



**SILVERSTONE**

# **Gemini Series**

## **Gemini 1300C Platinum Module**

### **1300W Replacement Module for Gemini 1300C Platinum (SST-GM1300C-PF)**

- Replacement module for SilverStone Gemini 1300C Platinum (SST-GM1300C-PF)
  - 1U height CRPS form factor
- Full range Active PFC with Cybenetics Platinum certification
  - All Japanese electrolytic capacitors
  - Support PMBus 1.2
- Hot-swappable design with convenient pull-out handle bars
  - Cold Redundancy
- Smart Ride Through (SmaRT) effectively obtains SMBAlert signal ensures continuity of power during power instability and interruptions.
  - Closed Loop System Protection (CLST)
  - 12V main output & 12V standby output
  - 3A max standby output current

# SPECIFICATION

## SilverStone Gemini Series

**Gemini 1300C Platinum Module**  
**SST-GM1300C-PFU**  
**CRPS Module AC to DC Power Supply**  
**Cybenetics Platinum efficiency certified.**

### 1.General Description

#### 1.1 Function briefly

GM1300C-PFU an AC/DC power supply with an input voltage range of 90~264Vac, 2 output voltages, main output 12.2V, standby output 12.2V, maximum output power 1300W. The power supply has input over-under voltage, output over-current, output over-voltage, short circuit, over-temperature and other protection functions. At the same time, the power module can control and monitor various functions through the I2C interface.

Model	Output(V)	Input(A)
SST-GM1300C-PFU	12.2V	2-105.3A
	12.2V	0.5-3A

## 2.Input requirements

### 2.1.1 AC input requirements

item	meas ure	Minimu m	Nominal	Max imum	note
Input Voltage	Vac	90	115/230	264	
Nom Input Voltage	Vac	100	115/230	240	
Vin Frequency	Hz	47	50/60	63	
Nom Vin Frequency	Vdc	180		310	
Nominal DC input voltage range	Vdc		240		
Maximum input current	A	/	/	14	@90Vac 100% load
Input surge current	A	/	/	50	230Vac/50Hz input, full load, cold start, 25°C
Power factor		0.9			10% load, 230Vac, 50Hz& 115Vac,60Hz
		0.96			20% load, 230Vac, 50Hz& 115Vac,60Hz
		0.98			50% load, 230Vac, 50Hz& 115Vac,60Hz
		0.99			100% load, 230Vac, 50Hz& 115Vac,60Hz
iTHD	%			20	>10%&<20% load, 230Vac,50Hz
	%			15	≥20% load, 230Vac, 50Hz
	%			10	≥40% load, 230Vac, 50Hz
	%			8	≥50% load, 230Vac,50Hz

## 2.1.2 Input protection function

Item	measur e	Minimum	Nominal	Maximum	note
Input Over current protection	A	/	/	/	Yes, the input fuse will blow when overcurrent occurs.
Input under voltage protection	Protect point	/	/	82Vac	Full load test, hysteresis more than 5V.
	Recover point	/	/	88Vac	
Input over voltage protection	Protect point	290Vac	/	/	Full load test, hysteresis more than 5V.
	Recover point	280Vac	/	/	

## 3. Output requirements

### 3.1.1 AC output requirements

Item	Unit	MIN	Nominal	MAX	Note
Output wattage	W			1000W	90-140Vac
				1300W	180-264Vac
Rated output voltage	V	11.6	12.2	12.8	Main output
	V	11.6	12.2	12.8	Standby output
Rated output current	A	2		80.5	@90-140Vac
	A	2		105.3	@180-264Vac
	A	0.5		3	Standby
Range	%			±5	Main Output
	%			±5	Standby
Delay turn on	ms			2500	Main output
	ms			1500	Standby output
Raise time	ms			70	Main output
	ms			70	Standby output
Hold up time	ms	12			70%load, @230Vac
Ripple noise	mV			120	Main output (Ripple noise test with external 2200uF solid capacitor)
	mV			120	Standby output (Ripple noise test with external 270uF solid capacitor)
Efficiency	%	92			20%load, @230Vac, fan with external power supply.
	%	94			50% load, @230Vac, fan with external power supply.
	%	91			100% load, @230Vac, fan with external power supply.
Dynamic response	V	11.6		12.8	The dynamic load range is not greater than 60%, the minimum load is 3A, 0.5A/us. (Dynamic load
	us			500	

