VPX55-32HSU, 3U VPX DC/DC Converter

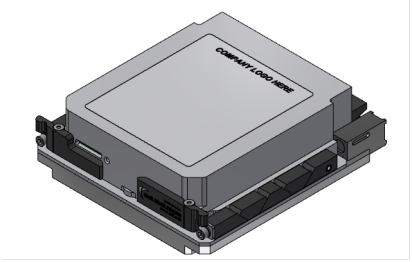
Made in the USA
Certified Small Business

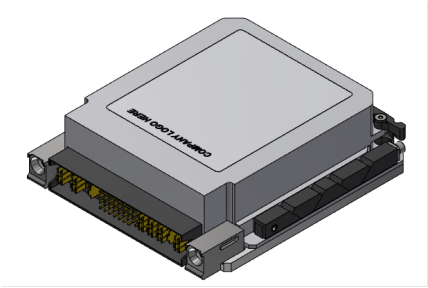
100-Watt Ruggedized Converter
SOSA™ outputs
Plug-in Module, Conduction-Cooled, 3U-S

Description

NAI's VPX55-32HSU is a high-performance DC/DC converter that delivers up to 100 watts and plugs directly into a 3U-S VPX chassis with a VITA 62, 1.4” power supply slot.

The VPX55-32HSU has an integrated IPMC bus. The VPX55-32HSU is conduction-cooled through card edge/wedgelock and operates with a +28 VDC input voltage, supporting SOSA™ (+12 Volt Only) configuration (see output power table for details). Key features include continuous Background Built-In-Test (BIT), I2C communication, remote error sensing, and protections against transients, overvoltage, overcurrent, over-temperature, and short circuits. Its intelligent design also allows for adaptability to meet specialized requirements.





Features

- Designed for Rugged VPX Power Applications: Optimized for durability .
- VITA Compliance Features a VPX-compatible connector and I/O
- System Management: Integrates a System Management Bus according to VITA 46.11
- IPMC IPMB-A
- Fully compatible with VITA-standard I/O, signals, and features.
- Operates with a +28 VDC input.
- Configured to align with SOSA™ output standards.
- Continuous Diagnostics: Includes Background Built-in-Test (BIT) for real-time performance monitoring.
- Transient Protection per MIL-STD-704F.
- Compliant with MIL-STD-461F for EMI.
- Per MIL-STD-810H and VITA 47.1 ECC4SL1 for environmental resilience.
- Supports full-load operation in temperatures ranging from -40°C to +85°C.

116 Wilbur Place, Bohemia, NY 11716 Tel: 631.567.1100 www.naii.com

Electrical Specifications

DC Input Characteristics	
Input	+28 VDC (+18 VDC to +40 VDC range)
EMI/RFI	Meets MIL-STD-461F;CE102 and CS101. Input power line *designed to meet* CS114, CS115 , CS116, RS103, RS105 and RE102 when enclosed within system chassis.
Input Transient Protection (When loaded with 75 Watts Max)	Complies with MIL-STD-704F for 28 volts DC systems including normal, abnormal, emergency operations, distortion spectrum, normal, and abnormal transients. Rides through overvoltage and undervoltage transients per TABLE LDC302-IV in MIL-HDBK-704-8.
Output Power	Up to 100 Watts max at 85°C; see Output Power Table
Output Voltage	+12V only per SOSA™ (see Output Power Table)
Efficiency	90% measured at 60 Watts
Line Regulation	Within 0.5% or 20 mV (whichever is greater) for low to high line changes at constant load.
Load Regulation	0.5% or 20 mV (whichever is greater) for 0 to 100% of rated load at nominal input line with remote sense.
PARD (Noise and Ripple)	1% or 50 mV p-p max per VITA 62; measurements are made with a 20 MHz bandwidth instrument connected on load wires < 5 inches from power supply and terminated with 1uF capacitors across load lines
Load Transient Recovery	Output voltage returns to regulation limits within 0.5 msec, half to full load
Load Transient Under/Overshoot	5% of nominal output voltage set point (1.4 V max);
Short Circuit Protection	Protected for continuous short circuit with automatic recovery
Current Limiting	All outputs to 130%
Over Voltage Protection	Automatic electronic shutdown if outputs exceed 125% ±10%
Remote Error Sensing	Sensing pins compensate for up to 0.5 V drop on VS1
Isolation Voltage	+/- 500 VDC input to output and input to case; 100 VDC output to case
Insulation Resistance	100 Mega Ohm at 500 VDC

