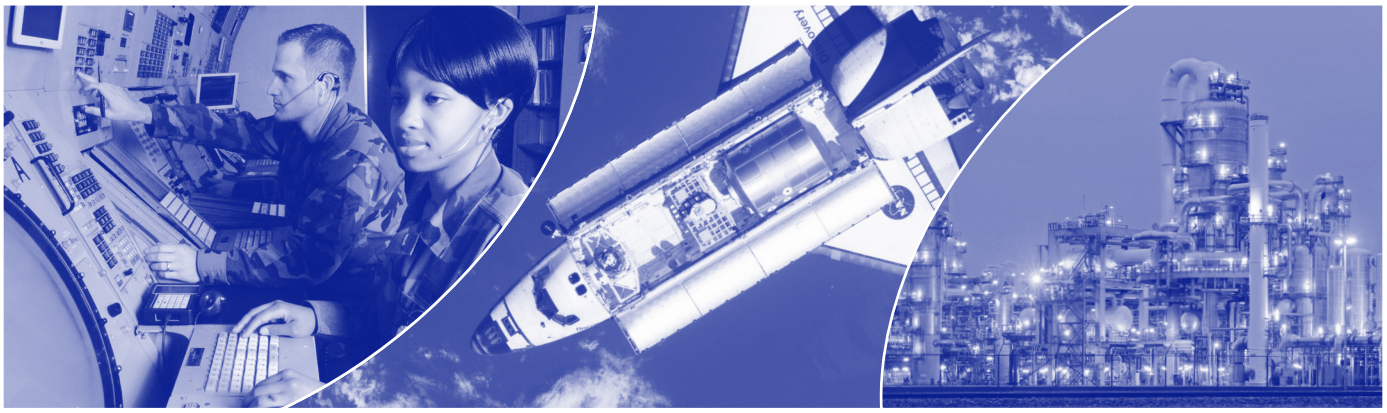
RF & microwave signal conditioning
and electromagnetic spectrum
management solutions, from
components to complete subsystems.

SOLUTIONS GUIDE

api
technologies corp.

Markets & Applications



Government & Defense

API 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 prime contractors, our precision-engineered MIL-grade products are ideal for applications where uncompromised reliability and uninterrupted performance is required.

Applications:

- Electronic Warfare
- Ground, Air, Naval & Satellite Communications
- Broadband Jamming
- Radar, ELINT & SIGINT
- Missile Defense
- Military Aircraft
- C4ISR

Space

Designed to withstand the most extreme environmental conditions, API's portfolio of space products includes hybrids, multi-chip modules and diodes, integrated assemblies, and a variety of components including amplifiers, VCOs, filters, mixers, attenuators and terminations screened to meet customer and application-specific requirements. API has a rich heritage of supplying products for space programs, dating back to 1976.

Applications:

- LEO, MEO & GEO Satellite Payloads
- Satellite Ground Communications
- Launch & Re-Entry Vehicles
- Scientific Missions
- Deep Space Exploration

Commercial & Industrial

API provides high performance filter products, and high reliability attenuators and terminations to fulfill the most challenging wireless, telecom, and test and instrumentation applications. Specializing in meeting the highest performance requirements, API brings industry expertise in rugged and harsh environments by providing high temperature electronics and electronic assemblies designed for commercial aerospace, oil and gas, medical and industrial applications.

Applications:

- Commercial Avionics
- Wireless Site Development
- Co-Site Interference Mitigation
- Test & Instrumentation
- Oil & Gas
- Industrial
- Healthcare & Medical Devices
- High Reliability Industrial

Featured Certifications

ISO-9000 AS-9100	ISO-13485 MIL-PRF-15733	MIL-PRF-28861 MIL-C-11015	MIL-PRF-49470 MIL-PRF-38534	Class H&K

Integrated Microwave Assemblies & Subsystem Solutions

API Technologies' IMAs and subsystems utilize advanced technologies to achieve narrow or wide bandwidths from DC to 50 GHz. With an emphasis on multi-disciplined vertical integration, these solutions seamlessly integrate into some of the world's most sophisticated technology platforms.

Integrated Microwave Assemblies

Complex assemblies that provide advantages in system performance and reliability, and achieve greater efficiencies. Multi-function units utilizing vertical integration and multi-disciplined engineering and design expertise.

