SpW backplane
- Advanced TCA -

M. Nomachi

Osaka University/JAXA

AdvancedTCA™

PICMG 3.0
Short Form Specification

January 2003

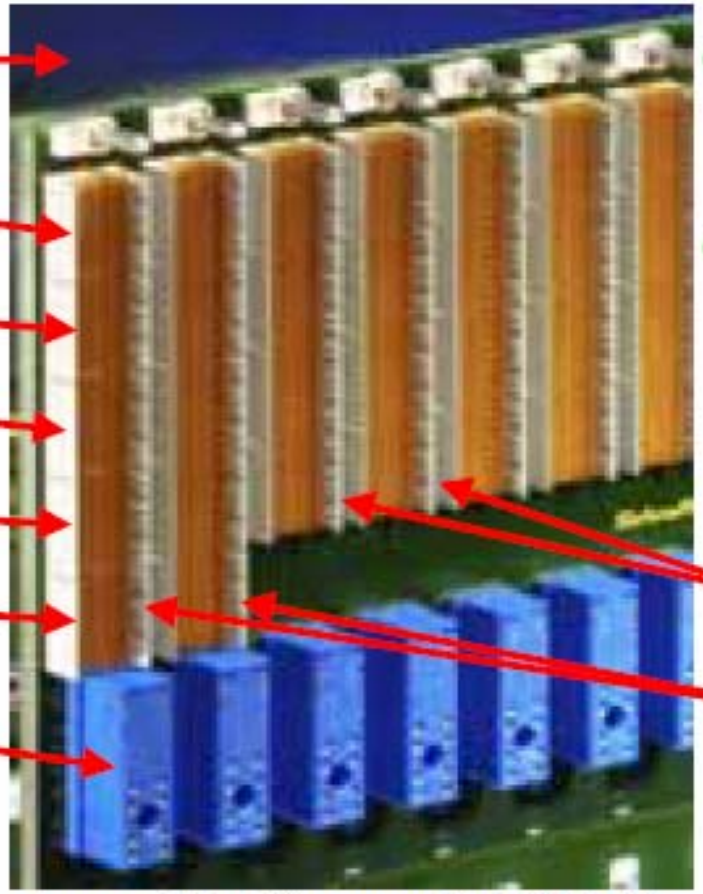
Mechanical Configuration

- 8U boards in 12U chassis
  - 16 slots in 600 mm frame
  - 14 slots in 19" cabinet
- 1.2" board pitch allows heat sinks plus rear SMT
- Forced air cooling for up to 200 watts per slot
- Front and rear fiber bend area in 600 mm depth
- Simplified sheet metal construction
- ETSI & NEBS vibration, shock and serviceability

AdvancedTCA®

From Schroff

Backplane



- Connector population options depend upon fabric architecture
- Full mesh backplane shown here

