



SPECIFICATION FOR APPROVAL



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KEC-400W SERIES

☒ Type 1

☐ Type 2

☐ Type 3

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Customer Name **KTEC**

Customer Part NO. _____

[illegible]

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KEC-400W SERIES Manufacturer Part No.: KS251471



1.	INPUT REQUIREMENTS	4
1.1	Highlight & Features.....	4
1.2	General Description.....	4
1.3	Chemical Substance Control Laws	4
1.4	Input Conditions.....	4
1.5	Ac inrush current	4
2.	OUTPUT REQUIREMENTS	5
3.	MECHANICAL	5
3.1	Enclosure and Layout	5
3.2	Input and Output Configuration	6
3.2.1	For type 1	6
3.2.2	For type 2	6
3.2.3	For type 3	7
3.2.4	Pin function description:	7
4.	REGULATORY COMPLIANCE	7
4.1	EMC Specifications.....	7
4.1.1	Radiated and Conducted Emission	7
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.....	8
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
5.1	Derating Curve	10
6.	MECHANICAL SPECIFICATIONS	11
6.1	Type1 Size: L127*W76.2*H37mm(L5" x W3" x H1.46")	11
6.2	Type2 Size: L127*W76.2*H37mm(L5" x W3" x H1.46")	12
6.3	Type3 Size: L127*W76.2*H37mm(L5" x W3" x H1.46")	13
7.	NAME PLATE.....	14
8.	PACKING (UNIT: MM).....	15

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KEC-400W SERIES

Manufacturer Part No.: KS251471



1. INPUT REQUIREMENTS

1.1 Highlight & Features

- Simple design philosophy.
- Size: L5" x W3" x H1.46"
- Universal AC input with active PFC circuit
- Suited for type BF medical products
- Remote on/off ,power OK
- 5 V standby @ 2.0A max. optional connector
- 12V fan port
- High efficiency up to 95%
- MTBF up to 500KHrs
- This product is used in medical instruments, industrial equipment, printers and other fields.

1.2 General Description

This specification defines the performance and characteristics of an adaptor 400 watts with a metal case and internal fan cooling. The output voltage can be selected from 12V, 15V, 19V, 24V, 28V, 36V, 48V.

1.3 Chemical Substance Control Laws

PAHS 6P NP NOP 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	5.5A maximum
Power consumption (no-loading)	1.0W Max. @ 230Vac, Excluding fan power
Input configuration	3 Conductor
Power factor	0.95 minimum

1.5 Ac inrush current

Input inrush current less than 50A for rated input and cold-start at 25°C.

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KEC-400W SERIES Manufacturer Part No.: KS251471



2. OUTPUT REQUIREMENTS

2.1	Nominal DC output voltage	12.0V	15.0V	19.0V	24.0V	28.0V	36.0V	48.0V
2.2	Minimum load current	0.0A						
2.3	Output current and power convection	25.0A	20.0A	15.78A	12.5A	10.71A	8.33A	6.25A
		300W Max.						
2.4	Output current and power with fan 23CFM forced-cooled	33.33A	26.66A	21.05A	16.66A	14.28A	11.11A	8.33A
		400.0W Max.						
2.5	Load regulation	$\pm 3\%$ for Main & 5 VSB						
2.6	Line regulation	$\pm 1\%$						
2.7	Ripple and noise	12.0V	15.0V	19.0V	24.0V	28.0V	36.0V	48.0V
		240mVp-p	360mVp-p	360mVp-p	360mVp-p	360mVp-p	360mVp-p	480mVp-p
		Add 0.1uF/50V ceramic capacitor and 10uF/50V aluminum electrolytic capacitor across the output terminal. Measured with 20MHz Bandwidth Oscilloscope.						
2.8	efficiency	93%-95% Typical Value @ full load.						
2.9	Turn on delay time	2000ms maximum at 115VAC and output full load.						
2.10	Rise time	$\leq 50\text{ms}$ to 5V-19V output voltage at rated load; $\leq 100\text{ms}$ 24V-48V output voltage at rated load.						
2.11	Hold up time	14ms minimum for main O/P, measured at full Load from 115 VAC and Vout reduces to 90% of original value before the AC drop out.						
2.12	Output over-shoot	Less than 10% of nominal voltage value.						
2.13	Protection function							
	Over-voltage protection	110% to 150% of nominal output voltage. Latching, recycle AC power to recover						
	Over current protection	110% to 180% of rated output current value, hiccup mode, auto-recovery						
	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.						
	Over temperature protection	The output will be turned off when the temperature is too high.						

