vFeatures & Benefits

- 333 W SOSA Aligned ANSI/VITA 62.0 Compliant
- Wide Operating Temperature Range: -55 °C to 85 °C
- High Efficiency, High Power Density
- EMI Filters Included
- Up to 300 W Power on Isolated 12 V Primary Output
- Up to 33 W Power on Isolated 3.3 V Auxiliary Output
- Fixed Switching Frequency
- Droop Current Sharing & Internal ORing Diode
- Multiple Units in A Redundant or Parallel System
- IPMI 46.11 Communication
- Input Under Voltage Protection
- Input/Output Over Voltage Protection
- Short Circuit Protection
- Over Temperature Protection
- Conformal Coated
- Compliant with IES from MIL-STD-1275E @333 W Output Power (Down to 10.5 V input voltage)

Compliance

Module is compliant with:

- MIL-STD-461F
- MIL-STD-810G
- MIL-STD-1275E
- MIL-STD-704(A-F) *(Note 1)

Options available from the factory at customer request:

- CE marked
- RoHS & REACH compliant
- 50 ms hold-up feature
- Def Stan compliance
- Def Stan 61-005
- Def Stan 00-035
- Def Stan 59-411
- Def Stan 59-114

Typical Applications

- Armored Vehicles
- Land Platforms
- Aerospace Platforms
- Communications and Radar Systems

Product Ratings	
V_{IN}	16 – 40 V (10.5 V for 5 sec)
V_{OUT} (Primary)	12 V
I_{OUT} (Primary)	25 A
V_{OUT} (Auxiliary)	3.3 V
I_{OUT} (Auxiliary)	10 A
P_{OUT} (Total)	333 W

Product Description

This configurable power board designed to meet the unique and challenging environmental requirements of defense applications. This VPX Board with 3U form factor delivers up to 333 W power with high efficiency.

Hi-Rel VPX power supply can operate without failure under extremely harsh conditions which is crucial for military applications.

Size: 168 × 100 × 25.4 mm

Weight: 650±20g

Note 1: *Due to the absence of a hold-up capacitor in the product, it is expected that the output power will be interrupted during power interrupt tests. The unit will auto-recover after interruption ends.*

Electrical Characteristics

All data are obtained at nominal line and full load unless otherwise specified. (Ta = 25 °C)

Input Characteristics					
Parameters	**Notes & Conditions**	**Min**	**Typ**	**Max**	**Unit**
Non-Operating Input Voltage Range	Continuous	-1		50	V
Operating Input Voltage Range	(10.5 V for 5 sec) (110 V for 55 msec)	16	28	40	V
Input Under Voltage Turn-On Threshold		10.2	10.6	11	V
Input Under Voltage Turn-Off Threshold		10.1	10.5	10.7	V
No-Load Input Current			0.6	1	A
Disabled Input Current			0.2	0.6	A
Maximum Input Current			42		A

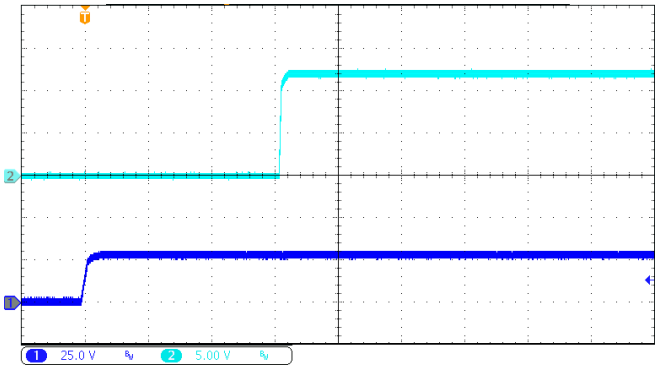
Main Output: +12V					
Parameters	**Notes & Conditions**	**Min**	**Typ**	**Max**	**Unit**
Output Voltage		11.7	12	12.3	V
Output Voltage Line Regulation			± 0.1		%
Output Voltage Load Regulation			± 3		%
Output Voltage Ripple and Noise (pk-to-pk)	20 MHz bandwidth		35		mV
Operating Output Current Range		0		25	A
Output Current Limit		27.5			A
Output Current Shutdown Limit			27.5		A
Output DC Current-Limit Shutdown Voltage			6		V
Output Power			300		W
Output Over-Voltage Protection	At nominal output voltage		14.4		V
Maximum Output Capacitance	At nominal output voltage			2.35	mF
Input Voltage Transient Response	50V/ms; See				
Step Change	18V to 36V to 18V input voltage		2.5		V
Settling Time	Within 1% of output voltage		10		ms
Load Current Transient Response	1A/µs; See				
Step Change	50% to 75% to 50% output load		0.2		V
Settling Time	Within 1% of output voltage		2		ms
Turn-On Transient Time	Within 90% of output voltage		120		ms
Soft Start Time	Within 90% of output voltage		5		ms

