

FMC238

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

Key Features

- Dual complete transceiver signal chain solution using Analog Devices ADRV9009 transceiver
- Frequency range 75 MHz to 6 GHz with receiver bandwidth up to 200 MHz and transmitter synthesis bandwidth up to 450 MHz
- MIMO transceiver is Time Domain Duplex (TDD) for 3G/4G/5G
- Compatible with Analog Devices design tools for ADRV9009
- FPGA Mezzanine Card (FMC) per VITA 57
- On-board clocking with multi-card synchronization capability

Benefits

- Ideal for 3G/4G/5G 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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FMC238

The FMC238 is a FPGA Mezzanine Card (FMC) per VITA 57.1 standard, offering small footprint and low power fully featured dual wideband transceivers.

The FMC238 utilizes single ADR9009. The ADRV9009 is a highly integrated, wideband radio frequency transceiver offering dual channel transmitters (TX) and receivers (RX) with integrated synthesizer, and digital signal processing functions. Each complete Rx and Tx subsystem includes dc offset correction, Quadrature Error Correction (QEC), and programmable digital filters.

The ADRV9009 further provides automatic gain control (AGC) and flexible external gain control modes, allowing significant flexibility in setting system level gain dynamically.

The FMC238 operates within the 75 MHz to 6.0 GHz frequency range, covering most licensed and unlicensed bands. The clocking is via the front panel or an internal clock. The FMC238 is an ideal choice for the development and/or deployment of advanced RF solutions. This Multiple Input Multiple Output (MIMO) module is the most versatile FMC in the market.

Supported Software

The FMC238 is compatible with Analog Devices design tools for ADRV9009.

The screenshot displays the 'ADRV9009 Transceiver Evaluation Software' interface. The top menu includes 'Connect', 'Program', 'Device', 'File', 'Tools', and 'Help'. Below the menu is a toolbar with options like 'Config', 'Iron Python Script', 'ObsRx Data', 'Receive Data', 'Transmit Data', and 'TDD/FDD Switching'. The main window is titled 'Configuration' and contains a block diagram of the ADRV9009 transceiver. The diagram shows two receiver channels (ORX1, ORX2) and two transmitter channels (TX1, TX2). It includes components like MUX, LO1, LO2, ARM M3, LPF, ADC, DAC, and Digital Processing blocks. The interface also features a configuration panel with the following settings:

Device	ADRV9008-2	LO PLL	Freq(MHz)	Ext. LO	RFPLL Phase Sync
Device Clock	122.88MHz	RF PLL	1800	NO	Disable
Tx Channel	TX1 and TX2 Enabled	Tx Channel		Attenuation	
Tx Profile	Tx 200/450MHz, IRate 491.52MHz	Tx1		0.00	
Observation Channel	Observation Rx1	Tx2		0.00	
Obs Profile	ORX 450MHz, IRate 491.52MHz	DAC Enabled			
Load Custom Stream	<input type="checkbox"/>	<input type="radio"/> Higher Power Faster Tx Switching Time <input checked="" type="radio"/> Lower Power Slower Tx Switching Time			

At the bottom left, the status 'Zynq Platform: Disconnected' is shown. The Analog Devices logo is in the bottom right corner.

Figure 1: FMC238 Compatible Design Tools for ADRV9009

Block Diagram

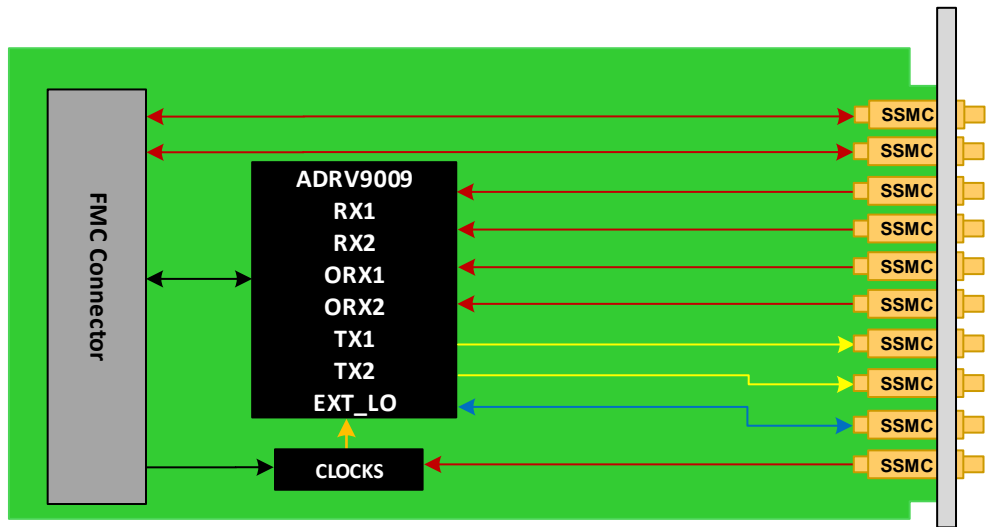


Figure 2: FMC238 Functional Block Diagram

Front Panel

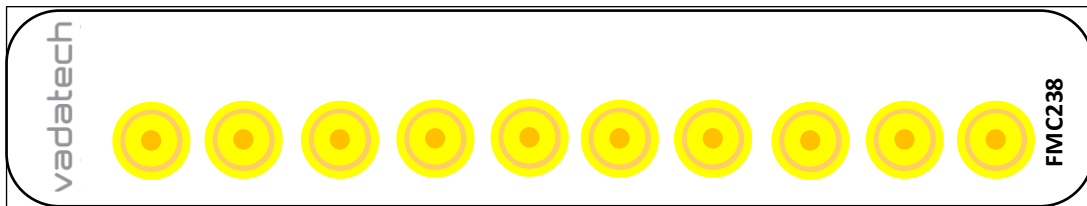


Figure 3: FMC238 Front Panel

Specifications

Architecture		
Physical	Dimensions	Single Module
		Width 2.71" (69 mm) Depth 3.01" (76.5 mm)
Type	FMC	Dual wideband transceiver, single ADRV9009
		FMC connector
Standards		
FMC	VITA 57	ANSI/VITA 57.1-2008
Configuration		
Power	FMC238	5 W
Performance	Broadband transmitter	Tuneable range from 75 MHz to 6 GHz, maximum synthesis bandwidth 450 MHz
		Transmitter attenuation power control range: 0 to 32 dB
	Broadband receiver	Tuneable range from 75 MHz to 6 GHz, maximum receiver bandwidth 200 MHz
		Receiver gain range: 30 dB
Observation receiver	Integrated synthesizers	Tuneable range from 75 MHz to 6 GHz, maximum receiver bandwidth 450 MHz
		2.3 Hz typical 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	10x SSMC Front Panel Connector
		LEDs
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

FMC238 – 0B0-000-0HJ

B = VCXO		H = Operating Temperature
0 = 100 MHz 1 = 122.88 MHz 2 = 153.6 MHz 3 = Reserved 4 = Reserved		0 = Commercial (-5° to +55°C) 1 = Industrial (-20° to +70°C) 2 = Extended (-40° to +80°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, XAU1, 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

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