

Product Specification

XR125 Series

125-Watt AC to DC Power Supplies

703591 Rev 04-11-19

Notices

N2Power™ and the *N2Power* logo are registered trademarks of Qualstar Corporation.

Copyright© 2016 by Qualstar Corporation — All Rights Reserved

For warranty information refer to www.n2power.com

Information contained in this document is copyrighted by Qualstar Corporation and is intended for use by customers and prospective customers to evaluate and integrate our power supplies. Customers and prospective customers may reproduce this document as needed for these purposes. Reproduction in whole or in part for any other purpose or by any other party is prohibited without prior written permission from Qualstar Corporation.

Every effort has been made to keep the information contained in this document current and accurate as of the date of publication or revision. However, no guarantee is given or implied that the document is error-free or that it is accurate with regard to any specification.

Qualstar reserves the right to modify the design or specification without notice. This specification may not be construed as a contractual obligation except as specifically agreed to by Qualstar in writing at the time of order.

For information about this product specification, please write or call Qualstar at:

130 West Cochran Street, Suite C Simi Valley, CA 93065

Phone: (805) 583-7744

E-Mail: sales@n2power.com www.n2power.com

703591 Rev 04-11-19

Table of Contents

| 1. | Introduction | 1-1 |
|-----|----------------------------------|------|
| 1.1 | 1 Introduction | 1-1 |
| 1.2 | 2 Agency Compliance | 1-2 |
| 2. | AC Input | 2-1 |
| 2.1 | 1 Input Line Requirements | 2-1 |
| 2.2 | 2 Input Over Current Protection | 2-1 |
| 2.3 | 3 Inrush Current Limiting | 2-1 |
| 2.4 | 4 Low Input Voltage | 2-1 |
| 2.5 | 5 Leakage Current | 2-1 |
| 3. | DC Outputs | 3-1 |
| 3.1 | 1 Output Voltage Regulation | 3-1 |
| 3.2 | 2 No Load Operation | 3-2 |
| 3.3 | 3 Output Current/Power | 3-2 |
| 3.4 | 4 Cooling | 3-4 |
| 3.5 | 5 Output Ripple/Noise | 3-5 |
| 3.6 | 6 Local and Remote Sensing | 3-7 |
| 3.7 | 7 Parallel Operation | 3-8 |
| 3.8 | 8 Output Protection | 3-9 |
| 3.9 | 9 Output Rise Time | 3-11 |
| 3.1 | 10 Overshoot At Turn On/Turn Off | 3-11 |
| 3.1 | 11 Output Transients | 3-11 |
| 3.1 | 12 Closed Loop Stability | 3-12 |
| 3.1 | 13 Capacitive Loading | 3-12 |
| 4. | General Specifications | 4-1 |
| 4.1 | 1 Environmental | 4-1 |
| 4.2 | 2 Mean Time Between Failures | 4-1 |
| 4.3 | 3 Component Stress | 4-1 |
| 4.4 | 4 Labeling/Marking | 4-2 |
| 4.5 | 5 Weight | 4-2 |
| 4.6 | 6 Mounting | 4-2 |
| 4.7 | 7 Physical Dimensions | 4-3 |
| 4.8 | 8 Mating Connectors | 4-3 |
| 4.9 | 9 Output Grounding | 4-6 |
| 4.1 | 10 Signal Pin Definitions | 4-7 |
| 5 | Efficiency | 5_1 |

| 6. | Timing and Control | . 6-1 |
|-----|-------------------------------------------------|-------|
| 6.1 | Power Supply Timing | . 6-1 |
| 6.2 | Power-Good Signal/PS_OK Signal/Remote ON Input | . 6-1 |
| 6.3 | Power-Good LED. | . 6-2 |
| 6.4 | Power Sequencing: XR125-1[ATX] and XR125-7[ATX] | . 6-2 |
| 6.5 | Voltage Hold-Up Time | . 6-3 |
| 7. | Ordering Information | . 7-1 |

703591 Rev 04-11-19

1.1 Introduction

This specification covers the design and performance characteristics of an open frame single-phase (3 wire) universal input, power factor corrected, single or multiple-output, 125-watt switching mode power supply. It includes information regarding the mechanical details, cooling requirements, connector configurations, electrical and signal specifications, and environmental ranges for storage and operation of the power supply. It describes all AC-input XR125 models as listed in Tables 7-1 and 7-2.

The XR125-1ATX, XR125-7ATX and XR125-8ATX are multiple-output power supplies. These models meet the output requirements of Intel ATX/ATX12V Power Supply Design Guide (Version 2.03). They include a 5-volt standby output, as well as a Remote Enable input to disable the main outputs.

All models of the XR125 Series can be used as standalone power supplies while models XR125-03 CS through XR125-56 CS can also be used in redundant or N+1 configurations with up to 4 units connected in parallel. Lettering shown in square brackets indicates optional features or similar models (e.g. [CS] indicates that an active current-sharing feature is available on this model while [ATX] and [RE] indicates this model is available with a remote enable input for the main outputs). See Tables 7-1and 7-2 for a list of available options.



Figure 1 XR125 (models differ slightly)

1.2 Agency Compliance

| Safety | Complies with Standard | Remarks | | |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|------------------|--|
| United States | UL 60950-1 (December 19, 2011) Second Edition (Information Technology Equipment) UL 62368-1 Second Edition | Leakage Current Hi-pot – 2121vdc for 1 second | | |
| Canada | CAN/CSA-C22.2 No. 60950-1 (2007) Second Edition | | | |
| EU Council | 2006/95/EC (August 2007) | Low Voltage Directive | | |
| International | IEC 60950-1 (2005) Second Edition IEC 62368-1 (2014) Second Edition | | | |
| EMC | Complies with Standard | Remarks | | |
| United States FCC part 15, subpart B | | Conducted emissions Limits per CISPR 22 Class B Tested to ANSI C63.4: 2003 | | |
| EU Council | 2004/108/EC | EMC Directive | | |
| International | EN 61204-3 (refers to the following) | Low Voltage Power Supplies – DC Output | | |
| EN 55022 Class B | | Conducted emissions Limits per CISPR 22 Class B | | |
| | EN 55024 (refers to the following) | Immunity | | |
| | EN 61000-3-2 Class D | Harmonic Current I (Power Factor Corr | | |
| | EN 61000-3-3 | Voltage Fluctuation | s & Flicker | |
| | EN 61000-4-3 | Radiated Susceptibility | | |
| | EN 61000-4-4 | Fast Transient/Burst Immunity | | |
| | EN 61000-4-5 | Power Mains Surge Immunity | | |
| EN 61000-4-6 | | RF Immunity | | |
| | EN 61000-4-11 | Voltage Dips, Short Interruptions | | |
| Reduction of H | Hazardous Substances (RoHS) | Complies with Standard | Remarks | |
| EU Council | | 2002/95/EC | RoHS Directive | |
| | | 2011/65/EU | RoHS 2 Directive | |

Marks of Conformance

United States & Canada



(Underwriters Laboratories File E211115)

Europe



EU Council



RoHS





Table 1-1 Agency Compliance

2. AC Input

2.1 Input Line Requirements

The following table defines the voltage and frequency requirements for the AC line inputs to the XR125 power supply. The XR125 is capable of supplying full rated power in continuous operation throughout the specified ranges of voltages and frequencies. The power supply will automatically recover from AC power loss and is capable of starting under maximum load at the minimum AC input voltage described below.

| Parameter | Minimum | Nominal | Maximum |
|-------------------|---------|-------------|---------------|
| RMS Input Voltage | 90 VAC | 100-240 VAC | 264 VAC |
| RMS Input Current | _ | _ | 1.8 A @ 100 V |
| | | | 0.8 A @ 240 V |
| Input Frequency | 47 Hz | 50/60 Hz | 63 Hz |

Table 2-1 XR125 AC Input Parameters

2.2 Input Over Current Protection

The XR125 series incorporates a primary AC line fuse for input over current protection and to meet product safety requirements as outlined in Section 1.2.

