



Product Specification

# **XL330 Series**

**330-Watt POE**

**AC to DC Power Supplies**

706200-01 Rev 04-12-19

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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](mailto:sales@n2power.com)  
[www.n2power.com](http://www.n2power.com)

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# 1.

# Introduction

## 1.1 Introduction

This specification defines the design and performance characteristics of the XL330-54 CS open frame, single-phase (3-wire), universal input, power-factor corrected, multiple-output switch mode power supplies. This power supply is available with a main output (V1) voltage of 54V and output (V2) voltage of 12V. The 54V output has additional insulation to meet the 2250VDC output isolation to chassis and the V2 output, to meet requirements of IEEE Std 802.3-2008 Paragraph 33.4.1. This product is therefore ideal for POE (Power Over Ethernet) applications.

Model major features:






- Universal Input (100-240VAC).
- Total of 330W output power.
- Total of 280W on main 54V output.
- Active current sharing and OR-ing MOSFET on the main 54V output.
- 54V output meets 2250VDC output isolation requirement.
- 12V 108W Output with OR-ing MOSFET.
- Internal temperature monitor requested by customer

This document includes information regarding installation, cooling requirements, connector configurations, electrical and signal specifications, and environmental ranges for storage and operation of the XL330 series of power supply.



Figure 1-1 XL330-54 CS AC-DC Power Supply

## 1.2 Agency Compliance

| Safety                                   | Complies with Standard  | Remarks  |
|--|---|--|
| United States                            | UL 60950-1 (2007) Second Edition<br>UL 62368-1 Second Edition<br>(Information Technology Equipment)   | Leakage Current – see table 2-2<br>Hi-pot – 2121vdc for 1 second   |
| Canada                                   | CSA 22.2: 60950-1   |  |
| EU Council                               | 2006/95/EC  | Low Voltage Directive  |
| International                            | IEC 60950-1 (2005) Second Edition<br>IEC 62368-1 (2014) Second Edition  |  |
| EMC                                      | Complies with Standard  | Remarks  |
| United States                            | FCC part 15, subpart A  | Conducted emissions<br>Limits per CISPR 22 Class A*<br>Tested to ANSI C63.4: 2003  |
| EU Council                               | 2004/108/EC   | EMC Directive  |
| International                            | EN 61204-3 (refers to the following)<br>EN 55022 Class A<br><br>EN 55024 (refers to the following)<br>EN 61000-3-2<br><br>EN 61000-3-3<br>EN 61000-4-3<br>EN 61000-4-4<br>EN 61000-4-5<br>EN 61000-4-6<br>EN 61000-4-11 | Low Voltage Power Supplies – DC Output<br>Conducted emissions<br>Limits per CISPR 22 Class A*<br>Immunity<br>Harmonic Current Emissions<br>(Power Factor Correction – PFC)<br>Voltage Fluctuations & Flicker<br>Radiated Susceptibility<br>Fast Transient/Burst Immunity<br>Power Mains Surge Immunity<br>RF Immunity<br>Voltage Dips, Short Interruptions |
| Reduction of Hazardous Substances (RoHS) | Complies with Standard  | Remarks  |
| EU Council                               | 2002/95/EC  | RoHS Directive   |
| Marks of Conformance                     |   |  |
| United States & Canada                   |    |  |
| Europe                                   |    |  |
| EU Council                               |    |  |
| RoHS                                     |     |  |

\* with IEC AC inlet filter Delta P/N: 06DEEG3E

Table 1-1 Agency Compliance

# 2.

# AC Input

## 2.1 Input Line Requirements

The XL330 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 | –       | –           | 4.0 A @ 100 V |
| RMS Input Current | –       | –           | 1.9 A @ 240 V |
| Input Frequency   | 47 Hz   | 50/60 Hz    | 63 Hz         |

Table 2-1 AC Input Parameters

## 2.2 Input Over Current Protection

The XL330 incorporates a primary AC line fuse for input over current protection to prevent damage to meet product safety requirements as outlined in Section 1.2.

## 2.3 Inrush Current Limiting

The cold-start inrush current at a 90-degree phase angle (the AC switch is closed at the peak of the AC waveform) is limited to 14-amps peak at 240 VAC input voltage and 7-amps peak at 120 VAC @ 25C.

Repetitive ON/OFF cycling of the AC input voltage should not damage the power supply or cause the input fuse to fail as long as the power remains off for two or more seconds when the outputs are loaded.

## 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 Protective Earth varies linearly with the input voltage and frequency (see “Operating” column of Table 2-2). The leakage currents of multiple power supplies are additive. Consult the appropriate electrical safety specification for the maximum leakage current permitted in your product. The leakage current will always go to zero when a DPDT switch simultaneously disconnects both the line and neutral circuits.

| Line Voltage<br>Frequency | Operating |
|---------------------------|-----------|
| 115VAC, 60Hz              | 0.40mA    |
| 240VAC, 60Hz              | 0.83mA    |
| 240VAC, 50Hz              | 0.69mA    |

Table 2-2 Leakage Current – XL330

## 2.6 Power-Factor

The input power-factor exceeds (0.91) from 100VAC to 230VAC at full-load.

