

# DESY MTCA.4 Product Portfolio

## DESY Board Development Stage and Licensing

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- > DESY developed a broad portfolio of boards
  
- > New Approach I: Develop boards in the scope of XFEL and license them to industry (dual use strategy).
  
- > New Approach II: Develop boards for the community to support MTCA.4
  
- > Benefits:
  - DESY Technology available to partners → good for MTCA.4
  - Higher volume, lower price
  - Off-the-shelf products: Easy ordering, do not deal with production issues
  - Board bring up and post-production test outsourced to company
  - Company has stronger buying department → Component cost reduced

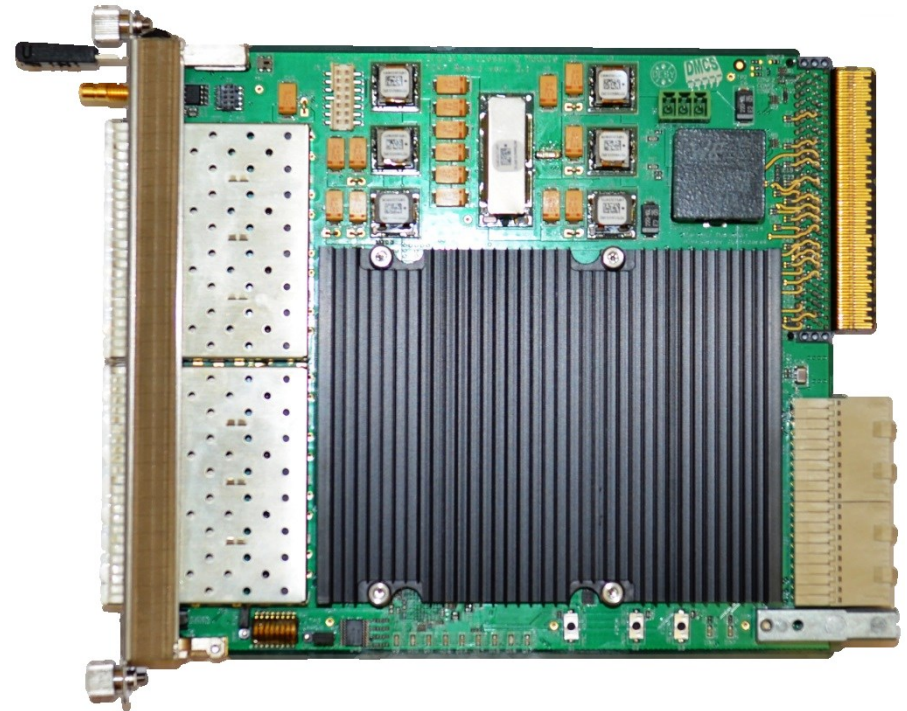


# DAMC-TCK7 → Vadatech CM045



## > Communication Board

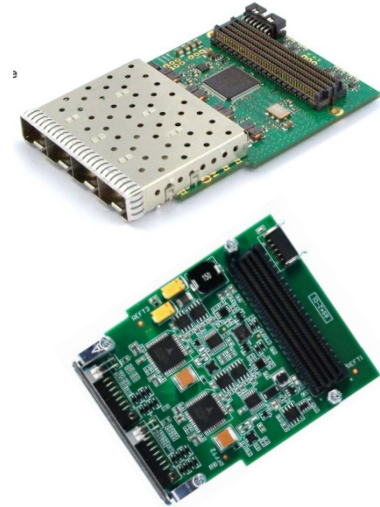
