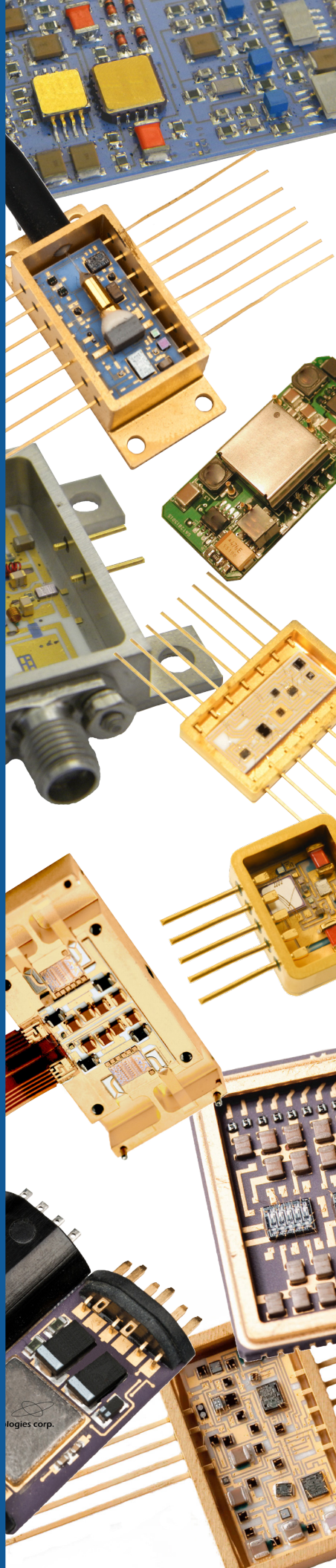
Microelectronics Capabilities & Technology

API Technologies is a world class leader in vertically integrated microelectronic solutions.

API is a full-service partner for hybrid engineering and thermal design expertise. We provide high performance products through state-of-the-art manufacturing processes with the reliabilty and superior quality that today's customers demand.

API Technologies is your complete microelectronics solution provider.

api technologies corp.



API Technologies

is your complete solution provider.



Our World-Class Facility

API Technologies has outfitted a 45,000 ft² facility to support the combined manufacturing and engineering operations of our Worcester and Marlborough facilities. Located in Marlborough Massachusetts Technology Park, the facility is AS9100 registered and fully certified to MIL-PRF-38534 Class H and Class K standards.

Within this facility, API professionals design and manufacture high performance hybrids, MCMs, power conversion and control products, SAW filters and SAW based sub-systems. Product functions include oscillators, filters, power regulators and conversion products as well as precision analog circuits. Our team brings over 45 years of design experience, and our high volume automated assembly lines allow the facility to develop custom solutions for defense, space, satellite, commercial, communications, avionics and industrial industries.


MIL-PRF-38534
HYBRID MICROCIRCUIT CERTIFICATION
FOR
CLASSES K and H
IS HEREBY AWARDED TO
SPECTRUM MICROWAVE
400 Nickerson Road
Marlborough, MA 01752

Technologies

- Mixed Signal & Power
- RF, Microwave & MMW
- Optoelectronics
- Space
- Thin Film / SAW Wafer
- Power Conversion / Regulation

Markets

- Defense (MIL-PRF-38534 Class H)
- Space (MIL-PRF-38534 Class K)
- Avionics
- Hi-Rel Commercial
- Ruggedized Industrial
- Secure Communications

Capabilities

- Advanced Engineering
- High Density Manufacturing
- DC-50 GHz
- High Reliability
- Class K Certified Facility
- Thin Film / SAW Wafer Fab

Certifications

REGISTERED COMPANY ISO 9001: 2008

DEFENSE LOGISTICS AGENCY

AS 9100 ACCREDITED

RoHS

API Benefits

- Fully Certified to MIL-PRF-38534 Class H and Class K
- 30,000 square feet of Class 100,000 Clean Room
- Prototypes, Production and Qualification
- Reduce Size/Lower Weight
- Improve Performance and Reliability
- Full Temperature Testing
- Environmental Stress Screening

State-of-the-Art Engineering

Using state-of-the-art software and simulation tools, our experience engineering team is able to quickly take a requirement from concept to production.

