

AC265W-38.7V-PBF

(115Vac, 47-800Hz INPUT)

265W, 38.7V OUTPUT

AIRBORNE PFC POWER SUPPLY

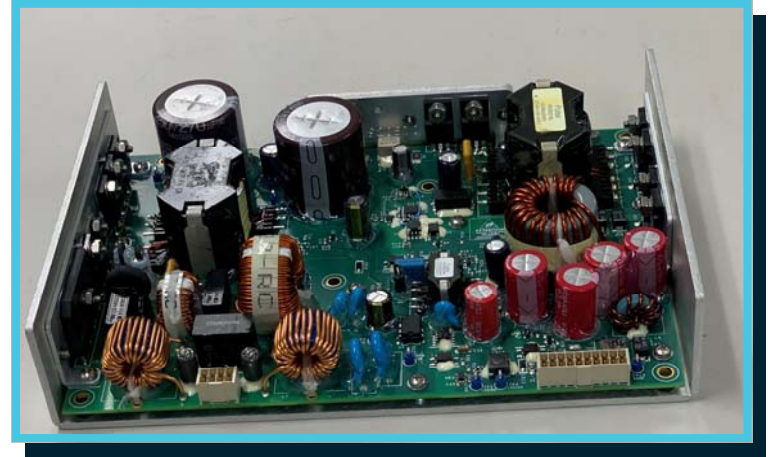


Providing one isolated 38.7V output voltage and two low level ~12V outputs and up to 265W continuous output power, the **AC265W-38.7V-PBF** is optimized for wide frequency RTCA/DO-160G airborne applications. Overall supply efficiency exceeds 84% at full rated output load. The **AC265W-38.7V-PBF** is capable of providing up to 50W output power during momentary input AC interrupts lasting 200mSec or more.

The main 38.7Vdc output can supply short term (5-10 seconds) peak loads up to 300W.

Weighing approximately 35oz, the **AC265W-38.7V-PBF** is housed within a sheetmetal enclosure suitable for flush mounting within an upper unit level chassis. Outline dimensions are 7.67" x 5.30" and overall supply height is 1.60". Interconnection is accomplished using two Samtec IPL1 connectors.

The **AC265W-38.7V-PBF** is designed and manufactured to stand-up to the harsh operating environments encountered in today's aircraft installations. Incorporating multiple layers of built-in protection features; including overcurrent, overvoltage and overtemperature; safe and reliable operation is assured for each and every application.



FEATURES

	Three isolated outputs: +38.7V, +12.V_ISO, +12.4V
	Meets both RTCA/DO-160G, section 16, and Airbus ABD0100.1.8.1 issue C for power factor and input current harmonic distortion levels over the wide frequency operating range (360Hz – 800Hz)
	Complies with RTCA/DO-160G for conducted emissions, susceptibility and power input (sect 16), see note 3
	Efficiency: > 84% at full rated load
	Wide input range: 92 – 134Vac, 320-800Hz
	Active inrush current limiting: 10Apk
	Size: 7.67" x 5.30" x 1.60"; Weight: less than 35 ounces
	Independent over-current and over-voltage protection each output
	PFC output overvoltage protection (internal 360Vdc PFC output)
	Over-temperature protection (100°C frame temp)
	Wide operating temperature range (-55°C to +70°C)
	MTBF: 289,000 Hrs, RIAC 217Plus, Aic category, 55°C case temperature, 65%DC, 2190 Cycles/ year

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OUTPUT TABLE

PARAMETER	OUTPUT VOLTAGE			NOTES
Voltage Regulation	38.7V \pm 3%	+12.8V_ISO \pm 10%	+12.4V \pm 10%	2
Output Current	6.85A	200mA	20mA	4
Full Load	265W	2.6W	25mW	4
Minimum Load	0A	0A	0A	
Peak Load (5—10 seconds)	310W	--	--	4
Pk-pk Ripple + Noise (20MHz)	774mVpp	256mVpp	248mVpp	5
Overcurrent Trip-point	9.5A	450mA	50mA	1

Notes:

- 38.7V output is foldback current limited using pulse retry with ~160mSec on/ 2Sec off. +12.8V_ISO output is foldback current limited. +12.4V output is constant current limited. Each will auto-recover into full rated load when fault conditions clears.
- Regulation for the 38.7V output is +/-3% of the programmed set point. Regulation for low current secondaries is +/-10% of nominal values.
- Requires external filter installed on power lines for full compliance; contact PPI engineering for details
- Attaching supply frame to external metal and forced air cooling may be required.
- Measured with bayonet grounding and 20MHz BW.