### 3.2.2 Output power characteristics

Output	Input voltage (Vac)	Min(A)	Max(Long-term load)	Peak load capacity (20s) (A)	Peak load capacity (10ms) (A)	Peak load capacity (100us) (A)
Main output	180-264	2	105.3	105.3+10	105.3+72	105.3+105
Main output	90-140	2	80.5	80.5+10	80.5+72	80.5+105
Standby output	90-264	0.5	3	>4		

### 3.2.3 Output protection function

Item	Unit	MIN	Nominal	MAX	Note
Main output Over Current Protection	A	110		145	180-264Vac, hiccup, self-recovery
	A	90		100	90-140Vac, hiccup, self-recovery
Standby	A	4		9	hiccup, self-recovery
Main output short circuit protection	/	/	/	/	Standby output, the main circuit can recover automatically after the short circuit is removed.
Standby output short circuit protection	/				The main circuit has no output, and the Standby can recover automatically after the short circuit is removed.
Over voltage protection	Main	V	13.5	15.5	The output is locked and the Standby output is not turned off.
	Second	V	13.5	15.5	Standby locks, turning off the main output
Over temperature protection	°C	60			Turn off the main circuit, it can self-recovery, the hysteresis is not less than 5°C, do not turn off the 3.3V Standby.

### 3.2.4 Indicator

Condition	Light condition	note
The power supply is working normally (both 12V & 12VSB are normal)	GREEN	/
Power supply without AC input (including parallel redundant power supplies)	OFF	/
AC input is normal, 12VSB is normal, and 12V has no output.	1Hz Blink GREEN	Standby condition
No AC input, but the AC input of the parallel redundant power supply is normal.	RED	/
Power supply warning, such as over temperature, over power, over current, fan failure, etc.	1Hz Blink RED	Output normally
Power supply protection, such as over-current protection, over-voltage protection, over-temperature protection, fan failure, input over and under-voltage protection, etc.	RED	Fail or output protect
Power supply enters cold redundancy state	0.33Hz Blink GREEN	1s OFF; 2s GREEN

Note: The light is a two-color LED light

### 3.2.5 Timing

Item	Description	MIN	MAX	UNITS
T_vout_rise	Output voltage rise time for +12V and +12VSB from 10% to within regulation limits.		70	ms
T_vstby_on_delay	Delay from AC being applied to +12VSB being within regulation.		1500	ms
T_vin_on_delay	Delay from AC being applied to all output voltages being within regulation.		2500	ms
T_vout_holdup	Time AC. +12V output voltage stay within regulation after loss of	12		ms
T_psok_holdup	Delay from loss of AC to de-assertion of PSOK.	10		ms
T_ps_on#_off_delay	Delay from PS_ON# de-asserted to power supply turning off.		10	ms
T_ps_on#_on_delay	Delay from PS_ON# active to output voltages within regulation limits.	5	400	ms
T_ps_on#_psok	Delay from PS_ON# deactivate to PSOK being de-asserted.		5	ms
T_psok_on	Delay from output voltages within regulation limits to PSOK asserted at turn on.	100	500	ms
T_psok_off	Delay from PSOK de-asserted to output voltages dropping out of regulation limits.	1		ms
T_psok_low	Duration of PSOK being in the de-asserted state during an off/on cycle using AC or the PS_ON# signal.	100		ms
T_vstby_vout	Delay from +12VSB being in regulation to O/Ps being in regulation at AC turn on.	50	1000	ms
T_vstby_holdup	Time the +12VSB output voltage stays within regulation after loss of AC.	70		ms
Tvingood_de-asserted	Delay from the Vin drop being 0V to VIN_GOOD de-assertion. (and SMBAlert# low)		3	ms



## 4.2 Turn on test

1. Under all input voltage and output current combinations, the output ripple must not have low-frequency oscillation;
2. Under various cross loads and input voltages, when plugging or unplugging any power supply, the overshoot (including undershoot) on the output DC bus must meet the specification requirements;
3. Dynamically respond to the output voltage under various extreme conditions to meet the system output voltage stabilization accuracy requirements;
4. When starting up under pure resistive load conditions of 0%, 25%, 50%, 75% and 100%, the system output voltage power-on waveform must be smooth;
5. Repeatedly plug and pull modules, and the power system must not cause other modules to die due to plugging and pulling;
6. Switching, plugging and unplugging the power supply must not cause abnormality in the output signal of the relevant power supply;
7. The power module should be able to support up to 4 power supplies in parallel for current sharing;