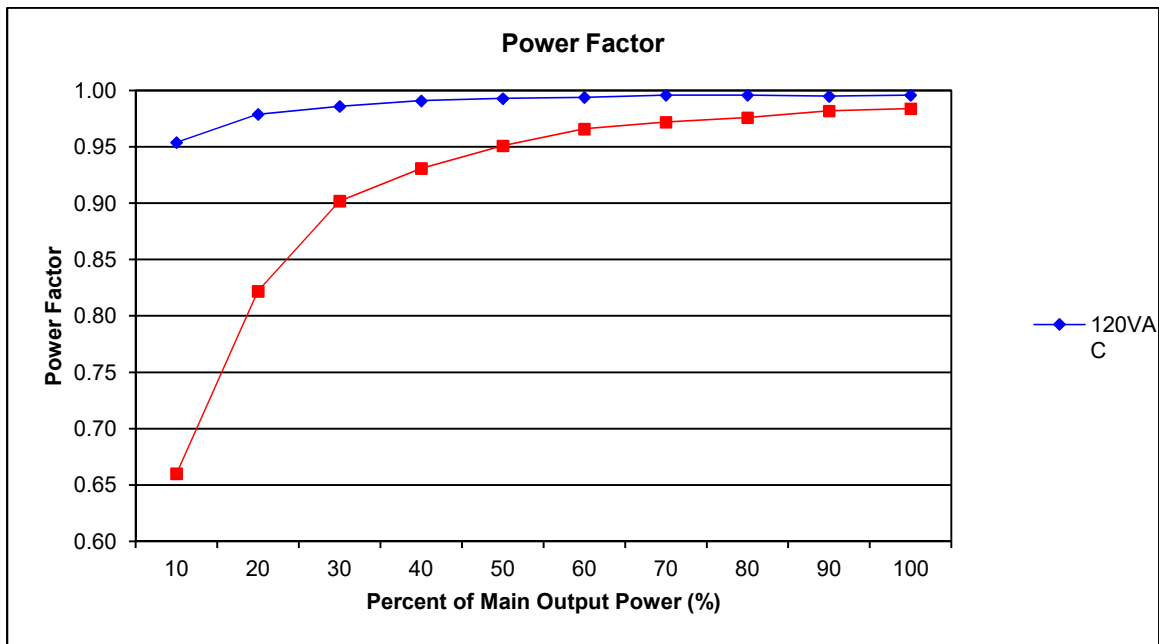


Figure 2-1 XL330 Typical Power Factor



# 3.

# DC Outputs

## 3.1 Output Voltage Regulation

Except as specified below, the DC output voltages shall remain within the Minimum and Maximum limits of Table 3-1 when measured at connector J2 under all specified line, load and environmental conditions contained herein.

| Output | Rated Voltage | Regulation | Minimum (VDC) | Nominal (VDC) | Maximum (VDC) | Remote Sense |
|--------|---------------|------------|---------------|---------------|---------------|--------------|
| V1     | +54V          | ±2%        | 52.380        | 54.000        | 55.620        | V1/RTN       |
| V2     | +12V          | ±5%        | 11.40         | 12.00         | 12.60         |              |

Table 3-1 Output Voltage Specifications

## 3.2 No Load Operation

The power supply will operate with reduced output voltage regulation of +/-5% on V1 and V2 with all outputs unloaded. This no load condition will not damage the XL330 or cause a hazardous condition. The power supply will remain stable and operate normally after application of the minimum loads specified in Table 3-2.

### CAUTION

*Remove AC power prior to attaching or removing loads.*

## 3.3 Output Current and Power

The maximum available output power is always a function of the cooling airflow and temperature. The total available output power is reduced with unrestricted natural convection cooling at an ambient temperature of 50°C or less (see Section 3.3.1). The total combined V1 and V2 output power must be limited to 330-watts of continuous power under the cooling conditions specified in Section 3.3.1 below.

### 3.3.1 Forced-Air Cooling

The maximum combined output power is limited to 330-watts with 13 CFM of forced air-cooling at no more than 50°C. Cooling efficiency is best with airflow down onto the top or into the J1 end of the XL330. Airflow into the J2 end is less efficient, but does meet the specifications. Under these cooling conditions, the individual outputs have the following limitations:

| Output | Rated Voltage | Minimum Load | Maximum Load | Maximum Watts |
|--------|---------------|--------------|--------------|---------------|
| V1     | +54V          | 0.1 A        | 5.2 A        | 280           |
| V2     | +12V          | 0.0 A        | 9.0 A        | 108           |

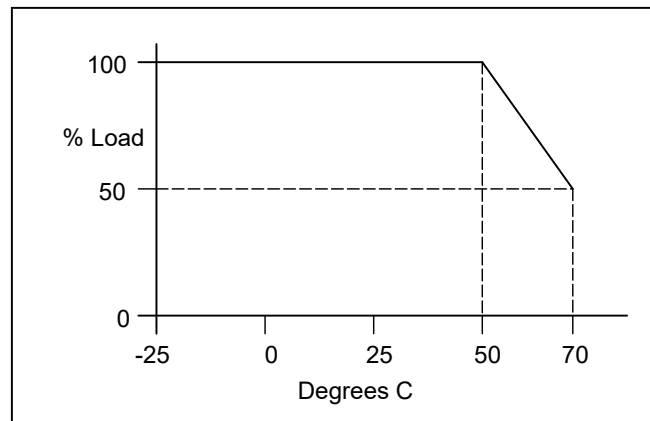
**Table 3-2 Individual Min/Max Load Currents**

### 3.3.2 Natural Convection Cooling

With unrestricted natural convection cooling, the maximum combined output power of V1 and V2 is reduced from 330-watts to 120-watts.

