



RFIC SOLUTIONS INC. CORPORATE PRESENTATION

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RFIC Solutions at a Glance

- ❖ Established June 2005 – offering RFIC/ Analog/Mixed-Signal/Digital ASIC/ Module design services and IP
- ❖ Design Center of RFIC Solutions in Nagpur, India, Staff of nearly 35 employees, B.S., M.S., Ph.D. Degrees
- ❖ Completed multiple tape-outs on different technologies like LP RFCMOS ,CMOS, SiGe BiCMOS, GaAs pHEMT, GaAs MESFET, GaAs HBT.
- ❖ We have taped out at 6 different foundries & designed 150 plus different RF building blocks covering 0-70 GHz.
- ❖ **Services Offered**
 - RF, Analog & Mixed-Signal IC's and Module design services
 - RF, Analog & Mixed-Signal layout design services
 - Digital ASIC & FPGA design, development services
 - RF Prototype Board Design & Development
 - FPGA Prototyping
 - Highly Integrated Packaging, MCMs (Multi Chip Module)
- ❖ **Technology Expertise**
 - Process: RFCMOS ,CMOS, BiCMOS, GaAs, SiGe, InGaP/GaAs
 - Packaging: Standard packages, Modules

Management

Dr. Sanjay Moghe,

C.E.O.

RFIC Solutions Inc. USA

Email: smoghe@rficsolutions.com



- Our goal is to provide innovative design services for complex RFIC solutions and wireless modules for challenging wireless communication system at lowest possible rates in the rapidly expanding consumer broadband markets.
- The focus of the company is to offer RFIC and Module design services for wireless (WiMAX, WiFi, UWB, ZigBee etc) and high speed wired applications.

Management

Dr. Sanjay B. Moghe - CEO

Background:

- Over 30 years of experience in Wireless Industry
- Co-founder, President & CTO of RF Solutions for 2000-2003, a leader in WiFi RF chips (acquired by Anadigics in 2003)
- Startup experience with RF Solutions & Pacific Monolithics. Helped raise \$17M funding. Managed engineering organization with 40+ engineers in large and small companies (Raytheon, AvanteK, Northrop Grumman, ADC telecom, Micro Linear etc.). Developed 600+ RF IC products using SiGe, GaAs (MESFET, PHEMT, HBT), BiCMOS technologies.
- 6 patents granted, published 45 papers in international journals, chaired many conferences
- Education: Ph.D.EE(RPI), MSEE, MS Physics (U of Louisville), BS
- Active in 802-xx and other standards bodies, Chaired the 802.16 PHY group for unlicensed band (2000-2001)

Management

Kausik Mandal,

Director

SM Wireless Solutions

Email: kausik@rficsolutions.com



- Our business executive for strategic partners based in Singapore
- 15 years of experience in the Global Semiconductor Industry(RF, Analog, Digital). At NXP Europe he has have driven a \$70M RF Business Portfolio. Driven & steered RF product Introductions Globally in GaAs (pHEMT), SiGe & RF CMOS technologies.
- Worked with Silicon Hive B.V. ,a Start up on Reconfigurable Processors(for Digital RF, Wireless & Media applications) funded by Intel Capital, Philips.
- He was instrumental in introducing world's first Integrated IC for Satellite Broadcasting outdoor unit in BiCMOS technology.
- MBA from University of Leicester, UK and Bachelor of Electrical Engineering from Jadavpur University, India

Management

Kiran Bhatt

Consulting Vice President, Operations
(MS EE, Univ. of Cincinnati, Ohio. MS Physics,
Gujarat Univ., India.)

RFIC Solutions Inc. USA



- 32 years of experience in the semiconductor field at fabless and with-fab IC companies.
- Twenty years at small and start-up companies. Started, built, managed and directed process, foundry management, technology development, product and test engineering groups of various sizes for digital, analog & mixed-signal, and RF/wireless products/technologies and holds one US patent.
- Experience with Bipolar and CMOS & BiCMOS technologies in Si & SiGe. Strategized, developed and managed business and engineering relationships with foundry, test and assembly partners.
- Previously worked at National Semiconductor, Advanced Micro Devices, Phillips / Signetics and Micro Linear corporations.

Design Services

We offer all types of RFIC Design service at competitive cost with our design center in India, using variety of IC processes including GaAs, AlGaAs, Silicon CMOS, SiGe BICMOS, RFCMOS for RFICs. We have designed MMIC and RFIC chipsets for **UWB, WLAN, WiMax, PCS** and cellular application.

➤ RFIC/MMIC Design Services

We offer RFIC/MMIC Design services with excellent performance up to customer satisfaction at very competitive price. We better understand customer need and deliver it within desired design time frame.

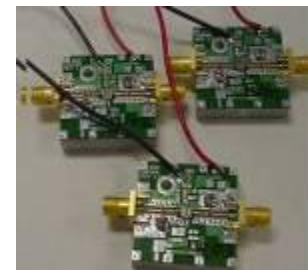
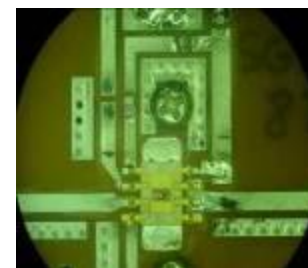
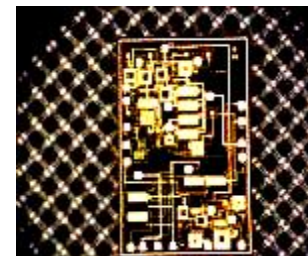
➤ RF Modules/Board/System Design Services

We provide RF Modules & boards design services to meet your requirements. We offer RF board and sub system level design layout and test We offer complete turn-key system solution with our partners

➤ RFIC/MMIC Intellectual Property

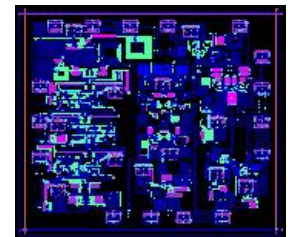
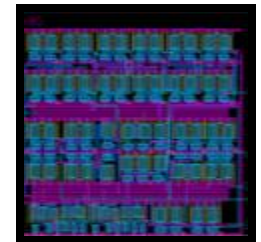
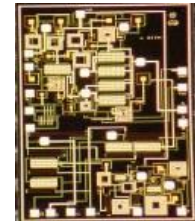
We have developed 150+ RFIC building blocks covering 0-70 GHz. We can license these RFIC Design Blocks.

Available Blocks: Power Amplifiers, Low Noise Amplifiers, Mixers, IF Amplifiers, Oscillators, Gain Blocks, Transceivers and Filters. In addition we provide Custom ASICs that meet your requirements.



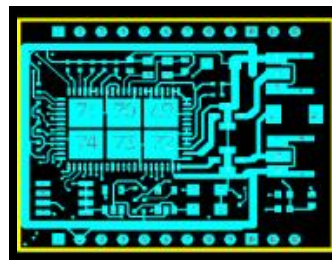
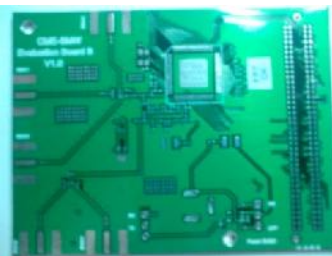
➤ Layout Design Services

We offer a IC layout design service for RF, Analog, Digital and Mixed signal designs. We have a good layout design team with vast experience which can better understand customer need and cater to all customer requirement. Layout design with RFIC Solutions offers a faster speed and lower cost solution to their customer.



➤ PCB Board design Services

RFIC Solutions Inc. design team is capable of developing board solutions from a simple prototyping board to the state of the art complex RF boards. We provide a multilayer board design services up to 22 layer. We had deliver complex six layer board for WLAN and other system application. We can provide services for developing the RF Prototype boards for multi way testing of manufactured simple and complex IC's along with testing on demand.