- Amplifier, Filter, and Frequency Generation-Based Integrated Assemblies
- Switched Filter Banks
  - » 20 – 7500 MHz; 2 to 7 channels; User-configurable
- Up/Down Converters
  - » High linearity, low power consumption
- IFMs & Discriminators
  - » 2 – 18 GHz coverage in a single unit
- Transmit Receive Modules
  - » Dual and quad modules for phased array radar and subsystem integration

Subsystem Solutions

High reliability subsystem solutions designed to meet the most challenging requirements for precision and mission critical applications. Modular, high efficiency subsystems designed to optimize component and assembly efficiencies across the block diagram.

- Active Antenna Array Units
  - » Scalable Quad Transmit Receive Module Solutions
- Amplifier Subsystems
  - » Small signal and power amplifier-based
- Frequency Generation Subsystems
  - » Oscillator and synthesizer-based solutions
- Receiver Front Ends
- Attenuator-Based Subsystems
  - » Multichannel Programmable Attenuation Units
  - » Transceiver Test Units
  - » Attenuation Mesh Networks
  - » Handover Test Units
  - » Attenuation Matrices
  - » Programmable Attenuation Profile Simulator
  - » Multichannel Standard Switch Units
  - » Custom Switch Matrices
  - » Custom Signal Routing and Conditioning Units

Power Distribution & Conversion

Ruggedized, temperature stable and MIL-STD capable power distribution and conversion products for electronic warfare and C4ISR applications. Remote monitoring/accessibility options in both AC and DC power distribution and power conversion supplies with a variety of output and input options.

- Switched Power Distribution Unit
  - » Single phase up to 30 Amps power; 1U package
- Junction Box
  - » 28 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

RF & Microwave Components

API Technologies' extensive portfolio of RF/Microwave components are easily integrated into existing systems or block diagrams. Multi-disciplined component heritage with a wide range of standard, configurable and customizable design options.

RF & Microwave Filters

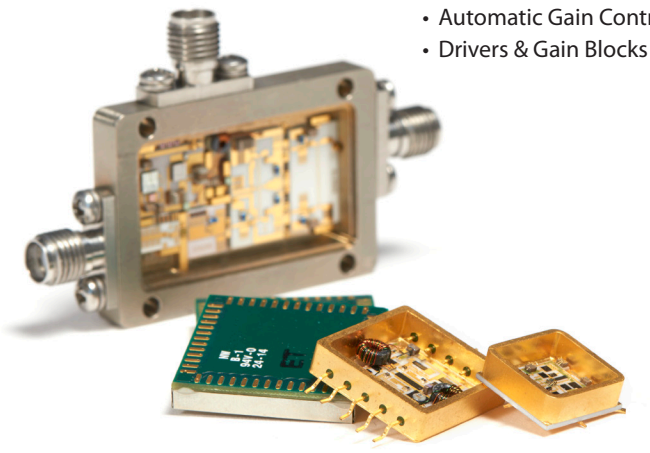
High performance filter solutions for defense, wireless telecom and co-location, and space applications with an expertise in the integration of multiple and mixed topologies in a single unit that optimize system performance.

- Lumped Element, Cavity, Tubular, Ceramic, Suspended Substrate, Waveguide
- Bandpass, Lowpass, Highpass, Band Reject
- Duplexers, Diplexers, Triplexers, Multiplexers
  - » DC to 40 GHz, contiguous and non-contiguous; mixed topologies

Amplifiers

Custom and semi-custom components and modules utilizing hybrid thick and thin film, chip and wire, and SMT processes with leading edge semiconductor technologies.

- High Power Amps
  - » Broadband; Class A, Class AB; Linear; Operating frequencies to 26 GHz
- High Linearity Amps
  - » Second order intercept performance as high as +120 dBm
- Low Phase Noise Amps
  - » Ultra-low phase noise performance as low as -181 kHz at 10 kHz
- Low Noise Amplifiers
  - » Noise figure values as low as 0.8 dB
- Filtered GPS LNAs
  - » COTS; 1.8 dB typical noise figure
- Automatic Gain Control Amps
- Drivers & Gain Blocks



Programmable Attenuators

Relay based and Solid State (PIN Switched, MMIC, Phase Compensated GaAs) topologies offered.

