

## DS1100SLPE

1100 Watts Distributed Power System

Data Sheet

Front-end Bulk Power  
 Total Output Power:  
 1100 W continuous  
 Wide Input Voltage:  
 90 to 264 Vac



### SPECIAL FEATURES

- 1100 W output power
- High-power and short form factor
- 1U power supply
- High-density design: 26 W/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 Artesyn's Universal PMBus GUI
- Reverse airflow option
- Two-year warranty

### COMPLIANCE

- EMI Conducted/Radiated Class A Limits + 6 dB margin
- EN61000-4 Electro-magnetic Compatibility
- ROHS 6/6

### SAFETY

- UL/cUL 60950
- DEMKO+ CB Report
- CE Mark
- China CCC
- BSMI

### Electrical Specifications

Input						
Input range:	90 - 264 Vac					
Frequency:	47 Hz to 63 Hz					
Efficiency:	94.0% peak					
Max input current:	14.5 Arms					
Inrush current:	55 Apk					
Conducted EMI:	Class A +6dB margin					
Radiated EMI:	Class A +6dB margin					
Power factor:	> 0.9 beginning at 20% load					
ITHD:	10%					
Leakage current:	1.75 mA					
Hold-up time:	16 ms at full load					
Output						
	Main DC Output			Standby DC Output		
	MIN	NOM	MAX	MIN	NOM	MAX
Nominal setting:	-1%	12	+1%	-1%	3.3	1%
Total output regulation range:	11.64 V	12	12.36 V	3.14 V	3.3	3.46 V
Dynamic load regulation range:	11.64 V		12.36 V	3.14 V		3.46 V
Output ripple:			180 mVp-p			45 mVp-p
Output current:	0.5 A <sup>1</sup>		90.0 A	0.1 A		3.0 A
Current sharing:	Within ±5.625A of each other from 25% to 100% load			N/A		
Capacitive loading:	500 uF		11,000 uF	100 uF		680 uF
Start-up from AC to output:			2200 ms			1700 ms
Output rise time:	5 ms		50 ms	2 ms		60 ms

Note: Outputs shall be isolated from the chassis ground by at least 50 V

<sup>1</sup> Minimum starting current for transient load response testing only. Unit is designed to operate and be within output regulation at zero load.

## Electrical Specifications

Protections			
Main Output	MIN	NOM	MAX
Over-current protection <sup>2</sup> :	107%		130%
Over-voltage protection <sup>1</sup> :	13.5 V		15.0 V
Over-temperature protection:	Yes, autorecovery		
Fan fault protection:		Yes	
Standby Output			
Over-current protection <sup>3</sup> :	110%		150%
Over-voltage protection <sup>1</sup> :	3.6 V		3.9 V

<sup>1</sup> Latch mode

<sup>2</sup> No shutdown if the over-current is within the range and does not last for more than 200ms, otherwise, latch will occur

<sup>3</sup> Autorecovery

## Control and Status Signals

Input Signals			
<b>PSON_L</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 VSB is 5.1 kohms. A 100 pF decoupling capacitor is also recommended.			
		MIN	MAX
$V_{IL}$	Input logic level LOW		0.8 V
$V_{IH}$	Input logic level HIGH	2.0 V	3.6 V
$I_{SOURCE}$	Current that may be sourced by this pin		2 mA
$I_{SINK}$	Current that may be sunk by this pin at low state		0.5 mA
<b>PSKILL_H</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 220 ohm resistor. A 100 pF decoupling capacitor is also recommended.			
		MIN	MAX
$V_{IL}$	Input logic level LOW		0.8 V
$V_{IH}$	Input logic level HIGH	2.0 V	3.6 V
$I_{SOURCE}$	Current that may be sourced by this pin		2 mA
$I_{SINK}$	Current that may be sunk by this pin at low state		0.5 mA
<b>VSENSE+, VSENSE-</b>			
VSENSE+ and VSENSE- lines are the remote sense lines for regulation. Each line will compensate for a maximum of 100 mV.			

## I2C Addressing

A1 Pin	A0 Pin	PMBus (w/r)
0	0	B0/B1
0	1	B2/B3
1	0	B4/B5
1	1	B6/B7

## Ordering Information

Model Number	Nominal Main Output	Standby Output	Airflow Direction
DS1100SLPE-3	12 V	3.3V @ 3A	Std (forward)
DS1100SLPE-3-001	12 V	3.3V @ 3A	Reverse <sup>1</sup>

<sup>1</sup> Derating may apply.