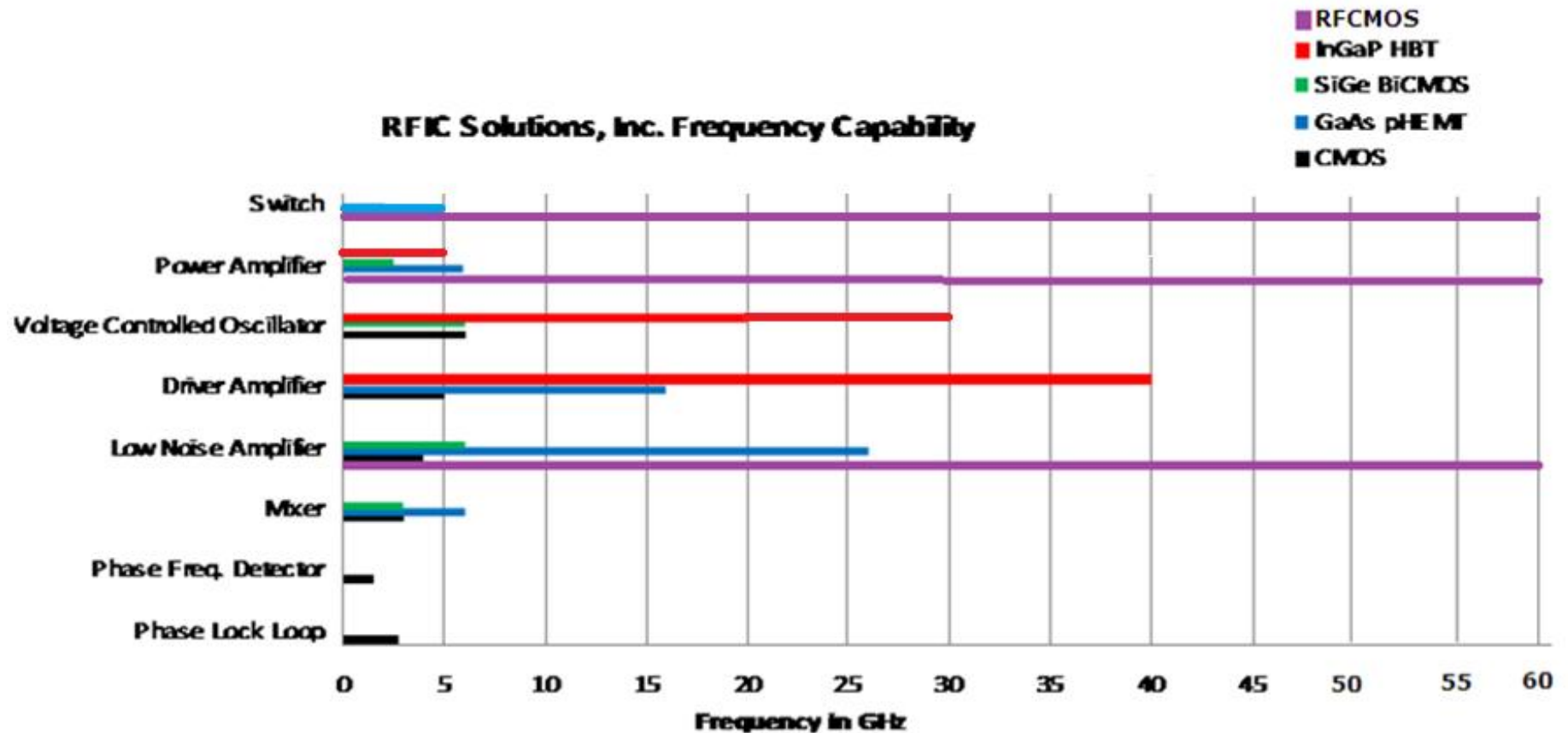


Key Achievements & Past Experiences

- ❖ Developed more than 150 IC building blocks in CMOS and GaAs technologies
- ❖ Developed 4 complex ICs including One Giga bit data rate MIPI transceiver, 8-40 GHz synthesized source, 900 MHz transceiver etc.
- ❖ Delivered custom IC designs, IP and design services to more than 20 customers including 7 from USA, 3 from Japan, some of our customers have market cap of more than \$100 Billion
- ❖ Developed a strong design team in India offering design services with high performance and low cost
- ❖ Total team experience – 100+ years in semiconductors; design, process, products, marketing, sales, technology development
- ❖ Team has 7 patents, published more than 45 papers in international journals
- ❖ Designed more than 600 RF ICs chips covering 0.01-100 GHz frequencies
- ❖ Designed with Si, SiGe, RFCMOS, CMOS, BiCMOS, GaAs, AlGaAs and other processes

RFIC Designs Frequency Capability

Design Team at RFIC Solutions, Inc has delivered RFIC/MMIC and Mixed Signal Solutions up to 60 GHz.





Our Design Functional Capability

We have capability to design to address different systems

mmWave		RF		Analog	
60 GHz, IEEE 802.11ad, UWB		802.11(a,b,g,n,ac), Cellular Devices & Base Stations		Amplifiers, LDO, Detector, Multipliers	
Function	Freq. Band (GHz)	Function	Freq. Band (GHz)	Function	Freq. Band (GHz)
LNA	20 to 60	LNA	0.4 to 10	Programmable Gain Amplifier (PGA)	
Power Amplifiers	20 to 60	Complex Band Pass Filter (CBPF)		LDO	
RX Mixer	20 to 60	RX Mixer + TIA	0.9	PLL	1 to 2.8
TX Mixer	20 to 60	LNA + RX Mixer + TIA	0.9	Band Gap Reference	
VCO	20 to 60	PA + LPF + ATT	0.9	Gain Control Amplifier	0.4 to 1
Driver Amplifier	20 to 40	CBPF + PGA	0.9	OPAMP	0.1
RX Mixer	20 to 60	LNA + Mixer + CBPF + PGA	0.9	Phase Frequency Detector	0 to 2
		TX PA	0.8 to 20	Frequency Multiplier	10 to 20
		Synthesizers	7 to 40		
		Attenuator	0.9		
		VCO	10 to 20		
		LO + Buffer	0.9		
		XTAL Buffer	0.9		
		Programmable Frequency Divider	0.9 to 20		
		Gain Control Amplifier	1 to 6		
		Driver Amplifier	0.01 to 20		
		RF Switch	0 to 6		
		CATV Amplifier	0.04 to 0.87		
		Differential Amplifier	10 to 20		
		Oscillators	14 to 16		
		Complete Transceiver PHY			
		Complete Receiver PHY			

Design Experiences

Applications	Functions	Technologies	Foundry Support	Process Nodes	Freq. Range
60 GHz (WiGig/802.11ad)	Transceivers	CMOS	TSMC	350nm to 65nm	DC to 60 GHz
Cellular (GSM, LTE, WCDMA)	LNA	SiGe BiCMOS	WIN Semiconductor		
Cellular Basestations	Power Amplifiers	GaAs pHEMT	TriQuint		
Ultrawideband (UWB)	Oscillators (Voltage Controlled & Fixed)	InGaP HBT	TowerJazz		
IEEE 802.11 a/b/g/ac/ad	Mixers		GCS		
Wi-Fi	Synthesizers				
WLAN	Phase Locked Loop (PLL)				
Bluetooth	Attenuators				
RF Front End Module (FEM)	Switches				
Zig-Bee	Low-Dropout Regulators (LDO)				
WiMax	Filters				
GPS					
CATV/HFC					
RFID					

Product Expertise Area

We have IC design expertise in following market segments/components

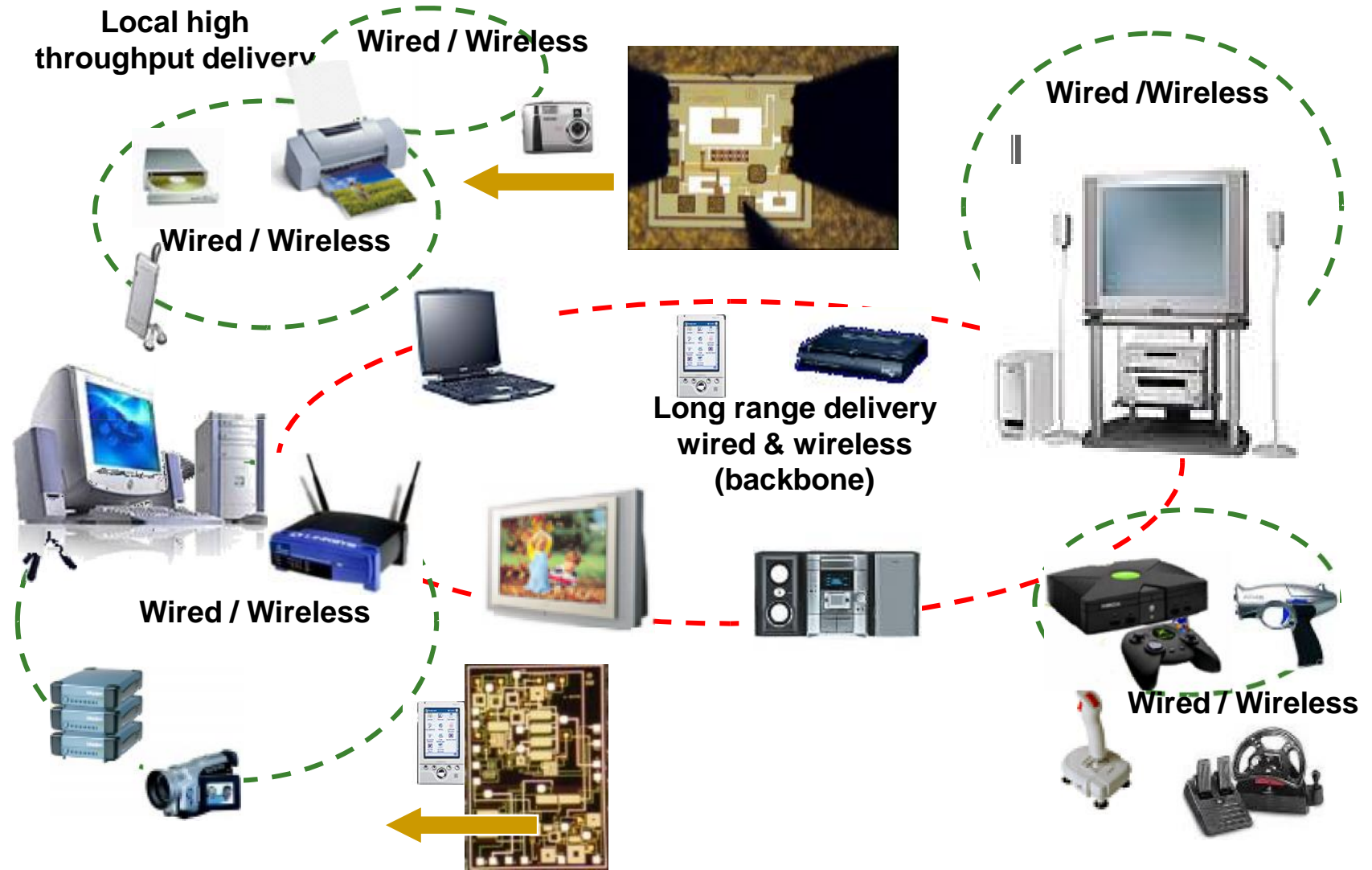
Components

- RF/Wireless & wired transceiver
- Power management
- PLLs
- Low noise amplifiers
- Power amplifiers
- Oscillators
- Filters
- High speed I/Os

