CWT	**MODEL NO： KPL-060M 24.0V/2.50A** **ENGINEERING SPECIFICATION SHEET**

Purpose: This specification document represents the design criteria of the product identified herein, for the approval of the designated recipient (customer). Prior to production and delivery of this product by CWT, the customer shall endorse its approval of this specification document, upon review of the detailed information provided herein. The customer's endorsement (approval) verifies that the product description is determined to be fully compliant to the customer's design requirements. If one or more samples are included with this specification, the customer's endorsement (approval) further verifies that the product has been tested by the customer, for which the product satisfactorily meets all aesthetic, mechanical, electrical, and operating requirements for its intended usage with the customer's suitable indoor equipment or applications.

To Approve: An authorized employee or agent of the customer shall endorse approval of this specification. Please sign & date this cover-page, and initial each subsequent page in the lower left corner to signify all sections have been read and found to be acceptable. A completed, original copy (signed, dated, initialed) of this specification must be returned to CWT to record the approved customer design. The customer shall keep one or more copies for its records. Upon receipt, CWT shall manufacture the product to the approved customer design. If design revisions are otherwise required, a revised specification and/or modified samples shall be provided by CWT for the endorsement (approval) by the customer.

Approved

Customer Signed

Issued	Checked	Planned

Channel Well Technology Co., Ltd.

SPEC. Revision History

Date	Revision No.	Change Information	
		Description	Current version
2010/08/01	1	New revision	Initial
2011-1-25	2	Fuse is changed T4.0A	2.0
2011-4-1	3	Add AC adapter external dimension	3.0
2011-5-12	4	MTBF 50,000 H	4.0

Table of Contents

1 SCOPE

This document describes basic electrical characteristics and mechanical characteristic of 60W power adapter.

2 ELECTRICAL SPECIFICATION

2.1 INPUT REQUIREMENT

2.1.1 INPUT VOLTAGE RANGE

Power adapter shall operate within input specification from 90Vac to 264Vac or provide automatic switching between high line and low line input ranges. The table below shows common input voltage range.

Input Range	Minimum	Nominal	Maximum	Unit
	90 V	100V- 240V	264V	Vac, rms

Table 1 - Input Voltage Range

2.1.2 INPUT FREQUENCY RANGE

The power adapter shall operate within specification from 47 to 63 Hz.

2.1.3 AC INRUSH CURRENT

Peak inrush current should not exceed 70 A at 240Vac, 50Hz, 25 degrees C, cold start. It should not interrupt line fuse or cause damage to the power adapter either at cold or warm start.

Peak inrush current should not exceed 70 A at 100Vac, 60Hz, 25 degrees C, cold start. It should not interrupt line fuse or cause damage to the power adapter either at cold or warm start.

The inrush current must be limited to the extent that no damage is done to the supply under any specified line, load, and temperature conditions. The inrush current shall not cause any external protection devices (i.e. fuses) to trip.

2.1.4 INPUT CURRENT

Maximum steady state input current shall not exceed 1.7 A for any line voltage specified in 2.1.1.

2.1.5 LEAKAGE CURRENT

0.7mA max. at 240Vac .

2.1.6 INSULATION RESISTANCE

Insulation resistance shall be more than 100M ohm between primary and secondary.

2.1.7 LOW POWER CONSUMPTION

Vin	Load	Power consumption
240Vac/50Hz 100Vac/60Hz	0A	≤ 0.3 W

Note: No load (0A) current draw complies to EPA standard Version 2.0 Energy Star EPS specification.

2.2 INPUT PROTECTION

2.2.1 INPUT CURRENT PROTECTION

A fuse with rating of 4.0 A / 250 V (Time Lag type) shall be installed on the input line side near the input connector and no any electrical components before.

2.3 OUTPUT REQUIREMENT

2.3.1 OUTPUT POWER

The total output power, under steady state conditions, shall not exceed 60 W.

Power supply will meet and be tested to IEC60950-1 LPS (Limited Power Source, section 2.5 in the standard) requirements. The LPS designation will be included on the data-plate label.

2.3.2 OUTPUT VOLTAGE AND CURRENT

Under any combination of line and load variation and environmental conditions, all outputs shall remain within tolerance as defined in Table 2. Output voltage(s) shall be measured at the load side of output connector.

Output Voltage	Voltage Range		Current Range	
	Lower Limit	Upper Limit	Minimum Load	Full rated load
+24.0V	23.00V	25.00V	0A	2.5A

Table 2 - Output Voltage and Current

2.3.3 RIPPLE AND NOISE

Measurements shall be made with an oscilloscope with minimum of 20MHz bandwidth and 1:1 scope probe, Output shall be bypassed at the connector with a 0.1μF ceramic disk capacitor and a 22μF electrolytic capacitor for general testing purpose.

