POWER

Data Sheet

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

SPECIAL FEATURES

- 495 W output power
- 1U power supply
- Active Power Factor Correction
- EN61000-3-2 Harmonic compliance
- Inrush current control
- 80plus Platinum efficiency
- N+N redundant
- Hot-pluggable
- Active current sharing
- Full digital control
- PMBus compliant
- Standard airflow
- Two-year warranty

COMPLIANCE

- Conducted/Radiated EMI Class A Limits + 6 dB margin
- EN61000-4-11

SAFETY

- IEC62368
- UL/cUL
- Demko +CB Report
- CE Mark
- CCC
- BSMI

Electrical Specifications

Input	
Input range	90 - 264 Vac
Frequency	47 Hz to 63 Hz
Efficiency	94.0% peak
Max input current	6.6 Arms @ 90 Vac
Inrush current	25 Apk
Conducted EMI	Class A with 6 dB margin
Radiated EMI	Class A with 6 dB margin
Power factor	>0.9 beginning at 20% load
ITHD	10%
Leakage current	1 mA
Hold-up time	10 ms at full load

Output						
	Main DC Output			**Standby DC Output**		
	MIN	**NOM**	**MAX**	**MIN**	**NOM**	**MAX**
Nominal setting	-0.20%	12	0.20%	-2.5%	12	+2.5%
Total output regulation range	11.4 V		12.6 V	11.4 V		12.6 V
Dynamic load regulation range	11.4 V		12.6 V	11.4 V		12.6 V
Output ripple (peak to peak)			120 mV			120 mV
Output current	2.0 A[1]		41.25 A	0.0 A		3.0 A
Current sharing	Within ±5% of full load rating			N/A		
Capacitive loading	TBD		38,000 μF	47 μF		4,700 μF
Start-up from AC to output			2000 ms			1700 ms
Output rise time	2 ms		20 ms	2 ms		20 ms

[1] Minimum current for transient load response testing only. Unit is designed to operate and be within output regulation range at zero load.

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Electrical Specifications

Protections

Main Output	MIN	NOM	MAX
Overcurrent protection[2]	110%		150%
Overvoltage protection[1]	13.5 V		15.0 V
Undervoltage protection	10.0 V		11.0 V
Overtemperature protection		Yes	
Fan fault protection		Yes	
Standby Output			
Overcurrent protection[2]	3.6 A		4.5 A
Overvoltage protection[2]	13.5 V		15.0 V
Undervoltage protection	10.0 V		11.0 V

[1] Latch mode
[2] Standby protection is auto-recovery

Ordering Information

Model Number	Nominal Main Output	Standby Output	Airflow Direction
DS495SPE-3	12 V @ 41.25 A	12 V @ 3 A	Standard (forward)
DS495SPE-3-001	12 V @ 41.25 A	12 V @ 3 A	Reverse

Control and Status Signals

Input Signals

PSON_L

Active LOW signal which enables/disables the main output. Pulling this signal LOW will turn-on the main output. It is recommended that this pin is connected to a 100pF decoupling capacitor and pulled down by a 3.0K ohm resistor.

		MIN	MAX
V_{IL}	Input logic level LOW		0.4 V
V_{IH}	Input logic level HIGH	2.06 V	3.0 V
I_{SOURCE}	Current that may be sourced by this pin at low state		1 mA

PSKILL_L

First break/last mate active high signal which enables/disables the main output. When driven high, the main output shall be turned-off.

		MIN	MAX
V_{IL}	Input logic level LOW		0.4 V
V_{IH}	Input logic level HIGH	2.4 V	3.0 V
I_{SOURCE}	Current that may be sourced by this pin at low state		1.0 mA

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.

		MIN	MAX
V_{oL}	Output logic level LOW		0.6 V
V_{oH}	Output logic level HIGH	2.0 V	3.0 V
I_{SOURCE}	Current that may be sourced by this pin		4.0 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. It is recommended that this pin be connected to a 100 pF decoupling capacitor and pulled down by a 10 kohm resistor.

