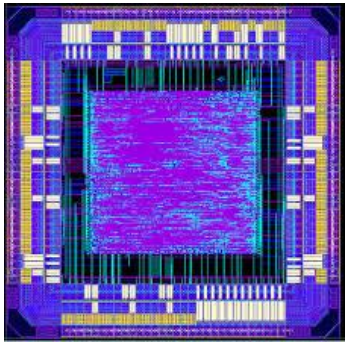
Active Technologies

Innovative test solutions



History and milestones

2003: Active Technologies is founded as University of Ferrara start-up. Mission: develop custom oriented innovative test equipment

2007 : Active Technologies is a 100% private company

Achievements in 13 years of activity:

- OEM agreements with T&M leaders: **Tektronix**, **LeCroy**, **NI**
- Qualified supplier of custom test bench for **semiconductor** and **Aerospace** & **Defence** customers
- 5 partnerships in **European Projects (ACT-ITALY PIC: 999735060)**

Location

Ferrara: north-east of Italy (Between Florence and Venice)

Main Customers

Eurpean projects

- GOSSAMER: http://www.fp7-gossamer.eu/
- ESTRELIA: http://www.estrelia.eu/
- ATHENIS 3D: http://www.athenis3d.eu/
- P-SOCRATES: http://www.p-socrates.eu/
- E!-VAMPA: http://vampa.epfl.ch/

AT Target market

- NVM semiconductor engineering tester
  - RIFLE and customized testing tools
- AT branded modular instruments
  - Arbitrary waveform generators
- OEM / Custom projects
  - OEM AWGs
  - High speed digitizer
  - Terabyte Record and Playback system

Cooperation with T&M leaders

Integration with Tektronix

OEM for Teledyne LeCroy

Original product for NI

AWG110x

AWG1102 / 1104 (Arbstudio)

- 2 – 4 channel models
- Up to 8 stackable units (**32 channels**)
- 16 bit vertical resolution
- 2Mpts per channel
- 250 Ms/s update rate (1G interleaved)
- 125MHz analogue bandwidth (3ns rise time)
- 12Vpp – 50ohm (24Vpp open) output swing
- Up to 36 digital outputs

AWG GS2500

AWG-GS-2500

- 2 channel model
- Up to 2 stackable units (4 ch)
- 14 bit vertical resolution
- 64Mpts per channel
- 2.5 Gs/s update rate
- > 1GHz analogue bandwidth (280ps rise time)
- 2Vpp – 50ohm (4Vpp open) output swing
- Up to 32 digital outputs

Flex-RIO Adapter Module

- Adapter module for Flex-RIO platform
- 1 Channel model (AT-1120):
  - 2 Gsps update rate – 14 bit vertical resolution
  - 800 MHz Bandwidth
- 2 Channel model (AT-1212):
  - 1.2 Gsps update rate – 14 bit vertical resolution
  - 480 MHz Bandwidth

Now distributed by NI's WW sales channel:

http://sine.ni.com/nips/cds/view/p/lang/it/nid/211055

AWG Patent

Active Technologies patented a specific core for signal generation called ATDS

- Italian Patent already approved
- US extension on going
- European extension on going

Ministero dello Sviluppo Economico
Direzione generale per la lotta alla contraffazione
Ufficio Italiano Brevetti e Marchi

ATTESTATO DI BREVETTO PER INVENZIONE INDUSTRIALE

N. 0001415960

Il presente brevetto viene concesso per l'invenzione della domanda sotto specificata:

num. domanda	anno	C.C.I.A.A.	data pres. domanda	classifica
000068	2013	BOLOGNA	18/02/2013	G06F1 03

