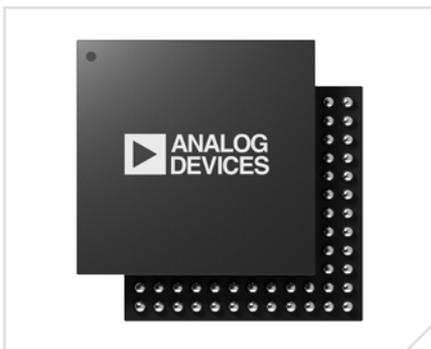


# CUSTOM INTEGRATED SOLUTIONS



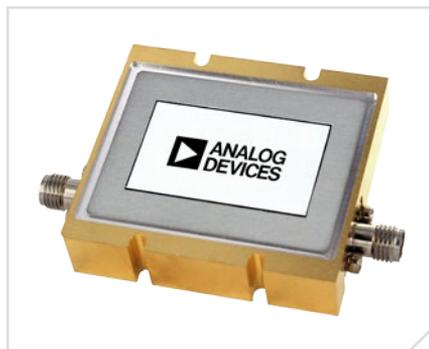
Application Specific Integration at Any Level MMIC to Subsystem

## On-Chip



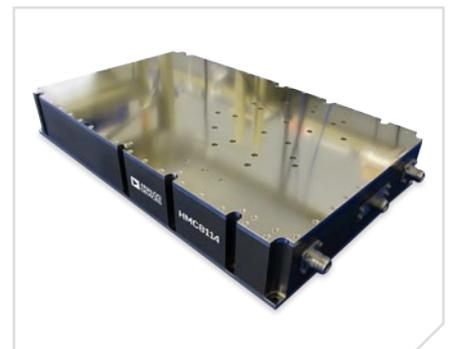
Custom MMICs/MCMs

## In-Package



Multichip Components

## Line Replaceable Units (LRUs)



Modules and Subsystems

# Custom Modules to Enable your High Reliability System

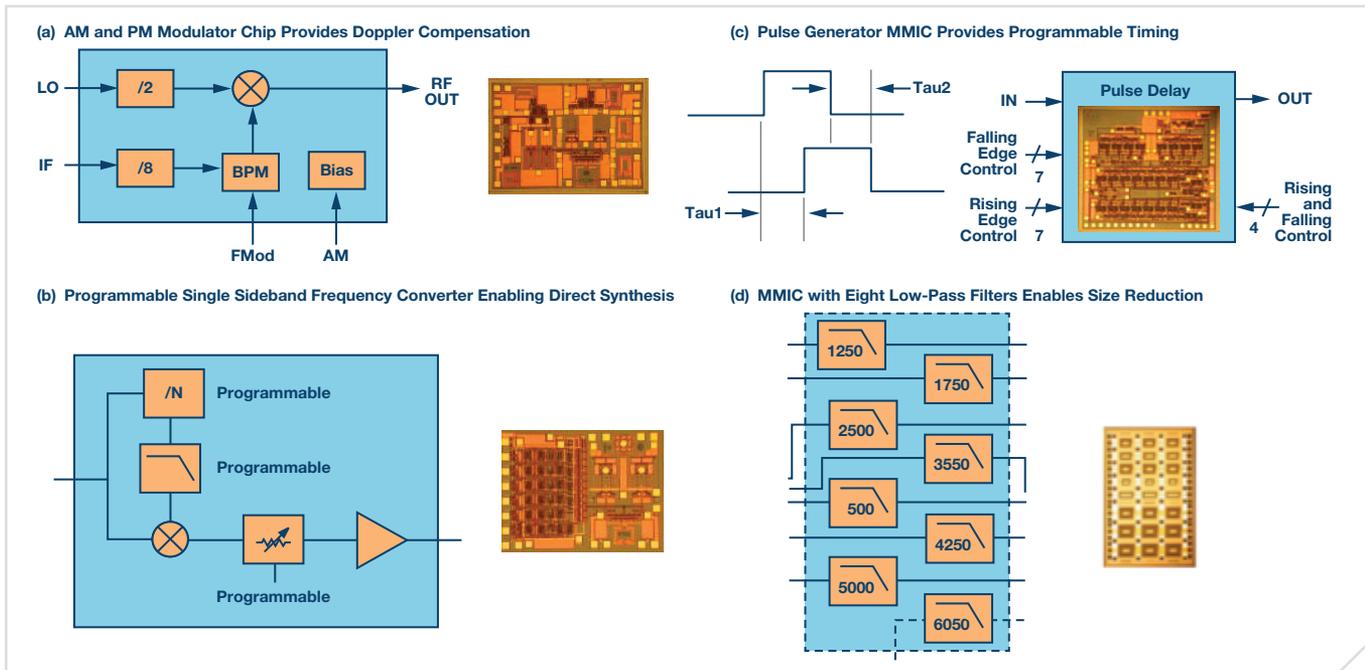
- ▶ High performance exciters and synthesizers
- ▶ RF mmW converters, tuners, and multichannel receivers
- ▶ RF mmW signal control, monitoring, and conditioning modules
- ▶ EW and radar solid-state power amplifiers including high power GaN