		MIN	MAX
V_{oL}	Output logic level LOW		0.4 V
V_{oH}	Output logic level HIGH	2.0 V	3.0 V
I_{SINK}	Current that may be sunk by this pin		10.0 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 connected to the standby return in the power supply through a 220 ohm resistor. Recommended pull-up resistor to 12 VSB is 8.2 k with a 3.0 k pull-down to ground. A 100 pF decoupling capacitor is also recommended.

PS_INTERRUPT_L

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 12 VSB is 8.2 k with a 3.0 k pull-down to ground. A 100 pF decoupling capacitor is also recommended.

		MIN	MAX
V_{oL}	Output logic level LOW		0.8 V
V_{oH}	Output logic level HIGH	2.0 V	3.0 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

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 inorder 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	Voltage at 100% load, stand-alone unit	7.75	8.25
	Voltage at 50% load, stand-alone unit	3.85	4.15
	Voltage at 0% load, stand-alone unit	0	0.35

SCL, SDA

Clock and data signals defined as per I²C requirements.

			MAX
VL	Input logic level LOW		0.8 V
VH	Input logic level HIGH	2.0 V	3.0 V

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

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, with external 12 V available	Blinking GREEN (2 sec on, 1 sec off)
Standby mode	Blinking GREEN (2 sec on, 1 sec off)
Main output ON	Solid GREEN
Power supply failure (OCP, OVP, OTP, FAN FAULT)	Blinking AMBER (1 sec on, 1 sec off)
Standby fault	OFF

Firmware Reporting And Monitoring

	Accuracy Range		
Output loading	5 to 20%	20 to 50%	50 to 100%
Input voltage	±5%		
Input current	±0.55 A fixed error	±5%	
Input power	6.25W	5%	
Output voltage	±2%		
Output current	±0.7 A error	±3%	
Temperature	±5 °C on the operating range		
E_{IN}	±15% from 10% to 20% load	±5%	
Fan speed	Actual RPM ±250 RPM		

Timing Specifications

|	Description	Min	Max	Unit
T_{sb_On}	Delay from AC being applied to standby output being within regulation		1700	ms
T_{Vout_rise}	Rise time of output voltage going from 10% to 90% of the nominal regulation	2	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		2000	ms
T_{PWOK_On}	Delay from output voltages within regulation limits to PWOK asserted	100	500	ms
$T_{ACOK\_PWOK\_Delay}$	Delay from deassertion of ACOK, due loss of input, to deassertion of PWOK	4		ms
$T_{PWOK\_Hold-up}$	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
$T_{Vout\_sb\_dwell}$	Delay from main output going <1V to stnadby voltage falling out of regulation	5		ms
$T_{ACOK\_off\_dwell}$	Duration time of ACOK deassertion when the PSU has sensed a loss of input	75	120	ms
$T_{sb\_Hold-up}$	Delay from loss of AC to standby output being within regulation *Tested with standby at 1A load	150		ms
T_{PWOK_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