- Ansoft HFSS
- Ansoft Designer
- Microwave Office
- Agilent ADS Design Suite
- SolidWorks
- Labview
- Agilent Genesys
- AutoCAD
- Cadence Allegro
- Sonnet EM Simulator
- PSpice
- PCad
- Or Cad
- Finite Element Analysis for Thermals







Space Capabilities

Developing mission critical solutions for space applications has never been more challenging. Prime contractors delivering today's deep space exploration, scientific discovery, military surveillance/protection, and commercial communications innovations demand suppliers who combine the highest reliability products with cost efficiency. API Technologies is exactly that kind of partner. With a space heritage dating to 1976, we have proven experience participating in a long line of past and present space programs.

API is a designer and manufacturer of RF/microwave and hybrid components, microwave semiconductors and microelectronic assemblies for space systems, satellites, launch vehicles, and associated support networks. We utilize five manufacturing space centers of excellence offering a wide range of space and Hi-Rel certifications and extensive testing capabilities. Our experienced engineering team will recommend one of our many space-approved standard designs or develop a custom solution radiation hardened to withstand the most extreme environments.

Program Heritage

Deep Space Launch

- Galileo
- Cassini
- USERS (2 sats)
- Selene & Okina
- Mars Phoenix
- Lunar Reconnaissance Orbiter

Scientific Missions

- SAOCOM
- Hershel Plank
- AMS-02
- Aquarius (SAC-D)
- Lisa Pathfinder
- Juno

Launch & Reentry

- Vehicles
- Taurus
- Minuteman
- H-II

Communications

- GPS-2F
- Prima
- O3B
- Inmarsat
- Intelsat
- Sirius Radio
- Direct TV
- Optus 10
- Amazonas 3
- Grail (2 sats)
- EnMap
- Vegetation
- Cassini
- Meteosat
- Thor 7
- MUOS
- Hot Bird
- MARECS
- Olympus
- SkyNet
- Eutelsat
- Koreasat
- OCO
- LCROSS
- Mars Science Lab
- ISS Kibo EF

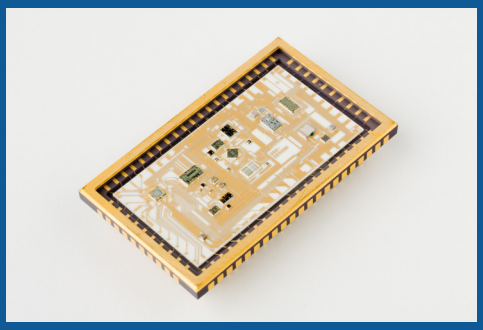
Certifications

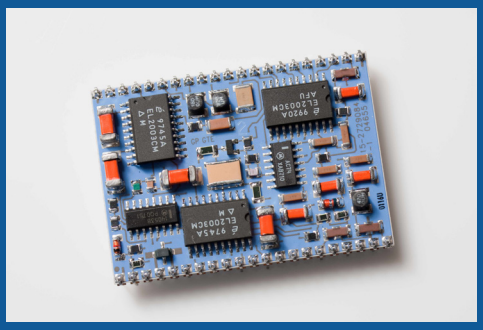
- MIL-PRF-38534 Class K
- MIL-PRF-38534 Class H
- AS9100
- ISO9001
- IPC-610 Class 3
- J-STD 001
- MIL STD 883
- ESA/SCC 5010 – Microwave Diodes QPL

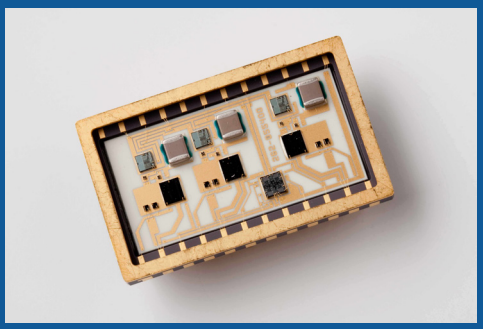
Process Verification & Environmental Screening

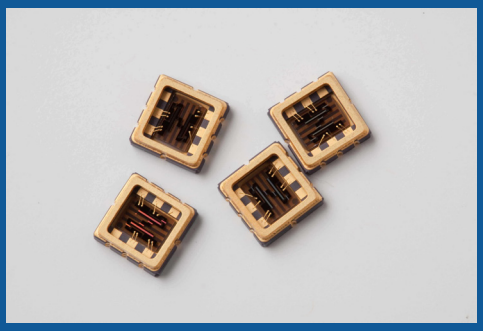
- Wirebond Pull & Shear Tester
- Pressurizing Helium Chamber
- Temp Cycling
- Fine Leak Test
- Gross Leak Test
- Real Time X-Ray
- Centrifuge
- PIND Test
- Thermal Shock