Source: Michael Thompson, Pentair/Schroff

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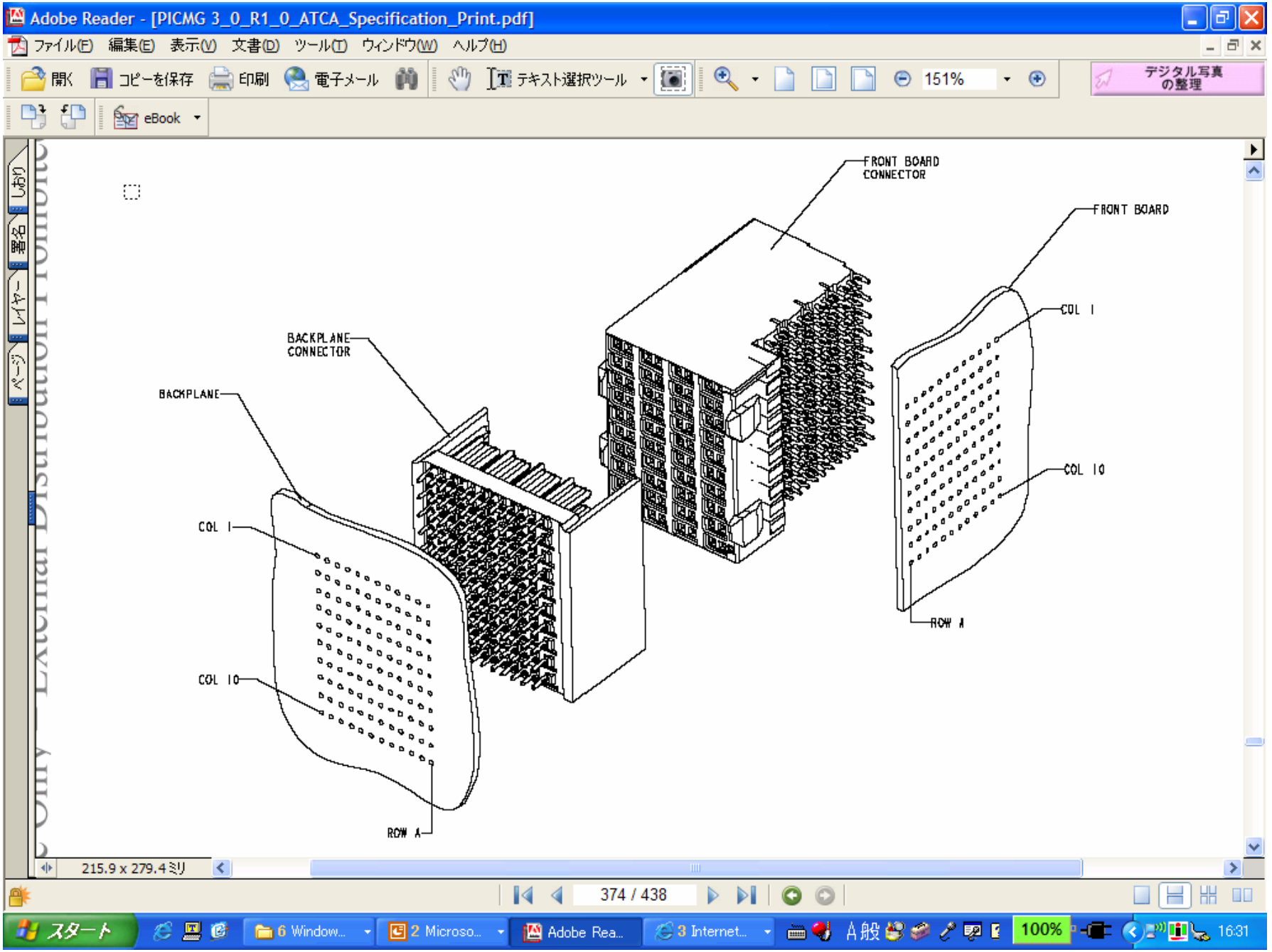

Adobe Reader - [PICMG 3_0_R1_0_ATCA_Specification_Print.pdf]
FRONT BOARD CONNECTOR
FRONT BOARD
COL 1
COL 10
ROW A
BACKPLANE CONNECTOR
BACKPLANE
COL 1
COL 10
ROW A
215.9 x 279.4ミリ
374 / 438
151%
100%

AdvancedTCA and Fabrics

PICMG 3.0 Specification

- Power Distribution
- Mechanical Elements
- System Management
- Regulatory Guidelines
- Connector Zones and type
- Fabric Topology
- Thermal Management Guidelines

PICMG 3.1 Specification	PICMG 3.2 Specification	PICMG 3.3 Specification	PICMG 3.4 Specification	PICMG 3.5 Specification
Ethernet & Fibre Channel	InfiniBand	StarFabric	PCI-Express & Advanced Switching	RapidIO & Advanced Fabric Interface**