Markets

- WiFi
- Cellular
- WiMax
- CATV/HFC
- Fiber optic
- High speed digital /
LVDS/DDR3/PCI Express/HDMI

Our Market →



Infrastructure and Facility

- Facilities – 20 work stations for RF IC/Module design with best industry proven Electronic Design Tool
 - Cadence-Virtuoso Layout Editor & Assura
 - Agilent-Advanced Design System
 - AWR-Microwave Office & Analog Office,
 - IC Editor, Easelware, Mentor Graphic, Microwind
 - Altium , cadence Orcad, express PCB, Spice
 - Microsoft Visio
 - AutoCAD and other engineering software
 - Xilinx ISE Design suite & Altera Quartas II for FPGA design & development
- Projects: Consulting and design work on components and sub systems for WLAN, MIMO systems, WiMax, Ultra Wide band (UWB), High speed I/Os wire line systems.
- Offer high quality RF, Analog, Digital & Mixed-Signal design services at competitive price

Testing

RFIC Solutions has testing capability using state of the art Test Instruments like Wafer Probes station/ Vector Network Analyzers/ Spectrum Analyzers/ Noise Figure Meters/ Digital Oscilloscopes (>40 Gps)



Wafer Level Testing of MMICs

- Noise Figure Characterization using NF Meters
- Frequency Domain Measurements like Inter Modulation Distortion and Phase noise using Spectrum Analyzer



S-Parameter Characterization Setup

- Wafer Level Testing to characterize RFIC/MMIC using Wafer Probe station
- S-parameter Characterization, Load Pull Measurements using Vector Network Analyzer



Time Domain Measurement Setup for UWB Transceiver

- Time Domain Measurement using Oscilloscopes

Prototyping

- RFIC Solutions has expertise in delivering units in prototype quantities ranging from 1-100 units



Ultra Wide Band Transceiver Prototype Boards



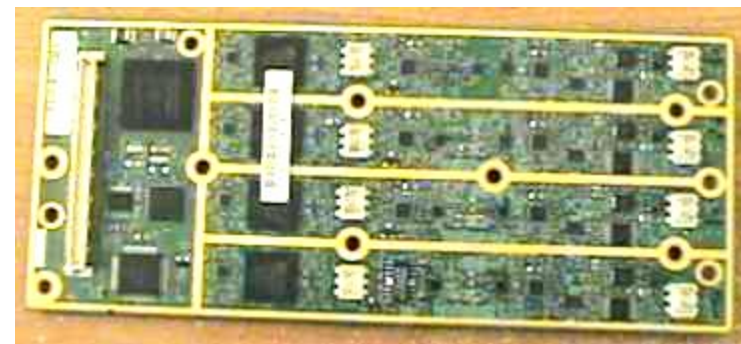
WLAN Transceiver Prototype Board



Cable TV Line amplifier Prototype units



Prototype Board for 900 MHz Transceiver



Prototype Board for CMTS based on DFRI/DOCSIS Standard

ANALOG AND MIXED SIGNAL DESIGNS

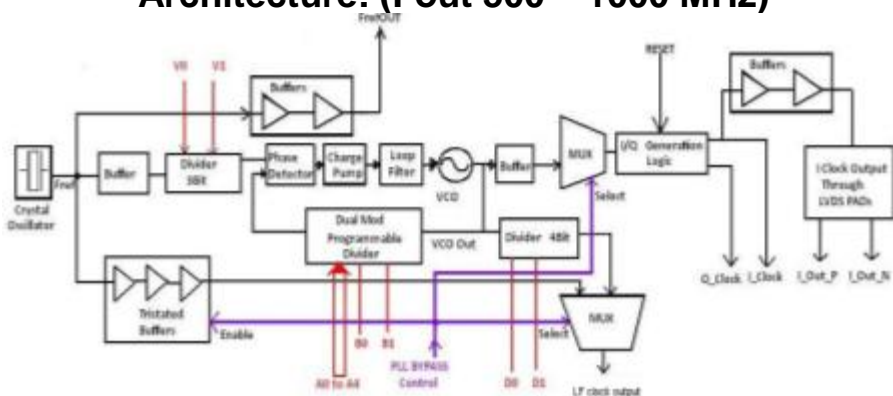
Summary

PLL developed by RFIC Solutions

Electrical specifications:

Parameter	Descriptions	Min.	Typ.	Max.	Units
VCO	Frequency Range	500		1000	MHz
	Tuning Voltage	0.6		1.8	V
	Phase noise@100 KHz offset	-115			dBc/Hz
	Phase noise@1MHz Offset	-140			dBc/Hz
Phase Frequency Detector (PFD)	PFD frequency	10			MHz
Charge Pump	Icp Source/sink	.9		2.8	mA
Dual Mode Divider	Division Range	16		127	
IQ Generator	Phase difference		90		Degree
	Frequency Range	250		500	MHz

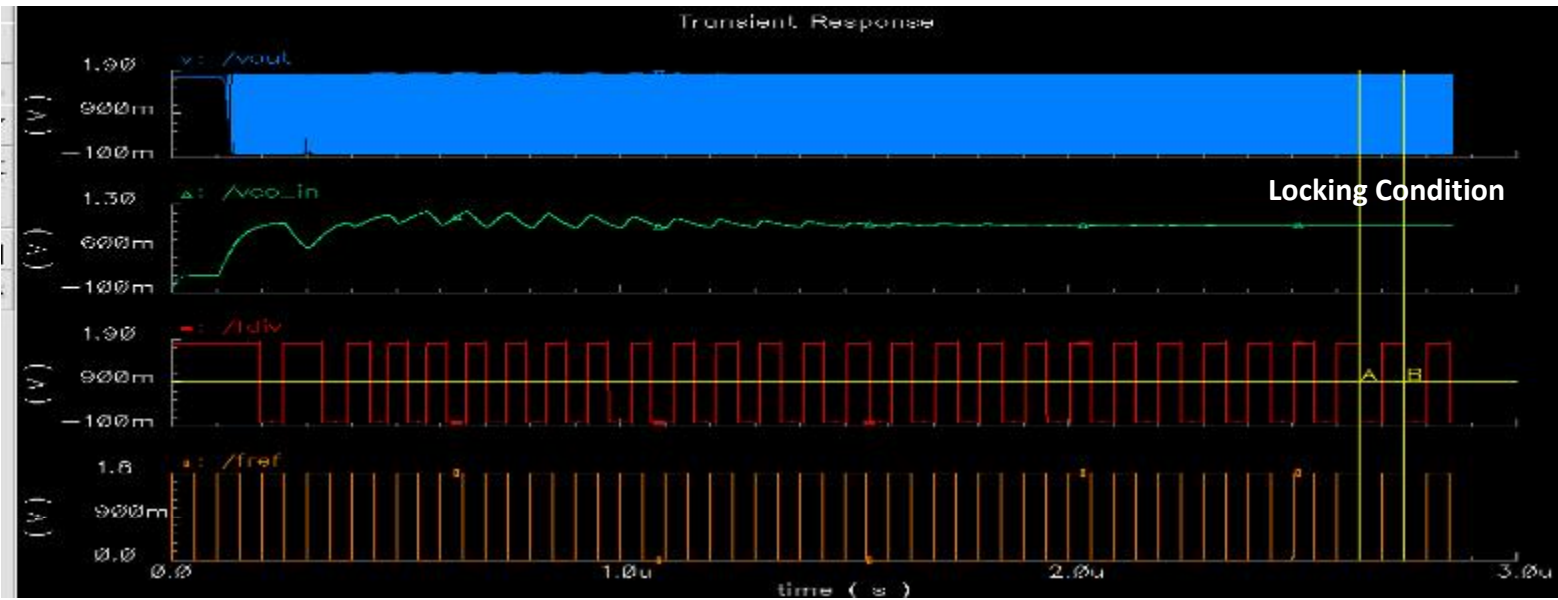
Architecture: (Fout 500 – 1000 MHz)



Features:

1. On-Chip VCO tunes from 500 MHz to 1000 MHz
2. Programmable Divider (16-127 division)
3. High Speed In-Phase & Quadrature-Phase output Signal (250-500 MHz)
4. Low Speed Signal (15-30 MHz)
5. Different Reference Frequency (10-40 MHz)
6. Low dynamic power consumption in locked state
7. Prescaler 4/5
8. Duty cycle (45% to 55%)
9. Temperature stability (-40 to +125° C)

