

## DS1100PED

1100 Watts

Distributed Power System

Front-end Bulk Power

Total Output Power: 1100W continuous

Wide Input Voltage 90 to 264Vac

**Preliminary**



### Special Features

- 1100W output power
- High-power and short form factor
- 1U power supply
- High-density design: 24W/in<sup>3</sup>
- Active Power Factor Correction
- EN61000-3-2 Harmonic compliance
- Inrush current control
- 80plus Platinum Efficiency
- N+1 or N+N Redundant
- Hot-pluggable
- Active current sharing
- Full Digital control
- PMBus Compliant
- Accurate input power reporting
- Compatible with Emerson's Universal PMBus GUI
- Reverse airflow option
- Two-year Warranty

### Compliance:

- Conducted/Radiated EMI FCC Docket 20780 Part 15 Subpart J Class A Limits + 6dB margin
- EN61000-4-11

### Safety

- UL/cUL 60950 (UL Recognized)
- NEMKO+ CB Report EN60950
- EN60950
- CE Mark
- China CCC

### Electrical Specifications

Input	
Input range:	90 - 264Vac
Frequency:	47Hz to 63Hz
Efficiency:	94.0% peak
Max Input Current:	14Arms
Inrush Current:	55Apk
Conducted EMI:	Class A
Radiated EMI:	Class A
Power Factor:	>0.9 beginning at 20% load
ITHD:	10%
Leakage Current:	1.4mA
Hold-up Time:	10ms at full load

## Electrical Specifications

OUTPUTS			
Main DC Output	MIN	NOM	MAX
Nominal Setting:	-0.20%	12	0.20%
Total Output Regulation Range	11.4V		12.6V
Dynamic Load Regulation Range:	11.4V		12.6V
Output Ripple:			120mVp-p
Adjustment Range:		TBD	
Output Current:	2A <sup>4</sup>		91.6A
Current Sharing:	Within +/-5% of full load rating		
Capacitive Loading:	2000uF		4000uF
Start-up from AC to Output:			2200ms
Output Rise Time:	5ms		50ms
Standby DC Output			
Output Setpoint Range:	-1%	12	1%
Total Output Regulation Range:	11.4V		12.6V
Dynamic Load Regulation Range:	11.4V		12.6V
Output Ripple:			120mVp-p
Adjustment Range:		N/A	
Output Current:	0.1A		3.0A
Current Sharing:		N/A	
Capacitive Loading:	100uF		680uF
Start-up from AC to Output:			1700ms
Output Rise Time:	2ms		60ms
PROTECTIONS			
Main Output			
Over-Current Protection <sup>2</sup> :	120%		150%
Over-Voltage Protection <sup>1</sup> :	13.5V		15.0V
Under-Voltage Protection:	10.5V		11.0V
Over-Temperature Protection:		Yes	
Fan Fault Protection:		Yes	
Standby Output			
Over-Current Protection <sup>3</sup> :	120%		150%
Over-Voltage Protection <sup>3</sup> :	13.5V		15.0V
Under-Voltage Protection:	10.0V		11.0V

<sup>1</sup>Latch mode

<sup>2</sup>Autorecovery if the overcurrent is less than 120% and last only for <500ms

<sup>3</sup>Standby protection is auto-recovery

<sup>4</sup>Minimum starting current during transient load. Output stays within regulation range at zero load.

# Electrical Specifications

CONTROL AND STATUS SIGNALS			
<b>Input Signals</b>			
<b>PSON</b>			
Active LOW signal which enables/disables the main output. Pulling this signal LOW will turn-on the main output. Recommended pull-up resistor to 12VSB is 8.2k with a 3.0k pull-down to ground. A 100pF decoupling capacitor is also recommended.			
		MIN	MAX
$V_{IL}$	Input logic level LOW		0.8V
$V_{IH}$	Input logic level HIGH	2.0V	5.0V
$I_{SOURCE}$	Current that may be sourced by this pin		2mA
$I_{SINK}$	Current that may be sunk by this pin at low state		0.5mA
<b>PSKILL</b>			
First break/Last Mate active LOW signal which enables/disables the main output. This signal will have to be pulled to ground at the system side with a 220ohm resistor. A 100pF decoupling capacitor is also recommended.			
		MIN	MAX
$V_{IL}$	Input logic level LOW		0.8V
$V_{IH}$	Input logic level HIGH	2.0V	5.0V
$I_{SOURCE}$	Current that may be sourced by this pin		2mA
$I_{SINK}$	Current that may be sunk by this pin at low state		0.5mA
<b>Output Signals</b>			
<b>ACOK</b>			
Signal used to indicate the presence of AC input to the power supply. A logic level HIGH will indicate that the AC input to the power supply is within the operating range while a logic level LOW will indicate that AC has been lost. This is an open collector/drain output. This pin is pulled high by a 1.0kohm resistor connected to 3.3V inside the power supply. It is recommended that this pin be connected to a 100pF decoupling capacitor and pulled down by a 100kohm resistor.			
		MIN	MAX
$V_{IL}$	Output logic level LOW		0.6V
$V_{IH}$	Output logic level HIGH	2.0V	5.0V
$I_{SOURCE}$	Current that may be sourced by this pin		3.3mA
$I_{SINK}$	Current that may be sunk by this pin at low state		0.7mA
<b>PWR_GOOD/PWOK</b>			
Signal used to indicate that main output voltage is within regulation range. The PWR_GOOD signal will be driven HIGH when the output voltage is valid and will be driven LOW when the output falls below the under-voltage threshold. This signal also gives an advance warning when there is an impending power loss due to loss of AC input or system shutdown request. More details in the Timing Section. This is an open collector/drain output. This pin is pulled high by a 1.0kohm resistor connected to 3.3V inside the power supply. It is recommended that this pin be connected to a 100pF decoupling capacitor and pulled down by a 10kohm resistor.			
		MIN	MAX
$V_{IL}$	Output logic level LOW		0.8V
$V_{IH}$	Output logic level HIGH	2.0V	5.0V
$I_{SOURCE}$	Current that may be sourced by this pin		3.3mA
$I_{SINK}$	Current that may be sunk by this pin at low state		0.7mA

