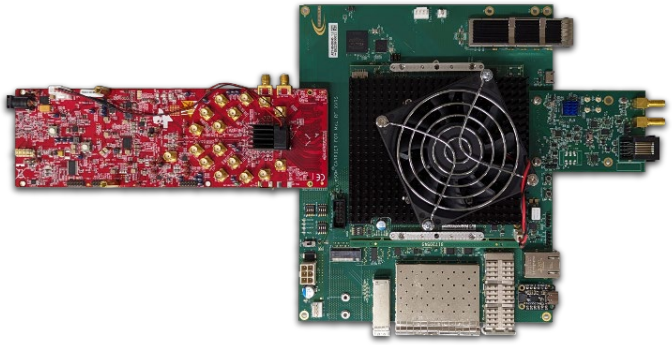
Agilex eSOM7 5G/Wireless Development Platform
Texas Instruments (TI)

Supported TI Development Kits

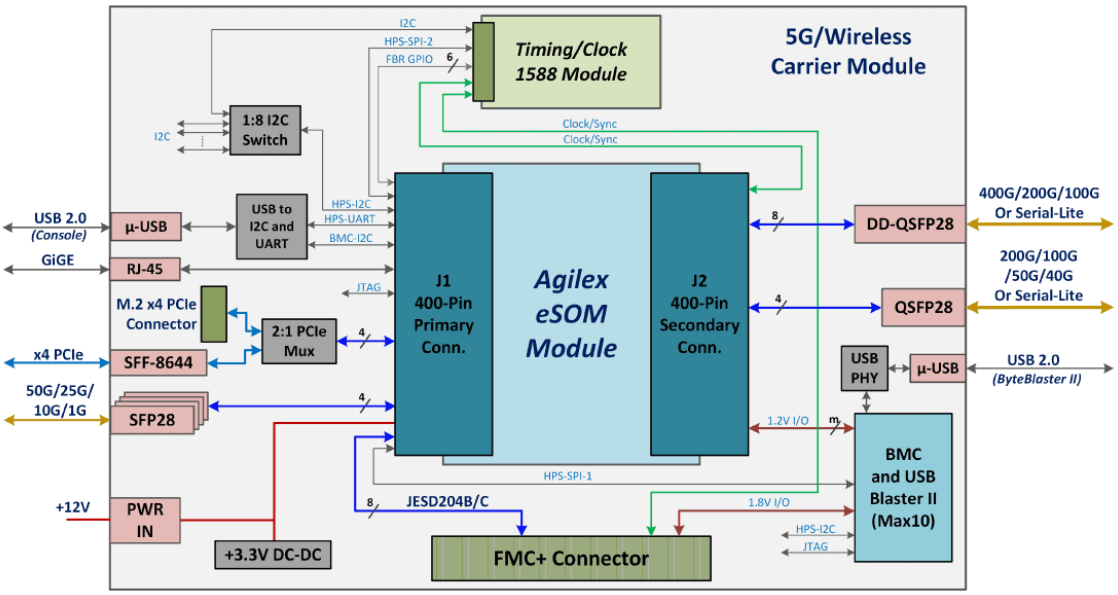
- AFE80xx (AFE8092/AFE8030)
- AFE79xx
- AFE77xx
- AFE77xxD



The Agilex eSOM7 5G/Wireless development platform provides a quick evaluation and prototyping platform for 5G ORAN and wireless solutions based on the Intel's latest high performance 10nm Agilex F-Series FPGAs. The development platform consists of two modules, an Agilex 7 F-Series FPGA based eSOM7 (embedded System On Module) board with two 400-pin high speed mezzanine connectors and a carrier board which implements breakout of the FPGA serdes and I/Os. The carrier module provides a VITA57.4 FMC+ connector with level translation and control logic to interface with TI RF transceivers, receivers, transmitters evaluation modules.

