# BytePipe x9002 System on Module (SOM)

The BytePipe x9002 SOM is a Software Defined Radio (SDR) System on Module (SOM) based on Analog Devices Inc.'s ADRV9002 Agile Transceiver™ with the Xilinx ZYNC®- UltraScale+ SoC. The SOM can be used as an evaluation tool, prototyping platform or integrated into a full-scale product.

A 2x2 MIMO transceiver with integrated DPD engine operates from 30MHz to 6000MHz and supports both narrowband and wideband channel bandwidths from 12.5KHz to 40MHz. The narrow band support makes it suitable for applications including, Land Mobile Radio, APCO P25-PII while supporting higher bandwidth applications like satellite communications, IoT, cellular, LTE or Wi-Fi.

NextGen RF—through our design services lab—can also support customized versions optimized for application specific requirements.
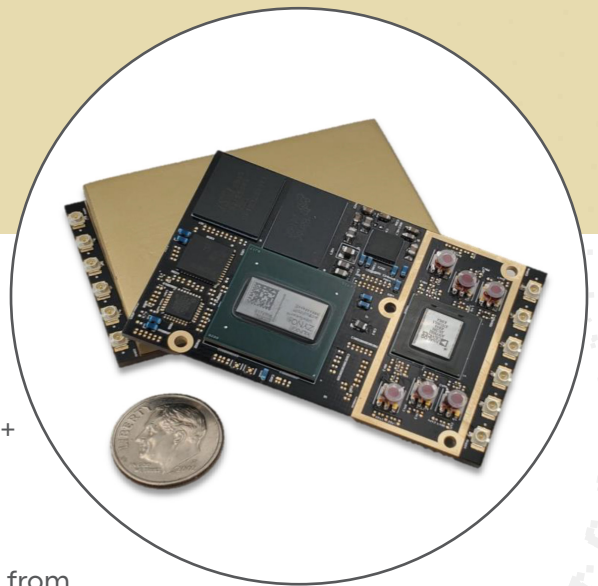
HIGHLIGHTS

FEATURES

- Two independently controlled Tx
- Operates from 30MHz to 6,000MHz
- 12.5KHz to 40MHz radio signal bandwidth
- 150 dBc/Hz dynamic range
- FDD and TDD capable—supports narrowband or wideband up to 40MHz channel bandwidth
- Each transceiver subsystem includes DC offset correction, quadrature error correction and programmable 128 taps Rx/Tx programmable FIR filters
- Board support package (BSP) for Linux, RTOS and Bare Metal OS
- Support for third party tools including MATLAB, Simulink, Gnu Radio
- Integrated digital pre-distortion (NB/WB)
- Fast frequency hopping

APPLICATIONS

- Mission critical RF communications
- Rapid prototyping platform
- Industrial IOT
- Product integration
- ADRV9002 evaluation tool
- Land mobile radio - APCO P25-PII
- Video streaming
- MIMO
- Drone communications

A PRODUCT OF

NextGen
R F D E S I G N

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HARDWARE BLOCK DIAGRAM

Processing System

LPDDR4

NOR,NAND,SRAM,QSPI

XCZU2CG – XCZU3EG

Real-Time Processing Unit

ARM® Cortex™ – R5

MPU
Floating Point
32kB D-Cache
128kB TCM
32kB I-Cache

GIC

Graphics Processing Unit

ARM Mali™ – 400 MP2

Pixel CPU
Geometry CPU
64kB L2-Cache
MMU

Application Processing Unit

ARM™ Cortex™ – A53
NEON™
Floating Point
TRACE
32kB D-
MMU
1MB L2
32kB I-Cache
GIC-400
SCU
CCI/SMMU

Multichannel DMA
Timers, WDT, Clocking

Power Management
System Monitor

Security AES,SHA,RSA

AMBA® Interconnect
AMBA® Interconnect

ACP
High-Performance AXI Ports

General-Purpose AXI Ports
Programmable Logic

High Density HD I/O
High Performance HP I/O

ADC

Block RAM
Ultra RAM
DSP

8GB eMMC
2GB LPDDR4

TRX   TRX
ETH   USB

GigE
USB2
CAN
UART
SPI
QSPI
SD
DP
USB3
SATA
PCIe
GTR
EMIO
MIO

ADC
JTAG
LVDS
UART
I2C
GTR
MIO

LVDS   LVDS   SPI   GPIO   VCTCXO   LVDS   LVDS

ADRV9002

INT QEC LOL
DAC
DAC

DDC DEC QEC DC
HPADC LPADC LPADC HPADC

SPI
CTL
CLK

LO1 LO2
LPF
0° 90°
SSI

DDC DEC QEC DC
HPADC LPADC LPADC HPADC

INT QEC LOL
DAC
DAC

LO1
LO2
CLK

2Tx, 2Rx, 2ORx
30MHz – 6GHz

PMIC

CHANNEL 1 7A BUCK
CHANNEL 2 7A BUCK
CHANNEL 3 3A BUCK

VOUT1
VOUT2
VOUT3

VCCIO
RF_CLK
MCS
DAC
ADC
GPIO
5V

NextGen — RF DESIGN —