## Electrical Specifications

CONTROL AND STATUS SIGNALS			
<b>Output Signals</b>			
<b>PS_PRESENT</b>			
Signal used to indicate to the system that a power supply is inserted in the power bay. This pin is shorted to the standby return in the power supply. Recommended pull-up resistor to 12VSB is 8.2k with a 3.0k pull-down to ground. A 100pF decoupling capacitor is also recommended.			
<b>PS_INTERRUPT</b>			
Active low signal used by the power supply to indicate to the system that a change in power supply status has occurred. This event can be triggered by faults such as OVP, OCP, OTP, and fan fault. This signal can be cleared by a CLEAR_FAULT command. Recommended pull-up resistor to 12VSB is 8.2k with a 3.0k pull-down to ground. A 100pF decoupling capacitor is also recommended.			
		MIN	MAX
$V_{IL}$	Output logic level LOW		0.8V
$V_{IH}$	Output logic level HIGH	2.0V	5.0V
$I_{SOURCE}$	Current that may be sourced by this pin		4mA
$I_{SINK}$	Current that may be sunk by this pin at low state		4mA
<b>BUS Signals</b>			
<b>ISHARE</b>			
Bus signal used by the power supply for active current sharing. All power supplies configured in the system for n+n sharing will refer to this bus voltage in order to load share.			
<b>VOLTAGE RANGE</b>	The range of this signal for active sharing will be up to 8.0V, which corresponds to the maximum output current.		
		MIN	MAX
$I_{SHARE}$ Voltage	Voltage at 100% load, stand-alone unit	7.75	8.25V
	Voltage at 50% load, stand-alone unit	3.85V	4.15V
	Voltage at 0% load, stand-alone unit	0	0.3
$I_{SOURCE}$	Current that may be sourced by this pin		160mA
<b>SCL,SDA</b>			
Clock and data signals defined as per I2C requirements. It is recommended that these pins be pulled-up to a 2.2kohm resistor to 3.3V and a 100pF decoupling capacitor at the system side.			
$V_L$	Output logic level LOW		0.8V
$V_H$	Output logic level HIGH	2.0V	5.0V

Note: All signal noise levels are below 400mVpk-pk from 0-100MHz.

I2C Addressing Table: Not applicable. This power supply has a fixed I2C address. In order to support multiple addresses, the system will have to utilize a switcher or an I2C expander.

# Electrical Specifications

## LED INDICATORS

A single bi-color LED is used to indicate the power supply status.

	Status LED
NO AC INPUT TO PSU	Off
AC PRESENT, STBY ON, MAIN OUTPUT OFF	Solid GREEN
MAIN OUTPUT ON	Solid GREEN
POWER SUPPLY FAILURE (OCP, OVP, OTP, FAN FAULT)	Blinking AMBER