- Relay-based Programmable Attenuators
  - » DC – 40 GHz; 1 watt; attenuation range 0 – 127 dB; step size 0.25 – 10 dB
- Relay Switched Programmable Attenuators
  - » With built-in Microprocessor Base Driver
  - » DC – 40 GHz; 1 watt; attenuation range 0 – 127 dB; step size 0.25 – 10 dB
- Solid State and Digital Attenuators
  - » 10 MHz – 6 GHz; average power +20 – +36 dBm; attenuation range 0 – 103 dB; step size 0.25 – 1 dB

Powerfilm Surface Mount Resistive Products

Ideal for low and high power applications with MIL-SPEC quality screening standard. Powerfilm represents the highest quality surface mount attenuator, termination and resistor chips available. Made in both thin and thick film options with a variety of substrates and wrap options.

- Flange Attenuators
  - » 0.5 – 4.0 GHz; 10 – 100 watts
- Chip Attenuators
  - » 0.5 – 18 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

Passive & Active RF/Microwave Components

Broad portfolio of RF/Microwave components to support system integrators across a wide variety of systems and applications. Manufactured both in the U.S. and U.K.; products available standard, configurable or as customizable models. MIL-SPEC approved design capabilities.

- Attenuators
  - » Convection and conduction cooled
  - » 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 900-3000)
- 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
  - » SMA, 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
  - » CMOS 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

Frequency Sources

API offers an extensive design library of low phase noise frequency sources, optimizing the overall design for superior performance and value.

- Phase Locked Oscillators (PLO)
  - » Internal/External references; low phase noise figures
- Dielectric/Coaxial Resonator Oscillators (DRO/CRO)
  - » 500 MHz – 21.5 GHz
- Voltage Controlled Oscillators (VCO)
  - » Up to 7 GHz; gold substrates; low junction temperature
- Frequency Multipliers
  - » 21 transmit channels; output power 27 dBm min
- Surface Mount Synthesizers
  - » Configurable; internal/external references; standard designs to 6 GHz
- Master Reference Oscillators
  - » 60 – 480 MHz; output power level +20 dBm
- Synthesizers
  - » Wide bandwidth; fast switching speed; low phase noise

Microelectronic Solutions

Custom microelectronic solutions, hybrid assemblies, microcircuits and multi-chip modules utilizing multiple technologies including mixed signal and power, RF/Microwave, optoelectronics, thin film and SAW fab. Products are designed and manufactured in one of API Technologies' MIL-PRF-38534 Class K certified facilities.

- 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 – 12.5 Gbps data rates
  - » Optical transceivers and media converters with various packaging options
- High Temperature Electronics
  - » Hybrid modules, data processors, sensor/ motor controls
  - » Extreme/harsh environments
  - » Extended lifetime at 225°C continuous
- SAW Filters
  - » 20 – 2600 MHz; Insertion loss as low as 1.2 dB
- SAW Oscillators
  - » 100 MHz – 4000 MHz; low phase noise performance to -124 dBc/Hz at 1 kHz offset
- SAW Delay Lines
  - » 20 MHz – 2000 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 Power DC/DC Converters
- PCBa, Box Manufacture and Assembly

Secure Systems & Information Assurance Solutions

Information security solutions designed to provide protection against potential threats to data that could have financial, political or personal consequences. Featuring EMCON and SST-brand TEMPEST emanation secure products and ION Networks secure access software and appliances.

EMCON/SST TEMPEST Products

Emanation secure products for sensitive environments including government facilities, offices and mobile deployments. TEMPEST products prohibit hacker threats that may come from online, air- or land-based attacks by augmenting commercial products to prohibit emanation communication emissions with discrete and/ or rugged hardware.

- Mobile and desktop computers
- Monitors
- Phones
- Printers
- Scanners
- Teleconferencing systems
- Thin clients
- Storage
- VoIP systems
- Other accessories

ION Networks Products

Securing access to sensitive information in both government and commercial facilities by prohibiting unauthorized access to communication equipment including servers, modems and VoIP equipment. ION Networks products maximize authorized user visibility and minimize the threat of digital hackers by utilizing multi-factor authentication security in both Out-of-band and Cloud based digital environments.

- Privileged User Access: Remote device administration software, PRIISMS, and appliances
- CAC and Personal Identity Verification (PIV) access and authentication
- USB and device security solutions

EMI Filters, Components & Magnetics

One of the world's largest selections of EMI filtering components and assemblies. Trusted solutions for EMC compliance, energy efficiency and power management. Solutions addressing both conducted and radiated EMI; with flexibility to filter at the power source, I/O connection, in a barrier wall, or on the PCB. Standard and custom designs; wide range of size, performance and packaging options. RoHS compliant designs; over 800 standard MIL – QPL products and DSCC part numbers available.