### 3.3.3 High Temperature Derating

The XL330 can be operated at elevated temperatures by derating the total average output power by 2.5% per degree-centigrade from 50°C to 70°C (see Figure 3-1). Operating within this elevated temperature range still requires cooling air flow as described in Section 3.3.1.



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

## 3.4 Output Ripple and 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. The measured output must be bypassed at the connector with a 0.1  $\mu$ F ceramic disk capacitor and a 10 $\mu$ F tantalum capacitor to simulate system loading (see Figure 3-2). Ripple and noise shall not exceed the limits

specified in Table 3-3 under any condition of line voltage and frequency specified in Section 2.1 and DC loading specified in Table 3-2.

| Output | Voltage | Maximum Ripple+Noise<br>(peak-to-peak) |
|--------|---------|--|
| V1     | 54 V    | 540 mV                                 |
| V2     | +12 V   | 120 mV                                 |

**Table 3-3 Output Ripple and Noise Specification**

### 3.4.1 Ripple and Noise Measurement

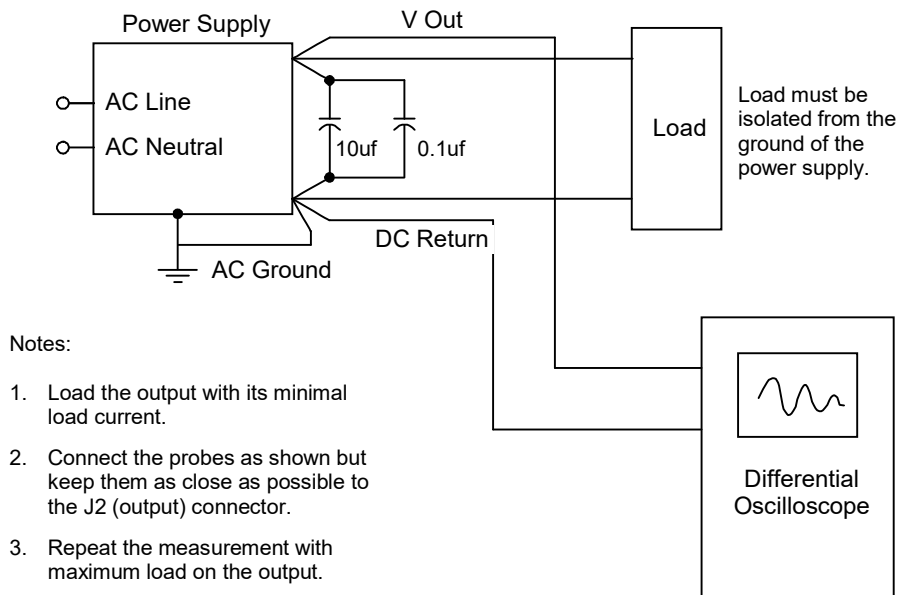
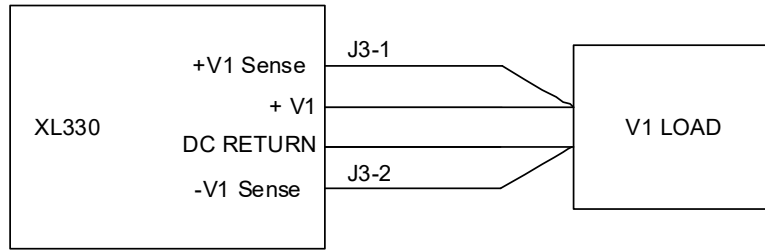


Figure 3-2 Ripple and Noise Measurement Setup

### 3.5 Remote Sensing

Remote sense inputs are provided to compensate for the normal voltage drops in the external V1 output wiring. If the V1 Sense inputs are left open, the V1 output will meet its load regulation specification only at the J2 terminals. Connecting the +V1 Sense and -V1 Sense pins to the load will raise the V1 output voltage to help compensate for the voltage drop in the external V1 wiring. The voltage difference between the +V1 Sense and +V1 output pins must be limited to 0.6-volts as must the difference between the -V1 Sense and RETURN pins. Figure 3-3 shows the optional remote sensing connections. Refer to Table 4-7 for the pin definition of the XL330 connectors.



**Figure 3-3 V1 Remote Sensing**

### 3.6 V1 Over-Voltage Protection

When an over-voltage condition occurs on either V1 or V2, the power supply will shut down and will not restart until AC power is turned off and back on. The XL330 will shut down under the following over-voltage conditions:

| Output | Rated Voltage | Minimum | Nominal | Maximum |
|--------|---------------|---------|---------|---------|
| V1     | +54V          | 61.7V   | 63.0V   | 64.5V   |
| V2     | +12V          | 13.5V   | 14.0V   | 14.7V   |

**Table 3-4 Over-Voltage Protection Thresholds**

### 3.7 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 rising output waveforms are monotonic from 10% to 90% under the maximum steady-state load conditions specified in Table 3-2.

### 3.8 Output Overshoot

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

### 3.9 Output Transients

The maximum output voltage transient caused by stepped load changes will not exceed the output voltage regulation limits by more than 5% of the nominal output voltage. 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 from 50 to 333 cycles per second
- Transient load slew rate used in verification testing is 1.0-amp per microsecond
- Capacitive loading per Table 3-5

### 3.10 Closed Loop Stability

The power supply is unconditionally stable under all line/load/transient load conditions including the capacitive loads specified in Table 3-5. The power supply shall exhibit a minimum of 45-degrees phase margin and 6 dB gain margin.