3. MECHANICAL

3.1 Enclosure and Layout

Case	No case
Weight	655g (Max.)
Dimensions	127*76.2*37mm

3.2 Input and Output Configuration

3.2.1 For type 1

Connector	Definition	Pin Number(s)	Connector Type
AC Input (C0N1)	AC line	Pin 1	Molex 26-62-4030, JVT4001WN2-XXSN-D-B 3.96mm (Or equivalent)
	Remove	PIN2 (Empty)	
	AC neutral	Pin 3	
DC Output (C0N3)	-Vout	-V	M4 Output terminal
DC Output (C0N4)	+Vout	+V	M4 Output terminal
DC Output (C0N5)	+12V fan	Pin 1	2.54mm 2pin (Or equivalent)
	+12V fan return	Pin 2	

3.2.2 For type 2

Connector	Definition	Pin Number(s)	Connector Type
AC Input (C0N1)	AC line	Pin 1	Molex 26-62-4030, JVT4001WN2-XXSN-D-B 3.96mm (Or equivalent)
	Remove	PIN2 (Empty)	
	AC neutral	Pin 3	
DC Output (C0N2)	+Vout	Pin 1,2,3,4,5,6	Molex 39-28-1123, JVT1150WN2-2X06SNBK-D(272) (Or equivalent)
	-Vout	Pin 7,8,9,10,11,12	
Control Terminal (CON5)	+5VSB	Pin 1	Molex 90130-1108, JVT1143WPT-2X04SN-D-B(LY) (Or equivalent)
	Power good signal	Pin 2	
	12V fan return	Pin 3	
	PSU on/off control	Pin 4	
	+Remote sense	Pin 5	
	-Remote sense	Pin 6	
	12V fan	Pin 7	
	5V AUX return	Pin 8	

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KEC-400W SERIES

Manufacturer Part No.: KS251471



3.2.3 For type 3

Connector	Definition	Pin Number(s)	Connector Type
AC Input (C0N1)	AC line	Pin 1	Molex 26-62-4030, JVT4001WN2-XXSN-D-B 3.96mm (Or equivalent)
	Remove	PIN2 (Empty)	
	AC neutral	Pin 3	
DC Output (C0N3)	-Vout	-V	M4 Output terminal
DC Output (C0N4)	+Vout	+V	M4 Output terminal
Control Terminal (CON5)	+5VSB	Pin 1	Molex 90130-1108, JVT1143WPT-2X04SN-D-B(LY) (Or equivalent)
	Power good signal	Pin 2	
	12V fan return	Pin 3	
	PSU on/off control	Pin 4	
	+Remote sense	Pin 5	
	-Remote sense	Pin 6	
	12V fan	Pin 7	
	5V AUX return	Pin 8	

3.2.4 Pin function description:

5V (logic level high): The PSU remains off

Floating (unconnected): The PSU remains off

0V (logic level low / connected to GND): The PSU turns on

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.

EN55015 & EN55032, Class B for radiated and conducted emissions.

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

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Filter: Reference for model selection

Model	Filter		Filter picture	
	TDK	EPCOS	TDK	EPCOS
KEC-400W	RSHN-2006L	B84776M0006A000		

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

IEC 60601-1-2, EN 55035, EN 61000-4-2

Air Discharge: $\pm 15\text{kv}$ Contact Discharge: $\pm 8\text{kv}$

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 , 15kv air discharge, 8kv contact discharge.

4.2.2 Radiated Field Immunity

IEC 60601-1-2, 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).

