

AMC and RTM Boards Intended for Performance Evaluation of MTCA.4 Based Modules

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MTCA Workshop
DESY, 10.12.2015

Introduction

- > Two MTCA.4 modules will be presented:
 - DAMC-AMCTEST
 - DRTM-RTMTEST
- > Boards will be used for:
 - Performance evaluation of analog modules compliant with DESY Analog Class Recommendation A1.1
 - Automated teststand for MTCA.4 modules



ZONE3 Analog Class Recommendation

> Analog signal transmission zone:

- 10 channel AC-coupled differential input signals
- 10 channel DC-coupled differential input signals
- 5 channel DC-coupled differential output signals

> Digital clock signal transmission zone:

- 6 AC-coupled differential inputs for low-jitter clock signals

> User signal transmission zone:

- 6-12 LVDS inputs / outputs for user-configuration
- Optional 3 LVDS outputs with fixed output direction
- Optional high-speed link

> Full specification available on website: mtca.desy.de

This board is an AMC module that can be used to test RTM modules working with frequencies up to 3 GHz.

Features:

- > Fully compliant with DESY Analog Class A1.1 recommendation
- > 10 analog channels with SMA outputs.
 - AC(10-3000 MHz)
 - DC(DC-1000 MHz)
- > 6 x DAC
 - 16 bit, 250 MSPS
 - 5 outputs to ZONE3
 - 1 output to SMA

> Clock distribution

- 6 SMA clock outputs (ZONE 3)
- DACs and FPGA can be clocked either from ZONE3 or external source (SMA input).

> Optional FPGA module:

- Mercury KX-1 module from Enclustra
- Kintex 7 FPGA (XC7K160T-1FBG676C)
- 1 GB DDR3 Memory
- PCI-e
- GbE

