DESCRIPTIONS

AC/DC 1300W CRPS SERVER POWER SUPPLY



RoHS

CE Report UKCA Report

EN62368-1 BS EN62368-1

FEATURES

- Input voltage range: 90 - 264VAC and supports AC & HVDC wide voltage range input
- Operating ambient temperature range: -5℃ to +55℃
- Meet the 80 PLUS Platinum efficiency
- N+M Intelligent redundancy N+M≤4 (N=3 max, M=2 max)
- Active current sharing function
- PMBus / I2C communication function
- Black box function
- Over-current alarm, over-current / short-circuit / over-voltage / under-voltage protection, over-temperature protection, fan-fault protection
- 5 years warranty
- Safety according to UL/EN/IEC62368, GB4943

APPLICATIONS

- Server

Selection Guide

Certification	Part No.	Rated Input Voltage*	Fan Operation Type	Output Power*(W)	nominal Output Voltage(VDC)		Main Load		Auxiliary Load	Max. Capacitive Load (μF)	
					Main Circuit	Auxiliary Circuit	Min.	Max.	Typ.	Main Circuit	Auxiliary Circuit
EN/BS EN	AES1300-P12B	100-127VAC	Normal Airflow, From DC To AC	1000W	12.2	12.0	1A	82.3A	3.0A	70000	3000
		200-240VAC 240VDC		1300W			1A	107A	3.0A		

Note: 1.* Maximum power cannot exceed 1300W at high voltage input and maximum power cannot exceed 1000W at low voltage input.
2.*The product picture is for reference only. For details, please refer to the actual product.

Specifications

	Item	Operating Conditions			Min.	Typ.	Max.	Unit
Input Specifications	Input Voltage Range	Low voltage AC input			90	115	140	VAC
		High voltage AC input			180	230	264	VAC
		DC input			180	240	320	VDC
	Input Voltage Frequency	AC input			47	--	63	Hz
	Efficiency	TA=25 ℃, without Fan	Vin: 230VAC/50Hz	10% load	--	89	--	%
				20% load	--	90	--	
				50% load	--	94	--	
				100% load	--	91	--	
	Input Current	V_{in}=100Vac/60Hz P_{out}=1000W			--	--	12	A
		V_{in}=200Vac/50Hz P_{out}=1300W			--	--	8	
	Inrush Current	V_{in}=264Vac/50Hz P_{out}=1300W		Cold start	--	--	35	
	Leakage Current	V_{in}=264Vac f_{in}=50Hz			--	--	0.875	mA
	Power Factor	Io=10% Load @ Vin=230Vac/50Hz			0.90	--	--	--
		Io=20% Load @ Vin=230Vac/50Hz			0.96	--	--	
		Io=50% Load @ Vin=230Vac/50Hz			0.98	--	--	
		Io=100% Load @ Vin=230Vac/50Hz			0.99	--	--	
	ITHD	5% < Io≤10% Load @ Vin=230Vac/50Hz			--	--	20	%
		10% < Io < 20% Load @ Vin=230Vac/50Hz			--	--	15	
		Io≥20% Load @ Vin=230Vac/50Hz			--	--	10	
		Io≥40% Load @ Vin=230Vac/50Hz			--	--	8	
		Io≥50% Load @ Vin=230Vac/50Hz			--	--	5	
Output Specifications	Rated Output Voltage	+12.2V			12.1	12.2	12.3	V
	Steady State Output Voltage Range				11.8	12.2	12.6	
	Dynamic Output Voltage Range				11.6	--	12.8	
	Output Ripple & Noise*				--	--	120	mV
	Output Current				1	--	107	A
	Current Sharing Accuracy (@260W < Pout < 650W)				--	--	10	%
	Current Sharing Accuracy (@650W≤ Pout≤1300W)				--	--	5	
	Hold-up Time				12	--	--	ms
	60% load jump; 0.5A/us; Main load parallel 2200uF capacitor with 1A minimum load, auxiliary load parallel 1000uF capacitor				11.6	--	12.8	V
	Rated Output Voltage	+12VSB			11.4	12	12.6	V
	Steady State Output Voltage Range				11.4	12	12.6	
	Dynamic Output Voltage Range				11.4	--	12.8	
	Output Ripple & Noise*				--	--	120	mV