TITOLARE/I ACTIVE TECHNOLOGIES S.R.L.
FERRARA

MANDATARIO FIORINI ANDREA

INDIRIZZO STUDIO TORTA S.P.A.
VIA VIOTTI N. 9
10121 TORINO

TITOLO METODO E SISTEMA PER LA SINTESI DIGITALE DI UNA FORMA D'ONDA

INVENTORE/I PELLATI PAOLO

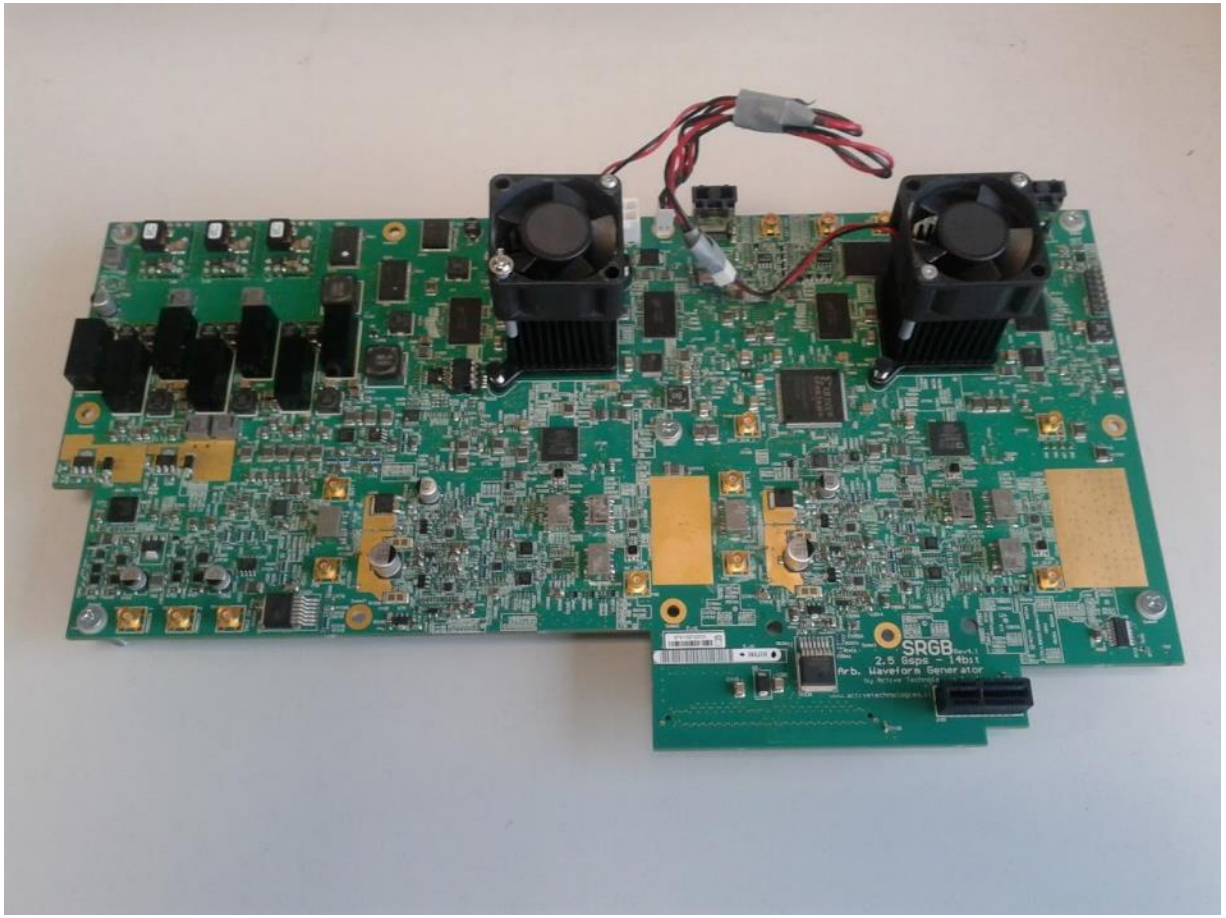
Roma, 18/05/2015

IL DIRIGENTE
Dr.ssa Loredana Guglielmetti

OEM under development

A new OEM product is under development (covered by NDA)

- PSR : Q1 -2016
- 18 layer PCB
- 3511 components
- 3 ground domains
- 28 power supplies



Cap. of complex HW design

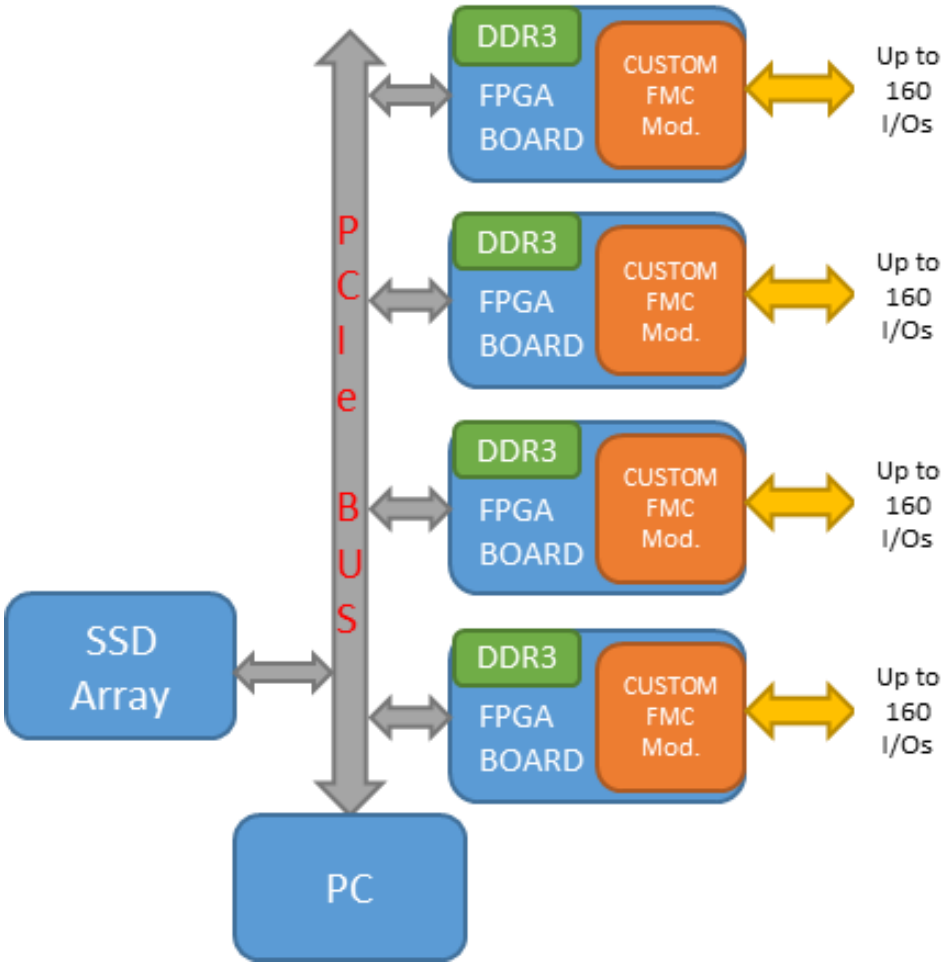
Manicore application board

STMicroelectronics

12Gs/s ADC FPGA board for radar system

(Italian Navy)