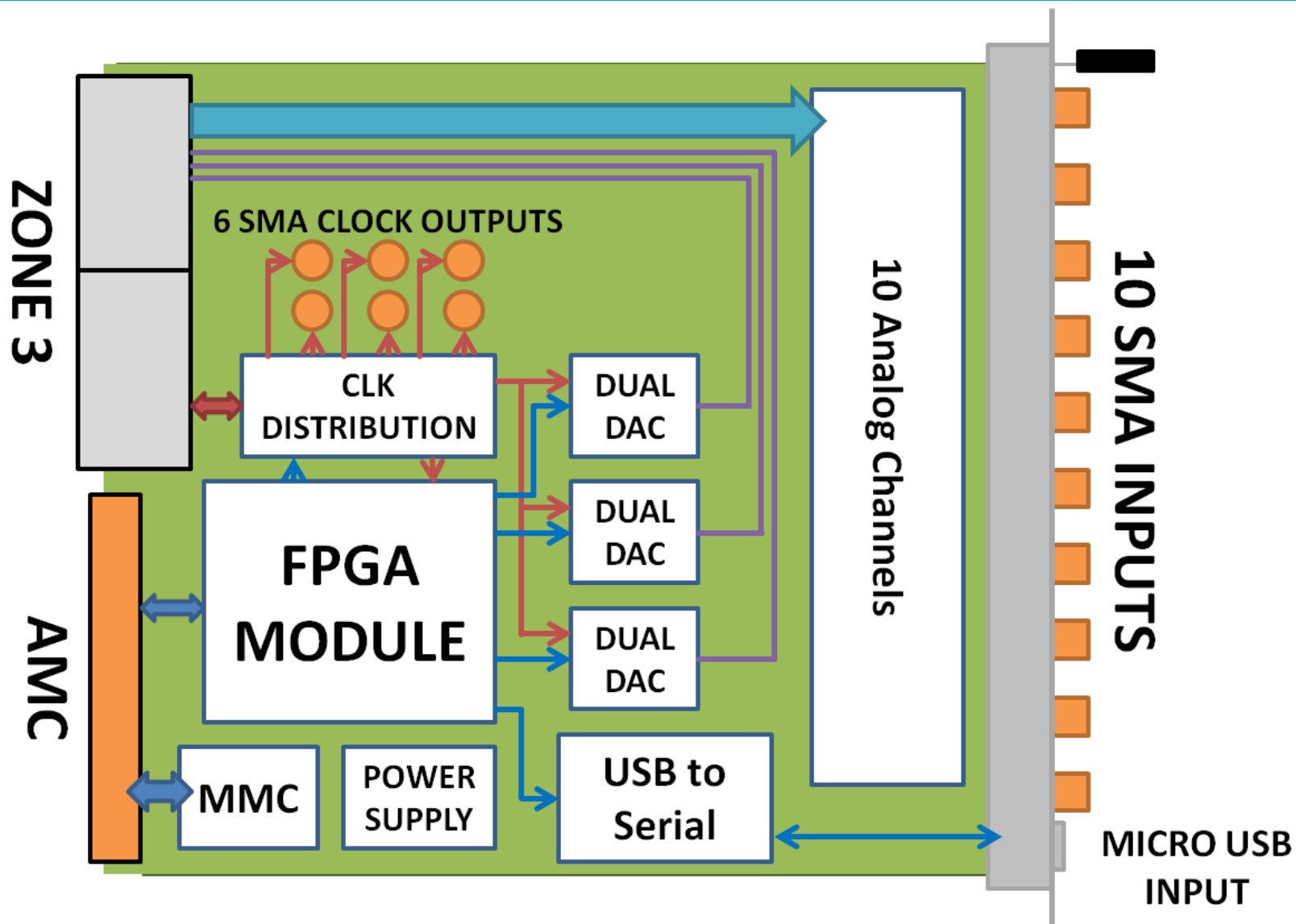
> Standard MTCA MMC

> Rx and Tx for trigger interlock signals

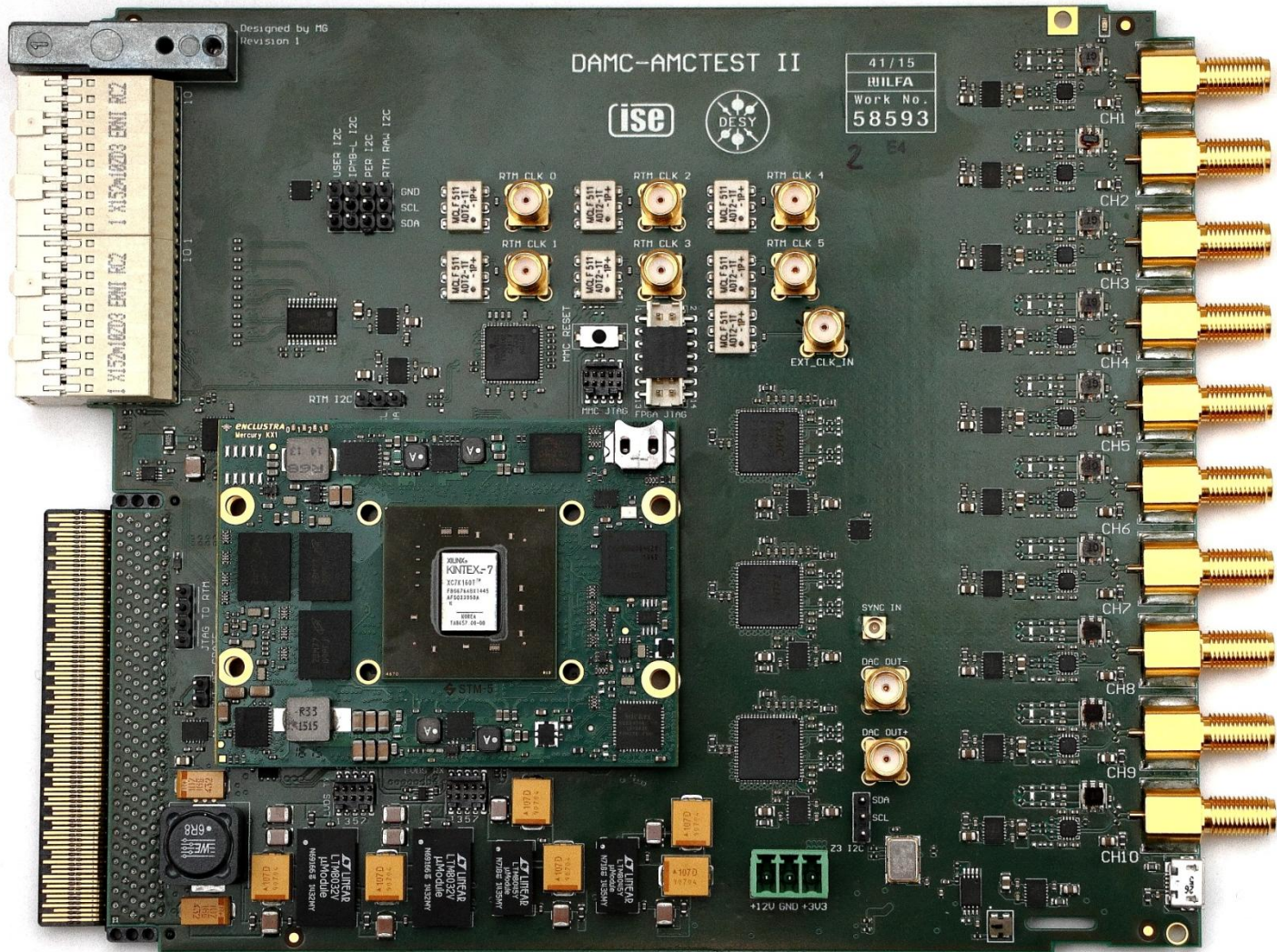