Timing Diagram
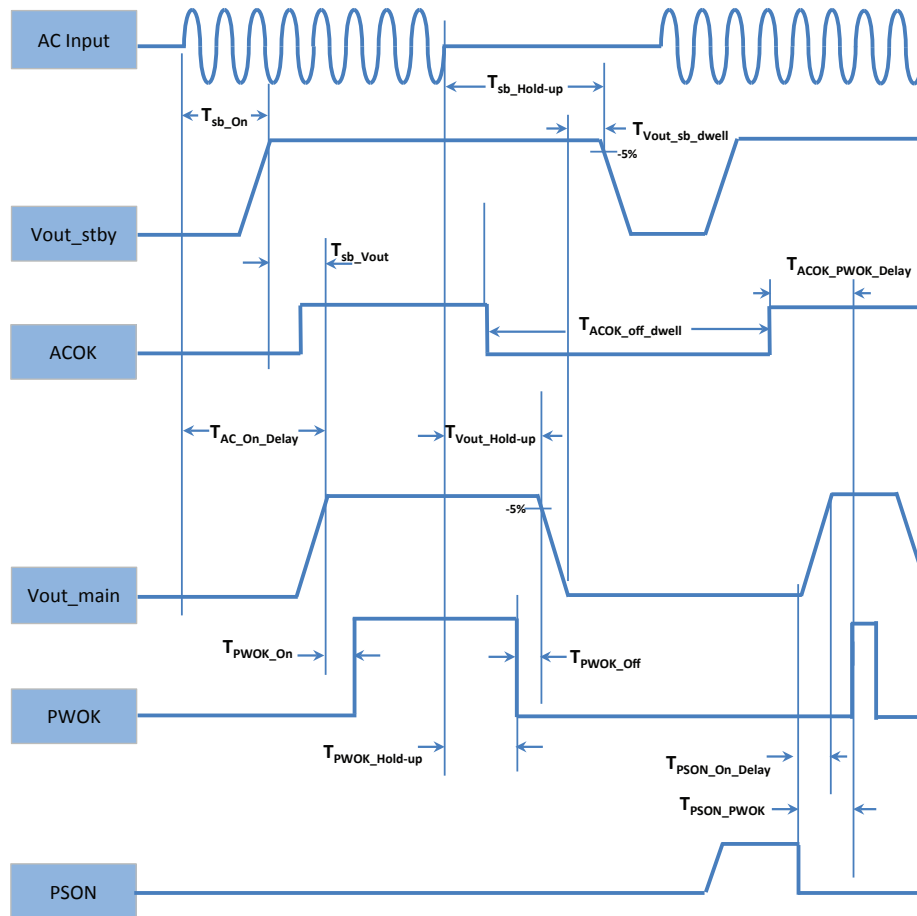
Environmental Specifications

Operating temperature	0 °C to 55 °C at 100% load; DS495SPE-3 can operate up to 65 °C at 300 W without damage DS495SPE-3-001 can operate up to 60 °C at 300 W without damage
Operating altitude	up to 16,400 feet, with ambient temperature derated to 45 °C at 10,000 feet
Operating relative humidity	10% to 95% non-condensing
Non-operating temperature	-40 °C 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	> 900 khours at 55 °C, 80% load
Operating life	> 5 years at 55 °C at 80% load

Mechanical Outline

DS495SPE-3 (FORWARD FLOW) ⟹

DS495SPE-3-001 (REVERSE FLOW) ⟸

8.8

196.5±0.5

LBLD-PRODUCT

DS495SPE-3-001 (REVERSE)
1. BLUE HANDLE

2. WITH FAN GRILL

DS495SPE-3 (FORWARD)
1. RED HANDLE

2. NO FAN GRILL

86.3±0.5

17.8

9.31±0.38

14.8±0.3

EMI CLIP

2.9

B

191.1±0.5

38.5±0.5

9.5

4 ±0.2

A

14±0.3

LATCH BUTTON (BLACK)

49.5

B

HANDLE (SEE TABLE 1)

