KTEC

SPECIFICATION FOR APPROVAL

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KEC-470A-02FP

Switching power supply specification

Switching power supply specification

KEC-470A-02FP Manufacturer Part No.: KS260349

Customer Name KTEC

Customer Part NO. _____

Project Modify List

Item	Content	Rev.	Date	Prepared By	Checked By
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Switching power supply specification

KEC-470A-02FP Manufacturer Part No.: KS260349

1. INPUT REQUIREMENTS 4
1.1 Highlight & Features 4
1.2 Chemical Substance Control Laws 4
1.3 Input Conditions 4
1.4 Ac inrush current 4
1.5 Power factor 4
2. OUTPUT REQUIREMENTS 5
3. MECHANICAL 7
3.1 Enclosure and Layout 7
4. REGULATORY COMPLIANCE 7
4.1 EMC Specifications 7
4.1.1 Radiated and Conducted Emission 7
4.2 Immunity 7
4.2.1 Electrostatic Discharge Immunity 7
4.2.2 Radiated Field Immunity 7
4.2.3 Fast Transient Immunity 8
4.2.4 Surge Immunity 8
4.2.5 Shock 8
4.2.6 Vibration 8
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. APPEARANCE DRAWING: (UNIT: MM) 11
7. CONNECTOR & PIN DEFINE 12
8. PACKING (UNIT: MM) 13
9. SCHEMATIC DIAGRAM 15
10. PCB LAYOUT 16
11. PCBA PICTURE 18

Switching power supply specification

KEC-470A-02FP Manufacturer Part No.: KS260349

1. INPUT REQUIREMENTS

1.1 Highlight & Features

- Simple design philosophy.
- This specification defines the performance and characteristics of an open frame power supply.
- >900,000 hours at 100Vac/60HZ typical load 25℃. The calculated M.T.B.F using Telcordia SR332, issue2.
- E-Cap. life time: The E-Cap. Life time can meet 25,000 Hours at 100Vac/60Hz and 240Vac/50HZ typical. load 50°C.
- Cooling: Air-cooled.

1.2 Chemical Substance Control Laws

PAHS REACH ROHS

1.3 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 +/- 3Hz
Rated input current	6A maximum
Power consumption	/ maximum
Primary current protection	An adequate internal fuse on the AC input line is provided.

1.4 Ac inrush current

The inrush current shall not exceed 60A at 115Vac and 120A at 230Vac,

Typical load, cold start, 25℃. At hot start no damage occurred.

1.5 Power factor

Minimum power factor of 0.95 at Typical load and 115Vac/60Hz.

Switching power supply specification

KEC-470A-02FP Manufacturer Part No.: KS260349

2. OUTPUT REQUIREMENTS

2.1 Output voltage and current

Output voltage	+54V	+12V	Fan auxiliary power supply(+12V)	Condition/ Notes
Min. load	0A	0A	0A	
Typical load	6.9A	8.34A	1.5A	
Max. load	8.34A	8.34A	1.5A	
Max. total power		110W(2)		
Max. total power	470W(3)			
Load regulation	±5%	±5%	±10%	
Line regulation	±1%	±1%	±10%	
Ripple & Noise	540mVp-p(4)	120mVp-p(4)		

NOTE: (1) When +54V output current is 0A, the output voltage should not be more than +58.5V.

(2) +12V and Fan auxiliary power supply total output power can't exceed 110W.

(3) The maximum DC output power shall not exceed 470W.

(4) The +12V output is decoupled with 47μF low ESR aluminum electrolytic and 0.1uF ceramic capacitor.
The +54V output is decoupled with 100μF low ESR aluminum electrolytic and 0.1μF ceramic capacitor.
Measurement is made with a high impedance probe connected across the decoupling capacitance.
The ripple and noise are defined as periodic or random signals over a frequency band of 10 Hz to 20 MHz.
Measurements shall be made with an oscilloscope with 20 MHz bandwidth.

2.2 Regulation Transient Response

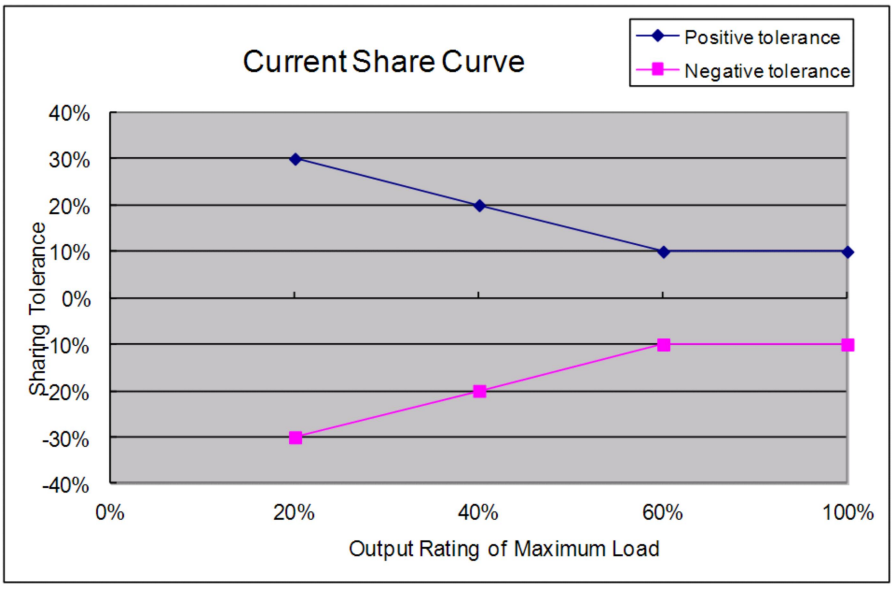
Output	Step load	Transient Voltage	Slew rate	Capacitive load
+12V	50% of typical load	±5%	1A/ μ s	Reference: 1000uF
+54V	50% of typical load	±5%	1A/ μ s	Reference: 1000uF