All specifications are subject to change without notice.

116 Wilbur Place, Bohemia, NY 11716 Tel: 631.567.1100 www.naii.com

Additional Specifications

Physical/Environmental	
Temperature Range	Operating: -40°C to +85°C at 100% load. Temperature measured at card edge, conduction via card edge. Storage: -55°C to +105°C per VITA 47 CC4.
Temperature Coefficient	0.01% per °C
Shock	40 G's each axis per MIL-STD-810H, Method 516, Procedure 1. VITA 47 OS2
Acceleration	6 G's per MIL-STD-810H, Method 513, Procedure II
Vibration	Per MIL-STD-810H, Method 514, Procedure 1; 12 GRMS, VITA 47, Class V3
Humidity	95% at 71°C per MIL-STD-810H, Method 507 (non-condensing)
Altitude	1,500 feet below sea level to +60,000 feet above sea level per VITA 47
Salt & Fog	Per MIL-STD-810H, Method 509, VITA 47 Class SL1.
Sand/Dust	Per MIL-STD-810H, Method 510
Fungus	Per MIL-STD-810H, Method 508
ESD	15 kV EN61000-4-2 per VITA 47
Enclosure	Aluminum housing to aluminum baseplate
Dimensions	See Mechanical Layout
Finish	Chemical film IAW MIL-DTL-5541, Type II, Class 3
Interface	50 Micro-Inch Gold on contacts; plated tails for tin whisker mitigation; See connector specifications table
Keys	Keyed per VITA-62.0 with Key 1 at position 0° and Key 2 at position 0°.
Weight	2.1 lbs. Max

All specifications are subject to change without notice.

116 Wilbur Place, Bohemia, NY 11716 Tel: 631.567.1100 www.naii.com

Signal Types

Signal	Description
ENABLE*	When the signal is High, all output voltages, including 3.3 V_AUX, are turned off. The ENABLE* signal is pulled Low using a mechanical switch that connects it to SIGNAL_RETURN, or it can be driven by a logic output. Opening the switch disables all outputs, while closing the switch or applying the logic signal enables the outputs, depending on the state of the INHIBIT* signal. An input of less than 0.8 VDC is recognized as Low, while an input greater than 2.0 VDC or a no-connect is recognized as High. Together with INHIBIT*, the ENABLE* signal controls the output power status of the VPX55-32HSU (refer to Power Status Table).
INHIBIT*	This signal disables all output voltages, although in most cases, it is expected to leave 3.3 V_AUX powered on. Pulling INHIBIT* Low turns off the VS1, VS2, VS3, and ±12 VDC_AUX outputs. An input below 0.8 VDC is considered Low, while an input above 2.0 VDC or a no-connect is treated as High. Together with ENABLE*, this signal controls the output power status of the VPX55-32HSU (refer to the Power Status Table).
SYSRESET*	An active low open-collector line driven by the Power Monitor module. Signal ensures a clean, stabilized startup based on monitoring the output voltage levels in accordance with VITA 46.0, paragraph 4.8.11. Timing can be factory customized.
FAIL*	Indicates failure when any of the outputs are not within specification. Signal complies with VITA 65 for active Low. FAIL* signal is Open Drain. It is expected that there will be a pull-up resistor on the backplane.
Holdup Time	75 Watts for 50 milliseconds
Geographical Addressing	As defined in VITA 46
Protocol	Per VITA 46.11 System Management Bus. Tier 1 mandatory sensors with additional Sensors for Output Voltages and Temperature
Status LED	See LED Status table below

