

FMC High Speed Quad Channels ADC and DAC



Overview

The **FMC-ADDA** is a FMC for High-Speed Data Acquisition applications based on the AD9689/AD9208 14-bit ADC and the AD9154 16-bit DAC from Analog Devices Inc (ADI).

The AD9689 is a dual, 14-bit, 2.0 GSPS/2.6 GSPS analog-to-digital converter (ADC). The device has an on-chip buffer and a sample-and-hold circuit designed for low power, small size, and ease of use. This product is designed to support communications applications capable of direct sampling wide bandwidth analog signals of up to 5 GHz. The -3 dB bandwidth of the ADC input is 9 GHz. The AD9689 is optimized for wide input bandwidth, high sampling rate, excellent linearity, and low power in a small package.

The AD9208 is a dual, 14-bit, 3 GSPS analog-to-digital converter (ADC). The device has an on-chip buffer and a sample-and-hold circuit designed for low power, small size, and ease of use. This product is designed to support communications applications capable of direct sampling wide bandwidth analog signals of up to 5 GHz. The -3 dB bandwidth of the ADC input is 9 GHz. The AD9208 is optimized for wide input bandwidth, high sampling rate, excellent linearity, and low power in a small package.

The AD9154 is a quad, 16-bit, high dynamic range digital-to-analog converter (DAC) that provides a maximum sample rate of 2.4 GSPS, permitting multicarrier generation up to the Nyquist frequency in baseband mode. The AD9154 includes features optimized for direct conversion transmit applications, including complex digital modulation, input signal power detection, and gain, phase, and offset compensation.

PanaTeQ offers the **VPX3-ZU1-ADDA-4AA-AS** development system based on the VPX3-ZU1 3U OpenVPX Zynq Ultrascale+ MPSOC and the FMC-ADDA-2AA for typical Digital Signal Processing.

