FMC214

70 MHz to 6 GHz Dual Versatile Wideband Transceiver (MIMO), FMC

FMC214

Key Features

- Dual complete transceiver signal chain solution using Analog Devices AD9361 transceiver
- Frequency range 70 MHz to 6 GHz with instantaneous bandwidth from 200 kHz to 56 MHz
- MIMO transceiver is Time Domain Duplex (TDD) and Frequency Domain Duplex (FDD) compatible
- Supported by DAQ Series™ data acquisition software
- FPGA Mezzanine Card (FMC) per VITA 57
- Multiplexed 2x RF inputs on each RF channel
- On-board clocking with multi-card synchronization capability
- Low Pin Count (LPC) 160-pin connector

Benefits

- Ideal for LTE and SDR applications with wideband range versatility
- High modulation accuracy with ultralow noise
- Array of FMC's and FMC carriers available from VadaTech
- Electrical, mechanical, software, and system-level expertise in house
- Full system supply from industry leader
- AS9100 and ISO9001 certified company

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FMC214

The FMC214 is a FPGA Mezzanine Card (FMC) per VITA 57.1 standard, offering small footprint and low power dual fully featured wideband Rx/Tx channels.

The FMC214 combines RF front end, frequency synthesizers for Rx and for Tx, mixed-signal baseband section and flexible digital interface to host processor through the LPC connector. The FMC214 operates within the 70 MHz to 6.0 GHz frequency range, covering most licensed and unlicensed bands, and provides an instantaneous bandwidth programmable from 200 KHz to 56 MHz.

Utilizing an AD9361 RF transceiver, the chip offers high performance noise figure and linearity. Each Receiver (RX) subsystem includes independent Automatic Gain Control (AGC), quadrature correction, dc offset correction, and digital filtering.

Figure 1: FMC214

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Data Acquisition

VadaTech offers a wide range of FPGA AMCs, RTMs, FMC Carriers and FMCs that can be combined to build a Data Acquisition (DAQ) sub-system. The DAQ Series software, when used with a supported hardware configuration, provides all that is needed to configure the system, acquire data and transfer it to a host processor. It also includes a user-configurable Graphical User Interface (Figure 2), which incorporates real-time display of acquired data. The host can be within the MTCA system or, via PCI113 or PCI123, in a separate PC. Full documentation is provided to allow users to customize system behavior or develop their own application on the AMC/FMC hardware.

The DAQ includes data acquisition software that allows users to get up and running quickly and easily, while providing a high level of performance and allowing the user to extend functionality by adding their own FPGA code. Please contact VadaTech sales for the latest information on supported combinations of VadaTech hardware. (Note that the DAQ Series software is not currently supported for 3rd party hardware).

Components provided in the DAQ software include:

- System libraries to configure clocking and triggers
- Sequencer to configure the acquisition (duration, start, stop)
- High-performance DMA firmware for acquiring ADC outputs and transferring to host processor
- Linux driver for host processor (e.g. AMC72x)
- EPICS channel access client API
- Pre-configured GUI (based on Qt Creator)

This software set allows the user to acquire, transfer and display data without the need for any user programming of the hardware. Status information is included in the GUI display, to ease integration and debugging activity.
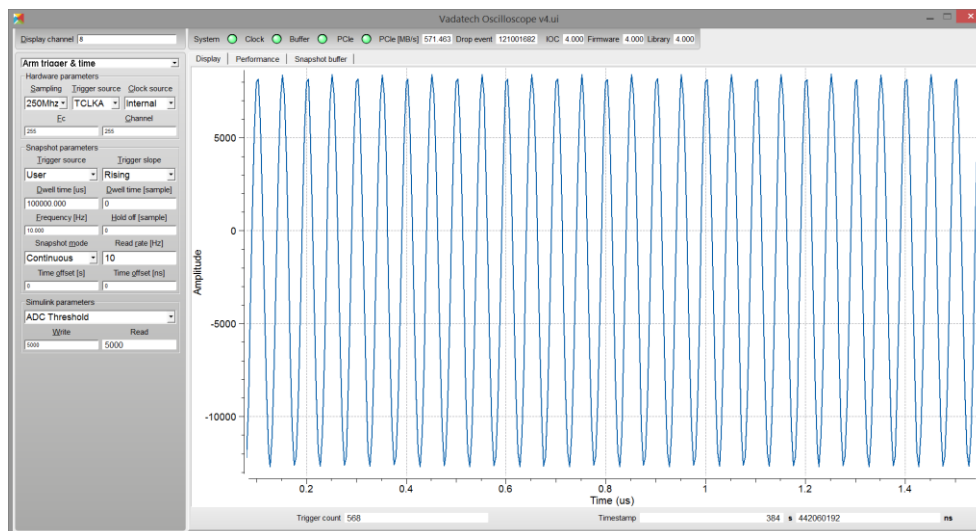