Output Voltage	Maximum Ripple & Noise (Vp-p)
+24.0V	240mV

Table 3 – Ripple and Noise

2.3.4 OVER VOLTAGE PROTECTION

The power adapter shall provide with over voltage protection such that under any single component failure.

Output Voltage And Crrent	Maximum OVP Trip Voltage
+24.0V 2.5A	36.0V

Table 4 – Over Voltage Protection

The power supply provides output over voltage protected in latch off by zener diode, and no damage to customer device.

2.3.5 OVER CURRENT PROTECTION

The power supply shall be protected when operating any output in overload condition (set @ max load: 3.0A – 4.60A). The power adapter shall be shut down and no any damage when the over current condition occurs on the output, and It will be auto-recovered when the failure is removed. Input voltage:100Vac or 240Vac

2.3.6 OVERSHOOT

During turn on or turn off, the output overshoot shall not exceed nominal output voltage by more than 5%, and output shall not change its polarity with respect to its return line.

2.3.7 SHORT CIRCUIT POTECTION

Power adapter shall have self-limiting protection to protect against short circuit or overload conditions. No damage to the power adapter shall result from a continuous or intermittent short circuit condition. It will be auto-recovered when the failure is removed.

2.3.8 AUDIBLE NOISE

There is no audible noise can be hear when it work with rated spec.

2.3.9 LIMITED POWER SOURCE

The power supply shall comply with the limited power source requirement as defined in IEC 60950-1 section 2.5 standard.

2.4 PERFORMANCE REQUIREMENT

2.4.1 EFFICIENCY

Efficiency (watt out / watt in) shall be a minimum of 87.0 % at active average mode, which complies to EPA standard Version 2.0 Energy Star EPS specification.

Note: when testing efficiency, adapter need to electrify to perform after full load 30 minutes

Input voltage 115Vac 60Hz or 230Vac 50Hz

2.4.2 TURN ON DELAY TIME

Output shall reach steady state within 3.0 seconds of turn on at 100Vac or greater.

2.4.3 HOLD-UP TIME

Hold-up time shall be a minimum of 8.0 mS at 115Vac / 60Hz input.

2.4.4 DYNAMIC LOAD

Power adapter shall operate within regulation defined in section 2.3.2 at following conditions:

Step load change: from 50% Load to100% Load on the output.

Dwell Time: 100Hz & 1 KHz 50% duty.

Slew rate: 0.5A/usec

3 ENVIRONMENTAL SPECIFICATION

3.1 TEMPERATURE

Operation within specification: -10 to 40 degrees C.

Storage: -20 to 85 degrees C

3.2 HUMIDITY

Operation: 10% to 90% relative humidity, non-condensation.

Storage: 5% to 95% relative humidity, including condensation.

3.3 VIBRATION AND SHOCK

The power supply shall be designed to withstand normal transportation vibration per MIL-STD-810F, method 514 and procedures X, as it is mounted in the chassis assembly and packed for shipping.

3.4 ALTITUDE

Sea level to 2000 meters.

3.5 CALCULATED MEAN TIME BETWEEN FAILURES (MTBF)

The MTBF for the power adapter shall equal or exceed 50,000 hours when operated at full rated load in an ambient temperature of 25 degree C.

4 APPLICATION STANDARD & RELATED SPECIFICATION

4.1 STANDARD & SAFETY CERTIFICATION

4.1.1 SAFETY STANDARD

Agency	Certification required	Countries
UL	UL60950-1(QQGQ,QQGQ7;AZSQ,AZSQ7)	US
cUL	C22.2 No. 60950-1	Canada
CB	IEC-60950-1:2005;IEC 60065:2001+A1	IEC
CCC	GB 4943;GB8898	China
BSMI	CNS13438, CNS14336	Taiwan
GS	EN 60950-1:2006+A11;EN 60065:2002+A1+A11	Germany
IRAM	IEC 60065:2001+A1	Argentina
Australia/New Zealand	AS/NZS 60950.1	Australia/New Zealand

(All certification marks need to be shown on data-plate)

4.1.2 EMI

VCCI Class-B

FCC 15(Class-B, 115Vac operation)

CISPR 22 Class-B limits

EN55022 (1998+A1:2000+A2:2003 Class-B limits)

47 CFR Part 15, Subpart B, Class B limits

EN 61000-3-2 Power line Harmonics

EN 61000-3-3 Flicker Emissions

GB 9254 ITE Emissions Latest Edition

GB 17625.1 Harmonics Latest Edition

4.1.3 IMMUNITY

EN 55024: 1998+A1:2001+A2:2003

Electrostatic Discharge: 61000-4-2

RF Immunity: 61000-4-3

Electrical Fast Transients: 61000-4-4

Surge: 61000-4-5

Voltage Sags and Interrupts: 61000-4-11

Conducted Immunity: 61000-4-6

4.1.4 ENVIRONMENT STANDARDS

RoHS regulation.