Aux Output: +3.3V					
Parameters	**Notes & Conditions**	**Min**	**Typ**	**Max**	**Unit**
Output Voltage		3.2	3.3	3.5	V
Output Voltage Line Regulation			± 0.2		%
Output Voltage Load Regulation			± 1		%
Output Voltage Ripple and Noise (pk-to-pk)	20 MHz bandwidth		20		mV
Operating Output Current Range		0		10	A
Output Current Limit		15			A
Output Current Shutdown Limit			16		A
Output Power			33		W
Maximum Output Capacitance	At nominal output voltage			2.35	mF
Input Voltage Transient Response	50V/ms; See				
Step Change	18V to 36V to 18V input voltage		20		mV
Settling Time	Within 1% of output voltage		1		ms
Load Current Transient Response	1A/µs; See				
Step Change	50% to 75% to 50% output load		100		mV
Settling Time	Within 1% of output voltage		40		µs
Turn-On Transient Time	Within 90% of output voltage		120		ms
Soft Start Time	Within 90% of output voltage		5		ms

General Characteristics					
Parameters	**Notes & Conditions**	**Min**	**Typ**	**Max**	**Unit**
Efficiency	Nominal line, 50% aggregate loads		84		%
Efficiency	Nominal line, 100% aggregate loads		88		%

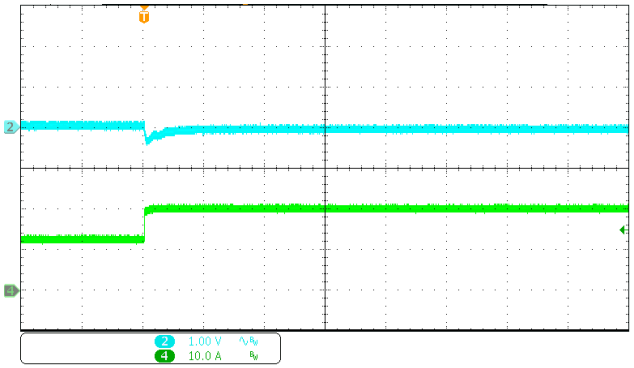
Standards Compliance

Environmental Characteristics						
Parameters	**Standard**	**Min**	**Typ**	**Max**	**Unit**	**Status**
Operational Temperature	MIL-STD-810G_CHG-1 Method 501.6/502.6 Procedure II	-55	-	+85	°C	Passed
Storage / Transport Temperature	MIL-STD-810G_CHG-1 Method 501.6/502.6 Procedure I	-65	-	+125	°C	Passed
Parameters	**Standard**	**Waveform**	**Peak Value**	**Pulse Duration**	**Axis**	**Status**
Shock	VITA 47.1 Section 4.5.2 / Class OS2	Sawtooth	40g	11 ms	±X, ±Y, ±Z	Passed
		Half-Sine	40g	11 ms	±X, ±Y, ±Z	Passed
Parameters	**Standard**					**Status**
Vibration	VITA 47.1 Section 4.4.3 / Class V3	5-100 Hz (Increasing at 3 dB/octave)				Passed
		100-1000 Hz (0.1g2/Hz)				Passed
		1000-2000 Hz (Decreasing at 6 dB/octave)				Passed
Electrical and EMI/EMC Characteristics						
Parameters	**Standard**	**Test**				**Status**
EMI/EMC	MIL-STD-461F	CE102				Passed
		CS101 CS114(Curve 5) CS115 CS116				Passed
28 VDC Input Electrical Characteristics	MIL-STD-704(A-F)	LDC101, LDC102, LDC103, LDC104, LDC105, LDC201, LDC301, LDC302, LDC401, LDC501, LDC601, LDC602				Passed
	MIL-STD-1275E	Starting Operation, Operational Voltage Range, Injected Surge, Reverse Polarity, Emitted Spike, Injected Spike, Emitted Surge,				Passed



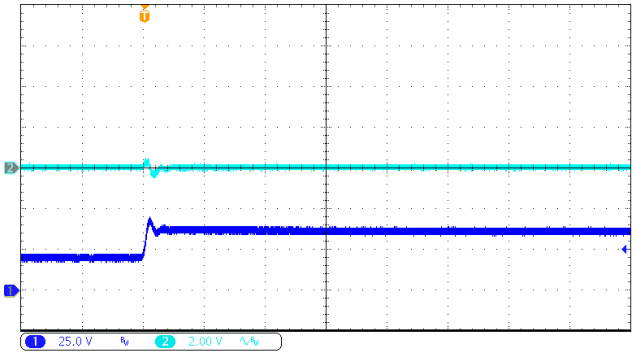
Main output voltage (navy blue) (5 V/div) Time base: 40 ms/div
Input voltage (blue) (25 V/div)

Figure A. Startup waveform of main output at full load



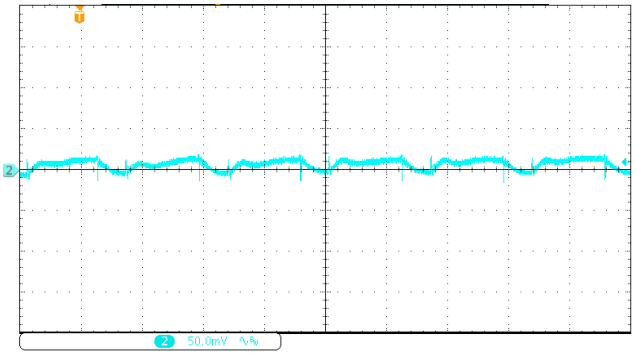
Main output voltage (blue) (1 V/div) Time base: 2 ms/div
Output current (green) (10 A/div)

