



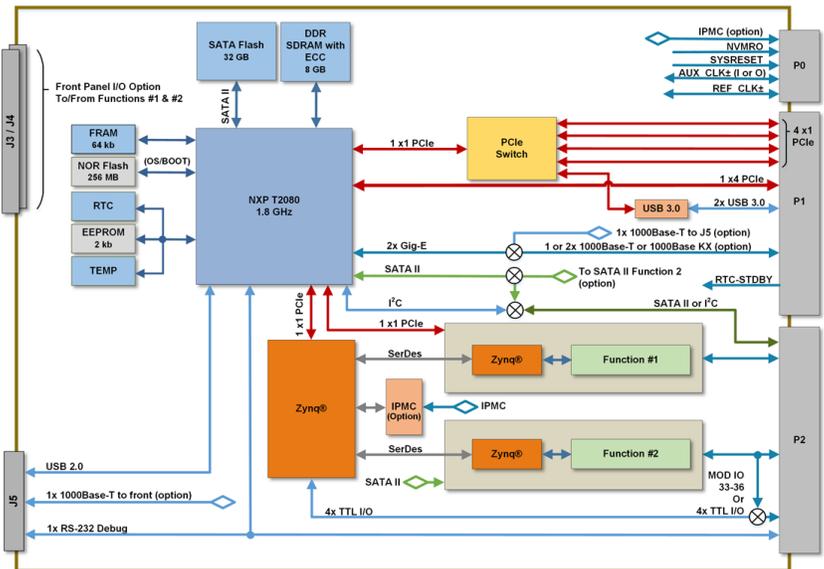
# 68PPC2 3U OpenVPX Single Board Computers

## 3U OpenVPX PowerPC SBC

**3U OpenVPX PowerPC SBC with two I/O and communications function module slots—  
Over 100 different modules to choose from**

NAI's 68PPC2 is a 3U OpenVPX, NXP®, QorIQ® T2080 quad-core processor, PowerPC-based, Single Board Computer (SBC) that can be configured with up to two intelligent function modules. Ideally suited for rugged defense, commercial aerospace, and industrial applications, the 68PPC2 delivers off-the-shelf solutions that accelerate deployment of SWaP-optimized systems. NAI's NXP® PowerPC™ QorIQ® T2080 based SBCs offer a feature-rich, low power/low cost solution for current and future generations of rugged military-aero, SWaP-constrained embedded applications.

The 68PPC2 includes BSP and SSK support for Wind River® VxWorks® and DDC-I Deos™. In addition, SSKs are supplied with source code and board-specific library I/O APIs to facilitate system integration.



### Features

- **Slot profile: SLT3-PAY-2F2U-14.2.3**
  - Data plane: 1 x4 & 4 x1 PCIe
  - Control plane: 2x 10/100/1000Base-T or 2X 1000Base-KX
- **Module profile: MOD3-PAY-2F2U-16.2.3-3**
- **NXP QorIQ® T2080 Quad Core e6500 Processor @ 1.8 GHZ**
  - 8 GB DDR SDRAM
  - 32 GB SATA II NAND Flash
- **1x USB 2.0, to front maintenance J5**
- **2x USB 3.0, to rear I/O**
- **I<sup>2</sup>C bus to rear I/O**
- **1x RS232 console (development) port, to front J5 and rear I/O**
- **Supports Two NAI smart I/O function modules**
  - COSA® architecture
  - 100+ modules to choose from
  - PCIe interface to function slot #1 (e.g. for 2 additional Gig-E ports option)
  - SATA II interface to function slot #2 (e.g. for 480 GB expansion function option)
- **Front and/or rear I/O**
- **4x TTL I/O to rear I/O (option)**
- **External SATA II interface (option)**
- **IPMC Support (configured option)**
  - VITA 46.11 Tier-2 compatible
- **Wind River®, VxWorks®, DDC-I Deos™ or Linux® BSP/OS support**
- **Intelligent I/O library support included**
- **Continuous Background BIT**
- **VICTORY Interface Services (Contact factory)**
- **< 20 W power dissipation (est./typ.) (not including module power)**
- **Commercial or rugged applications:**
  - Operating temperature:
    - Commercial: 0°C to 70°C
    - Rugged: -40°C to 85°C
  - Mechanical Options:
    - Air Cooled; 0.8" & 1.0" pitch
    - Conduction Cooled; 0.8" pitch