	Output Current		0	--	3	A
	Current Sharing Accuracy (@260W < Pout < 650W)		--	NA	--	%
	Current Sharing Accuracy (@650W≤ Pout≤1300W)		--	NA	--	
	Hold-up Time		70	--	--	ms
	60% load jump; 0.5A/us; Main load parallel 2200uF capacitor with 1A minimum load, auxiliary load parallel 1000uF capacitor		11.4	--	12.8	V

	Item	Min.	Typ.	Max.	Unit	Note
Protective Characteristics (+12V Output)	Over-current Alarm(High voltage input)	109	--	117	A	Alert after 20s, and then turn off the main output
	Over-current Alarm(Low voltage input)	86	--	91		
	Over-current Protection 1 (High voltage input)	117	--	150		Blocked, +12VSB output is normal
	Over-current Protection1 (Low voltage input)	91	--	99		
	Over-current Protection 2 (High voltage input)	150	--	179		
	Over-power protection(High voltage input)	179	--	212		
	Over-power protection(Low voltage input)	99	--	--		
	Short-circuit Protection	+12.2V output short circuit does not affect the normal operation of +12VSB; +12.2V output short-circuit protection mode is latching, reset by PSON or AC power off and restart for recovery				
	Over-voltage Protection	13.5	--	15.0	V	Latching, reset by PSON or AC power off and restart for recovery
	Under-voltage Protection	9.5	--	11		Self-recover
	Over-temperature Alarm Point	60	--	65	℃	Over-temperature protection hysteresis greater than 4℃
	Over-temperature Protection Point	--	--	70		
	Over-temperature Protection Release	58	--	--		
	Clear- point of the over-temperature alarm	55	--	--		
	Fan-fault Protection	When the fan is faulty, the output is turned off. After the fault is rectified, the output automatically recovers				
Protective Characteristics (+12VSB Output)	Over-current Alarm	3.2	--	4	A	Alarm
	Over-current Protection	4	--	5		Self-recovery (main output will be protected/self-recovery together)
	Short-circuit Protection	Self-recovery (main output will be protected/self-recovery together)				
	Over-voltage Protection	13.5	--	15	V	Self-recovery (main output will be protected/self-recovery together)

LED Indicator Light	Power Status	Light Status
	Power output normal	Green
	All power supplies no AC input	Light off
	When the fan is faulty, the output is turned off. After the fault is rectified, the AC input is automatically restored to normal. Only the slave machine with +12VSB output or in cold redundancy mode is asleep	The green light flashes at a frequency of 1Hz
	One product no AC input, the other one with AC input	Orange
	Product failure lead to output off, such as OVP, OCP, Fan Fault	Orange
	Product in alarm status but with output on	The orange light flashes at a frequency of 1Hz
	The module enters the firmware upgrade mode	The green light flashes at a frequency of 2Hz

Data Online Reading and Monitoring	Item	Accuracy Range		
	Output Load	<10%	10%-30%	30%-100%
	Input Voltage	±3%	±3%	±3%
	Input Current	NA	±0.5A	±10% or ±0.5A
	Input Power	NA	±5%	±3%
	Output Voltage	±5%	±3%	±3%
	Output Current	NA	±10%	±5%
	Output Power	NA	±10%	±5%

