# 68INT5 3U OpenVPX Single Board Computers

3U OpenVPX™ Intel® Xeon® SBC with One Smart Function Module Slot

The 68INT5 is a 3U OpenVPX Intel® Xeon® Processor E-2276ME based embedded Single Board Computer with integrated output graphics/video & I/O expansion. Balancing high-performance with relatively low-power dissipation, the processor supports up to six processing cores operating at up to 2.8 GHz. One I/O expansion module slot is provided that can be fitted/configured with any one of the 100+ NAI smart I/O and communications function modules. Ideally suited for rugged Mil-Aero applications, the 68INT5 delivers off-the-shelf solutions that accelerate deployment of SWaP-optimized systems in air, land and sea applications. The 68INT5 includes BSP and SSK support for CentOS, Linux®, and Microsoft Windows®. In addition, SSKs are supplied with source code and board-specific library I/O APIs to facilitate system integration.
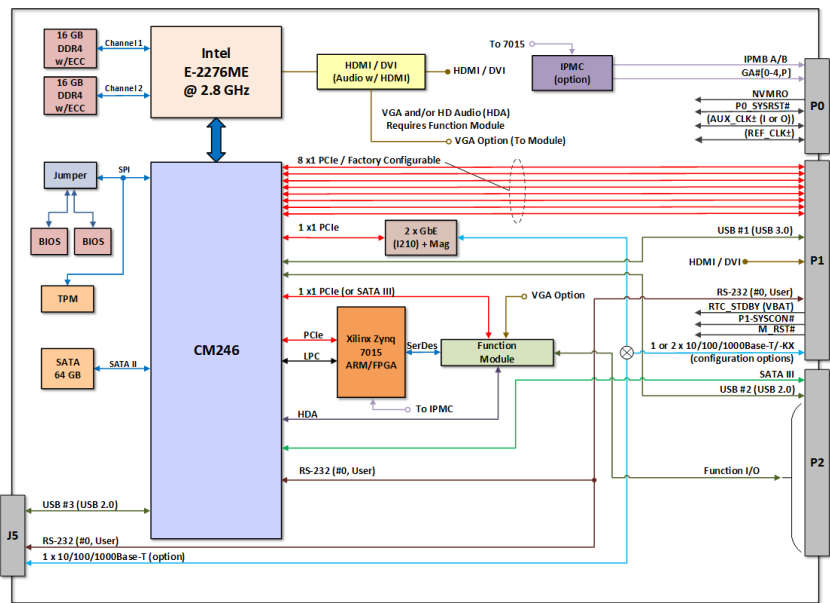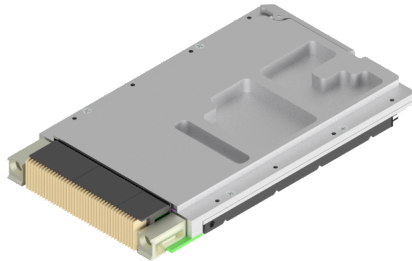
Features

- 3U OpenVPX (ANSI/VITA 65)
- Profiles Supported:
  - MOD3-PAY-2F2U-16.2.3-3
    - Data plane:
      - 8 x1 PCIe Gen 2 (default) (2 x4, 1 x4 & 4 x1 configurations avail.)
    - Control plane:
      - 2 x 10/100/1000Base-T (or -KX) (max.)
  - SLT3-PAY-2F2U-14.2.3
- Processor/Memory
  - Intel® Xeon® six-core E-2276ME up to 2.8* GHz 12 MB Cache
  - 32 GB DDR4 SDRAM w/ ECC (max)
  - 64 GB SATA II NAND Flash (on board)
- Processor Video / Graphics
  - Intel® UHD Graphics P630
  - HDMI / DVI output
    - 4K support (at 60 Hz)
    - OpenGL & DirectX Support
- IPMC Support (configured option)
  - VITA 46.11 Tier-2 compatible

- Supports one NAI smart I/O function module
  - COSA® architecture
  - 100+ modules to choose from
  - PCIe or SATA III I/F to function slot (e.g. for additional Gig-E ports or on-board NVM storage)
- Motherboard Peripheral I/O:
  - 1 x USB 3.0 & 1 x USB 2.0 (to rear)
  - 1 x USB 2.0 (to front maintenance J5)
  - 1 x RS-232 Debug Port (to front)
  - 1 x RS-232 Rear Port redirect:
    - 1 x User Port (rear, default)
    - 1 x Debug Port (front and rear, option)
  - SATA III capable interface (to rear)
    - Off-board SATA for NVM expansion
- Security & Reliability (supports)
  - Intel® Trusted Execution Technology
  - TPM / Secure Key / Intel® AES
- Operating Systems Supported
  - CentOS / Linux
  - Microsoft® Windows®