2.3 Inrush Current Limiting

The cold start inrush current is limited to 33 A peak at 115 VAC. Repetitive ON/OFF cycling of the AC input voltage shall not damage the power supply or cause the input fuse to fail.

2.4 Low Input Voltage

The application of an input voltage below the minimums specified in Table 2-1 shall not cause damage to the power supply.

2.5 Leakage Current

The leakage current from AC line or AC Neutral inputs to Earth Ground at 240 VAC, 50Hz is less than 1 mA.

3.1 Output Voltage Regulation

The DC output voltages shall remain within the Minimum and Maximum limits of Table 3-1 when measured at the power supply connector under all specified line, load and environmental conditions contained herein. The main output (V1) in the single output models (-03 thru -56V) and the 12-volt auxiliary outputs are both galvanic isolated from each other and chassis (Safety ground). Refer to Section 3.3.2.

| Model * | Output | Rated Voltage | Regu- lation | Minimum (VDC) | Nominal (VDC) | Maximum (VDC) | Remote Sense (← except ATX) |
|--------------------|-----------------|------------------------|-----------------|------------------|---------------------------|------------------|-----------------------------|
| | V1 | +3.3 | ±3% | 3.201 | 3.300 | 3.399 | V1/RTN |
| | V2 | +5 | ±4% | 4.848 | 5.050 | 5.252 | V2 [←] /RTN |
| XR125-1[ATX] | V3 | +12 | ±5% | 11.400 | 12.000 | 12.600 | RTN |
| XIX120-1[X1X] | V4 | -12 | ±5% | -11.400 | -12.000 | -12.600 | |
| | V5 [†] | $+5V_{\text{standby}}$ | ±5% | 4.750 | 5.000 | 5.250 | |
| | V1 | +2.5 | ±3% | 2.425 | 2.500 | 2.575 | V1/RTN |
| | V2 | +5 | ±4% | 4.848 | 5.050 | 5.252 | V2 [←] /RTN |
| XR125-7[ATX] | V3 | +12 | ±5% | 11.400 | 12.000 | 12.600 | RTN |
| | V4 | -12 | ±5% | -11.400 | -12.000 | -12.600 | |
| | V5 [†] | $+5V_{\text{standby}}$ | ±5% | 4.750 | 5.000 | 5.250 | |
| | V1 | none | | | | | |
| | V2 | +5 | ±5% | 4.848 | 5.050 | 5.252 | V2 [←] /RTN |
| XR125-8[ATX] | V3 | +12 | ±5% | 11.400 | 12.000 | 12.600 | RTN |
| | V4 | -12 | ±5% | -11.400 | -12.000 | -12.600 | |
| | V5 [†] | $+5V_{standby}$ | ±5% | 4.750 | 5.000 | 5.250 | |
| XR125-XX [CS] [RE] | V1 | +3.3, +5, +7, +8 | ±3% | Less 3% | 3.30, 5.00, 7.00, 8.00 | Plus 3% | V1/RTN |
| XX: 03, 05, 07, 08 | V2 | $+12V_{aux}$ | ±5% | 11.400 | 12.000 | 12.600 | |
| RE models only | V3 | +5V _{standby} | ±5% | 4.750 | 5.000 | 5.250 | |
| XR125-XX [CS] [RE] | V1 | XX volts | ±3% | Less 3% | XX.000 | Plus 3% | V1/RTN |
| 12 ≤ XX ≤ 56 | V2 | +/-12V _{aux} | ±5% | 11.400 | 12.000 | 12.600 | |
| RE models only | V3 | $+5V_{\text{standby}}$ | ±5% | 4.750 | 5.000 | 5.250 | |

^{*} See Tables 7-1 and 7-2 for lists of all available models

Table 3-1 XR125 Output Voltage Specifications for all AC-input Models

[†] ATX models only



3.2 No Load Operation

The power supply will operate with reduced output voltage regulation of +/-10% with all outputs unloaded. This no load condition will not damage the XR125 or cause a hazardous condition, however the Power-Good signal may not go true with less than a 5-watt load. The power supply will remain stable and operate normally after application of loads.

CAUTION

Remove AC power prior to installing or removing secondary loads.

3.3 Output Current/Power

The maximum available output power is always a function of the cooling airflow and temperature. The total output power is reduced when unrestricted natural convection cooling (no fan) is used at an ambient temperature of 50°C or less (see Sections 3.3.1 and 3.3.2). No output will exceed 190VA under any of overload or short circuit condition including single component fault conditions as described by IEC 60950.

3.3.1 Output Loading for Models XR125-1[ATX], -7[ATX], -8[ATX]

The maximum combined output power of V1 through V4 is limited to 125 watts with 5 CFM of forced air-cooling at no more than 50°C. The combined output power of V1 and V2 is further limited to 100 watts. The V5 output is limited to 5 watts under the same conditions (total of 130 watts possible).

| Output | Remarks | Rated V1 Output | Minimum Load | Maximum Load | Maximum Watts/Output |
|--------|----------------------------------------|-------------------------|-----------------|-----------------|-------------------------|
| V1 | -1[ATX], -7[ATX] (No V1 on -8[ATX]) | +3.3 V / +2.5 V | 0.0 A | 10.0 A / 12.0 A | 33 / 30 |
| V2 | | +5 V | 1.0 A | 15.0 A / 16.5 A | 75 / 82.5 |
| V3 | | +12 V | 0.0 A | 6.0 A | 60 |
| V4 | | -12 V | 0.0 A | 1.0 A | 12 |
| V5 | ATX Models Only | +5 V _{standby} | 0.0 A | 1.0 A | 5 |

Table 3-2 XR125-1[ATX], -7[ATX], -8[ATX]: Individual Min/Max Load Currents

With unrestricted natural convection cooling (see Section 3.4), the maximum combined output power of V1 through V4 is limited to 70 watts while the +5V standby output is limited to 0.5A (total of 72.5 watts possible).

3.3.2 Output Loading for Models XR125-03 [CS] [RE] through XR125-56 [CS] [RE]

The output currents listed in this section require at least 5 CFM of forced air-cooling at no more than 50°C. The XR125-03 requires 10CFM of cooling air for 106-watts output. The total output of 125-watts must be reduced to 100-watts with unrestricted natural convection cooling at an ambient temperature of 50°C or less except: the XR125-05 to 08 are limited to 70-watts and the XR125-03 is limited to 62-watts.

These single-output models (XR125-XX [CS] [RE] where [CS] means with or without current sharing and [RE] means with or without the remote enabled feature) all have an auxiliary 12V output (V2, 12V AUX) that is typically used to drive a cooling fan. The load on this V2 output can vary from 0 to 1.0 amps and does not affect the Power-Good or PS_OK signals. Its load power subtracts from the 125-watts otherwise available to the V1 load. On the XR125-03 thru XR125-08 models, the negative side of the V2 output is connected to the common ground "DC RETURN". The main output (V1) in the single output models (-12 thru -56V) and the 12-volt auxiliary outputs are both galvanic isolated from each other and chassis (Safety ground). Thus, they can be used as either a positive or negative supply.