Timing Definition	Item	Description	Min.	Max.	Unit
	Tvout_rise	Time for +12.2V output to rise from 0 to 10.8V	5	70	ms
		Time for +12VSB output to rise from 0 to 10.8V	1	25	
	Tsb_on_delay	Time from AC power on to +12VSB output reaching at 10.8V	--	1500	
	Tac_on_delay	Time from AC power on to +12.2V output reaching at 10.8V	--	2500	
	Tvout_holdup	Time from AC power off to +12.2V output reaching at 10.8V@70%Load	12	--	
	Tpwok_holdup	Time from AC power off to PWOK signal decreasing@70%Load	11	--	
	Tpson_on_delay	Time from high to low of PSON# signal to +12.2V output reaching at 10.8V	5	400	
	Tpson_pwok	Time from low to high of PSON# signal to PWOK signal becoming low-level	--	5	
	Tpwok_on	Time from +12.2V output reaching at 10.8V to PWOK signal becoming high-level	100	500	
	Tpwok_off	Time from PWOK signal becoming low-level to +12.2V output dropping to 10.8V	1	--	
	Tpwok_low	Time from PWOK signal becoming low-level to when the PWOK signal increases through the PSON switch or AC restart	100	--	
	Tsb_vout	Time from +12VSB output reaching at 10.8V to +12.2V output reaching at 10.8V	50	1000	
	T12VSB_holdup	Time from AC power off to +12VSB output voltage dropping to 10.8V	70	--	

General Specifications	Isolation Test	Input - ⏚	Electric strength test for 1min., leakage current <5mA		1500	--	--	VAC
		Input - Output*	Electric strength test for 1min., leakage current <10mA		3000	--	--	
	Insulation Resistance	Input - ⏚	Ambient temperature: 25 ± 5℃ Relative humidity: < 95%RH, no condensation Test voltage: 500VDC		50	--	--	MΩ
		Input - Output						
	Operating Temperature				-5	--	55	℃
	Storage Temperature				-40	--	70	
	Operating Humidity		Non-condensing		--	--	90	%RH
	Storage Humidity				--	--	95	%RH
	Operating Altitude				--	--	5000	m
	Storage Ambient Height				--	--	15200	
	Hot-plug		1. 0.5m/s≤speed≤1m/s, the backplane voltage cannot exceed the dynamic specification of the power module during hot-plug process. 2. Add 1000uF capacitive load at the output.	+12V	11.6	--	12.8	V
				+12VSB	11.4	--	12.8	
	MTBF		Rated input, 100% load @ 25℃ Evaluated by Telcordia SR-332		>500,000 h			
	Communication Method		PMBus / I2C					
	Warranty				5 years			
Mechanical Specifications	Case Material		Metal (SGCC)					
	Dimensions*		73.50mm x 185.00mm x 40.00/39.00mm (W x D x H)					
	Weight		850g (Typ.)					
	Cooling Method		Forced-air cooling					
	Fan Noise		25℃, the overall noise <= 75dB (measure at 0.5m)					

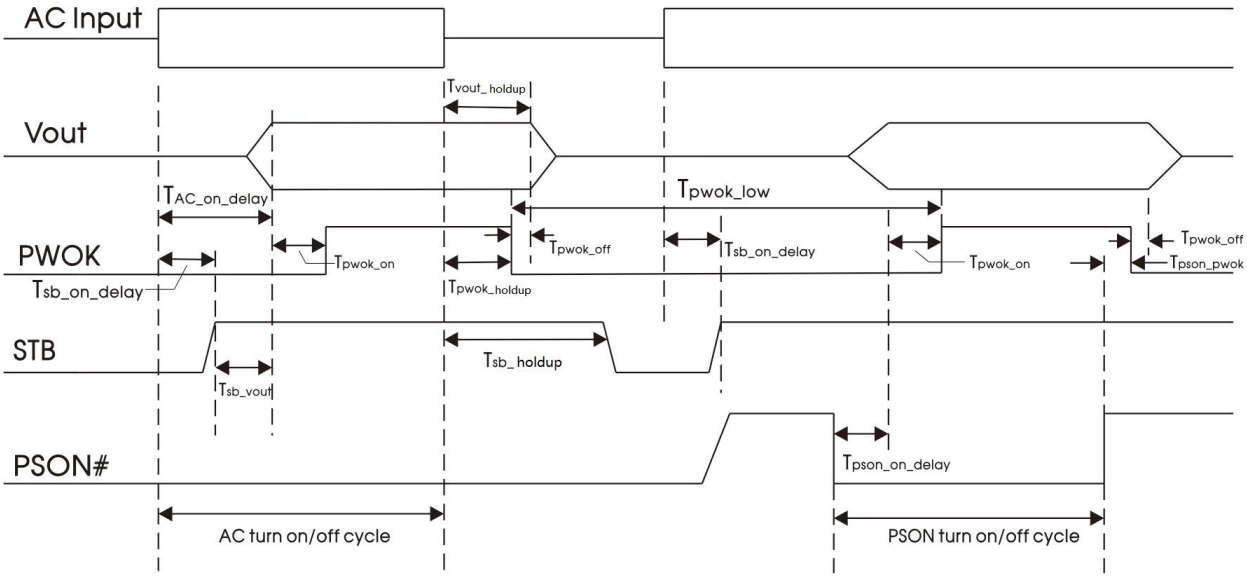
Note: 1. *The "Tip and barrel method" is used for ripple and noise test, output parallel 100uF electrolytic capacitor, coaxial cable in parallel with 10uF electrolytic capacitor and 0.1uF ceramic capacitor, please refer to Server Power Test Specifications for specific information;