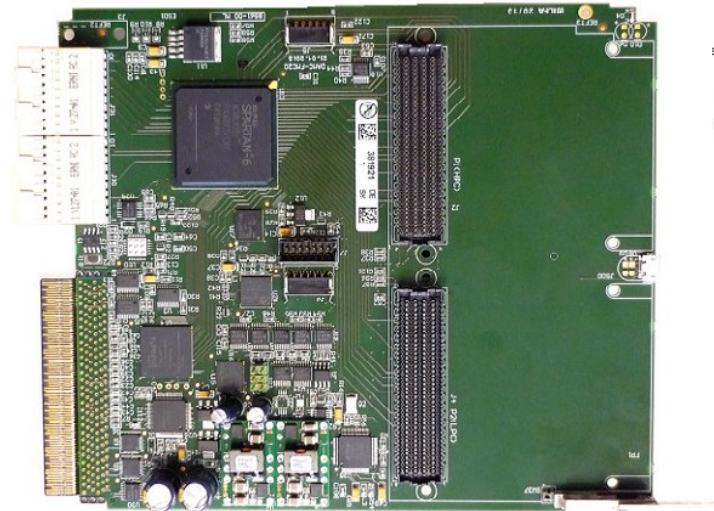
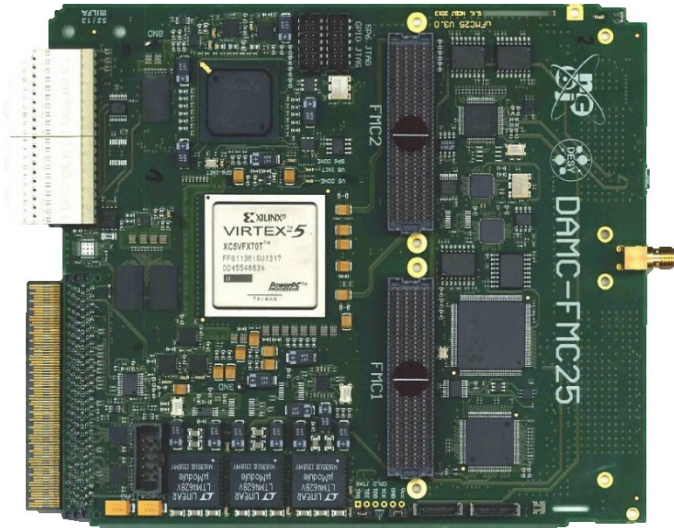
- XC7K355T or XC7K420T
- 8x SFP+ on front panel (12.5G)
- 16 Gb DDR 3 SDRAM
- PCIe x4 gen. 3 (8 Gbps)
- 10 MGTs to backplane (12.5G)
- 4 MGTs to RTM (12.5G)
- LVDS parallel bus to RTM





Board is significantly cheaper compared to production at DESY



# FMC Carriers + FMC Modules



## DAMC-FMC25

-  Two HPC FMC Slots (2/2 or 0/4 MGTs)
- Virtex-5 LX70T and Spartan-6 LX45T
- PCI-e x4, 256 MB + 128 MB DDR2
- Very Flexible Clocking
-  ➤ 1.8 to 3.3V FMCs

## DAMC-FMC20 (EAMC-FMC500)

- Entry-level AMC carrier
- One HPC, One LPC FMC Slot (1/2 MGTs)
- Spartan-6 LX45T and Spartan-6 LX150
- MGTs to Backplane via Crosspoint
- 2.5V FMCs with 3V3 option