Figure B. Main output load current transient response: from 50% to 75% (di/dt = 1A/µs)



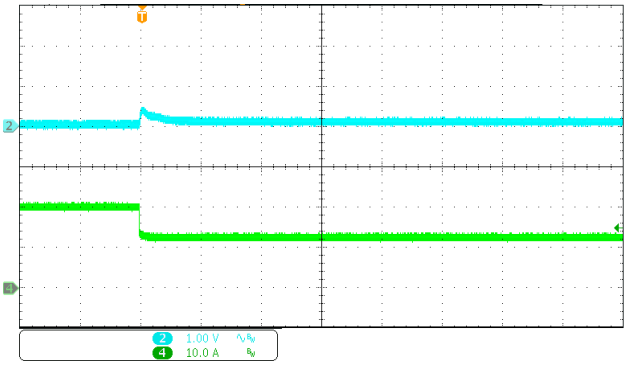
Main output voltage (blue) (2 V/div) Time base: 4 ms/div
Input voltage (navy blue) (25 V/div)

Figure C. Input voltage transient response, main output voltage (AC coupled): input voltage from 18V to 36V (dV/dt = 50V/ms)



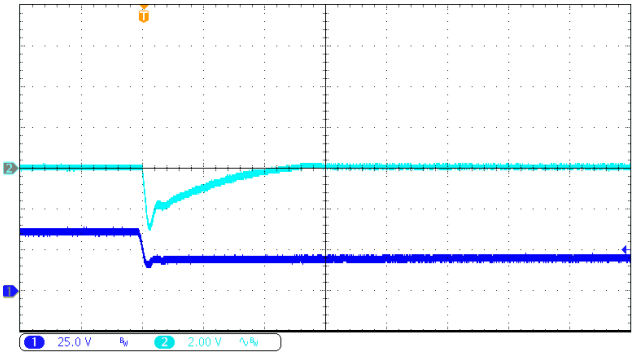
Main output voltage ripple (blue) (50 mV/div) Time base: 2 µs /div

Figure D. Main output voltage ripple at nominal input voltage and full load current



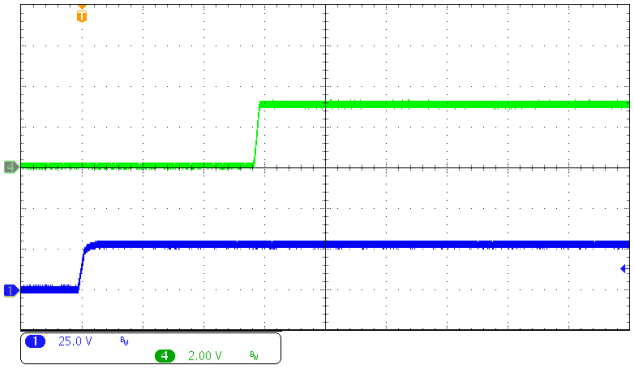
Main output voltage (blue) (1 V/div) Time base: 4 ms/div
Output current (green) (10 A/div)

Figure E. Main output load current transient response: from 75% to 50% (di/dt = 1A/µs)



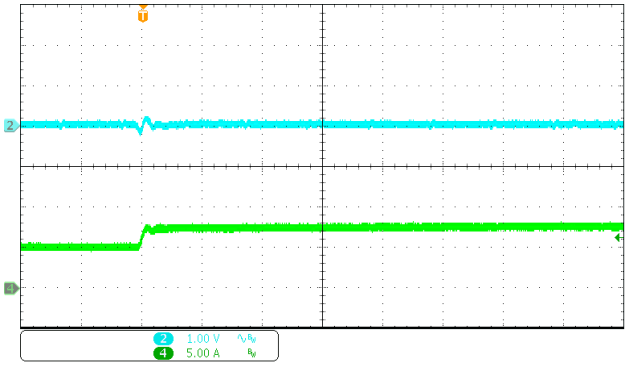
Main output voltage (blue) (2 V/div) Time base: 4 ms/div
Input voltage (navy blue) (25 V/div)

Figure F. Input voltage transient response, main output voltage (AC coupled): input voltage from 36V to 18V (dV/dt = 50V/ms)



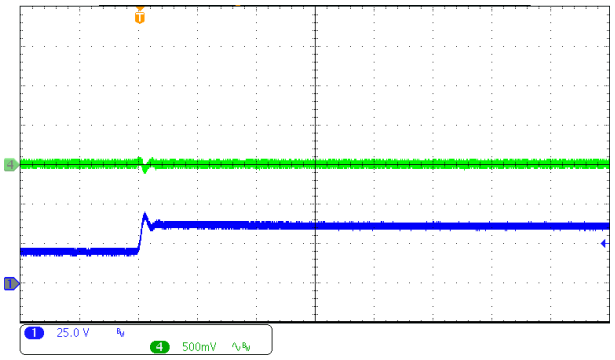
Aux output voltage (navy blue) (2 V/div) Time base: 40 ms/div
Input voltage (blue) (25 V/div)