2. *+12.2V power failure hold time, with 70% Load.

3. * Input-Output isolation voltage refer to PCBA only.

4. Product shell height 39mm, fan height 40mm.

Timing Diagram



Electromagnetic Compatibility (EMC)

Electromagnetic Compatibility (EMC)	Emissions	CE	CISPR32/EN55032 CLASS A	
		RE	CISPR32/EN55032 CLASS A	
		Harmonic current	IEC/EN61000-3-2	perf. Criteria A
	Immunity	ESD	IEC/EN 61000-4-2 Contact ±8KV/Air ±15KV	perf. Criteria A
		RS	IEC/EN 61000-4-3 10V/m	perf. Criteria A
		EFT	IEC/EN 61000-4-4 Input port: ±2KV	perf. Criteria A
		Surge	IEC/EN 61000-4-5 line to line ±1KV 2Ω/line to ground ±2KV 12Ω	perf. Criteria A
		CS	IEC/EN61000-4-6 3Vrms	perf. Criteria A
		Voltage dips, interruption	IEC/EN61000-4-11 > 95% dip 0.5 periods	perf. Criteria A

Functional requirements of black box

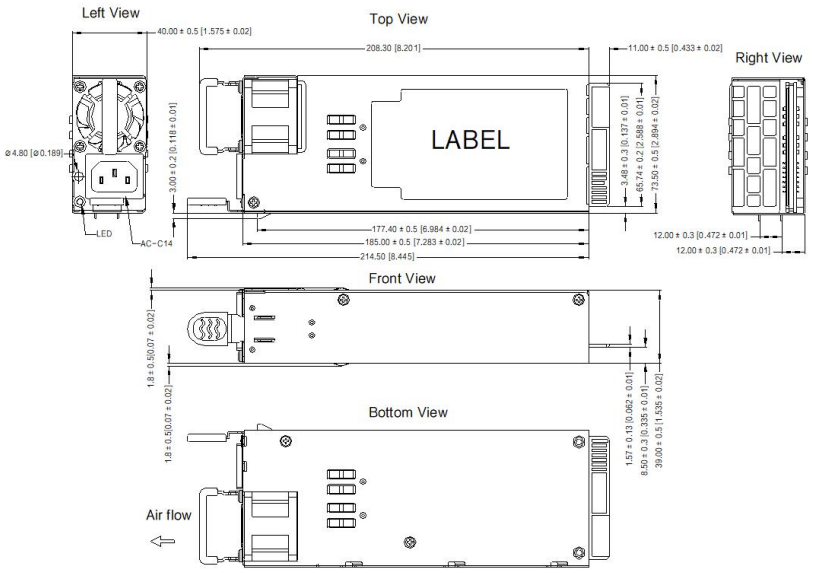
General function	1. It is to record the alarm when the output is turned off and the input power is down, the alarm status and the time of the fault occur are stored, and the important physical quantities at the fault site are saved and queried, including not limited to input voltage, output voltage, output current, temperature, fan speed, etc. Use the circular storage method (the black box information is written on the current index number +1 in case of failure, and when the index number is "record 9", the next line is written to "record 0"). 2. Support the host to query fault records one by one. Support the host to query the latest input power failure time. 3. Support host timing. The host needs to send the system time (time according to the Unix standard) to the power module, and the send it again every 10 minutes for the time synchronization of the power module. If the host is not timed, the time in the power supply is equivalent to the entire cumulative time of power supply work.
Storage and reading mechanism of black	Described from the time dimension, it is divided into the following stages: 1. Power-up initialization stage After powering on, read the historical fault of the EEPROM record into the cache, and the time is initialized to the