Step load change is 0.1A/us, at 50Hz-5KHz. The recovery time is less than 500us.

2.3	Overshoot	Overshoot at turn on shall be less than 10% of the nominal output voltage.
2.4	Turn on delay time	Turn on time 3 sec. Max. at 115Vac input and Typical load.
2.5	Rise time	The supply shall have a start-up rise time of less than 20ms to rise to within regulation limits for all DC outputs.
2.6	Hold up time	10 ms minimum at nominal input 115Vac minimum voltage and full load.
2.7	LED indication function	/

Switching power supply specification

KEC-470A-02FP Manufacturer Part No.: KS260349

2.8	**Current Share (Optional)**	Current share is achieved by means of active current sharing for max. 2 units of same type redundant application. Provision is made for a current share line for +12V or +54 V named +12VCS or +54VCS. +12VCS and +54VCS bus is independent. The current share line is referenced to the negative sense lead (+12CS_RTN and +54VCS_RTN). Current sharing tolerance is defined since every output load more than 20% of the max. load. If there was one piece of power supply shut down at the condition of 1+1 current sharing, the max. load of system must be reduced to 2 x 90% x max. load (Amp.) until the fault was removed and turned on the power supply. 
2.9	**Protection function**	If the output is OVP and OTP protected, the power supply shall shut down. The output return to normal operation after the fault has been removed and AC power must reset for OFF/ON cycle with a minimum OFF time more than 1 minute. Then it will turn on again. If the output is protected (when OCP and short protection), the power supply will be auto-recovery. The power supply return to normal operation after the fault has been removed.
2.10	**Over-voltage protection**	+12V at 16V Max.; 54V at 63V Max.
2.11	**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

2.12	**Over current protection**	12V at 8.7A~15A ; 54V at 9.2A~12.5A.
2.13	**Thermal protection**	The power supply must be with the thermal shutdown protection.

3. MECHANICAL

3.1 Enclosure and Layout

Weight	526 g (Typ.)
Dimensions	(L)152.4mm X (W) 101.6mm X (H) 33.8 mm (above PCB).

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.

4.2 Immunity

4.2.1 Electrostatic Discharge Immunity

EN 55035, EN 61000-4-2

Air Discharge: ±15kv

Contact Discharge: ±8kv

Performance Criteria B

Electrostatic-discharge test by contact or air should be conducted with Static-discharge tester (energy storage capacitance of 150pF and discharge resistance of 330Ω) 15kv air discharge, 8kv contact discharge.

4.2.2 Radiated Field Immunity

EN 55035, EN 61000-4-3

Frequency Range: 80-1000MHz, still need test singly 1800MHz, 2600MHz, 3500MHz, 5000MHz

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

Radio-frequency electromagnetic field susceptibility test, RS 80-1000MHz, 3V/m, 80%AM(1KHz).

4.2.3 Fast Transient Immunity

EN 55035, EN 61000-4-4

Power line: 2kv

Signal line: 0.5kv

Performance Criteria A

4.2.4 Surge Immunity

EN 55035, EN 61000-4-5

- Line to line: ±2kv

- Line to earth: ±4kv

- + 90°/ -270°

Lighting surge voltage of differential and common modes shall be applies across AC input lines and across input and frame ground.

4.2.5 Shock

Frequency 10~55Hz

Acceleration 19.6m/s^2

Sweep Rate 1min

Test Axis X, Y, Z axis

Test Time 30min each axis

4.2.6 Vibration

Wave Form Half sine wave

Acceleration 50m/s^2

Duration Time 11mS

NO . of Shock Each axis 1 times

Shock Direction X, Y, Z axis

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	/	GB4943.1
FCC	America	/	Class B part 15

4.3.2 Additional Safety Requirements

◎ Input – FG: AC 1.5KV 1min. (cut current 10mA) nominal temp. nominal humidity.
AC 1.8KV 3sec. (cut current 10mA) at factory nominal temp. nominal humidity.

◎ Input – Output AC 3KV 1min. (cut current 10mA) nominal temp. nominal humidity.
DC 4.242KV 3sec. (cut current 10mA) at factory nominal temp. nominal humidity.

