# 67G6 6U OpenVPX Multifunction I/O Boards
6U OpenVPX Multifunction I/O Board

The 67G6 is NAI's latest rugged 6U OpenVPX multifunction I/O and communications board. It provides high-performance I/O capabilities specifically designed for demanding aerospace, defense, and industrial applications. The board has the capacity to host a maximum of six NAI Configurable Open Systems Architecture™ (COSA®) smart function modules and also provides an elective 24-channel Discrete I/O hardware feature. By configuring the 67G6 with these modules, engineers can tailor the board's functionality for specific application needs, accelerating the deployment of SWaP-C optimized systems.
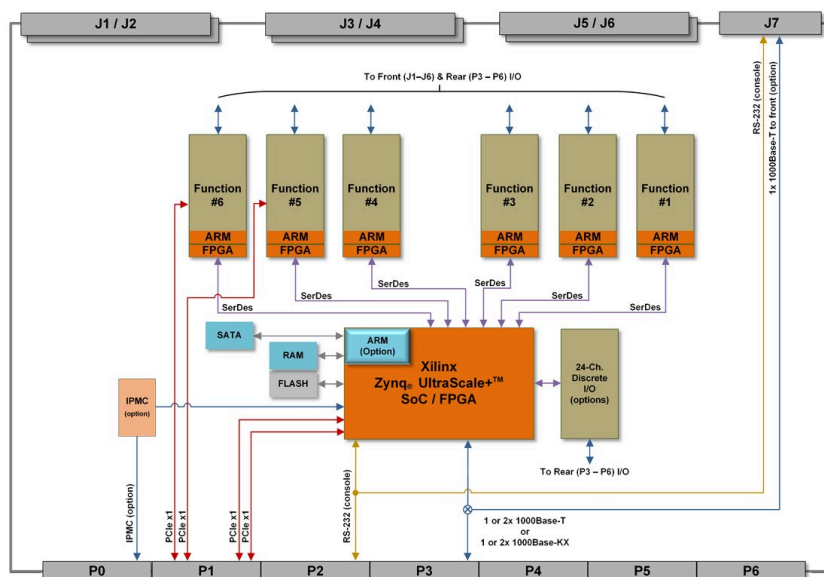
Features

- **OpenVPX Profile:**
  - Slot profile: SLT6-PER-4U-10.3.3
  - Module profile: MOD6-PER-4U-12.3.3-2
- **Data plane:**
  - 2 x1 PCIe (end point only)
  - 2 x1 PCIe direct to module
- **Control plane:**
  - 2x 10/100/1000Base-T or 2X 1000Base-KX
- **IPMC Support (configured option)**
  - VITA 46.11 Tier-2 compatible

- **Supports six NAI smart I/O function modules**
  - COSA® architecture
  - 100+ modules to choose from
  - Independent x1 SerDes interface to each function module slot
- **24 Channels programmable Discrete I/O (option)**
  - 0 to 60 VDC; Sink, source or push/pull
  - Standard (SF) or Enhanced (EF) Function
- **RS-232 console/maintenance port**
- **Continuous Background BIT**

- **ARM® Cortex®-A53 Processor (option)**
  - Provides access for local I/O processing
  - 2 GB DDR4 + ECC / 32 GB SATA (std.)
  - PetaLinux, Deos™, VxWorks® 7
- **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

67G6 Data Sheet
Rev C2

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05-01-2024
Page 1 of 3

Select up to 6 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 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
	AD2	12 CH. A/D, ±100 V (max), Dedicated, 256 kHz (max), Sigma-Delta		DF2	16 CH. 16 Channel Enhanced Differential I/O
	AD3	12 CH. A/D, ±25 mA, Dedicated, 256 kHz (max), Sigma-Delta	Discrete IO - Multichannel, Programmable	DT1	24 CH. Discrete I/O, 0-60 VDC Input/Output, Max Iout 500 mA - 2 A, Source/Sink (out)
	AD4	16 CH. A/D, ± 10 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)
	AD5	16 CH. A/D, ± 50 V, Multiplexed, 500 KHz Agg / 8 Ch, SAR		DT3	4 CH. Discrete Hi & Lo Side Switch Output @ 65V/2A (max), external individual supplied VCC & VSS per channel pair
	AD6	16 CH. A/D, ± 100 V, Multiplexed, 500 KHz Agg / 8 Ch, SAR		DT4	24 CH. Enhanced DT1
	ADE	16 CH. A/D, ±10 V, Individual 16-bit SAR, 200 kHz max., Simultaneous Sampling		DT5	16 CH. Enhanced DT2
	ADF	16 CH. A/D, ±100 V, 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
	DA4	4 CH. D/A, ± 20 to ± 80, 10 mA, Voltage Control Only	Variable Reluctance	VR1	8 CH. Variable Reluctance Signal Input and General-Purpose Pulse Counter, ±100 V, 100 kHz (max)
	DA5	4 CH. D/A, High-Voltage/High-Current Half-Bridge (2 Channels Full-Bridge) External VCC Sourced Outputs			