4.2.3 Fast Transient Immunity

IEC 60601-1-2, EN 55035, EN 61000-4-4

Power line: 2kv

Performance Criteria B

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4.2.4 Surge Immunity

- IEC 60601-1-2, EN 55035, EN 61000-4-5
- 1.2/50 μ s Open circuit voltage
- 8/20 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	USA	/	IT:UL 62368-1 MEDICAL:UL 60601-1
FCC	America	/	FCC Part 15 subpart B
CB	Global	/	IT:IEC62368-1 MEDICAL:IEC60601-1

4.3.2 Additional Safety Requirements

- ⦿ Dielectric Withstand Voltage:
 - Primary(input AC short)-to-Secondary(output DC short): 4000Vac, 20mA, 1 minute.
 - Primary input to GND and Secondary output to GND: 1500Vac, 20mA, 1 minute.
- ⦿ Insulation Resistance, Input to output: 50M Ω (MIN.) at 500VDC.
- ⦿ The leakage current shall not exceed 100uA.

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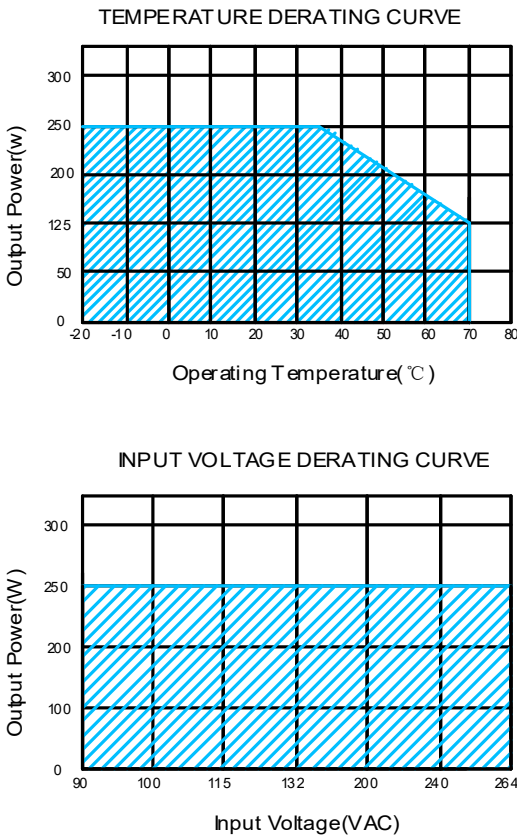


5. ENVIRONMENTAL REQUIREMENTS

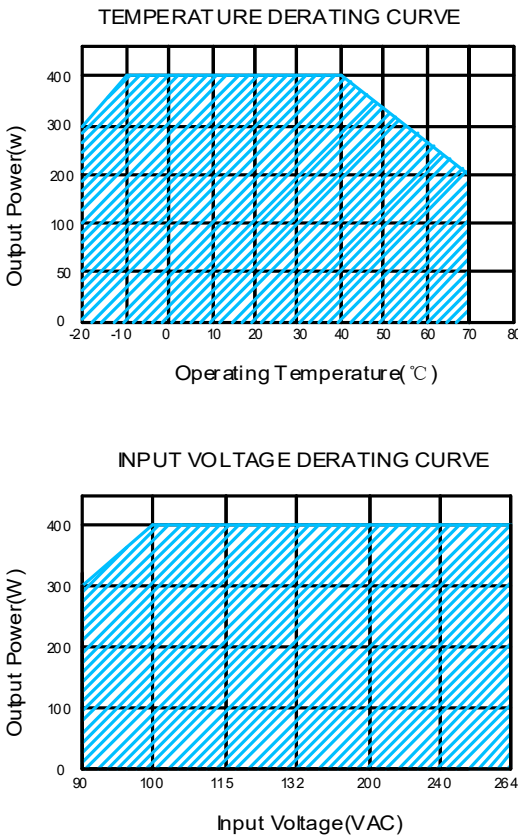
Temperature	Operating	-20°C +70°C
	Non-Operating	-40°C +80°C (Non Condensing)
	Note: For details about the operating environment, see 5.1 Derating Curve.	
Humidity	Operating	10%~95% (Non Condensing)
	Non-Operating	10%~95% (Non Condensing)
Altitude	Sea level to 5000m	
Vibration	10Hz-55Hz, 19.6m/s ² , 3 axes x 2 hours	
	Normal performance after test condition is removed.	

