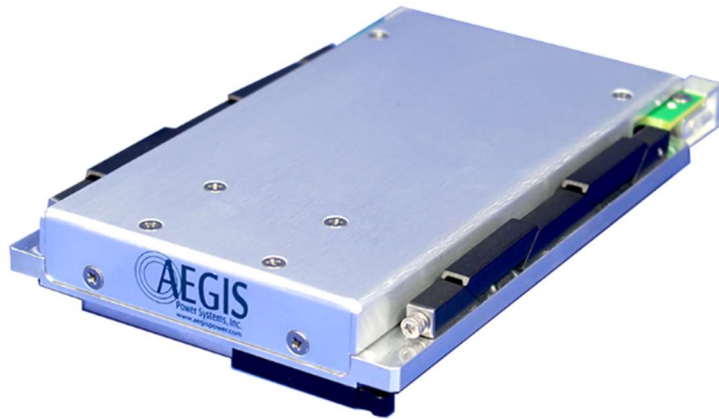# VPX2703UC1K-SA

Overview
3U VPX DC-DC Power Converter Card
270Vdc Input, 2 Outputs
1000W Max Combined Output

Market(s)
Defense

Typical Application(s)
Embedded Computing, C4ISR

Product Highlights
The VPX2703UC1K-SA is a single-slot (5HP) power card for interoperable systems in alignment with the SOSA™ Technical Standards. This power converter offers filtered 270Vdc input and two outputs (+12V and +3.3V_AUX DC). This COTS military power supply solution is designed to the applicable VITA 62 Modular Power Supply and VITA 48.2 conduction-cooled requirements. It also meets applicable portions of both the MIL-STD-810F vibration/shock requirements and the MIL-STD-461G EMI requirements. The VPX2703UC1K-SA provides users with high efficiency (up to 92%) and high power (up to 1000W). Additionally, the redundant IPMB bus and I2C functionality allows users to monitor sensor data (temperature, voltage, current, counter), obtain device ID, and retrieve self-test results per VITA 46.11 and SOSA™ Technical Standards.

Features

- 270Vdc per MIL-STD-704F
- 2 Output Voltages, 1000W
- Single Slot 5HP VITA 48.2 VPX Power Card
- MIL-STD-461G EMI *
- ANSI/VITA 46.11 Tier 2 IPMC *
- Redundant IPMB bus connections

* Designed to meet applicable portions of this standard. Contact Aegis Power Systems, Inc. for specific details.

Table 1: Maximum Continuous Operating Ratings

Parameter	Rating	Unit	Notes
Vin max range	200 to 330	Vdc	270Vdc Nominal
Temperature	–40 to +85	°C	Baseplate @ wedgelocks (85C @ 600W total output) (65C @ 1000W total output)
Input power	1112	W	@ 1000W out (270VDC input)
Combined output power	1000	W	See Table 2 for DC output variations
Efficiency	90	%	Typical @ nominal conditions

About Us
Aegis Power Systems, Inc. specializes in the design, development, and manufacture of AC-DC and DC-DC power supplies for high-performance, rugged, critical, and specialty applications. Markets served include defense, industrial, communications, aircraft, shipboard, rack mount, embedded computing, and electric vehicle applications.

Contact us to find out if this item can be configured or redesigned to meet your specific technology need.

SPECIFICATIONS   (Typical at 25°C, nominal line and 100% load, unless otherwise specified.)

