CHANNEL WELL TECHNOLOGY

SPECIFICATION FOR REFERENCE

APPROVAL SIGNATURE
DATE:

CUSTOMER: MITAC(442110000147) .

PART NO: E99-KPM180F-N023 **REV:** D .

DESCRIPTION: Adapter .

*PLEASE SIGN AND RETURN ONE COPY.

*ALL PRODUCTION UNITS WILL BE BUILT ACCORDING TO THIS SPECIFICATIONS.

PREPARED	CHECKED	APPROVED
何倩瑜	何君	鄒佳材
DATE:2020/01/08	DATE:2020/01/08	DATE:2020/01/08

MODEL NO: KPM180F-VI 1185#雙14*1C 4P固定(P1&P3-P2&P4+) .

CATALOG NO:

AGENCY APPROVAL:

PRESENTED BY:

NO.A200108-05

WEB SITE : http://www.cwt.com.tw

E-mail: sales@mail.cwt.com.tw

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Jing 2rd Road, Eastern Hi-tech Industrial Base, Zengjiang Street, Zengcheng , Guangzhou, Guangdong Province, China

MODEL NO： KPM180F-VI 12.0V/15A
ENGINEERING SPECIFICATION SHEET

SPEC. Revision History

Date	Revision No.	Change Information	
		Previous version	Current version
2018/08/06	A	新製作	Initial
2018/09/18	B	DC CABLE 16AWG W/ 4PIN	DC CABEL 14AWG W/ 4PIN (ECR#S18090012)
2018/10/23	C	Nameplate: CWT logo w/ blue color	* Nameplate: CWT logo w/ white color* Updated drawing (ECR# S18100022)
2020/01/08	D		Change the OUTPUT specification according to the latest requirement of ERP

Table of Contents

1 SCOPE

This document describes basic electrical characteristics and mechanical characteristic of 180W power adapters.

2 ELECTRICAL SPECIFICATION

2.1 INPUT REQUIREMENT

2.1.1 INPUT VOLTAGE RANGE

Industrial power supply 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 industrial power supply shall operate within specification from 47 to 63 Hz.

2.1.3 AC INRUSH CURRENT

At 240Vac, 50Hz, 25 degrees C, cold start. It should not interrupt line fuse or cause damage to the industrial power supply either at cold or warm start.

At 100Vac, 60Hz, 25 degrees C, cold start. It should not interrupt line fuse or cause damage to the industrial power supply 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 3.5 A for any line voltage specified in 2.1.1.

2.1.5 LEAKAGE CURRENT

3.5mA maximum at 240Vac 50Hz

2.1.6 POWER FACTOR

0.90Min at 100Vac/60HZ or 240Vac/50HZ full load

2.1.7 INSULATION RESISTANCE

Insulation resistance shall be more than 20M ohm between primary and secondary.

2.1.8 LOW POWER CONSUMPTION

Vin	Load	Power consumption
240Vac/50Hz 100Vac/60Hz	0A	≤ 0.15 W

2.2 INPUT PROTECTION

2.2.1 INPUT CURRENT PROTECTION

A fuse with rating of 4 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 180 W.

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	PK Load
+12.0V	11.40V	12.60V	0.0A	15A	--

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 47μF electrolytic capacitor for general testing purpose.

Output Voltage	Maximum Ripple & Noise (Vp-p)
+12.0V	240mV

Table 3 – Ripple and Noise

2.3.4 OVER VOLTAGE PROTECTION

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

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. The power supply 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.

Output Voltage	Over current protection		Test condition
	Lower Limit	Upper Limit	Input voltage:100Vac 60Hz or 240Vac 50Hz.
+12.0V	16.5A	24.0A	

Table 4 –Over current protection

2.3.6 OVERSHOOT

During turn on or turn off, the output overshoot shall not exceed nominal output voltage by more than 10% , and output shall not change its polarity with respect to its return line.

2.3.7 SHORT CIRCUIT POTECTION

Power supply shall have self-limiting protection to protect against short circuit or overload conditions. No damage to the power supply 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 canned been heard when it work with rated spec.

