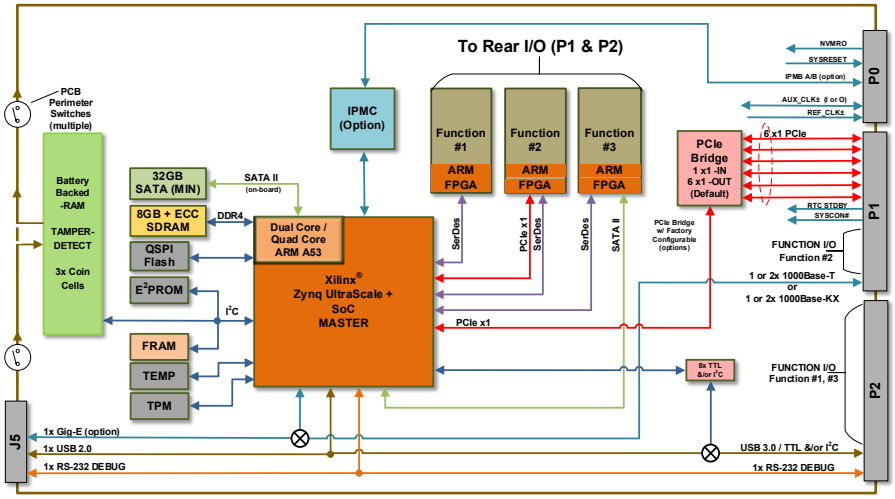
68ARM2 3U OpenVPX™ SBC with Three Smart I/O Function Module Slots

Over 70 different functions to choose from

Configure to Customize

The 68ARM2 is a 3U OpenVPX Zynq® UltraScale+™ Quad-core ARM® Cortex™-A53 MPCore™ based Single Board Computer that can be configured with up to three NAI Smart I/O and communications function modules. Ideally suited for rugged Mil-Aero applications, the 68ARM2 delivers off-the-shelf solutions that accelerate deployment of SWaP-optimized systems in air, land and sea applications.



Features Summary

- **3U OpenVPX (ANSI/VITA 65)**
  Profiles Supported:
  - MOD3-PAY-1F2U-16.2.11-2
    - Data plane: 6 x1 PCIe (default) (other factory configurations avail.)
    - Control plane: 2x 10/100/1000Base-T or 2x 1000Base-KX
  - SLT3-PAY-1F2U-14.2.12
- **Processor/Memory**
  - Xilinx Zynq® UltraScale+™ Quad-core ARM® Cortex™-A53 MPCore™ up to 1.3 GHz
  - 8 GB DDR4 SDRAM w/ ECC
  - 32 GB SATA II NAND Flash
- **Smart I/O Functions**
  - Support for 3 independent modules
  - PCIe interface to function slot #2 (e.g. for 2 additional Gig-E ports option)
  - SATA II interface to function slot #3 (e.g. for 256 GB expansion option)
- **Security / Cybersecurity (Option)**
  - FIPS 140-3 Level 3 Design Support
  - Crypto-key storage
    - Battery-backed RAM
  - Secure Boot
  - Anti-tamper / Tamper Detect & Sanitize
- **Motherboard Peripheral I/O**:
  - USB 2.0 to front maintenance J5 (option)
  - USB 3.0 to rear I/O (option)
  - I²C Bus to rear I/O (option)
  - 1x RS232 console port
    - To front maintenance J5 & rear I/O
  - 2x TTL I/O to rear I/O (8x TTL option)
- **IPMC Support**
  - VITA 46.11 Tier-2, basic, compatible (configured option)
- **Power**
  - < 15 W power dissipation (est./typ.) (not including module power)
- **Operating Systems**
  - Xilinx PetaLinux
  - Wind River® VxWorks®
  - DDC-I Deos
- **Background Built-in-Test**
  Continuous BIT (as applicable)
- **COSA® Architecture**
- **Intelligent I/O library support**
  (included)
- **VICTORY Interface Services**
  (Contact factory)
- **Commercial or Rugged Applications**
- **Operating Temperature**
  - Commercial: 0°C to 70°C
  - Rugged: -40°C to 85°C
- **Mechanical Options (ANSI/VITA 48)**
  - Air-cooled; 3U, 5HP/1.0” pitch
  - Conduction-cooled; 3U, 1.0” pitch

Select up to 3 functions for your application

For a full listing of available smart functions and detailed specifications please visit https://www.naii.com/functions