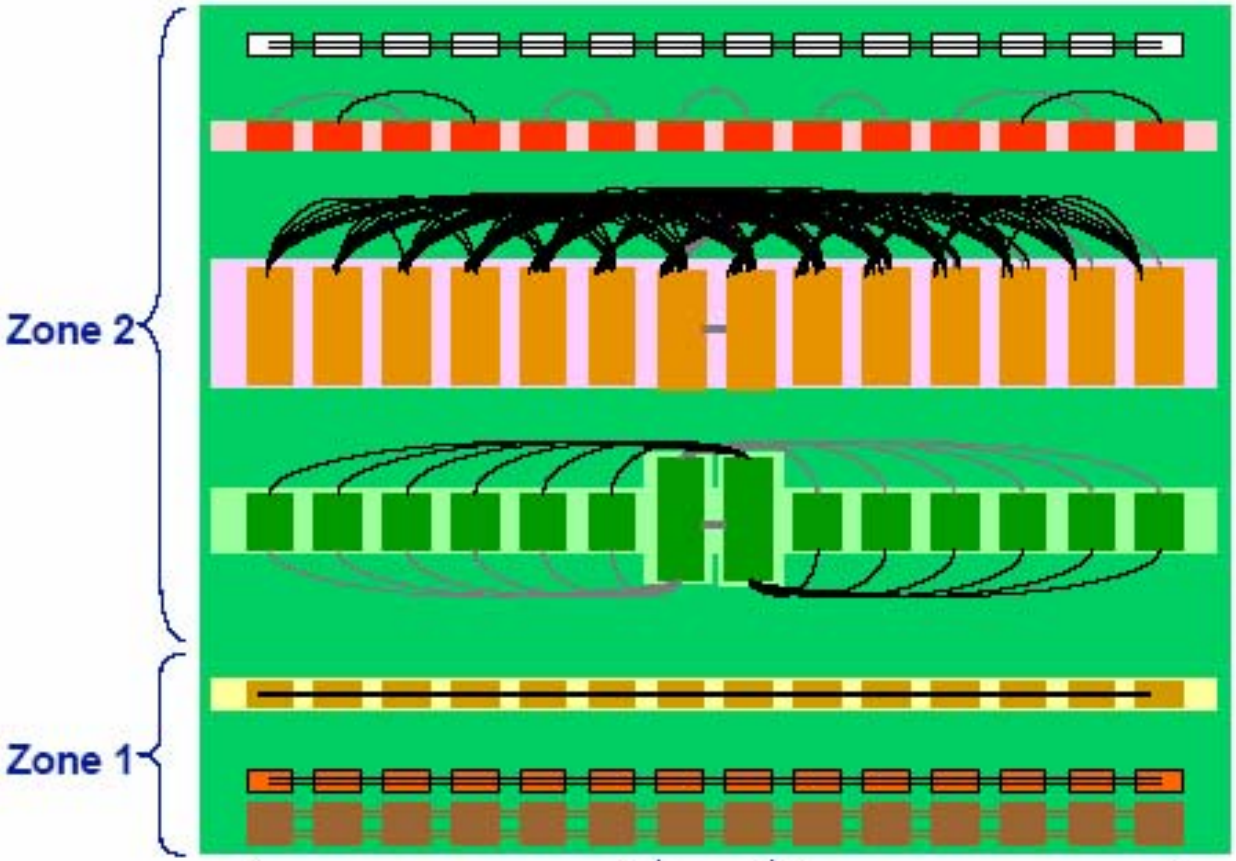
- Backplanes are fully defined in the PICMG 3.0 specification
- Interoperable Boards are defined in Subsidiary specifications

Source: Jim Kennedy, Intel Corporation

AdvancedTCA

From Schroff

PICMG 3.0 Backplane (Logical View)



Timing Clocks