Figure G. Startup waveform of aux output at full load



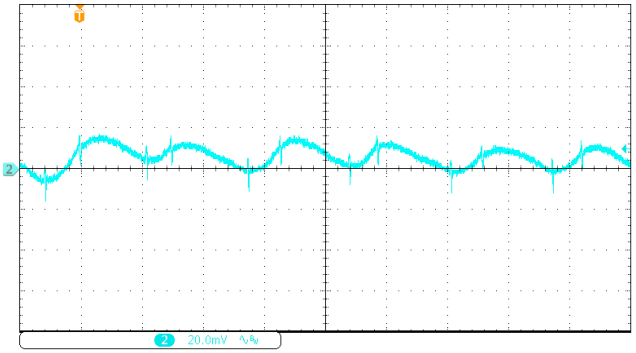
Aux output voltage (blue) (1 V/div) Time base: 40 µs/div
Output current (green) (5 A/div)

Figure H. Aux output load current transient response: from 50% to 75% (di/dt = 1A/µs)



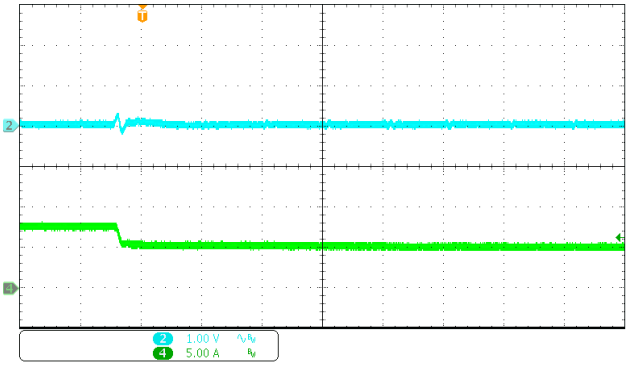
Aux output voltage (blue) (500 mV/div) Time base: 4 ms/div
Input voltage (navy blue) (25 V/div)

Figure I. Input voltage transient response, aux output voltage (AC coupled): input voltage from 18V to 28V (dV/dt = 50V/ms)



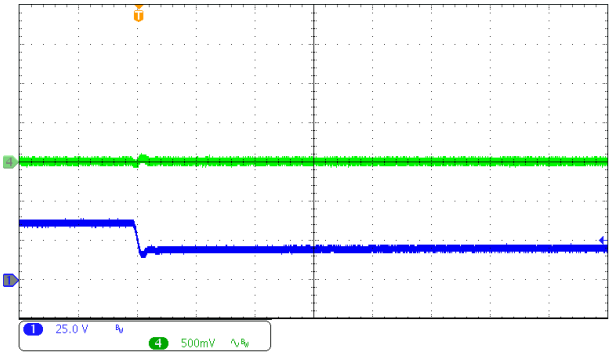
Aux output voltage ripple (blue) (20 mV/div) Time base: 2 µs /div

Figure J. Aux output voltage ripple at nominal input voltage and full load current



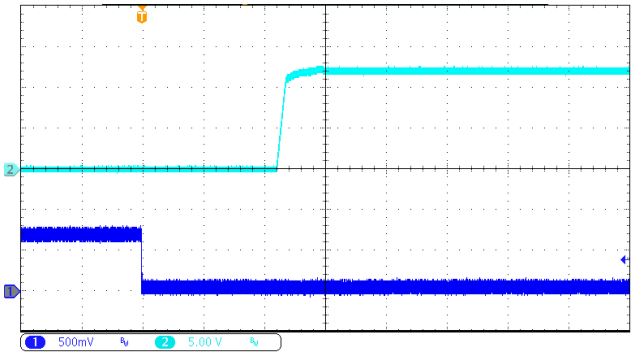
Aux output voltage (blue) (1 V/div) Time base: 40 µs/div
Output current (green) (5 A/div)

Figure K. Aux output load current transient response: from 75% to 75% (di/dt = 1A/µs)



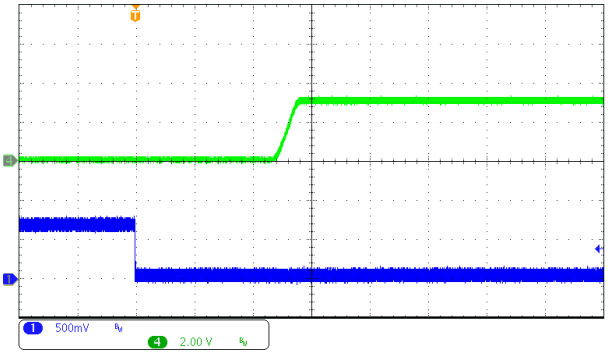
Aux output voltage (blue) (500 mV/div) Time base: 4 ms/div
Input voltage (navy blue) (25 V/div)

Figure L. Input voltage transient response, aux output voltage (AC coupled): input voltage from 28V to 18V (dV/dt = 50V/ms)



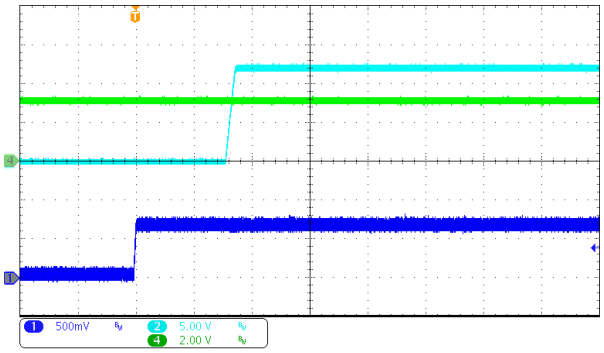
Main output voltage (blue) (5 V/div) Time base: 10 ms/div
ENABLE* (navy blue) (500 mV/div)