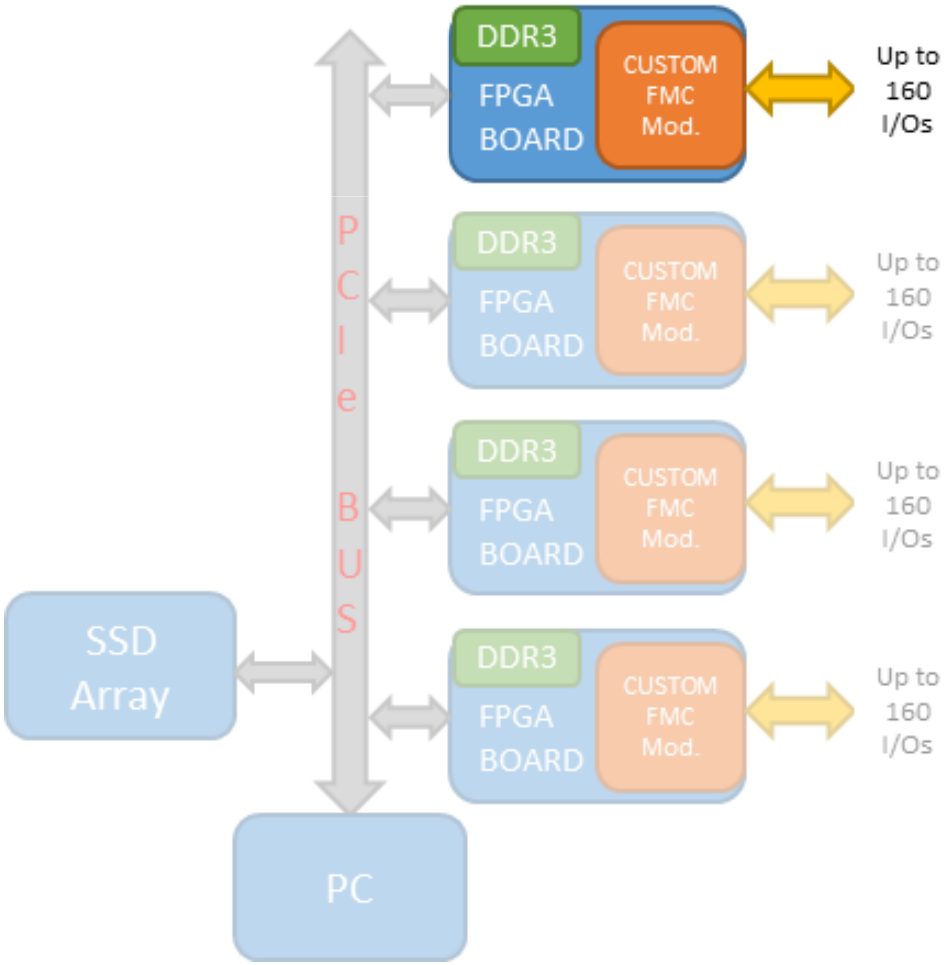
Record and Playback system



- **4GB/s continuous transfer rate**
- **16TB storage capability**
- **Customizable HW front-end**
- **Multi rack synchronization**

Record and Playback system

Record and Playback system

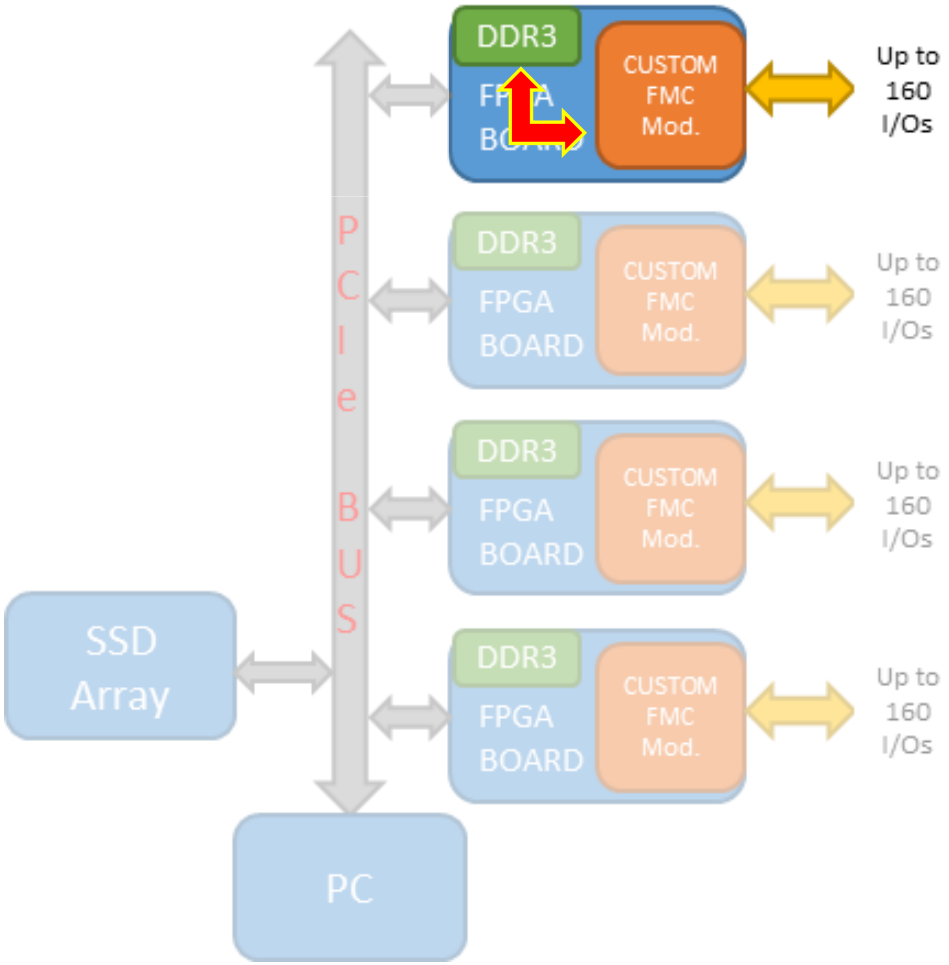


- **Xilinx Kintex 7 or Kintex 7 Ultrascale FPGA**
  - **LVDS + GTX to FMC module**
- **Custom FMC (Vita 57.1 std) module**
  - **ADC**
  - **DAC**
  - **High speed serial links**
- **Active Technologies' FMC modules**
- **Large set of COTS modules**