### 3.11 Efficiency

The XL330-54 CS is typically 90% efficient at full load with an input voltage of 230VAC 60Hz and 10 CFM of cooling air at 25°C. Efficiency is calculated as the total DC output power divided by the RMS input power.

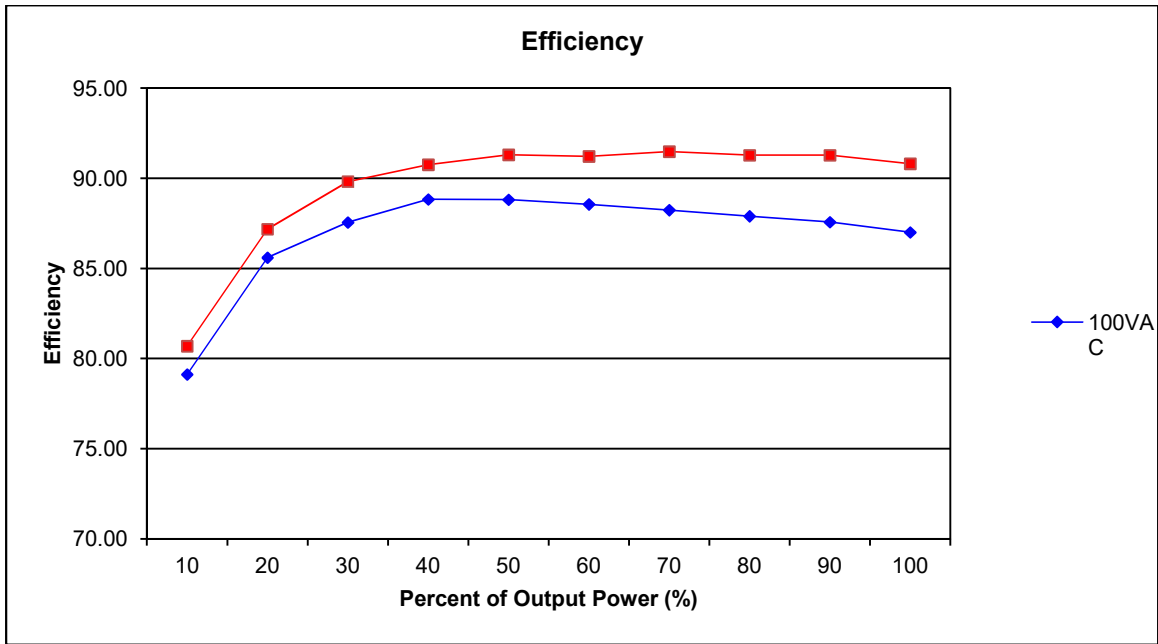


Figure 3-4 Typical XL330-54 CS Efficiency (with OR-ing MOSFET)

### 3.12 Capacitive Load

The XL330 will startup and operate normally with external load capacitance on the outputs do not exceed those listed in Table 3-5.

| Output | Voltage | Capacitive Load (µf) |
|--------|---------|----------------------|
| V1     | +54V    | 350µF                |
| V2     | +12V    | 1,000µF              |

Table 3-5 Capacitive Loading

## 3.13 Parallel Operation

The XL330 model has active current sharing on V1 output. With active current sharing the V1 output of two, three or four standard XL330s may be connected in parallel to provide higher V1 output power. They can also be used in an N+1 configuration to provide higher output power and greater reliability. There is built-in output OR-ing MOSFET and a Current Share signal for parallel operation on V1 output. Remote sensing may still be used in parallel operation.

XL330s running in parallel are capable of starting with a total load that exceeds the capability of an individual unit, however, the rising output waveform may not be monotonic. They are also fully compatible with hot swapping and will tolerate the dramatic load fluctuations encountered in an N+1 redundant configuration when supplies are removed and replaced. Because of the inherent limitations of current sharing, it is recommended that the total load not exceed 92%-94% of the sum of the rated outputs (see Table 3-6). Assuming all XL330 output power is dedicated to the main output (no +12V used), the following table lists possible total system output power.

| Number of XL330s | N Configuration | N+1 Configuration |
|------------------|-----------------|-------------------|
| 1                | 280-watts       | N/A               |
| 2                | 517-watts       | 280-watts         |
| 3                | 775-watts       | 517-watts         |
| 4                | 1035-watts      | 775-watts         |

**Table 3-6 Total Output Power in N and N+1 Configurations**

### 3.13.1 Current Sharing Connections

The Current Share signal (see Table 4-7) of each supply operating in parallel must be connected together. The output voltage of multiple power supplies in parallel is generally the same as that of the supply with the highest stand-alone output voltage.

Current sharing does not require the Remote Sense signals be connected together, but the sharing accuracy may not meet published specification unless they are also connected together. See Figure 3-5 for an example of wiring two XL330's in parallel.

Three and four supplies would be wired in a like manner with all four V1 Current Share signals tied together.

### 3.13.2 Current Share Accuracy

When all the current share signals are connected together and all the Remote Sense signals are connected together, the load delivered by any two of the sharing supplies will not differ by more than 10% at full load. The sharing accuracy decreases with lower loads and with poor grounding techniques.

With active current sharing systems, the Current Share signal is a high-impedance analog output/input on each supply. This signal is quite susceptible to noise pickup and care must be used in wiring the Current Share signals of multiple supplies together. Any external capacitance on this signal will cause the output voltages of all supplies to rise and will compromise sharing accuracy. Do not connect any capacitance to this signal.