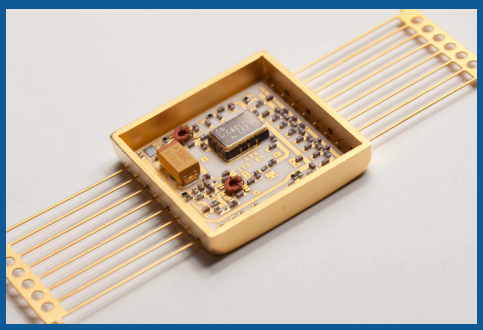








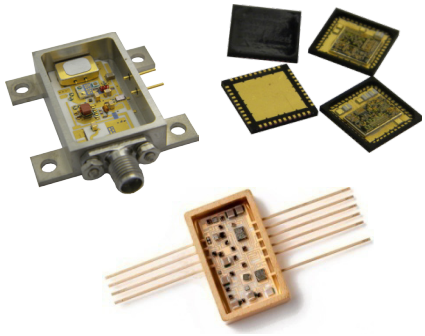






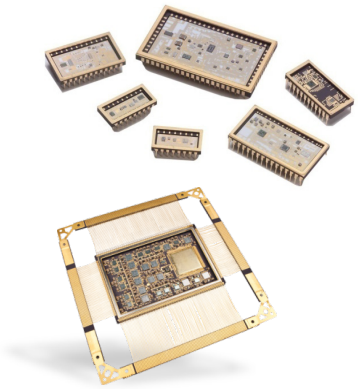
RF, Microwave/ MMW Solutions

- QFN (Quad Flat No-lead) Custom Packaging
- Q Band Power MMIC Amplifier
- S Band SiC/GaN MMIC Amplifier
- High Power Radar (X Band) Amplifier
- 16-way Power Amplifier
- 8-way Power Amplifier
- Ka Band Power Amplifier
- High Shock Timer
- SAW Oscillator
- Voltage Controlled SAW Oscillator
- Phase Locked Oscillator
- PIN Diode Drivers



Mixed Signal & Power Solutions

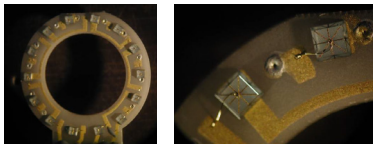
- Analog to Digital Converters
- Digital to Analog Converters
- Voltage References
- Operational Amplifiers
- Full Custom Mixed Signal Microelectronic Solution
- Full Custom Build to Print Power
- Solid State Opto-Isolated Relay
- Build to Print Motor Control Assembly
- Custom Build to Print Liquid Cooled IGBT Module



Optoelectronics/ LED Illumination Solutions

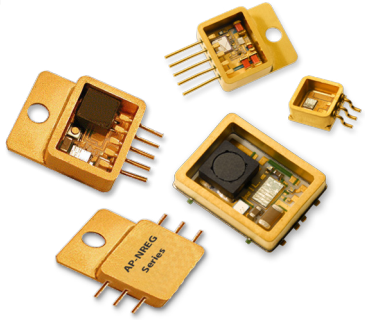
- VCSEL Encoder
- Tunable Receiver for Wavelength Monitoring
- Laser Range Finder
- Custom Build to Print Silicon Carbide Backlighting LED
- Custom Build to Print Silicon Carbide LED Illumination

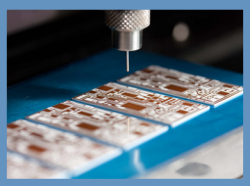


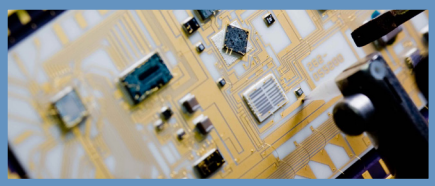


Rad-Hard Power Conversion & Control Products

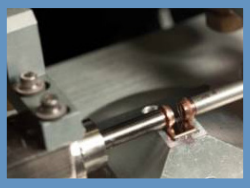
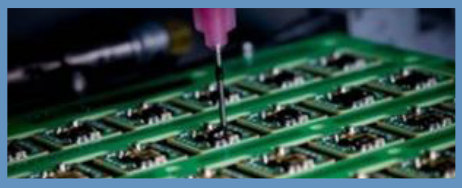
- Positive & Negative Voltage Reference/Regulators
- Remote Sense, High Precision, Laser Trimmed Voltage Regulators
- High Power Solid State Relays including SPDT SSRs
- Point-of-Load Switching Regulators
- DC/DC Conversion
- Data Converters
- High Reliability
- Space Level