Transfer rate

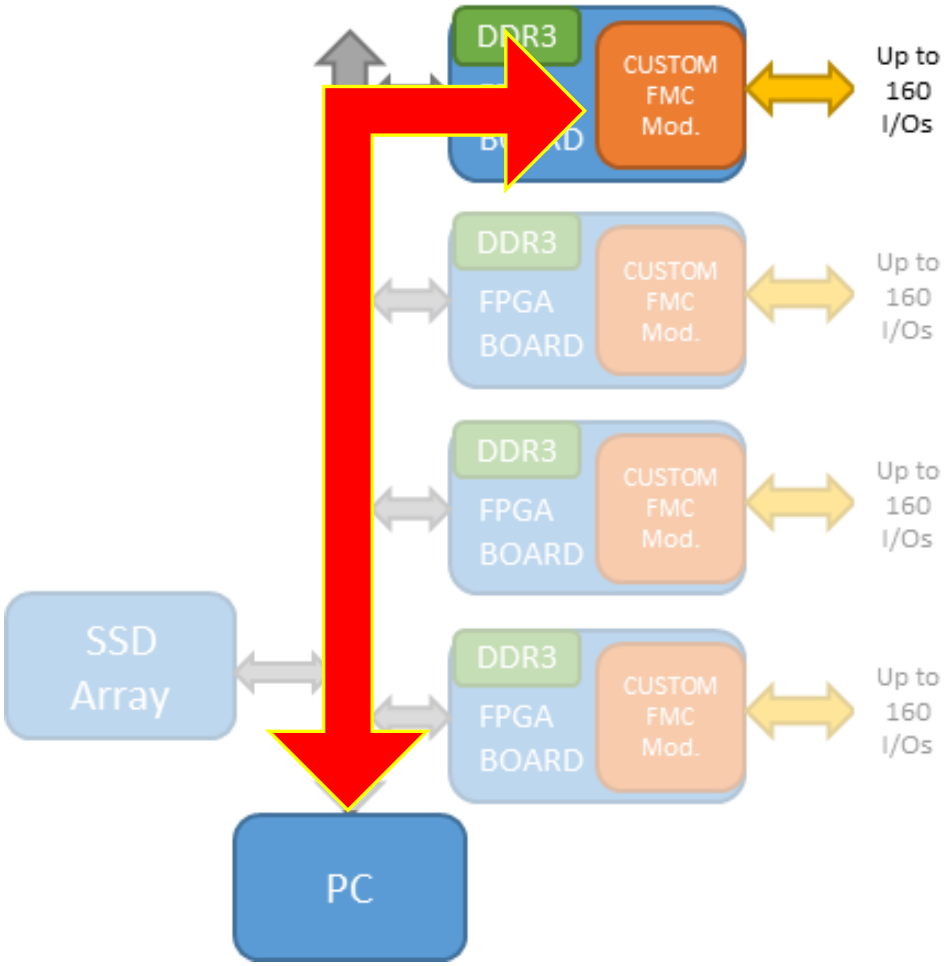
- The data transfer between front end and the mass memory is structured on three levels
  - I/O to local DDR3 module
  - I/O to PC DDR4 memory
  - I/O to SSD array

Transfer rate



- The FMC module is connected through FPGA to a local DDR3 SODIMM module:
  - **4GB** depth (on K7 board)
  - Up to **8GB/s** transfer rate

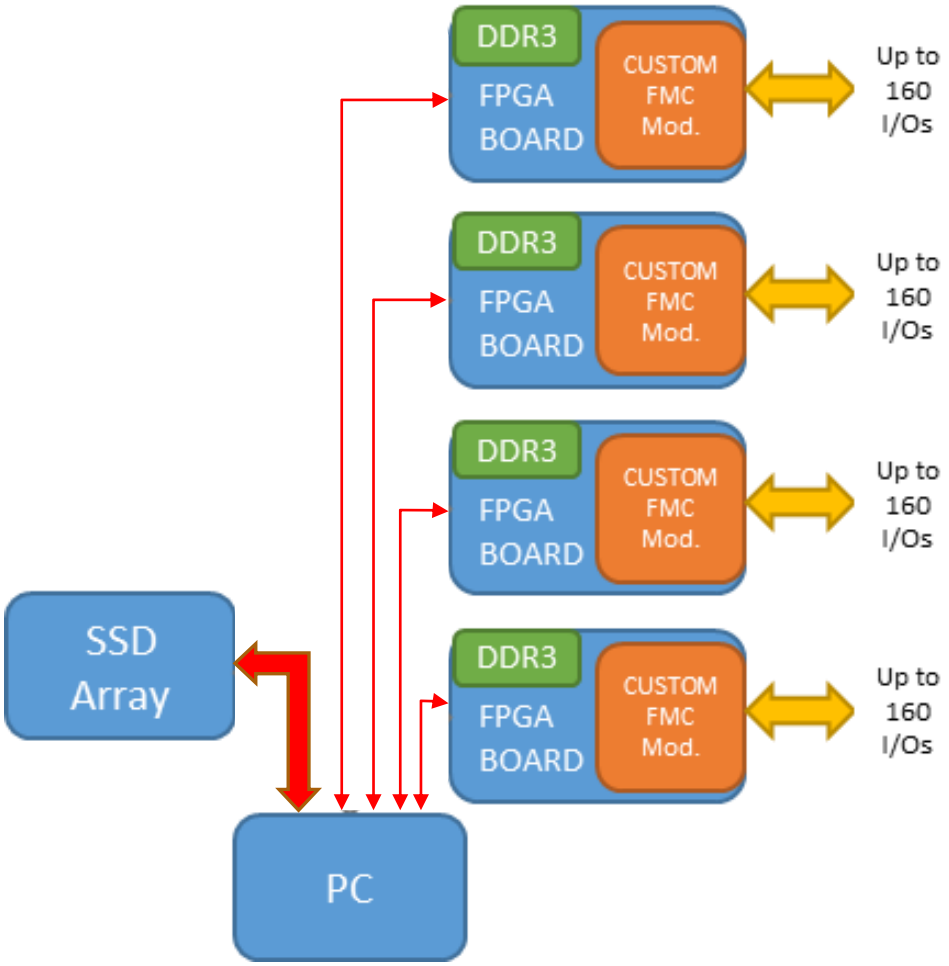
Transfer rate



- The FPGA module is connected through PCIe 4x gen2 to the PC DDR4:
  - **64GB** depth (on K7 board)
  - Up to 2**GB/s** average transfer rate

