



SPECIFICATION FOR APPROVAL

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CRPS AC-DC 1300W

SWITCHING POWER SUPPLY

SWITCHING POWER SUPPLY



CRPS AC-DC 1300W Manufacturer Part No.: KE260021

Customer Name _____

Customer Part NO. _____

Project Modify List

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SWITCHING POWER SUPPLY

CRPS AC-DC 1300W

Manufacturer Part No.: KE260021



1.	INPUT REQUIREMENTS	5
1.1	Highlight & Features.....	5
1.2	General Description.....	5
1.3	Chemical Substance Control Laws	5
1.4	Input Conditions.....	5
1.5	Ac inrush current	5
2.	OUTPUT REQUIREMENTS	6
3.	MECHANICAL.....	7
3.1	Enclosure and Layout	7
3.2	Output Configuration	7
4.	REGULATORY COMPLIANCE	8
4.1	EMC Specifications.....	8
4.1.1	Radiated and Conducted Emission	8
4.1.2	Harmonic Standard	8
4.1.3	Voltage fluctuations and Flicker.....	8
4.2	Immunity.....	8
4.2.1	Electrostatic Discharge Immunity.....	8
4.2.2	Radiated Field Immunity	8
4.2.3	Fast Transient Immunity.....	9
4.2.4	Surge Immunity	9
4.3	Safety Requirements and Certification.....	9
4.3.1	Regulatory Standard	9
4.3.2	Additional Safety Requirements.....	9
5.	ENVIRONMENTAL REQUIREMENTS	10
6.	MECHANICAL SPECIFICATIONS	11
7.	NAME PLATE	12
8.	PACKING (UNIT: MM)	13
9.	MAIN FUNCTION INTRODUCTION:	14
9.1	Standby Output	14
9.2	Load Sharing	14
9.3	Timing.....	14
9.3.1	Output voltage timing	14
9.3.2	Power on/off timing	15
9.4	PWOK signal and PSON# signal.....	15
9.5	+12VSB Feature	16

SWITCHING POWER SUPPLY



CRPS AC-DC 1300W Manufacturer Part No.: KE260021

9.6	Load Sharing	16
9.7	Alarm	16
9.8	PMBus	16
9.9	PMBus Related Definitions	18

SWITCHING POWER SUPPLY

CRPS AC-DC 1300W

Manufacturer Part No.: KE260021



1. INPUT REQUIREMENTS

1.1 Highlight & Features

- Size: L185x W73.5 x H40.3mm
- Universal AC input with active PFC circuit
- MTBF up to 100KHrs
- This product is used in redundant server, industrial equipment, and other fields.

1.2 General Description

This specification defines the functional requirements of the switching power supply. It is a redundant server power supply with features support hot plug N+1, dual outputs (+12V and +12VSB), and internal fan(s) for force air cooling.

1.3 Chemical Substance Control Laws

PAHS 6P NP REACH ROHS

1.4 Input Conditions

The supply shall operate over the voltage ranges as follows:

Rated input voltage	100-240Vac
Operating range	90-264Vac
Rated input frequency	50/60Hz
Rated input current	10.0A max.
Power consumption (no-loading)	/
Power factor	0.95 minimum @ full load

1.5 Ac inrush current

Under the conditions of ambient temperature 25°C, no-load output and cold start:

When the AC input is 220Vac, the value shall be less than 35A. Repeatedly turning on and off the power supply will not cause damage to the power source or the fuse to blow.