Figure M. ENABLE* signal asserted low



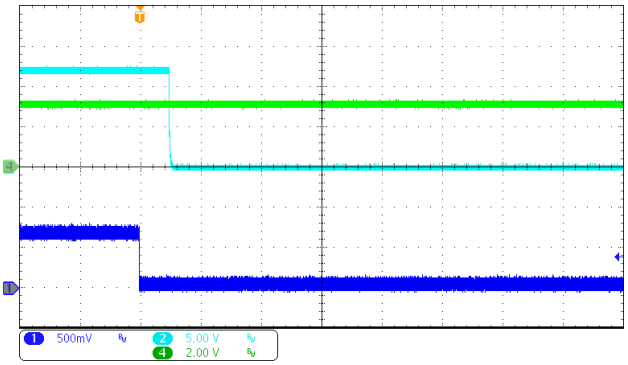
Aux output voltage (green) (2 V/div) Time base: 10 ms /div
ENABLE* (navy blue) (500 mV/div)

Figure P. ENABLE* signal asserted low



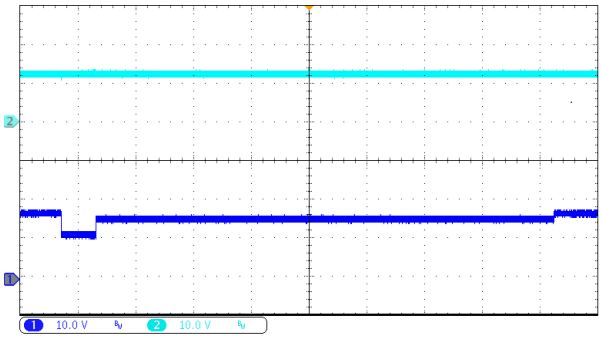
Main output voltage (blue) (5 V/div) Time base: 10 ms/div
Aux output voltage (green) (2 V/div)
INHIBIT* signal (navy blue) (500 mV/div)

Figure N. INHIBIT* asserted float



Main output voltage (blue) (5 V/div) Time base: 10 ms/div
Aux output voltage (green) (2 V/div)
INHIBIT* signal (navy blue) (500 mV/div)

Figure Q. INHIBIT* asserted low



Main output voltage (blue) (10 V/div) Time base: 4 s/div
Input voltage (navy blue) (10 V/div)

Figure O. Starting Operation Test MIL-STD-1275E

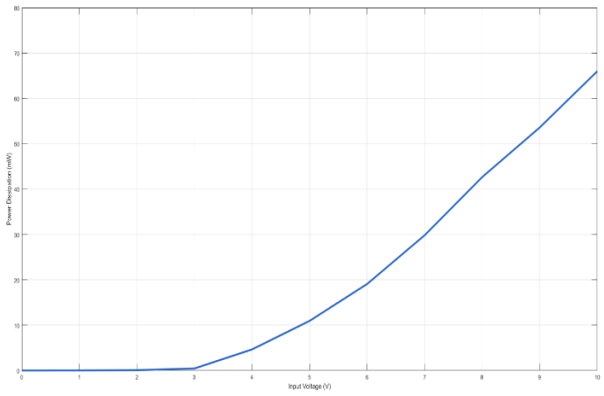


Figure R. Disabled power dissipation versus input voltage, ENABLE* asserted and INHIBT* de-asserted

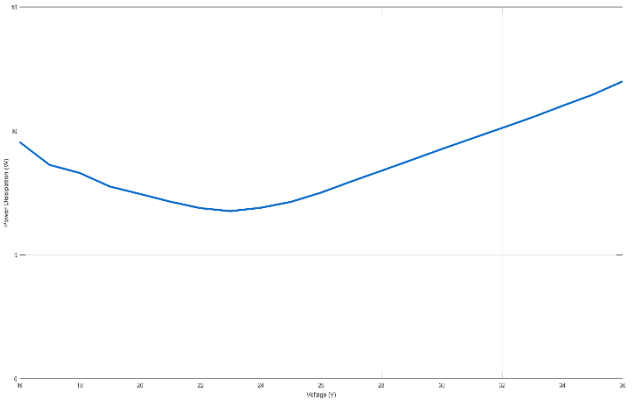


Figure T. Enabled power dissipation versus input voltage, ENABLE* asserted and INHIBT* de-asserted

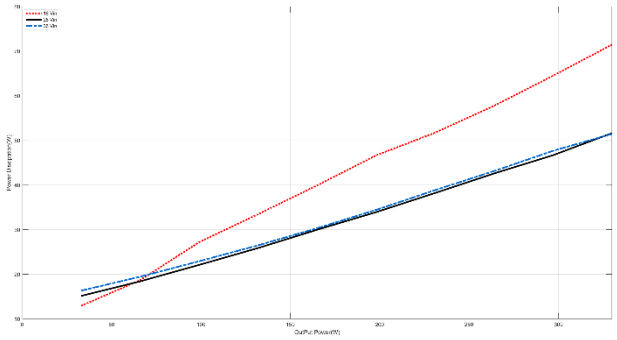


Figure S. Power dissipation versus output power at minimum, nominal and maximum input voltage