APPLICABLE SPECIFICATIONS

	RTCA/DO-160G, section 4, altitude/ temperature (operating) to 55,000 feet, category D2 equipment
	RTCA/DO-160G, section 6, humidity (operating) category B
	RTCA/DO-160G, section 7, shock (operating) category B & E applied in 6 directions
	RTCA/DO-160G, section 8, vibration (operating) category S curve E and category H curve R+
	RTCA/DO-160G, section 15, magnetic effect, category Z
	RTCA/DO-160G, section 16, power input requirements for 115V - AC input, category A(WF) equipment
	RTCA/DO-160G, section 17, voltage spike, category B equipment
	RTCA/DO-160G, section 18, conducted susceptibility, category K equipment (when embedded in LRU)
	RTCA/DO-160G, section 19, induced signal susceptibility, category CW equipment (when embedded in LRU)
	RTCA/DO-160G, section 20, conducted and radiated susceptibility, category RR equipment (when embedded in LRU)
	RTCA/DO-160G, section 21, conducted and radiated emissions, category M equipment, with external power line EMI filter
	Operating temperature: -55°C to +70°C, forced air and/ or external heatsinking may be required
	Storage temperature: -55°C to +100°C



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INTERCONNECTION

SUPPLY SIDE CONNECTORS AND PIN-OUTS

Connector	J1	J2
Pin #	Samtec IPL1-104-01-S-D-K	Samtec IPL1-110-01-S-D-K
1	Line	38.7V_RTN
2	n/c	38.7V_RTN
3	n/c	38.7V_RTN
4	Neutral	38.7VDC
5	Line	38.7VDC
6	n/c	38.7VDC
7	n/c	+12.4VDC
8	Neutral	38VST
9	--	+12.8V_ISO
10	--	ISO_GND
11	--	38.7V_RTN
12	--	38.7V_RTN
13	--	38.7V_RTN
14	--	38.7VDC
15	--	38.7VDC
16	--	38.7VDC
17	--	38UVS
18	--	Chassis Gnd
19	--	SHEDLS
20	--	RSTS