It is recommended that a twisted pair of wires be used to daisy-chain the Current Share signal and its adjacent DC Return between each unit. See Table 4-7 for pinout information. Loop the Current Share twisted pair through a ferrite core at each XL330 to reap further sharing and output voltage accuracy.

The current sharing signal is referenced to the same DC Return at the V1 output. It is imperative that the ground wiring from the load to each shared supply be of equal length and have the lowest possible resistance. This means four individual 18 AWG wires should be run from J2 of each supply to a star ground return terminal at the load.

### 3.13.3 V2 (+12V) Parallel Operation

The V2 output has a series OR-ing MOSFET that allows the output to be paralleled with the same output on like supplies. By doing so, the V2 output will remain alive as long as one of the paralleled supplies is functioning. The output current rating does not increase beyond the 9A rating.

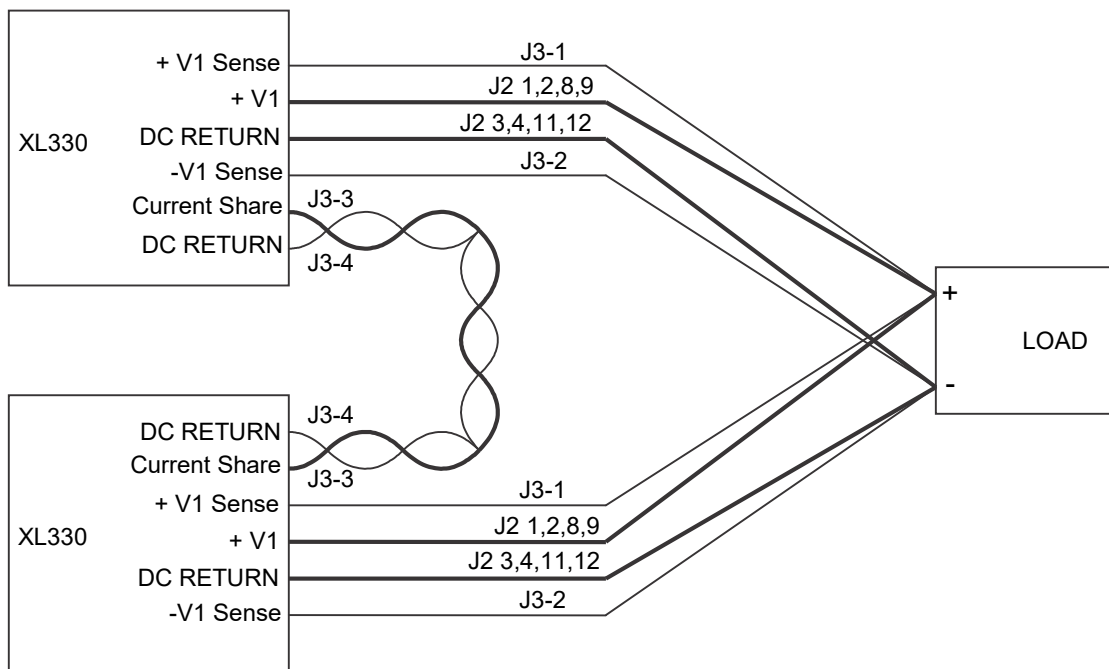


Figure 3-5 Current Sharing Wiring Example

## 3.14 Power Supply Protection

There are several different protection circuits designed to protect the load and the XL330 from component failures and extraordinary circumstances.

### 3.14.1 Over Temperature Protection

If the XL330 is operated without adequate cooling, it will sense an over-temperature condition and simultaneously shut down the V1 and V2 outputs. There are two possible fault-conditions: excessive PFC MOSFET or main transformer temperatures. Following

an over-temperature fault, the XL330 will automatically restart after it has cooled down to below its maximum temperature limits.

### 3.14.2 Over Voltage Protection

Excessive V1 or V2 output voltage (see Section 3.6 for details) will shut-down the V1 and V2 outputs. The XL330 will not restart until AC power is turned off and back on after a 2 second delay.

### 3.14.3 Over-Load Protection

V1 or V2 load currents in excess of 110% of the rated output will cause the V1 and V2 outputs to shut down. The average RMS output power of all the two outputs must still be limited to 330-watts. A combined V1 and V2 load exceeding 360W will also shut down these outputs.

After shutting down from overload, the XL330 automatically attempts to restart itself approximately every second. It will succeed if the sum of the V1 and V2 loads is reduced below the XL330's maximum rated load power.

### 3.14.4 Remote Main Transformer Temperature Sensor

A remote temperature sensor has been mounted on the PS to allow the customer to remotely monitor the temperature of the PS. The customer can determine if the power supply is heating up and if needed, the customer can, externally to the PS, turn on the fan.

The monitor consists of a 2N3904 transistor, mounted on the heatsink with thermal epoxy directly behind J4. Temperature is monitored by measuring the base to emitter junction voltage drop. The output signals are available at J4 pins 1 and 3, see table 4-7. The customer will use a temp monitor IC to monitor the two pins at J4, (Remote Thermal Controller and Voltage Monitor from ON Semi, P/N ADT 7476).



# 4.

# General Specifications

## 4.1 Environmental

The XL330 meets or exceeds the following environmental 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     | 10,000 feet MSL Max. | 3,048 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) |
| 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 Component Derating

The XL330 was designed with the following component-derating guidelines at an operating ambient temperature of 50°C: semiconductor junction temperatures shall not exceed ninety (90) percent of manufacturer's rating. Inductor winding temperatures shall not exceed safety agency requirements. Electrolytic capacitor case temperatures shall not exceed 95% of rated temperature. Resistor power dissipation shall not exceed 50% of rated while other components will not be operated at more than 90% of their rated voltage or current.