## Uniquely Positioned Module Solutions

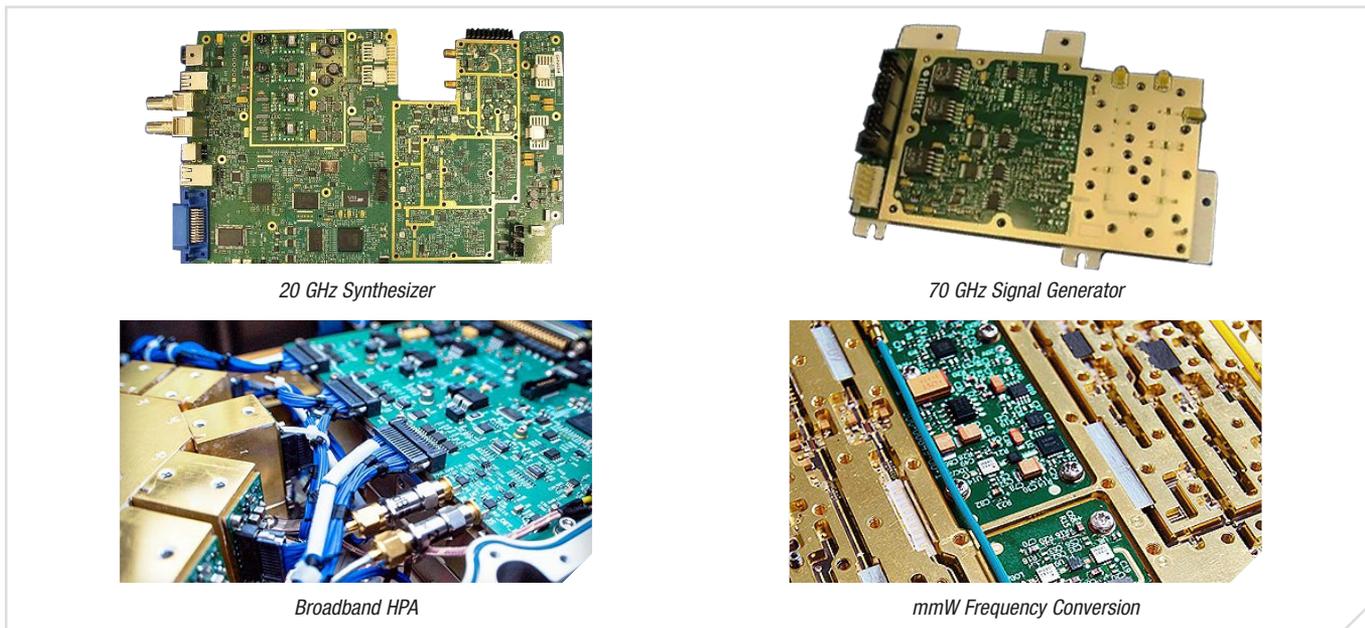
With nearly 43,000 products on the market today, Analog Devices has the broadest portfolio of semiconductor intellectual property available. Our semiconductor integrated circuits span digital, analog, RF, microwave and millimeter wave, power management, data conversion, and interface applications. Along with our market released components, ADI retains a vast array of unreleased components for use in custom modules. In addition, ADI has thousands of MMICs that are only available to ADI module designers in die form. These advantages enable the Integrated Solutions and Space (ISS) Modules Team to be uniquely positioned to reduce size and improve performance on the most complex modules and subsystems.

The figure below shows four of the hundreds of custom MMIC die that have been developed to solve specific system-level problems. These four MMICs were developed to allow for a smaller, ruggedized exciter solution. This synthesizer module was designed for a mid-volume market where the correct balance of cost and performance needed to be achieved.

## Custom MMICs Enable SWaP-C Optimization



## Leveraging Low Cost Surface-Mount Technology (SMT) into K<sub>u</sub>-Band Chip and Wire Expertise to Enable Optimal Performance up to 100 GHz



# Extending Our Customer's Design and Production Resources

## An Extension of Your Design Team

ADI design and applications teams are set up to work as an extension of a customer's design resources. Module designers are able to work seamlessly with our customer's system designers by leveraging a wide range of common tools and calculators to model electrical performance and physical attributes. These module-level models can be imported into system-level models to reduce integration risks and help ensure the end product interfaces seamlessly at the next higher level of assembly. This leads to faster development cycles and lower development costs.