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	Synchro Resolver Measurement and Simulation	DSx (DRx)	1 - 3 CH. Digital to Synchro/Resolver, 2 - 90 VLL, 2 - 1115 Vrms Exc, 47 Hz - 20 kHz Freq
LVDT RVDT Measurement and Simulation	DLx	1 - 3 CH. Digital to LVDT/RVDT, 2 - 90 Vrms Full Scale, 2 - 115 Vrms Exc, 47 Hz - 20 kHz Freq		SDx	4 CH. Synchro/Resolver to Digital, 2 - 90 Vrms Input, 2 - 115 Vrms Exc, 47 Hz to 20 kHz Freq
	LD1	4 CH. LVDT/RVDT to Digital, 2-28 Vrms Input, 2-115 Vrms Exc, 47 Hz -1 KHz Freq	Thermocouple and RTD Measurement	RT1	8 CH. Resistance Temperature Detectors (RTD), 2, 3, or 4 wire, 16 Bit Res, 16.7 Hz/Ch
	LD2	4 CH. LVDT/RVDT to Digital, 2-28 Vrms Input, 2-115 Vrms Exc, 1 KHz - 5 KHz Freq		TC1	8 CH. Thermocouple, 4.17 - 470 Hz, ±100 mV A/D
	LD3	4 CH. LVDT/RVDT to Digital, 2-28 Vrms Input, 2-115 Vrms Exc, 5 KHz - 10 KHz Freq		TR1	8 CH. Thermocouple (TCx) & Resistance Temperature Detectors (RTD), programmable per channel
	LD4	4 CH. LVDT/RVDT to Digital, 2-28 Vrms Input, 2-115 Vrms Exc, 10 KHz - 20 KHz Freq	Strain Gauge Measurement	SG1	4 CH. Strain Gauge, 4.7 Hz - 4.8 KHz, Measurement, Conventional 4-Arm Bridge

67G6 Data Sheet
Rev C2

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05-01-2024
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	FTF	4 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, 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.	MIL-STD-1760	FTJ	1 CH. MIL-STD-1760 (1553), BC, RT, BM, BM/RT, 128 KB RAM, Transformer Coupled
CANBus Communications	CB1	8 CH. CANBus, CAN 2.0 A/B, 16 K RX/TX Buffer, 1 Mb/s Max Data Rate		FTK	2 CH. MIL-STD-1760 (1553), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, Transformer Coupled
	CB2	8 CH. CANBus, J1939, 16 K RX/TX Buffer, 500 kb/s Max Data Rate	IEEE 1394 (FireWire)	FW1	2 CH. (nodes), IEEE 1394b (Firewire), tri-port per channel, including TLIM
	CB3	8 CH. CANBus, CAN 2.0 A/B (CB1) or J1939 (CB2) protocol layer programmable per channel		FW2	2 CH. (nodes), IEEE 1394b (Firewire), tri-port per channel, direct (no TLIM)
Ethernet NIC Interface	EM1	2 CH. Dual Ethernet I/F, Intel 82850, 10/100/1000		FW3	3 CH. (nodes), up to 3 ports per node, IEEE 1394b/AS5643 (Mil1394) (Firewire), S200b
MIL-STD-1553B	FTA	1 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM, Transformer Coupled	Serial Communications	SC1	4 CH. Serial, RS-232/422/423 (MIL-STD-188C)/485, Non Isolated
	FTB	2 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, Transformer Coupled		SC3	8 CH. (max) RS-232/422/485 Serial Communications or GPIO, Programmable, Non-isolated
	FTC	4 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM Per Channel, Transformer Coupled		SC5	4 CH. RS-232/422/485 communications, isolated per channel and from SYS GND
	FTD	1 CH. MIL-STD-1553 (AMC), BC, RT, BM, BM/RT, 128 KB RAM, Direct Coupled		SC6	4 CH. RS-232/422/485 communications, individual SYS GND provided per channel (non-isolated)
	FTE	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)	FM2	1 CH. 480 GB MLC SATA Flash, extended temp -40°C to 85°C 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	CMF	1 CH. ±100V A/D (ADF-type) & 8 Channels ±10V D/A (DA2-type), Combination
	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.

67G6 Data Sheet
Rev C2

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05-01-2024
Page 3 of 3