> MGT over ZONE3

> Possible operation outside of MTCA crate

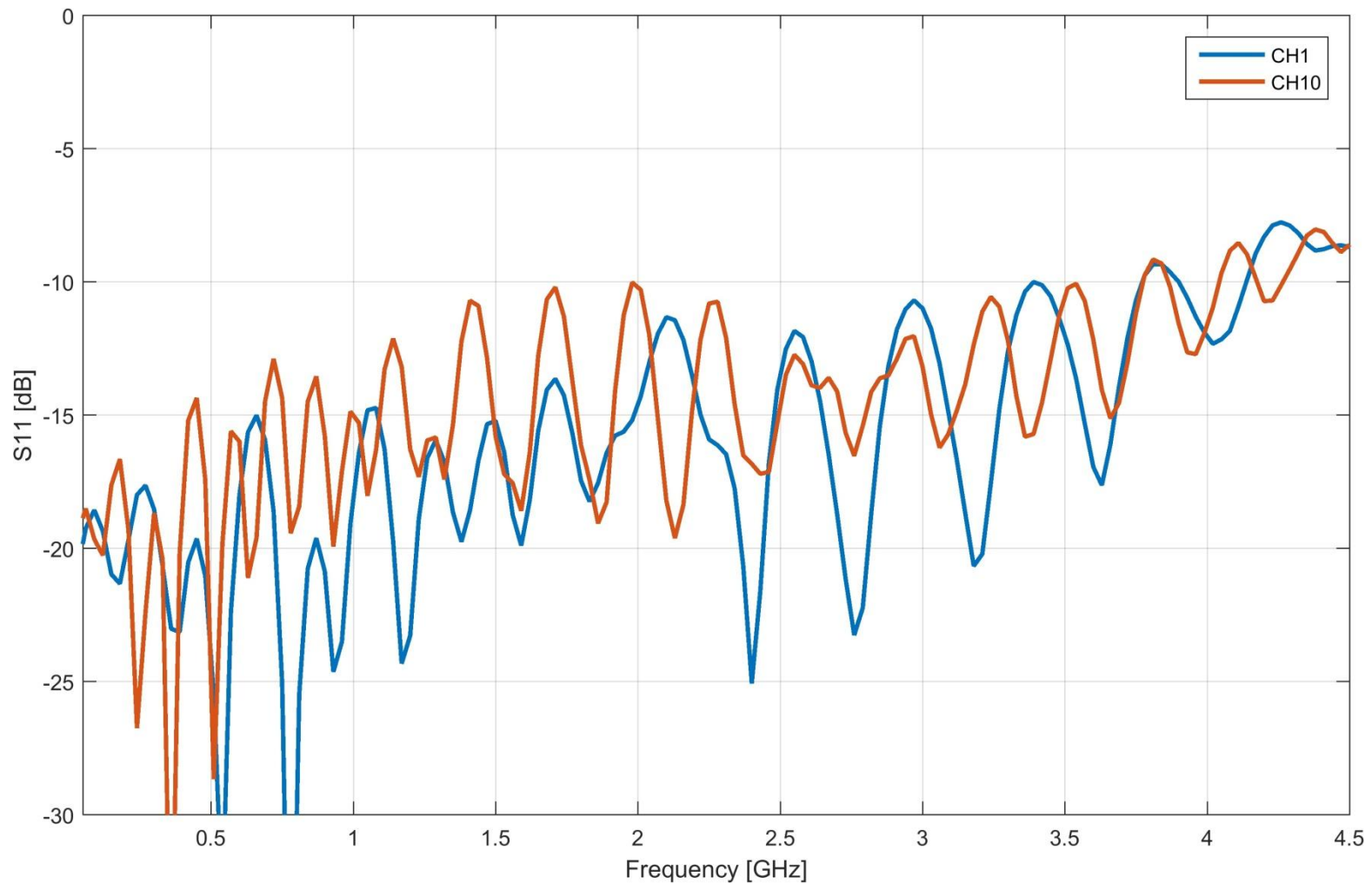
DAMC-AMCTEST – Block Diagram