## Control and Status Signals

### Output Signals

#### ACOK

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 10 kohm resistor connected to 3.3 V inside the power supply. It is recommended that this pin be connected to a 100 pF decoupling capacitor and pulled down by a 100 kohm resistor.

		MIN	MAX
$V_{IL}$	Input logic level LOW		0.6 V
$V_{IH}$	Input logic level HIGH	2.0 V	3.6 V
$I_{SOURCE}$	Current that may be sourced by this pin		3.3 mA
$I_{SINK}$	Current that may be sunk by this pin at low state		0.7 mA

#### PWR\_GOOD / PWOK

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 10 kohm resistor connected to 3.3 V inside the power supply. It is recommended that this pin be connected to a 100 pF decoupling capacitor and pulled down by a 100 kohm resistor.

		MIN	MAX
$V_{IL}$	Input logic level LOW		0.8 V
$V_{IH}$	Input logic level HIGH	2.0 V	3.6 V
$I_{SOURCE}$	Current that may be sourced by this pin		3.3 mA
$I_{SINK}$	Current that may be sunk by this pin at low state		0.7 mA

### Output Signals

#### PS\_PRESENT

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 VSB is 5.1 kohms. A 100 pF decoupling capacitor is also recommended.

#### PS\_INTERRUPT

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 VSB is 5.1 kohms. A 100 pF decoupling capacitor is also recommended.

		MIN	MAX
$V_{IL}$	Input logic level LOW		0.8 V
$V_{IH}$	Input logic level HIGH	2.0 V	3.6 V
$I_{SOURCE}$	Current that may be sourced by this pin		4 mA
$I_{SINK}$	Current that may be sunk by this pin at low state		4 mA

## Control and Status Signals

### BUS Signals

#### ISHARE

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.

Voltage Range	The range of this signal for active sharing will be up to 8.0 V, which corresponds to the maximum output current.		
		MIN	MAX
$I_{SHARE}$ Voltage	Input logic level LOW	7.75	8.25
	Voltage at 50% load, stand-alone unit	3.85	4.15
	Voltage at 0% load, stand-alone unit	0	1.0
$I_{SOURCE}$	Current that may be sourced by this pin		160 mA

#### SCL, SDA

Clock and data signals defined as per I<sup>2</sup>C requirements. It is recommended that these pins be pulled-up to a 2.2 kohm resistor to 3.3 V and a 100 pF decoupling capacitor at the system side.

VL	Input logic level LOW		0.8 V
VH	Input logic level HIGH	2.0 V	3.6 V

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

## Electrical Specifications

### LED Indicators

Two LEDs are used to indicate the power supply status.

	Input LED	Fail LED
Color:	Green	Amber/Green
No input to PSU:	Off	Off
Input present, STBY ON, main output OFF:	On	Blinking Amber, at least 1 Hz
Main output ON:	On	Green
Power supply warning (hi-temp)	On	Blinking Amber/Green, at 2:1 ratio, at least 1 Hz
Power supply warning (slow fan)	Off	Blinking Amber/Green, at 1:1 ratio, at least 1 H
Power supply failure (OVP, OTP, FAN FAULT):	On	Amber