Select up to 2 independent functions for your application

I/O Modules					
Function	Module	Description	Function	Module	Description
Analog-to-Digital	<u>AD1</u>	12 CH. A/D, ±10 V, Dedicated, 256 kHz (max), Sigma-Delta	Digital-to-Analog	<u>DA5</u>	2 CH. D/A, ±2A, @ 60 VCC max., voltage or current command output (VCC provided from external source)
	<u>AD2</u>	12 CH. A/D, ±100 V (max), Dedicated, 256 kHz (max), Sigma-Delta	Digital IO - Differential Transceiver	<u>DF1</u>	16 CH. Differential I/O, Input: -10 V to +10 V (422), -7 V to +12 V (485) Output: -.25 V to +5 V
	<u>AD3</u>	12 CH. A/D, ±25 mA, Dedicated, 256 kHz (max), Sigma-Delta		<u>DF2</u>	16 CH. 16 Channel Enhanced Differential I/O
	<u>AD4</u>	16 CH. A/D, ± 10 V, Multiplexed, 500 KHz Agg / 8 Ch, SAR	Discrete IO - Multichannel, Programmable	<u>DT1</u>	24 CH. Discrete I/O, 0-60 VDC Input/Output, Max Iout 500 mA - 2 A, Source/Sink (out)
	<u>AD5</u>	16 CH. A/D, ± 50 V, Multiplexed, 500 KHz Agg / 8 Ch, SAR		<u>DT2</u>	16 CH. Discrete I/O, ±80 V Input/Output, Max Iout 600 mA, Isolated/Ch Switch (out)
	<u>AD6</u>	16 CH. A/D, ± 100 V, Multiplexed, 500 KHz Agg / 8 Ch, SAR		<u>DT3</u>	4 CH. Discrete I/O, ±100 V Input/Output, Max Iout 3A, Isolated/Ch Switch/Bridge
	<u>AD7</u>	16 CH. A/D, ±10 V, Individual 16-bit SAR, 200 kHz max., Simultaneous Sampling		<u>DT4</u>	24 CH. Enhanced DT1
	<u>AD8</u>	16 CH. A/D, ±100 V, Individual 16-bit SAR, 200 kHz max., Simultaneous Sampling		<u>DT5</u>	16 CH. Enhanced DT2
	Digital-to-Analog	<u>AD9</u>	16 CH. A/D, ±25 mA, Individual 16-bit SAR, 200 kHz max., Simultaneous Sampling	Relay	<u>RY1</u>
<u>DA1</u>		12 CH. D/A, ± 10 V, 25 mA Per Channel, Current or Voltage Control	<u>RY2</u>		4 CH. Relay, 220V/2A @ 60W/62.5VA (Max), Latching
<u>DA2</u>		16 CH. D/A, ± 10 V, 10 mA Per Channel, No Current Control	Digital IO - TTL, CMOS	<u>TL1</u>	24 CH. TTL I/O, Standard Functionality, Programmable
<u>DA3</u>		4 CH. D/A, ±40 V, ±100 mA, Voltage or Current Output		<u>TL2</u>	24 CH. TTL I/O, Enhanced Functionality, Programmable
<u>DA4</u>	4 CH. D/A, ± 20 to ± 80, 10 mA, Voltage Control Only				
Measurement & Simulation Modules					
Function	Module	Description	Function	Module	Description
AC Reference	<u>AC2</u>	2 CH. AC Reference Source, 47 Hz - 20 KHz, ± 3% Acc, 2 - 28 Vrms, 6 VA (Max/Ch) Power	LVDT RVDT Measurement and Simulation	<u>LD5</u>	4 CH. LVDT/RVDT to Digital, 28-90 Vrms Input, 2-115 Vrms Exc, 47 Hz - 1 KHz Freq
	<u>AC3</u>	2 CH. AC Reference Source, 47 Hz - 2.5 KHz, ± 3% Acc, 28 - 115 Vrms, 6 VA (Max/Ch) Power		<u>RT1</u>	8 CH. Resistance Temperature Detectors (RTD), 2, 3, or 4 wire, 16 Bit Res, 16.7 Hz/Ch
LVDT RVDT Measurement and Simulation	<u>LD1</u>	4 CH. LVDT/RVDT to Digital, 2-28 Vrms Input, 2-115 Vrms Exc, 47 Hz - 1 KHz Freq	Thermocouple and RTD Measurement	<u>TC1</u>	8 CH. Thermocouple, 4.17 - 470 Hz, ±100 mV A/D
	<u>LD2</u>	4 CH. LVDT/RVDT to Digital, 2-28 Vrms Input, 2-115 Vrms Exc, 1 KHz - 5 KHz Freq		<u>TR1</u>	8 CH. Thermocouple (TCx) & Resistance Temperature Detectors (RTD), programmable per channel
	<u>LD3</u>	4 CH. LVDT/RVDT to Digital, 2-28 Vrms Input, 2-115 Vrms Exc, 5 KHz - 10 KHz Freq	Strain Gauge Measurement	<u>SG1</u>	4 CH. Strain Gauge, 4.7 Hz - 4.8 KHz, Measurement, Conventional 4-Arm Bridge
	<u>LD4</u>	4 CH. LVDT/RVDT to Digital, 2-28 Vrms Input, 2-115 Vrms Exc, 10 KHz - 20 KHz Freq	Variable Reluctance	<u>VR1</u>	8 CH. Variable Reluctance Signal Input and General-Purpose Pulse Counter, ±100 V, 100 kHz (max)