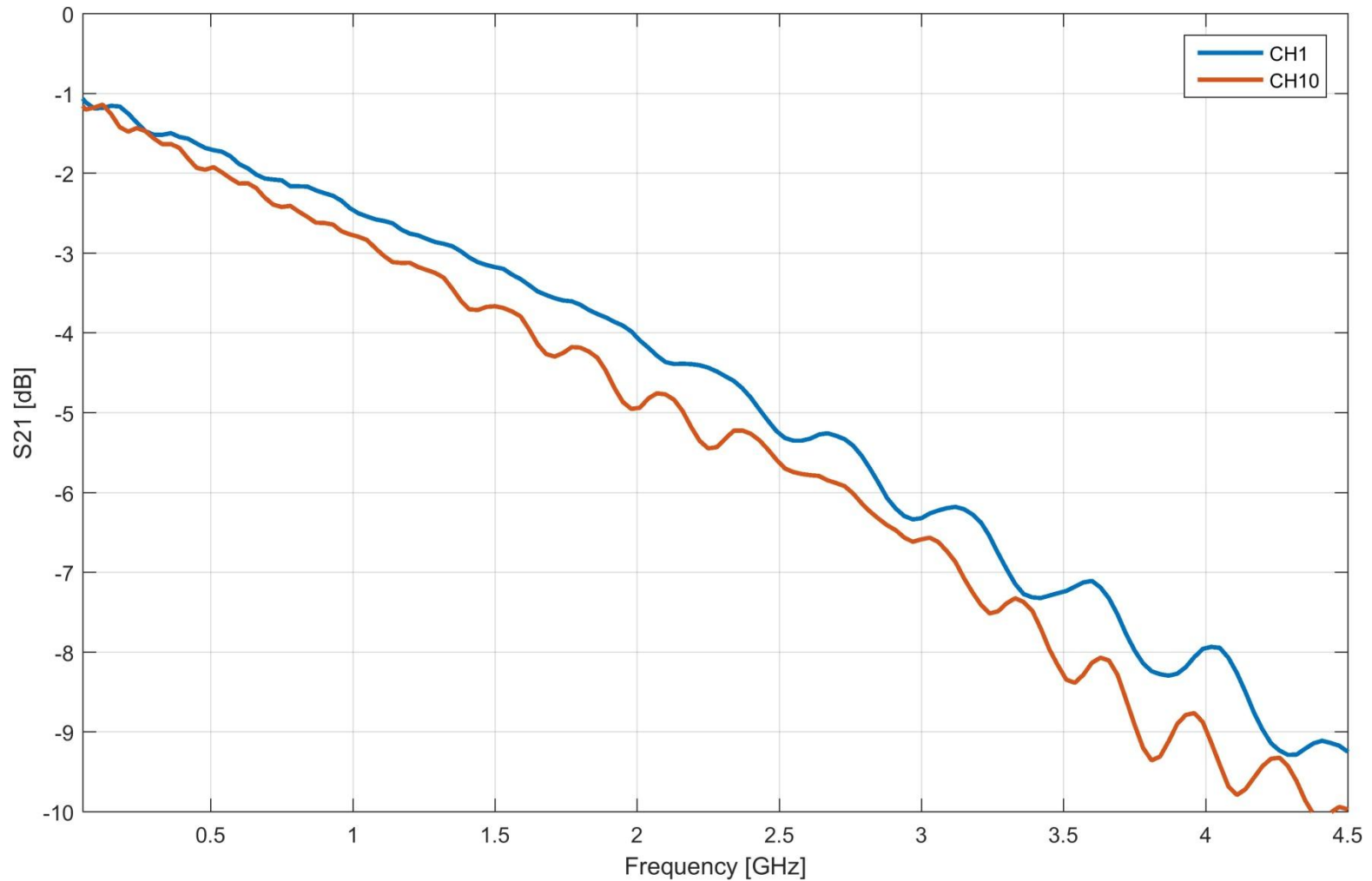
DAMC-AMCTEST - Photo



DAMC-AMCTEST - S11 Measurement



DAMC-AMCTEST – Transmission



