

70170AC-24V

(115Vac, 47- 800Hz Input)

170W, 24V Single Output,
Airborne PFC Power Supply



Targeting Point-of-Load (POL) applications, the **70170AC-24V** provides a single 24Vdc output at up to 7.1A continuous output current. It meets the most stringent airborne requirements including those for variable frequency 115Vac generator systems over the wide frequency range of 360-800Hz and RTCA/DO-160D category M emissions. Efficiency exceeds 80% at ½ to full output load helping to keep internal heat dissipation to a minimum. The **70170AC-24V** is capable of providing uninterrupted ride-through at full output load during momentary input AC brown-out conditions for up to 200mSec. Standard protection features are built-in in to assure years of fault-tolerant and reliable operation in the harshest environments.

Weighing less than 36 ounces, the **70170AC-24V** is housed in an aluminum enclosure with outer dimensions of 8.0" x 4.75" x 1.4". The top cover is perforated; the lower U-Chassis accepts five #4 screws to facilitate system mounting. Interconnection is accomplished using a single Samtec right angle connector.

70170AC-1 SHOWN



FEATURES

| | |
|--|--|
| | Meets both RTCA/DO-160D, section 16, notice 2 and Airbus ABD0100.1.8 issue D for power factor and input current harmonic distortion levels over the wide frequency operating range (360Hz – 800Hz) |
| | Efficiency: 80% minimum: ½ to full rated output load, all input (line) conditions |
| | Wide input range: 97Vrms – 134Vrms, 47 – 800Hz |
| | Complies with RTCA/DO-160D for conducted emissions, susceptibility and power input (section 16) |
| | Active inrush current limiting: 7Apk typical, 12Apk maximum |
| | Size: 8.0" x 4.75" x 1.4", weight: less than 32 ounces |
| | Single output: 24Vdc at up to 170W output power |
| | Overcurrent protection with foldback limiting |
| | Three layers of 24Vdc output overvoltage protection |
| | PFC output overvoltage protection with automatic restart (internal 360Vdc PFC output) |
| | Over-temperature shutdown with automatic restart (at or above 100°C) |
| | Under-temperature inhibit (at or below -20°C) |
| | AC status line (TTL) |
| | Output enable line (TTL) |
| | MTBF: 25,000 Hours, Aic category, 30°C case temperature (MIL-HDBK-217F) |

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PERFORMANCE SUMMARY

| PARAMETER | VALUE (TYPICAL) |
|--|-----------------|
| Voltage regulation | +24Vdc +/-2% |
| Output current | 7.1A |
| Minimum load | 60mA |
| Pk-Pk Ripple + Noise (20MHz) | 30mVpp |
| Efficiency | 82% |
| Output ride-through / full load | 200mSec |
| Output overcurrent threshold (1) | 7.8A |
| Output overvoltage trip-point "soft" protection | 27.0V |
| Output overvoltage trip-point "hard" protection | 30.9V |
| Output overvoltage "crowbar" activation set point | 34.0V |
| PFC output overvoltage trip-point | 420V |
| MTBF (Aic, 30°C case) | 25,000 Hours |

Notes:

1. Foldback current limited

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ELECTRICAL SPECIFICATIONS

Unless otherwise specified the following test conditions apply: Ta = 25°C, constant active load applied to output, Vin = 115Vrms, 360Hz to 800Hz, <1.25% sinusoid.

INPUT CHARACTERISTICS

| PARAMETER | 70170AC-24V | REMARKS | NOTES |
|---|--|---|-------|
| INPUT VOLTAGE RANGE | 97 – 134Vrms | Complies with normal / abnormal input voltages per DO-160D, section 16 | 2 |
| INPUT UNDERVOLTAGE DISABLE | 95 +2 / -3 Vrms | Supply is inhibited when input is detected below 92Vrms | 2 |
| INPUT FREQUENCY RANGE | 47 – 800Hz | Reduced distortion performance below 360Hz | 2 |
| EFFICIENCY | 80% minimum | 50% to 100% Output Load (85W to 170W); 82% typical | 2 |
| LEAKAGE CURRENT | < 5mArms | AC Line / Neutral to Chassis at 115Vrms / 400Hz | 1 |
| INRUSH CURRENT | <12.2Apk maximum | Cold or Warm Start; 7Apk typical | 2 |
| TOTAL HARMONIC DISTORTION (INPUT CURRENT) | < 3.5% | 50% to 100% Output Load (85W to 170W) | 2 |
| INDIVIDUAL HARMONICS AC CLEAN | EVEN: <1% If / n (n < 10) EVEN: <0.1%If (n ≥ 10) ODD: <30% If / n ODD TRIPLENS:<15% If /n | If = Fundamental Current Vthd < 1.25%, n=1 through 99 n = order of harmonic 50% to 100% Output Load (85W to 170W) | 1 |
| INDIVIDUAL HARMONICS DISTORTED INPUT | EVEN: <1% If / n + Vn (n < 10) EVEN: <0.1%If + Vn (n ≥ 10) ODD: <30% If / n + Vn ODD TRIPLENS:<15% If /n+Vn | If = Fundamental Current Vthd > 5%, n=1 through 99 Vn = corresponding input voltage harmonic 50% to 100% Output Load (85W to 170W) | 1 |
| POWER FACTOR | 0.90 min | Pout > 50W | 2 |
| CREST FACTOR (CURRENT) | 1.314 – 1.514 | Ratio of Peak / RMS | 1 |
| START-UP TIME | < 500mSec | Outputs within regulation | 2 |
| CONDUCTED EMISSIONS | RTCA/DO-160D | Category M | 1 |
| STORAGE TEMPERATURE RANGE | -55°C to +100°C | Non-operational | 1 |
| OPERATING TEMPERATURE RANGE | -15°C to +70°C | Supply in inhibited at or below -20°C Auto Restart | 1 |

