount Solutions and Custom Module Assemblies.

At APITech, our high performance power amplifier modules, assemblies and subsystem solutions are designed with strict attention to efficiency and reliability, utilizing the latest GaN, LDMOS and GaAsFET technologies. Our diverse product line features low noise figure designs, custom band configurations, rack mount and custom housings, and integration capabilities with a wide range of high performance RF and microwave components.

Utilizing in-house chip and wire (hybrid), thin film, and SMT technology, our integrated power amplifier solutions are available as standard or custom designs in operating frequencies up to 26 GHz with output levels from 500mW to 1 kW, ideal for communications, jamming, electronic warfare, aerospace and industrial applications.



Pulsed Power Amplifiers

GaN-Based Solid State Pulsed Power Amplifiers. Expanded Pulsing Capabilities.

APITech’s line of Gallium Nitride (GaN) Power Amplifiers utilize pulsed, solid state power amplifier technology and include designs that operate with output power levels up to 1,000 watts and frequencies to 18 GHz.

These power amplifiers serve as cost-effective replacements for traveling wave tube (TWT) amplifiers and offer longer life, better efficiencies and reduced size and weight than their TWT counterparts.



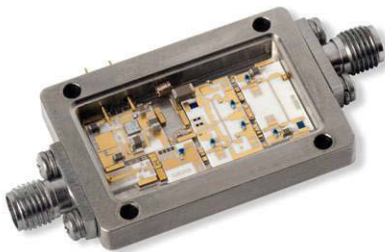


Power Amplifier Drivers & Gain Blocks

Excellent Linearity, Low Noise, Standard and Configurable Models Available Off-the-Shelf.

Designed to support various system requirements, APITech's drivers and gain blocks are packaged in a variety of configurations designed to meet customer-specific applications.

- 3 Stage Amplifier w/ Internal Voltage Regulation
- Includes Class A, and Class AB Linear Amplifiers
- Balanced Output Stage
- Filtered Input (18 dB/Octave Filter Roll-off)
- Latest GaN, GaAs, LDMOS Technologies
- Frequency ranges within 1 MHz - 26 GHz
- Transistor die - extended operating temperature range, -55C to +125C



Reliability Through Testing & Quality Assurance

Prior to delivery, APITech's performs 100% electrical testing on all power amplifiers to confirm compliance with the customer's specification requirements.

Our quality management system is compliant with ISO-9001:2008 and periodically audited by our registrar. Additionally, APITech also offers military and high reliability commercial environmental screening.

- Comprehensive Testing Capabilities
- Conversion Gain
- Spurious Testing
- Vibration and Shock
- IP2, IP3, and IP2H
- Current Draw
- Noise Figure
- Windowed Gain Ripple
- Compression Tests
- Linearity Testing
- LO Leakage Testing
- Image Rejection
- Group Delay
- Temperature Cycling

Our thick and thin film amplifiers are designed and tested to meet the reliability and testing requirements of MIL-PRF-38534 and the screening requirements of MIL-STD-883.



APItech Power Amplifier Applications

- Electronic Warfare
- Broadband Jamming
- Radar
- Pulsed Radar
- Military Communications
- Defense
- Transmitters
- Digital Control
- Satellite Links
- Test Equipment
- Test Sets
- Automated Metering Infrastructure
- Commercial/Medical/Industrial
- Aerospace

APItech's Complete Line of Amplifier Solutions

Standard, Configurable and Fully-Customizable Amplifier Products & Solutions.

High Linearity Amplifiers

Second order intercept performance as high as +113 dBm

Ultra Low Phase Noise Amplifiers

Low phase noise performance as low as -181 kHz at 10 kHz

Surface Mount Amplifiers

High volume packaged amplifiers at reduced costs

High Frequency Amplifiers

- Electronic Warfare
- Small size; Internal voltage regulators

Automatic Gain Control Amps

Frequency ranges from 100 MHz to 2000 MHz

RF Limiting Amplifiers

High input power ranges; Hermetic packaging

Low Noise Amplifiers

Low noise figure performance as low as 0.8 dB

Filtered GPS LNAs

COTS-based; Noise figure of 1.8 dB typical





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, millimeter-wave, 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.



www.apitech.com | 855.294.3800

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