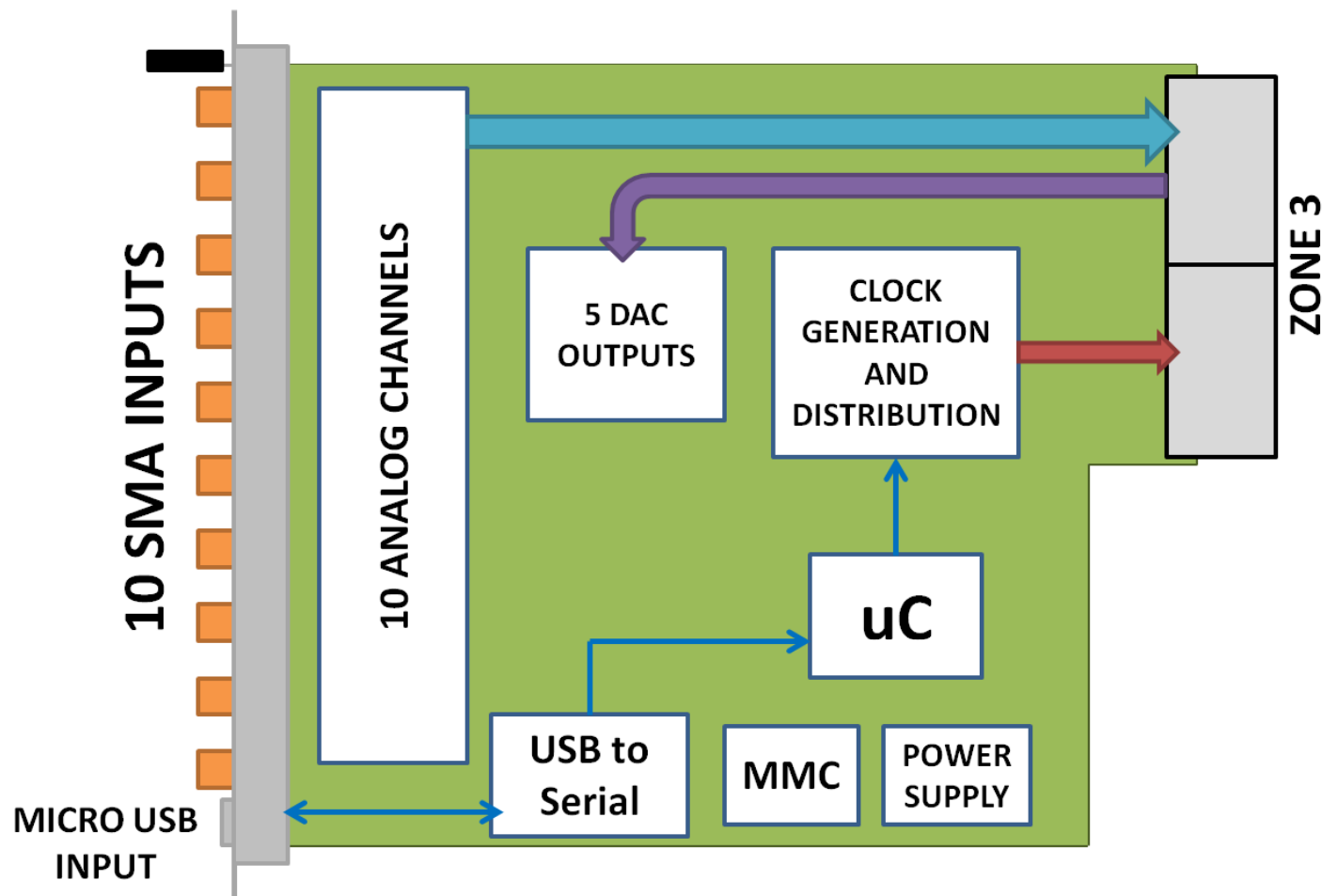
The board is a RTM module that can be used to test AMC modules working with frequencies up to 3 GHz.