<table>
<tr><td>box records</td><td colspan="5">last fault record plus 3 seconds.
2. Fault site storage stage
The upper computer timings the power time (10min/time), when the output is turned off, the enabling fault record mark writes all the fault scene data to the EEPROM to generate a fault record.
3. Fault data reporting stage
When the upper computer queries the alarm log, each time a single query is made, the lower computer takes the corresponding data from the EEPROM storage area and uploads it all to the upper computer.</td></tr>
<tr><td rowspan="3">Black box reading protocol</td><td>Command</td><td>Name of the command</td><td>Data reading type</td><td>Data bytes</td><td>Description of the order</td></tr>
<tr><td>D2h</td><td>MFR_READ_BLACK_BOX</td><td>Block Read</td><td>100</td><td>Power supply black box query,
Reading: multi-byte (fault record information, you need to write the fault index before reading, 0-9, 0 is the latest record. 9 is the earliest record)</td></tr>
<tr><td>D3h</td><td>MFR_READ_BLACK_BOX_INDEX</td><td>Write Byte</td><td>1</td><td>Write: single byte (request to read the index of the fault record)</td></tr>
<tr><td>System timing mechanism in the black box</td><td colspan="5">The power module needs to be time synchronized through host:
1) Product: -- Synchronization
-- Time to send the power module every 10 minutes
-- The time to send is in seconds
2) Power supply: -- The initialization time of one power on is equal to the last failure time +3 seconds
-- Time synchronization of accepting products
-- Interrupt timing, every 1second, the counter is increased by 1, and the time unit is seconds
The timing time (time according to the Unix standard) is the number of seconds relative to the base time. The delivery time under the host will be sent to the power supply from the number of seconds from the base time to the current time. The time read in the alarm log is the number of seconds from the base time of the alarm. If the host is not given time, the running time of the power supply will increase by seconds, and the power drop needs to be saved.</td></tr>
<tr><td>Black box data content</td><td colspan="5">The black box records the real-time physical quantity and state data of the scene. The storage content is divided into two parts: the head and the data department. Each record contains 100 bytes of data.</td></tr>
</table>

Gold-finger Definition

Output Terminal	Definition	Output Terminal	Definition
A1-A9	SGND	B1-B9	SGND
A10-A18	+12.2V	B10-B18	+12.2V
A19	PMBus_SDA	B19	A0
A20	PMBus_SCL	B20	A1
A21	PSON#	B21	+12VSB
A22	SMBAlert#	B22	SMART_ON
A23	+12V_Return sense	B23	+12V_Sharebus#
A24	+12V_Remote sense	B24	PRESENT#
A25	PWOK	B25	VIN_GOOD