- Intelligent I/O library support included
- Background Built-in-Test Continuous BIT (as applicable)
- VICTORY Interface Services (Contact factory)
- Operating Temperature
  - Commercial: 0°C to 70°C
  - Rugged: -40°C to 85°C
- Mechanical Options (ANSI/VITA 48)
  - Air-cooled; 3U, 4HP or 5HP (0.8" or 1.0" panel options)
  - Conduction-cooled; 3U, 0.8" pitch
  - Weight: ~1.25 lbs.
- Power
  - ~30 W power dissipation (typ.) (not including smart module power)
    - VS1 (+12V) & VS3 (+5V) req'd
    - +3.3V_AUX
    - ±12 V_AUX (select modules only)

* Note: Maximum CPU speed may be dependent on system environment and power constraints - consult factory/manual for details

68INT5 Data Sheet
Rev B1

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06-06-2022
Page 1 of 3

Select up to 1 independent functions for your application

I/O Modules					
Function	Module	Description	Function	Module	Description
Analog-to-Digital	AD1	12 CH. A/D, ±10 V, Dedicated, 256 kHz (max), Sigma-Delta	Digital-to-Analog	DA4	4 CH. D/A, ± 20 to ± 80, 10 mA, Voltage Control Only
	AD2	12 CH. A/D, ±100 V (max), Dedicated, 256 kHz (max), Sigma-Delta	Digital IO - Differential Transceiver	DF1	16 CH. Differential I/O, Input: -10 V to +10 V (422), -7 V to +12 V (485) Output: -.25 V to +5 V
	AD3	12 CH. A/D, ±25 mA, Dedicated, 256 kHz (max), Sigma-Delta		DF2	16 CH. 16 Channel Enhanced Differential I/O
	AD4	16 CH. A/D, ± 10 V, Multiplexed, 500 KHz Agg / 8 Ch, SAR	Discrete IO - Multichannel,Programmable	DT1	24 CH. Discrete I/O, 0-60 VDC Input/Output, Max Iout 500 mA - 2 A, Source/Sink (out)
	AD5	16 CH. A/D, ± 50 V, Multiplexed, 500 KHz Agg / 8 Ch, SAR		DT2	16 CH. Discrete I/O, ±80 V Input/Output, Max Iout 600 mA, Isolated/Ch Switch (out)
	AD6	16 CH. A/D, ± 100 V, Multiplexed, 500 KHz Agg / 8 Ch, SAR		DT3	4 CH. Discrete I/O, ±100 V Input/Output, Max Iout 3A, Isolated/Ch Switch/Bridge
	ADE	16 CH. A/D, ±10 V, Individual 16-bit SAR, 200 kHz max., Simultaneous Sampling		DT4	24 CH. Enhanced DT1
	ADF	16 CH. A/D, ±100 V, Individual 16-bit SAR, 200 kHz max., Simultaneous Sampling		DT5	16 CH. Enhanced DT2
	ADG	16 CH. A/D, ±25 mA, Individual 16-bit SAR, 200 kHz max., Simultaneous Sampling	Relay	RY1	4 CH. Relay, 220V/2A @ 60W/62.5VA (Max), Non Latching
Digital-to-Analog	DA1	12 CH. D/A, ± 10 V, 25 mA Per Channel, Current or Voltage Control		RY2	4 CH. Relay, 220V/2A @ 60W/62.5VA (Max), Latching
	DA2	16 CH. D/A, ± 10 V, 10 mA Per Channel, No Current Control	Digital IO - TTL,CMOS	TL1	24 CH. TTL I/O, Standard Functionality, Programmable
	DA3	4 CH. D/A, ±40 V, ±100 mA, Voltage or Current Output		TL2	24 CH. TTL I/O, Enhanced Functionality, Programmable