The RoHS compliance symbol will be included on the dataplate.

4.1.5 ENERGY STAR

EPS complies to EPA standard Version 2.0 Energy Star EPS specification.

CWT will be responsible for meeting the EPA requirements. Including all testing and application. The Energy Star Version 2.0 compliance symbol is to be included on the data-plate.

5 MECHANICAL

5.1 INPUT CONNECTOR AND OUTPUT CABLE

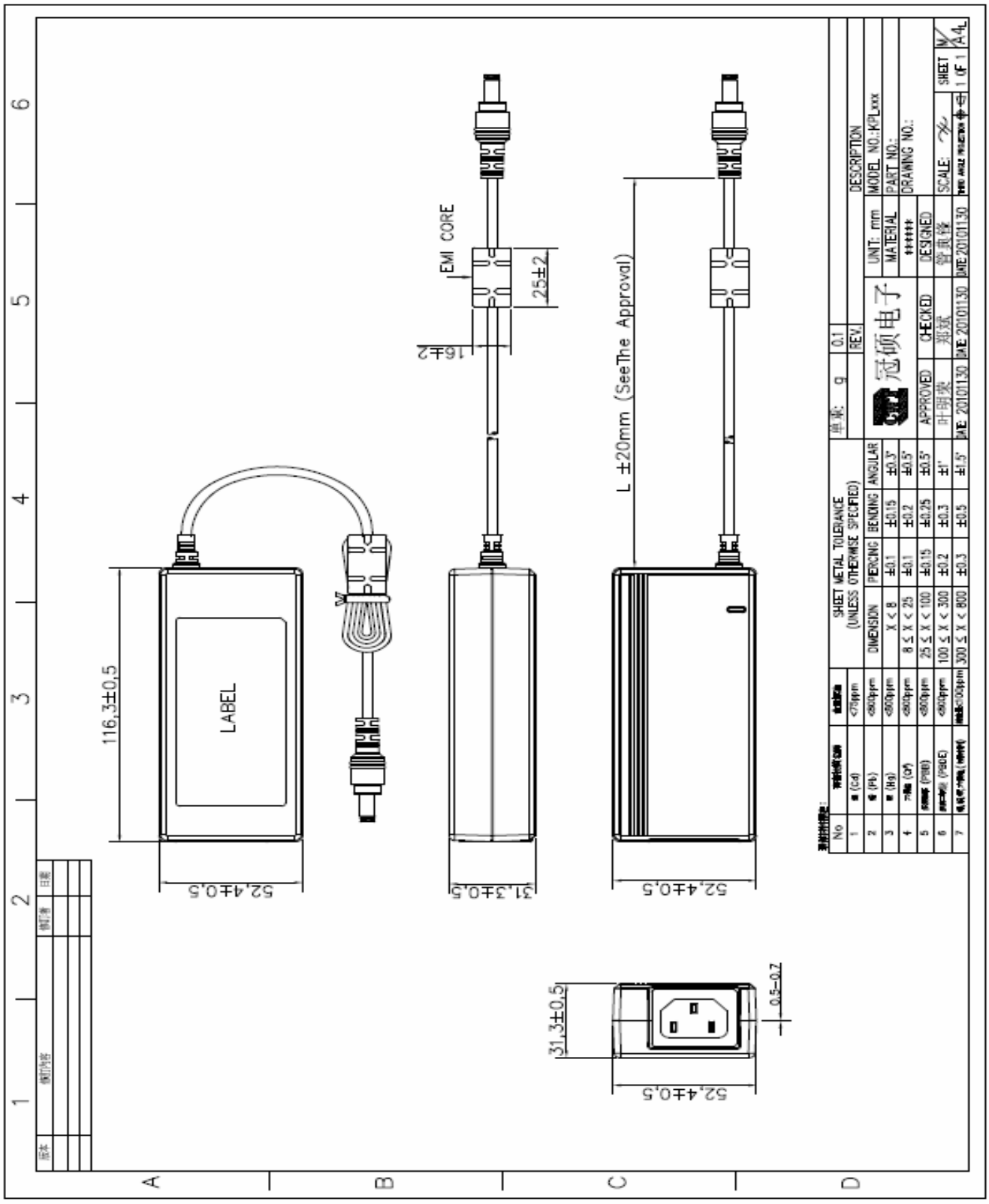
5.1.1 INPUT CONNECTOR

AC Input connector shall be IEC320 C14 power connector.