(6 x 1 diff. pair each)

Update Ports
(10 diff. pairs each)

Fabric Interface
Full Mesh shown
(8 diff. pairs each)

Base Interface
Ethernet Star
(4 diff. pairs each)

IPMB*
(2 traces each)

8 Ring/Test Lines

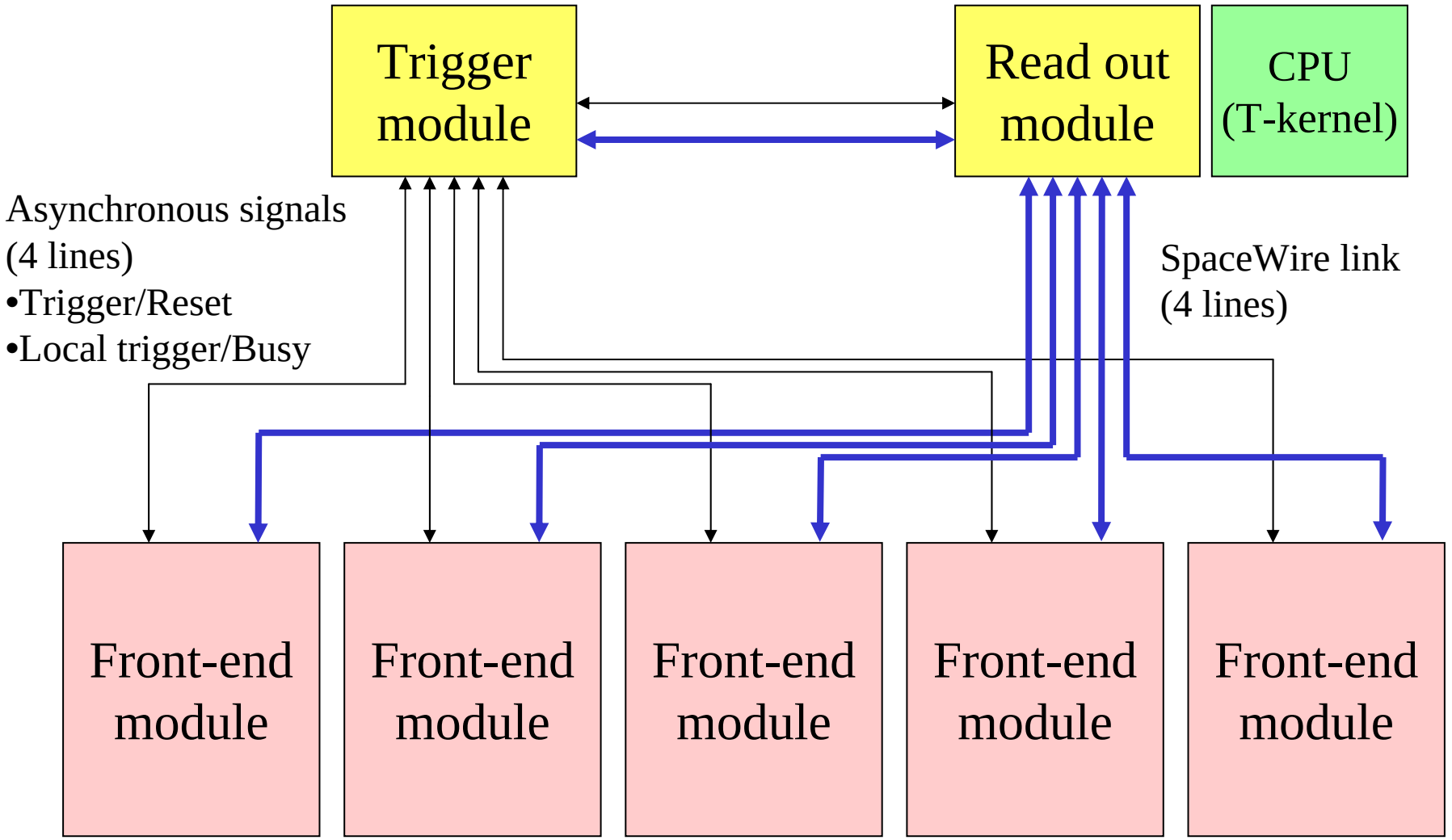
-48VDC Power
(2 feeds of –48V, RTN)