# DRTM-DWC10, DRTM-DWC8VM1, DRTM-DS8VM1

## Analogue boards (compatible to Struck SIS8300L)



### DRTM-DWC10

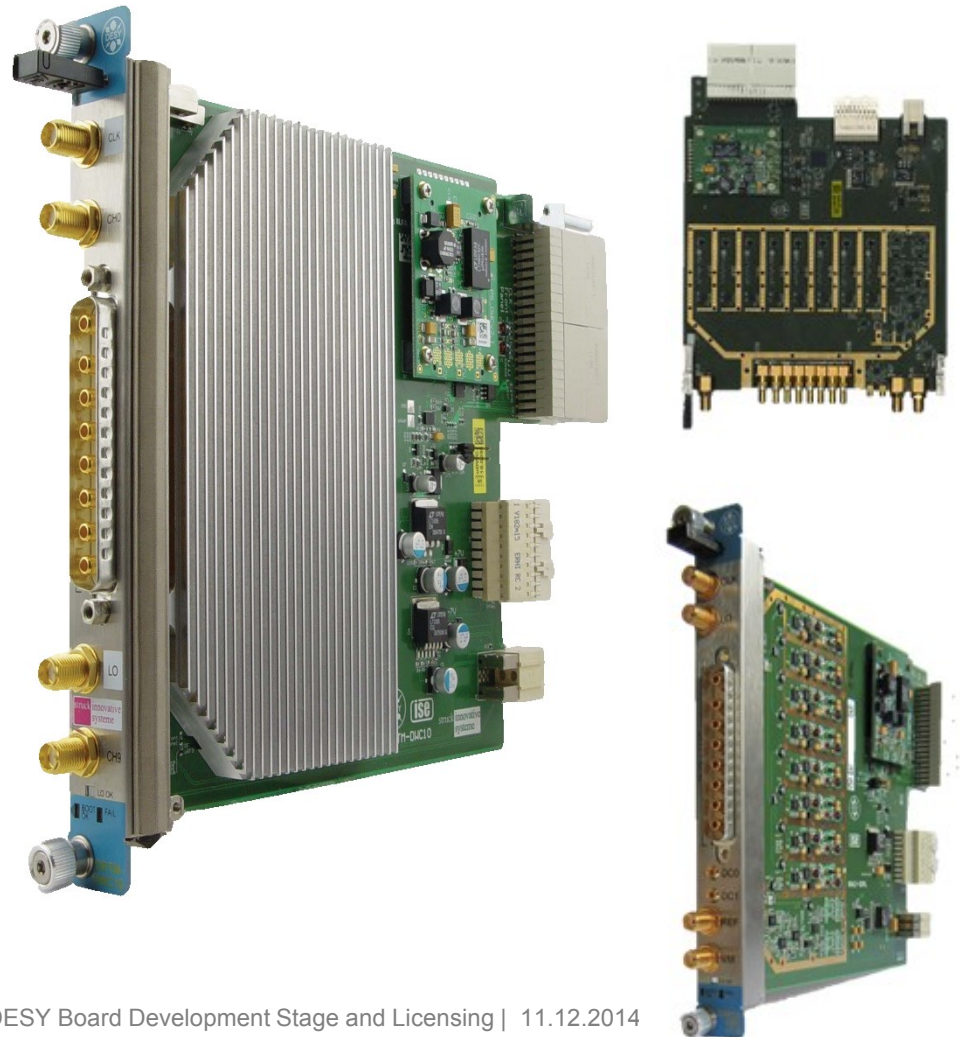
- 10 channel Down-Conversion:
- 0.7 GHz to 4 GHz
- < 0.002deg (1.3GHz) stability

### DRTM-DWC8VM1

- Performance comparable to DRTM-DWC10 (8 Ch.)
- Vector Modulator 0.05 GHz to 6.0 GHz

