Frequency Sources

With an extensive design library of low phase noise frequency sources including high performance amplifiers, mixers, filters, and switches -- API can optimize your overall frequency source design for superior performance and value.

- Synthesizers: Wide bandwidth; multiple step size; fast switching; low phase noise
- Phase Locked Oscillators (PLO): High reliability; excellent phase noise performance
- Dielectric/Coaxial Resonator Oscillators (DRO / CRO): 500 MHz to 21.5 GHz; modified standard; units available in HF to Ku band
- Comb Generators: Step recovery diode (SRD) generates very narrow voltage spikes
- Surface Acoustical Wave (SAW) Oscillators: Low phase noise; excellent frequency stability; rugged construction
- Voltage Controlled Oscillators (VCO): Low phase noise; superior high selectivity
- Digitally Tuned Oscillators (DTO): Low residual FM of less than 20 dBc @ 100 kHz
- Frequency Multiplier Oscillators (FMO): Unique isolation system for exceptional phase noise during vibration
- Master Reference Oscillators (MRO): SC cut crystal for frequency stability and low noise
- Multiplied Phase Locked Oscillators: Ultra low phase noise; modify standard parameters to meet customer requirements

Antennas

From design through manufacturing and testing, API is the leader in complete vertical integration of antennas. Our advanced simulation techniques, in-house prototyping and high volume manufacturing, enable us to deliver custom, or off-the-shelf solutions to meet the unique requirements of commercial, military, and space applications.

API has developed an approach that supports a LRU (Line Replaceable Unit) for AESA platforms providing TRM modules (dual and quad) for naval, ground and airborne applications. These LRUs allow for a common module building approach for ease of system integration, first line repair, and reduced cost of ownership.

- Patch Antennas: 1 GHz to 6 GHz; 13mm to 50mm square; Gain response from 0 to 3 dBi for half-power beamwidths of 1100; Gain at boresite (90° elevation) can exceed 6 dBi
- Planar Antennas: Custom linear and circularly polarized arrays; High gain up to 12 dBiC in L- and S-Band
- Phased Array: X-Band Quad Transmit Receive Module (4-Channel T/R Module) Demonstrator; Dual S-Band 100W Transmit/Receive Module (TRM); C-Band AESA capability
- Custom/Integrated Assemblies: 150 MHz to 14 GHz; Active antenna assemblies with filter and switching capabilities; GPS, RFID, meter reading, asset tracking, and point-to-point communications

Amplifiers

RF & Microwave Amplifiers from API have a long heritage in quality and design. From components, to complete amplifier subsystems, API engineers will work with you on your design to develop a custom or semi-custom solution utilizing hybrid thick and thin film and SMT processes with leading edge technologies like GaN, MOSFET, LMDOS, GaAs, and SiC.

- Broadband High Power: Wide bandwidth, high efficiency
- Small Signal: Ultra low phase noise, high dynamic range & spurious signal suppression
- High Linearity: Performance up to IP2 values of +120 dBm
- Filtered GPS LNA: Reduce out-of-band interference; achieve high dynamic range
- Automatic Gain Control: Anticipate power levels and adjust output power
- Transit/Receive Modules: X-Band QTRM, S-Band TRM, and phased array; AESA applications
Microelectronics
A world-class leader in the microelectronic vertically integrated solutions industry, API is your one-stop, full-service partner when superior quality and high performance is a must.

Technologies
- RF/Microwave & MMW
- Mixed Signal & Power
- Optoelectronics Illumination
- Build-to-Print
- Thin Film & SAW Fab
- MIL-PRF-38534 H & K
- Optical Transceivers

Capabilities
- Chip on Board
- Automated Pick & Place
- Automated Wirebonding
- DC to 50 GHz ATE
- High Temperature
- Void Free Solder Attach

Active Components
API engineers specialize in many types of active RF components including hybrid mixers, broadband/high isolation switches, filtered GPS LNAs, RF limiting amps, digital and voltage variable attenuators, temperature compensated detectors, PIN diode drivers, A/D and D/A converters, and operational amps.

- **Mixers**: Frequency ranges from 0.5 MHz to 26.5 GHz
- **Switches**: Includes PIN diode and GaAs frequencies up to 22 GHz
- **Limiters**: Protect from input overdrive and remove amplitude modulation
- **Attenuators**: Steps from 0.1 dB to 63.5 dB; frequency from 5 to 200 MHz
- **Detectors**: Converts RF input powers to corresponding DC voltage
- **PIN Diode Drivers**: Inverting/non-inverting modes; positive/negative output currents
- **A/D & D/A Converters**: High stability and linearity; +5 volts or +15 volts
- **Receiver Protection**: S-Band, J-Band, 12-18 GHz; C-, X-, K-Band
- **Diodes**: Frequency Multiplier Diodes, Tuning Varactor Diodes, PIN Diodes, MNS Chip Capacitors

Passive Components
API has the ability to develop various types of passive RF components including: BAW, steel dispersive & LC delay lines, low loss and durable rotary joints, electromechanical phase shifters, high-power handling couplers, and high isolation power dividers.

- **Power Dividers**: High isolation; excellent phase balance & amplitude tracking; low loss
- **Delay Lines**: Center frequency 10 to 100 MHz; delays 0.25-3000 uS; bandwidth 1 to 70%
- **Rotary Joints**: Durable design for high speed and long life; low loss
- **Phase Shifters**: DC to 50 GHz; commercial, military, and high performance optical applications
- **Combiners & Directional Couplers**: Multi-octave broadband; power up to 1500 W; flatness as low as +/- 0.4 dB
- **WIRELINE® and WIREPAC®, Couplers and Hybrids**: Frequency independent; quadrature output phase; low VSWR; low insertion loss; high directivity and freedom from intermodulation
High-Rel / High-Temp
API has an extensive history of supplying robust, high reliability products into the Space, Oil & Gas, and Aerospace and Defense markets. Product capabilities include meeting extensive temperature ranges such as: standard temperature (-55°C to 150°C), high temperature (150°C to 175°C), extreme high temperature (175°C to 200°C), and ultra high temperature (200°C to 225°C plus).