The signals on J3: DC Return, Current Share, PG and PS_OK are all with reference to the negative rail of the V1 Main output. Connecting the "+" voltage lead to ground or customer's return will yield a negative voltage on the "-" leads.



| | Rated V1 | Minimum Power-Good | Maximum Continuous |
|--------------------|-------------|-----------------------------|-----------------------|
| Model | Output | Load (5 W) ← | Load ↑ |
| XR125-03 [CS] [RE] | 3.3 V | 1.67 A | 32.0 A |
| XR125-05 [CS] [RE] | 5 V | 1.00 A | 25.0 A |
| XR125-07 CS [RE] | 7 V | 0.72 A | 17.9 A |
| XR125-08 CS [RE] | 8 V | 0.63 A | 15.6 A |
| XR125-12 [CS] [RE] | 12 V | 0.40 A | 10.5 A |
| XR125-15 [CS] [RE] | 15 V | 0.33 A | 8.3 A |
| XR125-19 CS [RE] | 19 V | 0.26 A | 6.6 A |
| XR125-24 [CS] [RE] | 24 V | 0.20 A | 5.2 A |
| XR125-28 [CS] [RE] | 28 V | 0.18 A | 4.5 A |
| XR125-30 [CS] [RE] | 30 V | 0.17 A | 4.2 A |
| XR125-48 [CS] [RE] | 48 V | 0.11 A | 2.6 A |
| XR125-51 CS [RE] | 51 V | 0.10 A | 2.5 A |
| XR125-54 [CS] [RE] | 54 V | 0.09 A | 2.3 A |
| XR125-56 [CS] [RE] | 56 V | 0.09 A | 2.2 A |

 $[\]leftarrow$ Minimum load needed for the Power-Good signal to go true (high) and the PS_OK signal to go low

Table 3-3 Min/Max Load Currents XR125-03 [CS] [RE] thru XR125-56 [CS] [RE]

3.4 Cooling

The power supply can be used under certain output loading conditions in natural convection cooling or with forced air-cooling. The XR125 may be mounted in any attitude.

3.4.1 Unrestricted Convection Cooling

The maximum continuous output rating of all DC outputs combined is reduced under natural convection cooling with a maximum ambient temperature of 50°C (see Sections 3.3.1 through 3.3.2). On the XR125-1[ATX], -7[ATX] models, the sum of the V1 and V2 outputs must not exceed 40-watts. On the XR125-8[ATX] models, the V2 output must not exceed 40-watts.

3.4.2 Forced Air Cooling

The maximum continuous rating of all DC outputs combined is 125-watts with a minimum of 5 CFM of forced-air cooling at a maximum of 50°C. On the XR125-1[ATX] and -7[ATX] models, the sum of the V1 and V2 outputs must not exceed 100-watts. On the XR125-8[ATX] models, the V2 output must not exceed 100-watts. Airflow must be in the same plane as the circuit board (impinging on any side of the XR125).

[↑] Assuming no load on V2 output & that cooling requirements are met



3.4.3 High Temperature Derating

The XR125 can be operated at elevated temperatures by derating the total maximum output power (or current) by 2.5%/°C from 50°C to 70°C (see Figure 3-1).

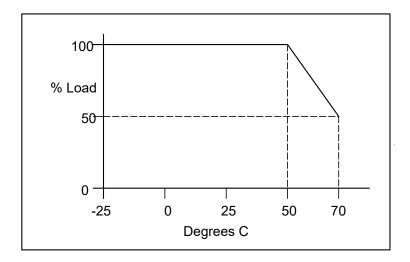


Figure 3-1 XR125 Output Power vs. Ambient Temperature Envelope

3.5 Output Ripple/Noise

Output ripple voltage and noise are defined as periodic or random signals over a frequency band of 10 Hz to 20 MHz. Measurements are to be made with an oscilloscope with at least 20 MHz bandwidth. Outputs should be bypassed at the connector with a 0.1 μF ceramic disk capacitor and a 10 μF tantalum capacitor to simulate system loading (see Figure 3-2). Ripple and noise shall not exceed the limits specified in the following tables.

3.5.1 Ripple/Noise Limits: XR125-1[ATX], -7[ATX], -8[ATX]

The ripple voltage of the outputs is measured at the pins of the mating connector. Ripple and noise shall not exceed the limits specified in Table 3-4 under any condition of line voltage and frequency specified in Section 2.1 and DC loading specified in Section 3.3.1.

| Output | Voltage | Maximum Ripple+Noise (peak-to-peak) |
|----------------------------|-------------------------|----------------------------------------|
| V1 (-1[ATX], -7[ATX] only) | +3.3V / +2.5V | 50 mV |
| V2 | +5 V | 50 mV |
| V3 | +12 V | 120 mV |
| V4 | -12 V | 120 mV |
| V5 (ATX models only) | +5 V _{standby} | 50 mV |

Table 3-4 Ripple Voltage: XR125-1[ATX], -7[ATX], -8[ATX] versions



3.5.2 Ripple/Noise Limits: XR125-03 [CS] [RE] through XR125-56 [CS] [RE]

The ripple voltage of the outputs is measured at the pins of the mating connector. Ripple and noise shall not exceed the limits specified in Table 3-5 under any condition of line voltage and frequency specified in Section 2.1 and DC loading specified in Section 3.3.2.

| Model | Rated V1 Output | Maximum Ripple+Noise (peak-to-peak) |
|--------------------|----------------------------|-------------------------------------------|
| XR125-03 [CS] [RE] | 3.3V | 30 mV |
| XR125-05 [CS] [RE] | 5 V | 50 mV |
| XR125-07 CS [RE] | 7 V | 70 mV |
| XR125-08 CS [RE] | 8 V | 80 mV |
| XR125-12 [CS] [RE] | 12 V | 120 mV |
| XR125-15 [CS] [RE] | 15 V | 150 mV |
| XR125-19 CS [RE] | 19 V | 190 mV |
| XR125-24 [CS] [RE] | 24 V | 240 mV |
| XR125-28 [CS] [RE] | 28 V | 280 mV |
| XR125-30 [CS] [RE] | 30 V | 300 mV |
| XR125-48 [CS] [RE] | 48 V | 480 mV |
| XR125-51 CS [RE] | 51 V | 510 mV |
| XR125-54 [CS] [RE] | 54 V | 540 mV |
| XR125-56 [CS] [RE] | 56 V | 560 mV |
| All of the above | V2 (12V) | 120 mV |
| RE models only | V3 +5 V _{standby} | 50 mV |

Table 3-5 Ripple Voltage: XR125-03 [CS] [RE] thru XR125-56 [CS] [RE]

3.5.3 Ripple/Noise Test Setup

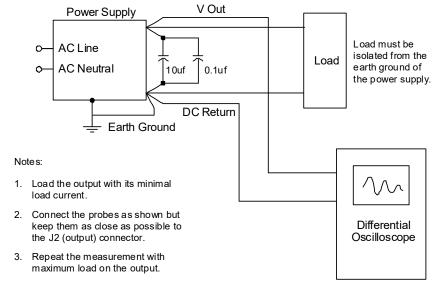


Figure 3-2 Ripple Noise Measurement Setup

703591 Rev 04-11-19 DC Outputs 3-6



3.6 Local and Remote Sensing

Remote sensing is provided to compensate for voltage drops in the V1 (+ Output) and DC RETURN connections to the load. All XR125-1, -7 and -8 models (both ATX & non-ATX) have an additional sense input of the V2 (+ Output). For every model, the OV Sense input must always be connected to either one of the DC Return pins of the XR125 or the DC Return terminal at the load. Connecting it to the return side of the load will reduce the voltage drop in the external return wiring.

If the V1 Sense input is left open, the V1 output may not meet its load regulation specification. The V1 output will meet its load regulation specification when the V1 Sense pin is connected to one of the V1 output pins. Connecting the V1 Sense pin to the V1 output at the load will reduce the voltage drop in the external V1 wiring.

3.6.1 Local and Remote Sensing: XR125-1[ATX], -7[ATX], -8[ATX]

The V1 +Sense input need not be connected for the XR125-8[ATX], as it has no V1 output. The XR125-1[ATX] and XR125-7[ATX] can compensate for up to 0.2V drop in each side (+ Output and DC RETURN) of the V1 output. The +Sense on J3-1 affects only the V1 output while the –Sense on J3-2 affects V1, V2 and V3. Figure 3-3 shows the required and optional remote sensing connections. Note that on the ATX versions J3 has 5-pins instead of the 3-pins shown below, but pins 1 and 2 are still used for remote sense as shown in Figure 3-3. Refer to Table 4-8 for the pin definition of the XR125 connectors.