Features

- Compact 8.5" x 7.0" carrier for Agilex eSOM7 FPGA module
- Supports interchangeable eSOMs with different Agilex devices; primarily designed for Agilex 7 series FPGAs with 1x and 2x F-Tiles
- Designed to provide End-to-End connectivity for 5G, Wireless and Satellite-Hub developments
- VITA57.4 FMC+ connector for RF transceiver evaluation modules
    - 8 Serdes lanes up to 32 Gbps for JESD204B/C connectivity
    - JESD clocks and SYSREF signals mapped to FPGA's true LVDS IOs
    - Control, configuration and I/O with level translation mapped through Max10 CPLD on carrier to support targeted evaluation modules
- Network interface connectors
    - 4 x SFP28 connectors with support for 10G/25G/50G Ethernet and eCPRI interfaces
    - One QSFP28 4 QSFP28 connector for networking up to 200G Ethernet
    - One QSFP-DD connector for high performance networking up to 400G Ethernet
- Selectable x4 Gen4 (16Gbps) PCIe Gen4 interface
    - SFF-8644 connector for x4 PCIe target to Agilex FPGA
    - x4 PCIe master interface through a M.2 connector
- Resistor steering based highly configurable carrier clocking network
- Integrated USB Blaster II debug interface through micro-USB connector
- 50-pin connector for network synchronizer and interface expansion modules
    - Signals mapped to eSOM HPS to support SPI, I2C and UART interfaces
    - Differential clock and synchronization signals to support PTP/1588 and SYNCE based network synchronization including JESD 204B/C clock generation
- Processor and debug interfaces
    - HPS Ethernet 1000Base-T via RJ45 connector
    - HPS UART and BMC I2C to the USB2.0 connector via USB to UART+I2C bridge
    - HPS I2C to the carrier I2C expansion switch and carrier CPLD
    - HPS mater SPI to the carrier CPLD with support for FMC+ SPI expansion
- 6-pin ATX connector for +12V power input

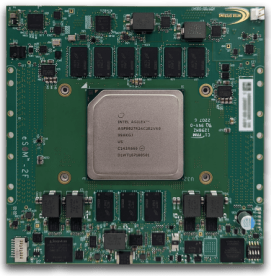


eSOM Wireless Platform Block Diagram

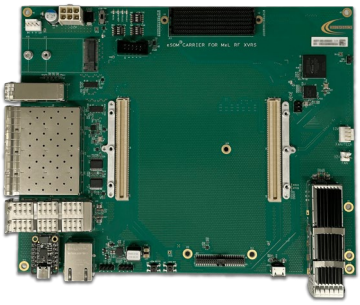
eSOM7-2F Features

- Aglilex 7 F-series 24C package FPGA with 2x F-tiles
- Supported FPGAs: 027/022 and 014/012
- Onboard FPGA fabric memory: 2banks of 72-bit 4/8GB DDR4 memories, 2GB SDM QSPI for FPGA image
- On board HPS memory: 72-bit 4/8GB component DDR4 memory, 16/32GB eMMC and µSD card debug slot
- Two 400 pin connectors (Primary and secondary)
- Primary Connector (J1)
  - F-Tile based Serdes interface; 16 NRZ (32Gbps) or 12 PAM4 (58.125Gbps) transceivers
  - HPS Interfaces: Ethernet (1000Base-T/MDI), USB 2.0 host, UART, I2C and SPI
  - BMC Interfaces: UART, I2C, board control I/O
  - Single +12V power input the module
- Secondary Connector (J2)
  - F-Tile based Serdes interface; 16 NRZ (32Gbps) or 12 PAM4 (58.125Gbps) transceivers
  - Fabric side true-differential (LVDS), 1.2V differential, 1.2V single-ended GPIO for control, interface and clock management
- Debug support: FPGA JTAG access, console access to HPS, UART and I2C interfaces to BMC FPGA, extensive temperature and voltage sensors for board telemetry
- Up to 120A core rail supply using multi-phase controller and DrMOS power stages