## 5. Cold redundancy requirement

### 5.1 Cold redundancy configuration

There is a register Cold Redundancy configuration (D0h) inside the power supply, which can be read or written accessed by the system. An example of the command format, such as S B0 w D0 01 PEC P means to set the D0h address register value in power supply B0 to 01h. The register value can be set to 00h/01h/02h/03h/04h as needed. The meanings represented by different values are describe in the following table:

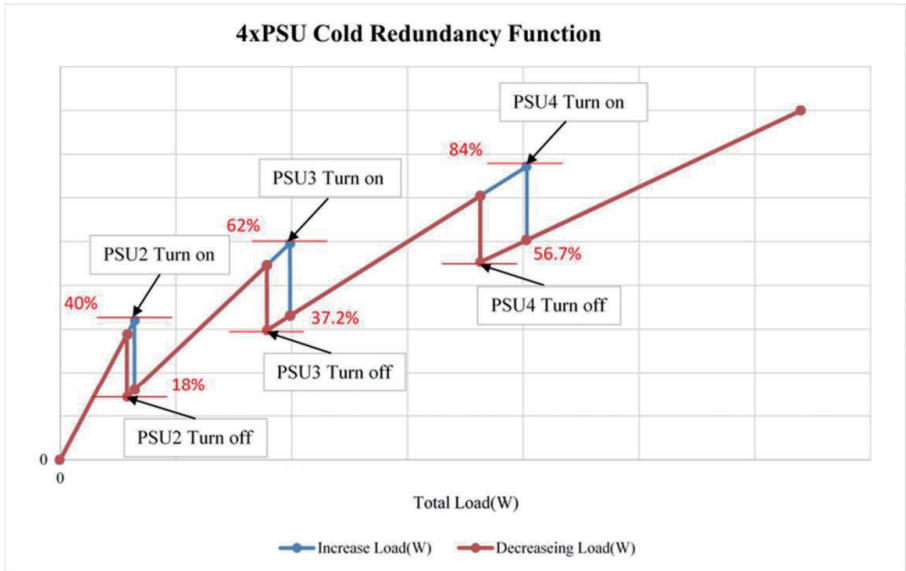
Value	State	Description	Active	Stop
00h	Standard Redundancy	Power load sharing redundant backup operation		
01h	Cold Redundant Active	Power supply with normal operating output power in cold backup		

02h	Cold Standby 1	The first power supply to exit cold backup and enter working status	40% of max	$0.9 \times (40\% \text{ of max} \times 1/2)$ =18%
03h	Cold Standby 2	The second power supply exits the cold backup and enters the working state	62% of max	$0.9 \times (62\% \text{ of max} \times 2/3)$ =37.2%
04h	Cold Standby 3	The third power supply exits the cold backup and enters the working state	84% of max	$0.9 \times (84\% \text{ of max} \times 3/4)$ =56.7%

Note: The factory default state of the power supply is Standard Redundancy, and the corresponding D0h register value is 00h.

### 5.2 PSU turn on function

The power on and off power supply in cold backup is only controlled by the output load. Once the load exceeds the enable threshold, the power supply is turned on; when the load decreases to the disable threshold, the power supply enters Cold standby.



### 5.3 Cold Standby work condition

The necessary conditions for the power supply to enter the Cold standby state are: PSON low level and the register value is 02h/03h/04h. At the same time, for the power supply that enters the Cold standby state, the requirements are:

- When CRB is low, the power supply in Cold Redundant Active and Cold Standby should be able to wake up immediately and the D0h value returns to 00h, entering the standard redundancy state.
- Keep PWOK high
- All states of the power supply should remain normal, and no faults or abnormalities should be reported unless a fault or abnormality does occur.
- The indicator light flashes according to the specifications.
- All fans remain running
- LED flashes green
- Any time any power supply is abnormal, pull down the CRB level, and all power supplies will automatically enter the Standard Redundancy state. The CRB low level range is 0V-0.6V; the high level range is 2.0V-3.46V, and the timing priority of CRB pulling down must be High to ensure timely wake-up of other Cold Redundant power supplies.