Parameter	Notes
Input Voltage	Designed to meet MIL-STD-704F Table IV (DC Normal Operation) 250Vdc to 280Vdc, 270 Vdc nominal, continuous operation during Figure 16 (Normal DC voltage transients).
Input Current	4.44A max @ 250Vdc, 4.12A typical @ 270Vdc input (1000W out).
Input Power	1112W max @ 1000W out.
Total Output Power	1000W max. all outputs combined (see Table 4).
Output Voltages	(see Table 2).
Efficiency	88.5% minimum, 90% typical, 93% max.
Start-Up Time	1 second maximum.
Voltage Set Point	+/− 5% V Out nominal (for any combination).
Line/Load Regulation	+/− 5% V Out nominal (for any combination).
Output Ripple	50mVpk-pk Max. (20 MHz BW) all except; +/-12 Vdc 100mVpk-pk Max.
Current Limit	Short circuit protected with automatic recovery (110% - 130% of rated output).
Temperature	−40°C to +65°C Operating baseplate @ 1000W output. (+85°C Operating baseplate @ 600W output) −40°C to +125°C Storage.
Cooling	Conduction cooling through wedgelocks to customer rack.
Package	Single slot pluggable slide in rack card.
Dimensions	3U x 5hp x 168.49mm (see mechanical drawing page) (VITA 48.2 Table 3).
Weight	1.65 lbs. (typical).
Connectors	1ea TE Connectivity 6450849-7 or equivalent (see Table 5).
Vibration	Designed to meet – ANSI/VITA 47-2005 (R2007), Section 4.4.3 Vibration Class V3. MIL-STD-810F, Method 514.5, Procedure I.
Shock:	Designed to meet - ANSI/VITA 47-2005 (R2007), Section 4.5.2 Operating Shock Class OS2 ANSI/VITA 47-2005 (R2007), Section 4.5.3 Bench Handling Shock. MIL-STD-810F, Method 516.5, Procedure I.
Humidity	0 – 95% non-condensing per ANSI/VITA 47-2005 (R2007), Section 4.6 Humidity.
EMI	Designed to meet MIL-STD-461G conducted emissions (external EMI filter may be required).
System Management	VITA 46.11 IPMI I2C interface with monitoring & dual IPMB bus (see Table 6).

Specifications subject to change without notice.

Table 2: Voltage Output (Nominal)

VPX2703UC1K-XX	VS1	3.3V_AUX
VPX2703UC1K-SA	+12VDC @ 975W	+3.3VDC_AUX @ 66W

Output power levels indicate maximum power available per output.
Total combined power of all outputs on VPX2703UC1K-SA cannot exceed 600W @ 85°C / 1000W @ 65°C (Temperature measured on the unit's baseplate @ wedge locks)

Table 3: ENABLE / INHIBIT

Control Inputs		Power Outputs	
ENABLE	**INHIBIT**	**3.3V_AUX**	**VS1**
High	High	Off	Off
High	Low	Off	Off
Low	High	On	On
Low	Low	On	Off