40.1 +0.3/−0.1

20

A
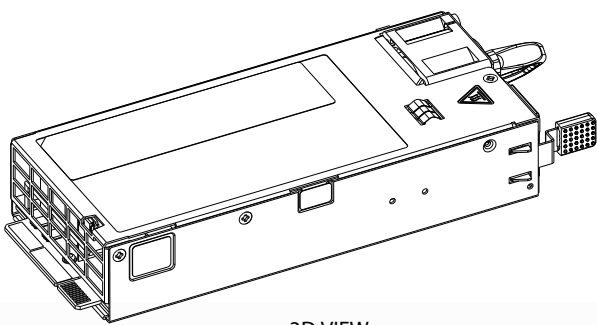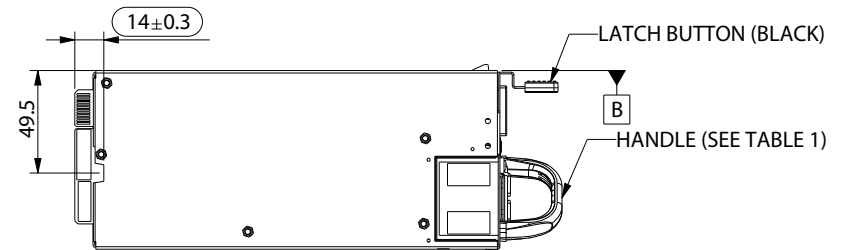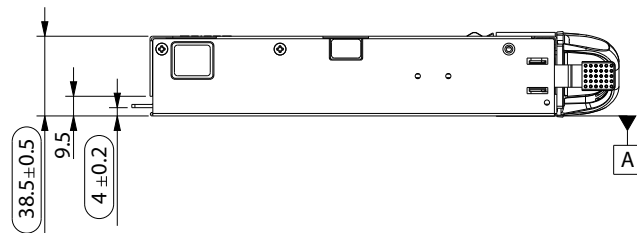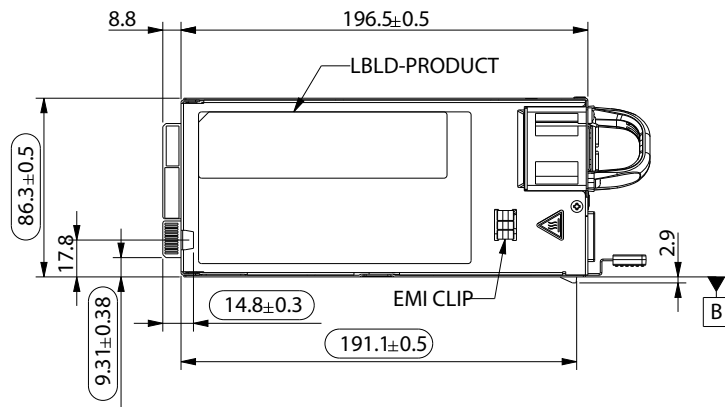
3D VIEW

Connector Definitions

Output Connector Part Number	Card-edge
Mating Connector Part Number	FCI 10107844-002LF or equivalent

Power Supply Output Card Edge (Bottom Side)
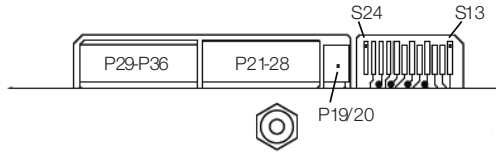
Power Supply Output Card Edge (Top Side)
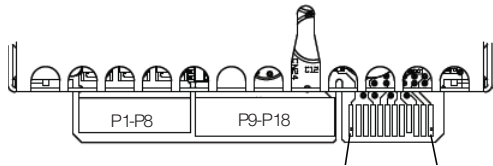
Output Connector Pin Configuration

S1	PS PRESENT	S13	PS_ON_L
S2	Reserved	S14	PS_KILL_L
S3	Reserved	S15	Reserved
S4	Pwr_Good (PWOK)	S16	RETURN
S5	ACOK (AC Input Present)	S17	SDA
S6	RETURN	S18	RETURN
S7	ISHARE	S19	SCL
S8	RESERVE	S20	RETURN
S9	PS INTERRUPT_L	S21	REMOTE SENSE-
S10	RETURN	S22	RETURN
S11	Reserved	S23	REMOTE SENSE+
S12	Reserved	S24	RESERVE
P1-P8	Vo	P19-P20	VSB
P9-P18	RTN	P21-P28	RTN
		P29-P36	Vo

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