The cold redundancy power supply must exit the cold backup state under fault or overcurrent conditions

Any abnormality in the power supply will restore the register value to the default value 00h, and set the Cold Redundant BUS abbreviation CRB (B22 PIN) to low level, forcing other power supplies working in parallel to enter the standard redundancy state. Trigger conditions:

1. A 12V OCP alarm failure occurs
2. 12V OVP fault
3. 12V UVP
4. OTP alarm failure
5. Fan speed alarm failure
6. AC power failure

### 5.4 Turn on smart opening function

Here are the steps to put your PSU into smart-on mode. PSUs designated as smart standby can be powered off and on to main power when necessary. For practical applications, the above trigger levels may have a tolerance of +/-10%.

Step 1: Make sure each PSU has an AC power cord connected. Use the Write Bytes command to set command 0xD0 for each PSU to have its own role (there must be one PSU as the active role). The command format of the smart enable function is as follows.

B0 is in smart on state (S B0 w D0 01 PEC P)

B2 is in smart on standby state (S B2 w D0 02 PEC P)

Step 2: Once the load drops below the corresponding trigger point, the PSU will enter smart slave mode.

Step 3: If the CRB signal drops low, all PSUs will turn on main power and reset Cold\_Redundancy\_CONFIG to 0x00. The system needs to reassign the positions of all PSUs to enable the smart on feature again.

## 6.PMBUS AND EEPROM

### 6.1 PMBUS

The power supply should support access to PMBUS information via the I2C bus. The power supply is equipped with four pin connectors, namely SCL, SDA, A1, and A0. Clock bus (SCL) and data bus (SDA), the two pins communicate each other and form a continuous bus, A0 and A1 are used to determine the address. The backplane defines the state of these lines so that the power supply address is unique within the system. The generated I2C address should conform to the table below. The write protect pin is used to ensure data is not lost due to accidental overwriting. The bus operates at 3.3V voltage, and SDA and SCL need to be pulled up to 3.3V on the system board.

	MCU Address		System addressing	
	PMBUS	IPMI FRU	A1	A0
PSU-1	B0	A0	0	0
PSU-2	B2	A2	0	1
PSU-3	B4	A4	1	0
PSU-4	B6	A6	1	1

The power supply can monitor and read the input voltage, input power, output voltage, output current and other data of the power supply in real time.

CMD Code	Name	Type	Bytes	Conditions
01h	OPERATION	Read/Write	1	Power on/off sign, 0x80 means power on (default value), 0x00 means power off
02h	ON_OFF_CONFIG	Read/Write	1	0x15 (hardware controlled power on and off, default value), 0x19 (software controlled power on and off)

03h	CLEAR_FAULTS	N/A	0	
19h	CAPABILITY	Read Byte	1	Value 90h
1Ah	QUERY	Block Write- Block Read Process Call	1	
20h	VOUT_MODE	Read Byte	1	
3Ah	FAN_CONFIG_1_2	R/W	1	D0h
3Bh	FAN_COMMAND_1	R/W	2	
79h	STATUS_WORD	Read Word	2	
7Ah	STATUS_VOUT	Read Byte	1	
7Bh	STATUS_IOUT	Read Byte	1	
7Ch	STATUS_INPUT	Read Byte	1	
7Dh	STATUS_TEMPERATURE	Read Byte	1	
88h	READ_VIN	Read Word	2	
8Bh	READ_VOUT	Read Word	2	
8Ch	READ_IOUT	Read Word	2	
8Dh	READ_TEMPERATURE_1	Read Word	2	
96h	READ_POUT	Read Word	2	
97h	READ_PIN	Read Word	2	
98h	PMBUS_REVISION	Read Byte	1	Value 22h
99h	MFR_ID	Read Block	Variable	
9Ah	MFR_MODEL	Read Block	Variable	
9Bh	MFR_REVISION	Read Block	Variable	
A0h	MFR_VIN_MIN	Read Word	2	
A1h	MFR_VIN_MAX	Read Word	2	
A2h	MFR_IIN_MAX	Read Word	2	
A3h	MFR_PIN_MAX	Read Word	2	
A4h	MFR_VOUT_MIN	Read Word	2	
A5h	MFR_VOUT_MAX	Read Word	2	
A6h	MFR_IOUT_MAX	Read Word	2	
A7h	MFR_POUT_MAX	Read Word	2	
A8h	MFR_TAMBIENT_MAX	Read Word	2	
A9h	MFR_TAMBIENT_MIN	Read Word	2	
ABh	MFR_EFFICIENCY_HL	Read Block	14	
D0h	Cold standby	R/W	1	