SWITCHING POWER SUPPLY



CRPS AC-DC 1300W

Manufacturer Part No.: KE260021

2. OUTPUT REQUIREMENTS

2.1	Nominal DC output voltage	+12V main						+12VSB					
2.2	Output current(A)	200-240VAC			110-270VAC			200-240VAC			110-270VAC		
		Min	Nom	Max	Min	Nom	Max	Min	Nom	Max	Min	Nom	Max
		1.0	108.0	113.0	1.0	82.0	87.0	0		3.0	0		3.0
2.3	Rated power	200-240VAC						110-270VAC					
		1300W Max.						1000W Max.					
2.4	Load regulation	± 5%						± 5%					
2.5	Line regulation	± 3%						± 3%					
2.6	Ripple and noise	120mV						120mV					
		Add 0.1uF/50V ceramic capacitor and 10uF/50V aluminum electrolytic capacitor in parallel the output terminal. Measured with 20MHz bandwidth oscilloscope at rated load and rated input voltage.											
2.7	Efficiency	10% load			20% load			50% load			100% load		
		82%			90%			94%			91%		
		230Vac/60Hz.											
2.8	Output over-shoot	Less than 10% of nominal voltage value.											
2.9	Protection function	When the hardware protection circuit of the power supply is activated due to overvoltage, overpower, or short circuit, the power supply locks and there is no output at this time; After self-locking, the power supply will automatically reset every 3 seconds. If there are 3 consecutive reset failures within 20 seconds, the power supply will lock and report the fault status to the system.											
	Over power protection	After the power over protection, the power supply did not output and was locked. Its output load increases from full load at a rate of at least 10A/second, and the average power of the protection action is not less than 1350W and not more than 1560W.											
	Over voltage protection				Min			Nom			Max		
		+12V			13.3V			14.0V			14.5V		
		+12VSB			13.3V			14.0V			14.5V		
	Short circuit protection	The adapter shall not be damaged by short the DC output to Ground. The adapter shall resume normal operation when a short circuited fault condition is removed.											

SWITCHING POWER SUPPLY

CRPS AC-DC 1300W Manufacturer Part No.: KE260021



3. MECHANICAL

3.1 Enclosure and Layout

Case	/
Weight	/g (Max.)
Dimensions	185*73.5*40.3mm

3.2 Output Configuration

Pin	Name	Pin	Name
A1-A9	GND	B1-B9	GND
A10-A18	+12V	B10-B18	+12V
A19	SDA	B19	A0 (SMBus address)
A20	SCL	B20	A1 (SMBus address)
A21	PSON	B21	+12VSB
A22	SMB Alert#	B22	SMART ON
A23	RS-	B23	+12V load share bus
A24	RS+	B24	PS_PRESENT#
A25	PWOK	B25	PSKILL#

SWITCHING POWER SUPPLY

CRPS AC-DC 1300W

Manufacturer Part No.: KE260021



4. REGULATORY COMPLIANCE

4.1 EMC Specifications

The external power supply must meet all specification in this section. It is required that the external power supply work closely with the customer's equipment in order to get the best EMC solution.

4.1.1 Radiated and Conducted Emission

FCC part 15: Class B for radiated and conducted emissions.

EN55032, Class B for radiated and conducted emissions.

Note: Applications that meet Class B requirements for some end products may require additional EMI filters

4.1.2 Harmonic Standard

Meet EN61000-3-2

Performance Criteria A

4.1.3 Voltage fluctuations and Flicker

Meet EN61000-3-3

4.2 Immunity

4.2.1 Electrostatic Discharge Immunity

EN 55035, EN 61000-4-2

Air Discharge: $\pm 8\text{kv}$

Contact Discharge: $\pm 4\text{kv}$

Performance Criteria A

Electrostatic-discharge test by contact or air should be conducted with static-discharge tester, energy storage capacitance of 150pF, and discharge resistance of 330 Ω , 8kv air discharge, 4kv contact discharge.

4.2.2 Radiated Field Immunity

EN 55035, EN 61000-4-3

Frequency Range: 80MHz -2.7GHz

Field Strength: 3 V/m with 80% amplitude modulation of 1kHz

Performance Criteria A

Radio-frequency electromagnetic field susceptibility test, RS 80MHz -2.7GHz, 3V/m, 80%AM(1kHz).

SWITCHING POWER SUPPLY



CRPS AC-DC 1300W

Manufacturer Part No.: KE260021

4.2.3 Fast Transient Immunity

EN 55035, EN 61000-4-4

Power line: 1kv

Performance Criteria B

4.2.4 Surge Immunity

EN 55035, EN 61000-4-5

1.2/50 μ s Open circuit voltage8/20 μ s Short circuit current

Power line: 1kv

Line to earth: 2kv

Performance Criteria A

Lightning surge voltage shall be applied in differential and common mode to AC input lines and cross primary AC input and secondary GND.