### DRTM-DS8VM1

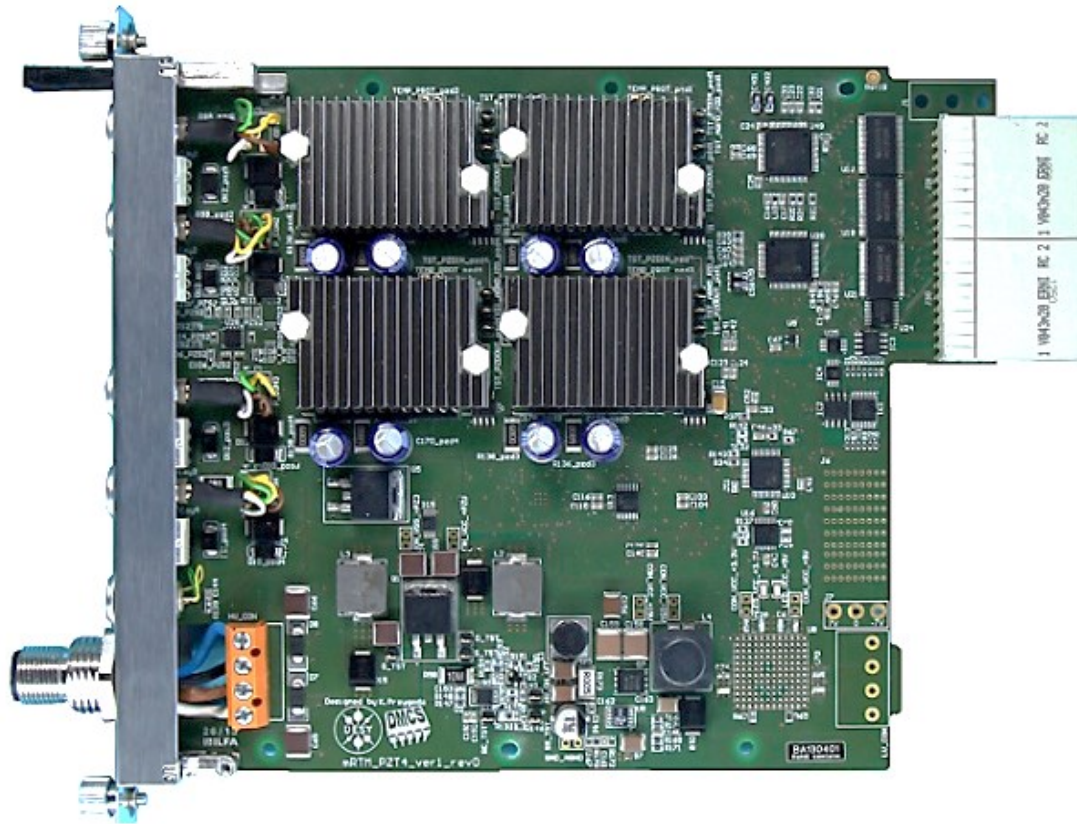
- 8x feeding 5 to 400 MHz to AMC
- Vector Modulator 0.05 GHz to 6.0 GHz
- Reference Clock