All XR125-1, -7 and -8 models (both ATX & non-ATX versions) have an additional +V2 sense pin at J4 (see Figure 4-3). This pin may be connected to +5V load to reduce the voltage drop in the V2 load wiring. The +V2 sense input only affects V2 & V3 and does not affect the V1, V4 or V5 voltages.

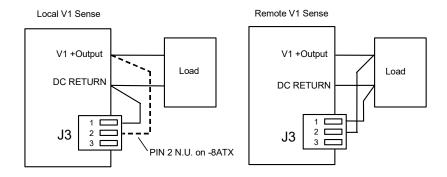


Figure 3-3 Remote V1 Sensing: XR125-1[ATX], -7[ATX], -8[ATX]

3.6.2 Local and Remote Sensing: XR125-03 [CS] [RE], XR125-07 CS [RE] and XR125-08 CS [RE]

Up to 0.2V in the return and 0.2V in the V1 connection may be compensated. Figure 3-4 shows the required and optional remote sensing connections. J3 actually has five pins but only the first three are shown below. Refer to Table 4-9 for the pin definition of the XR125 connectors.

This model contains an internal OR-ing MOSFET so that V1 output of multiple power supplies may be connected in parallel. Follow the same sense wiring for each paralleled supply as if it were a single supply.

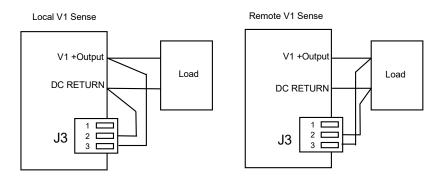


Figure 3-4 Remote Sensing Wiring: XR125-03 [CS] [RE], XR125-05 [CS] [RE], XR125-07 CS [RE] and XR125-08 CS [RE]

3.6.3 Local and Remote Sensing: XR125-12 [CS] [RE] thru XR125-56 [CS] [RE]

Up to 0.5V in the return and 0.5V in the V1 connection may be compensated. Figure 3-5 shows the required and optional remote sensing connections. J3 actually has five pins but only the first three are shown below. Refer to Figure 4-3 for the pin definition of the XR125 connectors. These models contain internal OR-ing diodes or OR-ing MOSFETs so that V1 output of multiple power supplies may be connected in parallel. Follow the same sense wiring for each paralleled supply as if it were a single supply.

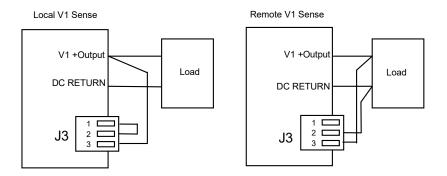


Figure 3-5 Remote Sensing Wiring: XR125-12 [CS] [RE] through XR125-56 [CS] [RE]

3.7 Parallel Operation

3.7.1 XR125-03 [CS] [RE], -05 [CS] [RE], -07 CS [RE], -08 CS [RE] and XR125-12 [CS] [RE] through -56 [CS] [RE]

The V1 outputs of two XR125-xx [CS] [RE] power supplies may be connected directly in parallel to provide 1 + 1 output power. Each of these models has an optional built-in V1 output OR-ing diode (or MOSFET) and a single wire Current Share signal for active load-leveling parallel operation.



The V2 outputs may be connected together using OR-ing diodes and they are unaffected by the active current sharing of the V1 outputs.

3.7.2 Current Sharing Connections

The Current Share signal (see Table 4-8) of each supply operating in parallel must be connected together. Power sharing does not require the 0V Sense signals be connected together, but the sharing accuracy may not meet published specification unless they are also connected together.

Power-Good signals may be externally wire OR-ed together, but this is not recommended, as a failing power supply will pull the signal low. They should be monitored individually by the user's system.

3.7.3 Current Share Accuracy

When all the current share signals are connected together and all the 0V Sense signals are connected together, the load delivered by two supplies of the sharing supplies will not vary by more than 10% at full load.

3.7.4 Transients

The output rise time and monotonic requirements of Section 6.1 may not be met where the load exceeds 125 watts, because of the difference in start-up times of the paralleled power supplies.

When the AC line to one of the parallel power supplies is disconnected or reconnected, or a power supply fails, the transient on the V1 output is within five (5) percent of nominal output voltage, although the output voltage may ramp to a new nominal voltage within the regulation band.

3.8 Output Protection

There are three different output protection schemes designed to protect the load and the XR125 from component failures and extraordinary circumstances.

3.8.1 Over Temperature Protection

If the XR125 is operated without adequate cooling, it will sense an over-temperature condition and shut itself down. It will not restart until it has cooled down to below its maximum operating temperature and the AC power is cycled off and back on.

3.8.2 V2 or V3 Outputs Over-Load Protection

The V2 outputs of the XR125-03, -05, -07, -08 and -12 through -56 are current limited at approximately 1.5A through a thermally protected linear regulator.

An overload on the V2 output should not affect the operation of the other outputs unless the V2 output power adds to already excessive output power, thereby causing overpower protection. The V2 output will resume normal operation when the over-load condition is removed.

3.8.3 Over-Power Protection

Total output power in excess of approximately 190-watts will cause the XR125 to shut down all outputs except for the (+5Vstandby) output. The power supply will periodically attempt to restart until the over-load condition is removed.

Pulsating loads of 150% of the rated output can be sustained for 10-milliseconds provided the duty cycle does not exceed 10%. The total RMS power must still be limited to 125-watts.

3.8.4 Short Circuit Protection

A short circuit is defined as an impedance of less than 0.1 ohms placed between DC RETURN and any output. A short circuit will cause no damage to the power supply, but will cause it to shutdown. The power supply will periodically attempt a restart until the short circuit condition is removed. After successfully restarting, the power supply will operate normally.

3.8.5 Over Voltage Protection

No single fault is able to cause a sustained over voltage condition on any output. The following outputs have OVP sensing and will shut the supply down if the output reaches the OVP threshold. Following an OVP event, the XR125 will not restart until either AC power or remote on/off signal is cycled off and back on.

| Model | OVP Sensing on Outputs: |
|-----------------------|-------------------------|
| XR125-1[ATX], -7[ATX] | V1, V2, V3 |
| XR125-8[ATX] | V2, V3 |
| XR125-XX [CS] [RE] | V1 |

Table 3-6 OVP Protected Outputs by Model



| Rated Output Voltage | Minimum OVP Threshold | Nominal OVP Threshold | Maximum OVP Threshold |
|-------------------------|--------------------------|--------------------------|--------------------------|
| 2.5 V | 2.87 V | 3.15 V | 3.44 V |
| 3.3 V | 3.76 V | 4.2 V | 4.9 V |
| 5.0 V | 5.74 V | 6.3 V | 6.88 V |
| 7 V | 7.88 V | 8.7 V | 9.63 V |
| 8 V | 9.00 V | 10.0 V | 11.0 V |
| 12 V | 13.5 V | 15.0 V | 16.5 V |
| 15 V | 16.9 V | 18.8 V | 20.6 V |
| 19 V | 21.4 V | 23.8 V | 26.1 V |
| 24 V | 27.0 V | 30.0 V | 33.0 V |
| 28 V | 31.5 V | 35.0 V | 33.5 V |
| 30 V | 33.8 V | 37.5 V | 41.3 V |
| 48 V | 54.0 V | 58.0 V | 66.0 V |
| 51 V | 57.4 V | 63.8 V | 70.1 V |
| 54 V | 60.8 V | 64.8 V | 74.3 V |
| 56 V | 63.0 V | 70.0 V | 77.0 V |

The XR125 will shut down under the following over voltage conditions:

Table 3-7 Over Voltage Protection Limits by Rated Output Voltage

3.9 Output Rise Time

All output voltages shall rise from 10% to 90% of nominal output voltage (as specified in Table 3-1) within 0.2ms to 20ms. The output voltages waveform must be a monotonic ramp from 10% to 90% of final set-point within the regulation band under any loading conditions specified in the respective load current tables in Section 3.3.