5.1 Derating Curve

Convection, no fan



Forced-air,with fan



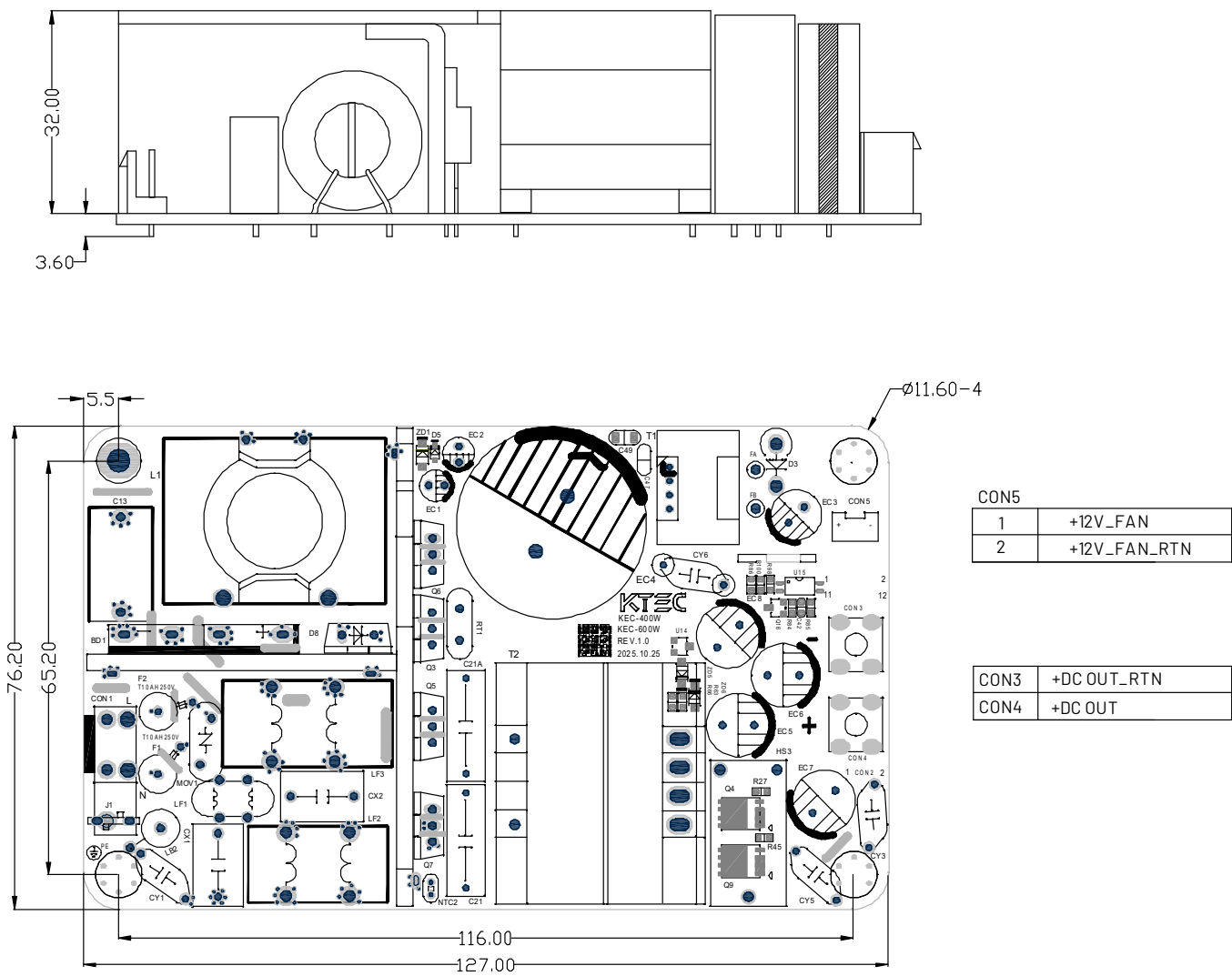
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KEC-400W SERIES Manufacturer Part No.: KS251471