  The DDR3 SODIMM is used as **FIFO memory** (FIFO **IP** provided by Active Technologies) in order to guarantee zero interruption data transfer.

Transfer rate

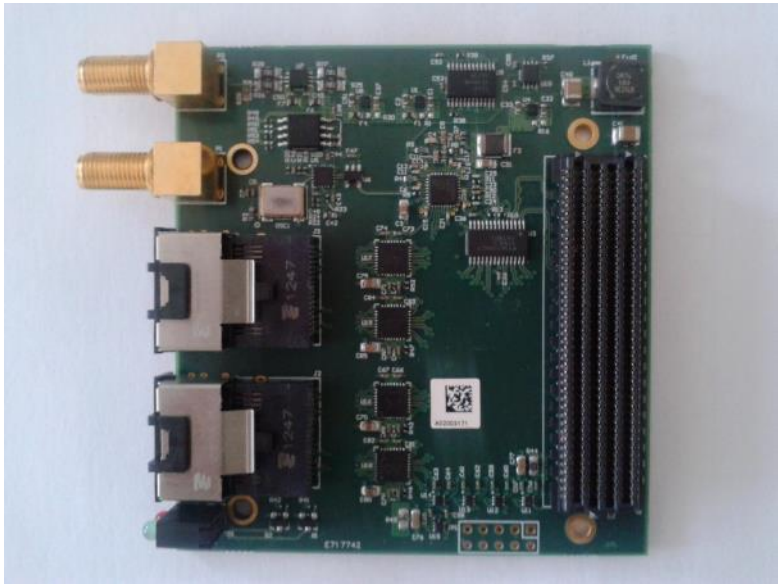


- The FPGA modules can read / write into SSD array:
  - **4GB/s** continuous transfer rate
  - **16TB** storage capability

  Active Technologies provides the **IP** to manage the local DDR3 FIFO buffer into FPGA cards as well as the **API** to manage the swap buffers into the DDR4 PC memory.

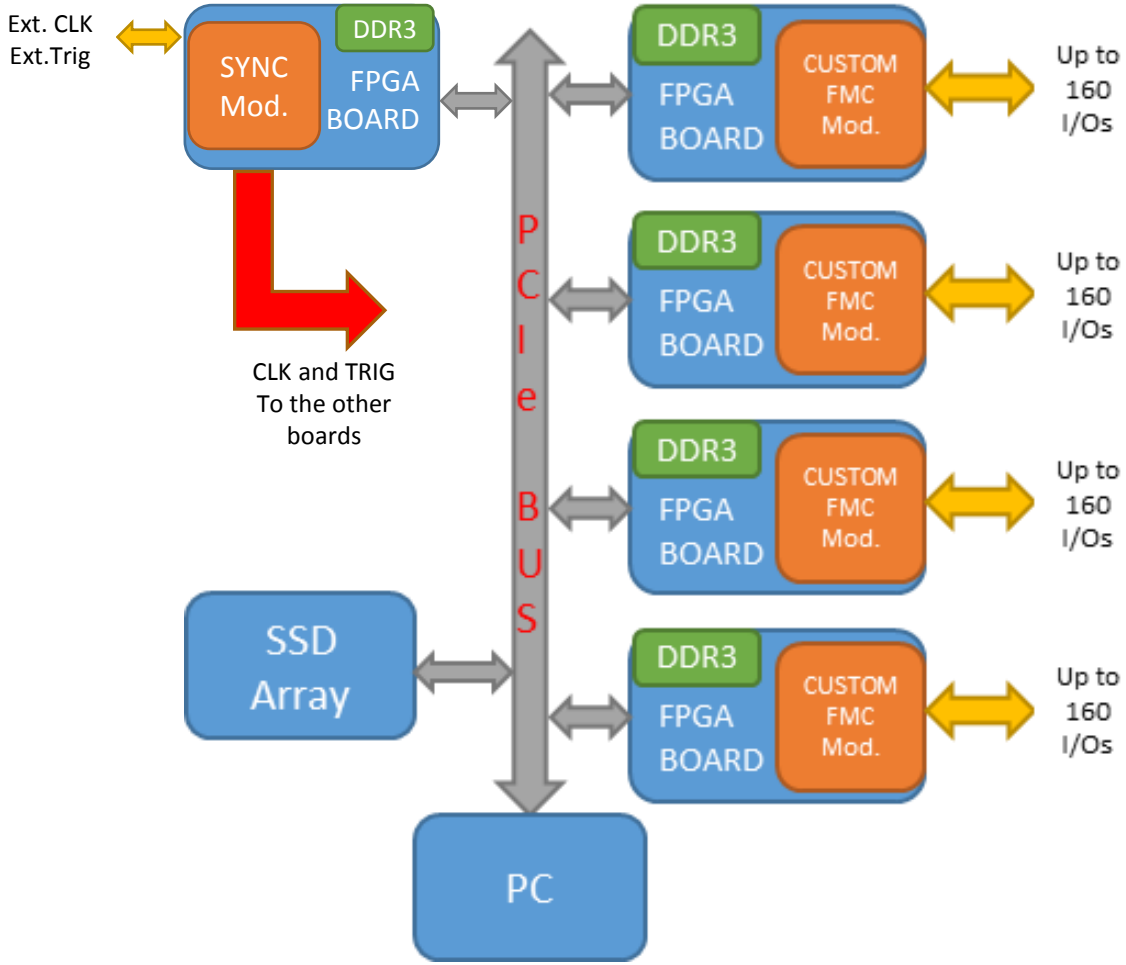
Record and Playback system

The synchronization of the system is manage by a sych. Board which distribute CLK and Trig.