LED Status

LED State	Meaning
Off	Input Low
Green (Steady)	Vout OK; All outputs are good
Red (Steady)	Fail; Follows same logic as FAIL* signal
Blinking Green	Unit disabled
Blinking Red	Over Voltage or Over Temperature (all outputs are off)

Power Status

Control Input States		Power Output States	
ENABLE*	INHIBIT*	+3.3V_AUX	VS1,
High	High	Off	Off
High	Low	Off	Off
Low	High	On	On
Low	Low	On	Off

Connector Specifications

Unit	Backplane
P0: TE Connectivity p/n 2314578-2	**J0:** 2 TE Connectivity p/n 2309390-1

116 Wilbur Place, Bohemia, NY 11716 Tel: 631.567.1100 www.naii.com

Output Configuration

Up to 100 Watts Power		
+12V Only per SOSA™		
Designation (Power Form)	Volts	Amps
VS1 (PO1)	+12Vdc	7
+3.3V_Aux	+3.3Vdc	4

Pinout Designations (P0)

PIN #	RATED CURRENT (A)	Pin Name	12V Only SOSA™ Configuration	PIN #	RATED CURRENT (A)	Pin Name	12V Only SOSA™ Configuration
P1	40A	-DC_IN/ACN	-DC_IN/ACN	B5	<1A	GA1*	GA1*
P2	40A	+DC_IN/ACL	+DC_IN/ACL	C5	<1A	SM0	SM0
LP1	20A	CHASSIS	CHASSIS	D5	<1A	SM1	SM1
A1	<1A	UD1	N/U	A6	<1A	SM2	N/U
B1	<1A	UD2	N/U	B6	<1A	SM3	N/U
C1	<1A	UD3	GA2* (UD3)	C6	<1.5A	-12V_AUX	N/U
D1	<1A	UD4	UD4	D6	<1A	SYSRESET*	SYSRESET*
A2	<1A	VBAT	N/U	A7	<1A	SHARE_1	N/U
B2	<1A	FAIL*	FAIL*	B7	<1A	SHARE_2	N/U
C2	<1A	INHIBIT*	INHIBIT*	C7	<1A	SHARE_3	N/U
D2	<1A	ENABLE*	ENABLE*	D7	<1A	SIGNAL_RETURN	SIGNAL RETURN
A3	<1A	UD0	N/U	A8	<1A	PO1_SENSE	SENSE, +12VDC
B3	<1.5A	+12V_AUX	Reserved	B8	<1A	PO2_SENSE	SENSE, 3.3V_AUX
C3	<1A	N/U	N/U	C8	<1A	PO3_SENSE	N/U
D3	<1A	N/U	N/U	D8	<1A	SENSE_RETURN	SENSE RETURN
A4	<1.5A	3.3V_AUX	Reserved	P3	40A	PO3	N/U
B4	<1.5A	3.3V_AUX	Reserved	P4	40A	POWER_RETURN	POWER RETURN
C4	<1.5A	3.3V_AUX	Reserved	P5	40A	POWER_RETURN	POWER RETURN
D4	<1.5A	3.3V_AUX	Reserved	LP2	20A	PO2	3.3V_AUX
A5	<1A	GA0*	GA0*	P6	40A	PO1	+12VDC (Vs1)