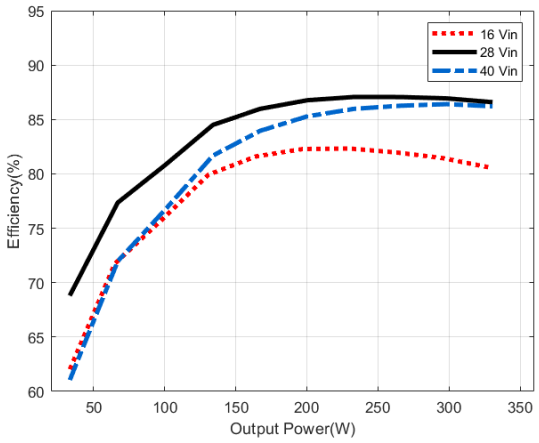


Figure U. Efficiency versus output power at minimum, nominal and maximum input voltage

Block Diagram

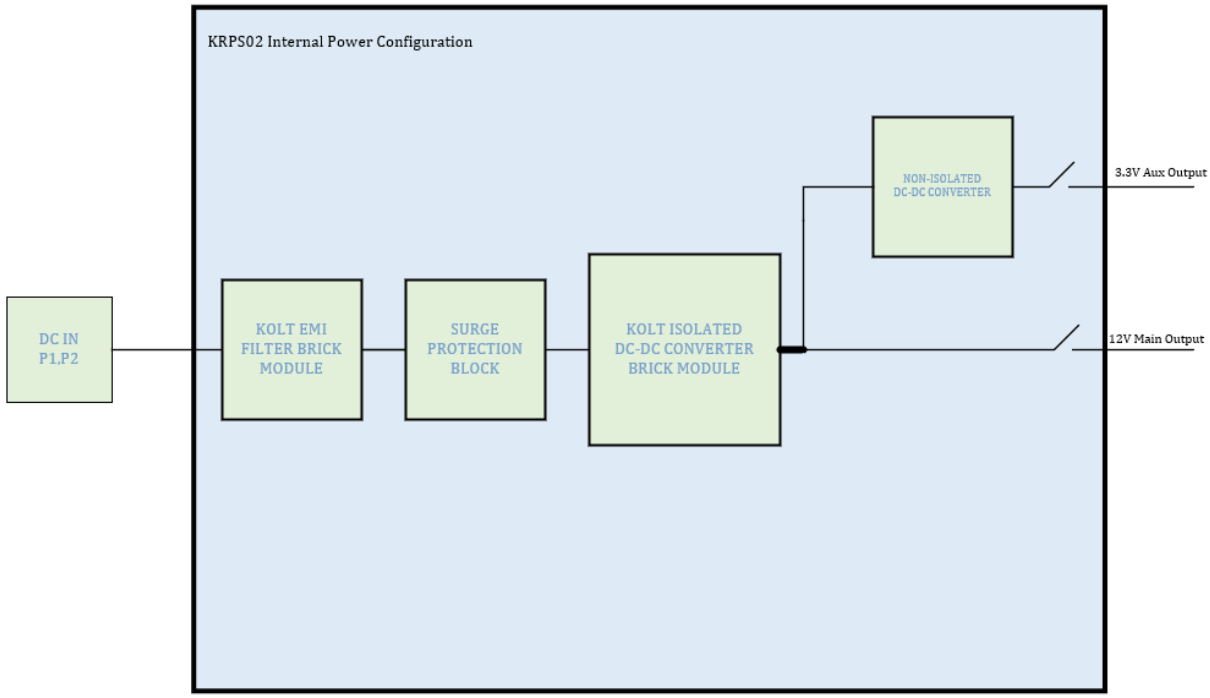


Figure V. Internal Block Diagram Representation

IPMI Interface

Four constants are used to calculate a real-world value from the single byte variable returned in the response. The conversions can be realized with the following equation:

$$y = \left(M * x + (B * 10^{K1})\right) * 10^{K2}$$

Where;

y = the converter reading

x = the raw sensor reading

M = the signed integer multiplier

B = the signed additive offset

K1 = signed exponent for constant B (sets decimal point for B)

K2 = signed result exponent (sets decimal point for y)

Sensor Number	Hex	Sensor Name	SI Units	M	B	K1	K2
7	0x07	Input Voltage	V	30	90	1	-2
8	0x08	Main Output Voltage	V	20	90	2	-3
11	0x0B	Aux Output Voltage	V	10	20	2	-3
18	0x12	Temperature P6	K	1	20	1	0
19	0x13	Temperature P1	K	1	20	1	0
25	0x19	Aux Output Current	A	10	0	0	-2

Protection Features

Input Under Voltage Lockout

The VPX module starts operating when the input voltage is raised above the "Under Voltage Turn-On Threshold." Once turned on, turn off is initiated when the input falls below the "Under Voltage Turn-Off Threshold." The "Module Input Specifications" Table gives the associated limits.

Input Over Voltage Protection

The VPX module protects itself by ceasing operation when the input goes above the "Over Voltage Turn-Off Threshold." It resumes operation when the input falls below the "Over Voltage Turn-On Threshold." The associated limits are given in the "Module Input Specifications" Table.