Table 4: Power Derating

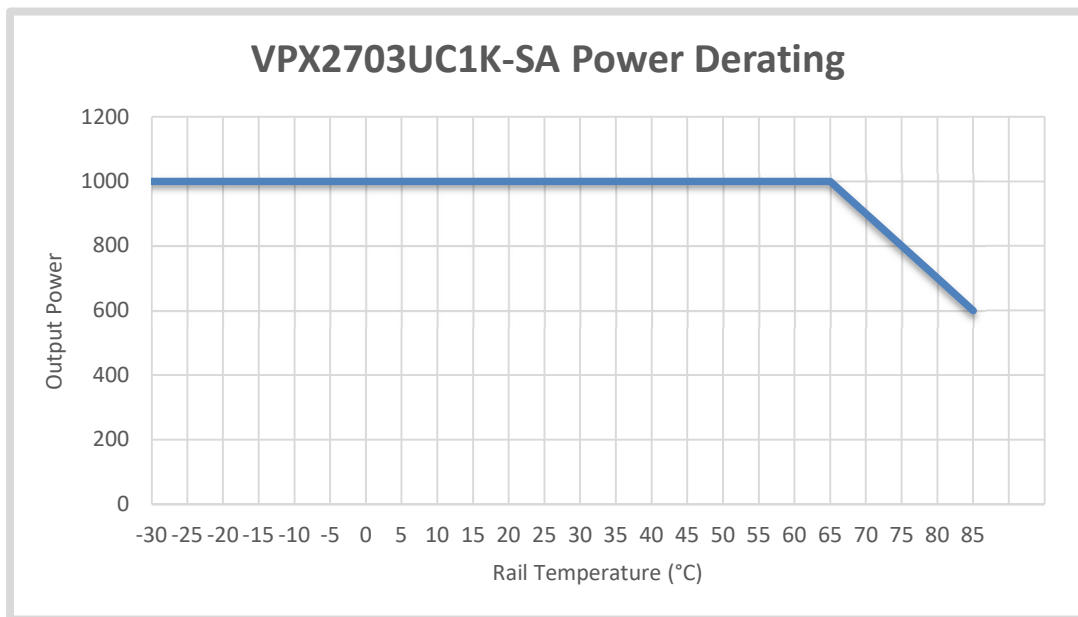## Table 5: Connector Specifications

TE Connectivity Connector 6450849-7 or equivalent

Contact Designation		Conductor Circuit
P1	40A	-DC_IN/ACN
P2	40A	+DC_IN/ACL
LP1	20A	CHASSIS
A1	<1A	(NC)
B1	<1A	(NC)
C1	<1A	GA2*
D1	<1A	(NC)
A2	<1A	(NC)
B2	<1A	FAIL*
C2	<1A	INHIBIT*
D2	<1A	ENABLE*
A3	<1A	(NC)
B3	<1.5A	(NC)
C3	<1A	(NC)
D3	<1A	(NC)
A4	<1.5A	(NC)
B4	<1.5A	(NC)
C4	<1.5A	(NC)
D4	<1.5A	(NC)
A5	<1A	GA0*
B5	<1A	GA1*
C5	<1A	SM0 (I2C/SCL)
D5	<1A	SM1 (I2C/SDA)
A6	<1A	SM2 (I2C/SCL)
B6	<1A	SM3 (I2C/SDA)
C6	<1.5A	(NC)
D6	<1A	SYSRESET*
A7	<1A	(NC)
B7	<1A	(NC)
C7	<1A	(NC)
D7	<1A	SIGNAL_RETURN
A8	<1A	+12VDC SENSE
B8	<1A	+3.3V_AUX SENSE
C8	<1A	+12VDC SENSE
D8	<1A	SENSE_RETURN
P3	40A	+12VDC (VS1)
P4	40A	POWER_RETURN
P5	40A	POWER_RETURN
LP2	20A	+3.3V_AUX
P6	40A	+12VDC (VS1)

* Use of a trailing asterisk indicate a logic signal which is active when at the less positive level of its allowable range
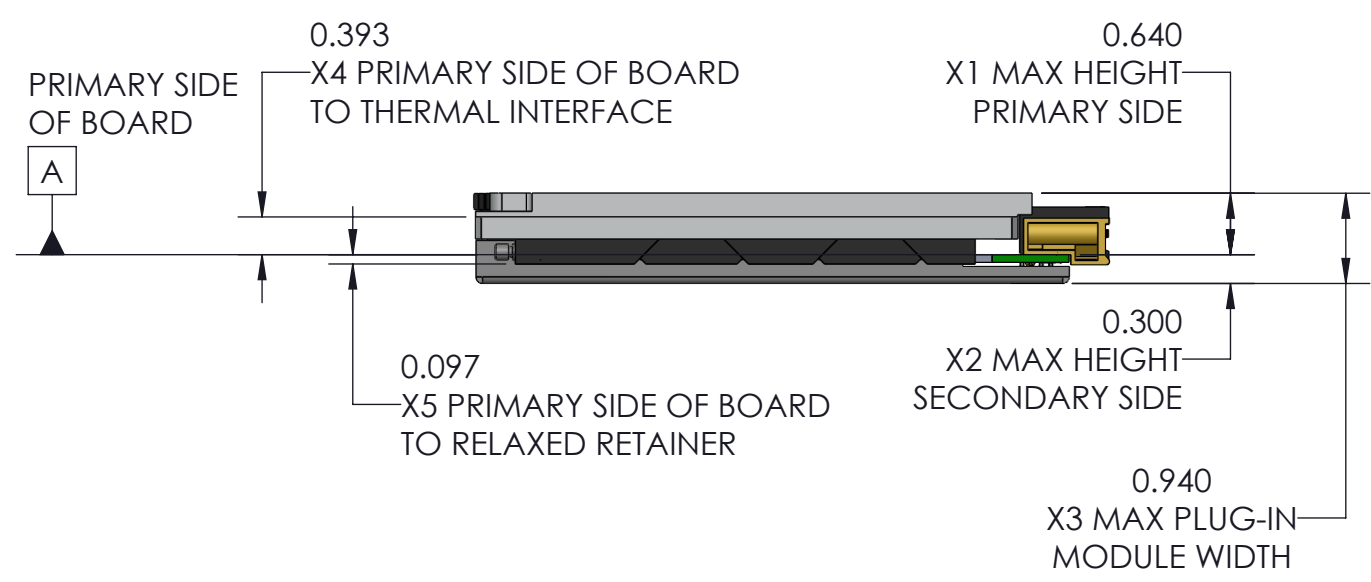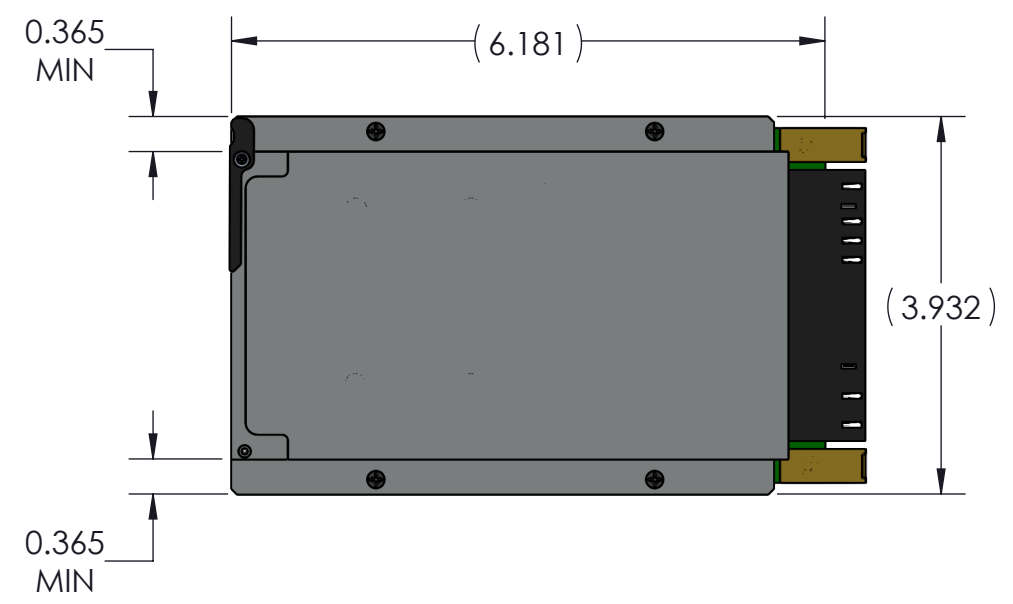
Table 6: IPMI Commands