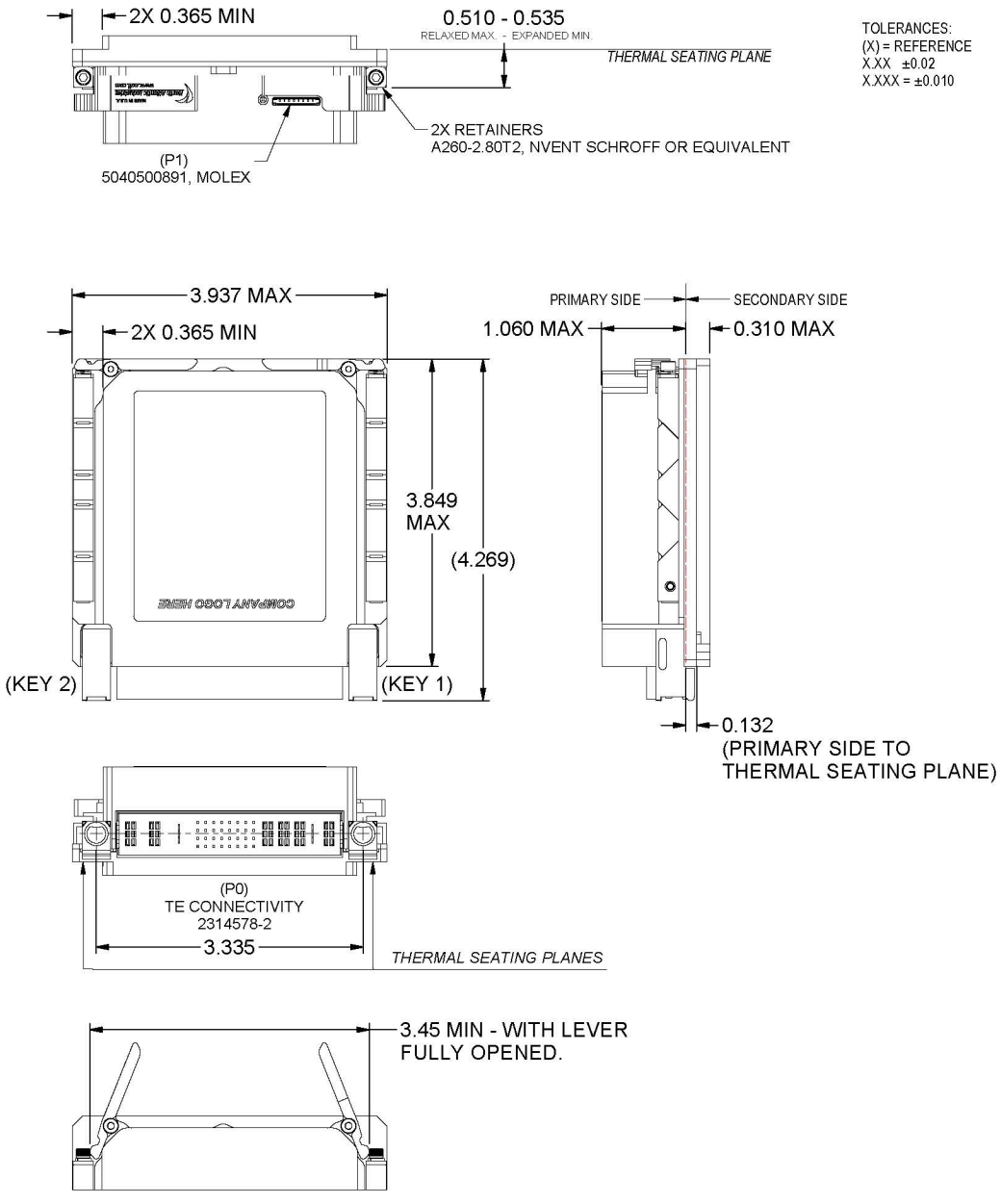
Option Code Table

Code	Description
00	Standard unit, no additional options

116 Wilbur Place, Bohemia, NY 11716 Tel: 631.567.1100 www.naii.com

Mechanical Layout

MECHANICAL LAYOUT FOR VPX55-32HSU
NAI POWER SUPPLY PLUG-IN MODULE



116 Wilbur Place, Bohemia, NY 11716 Tel: 631.567.1100 www.naii.com