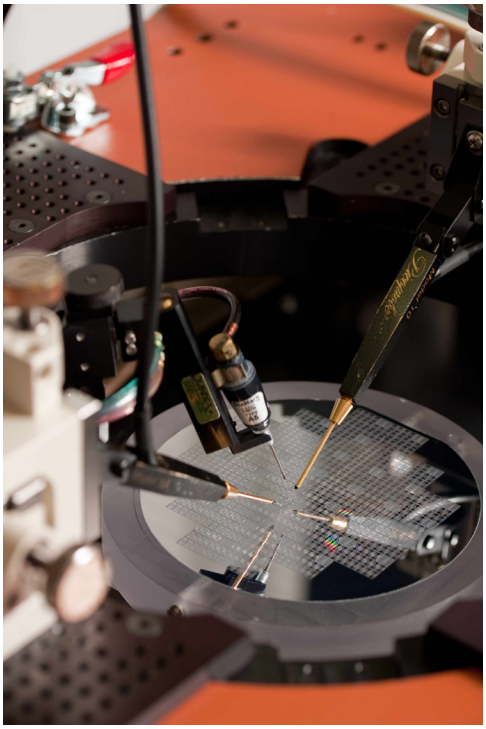





Manufacturing Capabilities

- Auto Dispensing
- Auto Die Attach
- Auto Flip Chip/BGA
- Auto Wirebonding
- Stenciling/Screen Printing
- SMT/Pick n Place
- Solder Reflow
- Aqueous Cleaning
- Hermetic Cover Seal
- Vacuum Seal
- Encapsulation



Engineering Expertise

- Extensive design experience in high-reliability microelectronics solutions
- Deep space, scientific, military communications and commercial programs
- Thermal and packaging expertise
- State of the art design and simulation tools, ATE, and element evaluation
- Vertically integrated, in-house machining, thin film FAB, SAW
- Certified to MIL-PRF-38534 Class H/K
- ISO 17025 accredited test facility
- Environmental screening to IECQ, MIL-STD-202, MIL-STD-883



Test Technologies

- VLSI Tests
- Mixed Signal Test Stations
- MMW LabView Test & Chamber
- Custom ATE Stations
- High Power Testers
- RF Test Benches








SAW Wafer Fab Technology

API's SAW filters, in frequencies from 20 MHz to 2600 MHz, offer many outstanding features including:

- Loss Less Than 2 dB
- Fractional Bandwidths from 0.04% to 60%
- Shape Factors Below 1.10:1
- Hermetically Sealed Packages

API's SAW Oscillators include Rad-Hard Voltage Controlled (VCSOs), Fixed Frequency, and Phase Locked. Low phase noise SAW oscillators feature high stability and reliability in frequencies from 100 MHz to 20 GHz.

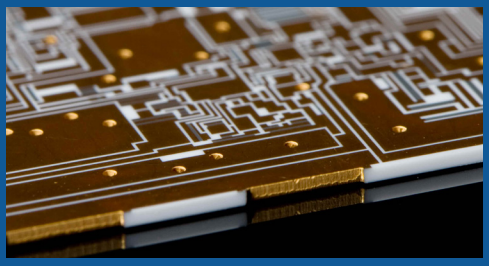
- Low Jitter Planar SAW
- High Stability of less than 10 ppm/Year
- Class-K and Class-H Rugged Designs
- On-board Micro-controllers to Maintain Signal Integrity



Thin Film Capabilities

Whether drilling on Alumina, Aluminum Nitride, BeO, Silica or Quartz, using our advanced laser drilling method ensures enhanced mounting convenience without the need for awkward bonding techniques. Specific Core Competencies Include:

- Tolerances to ± 0.00005" (1.27µm)
- Resistor Tolerance to 0.1% Absolute, 0.01% Matching
- Metallized Vias and Wraparounds
- Gold Filled Vias
- Copper Filled Vias
- Polyimide, Silox and Silicon Nitride Dielectrics
- Dielectric Bridges
- Gold/Tin Selective Deposition
- Fine Lines and Spaces 0.0004"/0.0004" (10µm)
















Thin Film & SAW Fab Technologies

API Technologies provides cutting edge technologies for today's military, space and commercial markets with in-house state-of-the-art SAW fab technology and thin film capabilities.

- Laser Cutting
- Metal Deposition
- Photo Lithography
- Autho Redical Stepper
- Precision Photo Recist
- Automated Developer Application
- Ion Etching
- Pack
- Auto Probe & Trim
- Auto Wafer Dicing