For the purposes of this specification, a monotonic ramp is defined as always having a positive slope of from zero to $10 \times \text{Vout volts/millisecond}$. During any 5-millisecond portion of the ramp, its slope must be greater than 5% of its rated voltage per millisecond.

3.10 Overshoot At Turn On/Turn Off

The output voltage overshoot upon the application or removal of the input mains voltage is less than 10% above the nominal voltage. No opposite-polarity voltage is present on any output during turn on or turn off.

3.11 Output Transients

The maximum output voltage transient caused by step load changes will not exceed the output voltage regulation limits by more than 5%. With an AC input as specified in Section 2.1, the power supply will remain stable when subjected to the load transients described below:



- Load changes between 75% and 100% on any output
- Load changing repetition of 50 to 333 cycles per second
- Transient load slew rate = 1.0 A/microsecond
- Capacitive loading per Table 3-8

3.12 Closed Loop Stability

The power supply is unconditionally stable under all line/load/transient load conditions including the capacitive loads specified in Table 3-8. The power supply shall exhibit a minimum of 45-degrees phase margin and 6 dB gain margin.

3.13 Capacitive Loading

The power supply will power up and operate normally with the capacitances listed in Table 3-8 simultaneously present on the outputs. Cap values are the same for [CS] and/or [RE] mode.

| XR125 | -1[ATX], -7[ATX], -8[ATX] | -03 thru -08 | -12 | -15 thru -19 | -24 thru -30 | -48 thru -56 |
|------------------------------|---------------------------------|--------------------|---------------|--------------------|--------------------|--------------------|
| Output: | have demonstra | ated starting | and stability | with the fol | lowing capac | itive loads |
| +3.3 V / +2.5 V | 6,000 µF | | | | | |
| +5 V | 10,000 μF | | | | | |
| +5 V _{standby} [RE] | 100 μF | 100 μF | 100 μF | 100 μF | 100 μF | 100 μF |
| +12 V | 1,000 µF | | | | | |
| V1 (Main Output) | | 10,000 μF | 4,000 µF | 3,000 µF | 2,000 μF | 500 μF |
| 12 V _{aux} | 350 µF | 350 µF | 350 µF | 350 µF | 350 µF | 350 µF |

Table 3-8 XR125 Demonstrated Capacitive Loading

703591 Rev 04-11-19 DC Outputs 3-12

4.1 Environmental

| mi voase . | 1 .1 | C 11 ' | | · C• . · |
|------------------|----------------|-----------|-----------------------|-----------------|
| The XR125 meets | or exceeds the | tollowing | renvironmental | cnecifications |
| THE MILLS INCCES | or cacceas are | | , CIIVII OIIIIICIICAI | specifications. |

| Parameter | Conditions | Specification | Remarks |
|-------------------|---------------|----------------------|-----------------------------------------------------------------------|
| Temperature | Operating | -25°C to 50°C | See cooling requirements |
| | Non-Operating | -40°C to 85°C | |
| Relative Humidity | Operating | 95% Maximum | Non-Condensing |
| | Non-Operating | 95% Maximum | Non-Condensing |
| Altitude | Operating | 6,561 feet MSL Max. | 2,000 meters |
| | Non-Operating | 50,000 feet MSL Max. | 15,240 meters |
| Vibration | No damage | 2.4G RMS Maximum | 5-500Hz, 10-min. each axis per MIL-PRF-28800F: 3.8.4.1 (Class 3,4) |
| | | 6.0G RMS Maximum | 100-1,000Hz random, 10-min. vertical axis only |
| Mechanical Shock | No damage | 30G half-sine, 11mS | Six shocks each axis per MIL-PRF-28800F: 4.5.5.4.1 |

Table 4-1 Environmental Specifications

4.2 Mean Time Between Failures

The MTBF for XR125 models are tested under the following conditions: Continuous operation at maximum output loading and worst case input line voltage with forced-air cooling at 25° C.

The XR125-1[ATX] and -7[ATX] models are rated at 618,000 hours while the XR125-8[ATX] is rated at 648,000 hours. The XR125-12 and 15 CS models are rated at 770,000 hours. The XR125-19 thru 56 CS models are rated at 785,000 hours. The XR125-03 thru -08 CS models are rated at 684,000 hours.

N2Power does not warrant the MTBF to be representative of any particular unit. The MTBF of the power supply is calculated with an 80% confidence level in accordance with Bellcore, SR-332, Issue 2. Actual failure rates vary from unit to unit.

4.3 Component Stress

The XR125 design followed these component-derating guidelines: semiconductor junction temperatures shall not exceed ninety (90) percent of manufacturer's rating with an ambient of 50° C. Inductor winding temperatures shall not exceed safety agency requirements. Capacitor case temperatures shall not exceed 95% of rated temperature. Resistor power dissipation derating is greater than 50%. Component voltage and current derating is greater than 10% at 50° C.



4.4 Labeling/Marking

The power supply is marked and labeled with the N2Power logo and part number, model number, input and output specifications, production code, appropriate safety agency logos, CE mark, patent number, and country of origin. A typical label is pictured below.

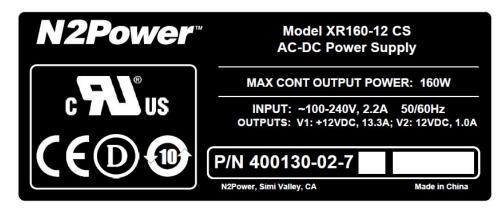


Figure 4-1 Sample XR Series Label

4.5 Weight

| Model | Pounds | Ounces | Kilograms |
|-------------------------------------------------------------------|--------|--------|-----------|
| XR125-1[ATX], -7[ATX] | 0.73 | 11.7 | 0.331 |
| XR125-8[ATX] | 0.69 | 11.0 | 0.312 |
| XR125-03 [CS] [RE], -05 [CS] [RE], -07 CS [RE] and -08 CS [RE] | 0.69 | 11.0 | 0.312 |
| XR125-12 [CS] [RE] thru -56 [CS] [RE] | 0.65 | 10.4 | 0.295 |

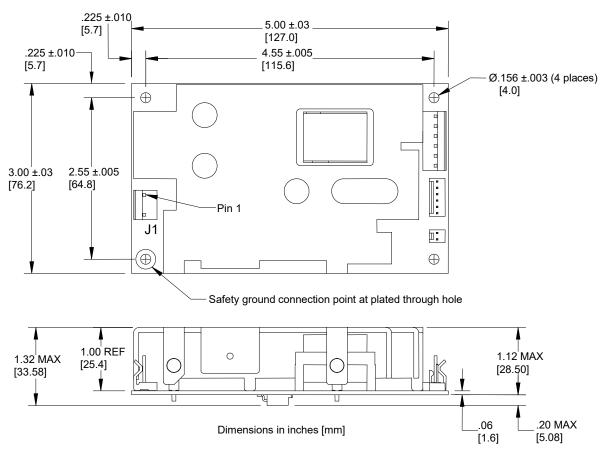
Table 4-2 XR125 Weights

4.6 Mounting

The XR125 may be mounted in any attitude but must be mounted on all four corners. No. 6 or M3 mounting hardware should not exceed .282-inches (7.16-mm) in diameter for any lock washer, flat washer, standoff, screw head or other mounting hardware to avoid contact and maintain adequate safety agency spacing requirements with components or printed circuit board traces.



4.7 Physical Dimensions



Note: Recommended standoff size is .375" high and all mounting hardware should be less than .28" in diameter. A standoff less than .375" high is acceptable when a thin insulator, 0.4mm thick (polyester, fish paper or equivalent UL rated 94V-2 minimum) is placed between the XR125 and the mounting chassis (refer to applicable UL standard for clearance requirements).