## 6.2 EEPROM

### 6.2.1 EEPROM Data

The EEPROM data format shall comply with the IPMI version 1.0 (document revision 1.3 March 24, 2015) specification.

## 6.2.2 EEPROM data format

### EEPROM Addressing

Item	Address	Byte Value (hex)	Description	Area
0	00H	01	Common Header	Format Version Number
1	01H	00	Internal Use Area	
2	02H	00	Chassis Info Area	
3	03H	00	Board Info Area	
4	04H	01	Product Info Area	
5	05H	0C	Multi Record Info Area	
6	06H	00	PAD Area	
7	07H	F2	Common Header Checksum (Total Of Bytes)	
8	08H	01	Product Area Format Version	Product Information Area
9	09H	0B	Product Area Length	
10	0AH	19	Language Code	
11	0BH	C9	Manufacturer Name type/length byte	
12	0CH	46	Manufacturer Name bytes	
13	0DH	53	Manufacturer Name bytes	
14	0EH	50	Manufacturer Name bytes	
15	0FH	20	Manufacturer Name bytes	
16	10H	47	Manufacturer Name bytes	
17	11H	52	Manufacturer Name bytes	
18	12H	4F	Manufacturer Name bytes	
19	13H	55	Manufacturer Name bytes	
20	14H	50	Manufacturer Name bytes	
21	15H	CD	Product Name type/length byte	
22	16H	46	Product Name bytes	
23	17H	53	Product Name bytes	
24	18H	50	Product Name bytes	
25	19H	31	Product Name bytes	

26	1AH	33	Product Name bytes	
27	1BH	30	Product Name bytes	
28	1CH	30	Product Name bytes	
29	1DH	2D	Product Name bytes	
30	1EH	32	Product Name bytes	
31	1FH	51	Product Name bytes	
32	20H	30	Product Name bytes	
33	21H	31	Product Name bytes	
34	22H	41	Product Name bytes	
35	23H	31	Product Name bytes	
36	24H		Product Part/Model Number type/length byte	
37	25H		Product Part Number bytes	Need be consistent with SPEC label
38	26H		Product Part Number bytes	
39	27H		Product Part Number bytes	
40	28H		Product Part Number bytes	
41	29H		Product Part Number bytes	
42	2AH		Product Part Number bytes	
43	2BH		Product Part Number bytes	
44	2CH		Product Part Number bytes	
45	2DH		Product Part Number bytes	
46	2EH		Product Part Number bytes	
47	2FH	C2	Product Version type/length byte	
48	30H		Product Version	Need be consistent with BOM
49	31H		Product Version	
50	32H		Product Serial Number type/length byte	
51	33H		Product Serial Number bytes	Need be consistent with SPEC label
52	34H		Product Serial Number bytes	
53	35H		Product Serial Number bytes	
54	36H		Product Serial Number bytes	
55	37H		Product Serial Number bytes	
56	38H		Product Serial Number bytes	
57	39H		Product Serial Number bytes	
58	3AH		Product Serial Number bytes	
59	3BH		Product Serial Number bytes	
60	3CH		Product Serial Number bytes	
61	3DH		Product Serial Number bytes	
62	3EH		Product Serial Number bytes	
63	3FH	C1	type/length byte encoded to indicate no more info fields	
64	40H	00	PAD	