Figure 2: Typical Graphic User Interface Display

The data acquisition software provided as part of the DAQ can be used as-delivered without the user needing to develop any FPGA code.

Full source code is provided for the libraries, sequencer, DMA, Linux driver and GUI, allowing users to easily customize or brand to their own requirements at the exception of a low level PCIe IP from Xilinx provided only as Netlist (this low-level block doesn't require modification/customization from integrators or end-users).
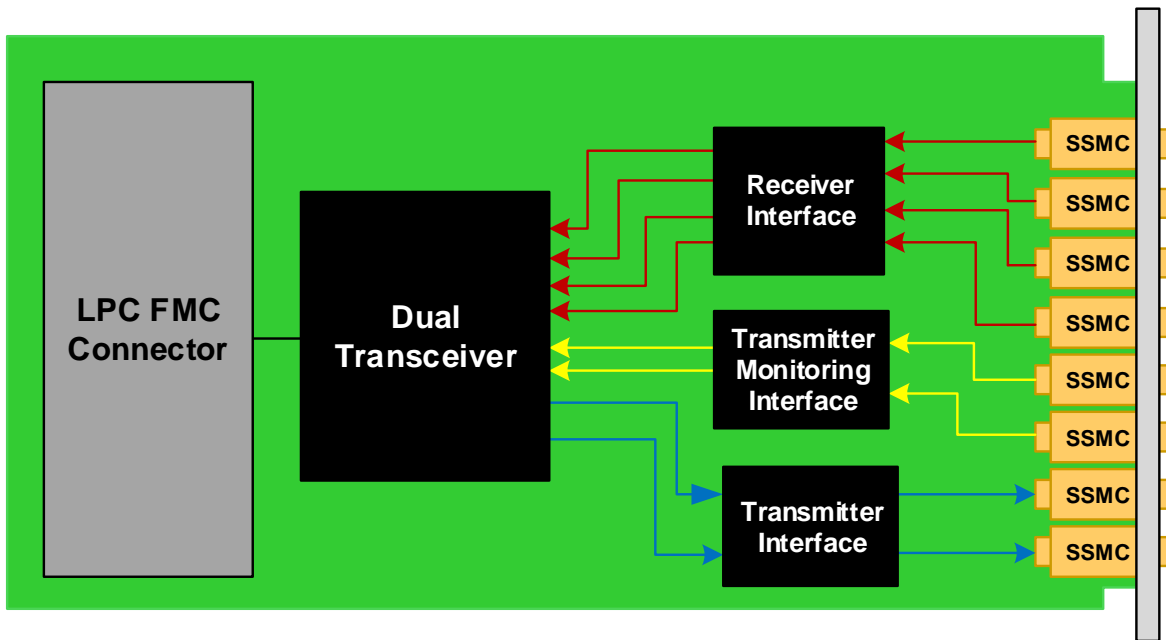
Block Diagram