4.3 Safety Requirements and Certification

4.3.1 Regulatory Standard

The power supply shall comply with the following international regulatory standards:

for short	Country	Certified Status	Standard
UL/CUL	USA	/	UL 62368-1
CCC	China		GB4943
CB	Global	/	IEC62368-1
CE	Europe	/	CE Mark EN 62368-1

4.3.2 Additional Safety Requirements

⊙ Dielectric Withstand Voltage:

Primary(input AC short)-to-Secondary(output DC short): 3000Vac, 5mA, 1 minute.

Primary input to GND and Secondary output to GND: 1500Vac, 5mA, 1 minute.

⊙ Insulation Resistance, Input to output: 10M Ω (MIN.) at 500VDC.

⊙ The leakage current shall not exceed 0.25mA.

SWITCHING POWER SUPPLY

CRPS AC-DC 1300W Manufacturer Part No.: KE260021



5. ENVIRONMENTAL REQUIREMENTS

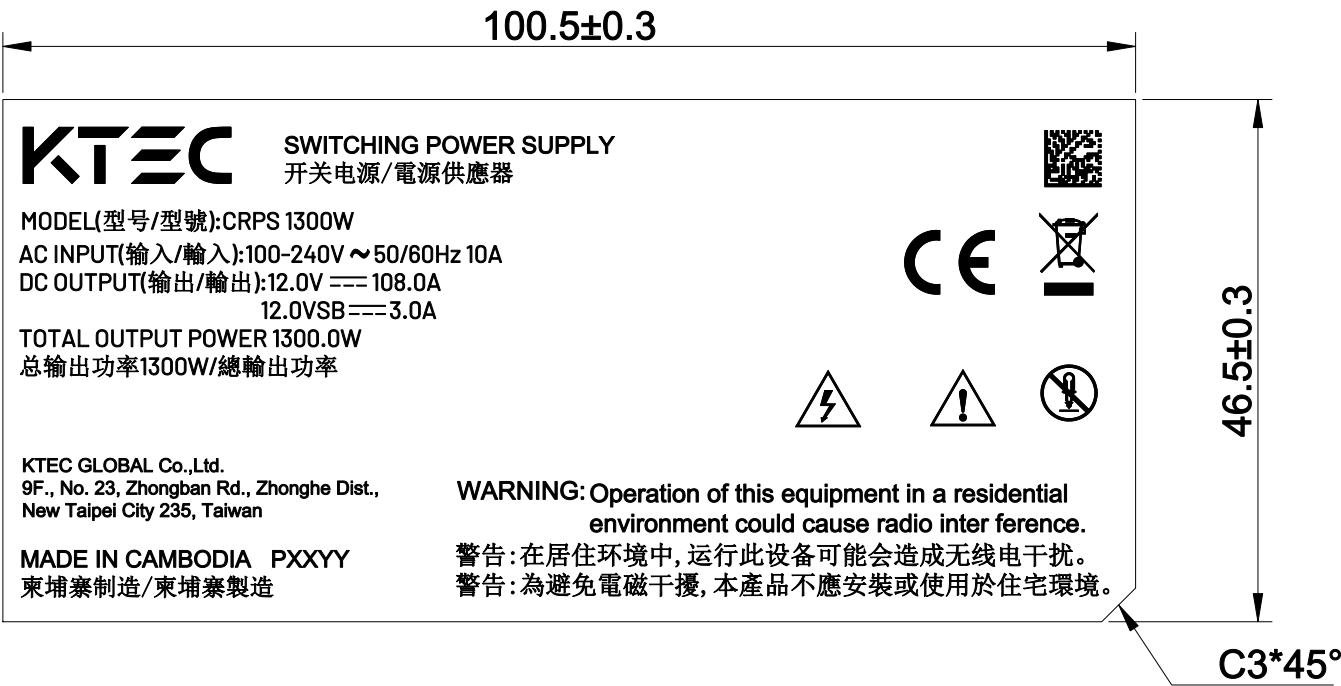
Temperature	Operating	0°C +50°C
	Non-Operating	-40°C +70°C (Non Condensing)
Humidity	Operating	5%~85% (Non Condensing)
	Non-Operating	5%~95% (Non Condensing)
Altitude	Operating	0 m to 5,000 meters
	Non-Operating	0 m to 15250 meters
Vibration	10Hz-55Hz, 19.6m/s ² , 3 axes x 2 hours.	
	Normal performance after test condition is removed.	