### Firmware Reporting And Monitoring

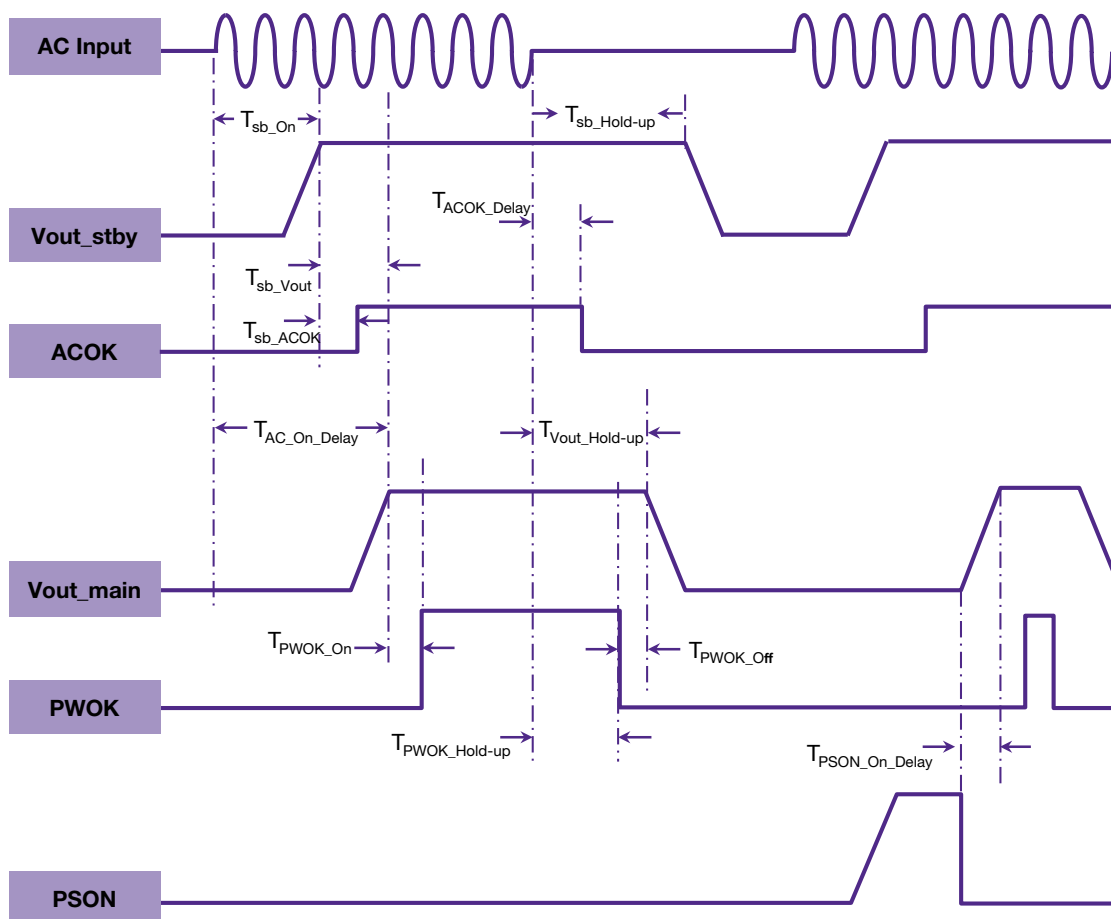
	Accuracy Range		
Output loading:	<10%	10% to 20%	20% to 100%
Input voltage:	+/- 5%		
Input current:	+/- 1A fixed error	+/-10%	+/-5%
Input power:	30W fixed error up to 120W	+/-15%	+/-10%
Output voltage:	+/-5%		+/-2%
Output current:	0.8A fixed error	+/-15%	+/-5%
Temperature:	+/-5°C		
Fan speed:	Actual +/- 250 RPM		

