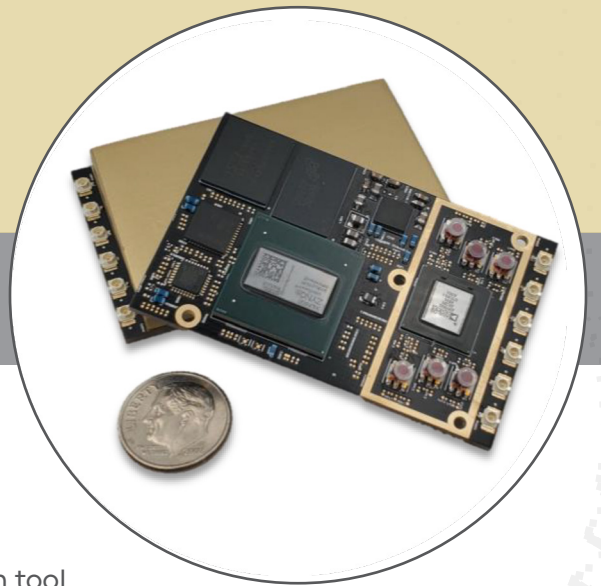# BytePipe x9002

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/AMD Zynq™ UltraScale+™ MPSoC. The SOM can be used as an evaluation tool, prototyping platform, or integrated into a full-scale product.

A 2x2 MIMO transceiver with integrated Digital Pre-Distortion (DPD) engine operates from 30MHz to 6000MHz and supports both narrowband and wideband channel bandwidths from 12.5KHz to 40MHz. The narrowband support makes it suitable for applications including Land Mobile Radio 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 Tx and two Rx ports, configurable between two independent LO's
- Operates from 30MHz to 6000MHz
- 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 errorcorrection, and 128-tap Rx/Txprogrammable FIR filters
- Board support package (BSP) for Linux, RTOS, and Bare Metal OS
- Support for third party tools including MATLAB, Simulink, and GNU Radio
- Integrated Digital Pre-Distortion (DPD) (NB/WB)
- Fast frequency hopping

APPLICATIONS

- Mission Critical RF Communications
- Rapid Prototyping Platform
- Industrial IoT
- Product Integration
- ADRV9002 Evaluation Tool
- Land Mobile Radio / Narrowband
- Video Streaming
- MIMO
- UAS Command and Control
- Spectrum Monitoring

A PRODUCT OF

NextGen
RF DESIGN

Hardware Block Diagram

ADRV9002

DAC
INT
QEC
LOL
LPF
LO1
LO2
0°
90°
SSI

LVDS

LPF
HPADC
LPADC
LPADC
HPADC
DDC
DEC
QEC
DC
LO1
LO2
0°
90°

LVDS

2Tx, 2Rx, 2ORx
30MHz – 6GHz
LO1
LO2
CLK

SPI — SPI
CTL — GPIO
CLK — VCTCXO

LPF
HPADC
LPADC
LPADC
HPADC
DDC
DEC
QEC
DC
LO1
LO2
0°
90°

LVDS

DAC
INT
QEC
LOL
LPF
LO1
LO2
0°
90°

LVDS

XCZU2CG—XCZU3EG

NOR,NAND,SRAM,QSPI   LPDDR4   Processing System

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

AMBA® Interconnect

Application Processing Unit

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

Real-Time Processing Unit

ARM® Cortex™ – R5 | MPU / Floating Point
128kB TCM | 32kB I-Cache | 32kB D-Cache
GIC

Power Management | Multichannel DMA
System Monitor | Timers, WDT, Clocking

Graphics Processing Unit
ARM Mali™ – 400 MP2
Geometry CPU | Pixel CPU
MMU | 64kB L2-Cache

Security AES,SHA,RSA

AMBA® Interconnect

ACP

General-Purpose AXI Ports | Programmable Logic | High-Performance AXI Ports

Block RAM
Ultra RAM
DSP

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

PMIC
CHANNEL 1 7A BUCK — VOUT1
CHANNEL 2 7A BUCK — VOUT2
CHANNEL 3 3A BUCK — VOUT3

5V | GPIO | ADC | DAC | MCS | RF_CLK | VCCIO

MIO | GTR | I2C | UART | LVDS | JTAG | ADC

2GB LPDDR4 | 4GB eMMC

TRX | TRX
USB | ETH

Analog/Power Interconnect - J601

Digital Interconnect - J600

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