SWITCHING POWER SUPPLY

CRPS AC-DC 1300W

Manufacturer Part No.: KE260021

7. NAME PLATE



Note: MATERIAL: silver polyester (消银龙); Thickness: 0.08+-0.01mm

Black characters silver background

PAHS REACH ROHS

PXXYY (P=PAHS, 6P, NP XX=Week, YY=Year), use the actual production date.

SN (Data Matrix Code size: 5*5mm):

First code G（Ktec）+Production part number (Product code)+Ten yards of flow code SSSSSSSSSS (decimal)

Total 19 codes

Example: GKE2600210000000001, GKE2600210000000002...GKE2600219999999999.

SWITCHING POWER SUPPLY

CRPS AC-DC 1300W

Manufacturer Part No.: KE260021



8. PACKING (UNIT: MM)

TBD

SWITCHING POWER SUPPLY

CRPS AC-DC 1300W Manufacturer Part No.: KE260021



9. MAIN FUNCTION INTRODUCTION:

9.1 Standby Output

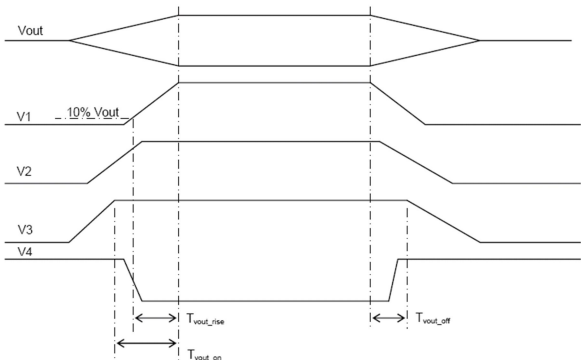
The +12VSB output shall present when AC input greater than the power supply start up voltage. There should be load sharing in the standby rail.

9.2 Load Sharing

The +12V output will have active load sharing. The output will share within 10% at full load. The failure of a power supply should not affect the load sharing or output voltages of the other supplies still operating. The supplies must be able to load share in parallel and operate in a hot-swap / redundant 1+1 configurations. +12VSB output is not required to actively share current between power supplies (passive sharing). The +12VSB output of the power supplies are connected together in the system so that a failure or hot swap of a redundant power supply does not cause these outputs to go out of regulation in the system.

9.3 Timing

9.3.1 Output voltage timing



Item	Description	MIN	MAX	Units
Tvout_rise	Output voltage rise time from each main output.	5	70	ms
T12vsb_rise	Ouput voltage rise time for the 12VSB output	1	25	ms
Tvout_on	All main outputs must be within regulation of each other within this time.		50	ms
Tvout_off	All main outputs must leave regulation within this time.		400	ms

SWITCHING POWER SUPPLY

CRPS AC-DC 1300W

Manufacturer Part No.: KE260021



Signal type	TTL
Logical low level	<0.4V, Sink current 4mA
Logical high level	2.4-3.46V, Source current 200uA

2. The PS_ON# signal is a TTL-compatible signal. The motherboard uses PS_ON# to control the power switch. When the PS_ON# signal is at a low level, the power is turned on. When the PS_ON# signal is at a high level, the power is shut off.

	Min.	Max.
V _{IL} , Input low voltage level	0.0V	0.4V
I _{IL} , Input low current level(V _{in} =0.4V)		4mA
I _{IH} , Input high voltage level(I _{in} =-200uA)	2.4V	3.46V

9.5 +12VSB Feature

As long as there is an input of AC voltage, +12VSB will have an output voltage. +12VSB provides the power output for the system in the standby state.

