

DS2500PE

180 Vac to 264 Vac
2500 W

Distributed Power Bulk Front-end
Single Output Standard

Total Output Power: 2500 W
continuous



Special Features

- 2500 W output power
- High-power and narrow form factor
- 1U form factor
- High-density design: 23.3 W/in³
- 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
- PMBus compliant
- Compatible with Emerson's universal PMBus GUI
- Two-year warranty

Compliance

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

Safety

- UL/cUL 60950
- DEMKO+ CB Report EN60950
- CE Mark
- BSMI

Electrical Specifications

Input	
Input voltage range:	180 to 264 Vac
Frequency:	47 Hz to 63 Hz
Efficiency:	94.0% peak
Max input current:	15.6 Arms
Inrush current:	55 Apk
Conducted EMI:	Class A
Radiated EMI:	Class A
Power factor:	>0.97, typical
ITHD:	10%
Leakage current:	0.75 mA
Hold-up time:	12ms

Ordering Information

	Main Output	Standby Output	Airflow Direction
DS2500PE-3	12V	3.3VSB @ 2.7A	Forward (output to handle)

Electrical Specifications

Outputs			
Main DC Output	MIN	NOM	MAX
Nominal setting:	-0.20%	12	0.20%
Total output regulation range:	11.4 V		12.6 V
Dynamic load regulation range:	11.4 V		12.6 V
Output ripple:			120 mVp-p
Output current:	2A ⁵		208 A
Current sharing:	Within +/-10% of full load rating		
Capacitive loading:	100 uF		25000 uF
Start-up from AC to output:			3000 ms
Output rise time:	5 ms		100 ms
Standby DC Output			
Output setpoint range:	-1%	3.3 V	1%
Total output regulation range:	3.135 V		3.465 V
Dynamic load regulation range ¹ :	3.135 V		3.465 V
Output ripple:			50 mVp-p
Output current:	0.5 A		2.7 A
Current sharing:		N/A	
Capacitive loading:	47 uF		560 uF
Start-up from AC to output:			2500 ms
Output rise time:	5 ms		100 ms

Protections			
Main Output	MIN	NOM	MAX
Over-current protection ² :	270		300
Over-voltage protection ³ :	13.4 V		15.0 V
Under-voltage protection ³ :	9.0 V		10.0 V
Over-temperature protection:		Yes	
Fan fault protection:		Yes	
Standby Output			
Over-current protection ⁴ :	145%		180%
Over-voltage protection ³ :	3.8 V		4.3 V

¹ Dynamic load limits will apply for 100A step load at 0.5A/us

² Unit will not shutdown if the overcurrent is less than 270A and last only for <1000ms. Otherwise, immediate latch if the current is more than 290A

³ Latch mode

⁴ Autorecovery

⁵ Minimum starting current during transient load. Output stays within regulation range at zero load.

Control and Status Signals

Input Signals

PSON

Active LOW signal which enables/disables the main output. Pulling this signal LOW will turn-on the main output.

		MIN	MAX
V_{IL}	Input logic level LOW		0.8 V
V_{IH}	Input logic level HIGH	2.0 V	3.46 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

FAN_POWER

Supplies the fan voltage to the power supply. These pins should be tied to the main 12V output at the system side.

		MIN	MAX
I_{SINK}	Current that may be sunk by this pin		3.0 A

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.

		MIN	MAX
V_{IL}	Input logic level LOW		0.6 V
V_{IH}	Input logic level HIGH	2.0 V	3.3 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.

		MIN	MAX
V_{IL}	Output logic level LOW		0.8 V
V_{IH}	Output logic level HIGH	2.0 V	3.46 V
I_{SOURCE}	Current that may be sourced by this pin		3.3 mA
I_{SINK}	Current that may be sunk by this pin		0.7 mA

Control and Status Signals

Output Signals

PS_PRESENT

Signal used to indicate to the system that a power supply is inserted in the power bay.

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.