The following three VITA 46.11 IPMI commands are currently implemented in firmware:

- **Get Device ID Command (App (06h) (01h))**
  This command will return the hardware revision, firmware/software revision, command interface revision, system serial number for the power supply.
- **Get Self-Test Results Command (App (06h) (04h))**
  This command will initiate the power supply to verify all available sensor readings are within specified operating ranges. It will report successful if there are no errors, or it will report the sensor that was out of range.
- **Get Sensor Reading Command (S/E (04h) (2Dh))**
  This command will return the data from one of the available sensors. The following sensors are available:

Self-test Sensor Threshold	Sensor Number	Available Data Sensors	Data Reply Format
OT = 90C	00h	BASEPLATE TEMPERATURE	2 BYTE HEX
OV/UV = +/-5%	01h	VS1 OUTPUT VOLTAGE	2 BYTE HEX
OV/UV = +/-5%	05h	+3.3V_AUX OUTPUT VOLTAGE	2 BYTE HEX
OC = 120% Nom.	07h	VS1 OUTPUT CURRENT	2 BYTE HEX
OC = 120% Nom.	08h	+3.3V_AUX OUTPUT CURRENT	2 BYTE HEX
N/A	0Ah	TURN-ON COUNTER	2 BYTE HEX

0.365 MIN

(6.181)

(3.932)

0.365 MIN

PRIMARY SIDE OF BOARD

A

0.393
X4 PRIMARY SIDE OF BOARD
TO THERMAL INTERFACE

0.640
X1 MAX HEIGHT
PRIMARY SIDE

0.097
X5 PRIMARY SIDE OF BOARD
TO RELAXED RETAINER

0.300
X2 MAX HEIGHT
SECONDARY SIDE

0.940
X3 MAX PLUG-IN
MODULE WIDTH

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ± N/A
DEGREES: ± .5
TWO PLACE DECIMAL ± .02
THREE PLACE DECIMAL ± .005

CONTRACT NO.

AEGIS POWER SYSTEMS
MURPHY, NORTH CAROLINA

TITLE:
VPXxx3UCxx-

AEGIS P/N: VPXxx3UCxx-

APPROVALS	NAME	DATE
DRAWN		
CHECKED		
ENG APPR.		
MFG APPR.	RP	
Q.A.	MH	

MATERIAL
SEE NOTE 3

FINISH
SEE NOTE 4

COMMENTS:
GENERATED: BY SOLIDWORKS

DO NOT SCALE DRAWING

SIZE **B**

FSCM NO. 06ES8

DWG. NO.
VPXxx3UCxx-

REV

SCALE: 1:2

SHEET 1 OF 1