- Synthesizers
- Phase Locked Oscillators (PLO)
- Dielectric & Coaxial Resonator Oscillators (DRO & CRO)
- Comb Generators
- Surface Acoustic Wave (SAW) Oscillators
- Voltage Controlled Oscillators (VCO)
- Low Temperature Co-fired Ceramic (LTCC)

Build-to-Print & Repairs
With microwave build-to-print facilities in the US and Europe, API helps customers design and manufacture components for the most complex microwave applications. Our highly trained engineers and expansive vertical integration, combined with state-of-the-art manufacturing facilities and testing, ensure superior performance and projects that are completed on-time and on-budget.

Capabilities
- Wirebonding
- Fluxless Soldering
- Automated PCB
- Automated Element Attach
- Die Bonding
- Laser Welding/Hermetic Sealing
- Low Temperature Co-fired Ceramic (LTCC)
- Glass Microwave Integrated Circuit (GMIC)
- Thin Film & Thick Film
- Ultra High Temp (225°C and above)

Design & Manufacturing Services
- Miniaturization
- Troubleshoot & Repair
- Upgrade & Manufacture Obsolete Designs
- Reverse Engineering
- Custom Box Build
- New Product Introduction (NPI)

Filters & Switched Filter Banks
Our reputation for designing and delivering today's most challenging RF & Microwave filters is unsurpassed. Our engineers specialize in understanding your filter requirement and customizing a solution that delivers superior performance in the smallest footprint.

Filter Type
- Bandpass
- Lowpass
- Highpass
- Bandreject
- Diplexers
- Multiplexers
- Multi-function

Topologies
- Cavity
- Lumped Element
- Ceramic
- Tubular, Coaxial
- Suspended Substrates
- SAW
- Waveguide

Integrated Microwave Assemblies (IMAs)
API's diverse Integrated Microwave Assemblies are ideal for the advanced solutions needed in today's defense-related systems including oscillator-based, filter-based, and signal conversion applications.

- Switched Filter Banks
- Switched Multiplexers
- Filtered GPS LNAs
- Cosite Modules
- Frequency Activity Detectors
- IFMs and Discriminators
- Frequency Multipliers
- Synthesizers
- Upconverters
- Downconverters
- Box Builds
- Switchable Multi-channel Amplifiers
Featured Applications

Defense Communications

*Power Amplifiers*

By utilizing GaN and other advanced technologies, API provides rugged, reliable, and efficient power amplifiers in smaller, lighter footprints.

- Electronic Warfare
- Battlefield Communications (Fixed and Mobile)
- IFF (Identification Friend or Foe)
- Broadband Jamming
- Communications (Air-to-Air and Air-to-Ground)
- Satellite Links
- Active Missiles (AMRAAM)
- Radar

Guided Munitions

*Rugged Antennas*

- 1575.42 MHz (L1)
- 10,000 g
- Operating Temp: 32°C to 63°C
- Storage Temp: -45°C to 71°C
- Low Profile

Missile Defense

*Multi-channel GPS Switched Diplexer; Dual Diplexed GPS Low Noise Amplifier; Ultra Low Phase Noise Source*

API offers next generation anti-jamming GPS assemblies for cruise missiles, as well as a host of frequency sources for optimum phase noise performance solutions.

Wireless Communications

*Co-location Filters, Duplexers, Diplexers, Multiplexers, Amplifiers, Mixers*

API specializes in the design, development, and manufacture of state-of-the-art co-location filters, amplifiers, mixers, and diplexers/multiplexers for the wireless telecom industry.

Medical

*Rotary Joints*

From wideband DC to 18 GHz high power, in-line designs to miniature 10 kilowatt models, API offers the right model rotary joint for your application.

Commercial & Military Radar

*Custom Synthesizers*

Rugged construction and ultra low phase noise make our custom synthesizers suitable for both military and commercial radar applications.
Oil & Gas

High Temperature Microelectronics

API has a strong heritage of providing proven technologies to harsh environment markets. This includes product capabilities meeting extensive vibration testing and temperature ranges up to extended lifetime at 225°C. This makes them ideal for oil & gas, offshore, and down-hole drilling.

- Solid State Anemometer Electronics
- Offshore Safety Control Systems
- Pressure Control Sensors
- Motor Controllers

AESA Radar

Scaleable Active Antenna Array

API Technologies’ RF/Microwave engineers are making significant improvements to AESA radar systems which offer warfighters unparalleled gains in reliability. By taking a Line Replaceable Unit (LRU) approach, API’s AESA modules are field replaceable allowing for ease of system integration, front-line repair/replacement, and overall reduced cost of ownership.

- Steerable Active Antenna Array Unit
- Scalable to Support Multiple Platforms
- Common Building Block – QTRM
- Incorporates Cooling Solution

API Technologies Corp. is a trusted provider of RF/microwave, microelectronics, and security solutions for critical and high-reliability applications. The company designs, develops, and manufactures electronic components, modules, systems and products for technically demanding defense, commercial/industrial and aerospace applications. API Technologies’ customers include many leading Fortune 500 companies, as well as a majority of NATO governments. While API was founded in 1981, our heritage brands have served the demanding, hi-rel marketplace for more than 60 years. API Technologies trades on the NASDAQ under the symbol ATNY.