		MIN	MAX
V_{IL}	Input logic level LOW		0.8 V
V_{IH}	Input logic level HIGH	2.0 V	3.46 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 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	Voltage at 100% load, stand alone unit	4.75	5.25
	Voltage at 50% load, stand-alone unit	2.375	2.625
	Voltage at 0% load, stand-alone unit	0	0.3
I_{SOURCE}	Current that may be sourced by this pin		160 mA

SCL, SDA

Clock, data and addressing signals defined as per I²C requirements. The maximum system side resistor pull-up and decoupling capacitance

V_L	Input logic level LOW		0.8 V
V_H	Input logic level HIGH	2.0 V	3.46 V

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

I²C Addressing Table

A1	A0	Active Bus	FRU EEPROM Address		I ² C Address	
Low	Low	None	Write	0xA0h	Write	0xA0h
Low	High	All "A"	Read	0xA1h	Read	0xA1h
High	Low	All "B"				
High	High	None				

Electrical Specifications

LED Indicators			
	AC GOOD LED	DC GOOD LED	FAULT LED
Color	GREEN	GREEN	AMBER
No AC input to PSU	Off	Off	Off
AC present, STBY ON, main output OFF	On	Blinking	Off
Main output ON	On	On	Off
Power supply failure (OVP, OTP, FAN FAULT)	On	Off	On

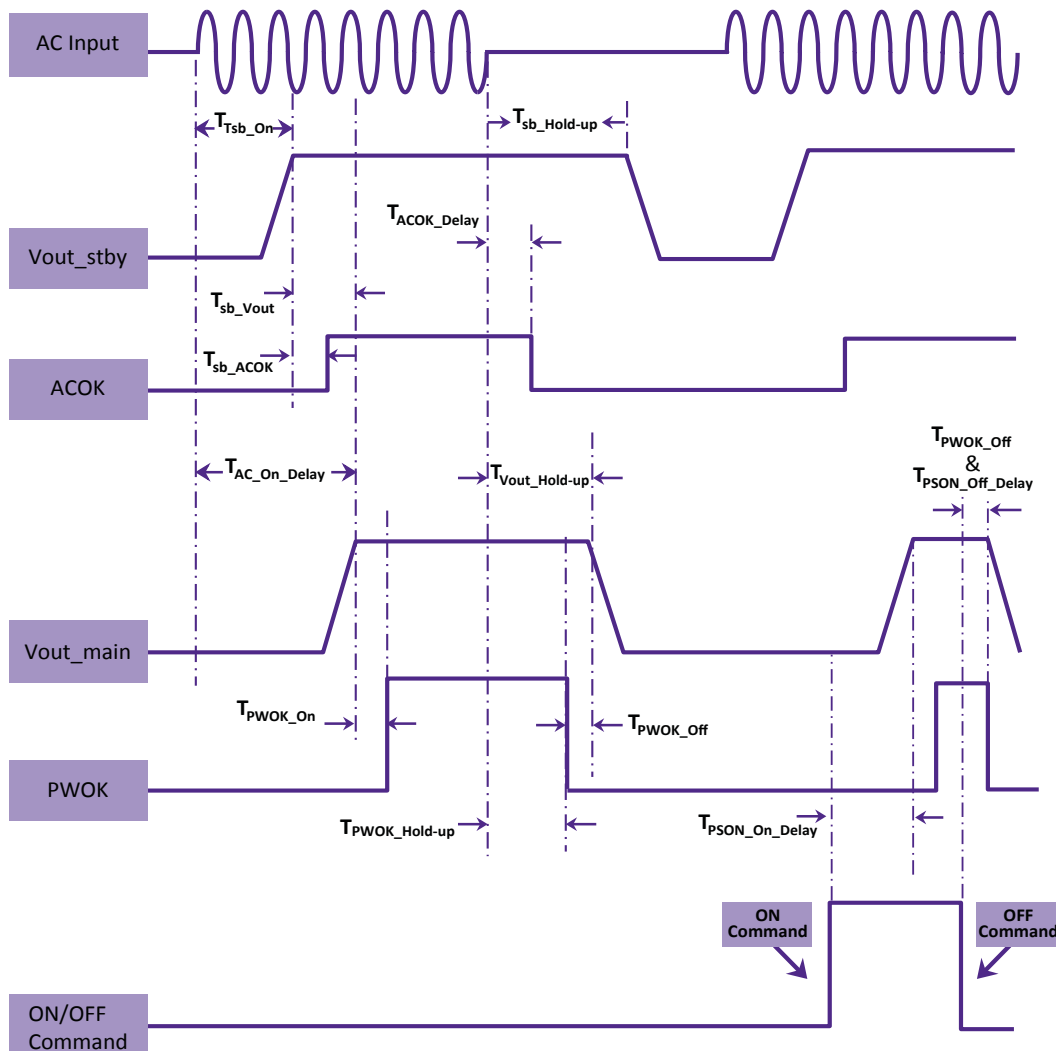
Firmware Reporting And Monitoring			
	Accuracy Range		
Output loading	5 to 20%	20 to 50%	50 to 100%
Input power	±10 W at <250 W input	±5%	
Output power	±10 W at <250 W Output	±5%	
Temperature	±5 degC on the operating range		
Fan speed	TBD		
PMBus	YES		
Remote ON/OFF	YES		