Output Current Limit

The VPX module will derate the output voltage if the output current exceeds the "Output Current Limit" value. If the fault condition is resolved, the control output voltage will increase to the nominal value.

Output Over Voltage Protection

If the output voltage exceeds the "Output Over Voltage-Protection" value the VPX module outputs are disabled immediately and retries after cooldown period. The "Output Over Voltage Protection Limit" is 120% of Output Voltage.

Output Over Current Protection

If the output current exceeds the "Output Current Shutdown Limit" value the VPX module outputs are disabled immediately and retries after cooldown period.

Short Circuit Protection

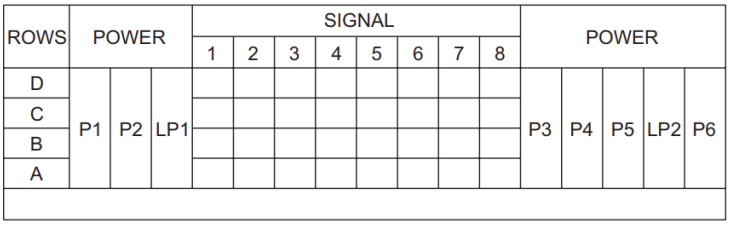
The short circuit condition is an extreme case of the Output Current Limit condition. When output voltage drops below "Output DC Current-Limit Shutdown Voltage" limit, the VPX module outputs are disabled immediately and retries after cooldown period. The "Output DC Current-Limit Shutdown Voltage" is 50% of Output Voltage.

Over Temperature Shutdown

The brick has a thermistor located at the hottest point inside the module. The thermal shutdown circuit is designed to turn the VPX module off when the temperature at the sensed location goes above the "Over Temperature Shutdown" limit. It is set as 125 °C. It locks itself and waits to cool off. The VPX module then resumes operation automatically when the temperature of the sensed location falls below the trip point by the amount equal to the "Over Temperature Shutdown Hysteresis"