Record and Playback system

Synchronization of the boards into the chassis



Record and Playback system

- Multi chassis synchronization up to 8 systems:
  - 5120 I/O Channels
  - 128 TB storage capacity
  - > 32GB/s continuous transfer rate

Innovative projects

Innovative projects

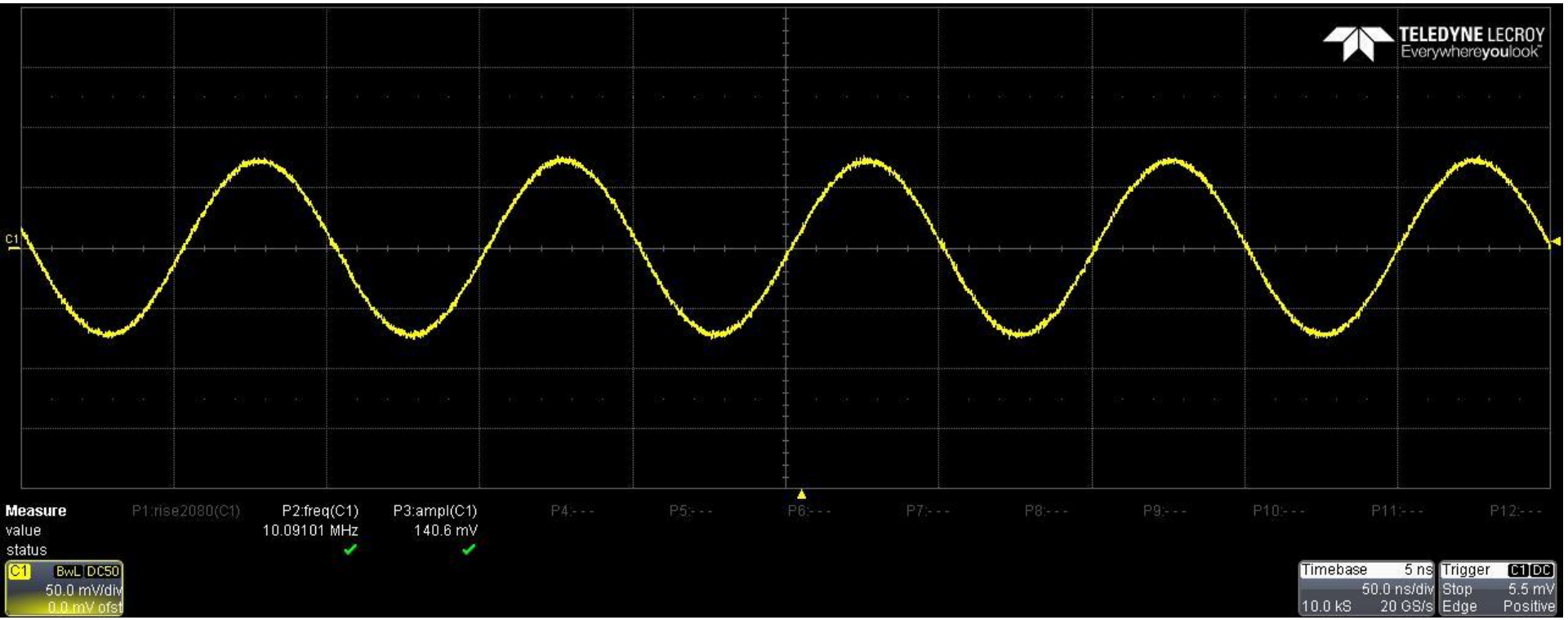
- Active Technologies is working on two innovative projects to get:
  - A new **12Gs/s real time DAC** – 12/16bits (expected for Q3-2016)
  - A new **wideband DC coupled amplifier**
- Two main application areas:
  - High performance AWGs
    - 4 channel 12.5Gs/s – 16bit
  - Innovative pulse generators
    - 5Vpp output range, <100ps rise time

DAC technology

- The first 8 bit version tape out is under test.