Features:

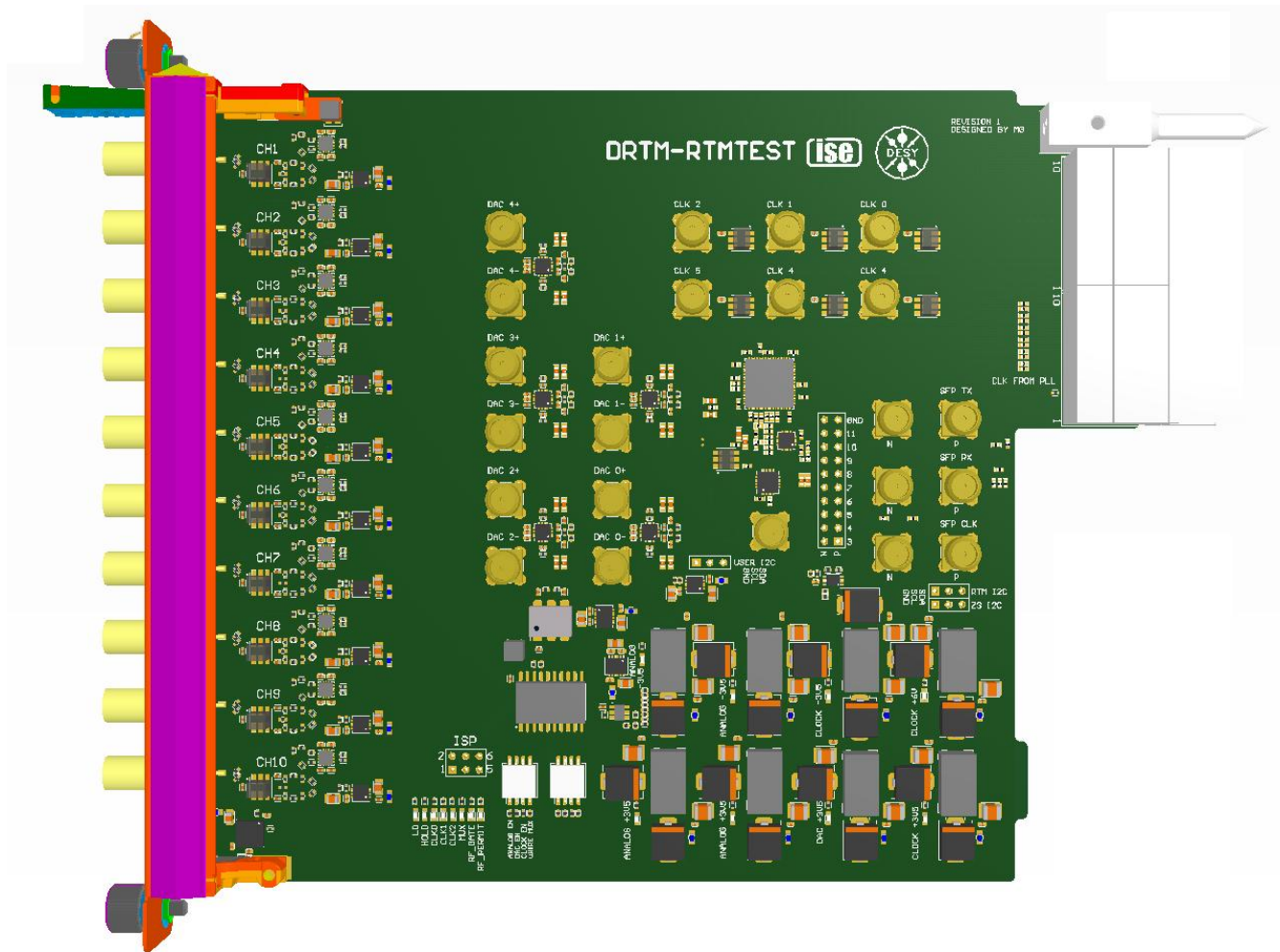
- > Fully compliant with DESY Analog Class A1.1 recommendation
- > 10 analog channels with SMA inputs.
 - AC(10-3000 MHz)
 - DC(DC-3000 MHz)
- > Universal clock distribution with integrated PLL
 - 6 clock outputs to ZONE3
 - Clock signal generation from external reference with low noise PLL
 - External clock distribution

- > Onboard configuration
- > Standard MTCA.4 MMC
- > ZONE 3 transceiver inputs and outputs (SMA)
- > Possible operation outside of MTCA crate

DRTM-RTMTEST – Block Diagram



DRTM-RTMTEST - Visualization



Summary

- > DAMC-AMCTEST and DRTM-RTMTEST are boards designed for performance evaluation of MTCA.4 modules compliant with DESY Analog Class A1.1 recommendation.
- > DAMC-AMCTEST was manufactured and it is in the characterization stage.
- > DRTM-RTMTEST is in final design stage and soon will be send to production.

Thank you for attention!