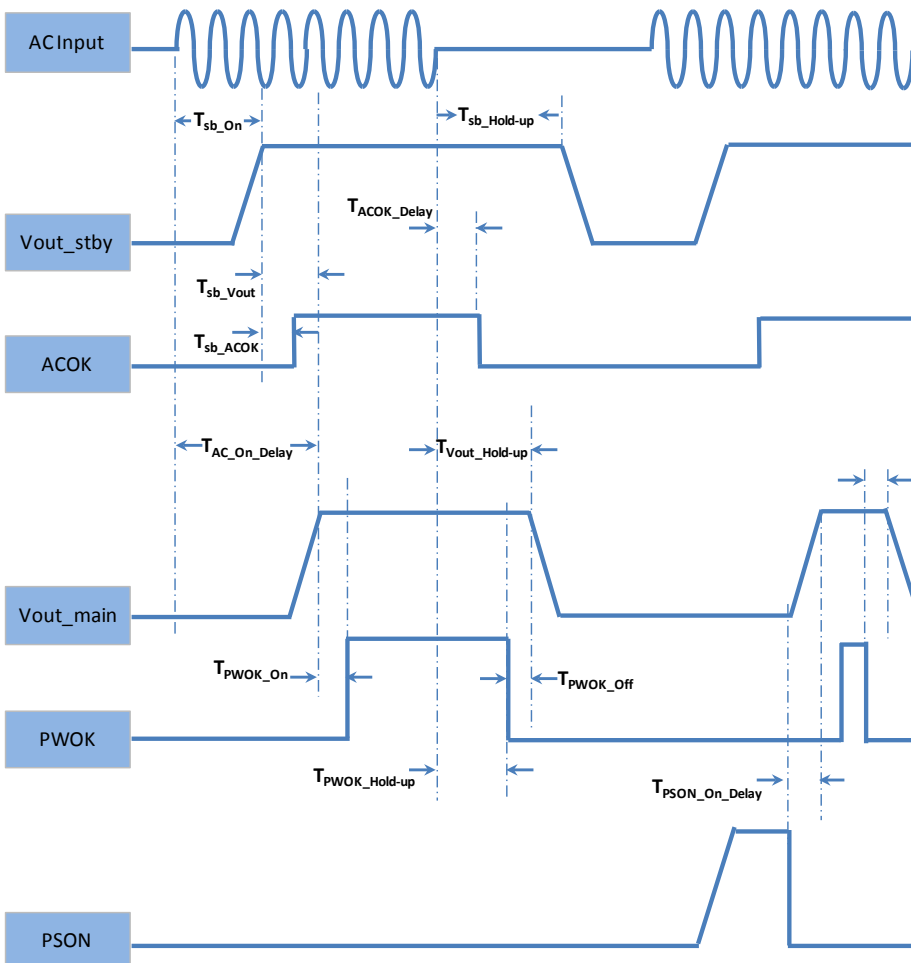
## FIRMWARE REPORTING AND MONITORING

ACCURACY RANGE			
OUTPUT LOADING	5 to 20%	20% to 50%	50% to 100%
INPUT VOLTAGE	+/-5%		
INPUT CURRENT	+/-0.55A fixed error		+/-4%
INPUT POWER	+/-1.25W at <125W input		+/-1.25%
OUTPUT VOLTAGE	+/-2%		
OUTPUT CURRENT	0.3A fixed error		+/-2%
TEMPERATURE	+/-5degC on the operating range		
$E_{IN}$	+/-15% from 10% to 20% load		+/-5%
PMBUS	YES		
REMOTE ON/OFF	YES		

# Electrical Specifications

Timing Specifications				
	DESCRIPTION	MIN	MAX	UNIT
$T_{sb\_On}$	Delay from AC being applied to standby output being within regulation	20	1700	ms
$T_{sb\_ACOK}$	Delay from standby output to ACOK assertion	See note below	20	ms
$T_{sb\_Vout}$	Delay from standby output to main output voltage being within regulation		300	ms
$T_{AC\_On\_Delay}$	Delay from AC being applied to main output being within regulation		2200	ms
$T_{PWR\_GOOD\_On}$	Delay from output voltages within regulation limits to PWOK asserted	100	1000	ms
$T_{ACOK\_Delay}$	Delay from loss of AC to assertion of ACOK		6	ms
$T_{PWR\_GOOD\_Hold-up}$	Delay from loss of AC to deassertion of PWOK	10		ms
$T_{Vout\_Hold-up}$	Delay from loss of AC to main output being within regulation	11		ms
$T_{sb\_Hold-up}$	Delay from loss of AC to standby output being within regulation	150		ms
$T_{PWR\_GOOD\_Off}$	Delay from deassertion of PWOK to output falling out of regulation	1		ms
$T_{PSON\_On\_Delay}$	Delay from PSON assertion to output being within regulation		350	ms
$T_{PWOK\_Low}$	Duration of PWOK being in deasserted state during an ON/OFF cycle of PSU	N/A	N/A	

Notes:  $T_{vout\_hold-up}$  tested at 1A load on standby output  
 $T_{sb\_ACOK}$ : ACOK can assert earlier than the standby output



## Environmental Specifications

Operating Temperature:	10 to 50°C
Operating Altitude:	up to 10,000 feet
Operating Relative Humidity:	20% to 80% non-condensing
Non-operating Temperature:	-40 to 70°C
Non-operating Relative Humidity:	10% to 95% non-condensing
Non-operating Altitude:	up to 50,000 feet

Vibration and Shock:	Astec Standard QP3205, IEC721-3-3 3M3 and IEC721-3-3 1M3
ROHS Compliance:	Yes

MTBF	400,000 hours using Bell Core TR-332, issue 6 specification, Method 1 Case 3 at 25degC ambient at full load.
Operating Life	Minimum of 5 years
Reliability	All electronic component derating analysis and capacitor life calculation is done at maximum ambient, 80% of maximum rated load, nominal input line voltage.