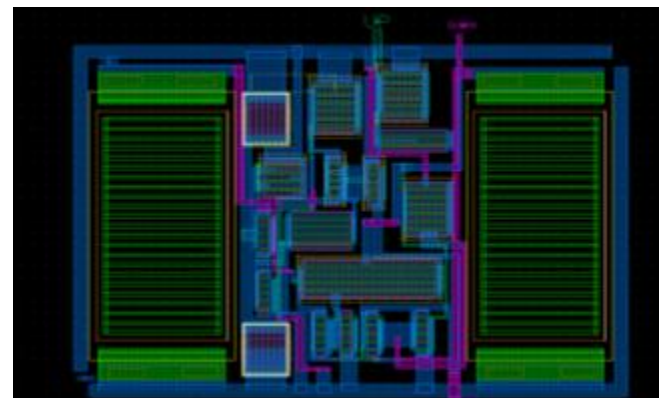
PLL developed by RFIC Solutions



PLL Layout



Charge pump Layout

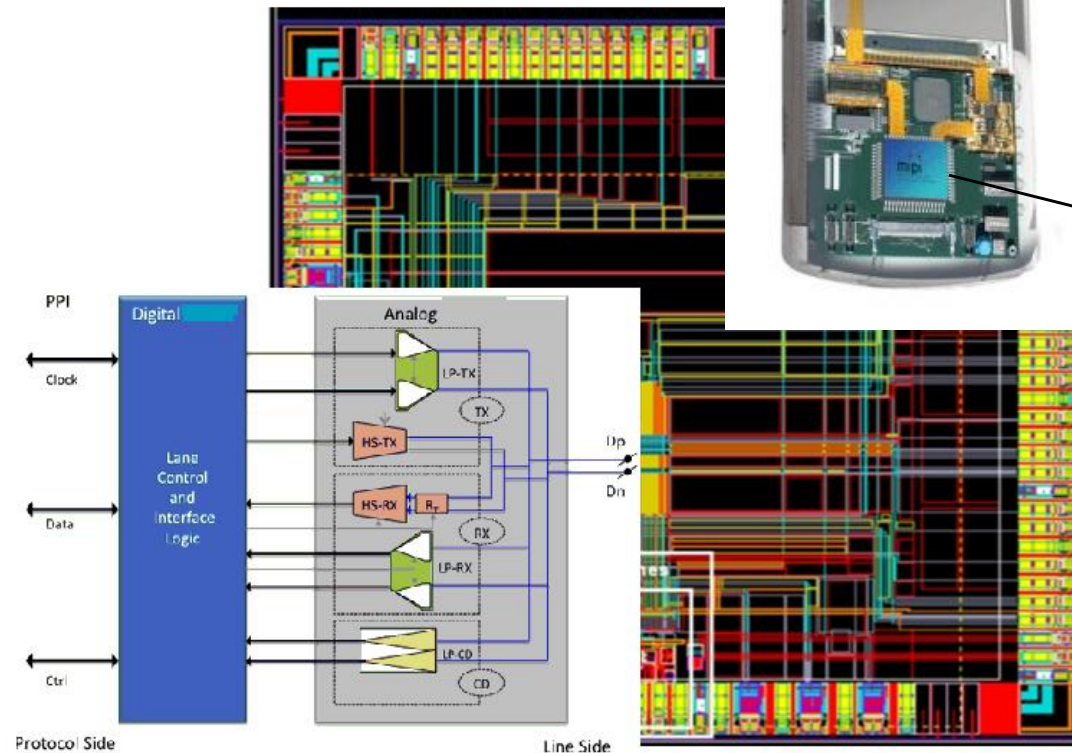


Complex CMOS MIPI Transceiver chip with PLL, LDO developed by RFIC Solutions

- Latest mobile standard complaint
- Applications: - Mobile Phone Camera interface
- Mobile Phone Display interface

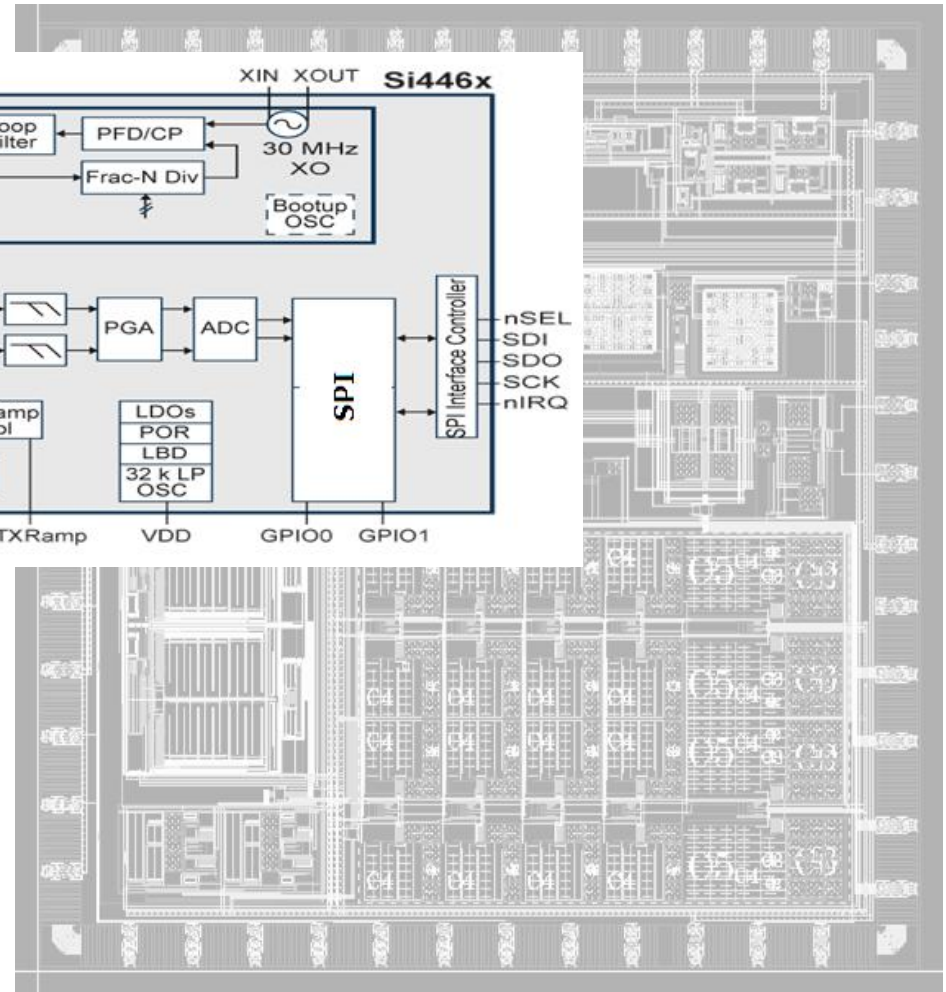
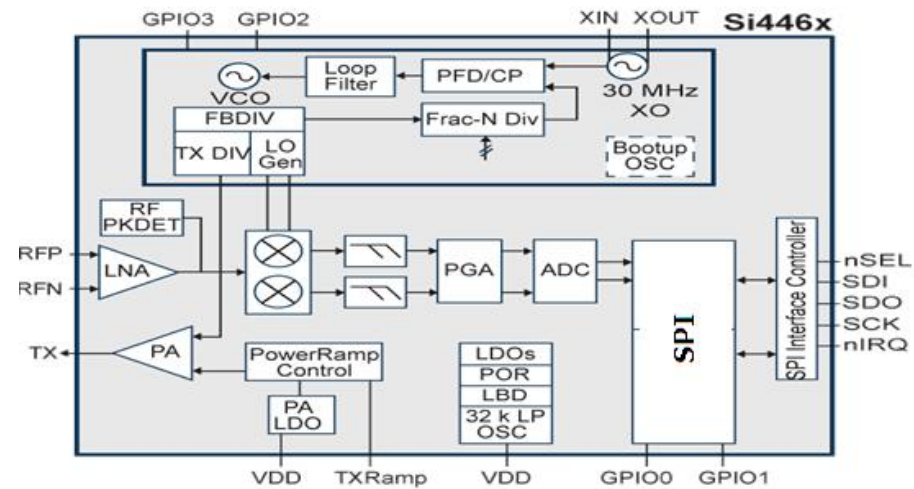


MIPI IC



802.15.4g CMOS 915 MHz Transceiver developed by RFIC Solutions

- 130 nm CMOS technology node
- RFIC Solutions developed the RF circuits and some digital blocks.
- Chip size 4.3x4.3 mm includes RF and Baseband circuits
- Features – low current – 15 mA Rx and 17 mA Tx with BB, low power, low cost,