Dimensions and Recommended Layout



THIRD ANGLE PROJECTION

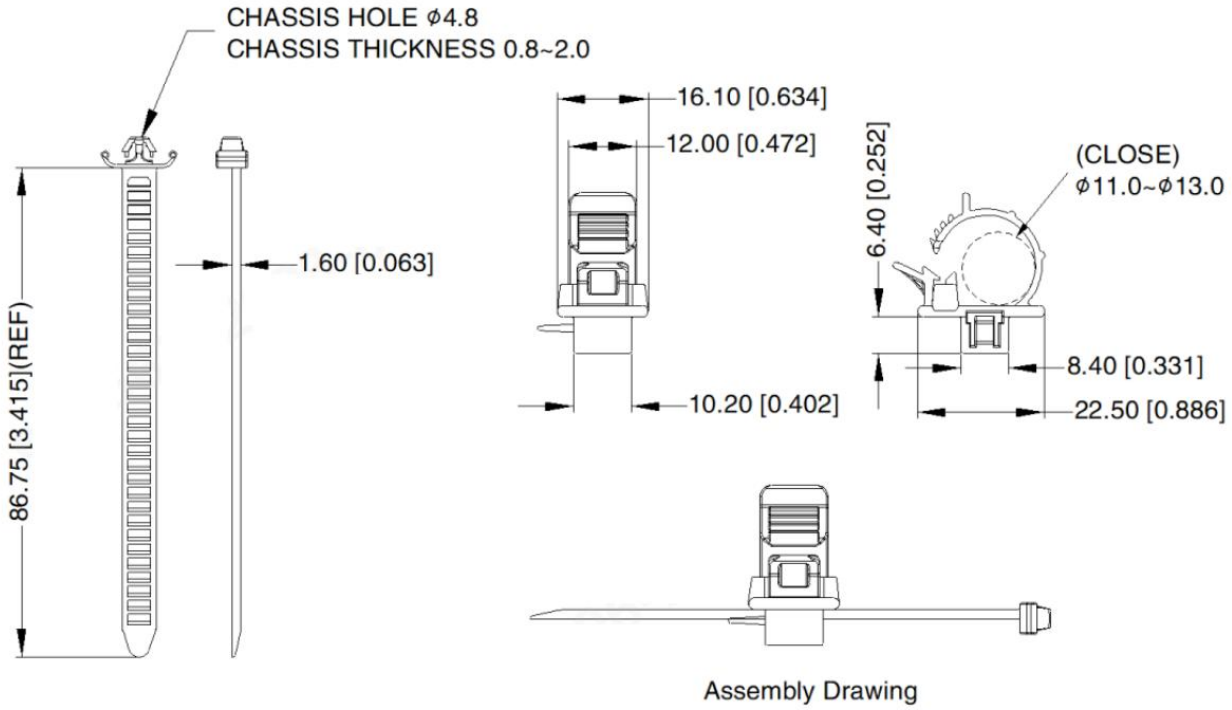
AC-C14 Pin-Out		Picture
Pin	Mark	
1	AC(L)	
2	⏚	
3	AC(N)	

Goldfinger Pin-Out(Top)		Picture
Pin	Mark	
A1~9	SGND	
A10~18	+12.2V	
A19	PMBus_SDA	
A20	PMBus_SCL	
A21	PSON#	
A22	SMBAlert#	
A23	+12V_Return sense	
A24	+12V_Remote sense	
A25	PWOK	

Goldfinger Pin-Out(Bottom)		Picture
Pin	Mark	
B1~9	SGND	
B10~18	+12.2V	
B19	A0	
B20	A1	
B21	+12VSB	
B22	SMART_ON	
B23	+12V_Sharebus#	
B24	PRESENT#	
B25	VIN_GOOD	

Note:
Unit: mm[inch]
General tolerances: ± 2[± 0.078]

Recommended Tie Type



Assembly Drawing

Note:

1. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity <75%RH with nominal input voltage and rated output load;
2. The room temperature derating of 1℃/300m is needed for operating altitude greater than 2000m;
3. In order to improve the efficiency at high input voltage, there will be audible noise generated, but it does not affect product performance and reliability;
4. Products are related to laws and regulations: see "Features" and "EMC";
5. The out case needs to be connected to PE (⏚)of system when the terminal equipment in operating;
6. The power supply is considered a component which will be installed into a terminal equipment. All EMC tests should be confirmed with the final equipment.
7. The image certification marks are for reference only; please refer to the selection table for actual specifications. Certification is based on the physical mark or packaging label.