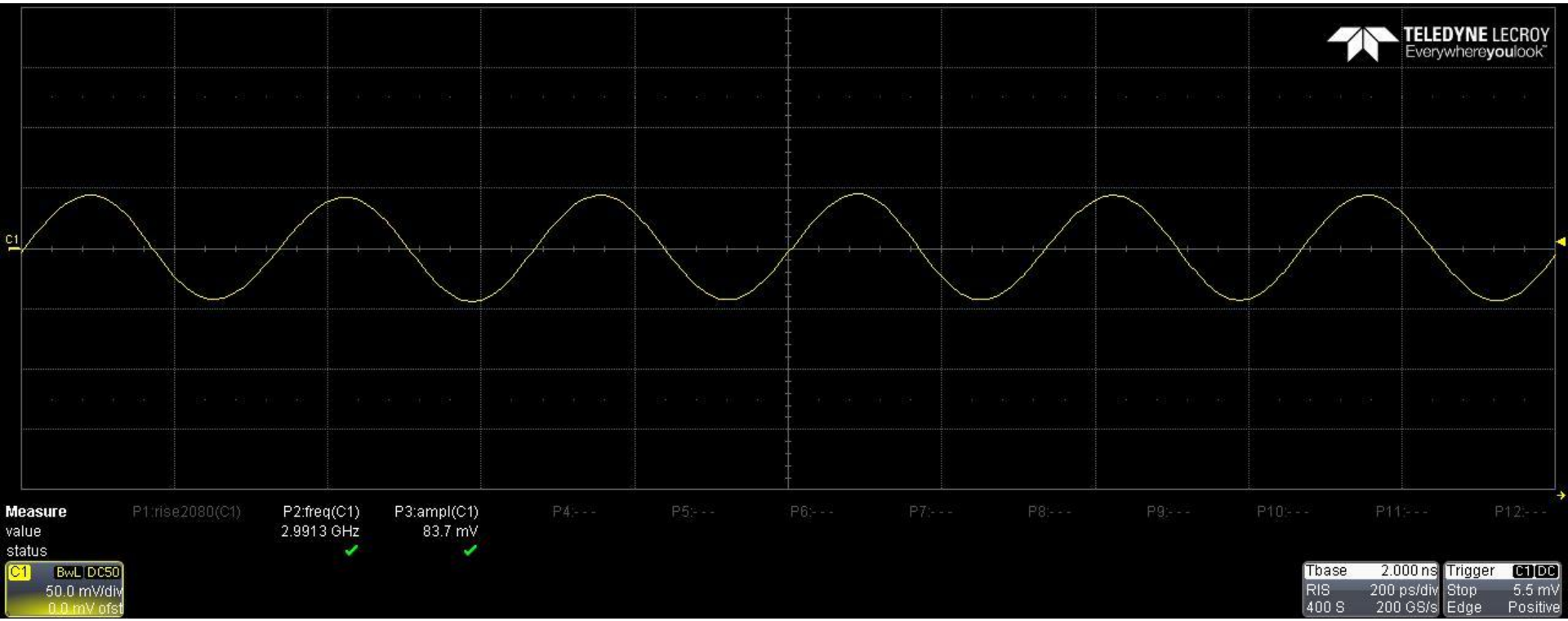
DAC technology

- 10 MHz sine wave



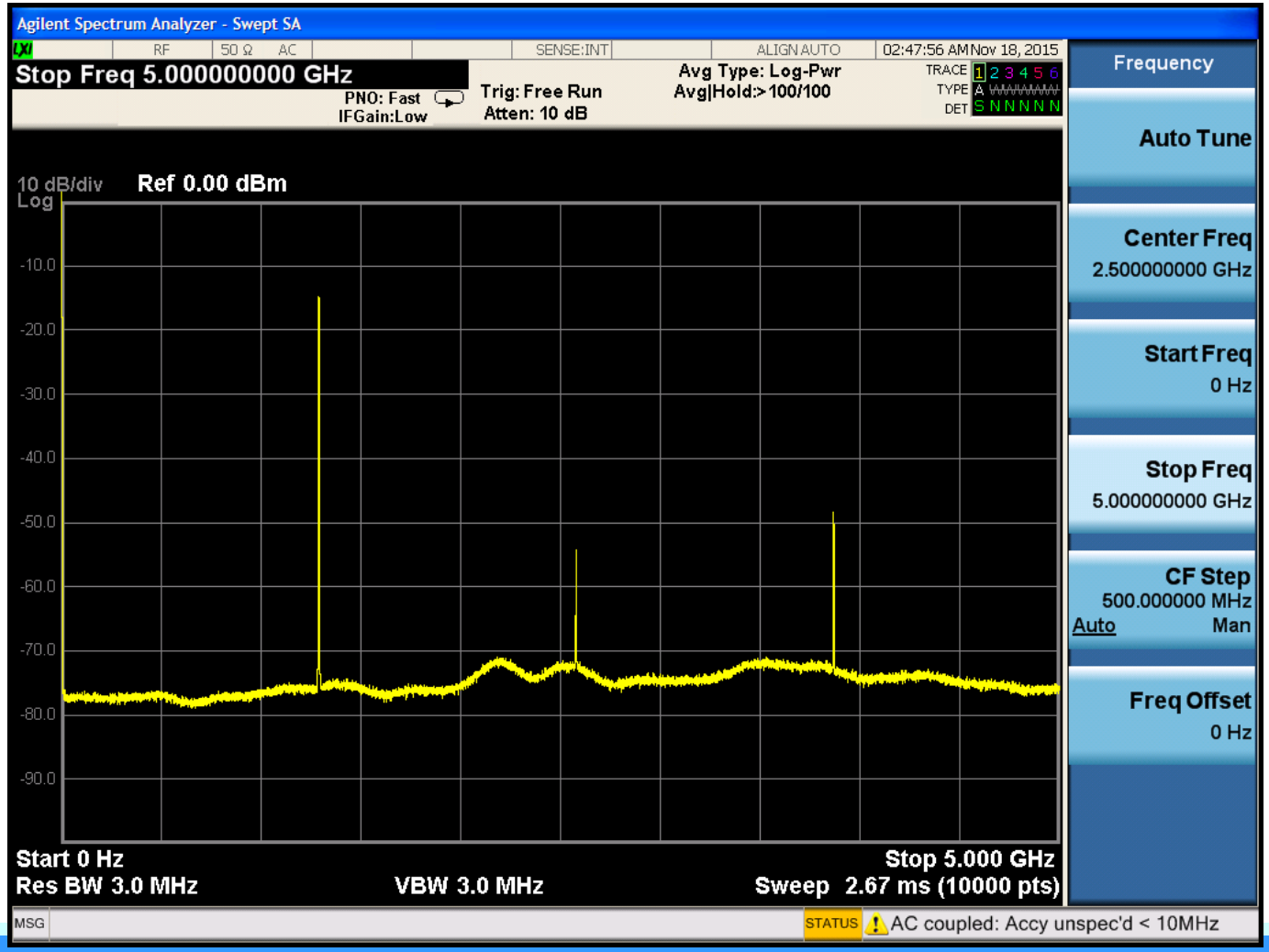
DAC technology

- 3 GHz sine wave (-4dB)