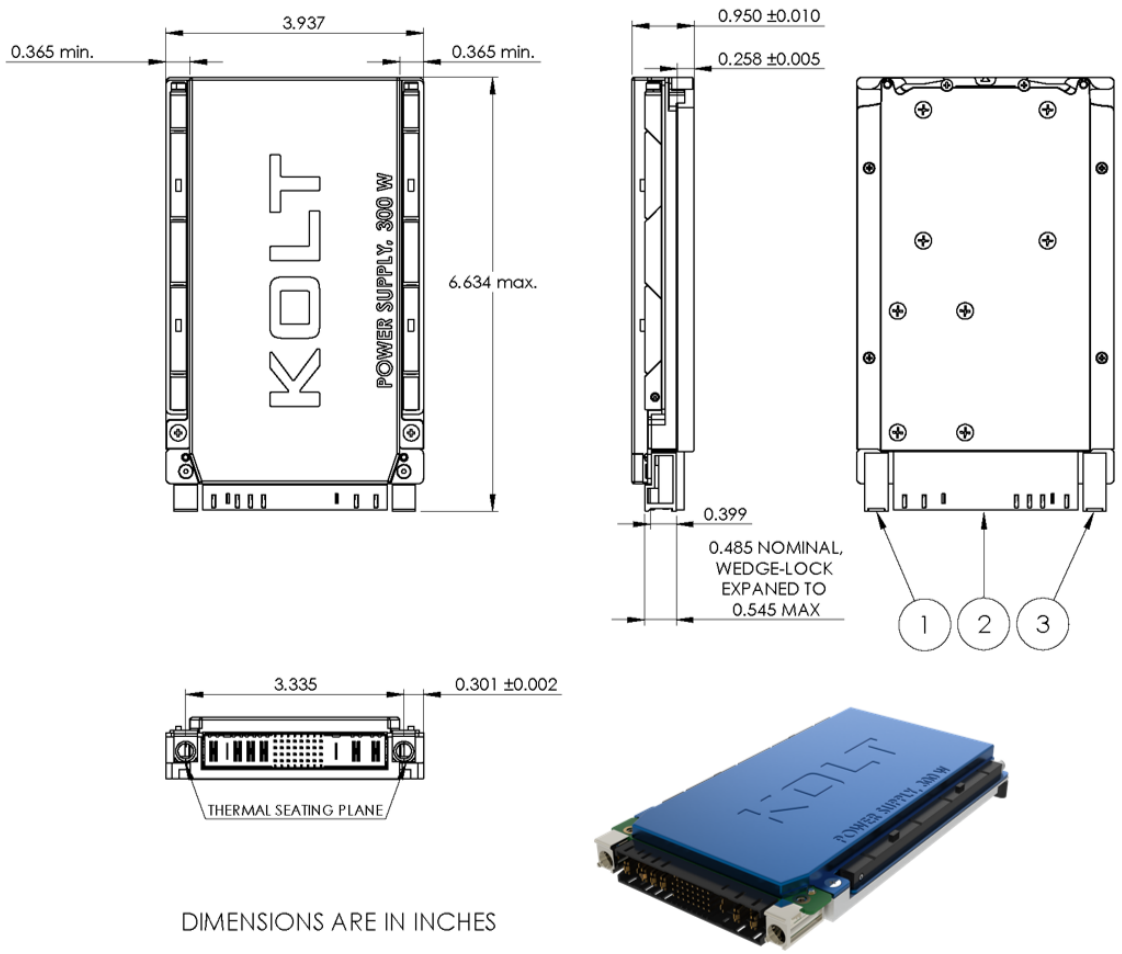
Connector Pin Configuration

- **Main Connector (Item No:2):**



Pin	Function/Name	Description
P1	-DC_IN	V_{in-}
P2	+DC_IN	V_{in+}
LP1	CHASSIS	-
A1	NC (SYNC_OUT)	-
B1	NC (NVMRO)	-
C1	GA2*	Address Bit 2
D1	NC	-
A2	NC (VBAT)	-
B2	FAIL*	When any of the output is not within specification, FAIL* signal will be driven low to indicate a failure
C2	INHIBIT*	Input control signal defined in VITA 62, referenced to SIGNAL RETURN
D2	ENABLE*	Input control signal defined in VITA 62, referenced to SIGNAL RETURN.
A3	NC (SYNC_IN)	-
B3	NC	JTAG VDD
C3	NC (NED)	-
D3	NC (NED_RETURN)	-
A4	NC	JTAG TDO
B4	NC	JTAG TCK
C4	NC	JTAG TDI
D4	NC	JTAG TMS
A5	GA0*	Address Bit 0
B5	GA1*	Address Bit 1
C5	SM0 (IPMB-A SCL)	Primary I^2C clock
D5	SM1 (IPMB-A SDA)	Primary I^2C data
A6	SM2 (IPMB-B SCL)	Redundant I^2C clock
B6	SM3 (IPMB-B SDA)	Redundant I^2C data
C6	NC	-
D6	SYSRESET*	System reset is actively low. It will be high impedance when all outputs are within voltage specification. It will be pulled low if any failure has occurred or if the outputs are disabled by the user during operation.
A7	NC (+12VDC SHARE)	-
B7	NC (3.3V_AUX SHARE)	
C7	NC (+12VDC SHARE)	
D7	SIGNAL RETURN	Ground pin for control and communication signals; internally Kelvin-connected to POWER RETURN
A8	+12VDC SENSE	Main output sense, should be connected at point-of-load
B8	3.3V_AUX SENSE	Aux output sense, should be connected at point-of-load
C8	+12VDC SENSE	Main output sense, should be connected at point-of-load
D8	SENSE RETURN	Aux output sense, should be connected at point-of-load
P3	+12VDC	+12V main output
P4	POWER RETURN	Common output voltage return pin
P5	POWER RETURN	
LP2	3.3V_AUX	+3.3V auxiliary output
P6	+12VDC	+12V main output

Mechanical Drawing



Guide Sockets Options	Item#	Description	Manufacturer	MPN
0 Deg - 135 Deg (SOSA standard)	1	VITA 46 135 Deg Guide Socket	TE Conn.	1-2000713-4
	3	VITA 46 0 Deg Guide Socket	TE Conn.	1-1469492-1
0 Deg - No-Key	1	VITA 46 No-Key Guide Socket	TE Conn.	1-1469492-9
	3	VITA 46 0 Deg Guide Socket	TE Conn.	1-1469492-1
Connector Plating Options	**Item#**	**Description**	**Manufacturer**	**MPN**
Sn plating	2	-	TE Conn.	6450849-7
Au plating	2	-	TE Conn.	2314578-2

Part Ordering Information

Family	Product Variant	Guide Sockets & Connector Plating Options	Compliance
KEU-VX247	**-001**	-XXX	**R:** RoHS & REACH

Ordering Number	Guide Sockets	Connector Plating	RoHS (Note*)
KEU-VX247-001-001	0 Deg - 135 Deg Guide Sockets (SOSA standard keying)	Sn plating	RoHS compliant with exemptions
KEU-VX247-001-002	0 Deg - 135 Deg Guide Sockets (SOSA standard keying)	Au plating	RoHS compliant with exemptions
KEU-VX247-001-003	0 Deg - No-Key Guide Sockets	Sn plating	RoHS compliant with exemptions
KEU-VX247-001-004	0 Deg - No-Key Guide Sockets	Au plating	RoHS compliant with exemptions
KEU-VX247-001-001R	0 Deg - 135 Deg Guide Sockets (SOSA standard keying)	Sn plating	RoHS-3 & REACH compliant
KEU-VX247-001-002R	0 Deg - 135 Deg Guide Sockets (SOSA standard keying)	Au plating	RoHS-3 & REACH compliant
KEU-VX247-001-003R	0 Deg - No-Key Guide Sockets	Sn plating	RoHS-3 & REACH compliant
KEU-VX247-001-004R	0 Deg - No-Key Guide Sockets	Au plating	RoHS-3 & REACH compliant

RoHS & REACH Compliance*

All KOLT products ship by default with SnPb solder under EU RoHS Directive 2011/65/EU, utilizing lead Exemption 7(a).

To obtain a lead-free build that meets **RoHS-3** requirements and REACH compliancy, add the "-R" suffix to the part number. These units are CE marked.

Revision History

Document Number	Revision	Date	Description	Page Number(s)
110267	01	02.04.2025	Initial Release	-
110267	02	15.07.2025	Second Release • Electrical characteristics updated. • Main and aux output measurements added. • Efficiency measurements added. • Internal block diagram added. • Compliance information added. • RoHS & Reach information added. • Released for production.	All Pages

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