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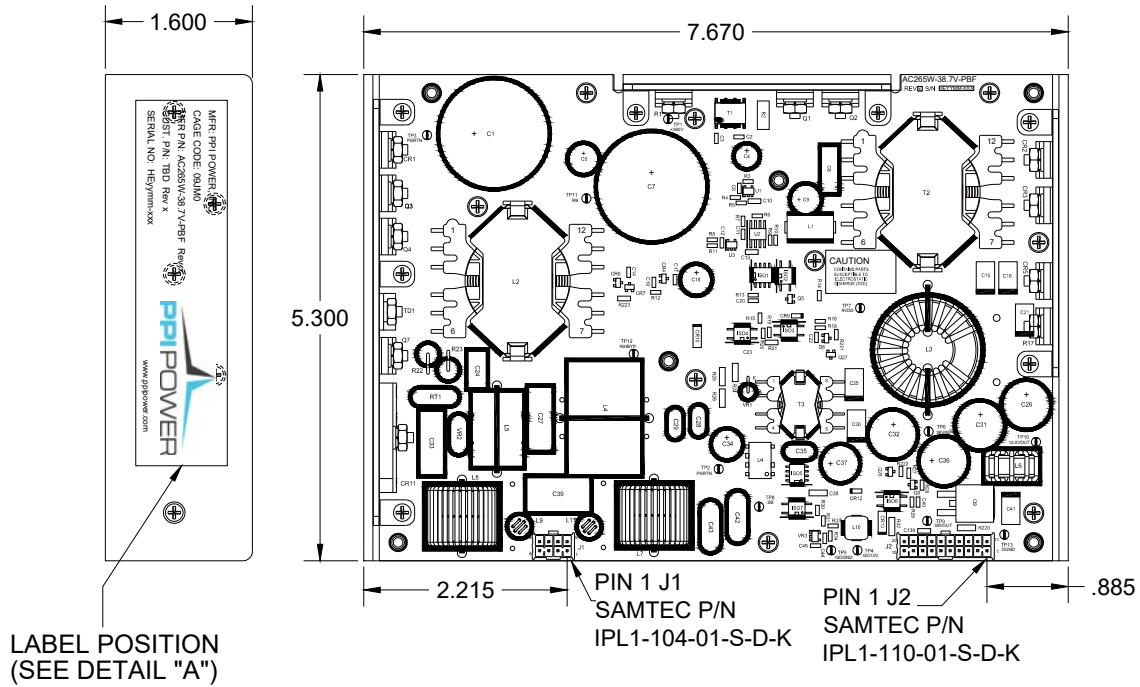
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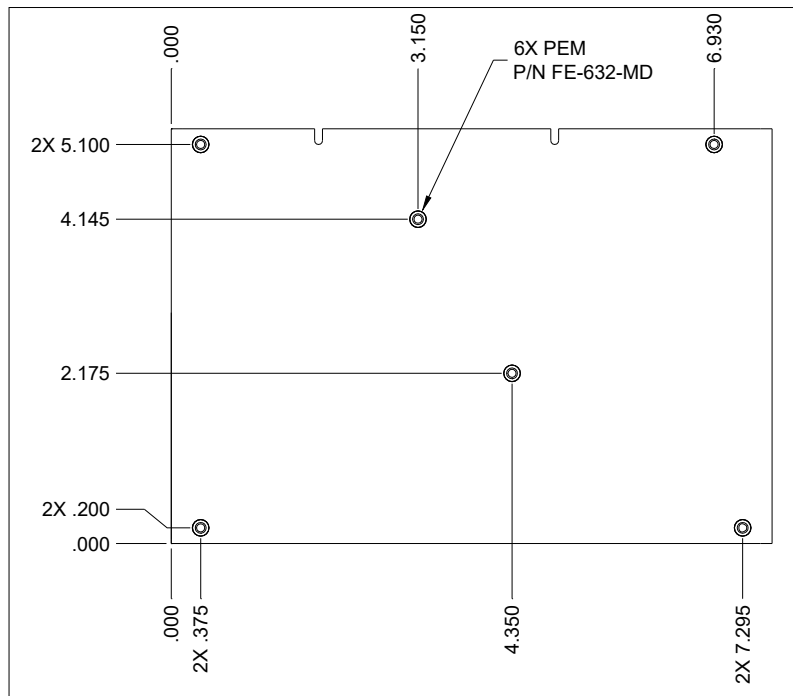
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MECHANICAL DIAGRAM



DETAIL DIMENSIONS MOUNTING HOLES



NOTE: DETAILED MECHANICAL AND SOLID WORKS DRAWING AVAILABLE UPON REQUEST



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ELECTRICAL SPECIFICATIONS

Unless otherwise specified the following test conditions apply: $T_a = 25^{\circ}\text{C}$, constant active load applied to output.
 $V_{in} = 115\text{Vrms}$, 360Hz–800Hz, <1.25% sinusoid.