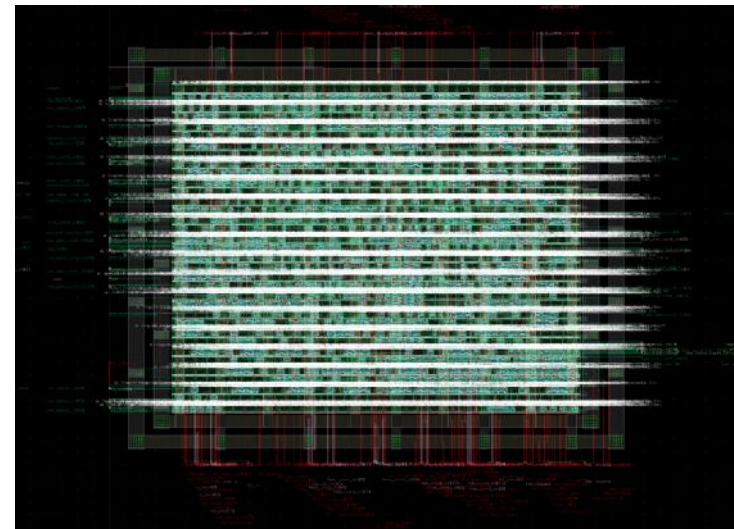
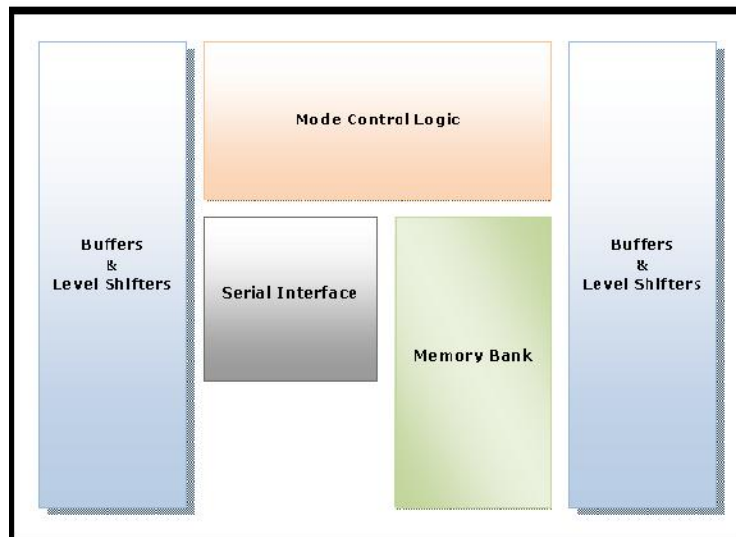


DIGITAL DESIGNS

Summary

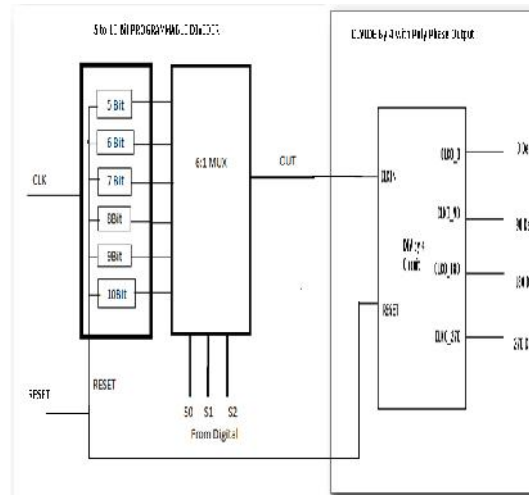
Digital Control Interface – RDCI12

- RFIC-Digital Control Interface allows dynamic control of analog, RF modules and there modes of operation. RFIC DCI is implemented on 130 nm RF CMOS Low Power process technology.
- A Serial Peripheral Interface (SPI) with clock speed in GHz can be achieved to program the control registers.
- Digital Control Interface used in GHz Transceivers and other wireless communication devices.



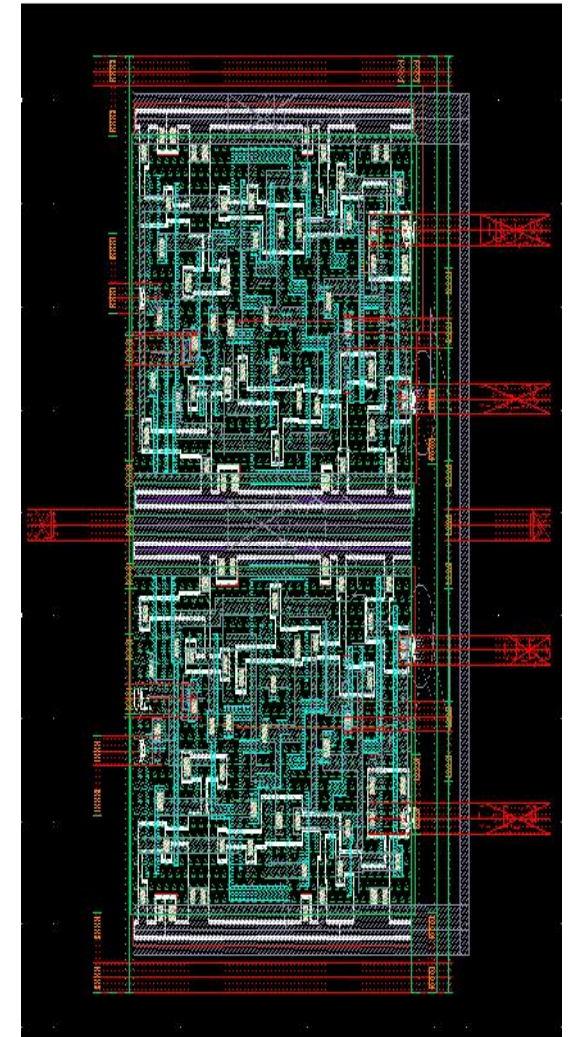
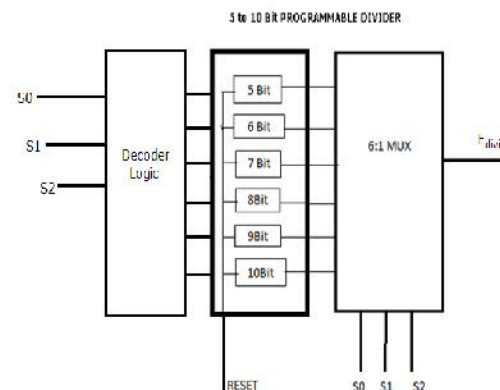
Poly Phase Programmable Frequency Divider

- This Poly phase CMOS Programmable Frequency Divider IP fabricated on 130 nm low power RF CMOS Technology. The module contains decoder logic, Divider logic and a multiplexer logic. This frequency divider gives the output in poly phase form with four different output phase.



Programmable Frequency Divider

- Wide range of frequency (50-2400 MHz) can be provided as input clock and programmable divider will be responsible for dividing the frequency by a particular frequency divider ration.

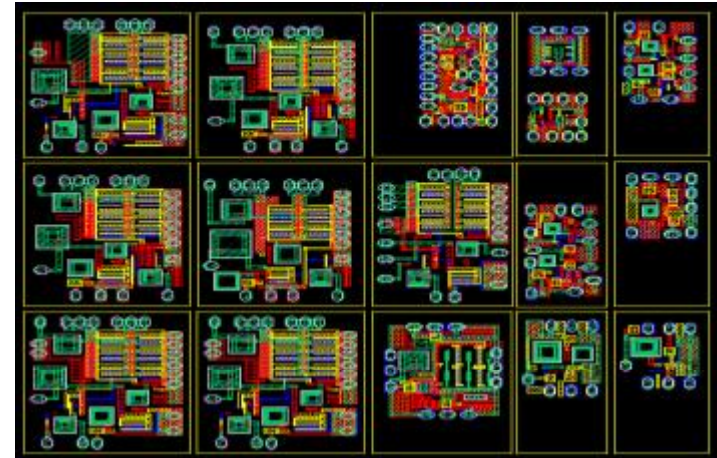


RFIC/MMIC TAPE OUTS COMPLETED



180nm SiGe BiCMOS Process

- Three SiGe BiCMOS/RFCMOS IC design tape outs on 180nm process.
- 15+ designs like LNA, Power amplifiers, drivers for WLAN and WCDMA applications.
- VCO, high speed drivers, mixers were also designed and fabricated on these masks.



The picture above shows one of the IC tile on BiCMOS process having LNA, PA and driver amplifier designs for WLAN and WCDMA applications.

GaAs 0.5um PS 50-70 pHEMT Process

- 15 Designs for various wireless applications.
- Designs Covering 0.5GHz to 12GHz frequency range.
- Power amplifier designs for low to high power applications up to 0.5 Watt.
- High performance Low noise amplifiers covering 2GHz to 8GHz.
- Other high performance designs like DA, PA, LNA, Oscillator, RF Switch, etc along with flexible amplifier test structures on the tile.
- Fabricated with Win Semi. foundry



1 Watt Power Amplifier

➤ Applications

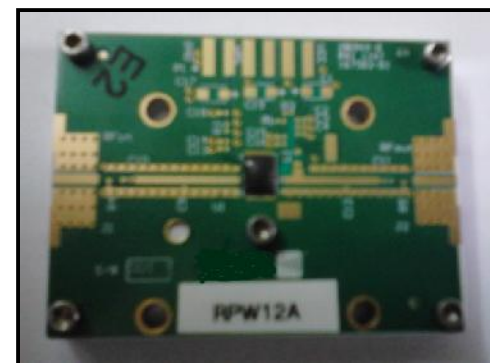
- ISM Band
- WiMax standard
- GSM, CDMA, TDSCDMA, WCDMA
- Single and Multi-Carrier Applications

➤ Key Features

- High output power
- Wide band operation
- Tunable
- ESD Protected

Electrical Specification:

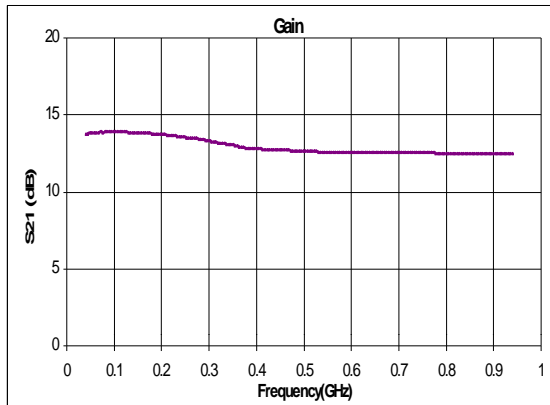
Parameter	Unit	Achieved Specs	Measured Results
Gain – 2140MHz	dB	18.7	16
S11	dB	9.8	-
S22	dB	8.2	-
P1dB	dBm	30	-
Pout -50dBc WCDMA	dBm	20.4	-
Current -50dBc WCDMA Pout	mA	238	-
NF	dB	5	-
Voltage	V	5	5
Quiescent Current	mA	240	-



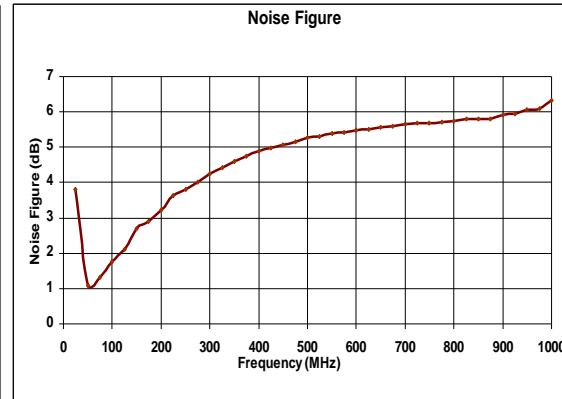
CATV Amplifier, (40 - 870 MHz)

Measured Data

Gain Vs Freq.



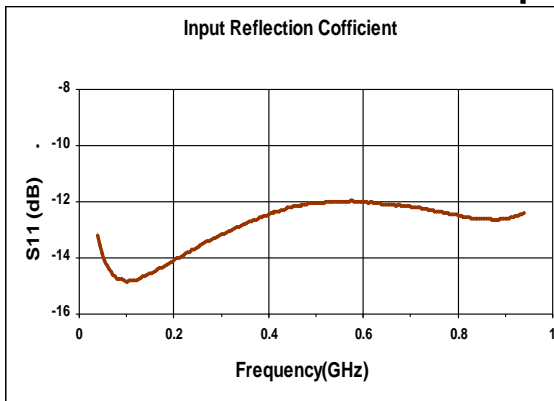
Noise Fig. Vs Freq.



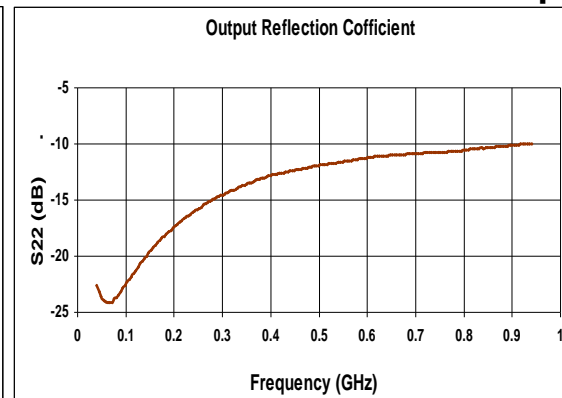
CATV Module



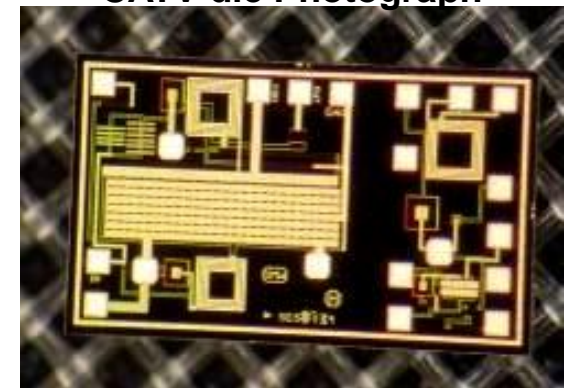
I/P Reflection coeff. Vs Freq.



O/P Reflection coeff. Vs Freq.



CATV die Photograph

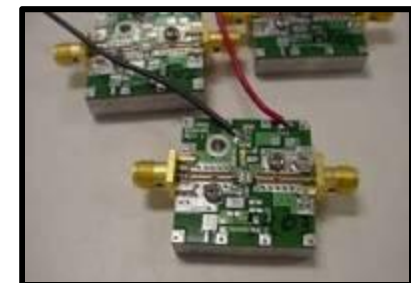


Partial listing of our design IPs

SiGe BiCMOS and CMOS IPs:

S.N	Part No.	Frequency	IP Name & Process
1	RIBPL01	1100 MHz	Phase Locked Loop, RF CMOS
2	RTPL01	1100 MHz	Phase Locked Loop, RF CMOS
3	RCLR01		Low Speed, low power Receiver IP
4	RCLTX01		Low Speed, low power Transmitter IP
5	RTDA01	2.0 to 5.0 GHz	Driver Amplifier, RF CMOS
6	RTLNA01	2 to 4 GHz	Low Noise Amplifier, RF CMOS
7	RCLDO1		Low Drop out regulator, CMOS
8	RCBGR1		Band Gap reference, CMOS
9	RJL01	1.5 to 1.7 GHz	Narrow band GPS LNA, SiGe BiCMOS
10	RJL02	1575 MHz	Narrow band GPS LNA, SiGe BiCMOS
11	RJP01	1.920 to 1.980 GHz	WCDMA PA, SiGe BiCMOS
12	RS01	1.7 to 2.7 GHz	Single Stage LNA, SiGe BiCMOS
13	RS03	2 to 6 GHz	Single Stage LNA, SiGe BiCMOS
14	RJP05	2.4 to 2.5 GHz	WLAN PA, SiGe BiCMOS
15	RJCT01	40 to 870MHz	CATV Line Amplifier, SiGe BiCMOS
16	RJVC01	0.5 - 1.15 GHz	VCO, SiGe BiCMOS
17	RJVC02	2.0 - 6.0 GHz	VCO, SiGe BiCMOS

- Samples of **2-6 GHz LNA, 2-10 GHz LNA, 2-5 GHz driver amp, 0.05-3.5 GHz LNA, CATV amp on GaAs.** products are available today on request.



Partial listing of our design IPs

RF CMOS IPs @915 MHz

Sr.No.	Designs	IP Name	Applications
1	Low Noise amplifier	RLNTA12	Transform Domain (TD) receiver and ISM
2	Tone generator	RTG12	For calibration in receiver (Tuning of filter center frequency) and as a Transmitter
3	RF CMOS Power Amplifier	RPA12C	Application Based Short Distance Communication
4	CBPF	RCBPF01	General Purpose System
			Portable system
			Anti-Alias Filter
			Tracking Filter
			Harmonic analysis
5	PGA	RCPGA01	Noise analysis
			Reconstruction Filters
			Analog input amplifier for Analog to Digital Converter
			Digitally controlled attenuators
			Programmable gain amplifiers
6	Digital Control Interface for wireless Applications	RDCI12	Function generation
			Linear automatic gain controls
7	Poly Phase CMOS Programmable Frequency Divider	RPD12	Wireless Communication
			GHz Tranceivers
8	CMOS Programmable Frequency Divider		PLL Frequency synthesizers
			LNA's and Tone Generators

Partial listing of our design IPs

GaAs p-HEMT IPs:

S.N	Part No.	Frequency	IP Name & Process
1	RGDA01	2.0 to 4.0 GHz	Driver Amplifier,
2	RGLNA02	2.0 to 6.0 GHz	Low Noise Amplifier,
3	RGLNA03	2.0 to 12.0 GHz	Low Noise Amplifier,
4	RGLNA01	0.7 to 3.0 GHz	Low Noise Amplifier,
5	RGLNA10	7.0 to 26.0 GHz	Low Noise Amplifier,
6	RGLNA11	2.0 to 6.0 GHz	Low Noise Amplifier,
7	RGLNA06	2.0 to 6.0 GHz	Low Noise Amplifier,
8	RDA03	2.0 to 4.0 GHz	Driver Amplifier
9	RTV01	40 to 870 MHz	CATV Amplifier,
10	RGPA03	3.4 to 3.6 GHz	Power Amplifier,
11	RGPA04	4.9 to 5.9 GHz	Power Amplifier,
12	RGPA01	2.4 to 2.5 GHz	Power Amplifier,
13	RGPA05	1.85 to 1.91GHz	Power Amplifier,
14	RFISFRT01	2.4 to 2.5 GHz	WLAN Front End,
15	RFISFR01	2.5 to 2.686GHz	Front End Module,
16	RGPA	880 to 960 MHz	5 watt, PA ,

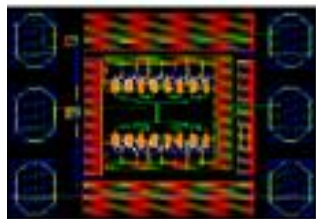
GaAs InGaP HBT IPs

S.N	Part No.	Frequency	IP Name & Process
1	GEDA01	7 to 20 GHz	Driver Amplifier,
2	GEDA01	20 to 40 GHz	Driver Amplifier,
3	GEV03	15 to 20 GHz	VCO,
4	GRV02	10 to 15 GHz	VCO,
5	GRFM1	10 to 20 GHz	Freq. Multiplier,
6	RGDIV01	7 to 20 GHz	Divide by 8,
7	RWPA01	2.3 to 2.7 GHz	Power amplifier,
8	GRDA1	10 to 20 GHz	Differential Amplifier,
9	GRO1	14 to 16 GHz	High Freq. Oscillator,
10	GRV03	14 to 21 GHz	Negative Resistance Generator,