6. MECHANICAL SPECIFICATIONS

6.1 Type1 Size: L127*W76.2*H37mm(L5" x W3" x H1.46")

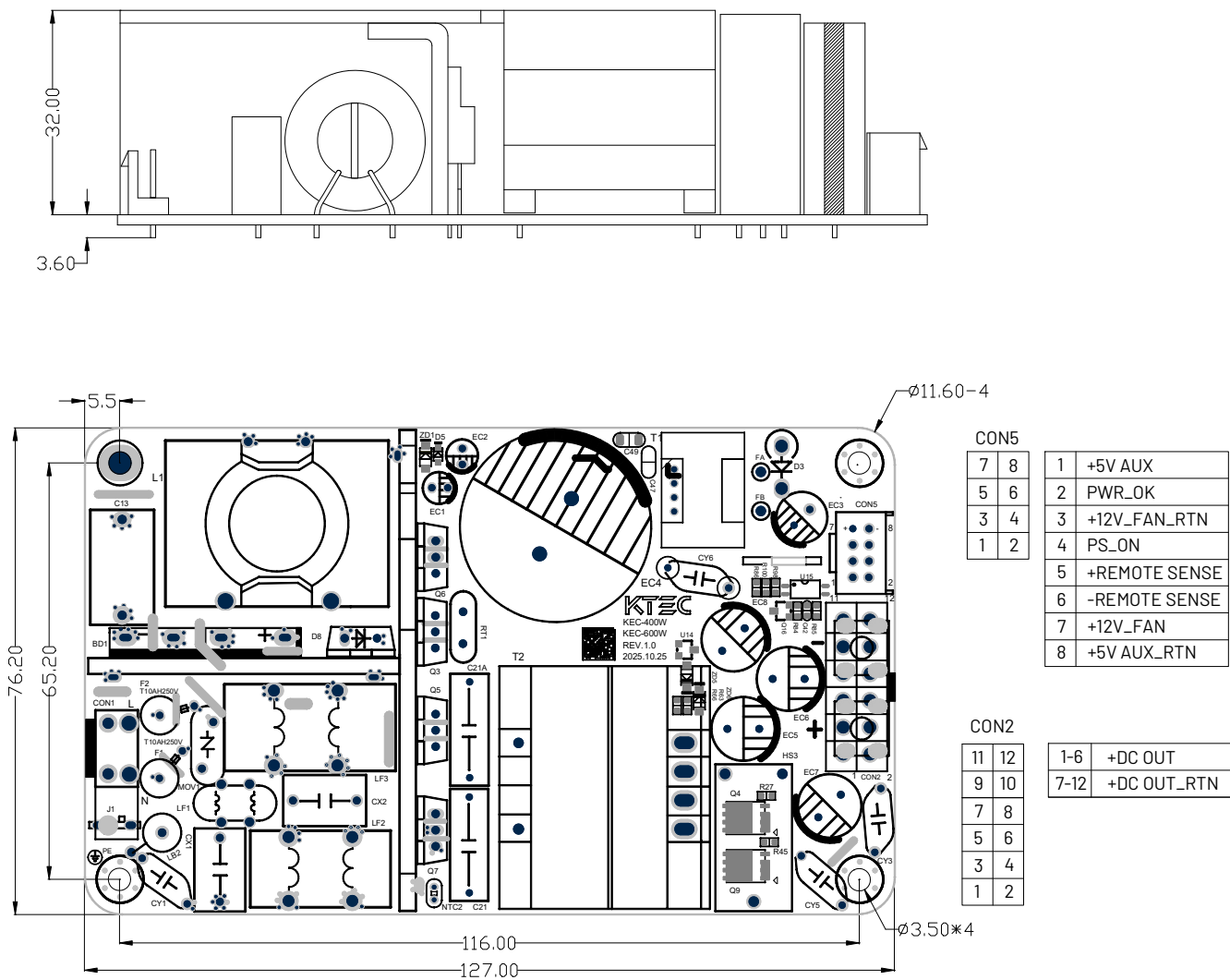


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6.2 Type2 Size: L127*W76.2*H37mm(L5” x W3” x H1.46”)