INPUT CHARACTERISTICS

PARAMETER	AC265W-38.7V-PBF	REMARKS	NOTES
INPUT VOLTAGE RANGE	92-134Vrms	Complies with normal / abnormal input voltages per DO-160G, sect 16	2
MUST START VOLTAGE	92Vrms minimum, 320Hz - 800Hz 104Vrms minimum, 47Hz - 320Hz	Supply will start and remained enabled for input voltage in the range of 92Vrms < V_{in} < 134Vrms at 320 - 800Hz line frequency	2
INPUT FREQUENCY RANGE	47 – 800Hz	Reduced harmonic distortion performance below 360Hz	2
EFFICIENCY (FULL LOAD)	84.8% typical at 115Vrms input 83% minimum at 115Vrms input	Full rated load (265W)	2
EFFICIENCY (NOMINAL LOAD)	83% typical at 115Vrms input 82% min at 115Vrms input	Nominal rated load (175W)	2
LEAKAGE CURRENT	< 5mArms	AC line / neutral to chassis at 115Vrms / 400Hz.	1
INRUSH CURRENT	< 7A _{pk} typical, 10A _{pk} max	Cold or warm start	2
START-UP TIME	< 1 Sec	Outputs within proper regulation	2
INDIVIDUAL HARMONICS AC CLEAN ($V_{thd} < 1.25\%$)	EVEN: <1% I_f / n ($n < 10$) EVEN: <0.1% I_f ($n \geq 10$) ODD: <30% I_f / n ODD TRIPLENS:<15% I_f / n	I_f = fundamental current $V_{thd} < 1.25\%$ n = order of harmonic (1 - 99) > 175W output load, with or without ext filter Harmonics < 10mA disregarded	1
INDIVIDUAL HARMONICS DISTORTED INPUT ($V_{thd} > 10\%$)	EVEN: <1% $I_f / n + 1.25V_n$ ($n < 10$) EVEN: <0.1% $I_f + 1.25V_n$ ($n \geq 10$) ODD: <30% $I_f / n + 1.25V_n$ ODD TRIPLENS:<15% $I_f / n + 1.25V_n$	I_f = fundamental current $V_{thd} > 10\%$ (clipped method), n = order of harmonic (1 - 99) V_n = corr input voltage harmonic. > 175W output load, with or without ext filter Harmonics < 10mA disregarded	1
POWER FACTOR	0.968 minimum leading 0.981 typical at 800Hz, $P_{out} > 175\text{W}$	Improves with lower line frequency and higher output power	1, 3
CONDUCTED EMISSIONS	RTCA/DO-160G	Section 21, category M	1, 3
QUIESCENT POWER	8W typical	$P_{out} = 0\text{W}$	2



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INPUT CHARACTERISTICS (Cont)

PARAMETER	AC265W-38.7V-PBF	REMARKS	NOTES
STORAGE TEMP RANGE	-55°C TO +100°C	Non operational	1
OPERATING TEMP RANGE	-55°C TO +70°C	May require external airflow or heatsink to assure case temperature does not exceed 100°C	1
OVERTEMPERATURE SHUTDOWN	100°C +/- 5°C	Supply is inhibited at or above 100°C, auto restart at ~ 80°C case temperature	1
RSTS-L (Reset Supply - L)	38.7V output is disabled when RSTS-L is pulled low to ISO_GND and enabled when left floating. +12.8V_ISO and +12.4V outputs are unaffected by this signal.	Clamped to +12.8V_ISO. 1kohm series resistance. ISO_GND referenced. 38.7V output is discharged to <5V within 2 seconds of assertion of RSTS-L	2
DIELECTRIC WITHSTAND INPUT TO CHASSIS	1500Vac	No arcing or damage for 60-second test duration (8mArms max leakage)	2
DIELECTRIC WITHSTAND INPUT TO ANY OUTPUT	1500Vac	No arcing or damage for 60-second test duration (8mArms max leakage)	2
INSULATION RESISTANCE 38.7V_RTN TO ISO_GND	100Mohm min at 500Vdc	No arcing or damage for 60-second test duration (5uAdc maximum)	1
INSULATION RESISTANCE ANY OUTPUT TO CHASSIS	100Mohm min at 500Vdc	No arcing or damage for 60-second test duration (5uAdc maximum)	2

Notes:

1. Ensured by design, not 100% tested in production
2. 100% tested for specification compliance in production
3. Requires external filter (differential and common mode) installed on power lines for full compliance, contact PPI Engineering for details
4. Attaching supply frame to external metal and forced air cooling may be required when operating at full load
5. 38.7V output is 100% tested for specification compliance in production. +12.4V and +12.8V_ISO outputs are ensured by design