Analog & Digital I/O

Function	Module	Description
A/D Converter	AD1	12 Ch. ±1.25 to ±10.0 VDC FSR; 256 kHz (max), 24-bit Sigma-Delta
	AD2	12 Ch. ±12.5 to ±100.0 VDC FSR; 256 kHz (max), 24-bit Sigma-Delta
	AD3	12 Ch. ±25 mA FSR; 24-bit 256 kHz (max), Sigma-Delta
	AD4	16 Ch. ±1.25 to ±10.0 VDC FSR or ±25 mA; 16-bit SAR, 8 Ch. x 2 A/D multiplexed, 400 kHZ (aggregate per A/D)
	AD5	16 Ch. ±6.25 to ±50.0 VDC FSR; 16-bit SAR, 8 Ch. x 2 A/D multiplexed, 400 kHZ (aggregate per A/D)
	AD6	16 Ch. ±12.5 to ±100.0 VDC FSR; 16-bit SAR, 8 Ch. x 2 A/D multiplexed, 400 kHZ (aggregate per A/D)
	ADE	16 Ch. ±10 VDC FSR; 200 kHz (max.), 16-bit SAR
	ADF	16 Ch. ±100 VDC FSR; 200 kHz (max.), 16-bit SAR
	ADG	16 Ch. ±25 mA FSR; 200 kHz (max.), 16-bit SAR
I/O TTL/CMOS	TL1	24 Ch. 3.3V/5V tolerant, high-speed, programmable
	TL2	24 Ch. 3.3V/5V tolerant, high-speed, programmable, enhanced
	TL3 – TL8	24. Ch. 3.3V/5V tolerant, multiple strapping options
I/O Differential	DF1	16 Ch. RS-422/485 I/O transceiver
	DF2	16 Ch. RS-422/485 I/O transceiver, enhanced

Function	Module	Description
D/A Converter	DA1	12 Ch. ±10 VDC or ± 25 mA / Ch.
	DA2	16 Ch. ±10 VDC @ 10 mA max. / Ch.
	DA3	4 Ch. ±40 VDC or ± 100 mA / Ch.
	DA4	4 Ch. ±20 to ± 80 VDC @ ±10 mA max. / Ch.
	DA5	2 Ch. 65 VDC @ ±2 A max., external applied VCC source
I/O Discrete	DT1	24 Ch. Discrete I/O, 0 - 60 VDC, 500 mA / Ch. max.
	DT2	16 Ch. Discrete switch, ±80 V, 625 mA / Ch. max., isolated
	DT3	4 Ch. Discrete-switch, 65 V, 2 A / Ch. as half-bridge configuration, ext. VCC or 2 Ch. ±65 V, 2 A / Ch. as full-bridge configuration, ext. VCC
	DT4	24 Ch. Discrete I/O, 0 - 60 VDC, 500 mA / Ch. max., enhanced operation
	DT5	16 Ch. Discrete switch, ±80 V, 625 mA / Ch., enhanced operation
	DT6	4 Ch. Discrete-switch, 65 V, 2 A / Ch. as half-bridge configuration, ext. VCC or 2 Ch. ±65 V, 2 A / Ch. as full-bridge configuration, ext. VCC (DT3-type enhanced operation TBD/pending)
I/O Relay		
	RY1	4 Ch. SPDT, 220 VDC/ 250 VAC, 2 A, 60 W/62.5 VA max., non-latching
	RY2	4 Ch. SPDT, 220 VDC/ 250 VAC, 2 A, 60 W/62.5 VA max., latching

Position, Timing, Measurement & Simulation

Function	Module	Description
AC Reference	AC1	1 Ch. 2-28 Vrms (LV) & 1 Ch. 28-115 Vrms (HV), programmable
	AC2	2 Ch. 2-28 Vrms (LV), 47 Hz -20 kHz (max. range),
	AC3	2 Ch. 28-115 Vrms (HV), 47 Hz - 2.5 kHz (max. range)
Thermocouple (Measure)	TC1	8 Ch. Thermocouple, J, K, T, E, N, B, R, S, and Low-voltage A/D
	TR1	8 Ch. RTD (RT1-type) or Thermocouple (TC1-type), programmable per Ch.
	RT1	8 Ch. RTD (2,3 or 4 wire), standard PT-type to 4 kohm
GPS	GP1	Multi-Ch. (satellite) GPS & IRIG Receiver or Source; 2x wide module, Javad TR2 high-performance GPS engine
	GP2	Multi-Ch. (satellite) GPS & IRIG Receiver or Source; 1x wide module, uBlox Neo GPS engine
IRIG	RG1	1 Ch. IRIG Receiver or Source, digital & analog w/ master timer
Strain Gauge	SG1	4 Ch. Strain Gauge, full-bridge measurement

Function	Module	Description
SYN/RSL-to-Dig	SD1	4 Ch. 2-28 Vrms Input, 2-115 Vrms Exc, 47 Hz - 1 Hz Freq
	SD2	4 Ch. 2-28 Vrms Input, 2-115 Vrms Exc, 1 kHz - 5 kHz Freq
	SD3	4 Ch. 2-28 Vrms Input, 2-115 Vrms Exc, 5 kHz - 10 kHz Freq
	SD4	4 Ch. 2-28 Vrms Input, 2-115 Vrms Exc, 10 kHz - 20 kHz Freq
	SD5	4 Ch. 28-90 Vrms Input, 2-115 Vrms Exc, 47 Hz - 1 kHz Freq
L(R)VDT-to-Dig	LD1-5	4 Ch. 2-28 Vrms Input, 2-115 Vrms Exc (47 Hz - 20 kHz Freq. and 2-90 Vrms ranges, reference detailed specifications)
Dig-to-SYN/RSL Dig-to-L(R)VDT	DSx / DRx DLx	3, 2 or 1 Ch. @ 0.5 VA, 2.2 VA or 3.0 VA 2-90 Vrms / 2-115 Vexc @ 47 Hz – 20 kHz (Multi-range inputs/frequency; reference module detailed specifications)
Chip Detect	CD1	Six (6) chip detection and burn channels
Variable Reluctance	VR1	8 Channels, Differential Input