◎ 54V – FG DC 0.5KV 1min. (cut current 10mA) nominal temp. nominal humidity.
DC 0.5KV 3sec. (cut current 10mA) at factory nominal temp. nominal humidity.

◎12V – FG DC 0.5KV 3sec. (cut current 10mA) nominal temp. nominal humidity.
DC 0.5KV 3sec. (cut current 10mA) at factory nominal temp. nominal humidity.

◎ Insulation Resistance, Input to output: 20M Ω(MIN.) at 500 VDC.

◎ Reinforced insulation system, Primary-to-Ground and Primary-to-Secondary.

◎ The leakage current shall not exceed 3.5mA.

Switching power supply specification

KEC-470A-02FP Manufacturer Part No.: KS260349

5. ENVIRONMENTAL REQUIREMENTS

Temperature	Operating	-20℃ +70℃
	Non-Operating	-40℃ +80℃ Derating linear 100% load @ 50℃ to 50% load @ 70℃. (See. Figure 1&2).

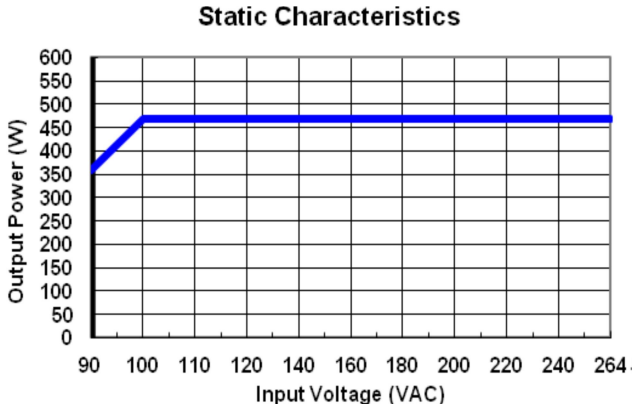


Figure1

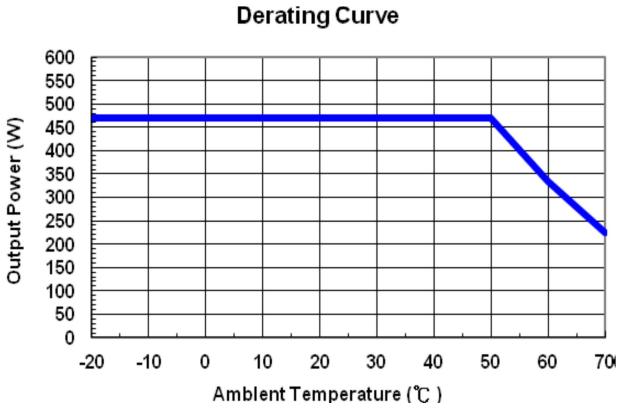
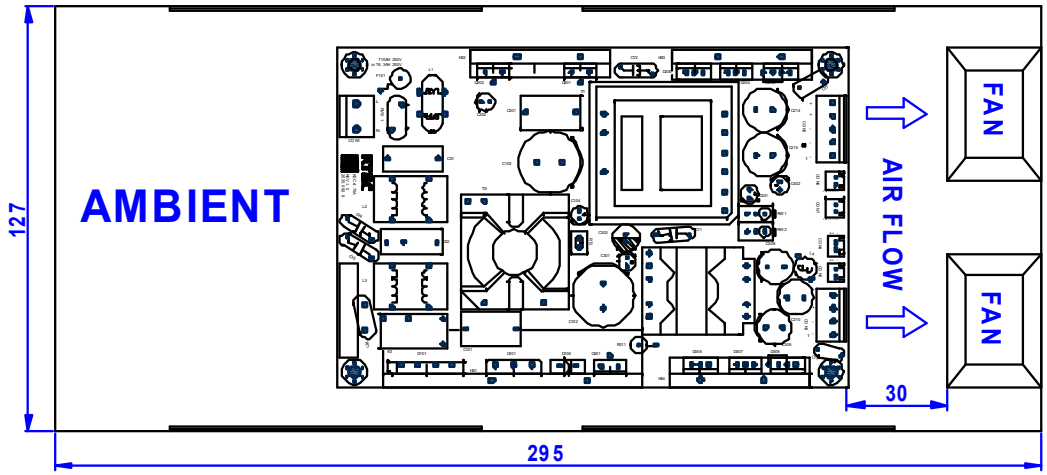