## 4.3 Mean Time between Failures

The calculated MTBF of the power supply is equal to or greater than 200,000 hours of continuous operation at maximum output loading and worst case input line voltage with 10-CFM of forced-air cooling at 25°C. 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, TR-332, Issue 6. Actual failure rates vary from unit to unit.

## 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 (if any apply), and country of origin. See Figure 4-1.

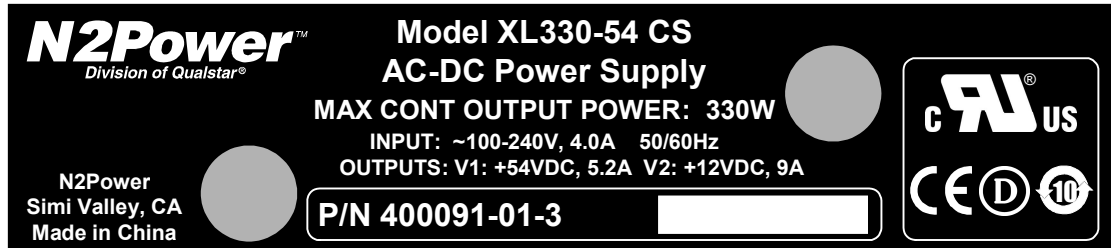
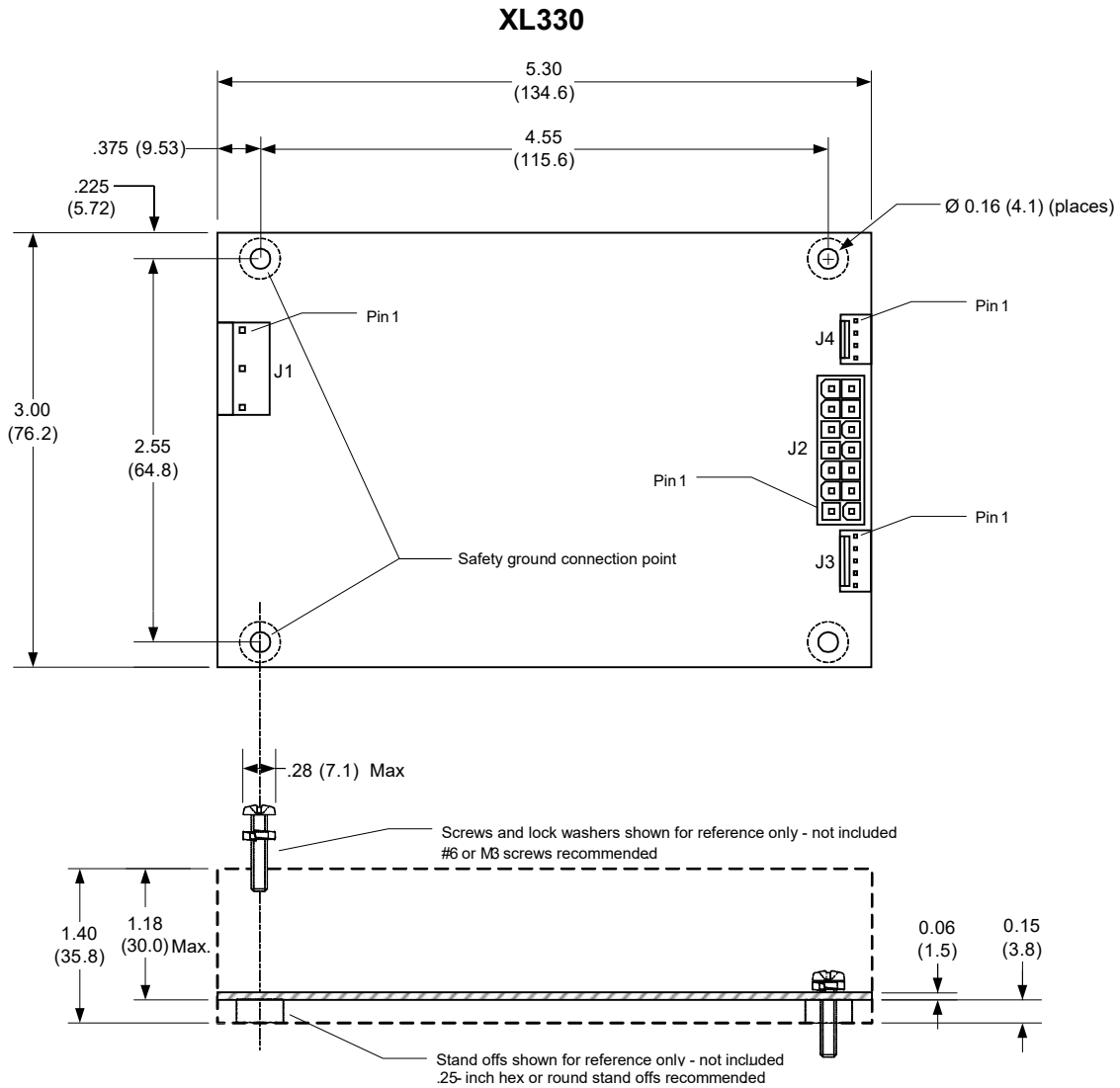


Figure 4-1 Sample XL330 Label

## 4.5 Mounting

The XL330 may be mounted in any attitude but must be mounted on all four corners using M3 or 6-32 UNC hardware. Any mounting hardware (screw heads, washers, standoffs, etc.) must not exceed .282-inches (7.16-mm) in diameter to assure adequate safety agency spacing requirements with components and the printed circuit board traces. A standoff height of 0.25-inches minimum can be used if a thin plastic insulator (0.4mm thick polyester, fish paper or equivalent UL rated 94V-2 material, minimum) is placed between the XL330 and the mounting chassis.