PMBus:	YES
Remote ON/OFF:	YES

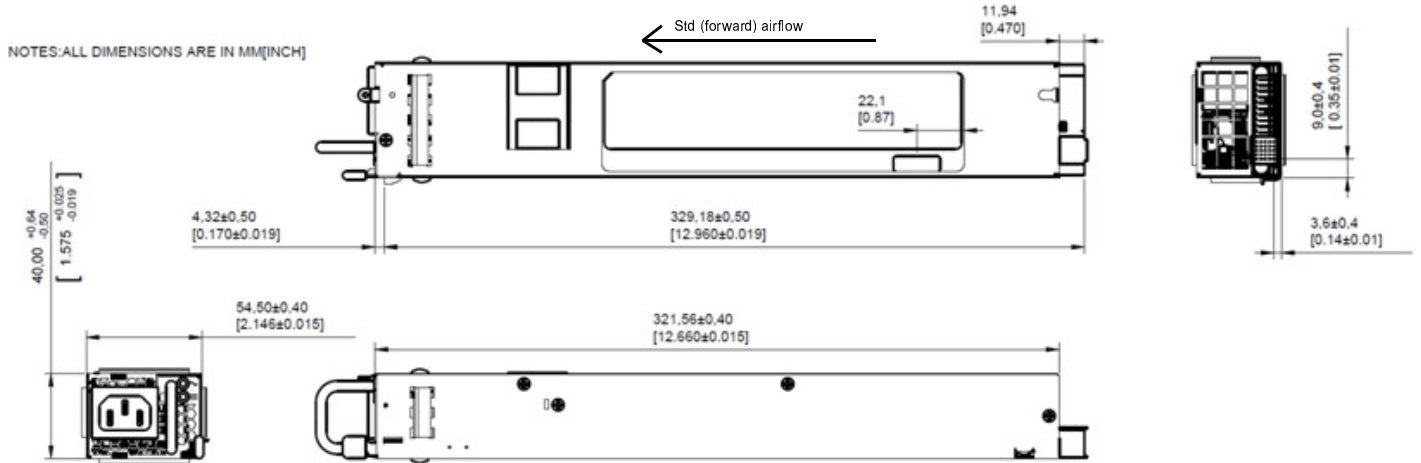
## Electrical Specifications

Timing Specifications				
	Description	Min	Max	Unit
$T_{sb\_On}$	Delay from AC being applied to standby output being within regulation		2500	ms
$T_{sb\_ACOK}$	Delay from standby output to ACOK assertion		1500	ms
$T_{sb\_Vout}$	Delay from standby output to main output voltage being within regulation		1000	ms
$T_{AC\_On\_Delay}$	Delay from AC being applied to main output being within regulation		3000	ms
$T_{PWOK\_On}$	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		20	ms
$T_{PWOK\_Hold-up}$	Delay from loss of AC to deassertion of PWOK	5		ms
$T_{Vout\_Hold-up}$	Delay from loss of AC to main output falling out of regulation	16		ms
$T_{sb\_Hold-up}$	Delay from loss of AC to standby output falling out of regulation	25		ms
$T_{PWR\_GOOD\_Off}$	Delay from deassertion of PWOK to output falling out of regulation	1	700	ms
$T_{PSON\_On\_Delay}$	Delay from PSON assertion to output being within regulation		400	ms

## Timing Diagram

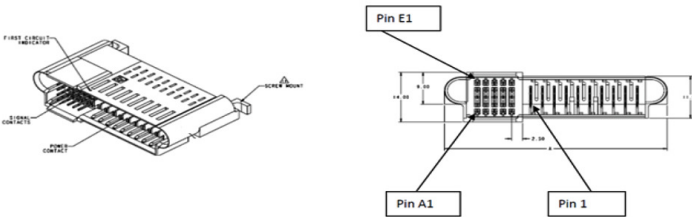


## Mechanical Outline



## Output Connector

Output Connector Part Number	TEI 1926736-3
Mating Connector Part Number	TEI 2-1926739-5, 1892787-6 or equivalent



## Output Connector Pin Configuration

Pin	Signal	Function
A1	3.3 VSB	Standby Output
B1	3.3 VSB	Standby Output
C1	3.3 VSB	Standby Output
D1	3.3 VSB	Standby Output
E1	3.3 VSB	Standby Output
A2	SGND	Signal Ground
B2	SGND	Signal Ground
C2	Reserved	
D2	Reserved	
E2	Reserved	
A3	A2/ A_Select	Optional address line
B3	A0	I <sup>2</sup> C address
C3	SDA	I <sup>2</sup> C Data
D3	-Remote_Sense	Wire drop compensation
E3	+Remote_Sense	Wire drop compensation
A4	SCL	I <sup>2</sup> C Clock
B4	PS_ON_L	Enable/Inhibit
C4	PS_INTERRUPT_L	Alert for failure
D4	A1	I <sup>2</sup> C address
E4	ACOK	Input indicator
A5	PSKILL_L	First break/last mate pin
B5	ISHARE	Current share bus
C5	PWOK	Output indicator
D5	Reserved	
E5	PS_PRESENT_L	power supply present
P1-P5	+12 V Return	Main output power contact
P6-P10	12 V	Main output return contact

## Environmental Specifications

Operating temperature:	DS1100SLPE-3: Full power at -5 to 55°C, can operate up to 65°C at 660W derated power DS1100SLPE-3-001: Full power at -5 to 45°C, can operate up to 55°C at 660W derated power
Operating altitude:	up to 10,000 feet
Operating relative humidity:	20% to 90% 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:	Standard operating/non-operating random shock and vibration
ROHS compliance:	Yes
MTBF:	>500,000 hours using Telcordia Issue 2, Method 1 Case 1 at 40 degC ambient at full load.
Operating life:	Minimum of 7 years at typical operating conditions
Reliability:	All electronic component derating analysis and capacitor life calculation is done at 40 degC ambient, 80% of maximum rated load, nominal input line voltage.

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