65	41H	00	PAD	
66	42H	00	PAD	
67	43H	00	PAD	
68	44H	00	PAD	
69	45H	00	PAD	
70	46H	00	PAD	
71	47H	00	PAD	
72	48H	00	PAD	
73	49H	00	PAD	
74	4AH	00	PAD	
75	4BH	00	PAD	
76	4CH	00	PAD	
77	4DH	00	PAD	
78	4EH	00	PAD	
79	4FH	00	PAD	
80	50H	00	PAD	
81	51H	00	PAD	
82	52H	00	PAD	
83	53H	00	PAD	
84	54H	00	PAD	
85	55H	00	PAD	
86	56H	00	PAD	
87	57H	00	PAD	
88	58H	00	PAD	
89	59H	00	PAD	
90	5AH	00	PAD	
91	5BH	00	PAD	
92	5CH	00	PAD	
93	5DH	00	PAD	
94	5EH	00	PAD	
95	5FH		Product Info Area Checksum	Sum Of Byte8 ~95
96	60H	00	Record Type ID	Power Supply Information
97	61H	02	End of List/Record Format Version	
98	62H	18	Record Length	
99	63H		Record Checksum (zero checksum)	
100	64H		Header Checksum (zero checksum)	
101	65H	14	Overall Capacity in Watts (LSB)	1300W
102	66H	05	Overall Capacity in Watts (MSB)	
103	67H	FF		
104	68H	FF	Peak VA	

105	69H	32	Inrush current	50A
106	6AH	05	Inrush interval in ms.	5ms
107	6BH	28	Low end Input voltage range 1 (10mV ,LSB)	90V
108	6CH	23	Low end Input voltage range 1 (10mV ,MSB)	
109	6DH	20	High end Input voltage range 1 (10mV ,LSB)	264V
110	6EH	67	High end Input voltage range 1 (10mV ,MSB)	
111	6FH	00	Low end Input voltage range 2 (10mV ,LSB)	
112	70H	00	Low end Input voltage range 2 (10mV ,MSB)	
113	71H	00	High end Input voltage range 2 (10mV ,LSB)	
114	72H	00	High end Input voltage range 2 (10mV ,MSB)	
115	73H	2F	Low end Input frequency range	47Hz
116	74H	3F	High end Input frequency range	63Hz
117	75H	0C	A/C dropout tolerance in ms(100%Load)	12mS
118	76H	1B	Binary flags	
119	77H	48	Peak Wattage(LSB)	1352W, 15S
120	78H	F5	Peak Wattage(MSB) – Hold up time in seconds	
121	79H	00	Combined Wattage	15S7:4 – Voltage 1 ; 3:0 – Voltage 2
122	7AH	00	Combined Wattage (LSB)	
123	7BH	00	Combined Wattage (MSB)	
124	7CH	00	Predictive fail tachometer lower threshold (RPS)	
125	7DH	09	Record Type ID (0x01: DC Output, 0x09: Extended DC Output)	12V Output Record
126	7EH	02	End of List/Record Format Version	
127	7FH	0D	Record Length	
128	80H		Record Checksum (zero checksum)	
129	81H		Header Checksum (zero checksum)	
130	82H	1	Output Information	
131	83H	C4	Nominal voltage (10 mV) (LSB)	12.2V
132	84H	04	Nominal voltage (10 mV) (MSB)	
133	85H	88	Maximum negative voltage (10 mV) (LSB)	11.6V
134	86H	04	Maximum negative voltage (10 mV) (MSB)	
135	87H	00	Maximum positive voltage (10 mV) (LSB)	12.8V
136	88H	05	Maximum positive voltage (10 mV) (MSB)	
137	89H	78	Ripple and Noise (1mV) (LSB)	120mV
138	8AH	00	Ripple and Noise (1mV) (MSB)	
139	8BH	32	Minimum current draw (10mA) (LSB)	2A