Communication Modules					
Function	Module	Description	Function	Module	Description
ARINC Communications	<u>AR1</u>	12 CH. ARINC 429, 100 KHz or 12.5 KHz, RX/TX, 256 Word Tx/Rx Buffer	MIL-STD-1553B	<u>FTE</u>	4 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, Direct Coupled
	<u>AR2</u>	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.	MIL-STD-1760	<u>FTJ</u>	1 CH. MIL-STD-1760 (1553), BC, RT, BM, BM/RT, 128 KB RAM, Transformer Coupled
CANBus Communications	<u>CB1</u>	8 CH. CANBus, CAN 2.0 A/B, 16 K RX/TX Buffer, 1 Mb/s Max Data Rate		<u>FTK</u>	2 CH. MIL-STD-1760 (1553), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, Transformer Coupled
	<u>CB2</u>	8 CH. CANBus, J1939, 16 K RX/TX Buffer, 500 kb/s Max Data Rate	IEEE 1394 (FireWire)	<u>FW1</u>	2 CH. IEEE 1394b (Firewire), tri-port per channel, including TLIM
	<u>CB3</u>	8 CH. CANBus, CAN 2.0 A/B (CB1) or J1939 (CB2) protocol layer programmable per channel		<u>FW2</u>	2 CH. IEEE 1394b (Firewire), tri-port per channel, direct (no TLIM)
Ethernet NIC Interface	<u>EM1</u>	2 CH. Dual Ethernet I/F, Intel 82850, 10/100/1000	Serial Communications	<u>SC1</u>	4 CH. Serial, RS-232/422/423 (MIL-STD-188C)/485, Non Isolated
MIL-STD-1553B	<u>FTA</u>	1 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM, Transformer Coupled		<u>SC2</u>	4 CH. Serial, RS-232/422/423 (MIL-STD-188C)/485, Isolated Per Channel and From Ground
	<u>FTB</u>	2 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, Transformer Coupled		<u>SC3</u>	8 CH. (max) RS-232/422/485 Serial Comms or GPIO, Programmable, Non-isolated
	<u>FTC</u>	4 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, Transformer Coupled		<u>SC7</u>	4 CH. Serial, RS-232/422/423 (MIL-STD-188C)/485, Non-Isolated w/ (4) SYS-GND pins provided
	<u>FTD</u>	1 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM, Direct Coupled		Time-Triggered Ethernet	<u>TE2</u>
	<u>FTE</u>	2 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, Direct Coupled			
Storage					
Function	Module	Description	Function	Module	Description
SATA Solid State Drive (SSD)	<u>FM2</u>	1 CH. 480 GB MLC SATA Flash, extended temp -40°C to 85°C operation	SATA Solid State Drive (SSD)	<u>FM9</u>	1 CH. 1.92 TB SATA TLC NAND Flash, Extended Temperature Operation
	<u>FM8</u>	1 CH. 1 TB SATA TLC NAND Flash, Extended Temperature Operation			
Combination Modules					
Function	Module	Description	Function	Module	Description
Combo	<u>CM5</u>	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	<u>CM8</u>	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.

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