North Atlantic Industries

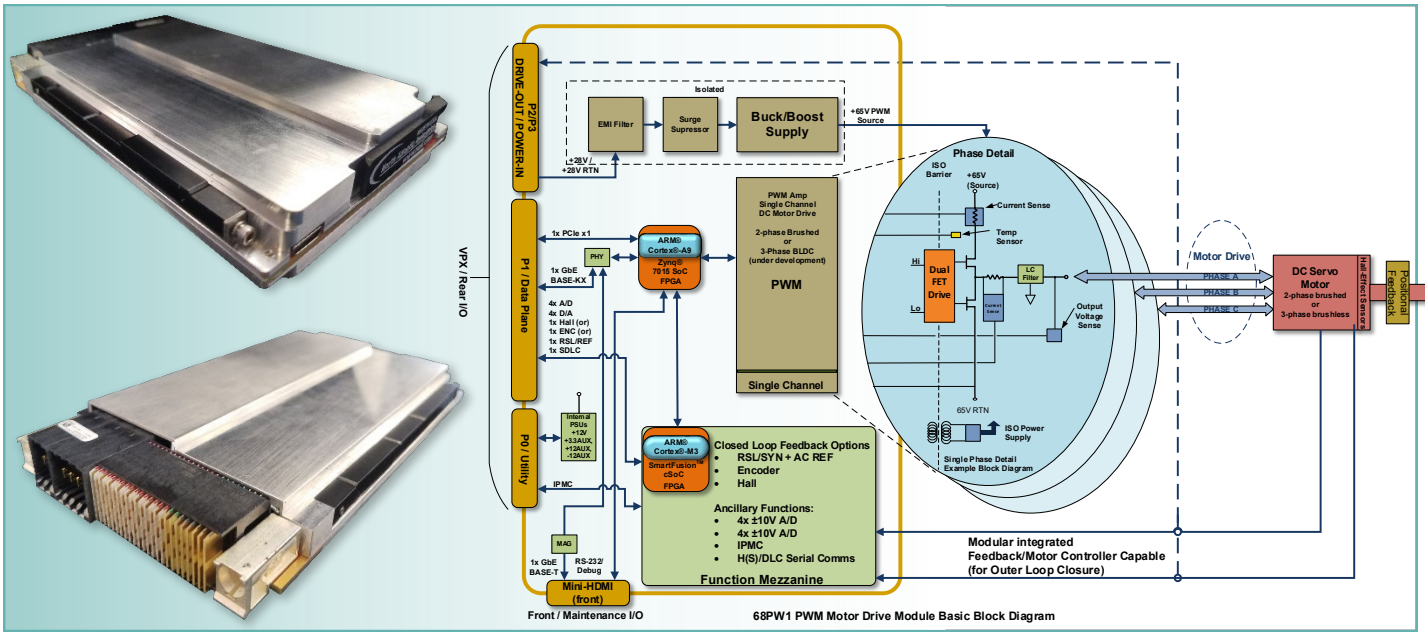



68PW1 3U OpenVPX™ SOSA™-aligned PWM Servo Motor Drive

1-Channel, 28 VDC-in / 24 – 65 VDC Regulated PWM V-out @ 10 A, 2-Ø Brushed or 3-Ø BLDC

Open Systems Configurable

The **68PW1** is a 3U OpenVPX SOSA-aligned (basis, Snapshot 2) single-axis PWM servo motor drive that can be configured with closed loop feedback measurement options including Hall, Resolver/Synchro or Encoder. The PWM drive provides programmable, regulated PWM output drive (up to 65 V @ 10 A continuous) from a single +28 VDC input source. Ideally suited for rugged Mil-Aero applications, the 68PW1 delivers off-the-shelf solutions that accelerate deployment of SWaP-optimized systems in air, land and sea applications.