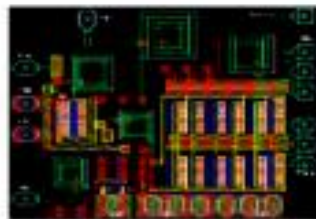
MMIC DESIGN LIBRARY AND SYSTEM BUILDING BLOCKS

Snapshots

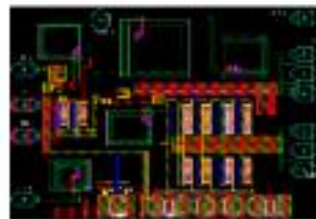
SiGe BiCMOS & RF CMOS MMIC



Cable TV Amplifier
40 to 870 MHz



WCDMA Power Amplifier
1920 to 1980 MHz



WLAN Power Amplifier
2.4 to 2.5 GHz



WiMAX Power Amplifier
3.4 to 3.6 MHz



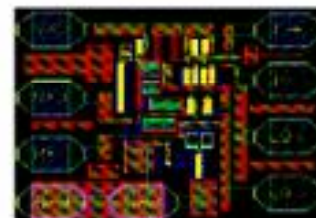
GPS LNA with Mode Ctrl
1.5 to 1.7 GHz



**Low Current Narrow Band
GPS LNA 1.575 MHz**



**7 GHz Voltage Controlled
Oscillator**



**1.6 to 3 GHz Gilbert Cell
Mixer**

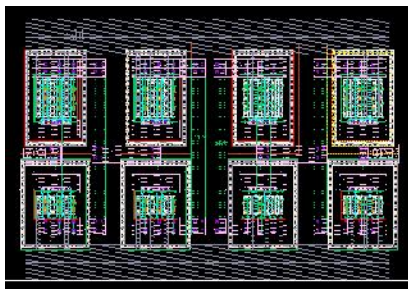


2.4 GHz LNA

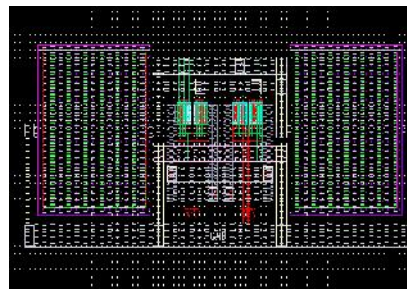


2.5 GHz Driver Amplifier

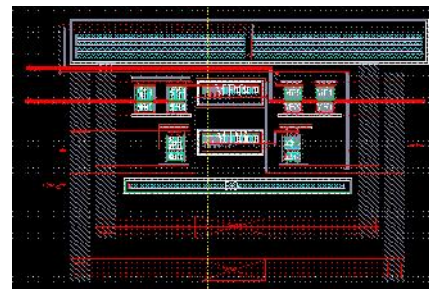
RF CMOS MMIC



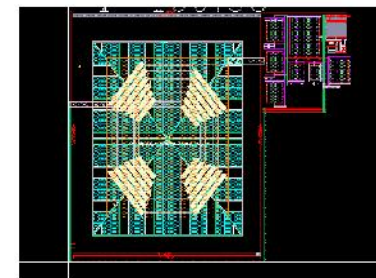
Buffer Amplifier



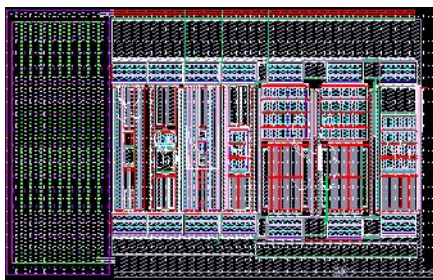
Mixer



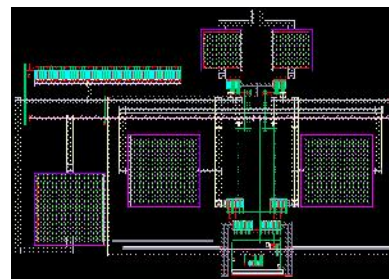
Crystal Oscillator



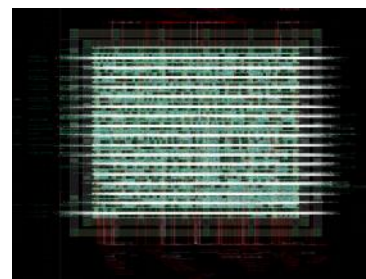
Power Amplifier



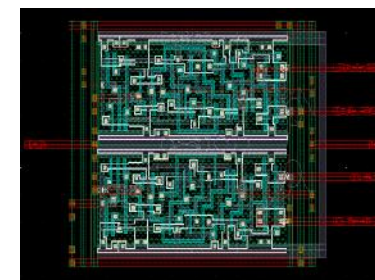
Attenuator



LNA

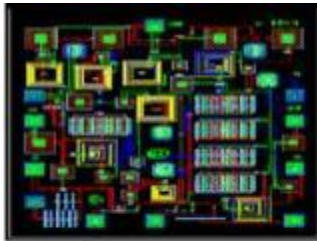


Digital Control Interface

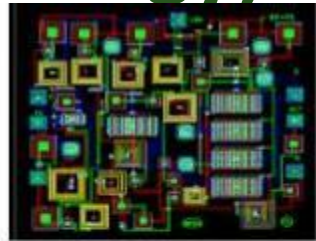


Poly phase
Freq Divider

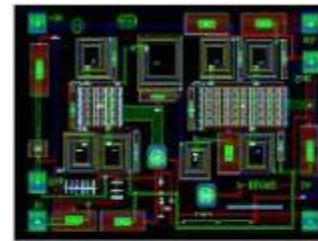
Driver and power amplifier MMIC (pHEMT technology)



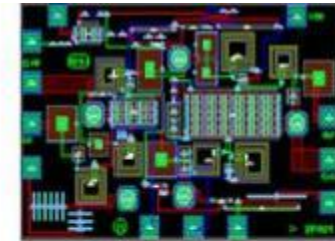
RGPA01 2.4 to 2.5 GHz
Power Amplifier



RGPA02 3.4 to 3.6 GHz
Power Amplifier



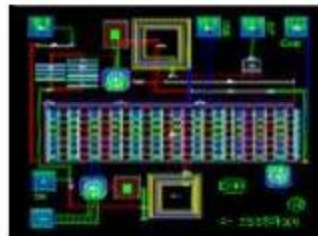
RGPA03 3.5 GHz
Power Amplifier



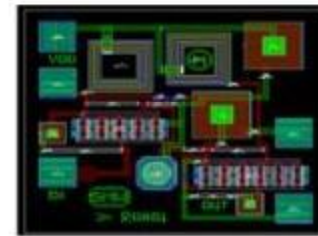
RGPA04 5 GHz
Power Amplifier



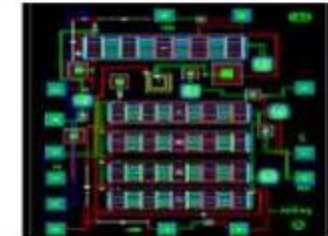
AP2520 50 MHz to 250
MHz Power Amplifier