Figure 4-2 XR125 Dimensions

4.8 Mating Connectors

The user must furnish all mating connectors. The mating connectors must meet the requirements of all applicable safety agencies (notably UL). Molex™ (Molex is a trademark of the Molex Corporation) did not change their part numbers when they took the lead out of their contacts. The Molex part numbers in this section should yield RoHS compliant contacts. The largest wire size accepted by each contact should be used for all power connections to help dissipate the heat generated by the resistive connections.

Note that the female contacts that mate to the power supply are only rated for 25-30 mating cycles. Excessive mating cycles causes dramatically increased terminal resistance and heating resulting in the eventual failure of the mating terminal and possibly the header on the power supply.



CAUTION

The pin-1 location differs amongst connector manufacturers. Sometimes pin-1 differs between the header (on the power supply) and the mating housing from the same manufacturer. Disregard the manufacturer's pin-1 location and follow only the pin-1 locations in Figure 4-3.

4.8.1 AC Input Mating Connector (J1)

The AC input connector to the XR125 is a 3-pin Molex[™] (Molex is a trademark of the Molex Corporation) KK style header with 0.156" centers. The center pin is omitted to provide adequate insulation spacing. The Molex part numbers for the mating housing and crimp-style snap-in terminals are listed below. There may be equivalent connectors available from other manufacturers. The line side of the input should be connected to the pin closest to the mounting hole (see Figure 4-2).

| J1 | Molex P/N |
|---------------------------|--------------|
| Connector Circuits (pins) | 2 of 3 |
| Mating Housing | 09-50-8031 |
| Rated Contact Current | 7.0 A |
| Crimp Terminal (tin) | 08-50-0106 |
| Rated Wire Size | AWG 18 or 20 |

Table 4-3 J1 Mating Connector



4.8.2 DC Output Connector (J2)

The DC output connector is a Molex KK style header with 0.156" centers. The Molex part numbers for the mating housing and crimp-style snap-in terminals are listed below. There may be equivalent connectors available from other manufacturers.

| J2 | XR125-1[ATX], -7[ATX], -8[ATX] | XR125-03 [CS] [RE], -05 [CS] [RE], -07 CS [RE], -08 CS [RE] | XR125-xx [CS] [RE] |
|---------------------------|-----------------------------------|----------------------------------------------------------------|--------------------|
| Connector Circuits (pins) | 14 | 6 (Terminal Strip) | 6 |
| Mating Housing | 09-50-8141 | Stripped and tinned wire | 09-50-8061 |
| Crimp Terminal (tin) | 08-52-0071 | N/A | 08-50-0106 |
| Rated Wire Size | AWG 18 or 20 | AWG 12 max. | AWG 18 or 20 |

Table 4-4 J2 Mating Connectors

4.8.3 Remote Sense / PG Connector (J3)

The Remote Sense/PG connector on the XR125 is a Molex KK style header with 0.100" centers. The Molex part numbers for the mating housing and crimp-style snap-in terminals are listed below. There may be equivalent connectors available from other manufacturers.

| | XR125-1ATX, -7ATX, -8ATX, XR125-03 [CS], -05 [CS], | | | | |
|----------------------------|-------------------------------------------------------|----------------|---------------|--|--|
| J3 | XR125-1, -7, -8 | -07 CS, -08 CS | XR125-xx [CS] | | |
| Connector Circuits (pins) | 3 | 5 | 6 | | |
| Mating Housing | 22-01-3037 | 22-01-3057 | 22-01-3067 | | |
| Crimp Terminal (tin, 2.5A) | 08-52-0123 | 08-52-0123 | 08-52-0123 | | |
| Rated Wire Size | AWG 22 to 30 | AWG 22 to 30 | AWG 22 to 30 | | |

^{*} For XR125-1, -7, -8 models only, the Molex 22-01-3037 housing is recommended and not an equivalent from another manufacturer.

Table 4-5 J3 Remote Sense/PG Mating Connectors

4.8.4 Remote Enable Connector (J3)

The Remote Enable connector on the XR125 is a Molex KK style header with 0.100" centers. The Molex part numbers for the mating housing and crimp-style snap-in terminals are listed below. There may be equivalent connectors available from other manufacturers.



| | XR125-03 [CS] RE, -05 [CS] RE, | |
|----------------------------|--------------------------------|------------------|
| J3 | -07 CS RE, -08 CS RE | XR125-xx [CS] RE |
| Connector Circuits (pins) | 8 | 8 |
| Mating Housing | 22-01-3087 | 22-01-3087 |
| Crimp Terminal (tin, 2.5A) | 08-52-0123 | 08-52-0123 |
| Rated Wire Size | AWG 22 to 30 | AWG 22 to 30 |

Table 4-6 J3 Remote Enable Mating Connectors

4.8.5 J4 Connector: 12V Aux or V2 Sense (see Table 4-8 & Table 4-9)

The 12V AUX or V2 Sense connector (see Table 4-7) is a 2-pin header with 0.100" centers. The part numbers for the mating housing and crimp-style snap-in terminals are listed below. There may be equivalent connectors available from other manufacturers.

| J4 | All Models except ATX |
|----------------------------|-----------------------|
| Connector Circuits (pins) | 2 |
| Mating Housing | Molex P/N 22-01-3027 |
| Crimp Terminal (tin, 2.5A) | Molex 08-52-0123 |
| Rated Wire Size | AWG 22 to 30 |

Table 4-7 J4 Mating Connectors

4.9 Output Grounding

The DC RETURN signal may be connected to the power supply chassis ground (safety ground) at the plated through mounting hole near the input connector.



4.10 Signal Pin Definitions

- There are three general output connector configurations for the XR125 Series
- Identical signal names are connected together on all connectors
- The V2 output (12V aux) is floating only on models XR125-12 through -56
- The safety ground connection is provided by the mounting screw near J1
- Refer to Figure 4-3 for connector and pin-1 locations
- Refer to Table 6-1 for signal level definitions

| Pin | XR125-1[ATX], -7[ATX] | XR125-8[ATX] |
|-------|-------------------------|-------------------------|
| J1-1 | AC Neutral | AC Neutral |
| J1-2 | No Pin | No Pin |
| J1-3 | AC Line | AC Line |
| J2-1 | V4 (-12V Output) | V4 (-12V Output) |
| J2-2 | V3 (+12V Output) | V3 (+12V Output) |
| J2-3 | V1 (+2.5/+3.3V Output) | V3 (+12V Output) |
| J2-4 | V1 (+2.5/+3.3V Output) | V3 (+12V Output) |
| J2-5 | V1 (+2.5/+3.3V Output) | V3 (+12V Output) |
| J2-6 | DC RETURN (0V) | DC RETURN (0V) |
| J2-7 | DC RETURN (0V) | DC RETURN (0V) |
| J2-8 | DC RETURN (0V) | DC RETURN (0V) |
| J2-9 | DC RETURN (0V) | DC RETURN (0V) |
| J2-10 | DC RETURN (0V) | DC RETURN (0V) |
| J2-11 | V2 (+5V Output) | V2 (+5V Output) |
| J2-12 | V2 (+5V Output) | V2 (+5V Output) |
| J2-13 | V2 (+5V Output) | V2 (+5V Output) |
| J2-14 | V2 (+5V Output) | V2 (+5V Output) |
| J3-1 | 0V Sense (-) | 0V Sense (-) |
| J3-2 | V1 Sense (+) | Not Used |
| J3-3 | Power-Good | Power-Good |
| J3-4 | PS_ON | PS_ON |
| J3-5 | +5 V _{standby} | +5 V _{standby} |