Select up to 3 functions for your application (Continued)

For a full listing of available smart functions and detailed specifications please visit https://www.naii.com/functions

Communication					
Function	**Module**	**Description**	**Function**	**Module**	**Description**
ARINC	AR1	12 Ch. ARINC 429/575, TX or RX	**CANBus**	CB1	8 Ch. CAN bus, CAN 2.0 A/B Protocol
	AR2	1 Ch. ARINC 568 (TX & RX) & 1 Ch. ARINC 579 (TX or RX)		CB2	8 Ch. CAN bus, J1939 Protocol
MIL-STD-1553	FTA, FTB, FTC	1, 2 & 4 Ch. MIL-STD-1553, Dual Redundant XFMR-Coupled Assisted Mode Capable		CB3	8 Ch. CAN bus, CAN 2.0 A/B Protocol or J1939 Protocol, programmable
	FTD, FTE, FTF	1, 2 & 4 Ch. MIL-STD-1553, Dual Redundant Direct-Coupled Assisted Mode Capable	**Serial**	SC1	4 Ch. Serial Communications, multi-mode RS-232/422/485/423 capable, ASYNC/SYNC (S/HDLC) non-isolated
MIL-STD-1760	FTJ	1 Ch. MIL-STD-1553/1760, XFMR-Coupled		SC2	4 Ch. Serial Communications, multi-mode programmable, isolated
	FTK	2 Ch. MIL-STD-1553/1760 XFMR-Coupled		SC3	8 Ch. Serial Communications RS-232/422/485 or GPIO, non-isolated
Ethernet	EM1	2-Port 10/100/1000Base-T Ethernet NIC, Intel 82850, PCIe I/F to processor (local or off-board host)		SC7	4 Ch. Serial Communications, multi-mode, individual GNDs, non-isolated
	ES2	16-Port 10/100/1000Base-T, managed switch, with L2/L3 Layer support 4x 10Gb Fiber Optic option, 2x wide module			

Combination & Specialty					
Function	**Module**	**Description**	**Function**	**Module**	**Description**
Combination	CM5	2 Ch. MIL-STD-1553 & 8 Ch. ARINC 429/575	**Flash**	FM1	240 GB SSD, SATA II, MLC, -40° C to +85° C
	CM8	2 Ch. MIL-STD-1553 & 12 Ch. Discrete I/O		FM2	480 GB SSD, SATA II, MLC, -40° C to +85° C
				FM4	128 GB SSD, SATA II, SLC, -40° C to +85° C
				FM5	256 GB SSD, SATA II, SLC, -40° C to +85° C
				FM7	1 TB SSD, SATA II, TLC, 0° C to +70° C
				FM8	1 TB SSD, SATA II, TLC, -40° C to +85° C
				FM9	2 TB SSD, SATA II, TLC, -40° C to +85° C

Architected for Versatility

NAI's Configurable Open System Architecture™ (COSA®) offers a choice of over 70 smart I/O, communications, or Ethernet switch functions, providing the highest packaging density and greatest flexibility of any 3U SBC in the industry. Preexisting, fully-tested functions can be combined in an unlimited number of ways quickly and easily.

Board Support Package and Software Support

The 68ARM2 includes BSP and SDK support for Xilinx PetaLinux or Wind River® VxWorks®. Please contact the factory regarding other OS support (e.g. DDC-I Deos, etc.). In addition, software support kits are supplied, with source code and board-specific library I/O APIs, to facilitate system integration. Each I/O function has dedicated processing, unburdening the SBC from unnecessary data management overhead.

Background Built-In-Test (BIT)

BIT continuously monitors the status of all I/O during normal operations and is totally transparent to the user. SBC resources are not consumed while executing BIT routines. This simplifies maintenance, assures operational readiness, reduces life-cycle costs and - *keeps your systems mission ready*.

One-Source Efficiencies

Eliminate man-months of integration with a configured, field-proven system from NAI. Specification to deployment is a seamless experience as all design, state-of-the-art manufacturing, assembly and test are performed - by one trusted source. All facilities are located within the U.S. and optimized for high-mix/low volume production runs and extended lifecycle support.

Product Lifecycle Management

From design to production and beyond, NAI's product lifecycle management strategy ensures the long-term availability of COTS products through configuration management, technology refresh and obsolescence component purchase and storage

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