Your Power House
VP ELECTRONIQUE

1U 3000 Watts AC/DC Power Supply

3000 Series

Distributed Power Bulk Front-End
Single Output

RoHS 2002/95/EC

PMBus

Special Features

- 3000 W output power
- 40 W/cu-in
- Optional customer provided air
- 1U x 3U form factor
- N+1 Redundant
- Hot-swap
- Internal OR-ing
- 5 V housekeeping
- High efficiency 89% @ 200 Vac, 100% load
- Variable speed “smart fans”
- Two year warranty

Compliance

- POE Isolation
- EMI Class B - EN55022, Level “A” @ 230 Vac
- EN61000 Immunity

Safety

- **UL/cUL** 60950
- **CSA** 60950
- **China** CCC
- **Nemko** TUV
- **CB Report**
- **CSA 22.2** 60950

Electrical Specifications

Input		
Input range (operating):	180 - 264 Vac 90 - 140 Vac	
Input range (nominal):	200 Vac 110 Vac	Input through Card Edge Connection on same end as DC output
Frequency:	47 to 63 Hz	
Input fusing:	Internal 25 A fuses	Both lines fused
Inrush current:	≤40 A peak	Either hot or cold start
Power factor:	0.97 typical	Meets EN61000-3-2
Harmonics:	Meets IEC 1000-3-2 requirements	@ 50% load
Input current:	19 A max input current	
Holdup time:	10 ms minimum	At full rated load
Leakage current:	1.4 mA	At 240 Vac
Power line transient:	MOV directly after the fuse	

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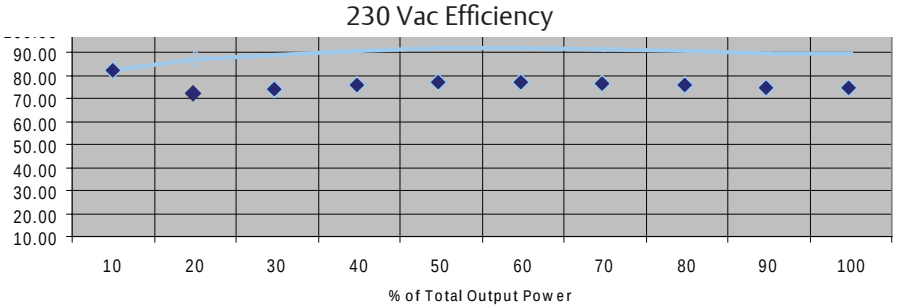

Output		
Output rating	48 V @ 62.0 A 5 Vsb @ 3.0 A	180 - 264 Vac
	48 V @ 29.4 A 5V @ 3 A	90 - 140 Vac
Set point	48 V	Programmable 96-117% through I²C serial bus
Total regulation range	48 V ± 5% 5 Vsb ± 4%	Line/load/transient when measured at output connection
Rated load	3000 W maximum @ 200 Vac Input 1500 W maximum @ 110 Vac Input	No derating over operating temp range
Minimum load	48 V @ 0.0 A 5 Vsb @ 0.0 A	No loss of regulation
Output noise	480 mV max P-P 100 mV max P-P	48 V output 5 Vsb output Measured with a 0.1µF Ceramic and 10 µF Tantalum capacitor on any input
Output voltage overshoot	± 5% maximum	Nominal Voltage Setting
Transient response	5% maximum deviation	50% load step @ 1 A/us Step load valid between 10% to 100% of output rating.
Max units in parallel	Up to 4	Total power in 1U 19" rack is 12 KW
Short circuit protection	120% - 130% of rated output	Output to return
Output isolation	Per POE specs	>2000 Vac
Forced load sharing	Within 10% of all shared outputs	Digital sharing control
Over current protection (OCP)	120% to 130% 110% to 140%	48 V output 5 Vsb output
Over voltage protection (OVP)	110% to 133% 110% to 125%	48 V output 5 Vsb output
Over temperature protection	10 - 15 deg C above safe operating area	Both PFC and output converter monitored 5 Vsb will operate under overtemperature condition. Built in hysteresis