CON5		1
7	8	+5V AUX
5	6	PWR_OK
3	4	+12V_FAN_RTN
1	2	PS_ON
		+REMOTE SENSE
		-REMOTE SENSE
		+12V_FAN
		+5V AUX_RTN

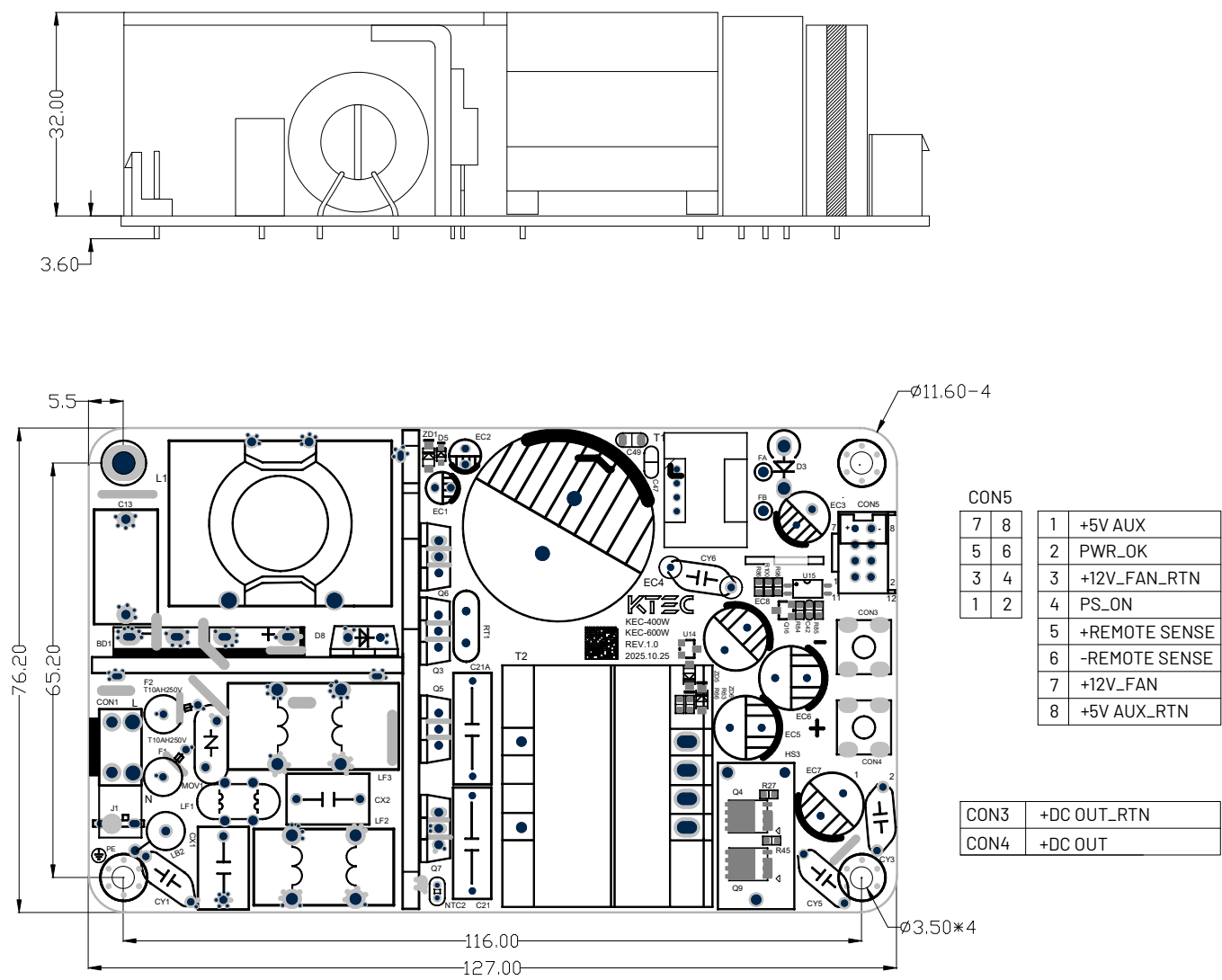
CON2		1-6
11	12	+DC OUT
9	10	+DC OUT_RTN
7	8	
5	6	
3	4	
1	2	

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6.3 Type3 Size: L127*W76.2*H37mm(L5" x W3" x H1.46")