## 4.6 Physical Dimensions



**Figure 4-2 Dimensions**

## 4.7 Weight

| Weight | Units     |
|--------|-----------|
| 0.87   | Pounds    |
| 13.8   | Ounces    |
| 0.39   | Kilograms |

**Table 4-2 Weight of Individual Supply**

## 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 will cause a dramatic increase in terminal resistance resulting in local heating that will cause 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 4.2**

### 4.8.1 AC Input Mating Connector J1

The AC input connector to the XL330 is a 5-pin Molex KK-156 style header with 0.156" centers. The pins 2 and 4 are 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.

| <b>J1</b>                 | <b>Molex P/Ns</b> |
|---------------------------|-------------------|
| Connector Circuits (pins) | 3 of 5            |
| Mating Housing            | 09-50-8051        |
| Crimp Terminal (tin)      | 08-50-0113        |
| Rated Contact Current     | 6.3 A @ AWG 20    |
| 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 Mini-Fit, Jr.® 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. AWG 16 wire with the 39-00-0078 contact is recommended.

| J2                         | Molex P/N  | Rated AWG |
|----------------------------|------------|-----------|
| Connector Circuits (pins)  | 14         |           |
| Mating Housing             | 39-01-2140 |           |
| Rated Contact Current      | 9.0 A      | 16        |
| Recommended Crimp Terminal | 39-00-0078 | 16        |
| Alternate Crimp Terminal   | 39-00-0039 | 18-24     |

**Table 4-4 J2 Mating Connector**

## 4.8.3 Remote Sense/CS Connector J3

The Remote Sense connector is a Molex KK-100 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.

| J3                        | Molex P/Ns     |
|---------------------------|----------------|
| Connector Circuits (pins) | 5              |
| Mating Housing            | 22-01-3057     |
| Crimp terminal (tin)      | 08-65-0816     |
| Rated Contact Current     | 2.5 A          |
| Rated Wire Size           | AWG 22 thru 30 |

**Table 4-5 J3 Mating Connector**

## 4.8.4 Control Connector J4

The Control connector is a Molex KK-100 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.

| J4                        | Molex P/Ns     |
|---------------------------|----------------|
| Connector Circuits (pins) | 4              |
| Mating Housing            | 22-01-3047     |
| Crimp terminal (tin)      | 08-65-0816     |
| Rated Contact Current     | 2.5 A          |
| Rated Wire Size           | AWG 22 thru 30 |

**Table 4-6 J4 Mating Connector**

## 4.9 Output Grounding

The V2 RETURN signal may be connected to the power supply chassis ground (protective earth) at the plated-through mounting hole nearest the J1 input connector.

The V1 output has a floating DC RETURN at J2 and J3 and are isolated from the V2 RETURN by 2250VDC.

## 4.10 Signal Pin Definitions

- Identical signal names are all connected together (on any connector)
- The Protective Earth connection is provided at both the mounting hole near J1 and J1, pin-1.
- Refer to Figure 4-2 for connector and pin-1 locations

| Pin   | Signal                |
|-------|-----------------------|
| J1-1  | Protective Earth (PE) |
| J1-3  | AC Neutral Input      |
| J1-5  | AC Line Input         |
| J2-1  | +V1                   |
| J2-2  | +V1                   |
| J2-3  | V1 RETURN             |
| J2-4  | V1 RETURN             |
| J2-5  | Not connected         |
| J2-6  | V2 RETURN (0V)        |
| J2-7  | V2 RETURN (0V)        |
| J2-8  | +V1                   |
| J2-9  | +V1                   |
| J2-10 | V1 RETURN             |
| J2-11 | V1 RETURN             |
| J2-12 | Not connected         |
| J2-13 | V2 (+12V)             |
| J2-14 | V2 (+12V)             |
| J3-1  | +V1 Sense Input       |
| J3-2  | -V1 Sense Input       |
| J3-3  | V1 I Share            |
| J3-4  | V1 RETURN             |
| J3-5  | PG54V                 |
| J4-1  | TM Base               |
| J4-2  | Power Good            |
| J4-3  | TM Emitter            |
| J4-4  | V2 RETURN             |

Table 4-7 I/O Pin Definitions in Pin-order and Signal-order

## **4.11 POE Isolation**

The main output V1 (54V) is isolated from V2 (12V) by 2250VDC.

The signals associated with the 54V output are on J3 and the signals associated with the 12V output are on J4, see table 4-7.

J3 signals include +/- V1 sense, V1 current share and V1 Return. J3 pin 5 is "PG54V". This signal is derived from the 12V output signal "Power Good" and is isolated via an optocoupler. It has the same timing and positive true logic as the 12V "PG" signal on J4 pin 2.

J4 signals Power Good and V2 Return are associated with the 12V output. The output Temperature Monitor Base (TM Base) and Temperature Monitor Emitter (TM Emitter) are not tied to any output and are free floating by 200VDC from the V2 and chassis.