Environmental Specifications

Vibration/Shock:	Non-operational 5G Sine sweep from 5 Hz to 500 Hz, dwelling at resonant frequencies for 1 hour each
Operating temperature:	-10 ° to +40 °C
Storage Temperature:	-40 ° to +85 °C
Cooling	External fans with Fan Fail and Fan Speed control
Operating Relative Humidity:	5% to 95% non-condensing
Storage Relative Humidity:	5% to 95% non-condensing
Operating Altitude	Up to 10,000 feet above sea level
Storage Altitude:	Up to 30,000 feet above sea level
RoHS Compliant:	Yes

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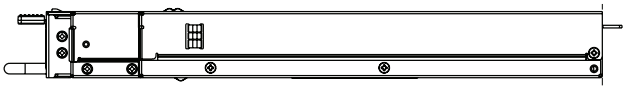
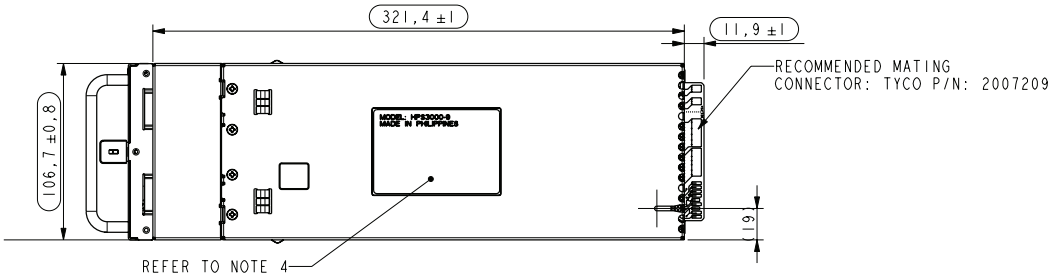
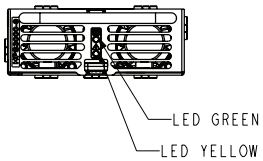
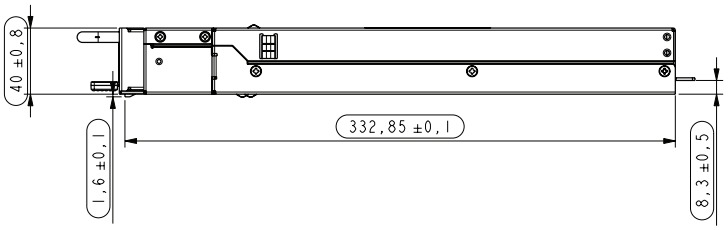
Module Information

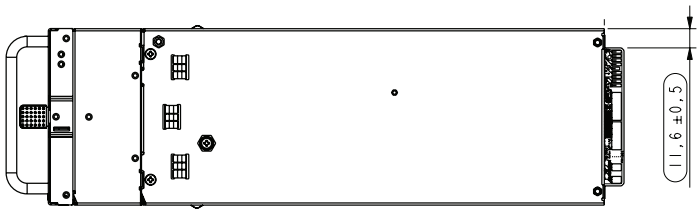
(All units in mm)