140	8CH	00	Minimum current draw (10mA) (MSB)	
141	8DH	22	Maximum current draw (10mA) (LSB)	105.3A
142	8EH	29	Maximum current draw (10mA) (MSB)	
143	8FH	09	Record Type ID	12Vsb Output Record
144	90H	82	End of List/Record Format Version	
145	91H	0D	Record Length	
146	92H		Record Checksum (zero checksum)	
147	93H		Header Checksum (zero checksum)	
148	94H	82	Output Information	
149	95H	C4	Nominal voltage (10 mV) (LSB)	12.2V
150	96H	04	Nominal voltage (10 mV) (MSB)	
151	97H	88	Maximum negative voltage (10 mV) (LSB)	11.6V
152	98H	04	Maximum negative voltage (10 mV) (MSB)	
153	99H	00	Maximum positive voltage (10 mV) (LSB)	12.8V
154	9AH	05	Maximum positive voltage (10 mV) (MSB)	
155	9BH	78	Ripple and Noise (1mV) (LSB)	120mV
156	9CH	00	Ripple and Noise (1mV) (MSB)	
157	9DH	00	Minimum current draw (10mA) (LSB)	0.5A
158	9EH	00	Minimum current draw (10mA) (MSB)	
159	9FH	2C	Maximum current draw (10mA) (LSB)	3A
160	A0H	01	Maximum current draw (10mA) (MSB)	
161	A1H	FF		
162	A2H	FF		
163	A3H	FF		
164	A4H	FF		
165	A5H	FF		
166	A6H	FF		
167	A7H	FF		
168	A8H	FF		
169	A9H	FF		
170	AAH	FF		
171	ABH	FF		
172	ACH	FF		
173	ADH	FF		
174	AEH	FF		
175	AFH	FF		
176	B0H	FF		
177	B1H	FF		
178	B2H	FF		
179	B3H	FF		

180	B4H	FF	
181	B5H	FF	
182	B6H	FF	
183	B7H	FF	
184	B8H	FF	
185	B9H	FF	
186	BAH	FF	
187	BBH	FF	
188	BCH	FF	
189	BDH	FF	
190	BEH	FF	
191	BFH	FF	
192	C0H	FF	
193	C1H	FF	
194	C2H	FF	
195	C3H	FF	
196	C4H	FF	
197	C5H	FF	
198	C6H	FF	
199	C7H	FF	
200	C8H	FF	
201	C9H	FF	
202	CAH	FF	
203	CBH	FF	
204	CCH	FF	
205	CDH	FF	
206	CEH	FF	
207	CFH	FF	
208	D0H	FF	
209	D1H	FF	
210	D2H	FF	
211	D3H	FF	
212	D4H	FF	
213	D5H	FF	
214	D6H	FF	
215	D7H	FF	
216	D8H	FF	
217	D9H	FF	
218	DAH	FF	
219	DBH	FF	

220	DCH	FF		
221	DDH	FF		
222	DEH	FF		
223	DFH	FF		
224	E0H	FF		
225	E1H	FF		
226	E2H	FF		
227	E3H	FF		
228	E4H	FF		
229	E5H	FF		
230	E6H	FF		
231	E7H	FF		
232	E8H	FF		
233	E9H	FF		
234	EAH	FF		
235	EBH	FF		
236	ECH	FF		
237	EDH	FF		
238	EEH	FF		
239	EFH	FF		
240	F0H	FF		
241	F1H	FF		
242	F2H	FF		
243	F3H	FF		
244	F4H	FF		
245	F5H	FF		
246	F6H	FF		
247	F7H	FF		
248	F8H	FF		
249	F9H	FF		
250	FAH	FF		
251	FBH	FF		
252	FCH	FF		
253	FDH	FF		
254	FEH	FF		
255	FFH	FF		

## 7.Environmental and reliability requirements

### 7.1 Environment

Item	Unit	MIN	NORMA L	MAX	Item
Operating temperature	°C	0	25	55	100% load
Storage temperature	°C	-40		85	
Storage humidity	%			95	Not turn on the power and on the no condensation.
Altitude	m	0	/	5000	When the power supply works for a long time, the maximum temperature at sea level (the maximum temperature defined in the specification book) decreases by 0.33°C for every 100m increase in altitude.
Heat dissipation method	The power supply comes with air cooling (exhaust air from the DC terminal side to the AC input side)				
Noise	58dB,@33°C,230Vac			Test method refers to ISO7779 bystander sound pressure level noise test	

### 7.2 MTBF

When the environment is 35°C and 100% load, the mean time between failures (MTBF) of the power supply is greater than 200,000 hours.