Platform Boards

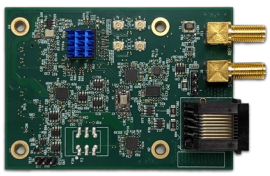


Agilex eSOM7-2F



eSOM TI Carrier

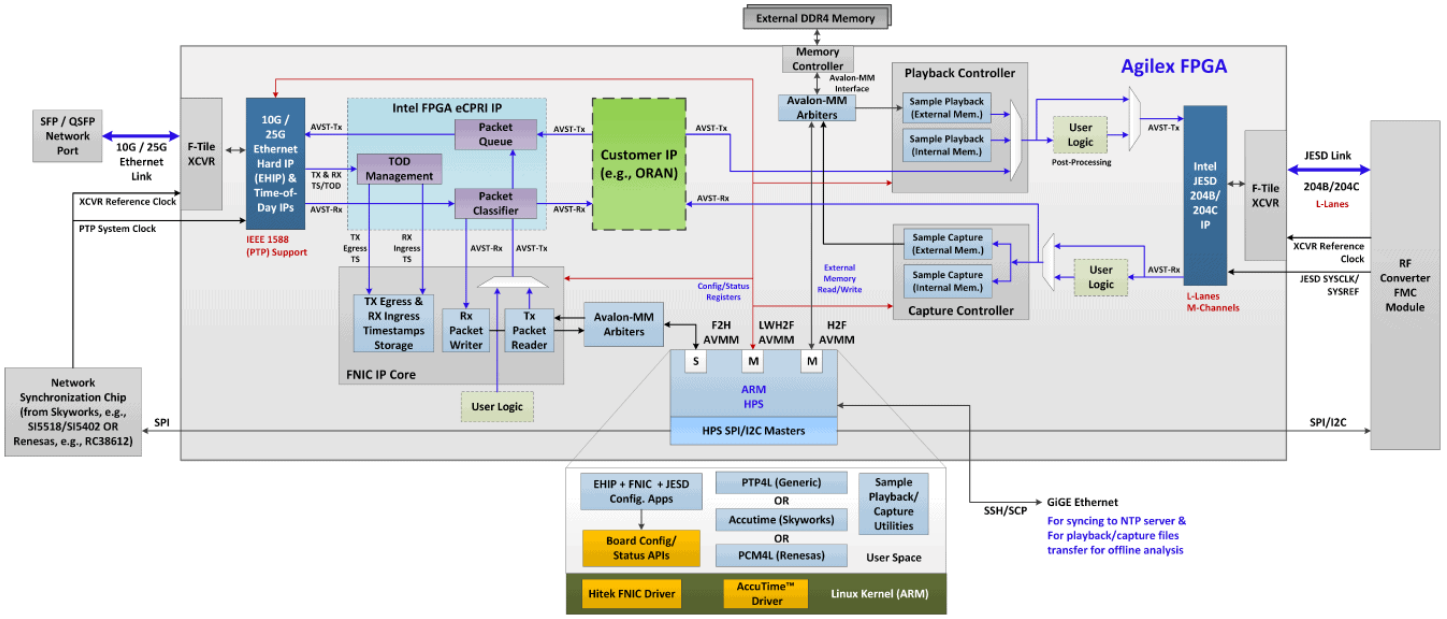
Optional Add-Ons



Skyworks Si5518 Renesas RC38612

eSOM Framework For ORAN Development

- Integrated JED204C Intel FPGA IP (with F-Tile) configured for supported RF-XVR/ADC/DAC devkits
- N-Channel (up to 8) Playback Controller with support for samples playback from FPGA internal memory or external DDR4 memory
- N-Channel (up to 8) Capture Controller with support for samples capture in FPGA internal memory or deep captures in external DDR4 memory
- Multiplexing logic for user custom pre-processing and post-processing logic at JESD Tx(DAC) path
- Multiplexing logic for sample capture at JESD Rx interface before or after user custom processing in ADC path
- External memory controller and Avalon-MM Arbitration
- Avalon-MM slave and Address decoder for configuration/status registers on HPS LWH2F interface
- Avalon-MM HPS H2F interface for burst read/write access to external memory (for sample playback/capture files)
- ARM HPS (Hard Processing Subsystem) with Linux support
- Software utilities and tools for sample playback and capture support



Product Ordering Codes

AGP-03-eSOM-1-B73-02: Default 5G platforms with eSOM SKU AG-eSOM-1-B73-02; Module with AGFB027R24C2E2VR2 FPGA, ES 2E2VR2 parts, HPS, -2 speed XVR, -2 core speed, Extended Temp, VID Power, 3 x 4GB DDR4, 16GB eMMC

Links

https://hiteksys.com/fpga-platforms
https://hiteksys.com/fpga-platforms/agilex-5g-wireless-platform-ti

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