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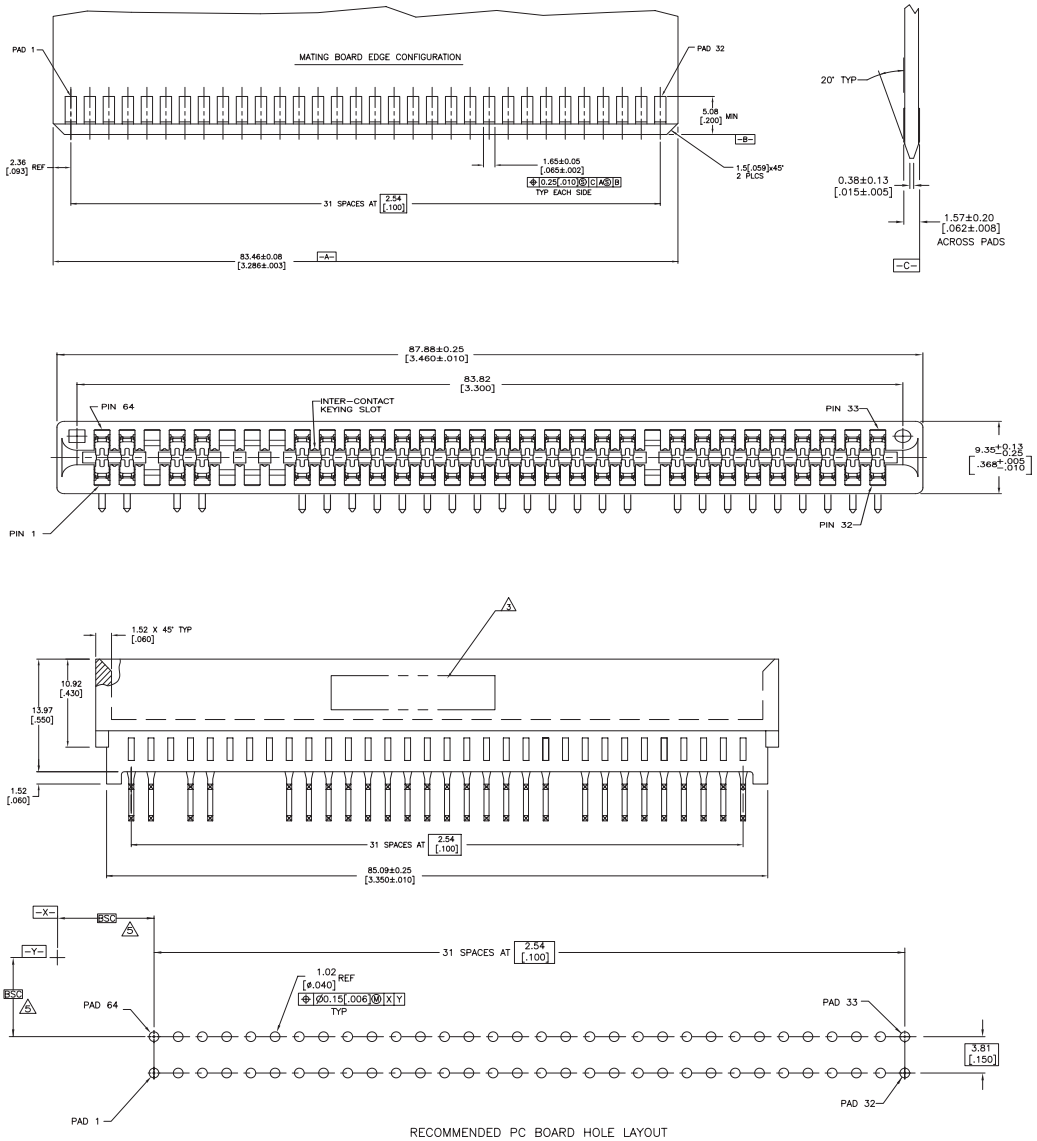
Pin Assignments