### 7.3 Test environment requirement

No	Test item	Standard	Note
1	Low Temperature Work)	0°C	24h
2	High Temperature Work)	55°C	24h
3	Low Temperature Storage)	-40°C	24h
4	High Temperature Storage)	85°C	24h
5	Temperature Cycling	-5~55°C	Each cycle is 3 hours, high and low temperature are 1 hour, 380 cycles

## 8 Safety requirement

### 8.1 Safety

Standard	Description
IEC 60950-1	'Information technology equipment – Safety. Part 1: General requirements', plus all existing national and group differences within the IECEE CB Scheme
GB 4943.1	Safety of Information Technology Equipment (Including Electrical Business Equipment) (standard for China, equivalent to IEC 60950)
IEC 60664-1	Insulation coordination for equipment within low-voltage systems -Part 1:Principles, requirements and tests
IEC62368-1	Audio/video, information and communication technology equipment-- Part 1: Safety requirements

### 8.2 Withstand voltage test and leakage current requirements

Test item	Requirement
primary versus secondary	The primary and secondary should be able to withstand 2545Vdc or 1800Vac for 1 minute, leakage current $\leq 20\text{mA}$ , and no breakdown or arcing.
Insulation resistance	Under normal atmospheric pressure, relative humidity $< 90\%$ , no condensation, when the test voltage is 500VDC, the insulation resistance between primary and secondary, primary and protective ground and secondary and protective ground is $\geq 10\text{M}\Omega$
Leakage current	$< 3.5\text{mA}$ , 264Vac

## 9.EMC Requirement

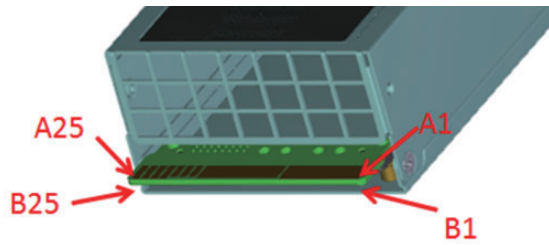
Item	Requirement	Standard	Note
(RE)	Frequency: 30MHz~1GHz Class A	EN 55022	230V@50Hz powered
		FCC part 15	120V@60Hz powered
(CE)	Frequency: 150KHz~30MHz Class A	EN 55022	230V@50Hz powered
		FCC part 15	120V@60Hz powered
(harmonic)	EN 61000-3-2 class A and Class D requiremnet.	EN 61000-3-2	230V@50Hz powered
(Flicker)	Pst not higher then 1.0; Plt value not over 0.65; The relative voltage change dc does not exceed 3.3%; The maximum relative voltage change dmax does not exceed 4%; The time during which the d(t) value exceeds 3.3% during voltage changes shall not exceed 500ms.	EN 61000-3-3	230V@50Hz powered

Item	Requirement	Category	Standard	Note
SURGE	AC input: Differential mode: $\pm 1\text{KV}$ , Common mode: $\pm 2\text{KV}$	B	EN61000-4-5 EN 55024	Basic requirement
EFT	AC input: $\pm 2\text{KV}$	B	EN61000-4-4 EN 55024 YD/T 1082	
ESD	contact discharge: $\pm 6\text{KV}$ air discharge: $\pm 8\text{KV}$	B	EN61000-4-2 EN 55024	
RS	80M~800MHz 3V/m 800M~960MHz 10V/m 960M~1GHz 3V/m 1.4G~2GHz 10V/m 2G~2.7GHz 3V/m 80% AM	A	EN 61000-4-3	
CS	150KHz~80MHz 3V, 80% AM	A	EN 61000-4-6 EN 55024	

## 10. Dimension

73.5mm (W) x 40mm (H) x 185mm (D)

# 11.Pin Define



Pin Number	Definition	Pin Number	Definition
A1	GND	B1	GND
A2	GND	B2	GND
A3	GND	B3	GND
A4	GND	B4	GND
A5	GND	B5	GND
A6	GND	B6	GND
A7	GND	B7	GND
A8	GND	B8	GND
A9	GND	B9	GND
A10	+12V	B10	+12V
A11	+12V	B11	+12V
A12	+12V	B12	+12V
A13	+12V	B13	+12V
A14	+12V	B14	+12V
A15	+12V	B15	+12V
A16	+12V	B16	+12V
A17	+12V	B17	+12V
A18	+12V	B18	+12V
A19	SDA	B19	A0
A20	SCL	B20	A1
A21	PSON	B21	+12VSB
A22	SMB_ALERT	B22	CRB
A23	RETURN_SENSE	B23	SHARE
A24	REMOTE_SENSE	B24	PRESENT
A25	PWOK	B25	AC_FAIL

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