Table 4-8 XR125 Signal Pin Definitions (Part A)



| Pin | XR125-03 [CS], -05 [CS], -07 CS, -08 CS | XR125-xx [CS] |
|------|--------------------------------------------|----------------|
| J1-1 | AC Neutral | AC Neutral |
| J1-2 | No Pin | No Pin |
| J1-3 | AC Line | AC Line |
| J2-1 | V1 (+5V Output) | V1 (+ Output) |
| J2-2 | V1 (+5V Output) | V1 (+ Output) |
| J2-3 | V1 (+5V Output) | V1 (+ Output) |
| J2-4 | DC RETURN (0V) | DC RETURN (0V) |
| J2-5 | DC RETURN (0V) | DC RETURN (0V) |
| J2-6 | DC RETURN (0V) | DC RETURN (0V) |
| J3-1 | Current Share | DC RETURN (0V) |
| J3-2 | 0V Sense (–) | 0V Sense (-) |
| J3-3 | V1 Sense (+) | V1 Sense (+) |
| J3-4 | PS_OK | Current Share |
| J3-5 | Power-Good | Power-Good |
| J3-6 | No Pin | PS_OK |
| J4-1 | +12V AUX (Fan) | V2 (+12V AUX) |
| J4-2 | DC RETURN (0V) | V2 (-12V AUX) |
| | | |

Table 4-9 XR125 Signal Pin Definitions (Part B)

| Pin | XR125-03 [CS] RE, -05 [CS] RE, -07 CS RE and -08 CS RE | XR125-xx [CS] RE |
|------|-----------------------------------------------------------|-------------------------|
| J1-1 | AC Neutral | AC Neutral |
| J1-2 | No Pin | No Pin |
| J1-3 | AC Line | AC Line |
| J2-1 | V1 (+5V Output) | V1 (+ Output) |
| J2-2 | V1 (+5V Output) | V1 (+ Output) |
| J2-3 | V1 (+5V Output) | V1 (+ Output) |
| J2-4 | DC RETURN (0V) | DC RETURN (0V) |
| J2-5 | DC RETURN (0V) | DC RETURN (0V) |
| J2-6 | DC RETURN (0V) | DC RETURN (0V) |
| J3-1 | Current Share | DC RETURN (0V) |
| J3-2 | 0V Sense (–) | 0V Sense (–) |
| J3-3 | V1 Sense (+) | V1 Sense (+) |
| J3-4 | PS_OK | Current Share |
| J3-5 | Power-Good | Power-Good |
| J3-6 | Remote Enable | PS_OK |
| J3-7 | +5 V _{standby} | Remote Enable |
| J3-8 | DC RETURN (0V) | +5 V _{standby} |
| J4-1 | +12V AUX (Fan) | V2 (+12V AUX) |
| J4-2 | DC RETURN (0V) | V2 (-12V AUX) |

Table 4-10 XR125 Signal Pin Definitions (Part C)



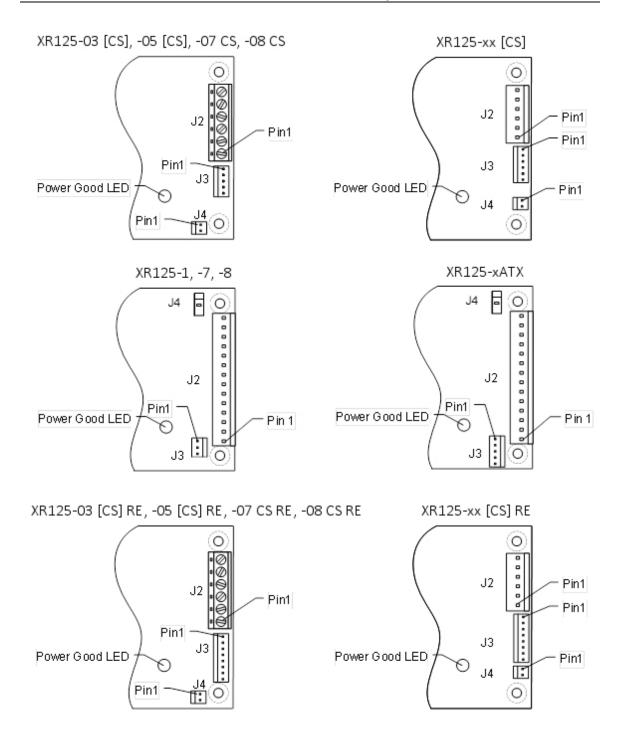
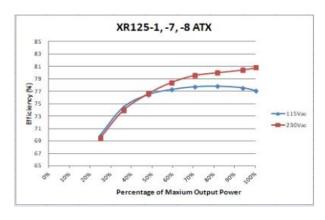


Figure 4-3 XR125 Output Connectors Layouts

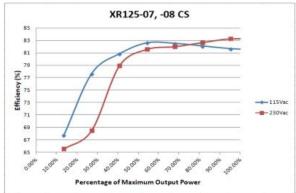
The power supply will meet high efficiencies under defined loading conditions specified in Table 5-1, with a line voltage of 230VAC and 10 CFM of cooling air at 25°C. Efficiency curves are shown in the following diagrams. These charts are for Current Sharing (CS) models, removing the Or-ing diodes will increase the efficiency by approximately 2%. This is available as an option. Note that only some models are shown.

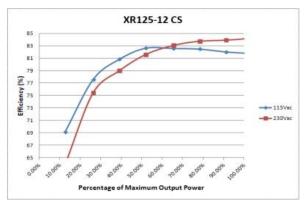
| XR125: | -1[ATX], -7[ATX] | -8[ATX] | -05 [CS] | -07 [CS], -08 [CS] | -12 [CS] | -15 [CS] | -48 [CS] | -56 [CS] |
|------------|---------------------|---------|----------|-----------------------|----------|----------|----------|----------|
| Efficiency | 81% | 81% | 81% | 83% | 86% | 85% | 86% | 89% |
| V1 | 0.10A | 7.0A | 25.0A | 15.6 A | 10.4 A | 8.3 A | 2.6 A | 2.2 A |
| V2 | 12.0A | 15 A | 0.0A | 0.0 A | 0.0 A | 0.0 A | 0.0 A | 0.0 A |
| V3 | 4.0A | 6.0A | 0.0A | 0.0 A | 0.0 A | 0.0 A | 0.0 A | 0.0 A |
| V4 | 1.0A | 1.0A | - | - | - | - | - | - |
| V5 | 1.0A | 1.0A | | | | | | |

Table 5-1 XR125 Output Currents at Rated Efficiency

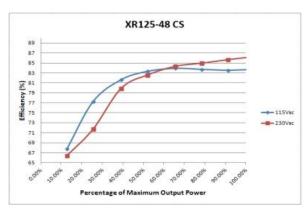


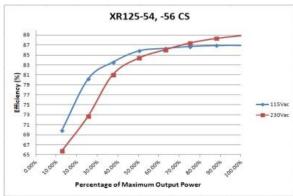






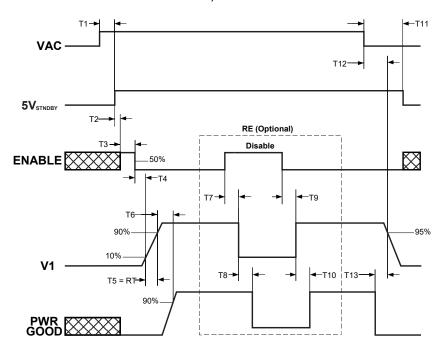






6.1 Power Supply Timing

XR125 -xx, xATX and RE Models



| | Min | Max |
|-----------------------|------|-------|
| STBY TURN ON DELAY T1 | 75mS | 800mS |
| ENABLE DELAY T2 | | <20mS |
| ENABLE DELAY T3 | | <5mS |
| V1 DELAY T4 | | <10mS |
| OUTPUT RISETIME T5 | 2mS | 19mS |
| PG DELAY_T6 | 30mS | 200mS |
| V1 DISABLE DELAY T7 | 2mS | 15mS |

| | Min | Max |
|-----|-------|------|
| T8 | 2mS | 15mS |
| T9 | | XXX |
| T10 | 2mS | 15mS |
| T11 | >35mS | |
| T12 | >22mS | |
| T13 | >2mS | |

PG OFF DELAY V1 ENABLE DELAY PG ON DELAY 5V STBY HOLD UP OUTPUT HOLDUP EARLY WARNING

Figure 6-1 XR125 Timing Diagram

6.2 Power-Good Signal/PS_OK Signal/Remote ON Input

6.2.1 Power-Good (PG)

The Power-Good Signal provides a high logic level to indicate that sufficient time has expired for the DC outputs to be within their regulation limits and that sufficient mains energy is stored by the power supply to ensure continuous power operation within specification for the duration of the hold-up time. When the AC mains power is removed for a period longer than 20ms, the Power-Good (PG) Signal transitions to a low logic level. PG Signal is active low with two TL331 outputs in parallel with a single 2.2K

resistor tied to 5 $V_{standby}$. The Power-Good signal is driven by open-drain channel MOSFET transistors. XR125-1, -7 and -8 models add a TTL compatible pull-up resistor on just the Power Good output. The electrical specifications for the Power-Good output are described in Table 6-1.