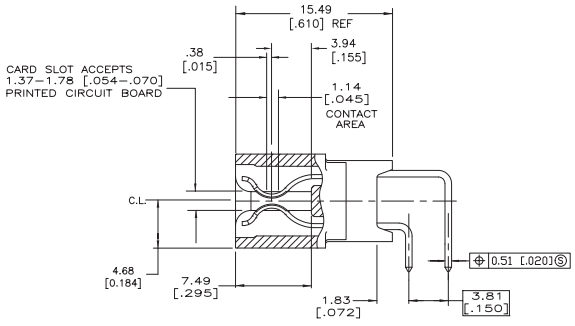
Bottom

Pin	
1	AC LINE
2	AC LINE
3	n.c.
4	AC NEUTRAL
5	AC NEUTRAL
6	n.c.
7	n.c.
8	n.c.
9	+48 Vdc out
10	+48 Vdc out
11	+48 Vdc out
12	+48 Vdc out
13	+48 Vdc out
14	+48 Vdc out
15	+48 Vdc out
16	+48 Vdc RTN
17	+48 Vdc RTN
18	+48 Vdc RTN
19	+48 Vdc RTN
20	+48 Vdc RTN
21	+48 Vdc RTN
22	+48 Vdc RTN
23	n.c.
24	V_STBY
25	Reserved
26	PRESENT#
27	DCOK/PWOK#
28	SDA
29	HVCC
30	PSON#
31	#ALERT
32	ISHARE

Top

Pin	
64	AC LINE
63	AC LINE
62	n.c.
61	AC NEUTRAL
60	AC NEUTRAL
59	n.c.
58	n.c.
57	n.c.
56	+48 Vdc out
55	+48 Vdc out
54	+48 Vdc out
53	+48 Vdc out
52	+48 Vdc out
51	+48 Vdc out
50	+48 Vdc out
49	+48 Vdc RTN
48	+48 Vdc RTN
47	+48 Vdc RTN
46	+48 Vdc RTN
45	+48 Vdc RTN
44	+48 Vdc RTN
43	+48 Vdc RTN
42	n.c.
41	SYS_GND
40	Reserved
39	ACOK#
38	SMBUS_ALERT_OUT
37	SCL
36	A2
35	PSKILL
34	A1
33	A0





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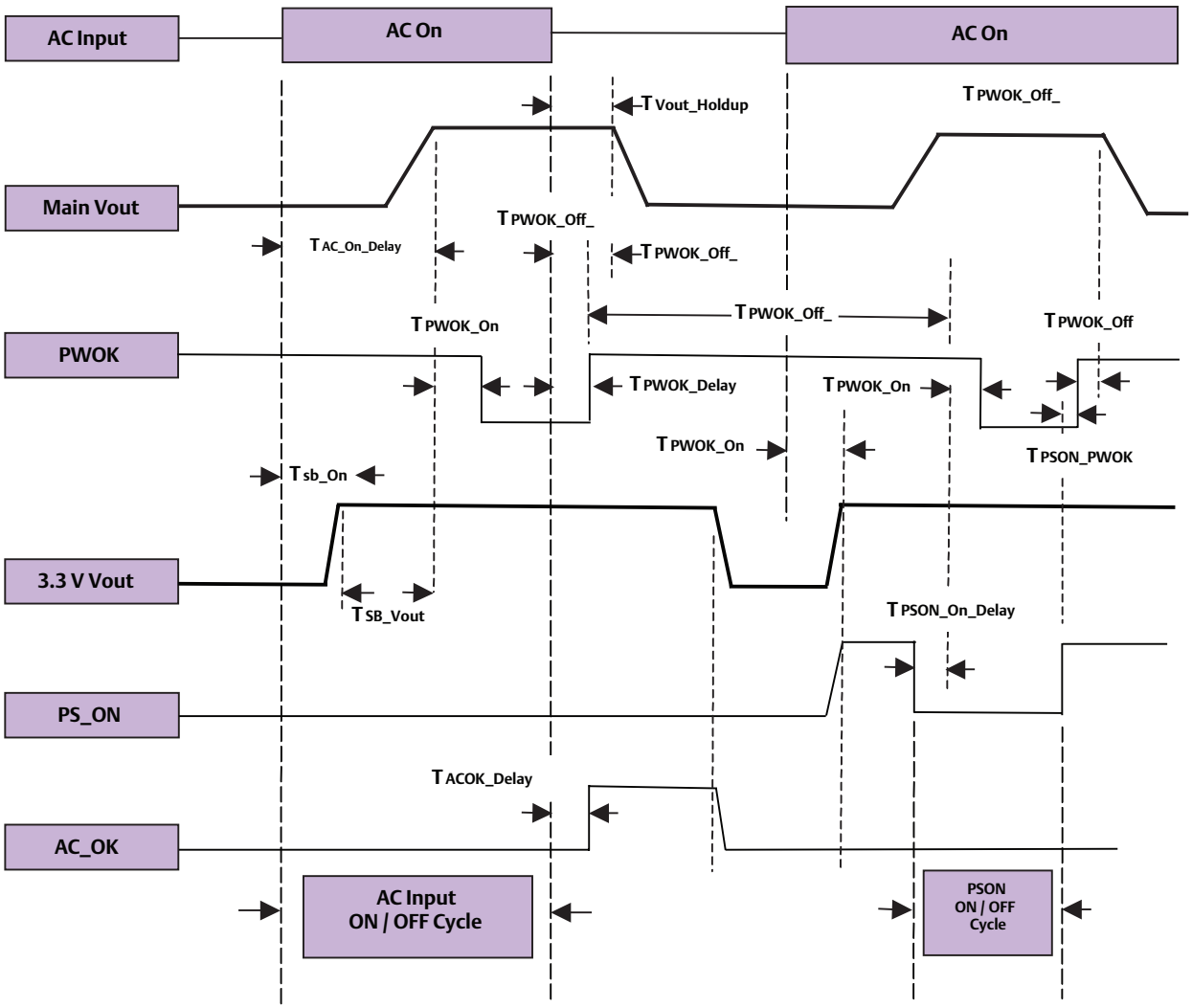
Timing Diagram