Source: Jim Kennedy, Intel Corporation

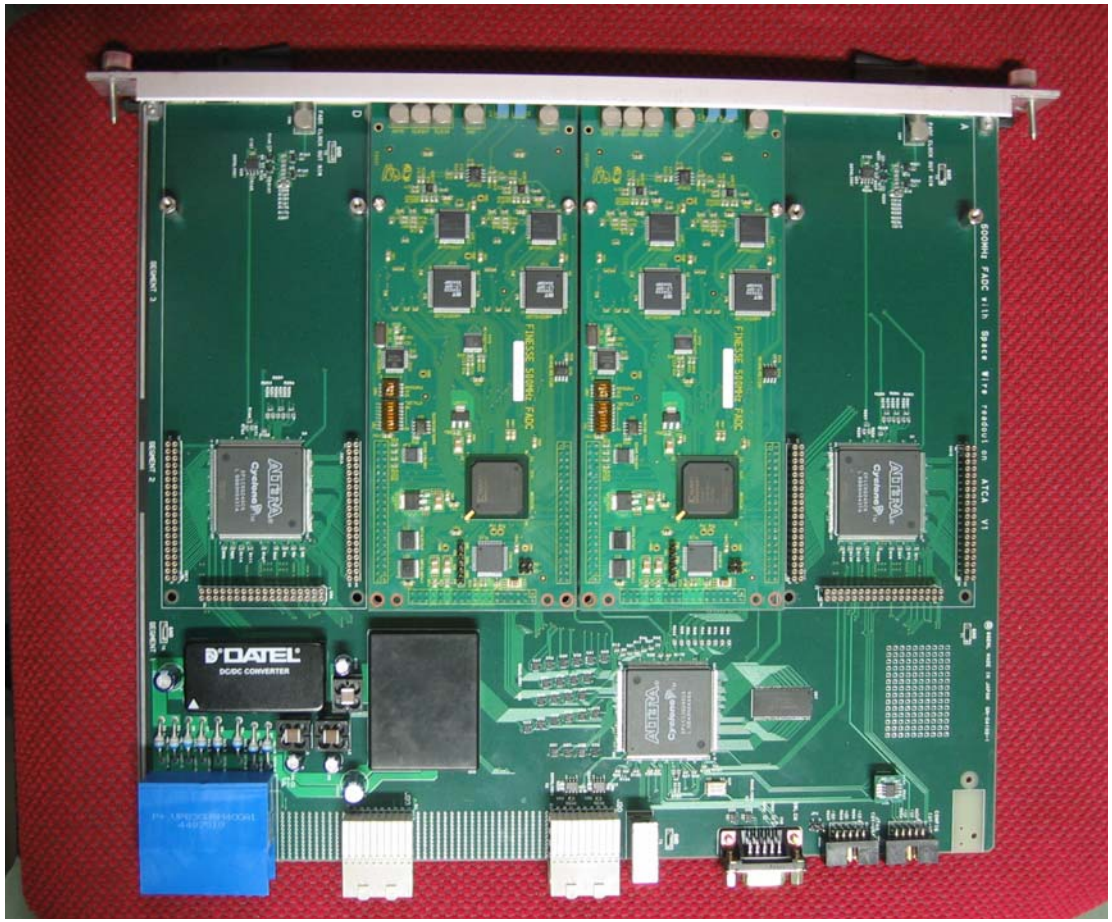
AdvancedTCA™

From Schroff

Dual star connection



500 MHz FADC

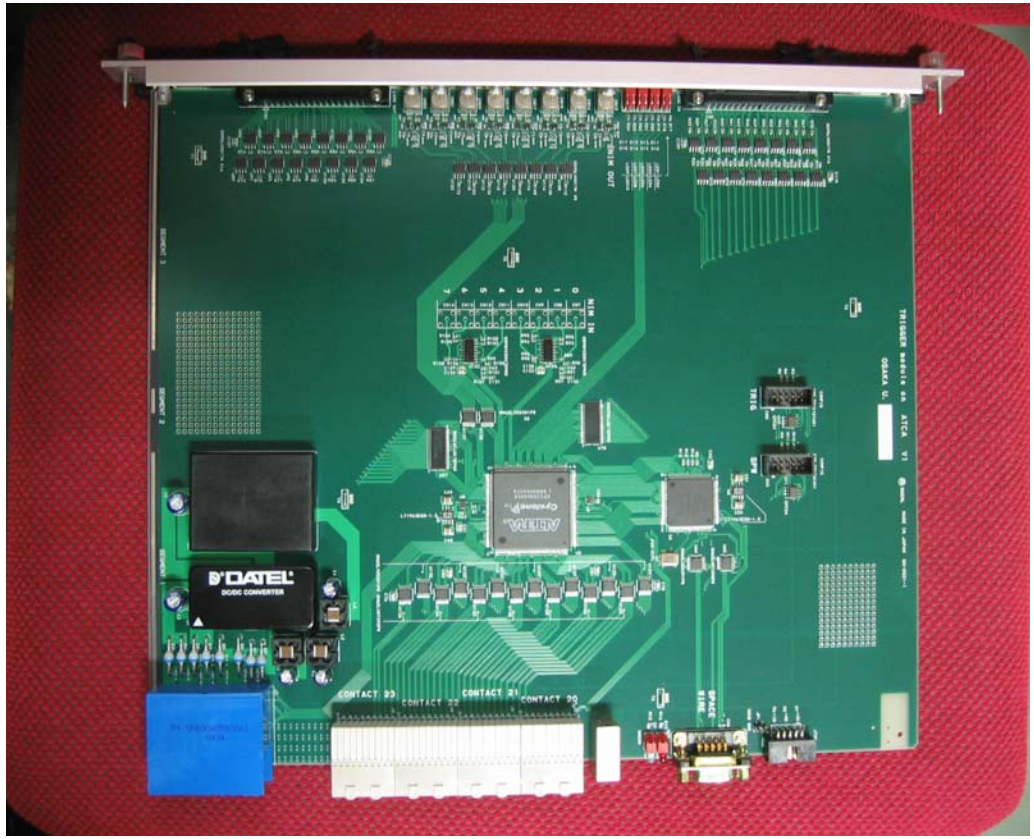


8 ch analog input FADC mezzanine card is developed at KEK
(FINESSE format)

Power consumption is About 20W

Cyclone EP1C6
Cyclone EP1C12 for SpW router
100Mbps SpW
Readout buffer with 128Mb SDRAM waiting second level trigger

Trigger module



16 LVDS in
16 LVDS out
8 NIM in
8 NIM out

Power consumption is about 10W

Cyclone EP1C12 for trigger logic
Cyclone EP1C6 for SpW
100Mbps SpW

Power Requirements

- -48/-60 VDC power input
  - -40.5 to -57 VDC, -50 to -72 VDC
- Redundant power inputs
- Distribution of ringing voltages
- Capacity of over 3,200 Watts per shelf
- Local power conversion
  - DC-DC converters on each board

Source: Michael Thompson, Pentair/Schroff

From Schroff

Summary

- SpaceWire is implemented on Advanced TCA. It is good to be applied for DAQ system for particle physics experiments on surface with accelerator and in underground non-accelerator physics.