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OUTPUT CHARACTERISTICS

PARAMETER	AC265W-38.7V-PBF	REMARKS	NOTES
RATED OUTPUT POWER	265W	Continuous	2, 4
PEAK RATED OUTPUT POWER	310W	Short term durations (10 seconds). Minimum efficiency is 82% at peak load of 355Wout	2, 4
OUTPUT VOLTAGE TOLERANCE	38.7V \pm 3%, +12.4V \pm 10%, +12.8V_ISO \pm 10%	No load to full load, See OUTPUT TABLE (sht 2)	2
OUTPUT OVERCURRENT THRESHOLD	38.7V: 9.5A +12.4V: 50mA +12.8V_ISO: 450mA	38.7V output is foldback current limited using pulse retry with ~160mSec on/ 2Sec off. +12.8V_ISO output is foldback current limited. +12.4V output is constant current limited. Each will auto-recover into full rated load when fault conditions clears. No damage will occur to supply during indefinite output short circuit conditions	2
TEMPERATURE STABILITY COEFFICIENT	0.05% / $^{\circ}$ C	Output voltage variation with temperature (500uV / $^{\circ}$ C)	1
OUTPUT RIPPLE + NOISE (pk-pk)	38.7V: <80mVpp typ, <774mVpp max +12.4V/ +12.8V_ISO: <248mVpp/ <256mVpp max	20MHz Bandwidth using bayonet grounding	2
MINIMUM OUTPUT LOAD	0A	No output load required for supply stability or proper output regulation	2
LINE REGULATION	< 0.1%	Output deviation for \pm 20% step change in input voltage	1
LOAD REGULATION (TRANSIENT LOAD RECOVERY)	Main 38.7V output remains within regulation limits	50% step change in output load. Full load to half load or half load to full load. 10uSec rise/fall time	2
HOLD-UP TIME	200mSec @ Pout = 50W	Outputs ride through during momentary loss of AC input power	2
MAXIMUM ALLOWABLE EXT OUTPUT CAPACITANCE	38.7V: 1500uF +12.4V: 47uF +12.8V_ISO: 220uF	Specified in order to assure proper start up and auto recovery into full rated load after entering overcurrent protection	1
MAXIMUM OUTPUT RISE TIME	38.7V: 100mSec +12.4V: 50mSec +12.8V_ISO: 50mSec	10-90%. No load to full load with no external output capacitance	5



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OUTPUT CHARACTERISTICS (Cont)

PARAMETER	AC265W-38.7V-PBF	REMARKS	NOTES
OUTPUT OVERVOLTAGE PROTECTION (non-latching)	+38.7V output is limited to 110% of maximum output set point	Pulse-by-pulse protection, main converter remains enabled. 4mSec fault to activation delay, auto-restart once fault condition clears. +12.4V and +12.8V_ISO outputs remain enabled	1
OUTPUT OVERVOLTAGE PROTECTION (non-latching)	+38.7V output limited to 120% of maximum output set point	Main converter enters pulse-retry operation as long as fault persists. +12.4V and +12.8V_ISO outputs remain enabled. Auto restart when fault clears	1
PFC 360Vdc OUTPUT OVERVOLTAGE PROTECTION (non-latching)	419V \pm 5%	PFC converter is disabled upon detection of 360Vdc output measuring > 419Vdc. PFC converter will enter pulse-retry operation until fault clears	1
38UVS (38.7V Undervoltage Status)	Status signal indicating 38.7V is operating above minimum regulation limit.	Pulled low within supply as long as 38.7V is operating above minimum regulation limit. Asserts high impedance if 38.7V output is detected below normal regulation limit (~7.5% low) through 100 ohm series resistance. 6.81k pull-up to +12.4V. 38.7V_RTN referenced	2
38VST (38.7V Normal Regulation Status)	Status signal indicating 38.7V is operating within normal regulation limits.	Pulled low within supply as long as 38.7V is within normal limits. 2.05kohm series resistance. 38.7V_RTN referenced	2
SHECLS (Shed Load State)	Status signal indicating input AC is not valid.	Provides open state as long as input AC is in valid operating range. Provides +12.8V_ISO through 6.81kohm series resistance if AC input is invalid for longer than 10mSec. ISO_GND referenced	2

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4. Attaching supply frame to external metal and forced air cooling may be required when operating at full load
5. 38.7V output is 100% tested for specification compliance in production. +12.4V and +12.8V_ISO outputs are ensured by design