Measurement & Simulation Modules					
Function	Module	Description	Function	Module	Description
AC Reference	AC2	2 CH. AC Reference Source, 47 Hz - 20 KHz, ± 3% Acc, 2 – 28 Vrms, 6 VA (Max/Ch) Power	LVDT RVDT Measurement and Simulation	LD5	4 CH. LVDT/RVDT to Digital, 28-90 Vrms Input, 2-115 Vrms Exc, 47 Hz - 1 KHz Freq
	AC3	2 CH. AC Reference Source, 47 Hz - 2.5 KHz, ± 3% Acc, 28 – 115 Vrms, 6 VA (Max/Ch) Power	Thermocouple and RTD Measurement	RT1	8 CH. Resistance Temperature Detectors (RTD), 2, 3, or 4 wire, 16 Bit Res, 16.7 Hz/Ch
Synchro Resolver Measurement and Simulation	DSK	3 CH. Digital to Synchro, 2-28 VLL, 2-115 Vrms Exc, 1 KHz - 5 KHz Freq, .5 VA/Ch (Max)		TC1	8 CH. Thermocouple, 4.17 - 470 Hz, ±100 mV A/D
LVDT RVDT Measurement and Simulation	LD1	4 CH. LVDT/RVDT to Digital, 2-28 Vrms Input, 2-115 Vrms Exc, 47 Hz -1 KHz Freq		TR1	8 CH. Thermocouple (TCx) & Resistance Temperature Detectors (RTD), programmable per channel
	LD2	4 CH. LVDT/RVDT to Digital, 2-28 Vrms Input, 2-115 Vrms Exc, 1 KHz - 5 KHz Freq	Strain Gauge Measurement	SG1	4 CH. Strain Gauge, 4.7 Hz - 4.8 KHz, Measurement, Conventional 4-Arm Bridge
	LD3	4 CH. LVDT/RVDT to Digital, 2-28 Vrms Input, 2-115 Vrms Exc, 5 KHz - 10 KHz Freq	Variable Reluctance	VR1	8 CH. Variable Reluctance Signal Input and General-Purpose Pulse Counter, ±100 V, 100 kHz (max)
	LD4	4 CH. LVDT/RVDT to Digital, 2-28 Vrms Input, 2-115 Vrms Exc, 10 KHz - 20 KHz Freq			

68INT5 Data Sheet
Rev B1

North Atlantic Industries, Inc.
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06-06-2022
Page 2 of 3

Communication Modules

Function	Module	Description	Function	Module	Description
ARINC Communications	AR1	12 CH. ARINC 429, 100 KHz or 12.5 KHz, RX/TX, 256 Word Tx/Rx Buffer	MIL-STD-1553B	FTD	1 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM, Direct Coupled
	AR2	1 CH. ARINC 568 (CH-1, RX & TX) & 1 Channel ARINC 579 (CH-2, Programmable RX or TX), 1024-Word TX & RX Buffers per Ch.		FTE	2 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, Direct Coupled
CANBus Communications	CB1	8 CH. CANBus, CAN 2.0 A/B, 16 K RX/TX Buffer, 1 Mb/s Max Data Rate		FTF	4 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, Direct Coupled
	CB2	8 CH. CANBus, J1939, 16 K RX/TX Buffer, 500 kb/s Max Data Rate	MIL-STD-1760	FTJ	1 CH. MIL-STD-1760 (1553), BC, RT, BM, BM/RT, 128 KB RAM, Transformer Coupled
	CB3	8 CH. CANBus, CAN 2.0 A/B (CB1) or J1939 (CB2) protocol layer programmable per channel		FTK	2 CH. MIL-STD-1760 (1553), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, Transformer Coupled
Ethernet NIC Interface	EM1	2 CH. Dual Ethernet I/F, Intel 82850, 10/100/1000	Serial Communications	SC1	4 CH. Serial, RS-232/422/423 (MIL-STD-188C)/485, Non Isolated
Ethernet Switch	ES2	16 CH. (Ports) Ethernet Switch, 10/100/1000Base-T (GbE), Layer 2+/3 Managed		SC2	4 CH. Serial, RS-232/422/423 (MIL-STD-188C)/485, Isolated Per Channel and From Ground
MIL-STD-1553B	FTA	1 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM, Transformer Coupled		SC3	8 CH. (max) RS-232/422/485 Serial Comms or GPIO, Programmable, Non-isolated
	FTB	2 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, Transformer Coupled		SC7	4 CH. Serial, RS-232/422/423 (MIL-STD-188C)/485, Non-Isolated w/ (4) SYS-GND pins provided
	FTC	4 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, Transformer Coupled			

Storage

Function	Module	Description	Function	Module	Description
SATA Solid State Drive (SSD)	FM2	1 CH. 480 GB MLC SATA Flash, extended temp -40°C to 85°C operation	SATA Solid State Drive (SSD)	FM9	1 CH. 1.92 TB SATA TLC NAND Flash, Extended Temperature Operation
	FM8	1 CH. 1 TB SATA TLC NAND Flash, Extended Temperature Operation			

Combination Modules

Function	Module	Description	Function	Module	Description
Combo	CM5	2 CH. Dual-redundant MIL-STD-1553 & 8 Channel ARINC 429/575, 100 KHz or 12.5 KHz, RX or TX, 256 Word Tx/Rx Buffer	Combo	CM8	2 CH. Dual-redundant MIL-STD-1553 & 12 Channel Discrete I/O, 0-60 VDC Input/Output, Max Iout 500 mA - 2 A, Source/Sink (out)

Architected for Versatility

NAI's Configurable Open Systems Architecture™ (COSA®) offers a choice of over 100 smart I/O, communications, or Ethernet switch functions, providing the highest packaging density and greatest flexibility of ruggedized embedded product solutions in the industry. Preexisting, fully-tested functions can be combined in an unlimited number of ways quickly and easily.

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.

68INT5 Data Sheet
Rev B1

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06-06-2022
Page 3 of 3