9.6 Load Sharing

In the standard redundancy mode, the current deviation is less than 10%. For example, if module 1 outputs I₁ and module 2 outputs I₂, then: $(I_1 - I_2) / (I_1 + I_2)$

9.7 Alarm

Status	LED State	Alarm line level
When the AC power is cut off and all the internal energy has been released	The light went out.	Low level
AC is normal only in the case of SB (PS_OFF), which is the standby state.	Light of a pale green color, flashing at a frequency of 1 Hz.	High level
The AC is normal only when SB is engaged (PS_ON), that is, in the faulty condition.	The red light is constantly on.	Low level

9.8 PMBus

Read the input power at the AC input terminal of the power supply. When the power supply load is greater than 10% but less than or equal to 19%, the reading accuracy P% is $\pm 15\%$; when the power supply load is greater than 19%, the reading accuracy P% is $\pm 5\%$.

Support PEC error checking;

SWITCHING POWER SUPPLY

CRPS AC-DC 1300W

Manufacturer Part No.: KE260021



The supported PMBus protocol command set is as follows:

Code	Page access command	Command	Data transmission protocol type for reading and writing
03h	N/A	CLEAR_FAULTS	Send Byte with PEC
79h	N/A	STATUS_WORD	Read Word with PEC
7Ah	N/A	STATUS_VOUT	Read Byte with PEC
7Bh	N/A	STATUS_IOUT	Read Byte with EC
7Ch	N/A	STATUS_INPUT	Read Byte with PEC
7Dh	N/A	STATUS_TEMPERATURE	Read Byte with PEC
81h	N/A	STATUS_FANS_1_2	Read Byte with PEC
86h	N/A	READ_EIN	Block Read with PEC
87h	N/A	READ_EOUT	Block Read with PEC
88h	N/A	READ_VIN	Read Word with PEC
89h	N/A	READ_IIN	Read Word with PEC
8Bh	N/A	READ_VOUT	Read Word with PEC
8Ch	N/A	READ_IOUT	Read Word with PEC
8Dh	N/A	READ_TEMPERATURE_1 (Ambient)	Read Word with PEC
8Eh	N/A	READ_TEMPERATURE_2 (Hot Spot)	Read Word with PEC
90h	N/A	READ_FAN_SPEED_1	Read Word with PEC
96h	N/A	READ_POUT	Read Word with PEC
97h	N/A	READ_PIN	Read Word with PEC
98h	N/A	PMBUS_REVISION	Read Byte with PEC
99h	N/A	MFR_ID	Block Read with PEC
9Ah	N/A	MFR_MODEL	Block Read with PEC
9Bh	N/A	MFR_REVISION	Block Read with PEC
9Ch	N/A	MFR_LOCATION	Block Read with PEC
9Dh	N/A	MFR_DATE	Block Read with PEC
9Eh	N/A	MFR_SERIAL	Block Read with PEC
A0h	N/A	MFR_VIN_MIN	Read Word with PEC
A1h	N/A	MFR_VIN_MAX	Read Word with PEC
A2h	N/A	MFR_IIN_MAX	Read Word with PEC
A3h	N/A	MFR_PIN_MAX	Read Word with PEC
A4h	N/A	MFR_VOUT_MIN	Read Word with PEC
A5h	N/A	MFR_VOUT_MAX	Read Word with PEC
A6h	N/A	MFR_IOUT_MAX	Read Word with PEC
A7h	N/A	MFR_POUT_MAX	Read Word with PEC
A8h	N/A	MFR_TAMBIENT_MAX	Read Word with PEC
A9h	N/A	MFR_TAMBIENT_MIN	Read Word with PEC

SWITCHING POWER SUPPLY

CRPS AC-DC 1300W Manufacturer Part No.: KE260021



9.9 PMBus Related Definitions

1. Communication speed: Maximum 100 KHz
2. Device Address: The address of the power module can be set to the following 4 options by using the address

setting lines A0 and A1 on the gold fingers of the power module:

Gold Finger A1 Address Line Logic Level	Gold finger A0 address line logic level	Based on the modules identified by A1 and A0 Address
0	0	0xB0
0	1	0xB2
1	0	0xB4
1	1	0xB6

3. Data interface:

PIN	Signal	Line color
1	PMBus Clock	blue
2	PMBus Data	white
3	PMBAlert	red
4	Returns	black
5	NC	no