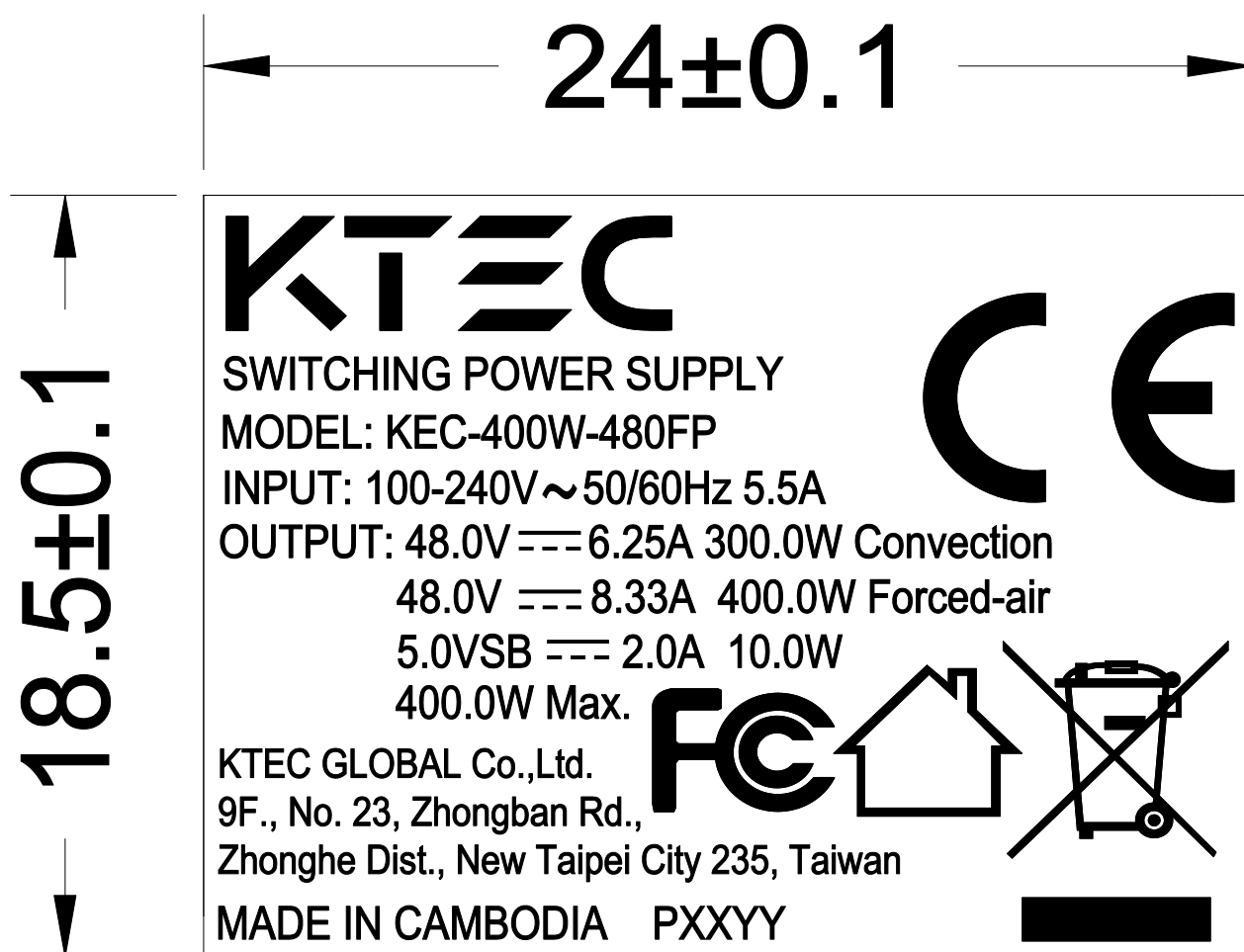
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KEC-400W SERIES

Manufacturer Part No.: KS251471

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7. NAME PLATE



FOR SAMPLE ONLY

Note: MATERIAL: silver polyester (消银龙) ; Thickness: 0.08+-0.01mm
Black characters silver background
PAHS 6P NP REACH ROHS
PXXYY (P=PAHS XX=Week, YY=Year), use the actual production date.
Location: affixed to EC4 side

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8. PACKING (UNIT: MM)