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Timing Signal Definitions

Turn ON/OFF Timing				
Item	Description	Min	Max	Units
Tvout_rise	48 V Output rise time	5	300	msec
Tsb_on_delay	Delay from AC being applied to 5 Vsb being within regulation.		1500	msec
Tac_on_delay	Delay from AC being applied to all output voltages being within regulation.		2000	msec
Tvout_holdup	Time all output voltages, including 5 Vsb, stay within regulation after loss of AC.	10		msec
Tpwok_holdup	Delay from loss of AC to de-assertion of PWOK	5		msec
Tpson_on_delay	Delay from PSON# active to output voltages within regulation limits.	5	400	msec
Tpson_pwok	Delay from PSON# de-active to PWOK being de-asserted.		50	msec
Tacok_delay	Delay from loss of AC input to de-assertion of ACOK#.	10		msec
Tpwok_on	Delay from output voltages within regulation limits to PWOK asserted at turn on.	100	1000	msec
Tpwok_off	Delay from PWOK de-asserted to 48 V dropping out of regulation limits.	1	1000	msec
Tpwok_low	Duration of PWOK being in the de-asserted state during an off/on cycle using AC or the PSON# signal.	100		msec
Tsb_vout	Delay from 5 Vsb being in regulation to 48 V being in regulation at AC turn on.	50	2000	msec

Signals and Controls - All Models

PSON

The PSON# signal is required to remotely turn on/off the power supply. PSON# is an active low signal that turns on the 48 V power rail. When this signal is not pulled low by the system, or left open, the 48 V output turns off. The 5 Vsb output remains on. This signal is pulled to a standby voltage by a pull-up resistor internal to the power supply. The power supply fan(s) shall operate at the lowest speed.

PSON# Signal Characteristic		
Signal Type	Accepts an open collector/drain input from the system. Pulled-up to the 5 Vsb located in power supply.	
PSON# = Low	ON	
PSON# = Open	OFF	
	MIN	MAX
Logic level low (power supply ON)	0 V	0.4 V
Logic level high (power supply OFF)	2.40 V	3.40 V
Source current, Vpson = low	--	4 mA
Power up delay: Tpson_on_delay	5 msec	400 msec

PWOK# (Power Good)

PWOK# is a power good signal and will be pulled LOW by the power supply to indicate that both the outputs are above the regulation limits of the power supply. When any output voltage falls below regulation limits or when AC power has been removed for a time sufficiently long so that power supply operation is no longer guaranteed, PWOK will be de-asserted to a HIGH state. The start of the PWOK# delay time shall be inhibited as long as the 48 V output is in current limit or the 5 Vsb output is below the regulation limit.