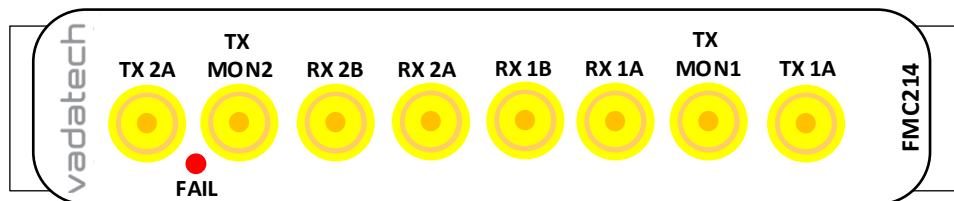Figure 3: FMC214 Functional Block Diagram

Front Panel

Figure 4: FMC214 Front Panel

FMC214 – 70 MHz to 6 GHz Dual Versatile Wideband Transceiver (MIMO), FMC   info@vadatech.com | www.vadatech.com

Specifications

Architecture		
Physical	**Dimensions**	Single Module
		Width 2.71" (69 mm)
		Depth 3.01" (76.5 mm)
Type	**FMC**	Dual wideband transceiver, AD9361
		FMC connector
Standards		
FMC	**VITA 57**	ANSI/VITA 57.1-2008
Configuration		
Power	**FMC214**	2 W
Performance	**Broadband transmitter**	TX EVM: </= 40 dB
		TX noise: </= 17 dBm/Hz noise floor
		TX monitor: </= 66 dB dynamic range with 1 dB accuracy
	Integrated synthesizers	2.4 Hz maximum LO step size
Environmental	**Temperature**	See ordering options (air flow requirements >400 LFM) and environmental spec sheet
		Storage Temperature: –40° to +85°C
	Vibration	1 G, 5 to 500 Hz on each axis
	Shock	30 Gs each axis
	Relative Humidity	5 to 95% non-condensing
Front Panel	**Interface Connectors**	8x SSMC Front Panel Connector
	LEDs	Status
Software Support	**Operating System**	Agnostic
Other		
MTBF		MIL Hand book 217-F@ TBD hrs
Certifications		Designed to meet FCC, CE and UL certifications, where applicable
Standards		VadaTech is certified to both the ISO9001:2000 and AS9100B:2004 standards
Warranty		Two (2) years

INTEGRATION SERVICES AND APPLICATION-READY PLATFORMS

VadaTech has a full ecosystem of OpenVPX, ATCA and MTCA products including chassis platforms, shelf managers, AMC modules, Switch and Payload Boards, Rear Transition Modules (RTMs), Power Modules, and more. The company also offers integration services as well as pre-configured Application-Ready Platforms. Please contact VadaTech Sales for more information.

Ordering Options

FMC214 – A00-000-0HJ

A = RF Clock Source		
0 = On-board clock generation 1 = External source via front panel		
		H = Operating Temperature
		0 = Commercial (–5° to +55°C) 1 = Industrial (–20° to +70°C)
		J = Conformal Coating
		0 = No coating 1 = Humiseal 1A33 Polyurethane 2 = Humiseal 1B31 Acrylic

Related Products

AMC515

- AMC FPGA carrier for FMC per VITA 57
- AMC Ports 4-11 are routed to FPGA (protocols such as PCIe, SRIO, XAUI, etc. are FPGA programmable)
- Xilinx Virtex-7 XC7V2000T in 1925 package

FMC108

- Single width FMC per VITA 57
- Two QSPF+ cages for 10GbE/SRIO/PCIE and Aurora
- Re-driver on both ports for a better signal quality

FMC223

- Single module AD9739 DAC 14-bit at 2.5 GSPS
- 2 Vpp differential Analog output swing
- Programmable DSP clock

Contact

VadaTech Corporate Office

198 N. Gibson Road, Henderson, NV 89014

Phone: +1 702 896-3337 | Fax: +1 702 896-0332

Asia Pacific Sales Office

7 Floor, No. 2, Wenhu Street, Neihu District, Taipei 114, Taiwan

Phone: +886-2-2627-7655 | Fax: +886-2-2627-7792

VadaTech European Sales Office

VadaTech House, Bulls Copse Road, Southampton, SO40 9LR

Phone: +44 2380 016403

info@vadatech.com | www.vadatech.com

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- Configurable solutions

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- Accelerated deployment
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