# 5.

# Timing and Control

## 5.1 Power Supply Timing

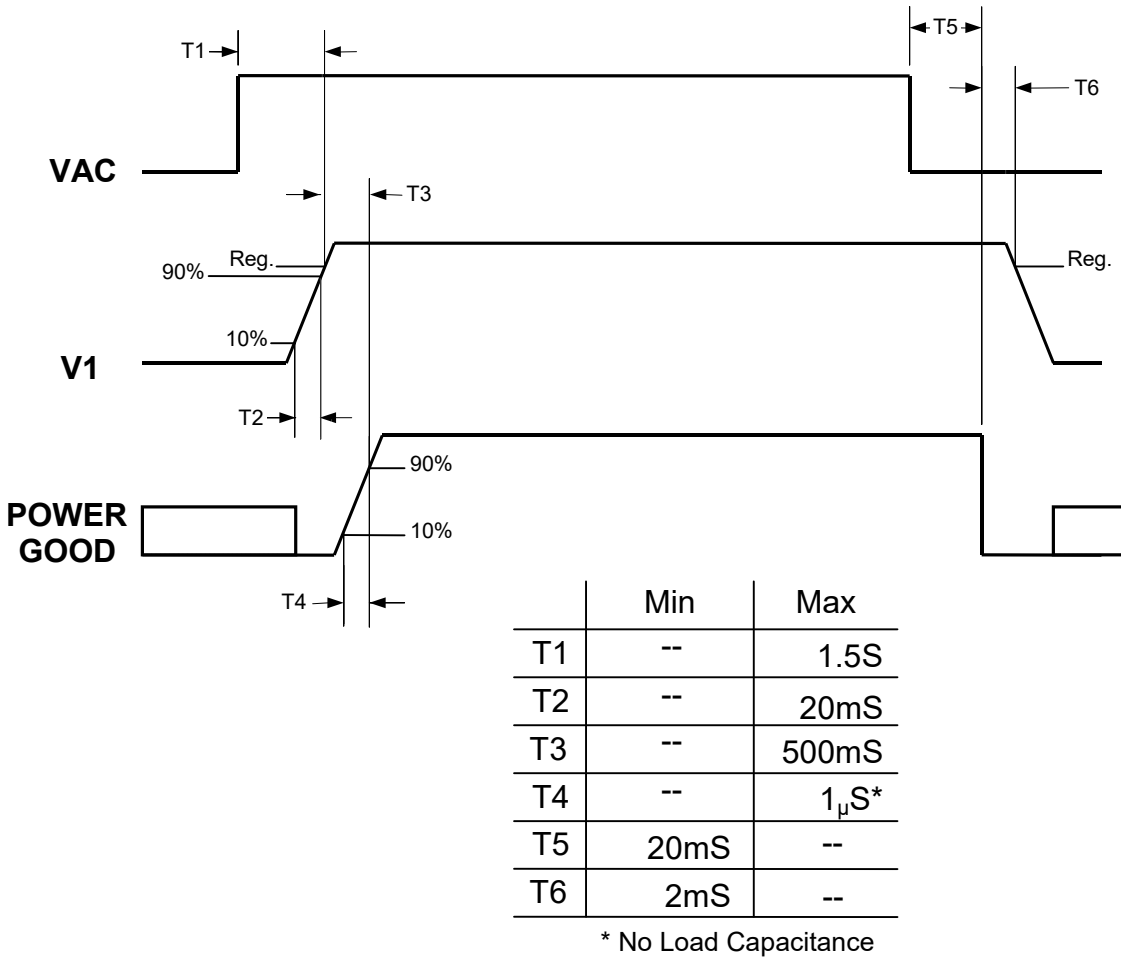


Figure 5-1 XL330 Timing Diagram

## 5.2 Power Good Outputs

The Power Good and PG54V signals provide a high logic level to indicate the DC outputs are 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 power is removed for a period longer than 20ms, both Power Good signals transition to a low logic level.

The Power Good signal is capable of sinking 5mA and has an internal 1K pull-up resistor connected to +6.5 V. The output voltage is clamped by a 5.1V zener diode.



The PG54V signal provides the same timing and positive true logic as the 12V “PG” signal. The PG54V output can sink 50mA and has a 2K pull-up resistor to an internal voltage, AUX1 (12V), and the output voltage is clamped by a 5.1V zener.

Power Good signals must not be wire ORed together. Each individual Power Good signal should be monitored separately by the user’s system.

### 5.3 Hold-Up Time (T5+T6)

The power supply will maintain output regulation (per Table 3-1) despite a momentary loss (lasting up to 22-milliseconds) of input power when operating at any rated input voltage (per \* with IEC AC inlet filter Delta P/N: 06DEEG3E

Table 1-1) at any rated load condition (per Table 3-2).

# 6.

# Ordering Information

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

| <b>Model Number</b> | <b>V1</b> | <b>N2Power Part Number</b> |
|---------------------|-----------|----------------------------|
| XL330-54 CS         | 54V       | 400091-01-3                |

**Table 6-1 Ordering Information**

All XL330 Models are RoHS compliant.

For warranty information refer to [www.n2power.com](http://www.n2power.com) .

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

|                     |   |
|---------------------|---|
| N2Power Order Desk: | <a href="mailto:orders@n2power.com">orders@n2power.com</a>                                |
| Sales:              | <a href="mailto:sales@n2power.com">sales@n2power.com</a><br>805-583-7744 x122             |
| Technical Support   | <a href="mailto:techsupport@n2power.com">techsupport@n2power.com</a><br>805-583-7744 x119 |
| Street Address:     | 130 West Cochran Street, Suite C<br>Simi Valley, CA 93065                                 |