PSON# Signal Characteristic		
Signal Type	Open collector/drain output from power supply. Pullup to 5 Vsb external to the power supply.	
PWOK = High	ON	
PWOK = LOW	OFF	
	MIN	MAX
Logic level low voltage, Isink=4mA	0 V	0.8 V
Logic level high voltage, Isource=200µA	2.0 V	4.80 V
Sink current, PWOK = low		4 mA
Source current, PWOK = high		2 mA
PWOK delay: $T_{pwok\ on}$	100 msec	1000 msec
PWOK rise and fall time		100 µsec
Power down delay: $T_{pwok\ off}$	1 msec	1000 msec

Power Supply Present Indicator (PRESENT#)

The PRESENT# signal is primarily used to provide a mechanism by which the host system can sense the number of power supplies physically present (operational or not). This pin is connected to ground in the power supply.

AC INPUT Present Indicator (ACOK#)

The AC OK# signal is used to indicate presence of AC input to the power supply. This signal shall be connected to 5 Vsb through a resistor on the host system side. A logic “Low” level on this signal shall indicate AC input to the power supply is present. A Logic “High” on this signal shall indicate a loss of AC input to the power supply.

Table 12 ACOK# Signal Characteristics		
Signal Type	Pull-up to 5 Vsb through a resistor in the host system.	
PRESENT# = Low	Present	
PRESENT# = High	Not present	
	MIN	MAX
Logic level low voltage, Ising=4mA	0 V	0.8 V
Logic level high voltage, Isink=50µA	2.0 V	4.80 V
Sink current, PRESENT# = Low		4 mA
Source current, PRESENT# = High		50 µA

LED INDICATORS

There will be a green POWER LED (PWR) to indicate that AC is applied to the PSU and standby voltage is available when blinking. This same LED should go solid when the 48 V output is enabled and operational.

There will be an Amber Power Supply Fail LED (FAIL) to indicate that the power supply has failed and a replacement of the unit is necessary. Faults including UVP, OVP, OTP, or Fan Fail when PSON# is asserted "Logic Low" shall cause the amber LED to turn on. The LED can be turned off by recycling PSON# signal or by an AC power interruption more than 1 second. The LED shall be off when PSON# is not asserted "Logic Low". Refer to table 13 for conditions of the LED's:

Table 13
LED Indicators

Power Supply Condition	Power LED (GREEN)	Fail LED (AMBER)
No AC power to PSU	OFF	OFF
AC present / Standby Output On	Blinking	OFF
Power supply 48 V output ON and OK	ON	OFF
Power supply failure (includes overvoltage, overtemperature)	OFF	ON
Current limit	ON	Blinking

MTBF

The.power.supply.has.a.minimum.MTBF.of.300K.hours.using.the.Bell.core.332,.issue.6.speci.cation.@.25.°C.and.40.°C,.ambient,.at.full.load...With.the.power.supply.installed.in.a.system.in.a.25.°C.ambient.environment.and.operating.at.full.load,.capacitor.life.shall.be.10.years,.minimum.for.ALL.electrolytic.capacitors.contained.within.this.power.supply..The.power.supply.shall.demonstrate.a.MTBF.level.of.>.500,000.hours.

Quality Assurance

Full QAV testing shall be conducted in accordance with our Standards with.reports available upon. equest.

Warranty

Provider shall warrant the power supply to be free of defectsin.materials and workmanship for a minimum period of two years from.the date of shipment, when.operated within speci.cations.
The warranty shall be fully transferable to the end owner of the equipment.owered by the supply.

Ordering Information

Model Number	Main Output	Main Output Current	Standby Output	Standby Current
3000-9	48 Vdc	62.0 A	5.0 V	3.0 A