Figure2

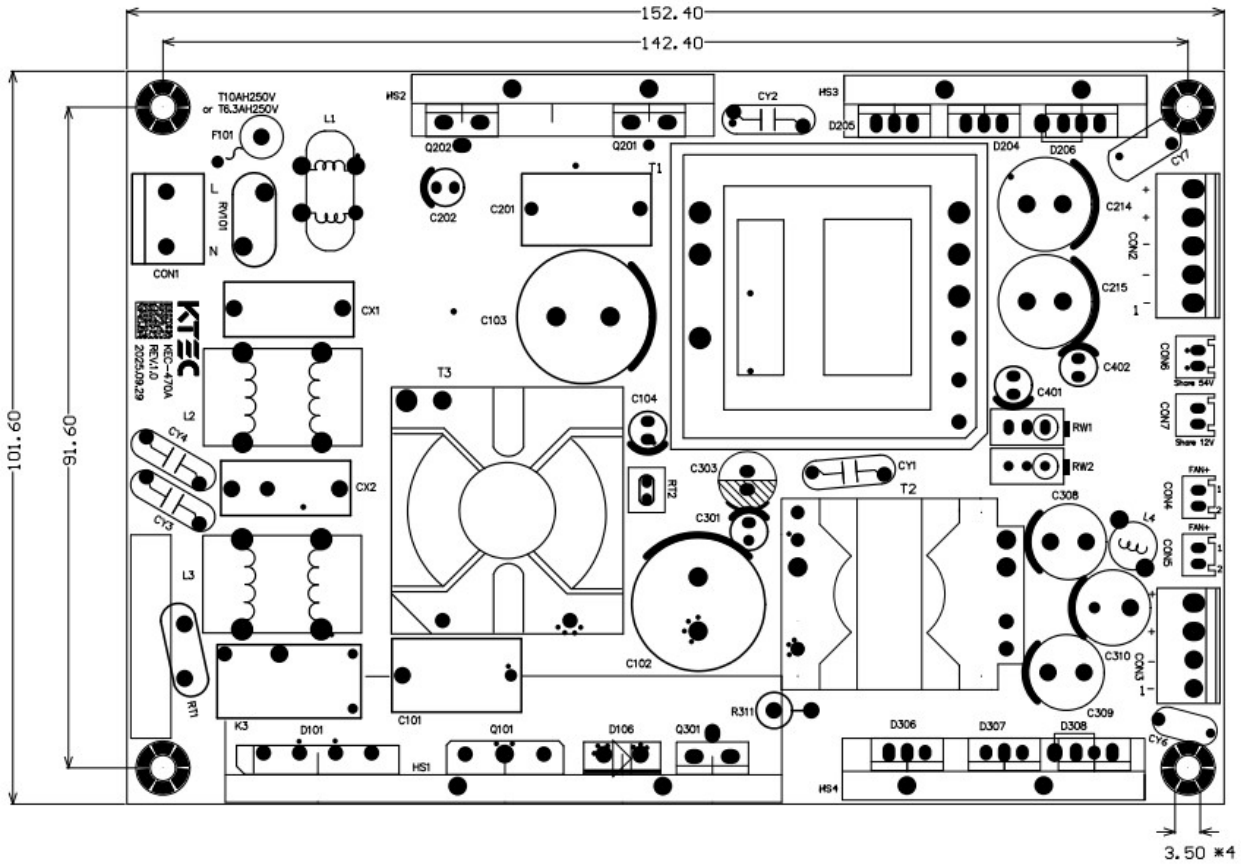
Humidity	Operating	20%~90% (Non Condensing)
	Non-Operating	5%~90% (Non Condensing)
Altitude	Meet 5000 meters.	
Cooling	A minimum airflow for 2 PCS 22.2CFM fan will be available to the power supply.	
	Recommended power supply and cooling airflow setting method as below:	



Switching power supply specification

KEC-470A-02FP Manufacturer Part No.: KS260349

6. APPEARANCE DRAWING: (UNIT: MM)



NOTE:

1. PAHS REACH ROHS

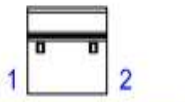
Switching power supply specification

KEC-470A-02FP Manufacturer Part No.: KS260349

7. CONNECTOR & PIN DEFINE

AC INPUT

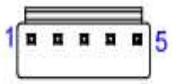
3.96mm*2P



Pin	Define
1	N
2	L

OUTPUT1

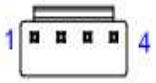
3.96mm*5P



Pin	Define
1	+54V
2	+54V
3	GND
4	GND
5	GND

OUTPUT2

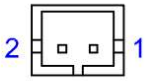
3.96mm*4P



Pin	Define
1	+12V
2	+12V
3	GND
4	GND

FAN1

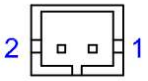
2.0mm*2P



Pin	Define
1	GND
2	+12V

FAN2

2.0mm*2P

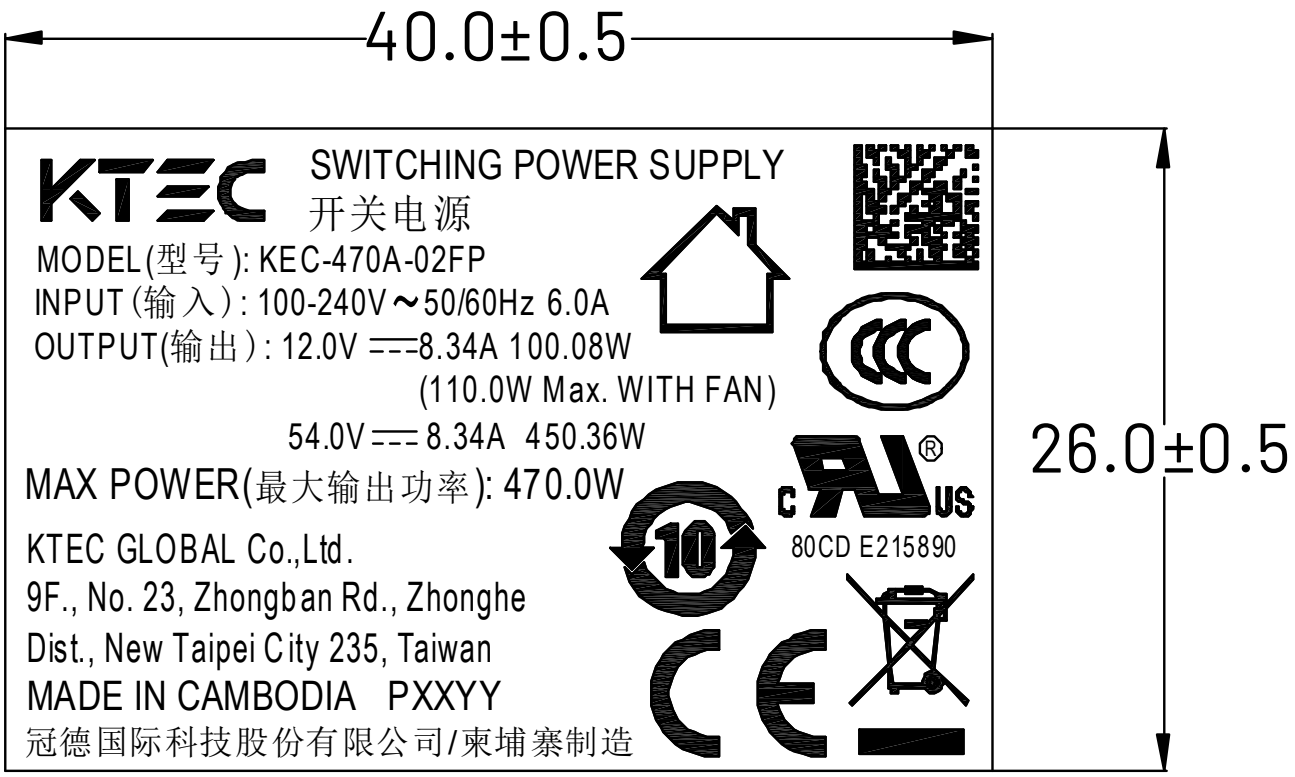


Pin	Define
1	GND
2	+12V

Switching power supply specification

KEC-470A-02FP Manufacturer Part No.: KS260349

8. NAMEPLATE (UNIT: MM)



Note: 1. ☑ 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) 按实际生产日期制作

2. Attach to transformer HS2

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

First code G(Ktec) + Production part number (Product code) + 10 yards of flow code SSSSSSSSS