5.1.2 OUTPUT JACK AND CABLE

The output cable shall be UL1185#雙18AWG 1200 +/- 20mm and Black in color. The DC Power Plug shall be 2.1*5.5*11.0mm.

5.2 AC ADAPTER EXTERNAL DIMENSION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16±2
L ±20mm (SeeThe Approval)
LABEL
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52,4±0.5
31,3±0.5
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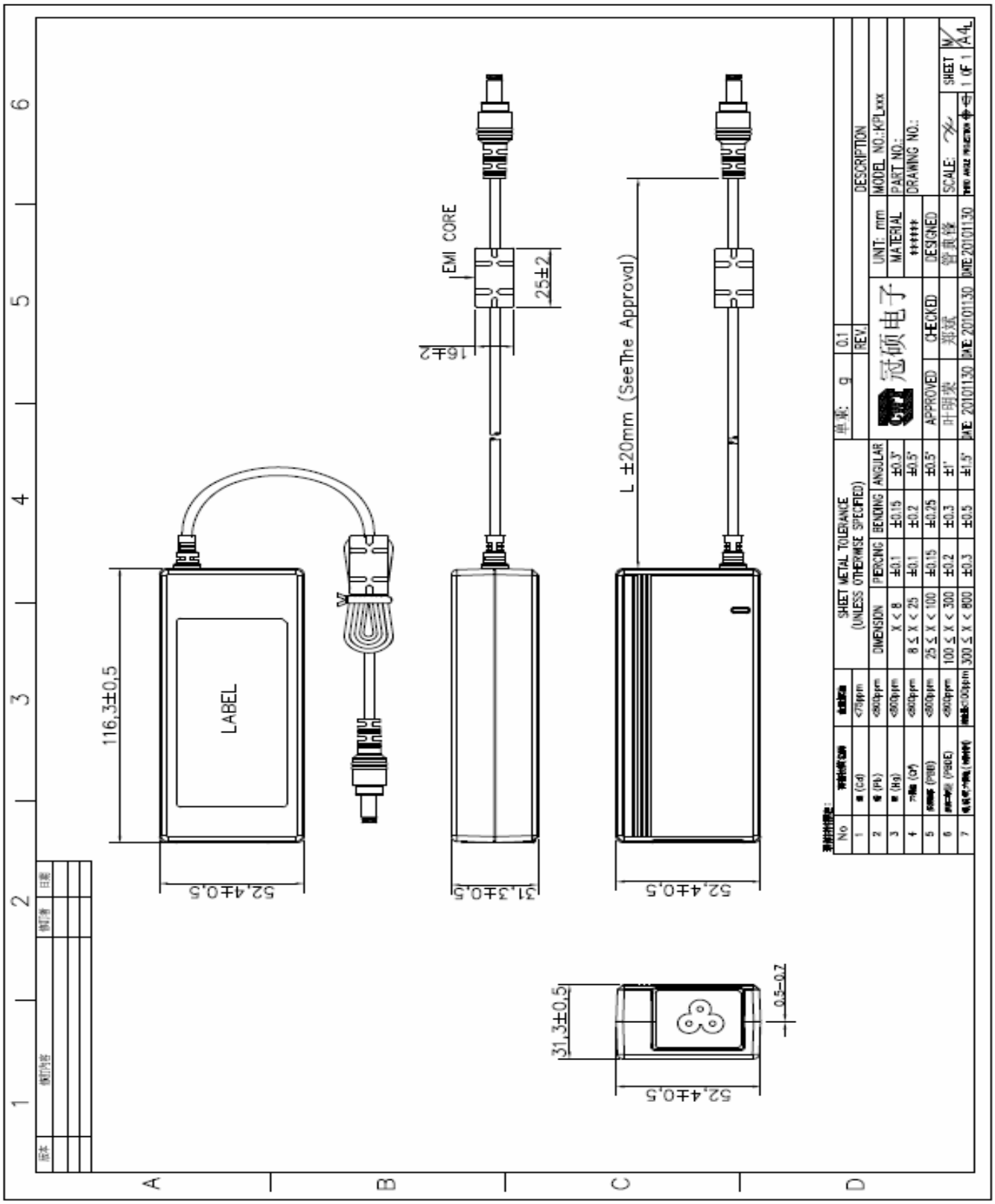
52,4±0.5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