Cable TV Amplifier



RDA01 2-4 GHz Driver
Amplifier



RGPA05 1.850 to 1.910
GHz Power Amplifier

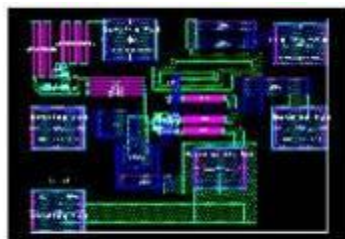


RDA01 2-4 GHz Driver
Amplifier



AP2520 50 MHz to 250
MHz Power Amplifier

InGaP HBT Synthesizer Building Blocks, 0.875-40 GHz



7 GHz to 20 GHz VCO



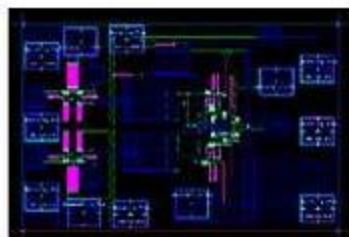
7 to 20 GHz Buffer Amplifier



0.5 to 3 GHz Buffer Amplifier



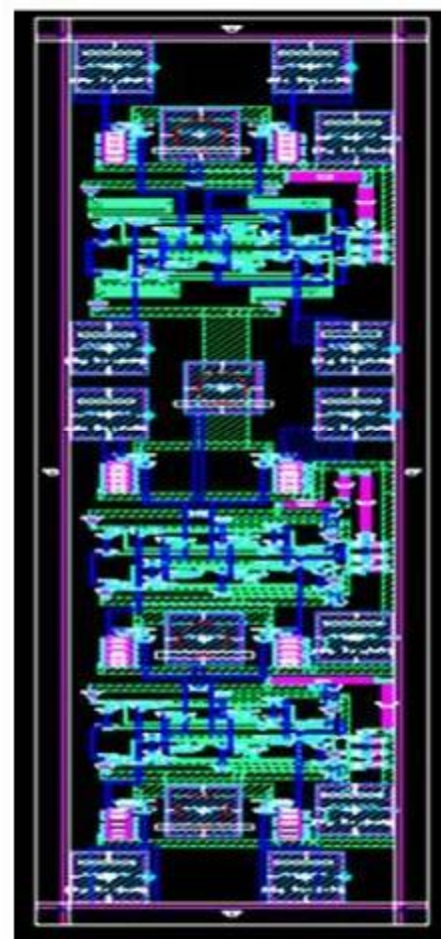
20 to 40 GHz Buffer Amplifier



40 GHz Gilbert Frequency Multiplier



20 GHz Frequency Multiplier



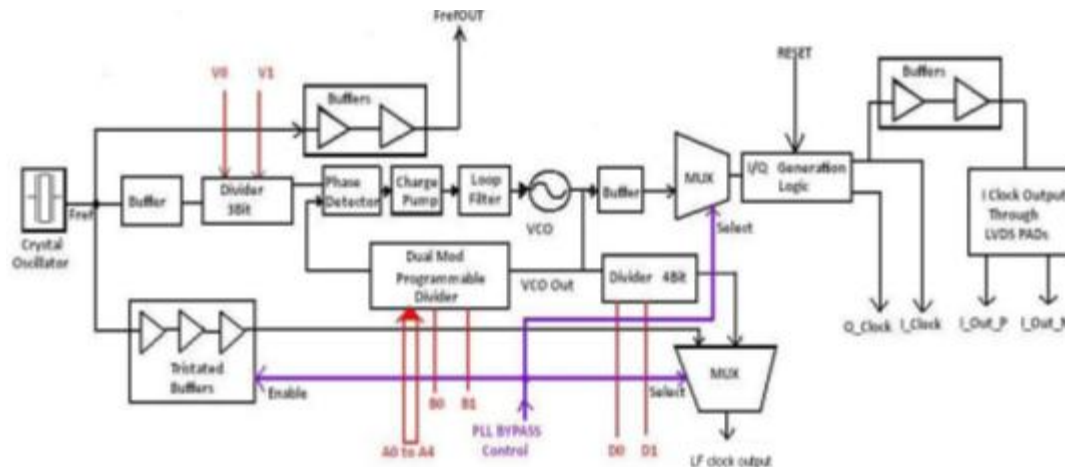
Frequency Divider Divide by 8 Stage

SUCCESSFUL DEPLOYMENTS (COMPLEXITY, APPLICATION)

1 GHz PLL with programmable reference frequency on 0.18um CMOS process

Distinguishing Features:

- On-Chip VCO tunes from 500 MHz to 1000 MHz
- Programmable Divider (16-127 division)
- High Speed In-Phase & Quadrature-Phase output Signal (250-500 MHz)
- Low Speed Signal (15-30 MHz)
- Different Reference Frequency (10-40 MHz)
- Low dynamic power consumption in locked state
- Prescaler 4/5
- Duty cycle (45% to 55%)
- Temperature stability (-40 to +1250 C)



- ## Applications:
- ASIC Clock Generator
 - Clocking of A/D and D/A Converters
 - Cellular Systems

Ultra Wideband RF/Analog Front-end for IEEE 802.15.4a standard

Distinguishing Features:

A RF/Analog Front-End board was to be designed. The board was expected to work from 3.0 GHz to 8.3 GHz
The Board was implemented using Discrete RFIC/MMIC and consumed very less power



UWB Board in testing phase



UWB Board in testing phase

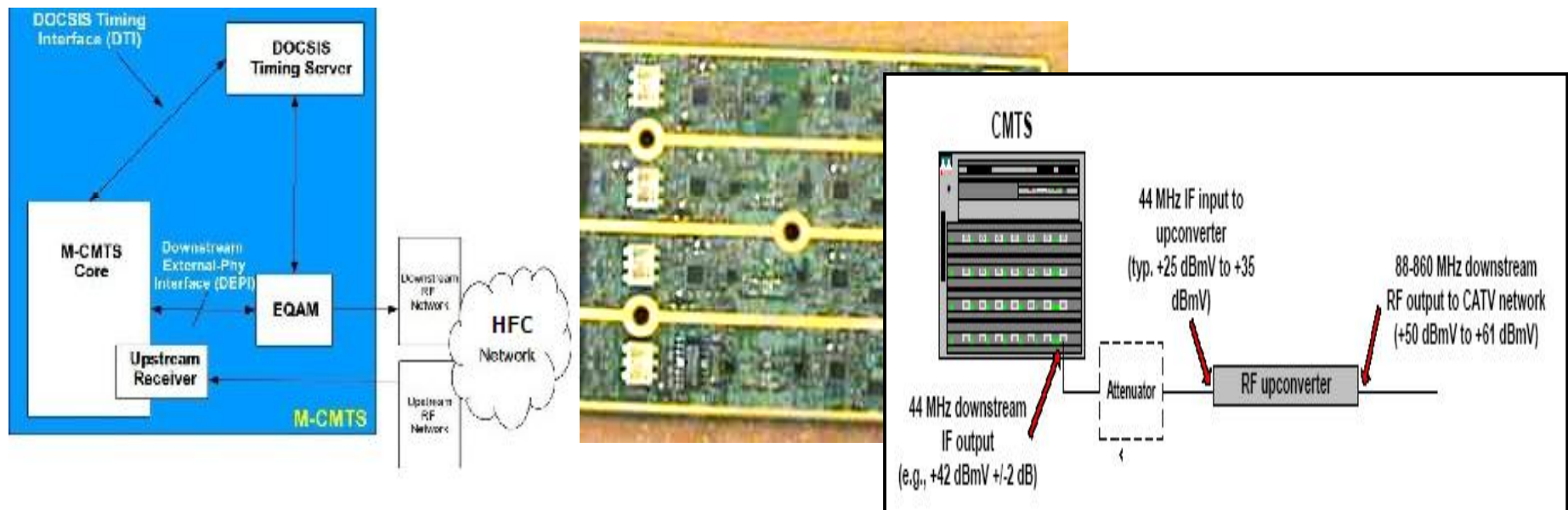
Applications

Reference Design for Ultra Wideband Communication Systems
Low Data Rate Wide Band Pulse Based non-coherent Communication systems

UP Converter for CMTS system based on DOCSIS Standard

Distinguishing Features:

Low Cost complete solution for CMTS based on DFRI/DOCSIS Standard.

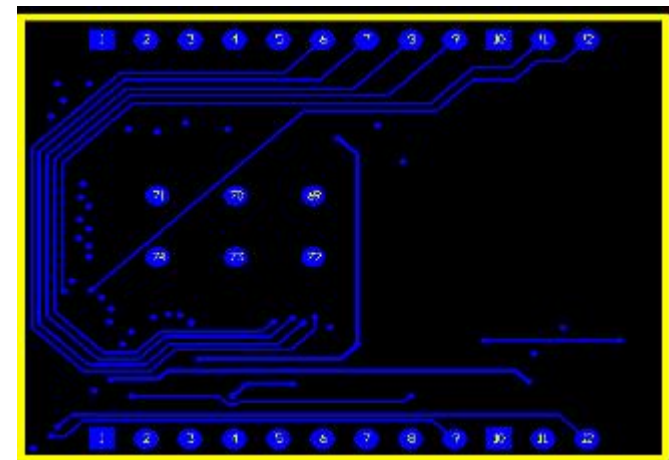
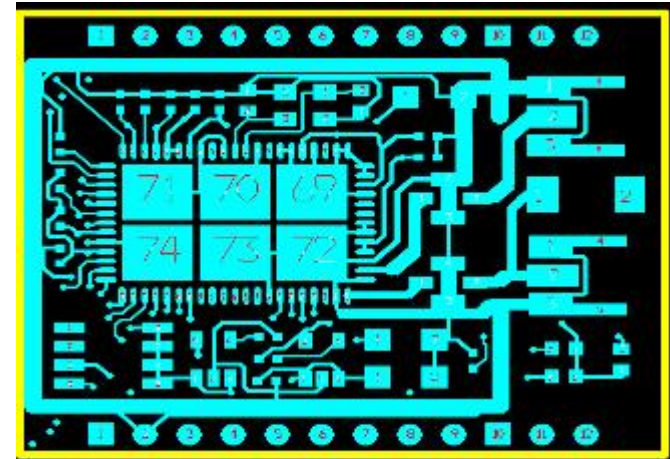


Applications

Cable Modem Termination System
Set-Top Box

WLAN Board system development

- We offer competitive RF Board and system level design service, RF board assembly and test service.
- We are designing WiFi, WiMax, UWB system boards along with our partners.



Conclusion

- RFIC Solutions has extensive RF, Analog, Digital & Mixed Signal IC design experience – offering RFIC, Analog, Digital ASIC design & development & Mixed-Signal IC, Module and system design services.
- Completed multiple tape-outs on E/D pHEMT GaAs HBT, Silicon CMOS, RF CMOS and SiGe BiCMOS technologies with 150 plus RFIC building blocks at various foundries.
- We offer RF IC, Analog, Digital & Mixed-Signal IC's and Module services and IP at very competitive rates.
- We are offering 802.11b/g/n, ac, ad and Blue tooth, RF Circuit IP which are currently under development.
- Currently funded privately.
- Looking for strategic customers / partners.

THANK YOU!