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_Vout}	Delay from standby output to main output voltage being within regulation		2000	ms
T_{sb_ACOK}	Delay from ACOK being asserted to standby output being within regulation		2000	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	900	1100	ms
T_{ACOK_Delay}	Delay from loss of AC to assertion of ACOK		10	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	12		ms
$T_{sb_Hold-up}$	Delay from loss of AC to standby output being within regulation	50		ms
$T_{PS_ON_Delay}$	Delay from ON command to output being within regulation	50		ms
T_{PWOK_Off} & $T_{PS_OFF_Delay}$	Delay from OFF command to output falling out of regulation and PWOK going low		2	ms

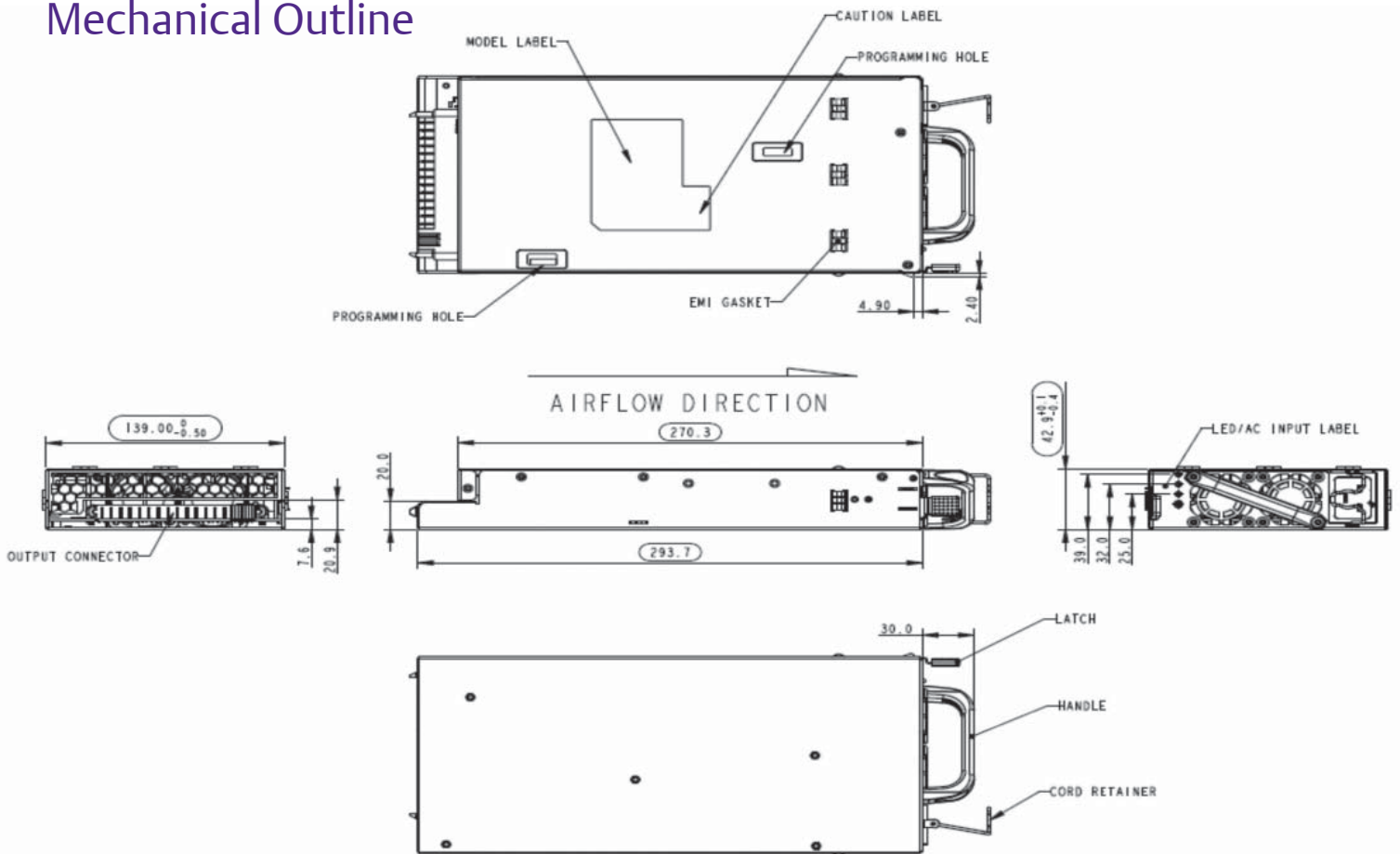
Timing Diagram



Environmental Specifications

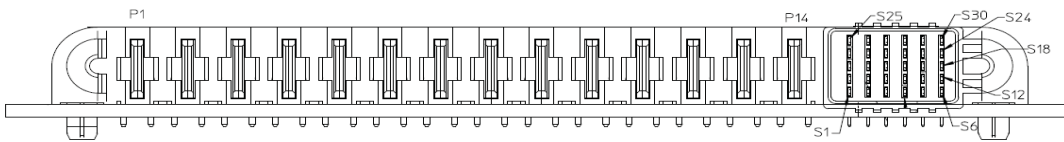
Operating temperature:	10 to 50 °C
Operating altitude:	up to 10,000 feet
Operating relative humidity:	8% to 80% non-condensing
Non-operating temperature:	-40 to +60 °C
Non-operating relative humidity:	5% to 90% non-condensing
Non-operating altitude:	up to 50,000 feet
Vibration and shock:	Standard operating/non-operating random shock and vibration
ROHS compliance:	Yes
MTBF:	200,000 hours using Bell Core TR-332, issue 6 specification, Method 1 Case 3 at 25 °C 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.

Mechanical Outline



Connector Definitions

Output Connector Part Number	Molex Ten60 Power 46437-1123
Mating Connector Part Number	Molex ten60 Power 46562-1123 or any Molex recommended equivalent



Output Connector Pin Configuration			