# DRTM-PZT4

**eicSys GmbH**  
Embedded Integrated Control Systems

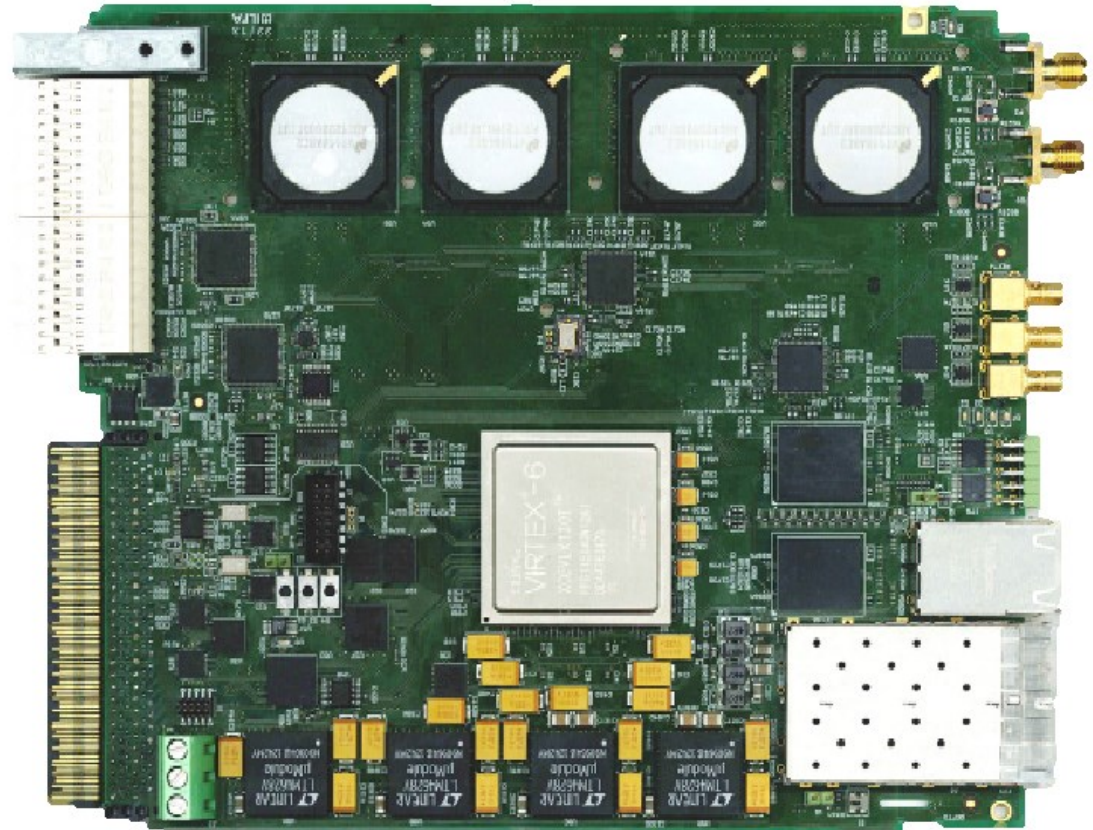
- Fully integrated solution on RTM
- Very high level of integration
- Provides 4-channel piezo drivers and piezo sensors
- Unipolar: 0...+100 V and bipolar:  $\pm 100$  V on-board piezo power supplies
- Integrated low pass filters
- Allows to build very compact systems (laser synchronisation, cavity tuning, special diagnostics, fiber link stabilisation)



# DAMC-DS800

## DAMC-DS800

- 8 channel, 16 bit very high speed digitizer, up to 800 MSPS or 4 channels up to 1.6GSPS
- Input signal bandwidths up to 2.7 GHz  
4x16-bit DAC channels
- Input from the rear (Zone 3)
- Lowest price per channel



# Introduction

> DAMC-TCK7	→ Vadatech CM045	✓	can be ordered
> DAMC-FMC20	→ EICSYS EAMC-FMC500	✓	can be ordered
> DAMC-FMC25	→ CAENels DAMC-FMC25	✓	data preparation
> DAMC-DS800	→ under negotiation	⚠	improvement
> DRTM-DWC10	→ Struck DWC8300	✓	can be orderd
> DRTM-DWC8VM1	→ Struck DWC8VM1	✓	can be ordered
> DRTM-DS8VM1	→ Struck DS8VM1	✓	sample production
> DRTM-VM2LF/HF		⚠	looking for partner
> DAMC-PTZ4	→ EICSYS	✓	pre-series production
> DFMC-MD22	→ EICSYS	✓	data preparation
> DFMC-SFP4	→ CAENels FMC-4SFP+	✓	data preparation
> RF Backplane	→ Elma	✓	data ready
> DRTM-LOG1300	→ Sandona LTD	✓	sample in production





# Conclusion

- > In 2014, we released 12 boards together with the partners
- > Pro's:
  - We greatly benefit from licensing because we can order the boards from a catalogue
  - The MTCA.4 community benefits from our solutions
  - We introduced a bug tracking system and data management to hardware projects in order to stay synchronized with partners and document issues and changes
- > Con's
  - We underestimated the work necessary to finalize boards as a PRODUCT
  - Very difficult to allocate resources for boards not required for 2015 XFEL installation
  - We use a significant amount of our time to give support to customers
  - We can not release our internal board support packages to the public
  - We had to create new board support packages from scratch
- > Support duties must be transferred to the industry partners