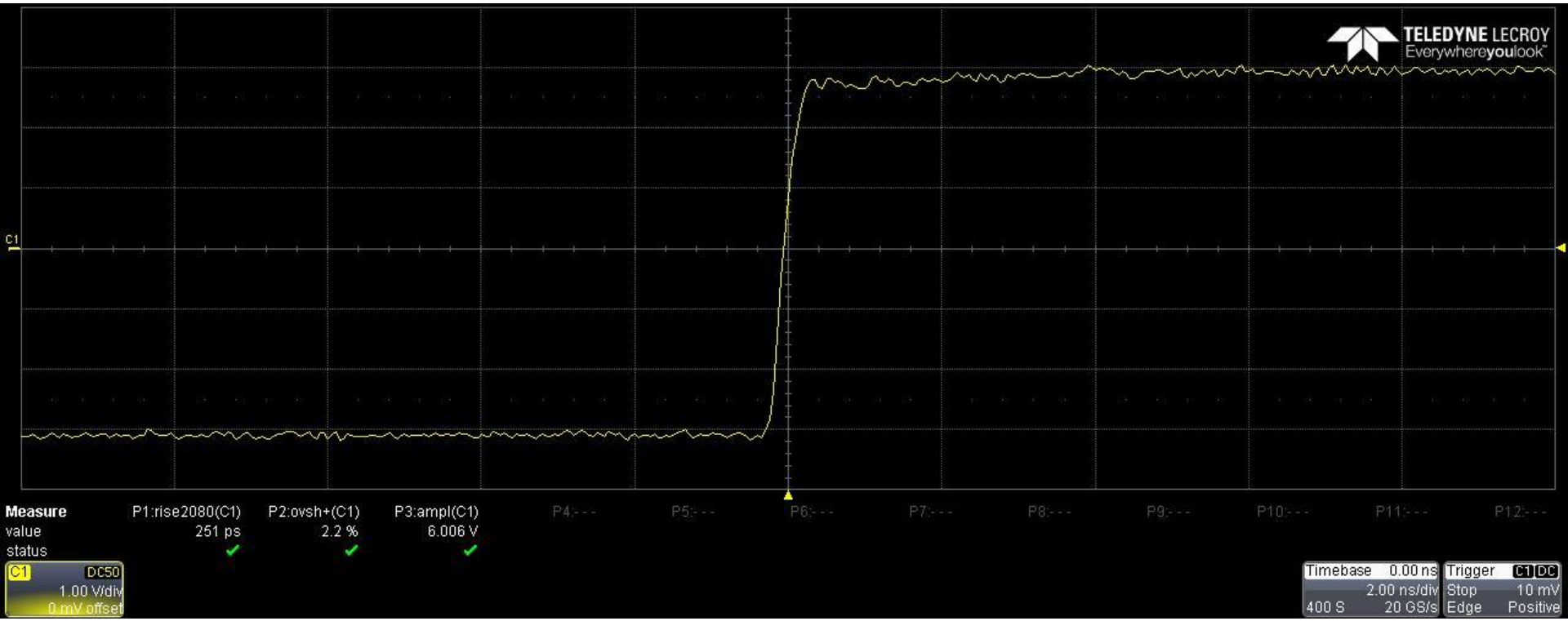
DAC technology

- 1.25 GHz sine wave spectrum: SFDR 35dB

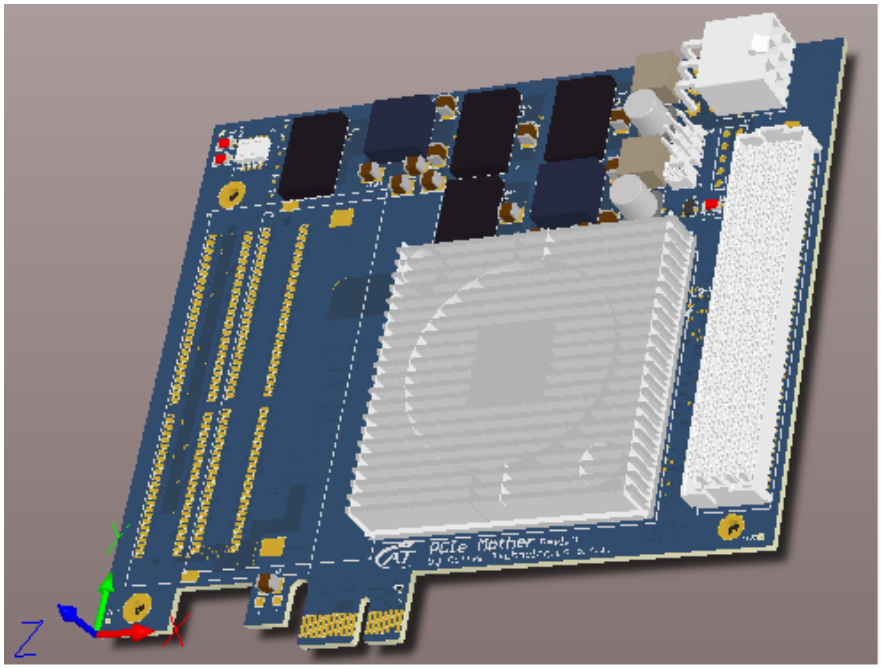


DC coupled HV amplifier

- 6Vpp – 250ps rise time



FPGA Carrier board



- Based on Kintex Ultrascale FPGA
- Up to 8GB DDR4 memory @ 250 Gbps bandwidth
- Up to 19 Transciever @16Gbps to FMC
- Up to 96 LVDS @1.25Gbps to FMC

Active Technologies

http://www.activetechnologies.it

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would like to thank you for your time and consideration