Coaxial Filters & Interconnects

Delivering a broad range of custom and off-the-shelf options to meet your design requirements.

- Surface Mount Filters
  - » Wide variety of package sizes with current ratings up to 20 Amps
- Resin & Hermetically Sealed Filters
  - » Largest number of MIL-PRF-15733, MIL-PRF-28861, DSCC-84084 and MIL-C-11015 filters available
- High Current/High Voltage Filters
  - » Voltage ratings up to 1250 VDC/240 VAC (400 Hz)
- Miniature and Large Diameter Solder-in and Press-in Filters
  - » 0.140 – 0.450 inch diameter
- Filter Plates
  - » Outperform surface mount EMI filters at frequencies above 50 MHz
- D-Sub Filtered Connectors
  - » Full ground plate and metallic shell provide minimal impedance and superior performance

Magnetics

Broad range of custom, application-specific solutions.

- Current Transformers
  - » Wide primary current range of 3.5 – 800 amps
- Power Inductors/Chokes
  - » Up to 100 amps, standard
- Switch Mode Power Supply Inductors
  - » Switching frequencies from 5 – 100 kHz
- Lighting Chokes & Inductor/Filters
  - » 120V models from 12.5 – 100 amps, 240V models from 8.3 – 60 amps
- Toroidal Power Transformers
  - » Low magnetic leakage, lower electrical noise, lower mechanical hum
- Laminate Power Transformers
  - » Value ranges from 3 VA – 100,000 VA
- Modem & Module Transformers
  - » Specialty and custom build to print
- Air Coils
  - » Designed to perform at frequencies as high as 1 Ghz

Power Filters

Ideal to filter the AC or DC power entering your system to prevent radiated or conducted EMI.

- Commercial Power Filters
  - » Conducted filtering from 10 KHz – 1 GHz
- Military/Aerospace Power Filters
  - » Voltage rating 115 – 250 VAC, up to 400 Hz and 400 VDC
- Power Entry Modules
  - » Meets over-voltage of IEC 664 category II and complies with IEC 950
- Feed-Through Filters
  - » Max voltage rating up to 250 VDC or VAC (60 Hz)

Ceramic Capacitors

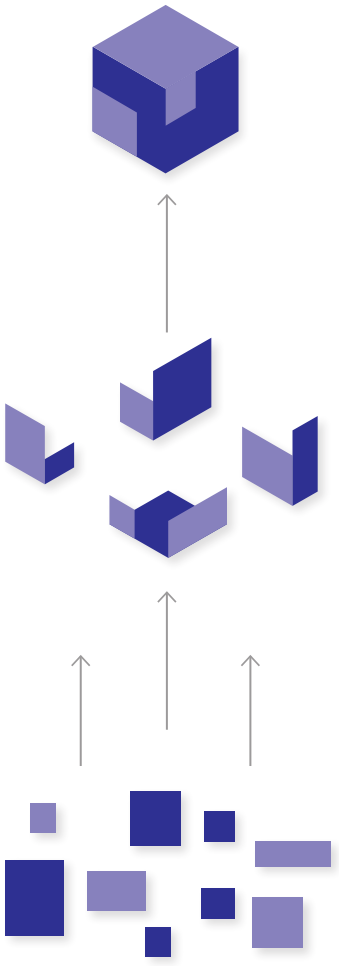
Exhibit low parasitic capacitance and superior EMI filtering capabilities.

- Switch Mode Power Supply Capacitors
  - » Capacitance values of 0.01µF – 47µF, Mil-PRF-49470 QPL
- Planar Capacitors
  - » Capacitance value up to 1µF
- Tubular Capacitors
  - » High ratio of capacitance to volume
- Discoidal Capacitors
  - » AC to 240V; DC to 500V

Specialty Connectors

Custom connectors can be designed to meet RTCA/DO-160 Section 22 Lightning Strike.

- Circular Connectors
  - » Capacitance values from 250µF to 50,000µF
- Mini-MIL Connectors
  - » Capacitance values from 1000µF to 20,000µF
- Audio Connectors



Value-Added Integration

From components to subsystem solutions

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api technologies corp.

API Technologies 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, API'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.

What We Do

RF and Microwave Signal Conditioning & Management

RF, microwave, millimeterwave, and power solutions to enable the wireless link across global defense, commercial, space and test applications.

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Electromagnetic Spectrum Management

Electromagnetic and security solutions to mitigate interference and protect the safe transmission of data in high performance defense and mission critical applications.

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