6.2.2 **PS_OK**

The PS_OK signal is the logical complement of the Power-Good signal and is driven by an open-drain MOSFET transistor. The electrical specifications for the PS_OK output are described in Table 6-1.

6.2.3 **PS ON**

On the ATX versions, the V1 through V4 outputs are enabled whenever the PS_ON input (J3 pin-4) is grounded to DC RETURN (or J3 pin-1). Opening the PS_ON/ input will disable the four outputs and cause the Power-Good output to go false. The PS_ON/ input has an internal 10K-ohm pull-up resistor connected to +5 Vstandby

| Signal Type | +5VDC, TTL Compatible |
|--------------------|------------------------------------------------------------------------------------------------|
| Low Logic Levels | <0.4V when sinking 4mA |
| High Logic Levels | Open Collector Output (see text above) |
| Power-Good output | High true (open) when conditions described above are met |
| Power-Good Delay | Less than 200mS after V1 outputs reaches regulation |
| Power Down Warning | >2 mS before V1 reaches minimum regulated output |
| Rise Time | <200 µS from 10% to 90% point. |
| PS_OK Output | Logical complement of Power-Good signal. Open drain MOSFET output with a 2.2K pull-up resistor |
| PS_ON/ (input) | Operate < 0.8V, Standby > 2.0V, Load: 10 K pull-up to +5 V |

Table 6-1 XR125 Status Signal Specifications

6.3 Power-Good LED

A green LED on all models illuminates whenever the Power-Good signal is true (high). See Figure 4-3 for the LED location near the output connector. At turn off, V2 is clamped via a diode to +5V output to insure 2.5 / 3.3V never exceed 5V output by 0.6V during turn-off.

6.4 Power Sequencing: XR125-1[ATX] and XR125-7[ATX]

The +12V and +5V output voltages are equal to or greater than the V1 (+2.5V or +3.3V) output voltage at all times during power up and normal operation. The time between the +5V output reaching minimum in-regulation voltage and the V1 output reaching minimum in-regulation voltage shall be less than 20 milliseconds. At turnoff, V1 is clamped via a diode to +5V output and not to exceed 0.6V.



6.5 Voltage Hold-Up Time

The power supply will maintain output regulation per Table 3-1 despite a loss of input power at 100VAC/50Hz and 230VAC/47Hz at maximum continuous output load for a minimum of 22 milliseconds. The Power-Good and PS_OK signals provide a minimum 2mS early warning of impending loss of output power.

The following table provides the N2Power part numbers that should appear on your purchase order and will appear on any N2Power correspondence:

| XR125 Models without active current sharing | | |
|---------------------------------------------|------------|-------------|
| Model Number | V 1 | P/N |
| XR125-1ATX | 3.3 | 400150-02-5 |
| XR125-7ATX | 2.5 | 400151-02-3 |
| XR125-8ATX | N/A | 400152-02-1 |
| XR125-1 | 3.3 | 400150-01-7 |
| XR125-7 | 2.5 | 400151-01-5 |
| XR125-8 | N/A | 400152-01-3 |
| XR125-03 | 3.3 | 400168-01-9 |
| XR125-05 | 5 | 400165-01-5 |
| XR125-12 | 12 | 400155-01-6 |
| XR125-15 | 15 | 400156-01-4 |
| XR125-24 | 24 | 400158-01-0 |
| XR125-28 | 28 | 400159-01-8 |
| XR125-30 | 30 | 400160-01-6 |
| XR125-48 | 48 | 400161-01-4 |
| XR125-54 | 54 | 400163-01-0 |
| XR125-56 | 56 | 400164-01-8 |

| XR125 Models with active current sharing | | |
|------------------------------------------|-----|-------------|
| Model Number | V1 | P/N |
| XR125-03 CS | 3.3 | 400168-02-7 |
| XR125-05 CS | 5 | 400165-02-3 |
| XR125-07 CS | 7 | 400166-01-3 |
| XR125-08 CS | 8 | 400167-01-1 |
| XR125-12 CS | 12 | 400155-02-4 |
| XR125-15 CS | 15 | 400156-02-2 |
| XR125-19 CS | 19 | 400157-01-2 |
| XR125-24 CS | 24 | 400158-02-8 |
| XR125-28 CS | 28 | 400159-02-6 |
| XR125-30 CS | 30 | 400160-02-4 |
| XR125-48 CS | 48 | 400161-02-2 |
| XR125-51 CS | 51 | 400162-01-2 |
| XR125-54 CS | 54 | 400163-02-8 |
| XR125-56 CS | 56 | 400164-02-6 |

Table 7-1 XR125 Model and Part Numbers



| Model Number | V1 | P/N |
|--------------|-----|-------------|
| XR125-03 RE | 3.3 | 400168-03-5 |
| XR125-05 RE | 5 | 400165-03-1 |
| XR125-12 RE | 12 | 400155-03-2 |
| XR125-15 RE | 15 | 400156-03-0 |
| XR125-24 RE | 24 | 400158-03-6 |
| XR125-28 RE | 28 | 400159-03-6 |
| XR125-30 RE | 30 | 400160-03-2 |
| XR125-48 RE | 48 | 400161-03-0 |
| XR125-54 RE | 54 | 400163-03-6 |
| XR125-56 RE | 56 | 400164-03-4 |

XR125 RE Models with active current sharing

| Model Number | V1 | P/N |
|----------------|-----|-------------|
| XR125-03 CS RE | 3.3 | 400168-04-3 |
| XR125-05 CS RE | 5 | 400165-04-9 |
| XR125-07 CS RE | 7 | 400166-02-1 |
| XR125-08 CS RE | 8 | 400167-02-9 |
| XR125-12 CS RE | 12 | 400155-04-0 |
| XR125-15 CS RE | 15 | 400156-04-8 |
| XR125-19 CS RE | 19 | 400157-02-0 |
| XR125-24 CS RE | 24 | 400158-04-4 |
| XR125-28 CS RE | 28 | 400159-04-2 |
| XR125-30 CS RE | 30 | 400160-04-0 |
| XR125-48 CS RE | 48 | 400161-04-8 |
| XR125-51 CS RE | 51 | 400162-02-0 |
| XR125-54 CS RE | 54 | 400163-04-4 |
| XR125-56 CS RE | 56 | 400164-04-2 |

Table 7-2 XR125 RE Model and Part Numbers



For warranty information refer to www.n2power.com

All XR125 power supplies are RoHS compliant.

Direct all questions, orders or requests for quotation as follows:

N2Power Order Desk: <u>orders@n2power.com</u>

Sales: <u>sales@n2power.com</u>

805-583-7744 x122

Technical Support <u>techsupport@n2power.com</u>

805-583-7744 x119

Street Address: 130 West Cochran Street, Suite C

Simi Valley, CA 93065