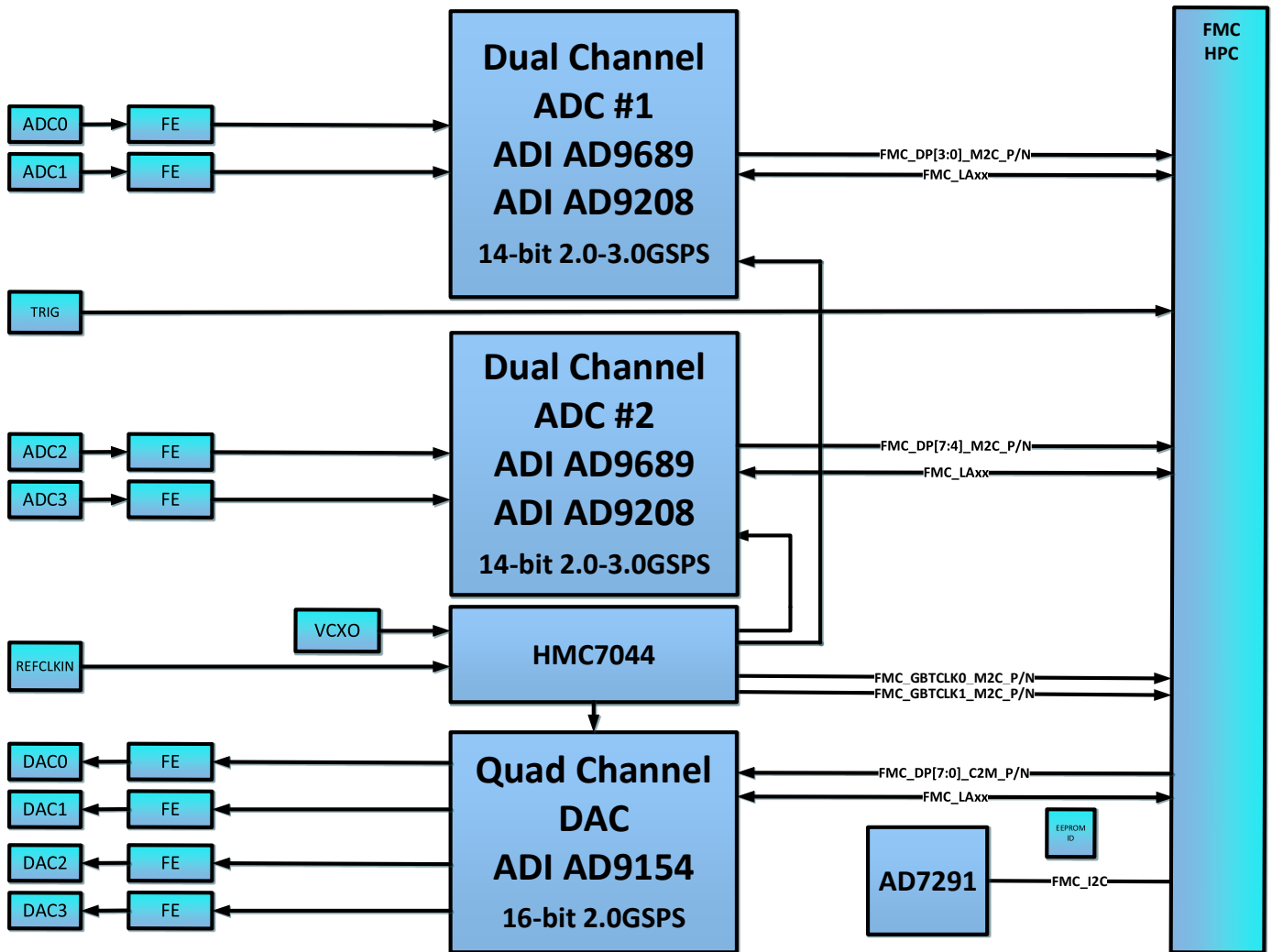
Key Features

- Vita 57.1-2010 specification compliant
- FMC High Pin Connector (HPC)
- JESD024B interface up to 16 Gbps
 - 8x Tx
 - 8x Rx
- LA Bus LVDS and Singled-Ended
- Operates with VAdj = 2.5V to 1.5V
- Air and Conduction Cooled compatible
- Dual or Quad ADC Channels (14-bit @2.0, 2.6 or and 3.0GSPS)
- Quad DAC Channels (16-bit @2.0 GSPS)
- Uses of 10x 12GHz bandwidth SSMC connectors
- Inputs with Impedance of 50 ohms AC Coupled
- Analog Bandwidth Input Up to 5GHz
- Reference Clock Input
- FPGA GPIO direct Input or Output
- On-board VCXO

Typical Applications

- Software Defined Radio (SDR)
- Digital Radio Frequency Memory (DRFM)
- Electronic Warfare (EW)
- Signal Intelligence (SIGN-INT)
- Counter Drones/UAVs Systems
- Military Communications (MILCOM)

Bloc Diagram



Board 3D Model (TBD)

Board Specifications

FMC HPC Interface

- VITA 57.1 Specifications compliant
- Single Module Width 69 mm, Depth 76.5 mm
- 8x MGT DP[3:0]_M2C, 8x MGT DP[3:0]_C2M for JESD204B interfaces up to 6Gbps
- 2x MGTCLK[1:0]_M2C
- LA Bus for LVDS and Single-Ended signals
- VADJ = 2.5V to 1.5V

Board Main ADI Components

- AD9689-2000 : 14-bit ADC 2.0 GSPS sampling rate
- AD9689-2600 : 14-bit ADC 2.6 GSPS sampling rate (Optional)
- AD9208-3000 : 14-bit ADC 3.0 GSPS sampling rate (Optional)
- AD9154 : 16-bit DAC @ 2.0 GSPS
- HMC7044 : JED204B Clock Generator
- AD7291 : 8-Channel, I2C, 12-bit SAR ADC with Temperature Sensor

Analog Performances

- Input Bandwidth up 5.0 GHz

On-board VCXO Options

- TBD

Front Panel I/O: 10x micro SSMC Connectors

- ADC Channel 0 Input
- ADC Channel 1 Input
- ADC Channel 2 Input (Optional)
- ADC Channel 3 Input (Optional)
- DAC Channel 0 Output
- DAC Channel 1 Output
- DAC Channel 2 Output
- DAC Channel 3 Output
- GPIO Input/Output (Trigger)
- External Reference Clock Input

Environmental Specifications

- Commercial Ruggedized 0-50C
- Conduction Cooled -40C to 70C at Thermal Interface

Product Codification

The FMC-ADDA can be assembled with different versions. The cooling technique et ruggedization level are also available options. The following table shows the product coding for all these options.

FMC-ADDA-A-2A A-AS

ADC Option	
A	ADI AD9689-2000 (2.0 GSPS)
B	ADI AD9689-2600 (2.6 GSPS)
C	ADI AD9208-3000 (3.0 GSPS)

ADC Channels	
2	Dual Channels
4	Quad Channels

VCXO Option	
A	
B	
C	

Board Option	
A	RFU

	Ruggedization Level	VITA 47
AS	Air Standard	EAC4
AR	Air Rugged	EAC6
CC	Conduction Cooled	ECC3
CR	Conduction Rugged	ECC4

Ordering Information

The following product references are offered by PanaTeQ as standard products. Other combinations of devices, speed grade, memory and cooling can be specially ordered. Please contact us for details

Reference	ADC Option	ADC Channels	Board Option	Ruggedization Level
FMC-ADDA-A-2AA-AS	ADI AD9689-2000 (2.0 GSPS)	2	A	Air Standard Cooled
FMC-ADDA-A-2AA-CC	ADI AD9689-2000 (2.0 GSPS)	2	A	Conduction Cooled
FMC-ADDA-A-4AA-AS	ADI AD9689-2000 (2.0 GSPS)	4	A	Air Standard Cooled
FMC-ADDA-A-4AA-CC	ADI AD9689-2000 (2.0 GSPS)	4	A	Conduction Cooled

Reference	SDR System Development
VPX3-ZU1-ADDA-4AA-AS	4U Desktop Chassis Air Cooled, VPX3-ZU1-B1M-AS, RTM-ZU1-A, FMC-ADDA-4AA-AS, Linux BSP, Cables