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INPUT CHARACTERISTICS—CONTINUED

| PARAMETER | 70170AC-24V | REMARKS | NOTES |
|--------------------------|--|---|-------|
| OUTPUT ENABLE SIGNAL - L | TTL active LOW signal; requires a TTL HIGH (> 5mA drive current) to disable supply | Secondary referenced; supply will disable within 1 second of asserting high level logic state | 1 |
| OVERTEMPERATURE SHUTDOWN | 100°C +/- 4°C | Supply is inhibited at or above 100°C Auto Restart at ~ 80°C case temp | 1 |

Notes:

1. Ensured by design, not 100% tested in production.
2. 100% tested for specification compliance in production.

OUTPUT CHARACTERISTICS

| PARAMETER | 70170AC-24V | REMARKS | NOTES |
|------------------------------------|--|--|-------|
| RATED OUTPUT POWER | 170W | Continuous | 2 |
| OUTPUT VOLTAGE | 24Vdc +/- 2% typical, 24Vdc +/-5% maximum | | 2 |
| OUTPUT OVERCURRENT THRESHOLD | 7.8A typical, 8.3A maximum | Output voltage will foldback, auto-recovery | 2 |
| TEMPERATURE STABILITY COEFFICIENT | 0.01% / °C | Output voltage variation with temperature | 1 |
| OUTPUT RIPPLE + NOISE | 150mVpp | 150mVpp maximum; 30mVpp typical. 20MHz bandwidth | 2 |
| LINE REGULATION | <0.5% | 24V output deviation for +/- 20% step change in input voltage | 1 |
| LOAD REGULATION | Output remains in regulation | 50% step change in output load | 1 |
| MINIMUM LOAD | 60mA | 60mA minimum for proper output regulation. Can safely unload the output – supply may not regulate within -5% limit when output is unloaded at high line | 2 |
| HOLD-UP TIME | 200mSec minimum | | 2 |
| ISOLATION VOLTAGE INPUT TO CHASSIS | 1500Vac, 60Hz | No arcing or damage for 60-second test duration (8mArms max leakage) | 1 |
| ISOLATION VOLTAGE INPUT TO OUTPUT | 1500Vac, 60Hz | No arcing or damage for 60-second test duration (8mArms max leakage) | 1 |
| DCPWRGOOD-L | 0.5V maximum when output is within proper regulation | TTL Level, 16mA max sink current | 2 |

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OUTPUT CHARACTERISTICS—CONTINUED

| PARAMETER | 70170AC-24V | REMARKS | NOTES |
|---|---|---|-------|
| ACPWRFAIL-L | 0.5V maximum when input is at or below 92Vrms | TTL Level, 16mA max sink current | 2 |
| 24V CURRENT SENSE | 500mV +/-10% per Amp | Valid for all Iout > 0.5A | 1 |
| OUTPUT OVERVOLTAGE PROTECTION (SOFT) | 27.0V set-point | Pulse by pulse protection (inner loop), auto-restart | 1 |
| OUTPUT OVERVOLTAGE PROTECTION (HARD) | 30.9V set-point | Supply enters low duty cycle operation as long as fault condition persists, auto-restart | 1 |
| OUTPUT OVERVOLTAGE PROTECTION (CROWBAR) | 34.0V set-point | Output is clamped to this level if soft and hard OVP circuits fail to limit output voltage. | 1 |
| OUTPUT VOLTAGE ADJUSTMENT | None | | |

Notes:

1. Ensured by design, not 100% tested in production.
2. 100% tested for specification compliance in production.

To inquire about price, delivery and supply options information please contact PPI sales department.