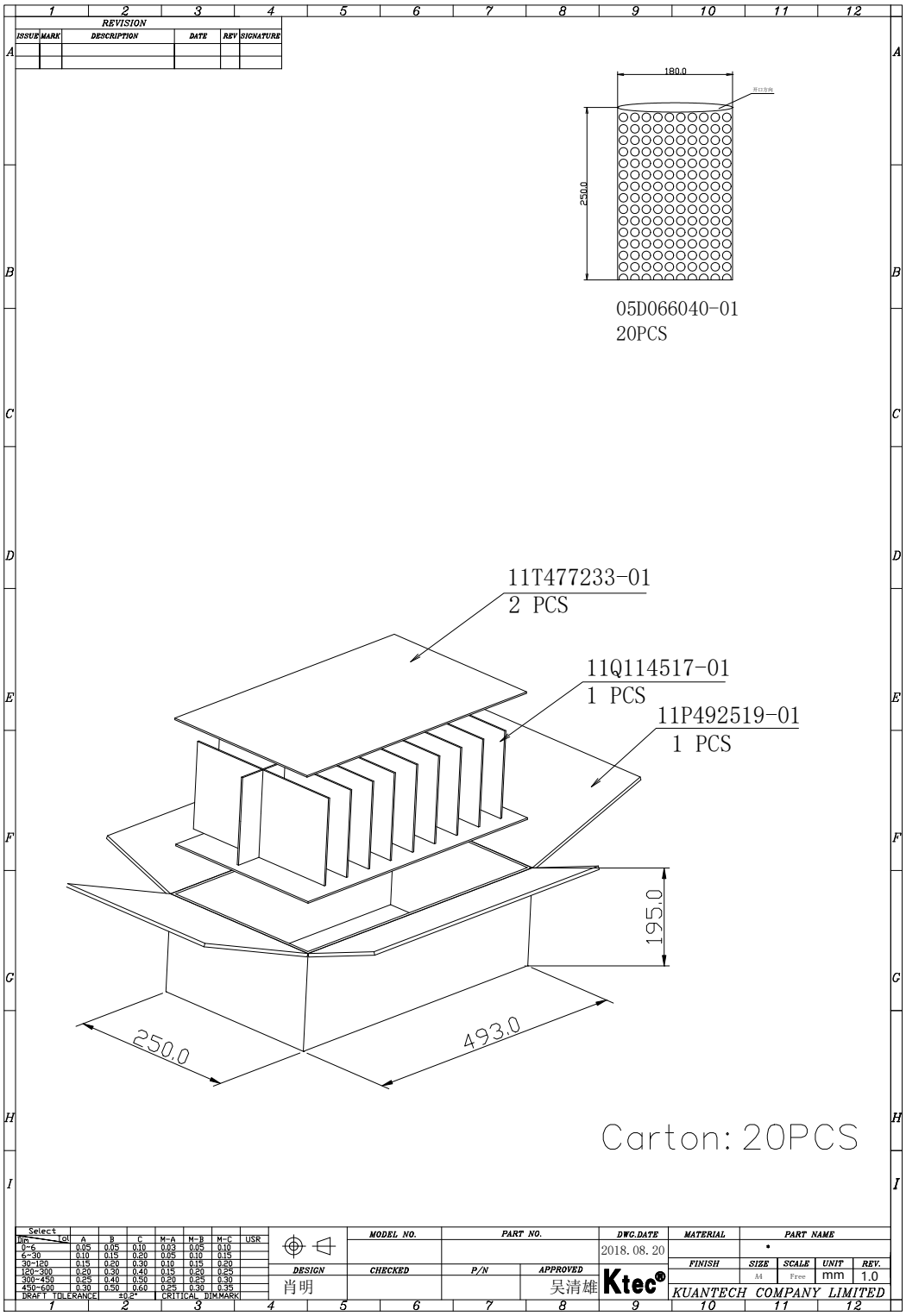
(Decimal) Total 19 codes

Example: GKS2603490000000001, GKS2603490000000002...GKS2603499999999999

Switching power supply specification

KEC-470A-02FP Manufacturer Part No.: KS260349

9. PACKING (UNIT: MM)