68PW1 PWM Motor Drive Module Basic Block Diagram

Features Summary

- **3U OpenVPX (ANSI/VITA 65) / SOSA**
  Profiles Supported (P2/P3 exception):
  - MOD3-PAY-2U2U-14.2.171
  - SLT3-PAY-2U2U-14.2.17
    - Data plane: 1 x1 PCIe (default)
    - Control plane: 1x 1000Base–KX
  - P1 VPX Tyco MULTIGIG RT 3 per SOSA
- **PWM/Drive**
  - Single channel, H-bridge
  - Motor types supported:
    - 2-phase brushed
    - 3-phase brushless (BLDC)
  - 28 Vin (nominal) drive power
    - MIL-STD-704F (18 – 36 VDC)
  - 24V to 65V programmable / regulated PWM output drive
  - 10 A maximum (to 650 W max.)
  - Discrete drive-enable control pins
  - P2/P3 TE high-current blade connectors
- **Ancillary I/O**
  - 4x ±10V A/D, 12-bit min. (16-bit avail.)
  - 4x ±10V D/A, 12-bit min. (16-bit avail.)
  - 1x RS-422/485 SDLC control option
  - 1x RS-232 (console/debug, front I/O)
  - 1x GbE (10/100/1000BASE-T) (control or maintenance, front I/O)
- **Feedback/control Options:**
  - Hall
  - Resolver/Synchro + AC Reference
  - Encoder
- **IPMC Support**
  - VITA 46.11 Tier-2, basic, compatible (configured option)
- **Power Input**
  - +12V, ±12V AUX, +3.3V AUX
  - ~10 W power dissipation (est./typ.)
  - ~96% efficient PWM Drive
- **Operating Systems (host supported)**
  - Xilinx PetaLinux
  - Wind River® VxWorks®
  - DDC-I Deos™
- **Background Built-in-Test**
  Continuous BIT (as applicable)
- **Modular & Programmable Architecture**
- **Intelligent I/O library support**
  (included)
- **Commercial or Rugged Applications**
- **Operating Temperature**
  - Rugged: -40 °C to 85 °C
- **Mechanical (ANSI/VITA 48)**
  - Conduction-cooled; 3U, 1.0” pitch
  - Weight: ~ 1.95 lbs.

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PWM Function Specifications

PWM Amplifier Specifications	**(Single channel, unless otherwise specified)** (after a 5 second warm-up period)
Power (Amplifier switching supply)	65 VDC ±5% maximum (programmable), internally supplied Standard: Brushed Motor interface or Brushless (BLDC)
Resolution / Loop Update Rate	12-bit (monotonic over temperature) / @ 115 kHz
Output	10 A continuous (maximum) Short circuit protected. Thermal protection determines duration of peak current drive.
Frequency (PWM)	345 kHz
Bandwidth	800 Hz (minimum) open loop minimum in current mode w/ user programmable loop control variables.
Efficiency	96% (minimum, at 65 VDC / 5 A)
Quiescent Power	+12VDC at 900mA with no motors connected +12VAUX at 45mA -12VAUX at 25mA +3.3VAUX at 350mA Note: +5V NOT required
Master Drive Enable	A discrete input, (normally open), opto-isolated from the motor supply, must receive a switch closure to permit operation (and cannot be overridden).
Shut down conditions (@ 65 VDC nom.)	RS-422 time-out, PWM card time out (software watchdog), Drive Fault (bias loss), Supply Overvoltage (71.5 VDC), Supply under-voltage (58.5 VDC), Over-Temp. condition (110 °C), Internal H-Bridge fault.
Output Filtering	LC Filter added to all motor drive signals (EMI mitigation)
Input current limit / soft-start	Characteristics TBD.
Over-current protection	Solid state circuit breaker ‘detect and protect’ – characteristics TBD.
Ancillary I/O Specifications	
A/D	4-Ch. ±10V, 12-bit (minimum) 16-bit (available) resolution, ±0.25% linearity FSR
D/A	4-Ch. ±10V, 12-bit (minimum) 16-bit (available) resolution, ±0.20% linearity FSR
RS-422/485 Serial Communications	1-Ch. programmable, up to 1.5 Mbps asynchronous or 10 Mbps synchronous (SDLC)
Ethernet, Command & Control	1-Port 1000BASE-KX provided on rear VPX connectors 1-Port 10/100/1000BASE-T provided on front debug/maintenance connector
RS-232 Serial Debug/Console	1-Ch. RS-232, debug/console provided on front debug/maintenance connector
Feedback, Outer-loop	1-Ch. Hall, Resolver/Synchro or Encoder (configured options, contact factory)
IPMC	VITA 46.11 Tier-2 basic, compatible (configured option, contact factory)

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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