S1	FAN INPUT	S16	RTN
S2	FAN INPUT	S17	PSON
S3	FAN INPUT	S18	3V3STBY
S4	PRESENT_A	S19	PRESENT_B
S5	RESERVED	S20	RTN
S6	SCL_A	S21	RESERVED
S7	PWR_GOOD_A	S22	ISHARE
S8	ACOK_A	S23	RTN
S9	A0	S24	SCL_B
S10	PS_INTERRUPT_A	S25	PWR_GOOD_B
S11	COMM_BUS_RESET_A	S26	ACOK_B
S12	SDA_A	S27	A1
S13	RESERVED	S28	PS_INTERRUPT_B
S14	VSENSE-	S29	COMM_BUS_RESET
S15	VSENSE+	S30	SDA_B
P1-P4	12VOUT	P5-P14	RTN

Americas

5810 Van Allen Way
Carlsbad, CA 92008
USA
Telephone: +1 760 930 4600
Facsimile: +1 760 930 0698

Europe (UK)

Waterfront Business Park
Merry Hill, Dudley
West Midlands, DY5 1LX
United Kingdom
Telephone: +44 (0) 1384 842 211
Facsimile: +44 (0) 1384 843 355

Asia (HK)

14/F, Lu Plaza
2 Wing Yip Street
Kwun Tong, Kowloon
Hong Kong
Telephone: +852 2176 3333
Facsimile: +852 2176 3888

For global contact, visit:

www.Emerson.com/EmbeddedPower
techsupport.embeddedpower@emerson.com

While every precaution has been taken to ensure accuracy and completeness in this literature, Emerson Network Power assumes no responsibility, and disclaims all liability for damages resulting from use of this information or for any errors or omissions.

Emerson Network Power.
The global leader in enabling
business-critical continuity.

- AC Power
- Connectivity
- DC Power
- Embedded Computing
- **Embedded Power**
- Monitoring
- Outside Plant
- Power Switching & Controls
- Precision Cooling
- Racks & Integrated Cabinets
- Services
- Surge Protection

EmersonNetworkPower.com

Emerson Network Power and the Emerson Network Power logo are trademarks and service marks of Emerson Electric Co. ©2013 Emerson Electric Co.