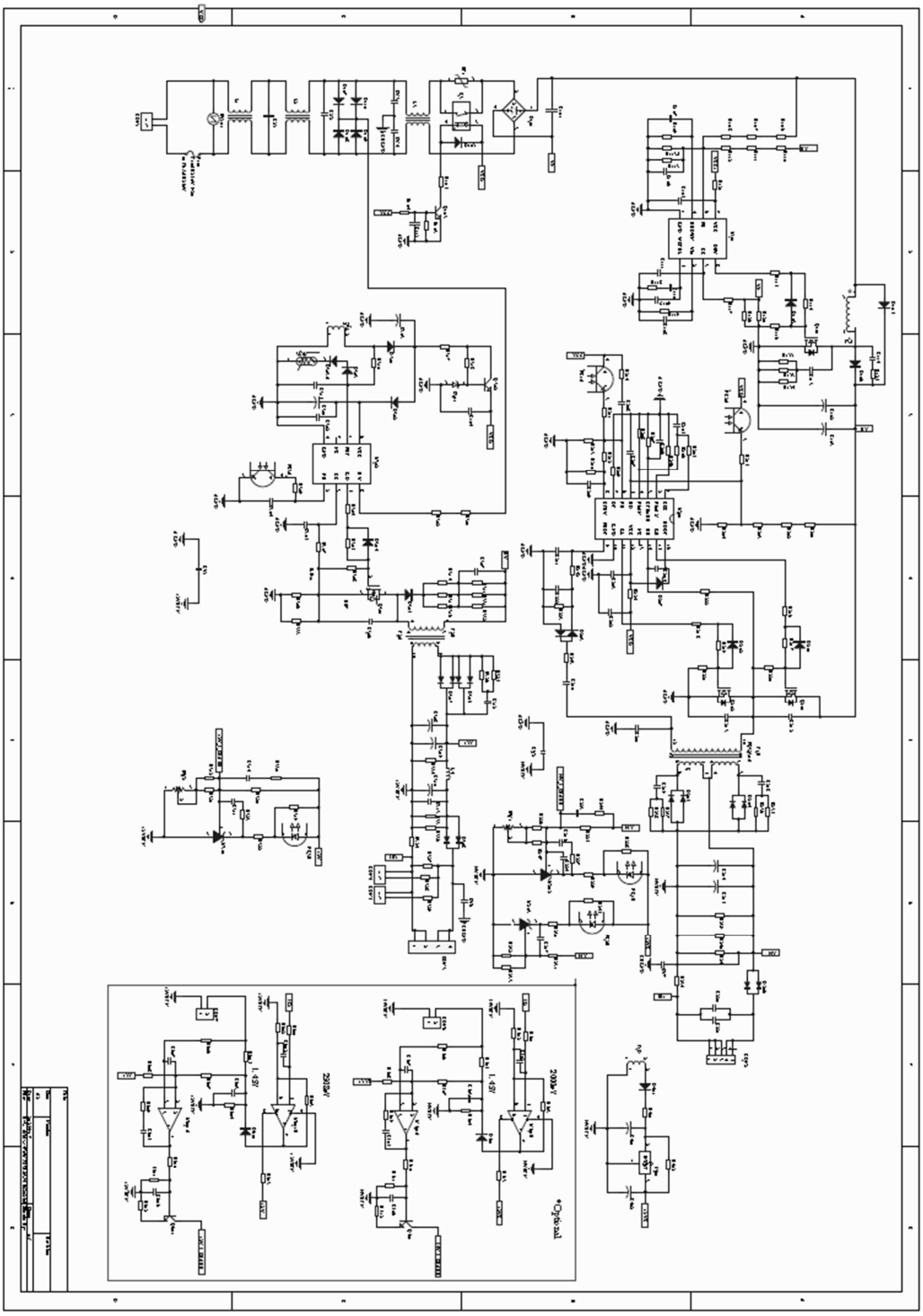


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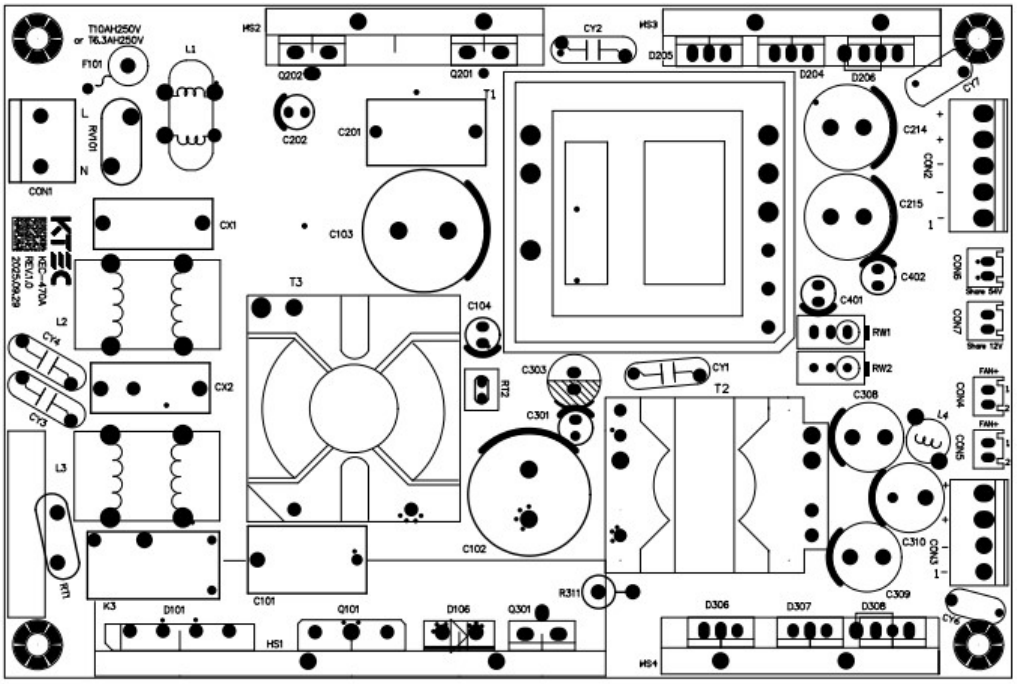
Switching power supply specification

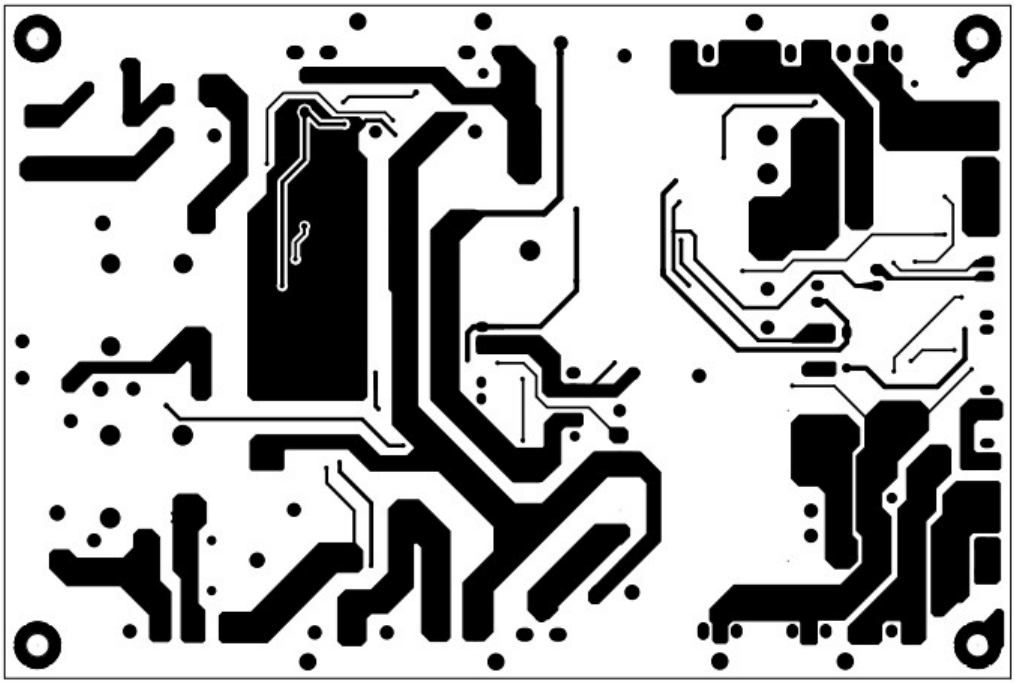
KEC-470A-02FP Manufacturer Part No.: KS260349