## Design Tools Enable Collaboration

Microwave Simulation Tools		Digital/Firmware Tools		Mechanical Design Tools			
Linear Simulation	Microwave Office	FPGA Tools	Xilinx® ISE Design Suite	3D Solid Modeling	Inventor		
	ADS		Xilinx Vivado		SpaceClaim		
2.5D Simulation	AXIEM		Signal Integrity	Modelism	2D Modeling	AutoCAD	
	Momentum	Analog Design Tools	PSPICE	Physical Analysis Tools		Structural FEA	Ansys Mechanical Enterprise
	Sonnet				Microcap		Thermal FEA Linear and Dynamic
HFSS	LTSPICE				Ansys—Gate to System		
3D Simulation	CST	HSPICE		Cadence	Thermal CFD	Qfin	
	Genesys	Reliability Prediction Tool		Layout Tools		Routing	PADS Layout 9.5
Filter Synthesis	Ansys	MBTF/FITS Prediction	PTC Windchill		Schematics		DXDesigner
	System Analysis Tools						
Cascade Analysis	Virtual System Simulator						
	Genesys Spectrasys						
	Custom In-House						
Statistical Analysis	Virtual System Simulator						

Our module design team consists of engineers with expertise in the design and implementation of:

- ▶ RF/microwave/millimeter wave from 1 kHz through 100 GHz
- ▶ Mixed-signal for high speed DAC/ADC and transceiver implementations
- ▶ Digital control
- ▶ FPGA firmware (Verilog/VHDL)
- ▶ Embedded software
- ▶ Power supply/regulation and sequencing
- ▶ Mechanical/thermal design
- ▶ 3D/solids models
- ▶ Reliability/stress
- ▶ FMEA
- ▶ Automated test software

## Module Production, Reliability, and Quality Assurance

We maintain Class 100000 clean rooms for assembly and testing, as well as several Class 100 work areas devoted to the testing and inspection of S-level products.

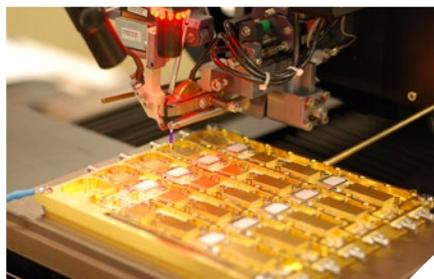
Our module testing personnel are trained and equipped to accurately characterize digital and microwave modules for all parameters, and for bands up to 110 GHz. We also maintain a complete environmental testing facility for acceleration, shock, vibration, gross and fine leak testing, temperature cycling, burn-in, and other factors.

ADI's state-of-the-art ISO9001 and AS9100 manufacturing facilities meet the demands for highly integrated, cost-effective chip and wire and surface-mount assemblies. Our manufacturing and screening standards conform to MIL-PRF-38534/5 and MIL-STD-883.

## ADI Manufacturing and Test Abilities Include

- ▶ ISO 9001:2008 and AS9100:2009 certified X automatic hybrid assembly equipment; includes
  - Die inspect/pick
  - Die/substrate attach
  - Wire bond
- ▶ IR reflow equipment for PCB-based assemblies
- ▶ Automated digital product test to 40 Gbps
- ▶ Automated RF, microwave, and millimeter wave product tests to 110 GHz

### Pick and Place/Wire Bonding



### Automated Test RF—mmW



### Automated Visual Inspection



## EngineerZone® Online Support Community

Engage with the Analog Devices technology experts in our online support community. Ask your toughest design questions, browse FAQs, or join a conversation.

Visit [ez.analog.com](http://ez.analog.com)



## Circuits from the Lab Reference Designs

Circuits from the Lab® reference designs are built and tested by ADI engineers with comprehensive documentation and factory-tested evaluation hardware.

Visit [www.analog.com/cftl](http://www.analog.com/cftl)

**Circuits  
from the Lab®**  
Reference Designs

### Analog Devices, Inc. Worldwide Headquarters

Analog Devices, Inc.  
One Technology Way  
P.O. Box 9106  
Norwood, MA 02062-9106  
U.S.A.  
Tel: 781.329.4700  
(800.262.5643, U.S.A. only)  
Fax: 781.461.3113

### Analog Devices, Inc. Europe Headquarters

Analog Devices GmbH  
Ott-Aicher-Str. 60-64  
80807 München  
Germany  
Tel: 49.89.76903.0  
Fax: 49.89.76903.157

### Analog Devices, Inc. Japan Headquarters

Analog Devices, KK  
New Pier Takeshiba  
South Tower Building  
1-16-1 Kaigan, Minato-ku,  
Tokyo, 105-6891  
Japan  
Tel: 813.5402.8200  
Fax: 813.5402.1064

### Analog Devices, Inc. Asia Pacific Headquarters

Analog Devices  
5F, Sandhill Plaza  
2290 Zuchongzhi Road  
Zhangjiang Hi-Tech Park  
Pudong New District  
Shanghai, China 201203  
Tel: 86.21.2320.8000  
Fax: 86.21.2320.8222

©2017 Analog Devices, Inc. All rights reserved. Trademarks and registered trademarks are the property of their respective owners. Ahead of What's Possible is a trademark of Analog Devices. BR15791-1-1-5/17

[analog.com](http://analog.com)



AHEAD OF WHAT'S POSSIBLE™