10. SCHEMATIC DIAGRAM



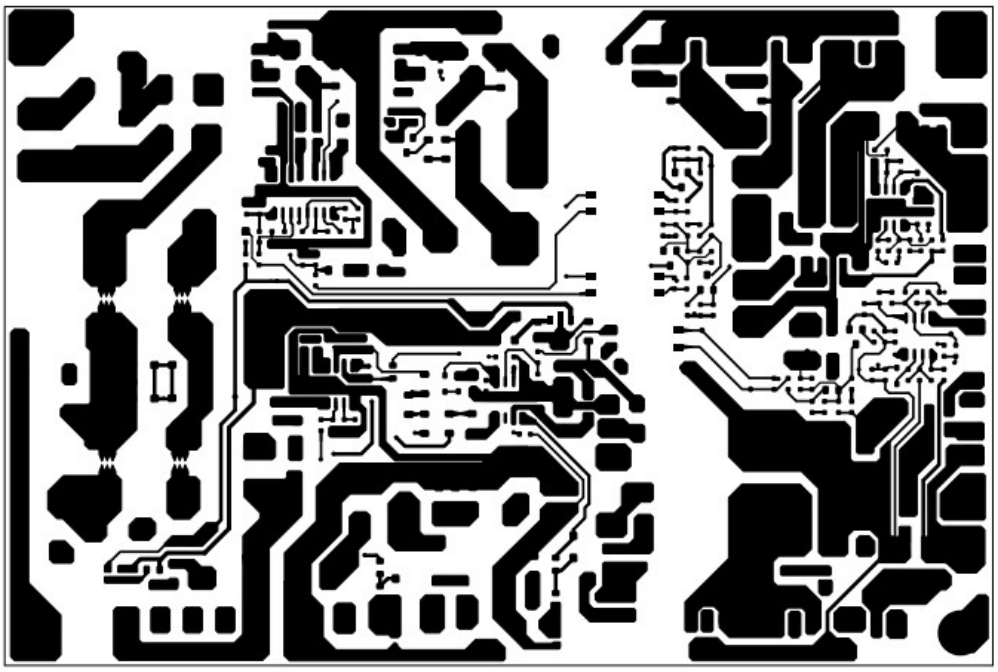
11. PCB LAYOUT

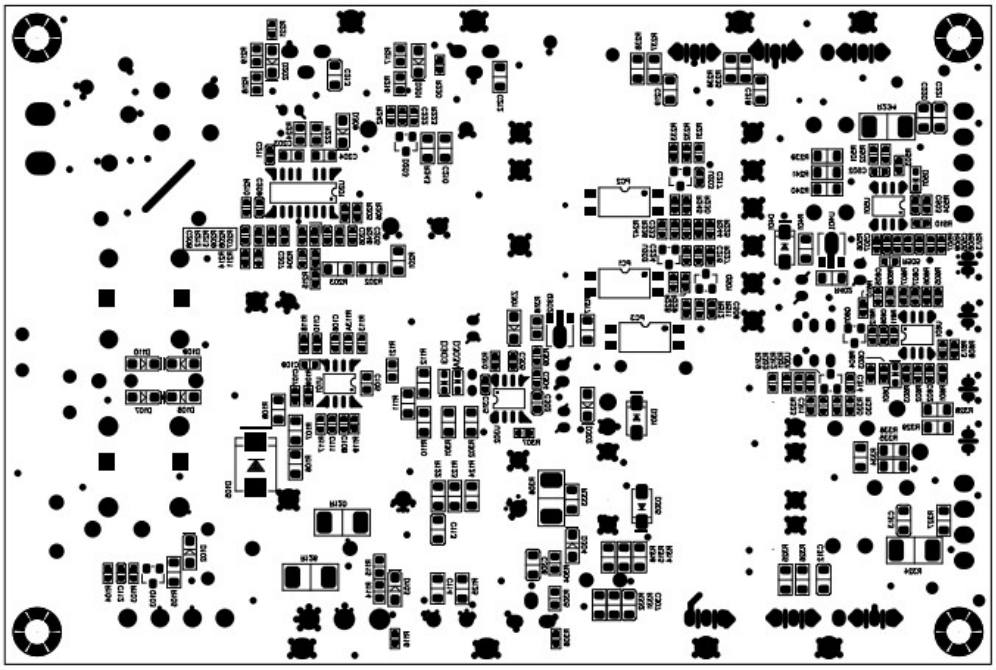




Switching power supply specification

KEC-470A-02FP Manufacturer Part No.: KS260349





Switching power supply specification

KEC-470A-02FP Manufacturer Part No.: KS260349

12. PCBA PICTURE