Test condition: The distance between microphone and the object should be 30cm spec ＜30 BA.

2.4 PERFORMANCE REQUIREMENT

2.4.1 EFFICIENCY

Active average mode Efficiency (watt out / watt in) shall be a minimum of 89.00 % at 230vac/50Hz.

Active average mode Efficiency (watt out / watt in) shall be a minimum of 89.00 % at 115vac/60Hz.

Complies to EPA DOE standard specification and EU CEC standard specification (Level VI).

calculate the model is single average active mode efficiency for each test voltage by testing at 100%,75%,50%,and 25% of rated current output and then computing the simple arithmetic average of these four values respectively at 115V/60HZ and 230V/50HZ test result for reference.

Efficiency (watt out / watt in) shall be a minimum of 79.00 % at 10% full load.

Note: when testing efficiency, adapter needs to electrify to perform after full load 60 minutes

Input voltage 115Vac 60Hz or 230Vac 50Hz

2.4.2 TURN ON DELAY TIME

Output shall reach steady state within 3 seconds of turn on at 100Vac or greater.

Output shall reach steady state within 2 seconds of turn on at 240Vac or greater.

2.4.3 HOLD-UP TIME

Hold-up time shall be a minimum of 8 mS at 100Vac / 60Hz input.

2.4.4 DYNAMIC LOAD

Power supply output voltage tolerance shall be complied with ± 10%.

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

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

Slew rate: 0.5A/uses

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

The power supply shall operate properly at any altitude between 0 ~ 16,404 feet (5000 meter) above sea level, and withstand storage at 50,000 feet.

3.5 CALCULATED MEAN TIME BETWEEN FAILURES (MTBF)

The MTBF for the power adapter shall equal or exceed 100,000 hours when operated at full rated load in an ambient temperature of 25 degree C.

3.6 BURN-IN

Burn-in test:

Test condition: 110Vac / 220Vac 50Hz, with 100% maximum load at 40 ±2℃ ambient temperature.

Test method: burn-in 110 minutes; and 30 seconds "ON", 30 seconds "OFF" within 5 minutes, then 5 minutes "ON"

Test criteria: during this conditioning the power supply output normal and no damage or hazardous condition will occur.

ORT and life test:

Input condition: 110Vac / 220Vac 50Hz, "ON/OFF" 10 times within 5 minutes,45 minutes "ON" 45 minutes "OFF",

Test condition: cycle by cycle test 168 hours with 100% maximum load at 40 ±2℃ ambient temperature.

Test criteria: during this conditioning the power supply output normal and no damage or hazardous condition will occur.

4 RELATED SPECIFICATION

4.1.1 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

GB 9254 ITE Emissions Latest Edition

4.1.2 DIELECTRIC STRENGTH—(HI-POT)

Primary to secondary: 1500VAC.

Test time: 60 second

Cut-off current: 10mA max

Arcing current: 10mA max

4.1.3 SURGE

It is referring to EN61000-4-5 IEC61000-4-5:2001 Level 4.

Differential mode surge immunity: 1KV

Common-mode Surge Immunity: 2KV

＊Determination level: Criteria A (Product testing and testing before and after any change in function is not).

4.1.4 ELECTROSTATIC DISCHARGE ESD

It is referring to EN61000-4-2, IEC61000-4-2:2001, IEC801-2 Level 3.

Contact electrostatic discharge: + - 6KV.

Air electrostatic discharge: + - 8KV.

＊Determination level: Criteria A (Product testing and testing before and after any change in function is not).

4.1.5 RF IMMUNITY

It is referring to IEC61000-4-3 Class A 3V/m

4.1.6 ENVIRONMENT STANDARDS

RoHS Regulation

The RoHS compliance symbol will be included on the data plate.

4.1.7 E LECTRICAL FAST TRANSIENTS (EFT)

It is referring to IEC61000-4-4 Class B Test Voltage: 2KV

4.1.8 GROUNDING

Adapter AC inlet FG pin to DC plug FG 0.1 ohm max at 25A/60second.

5 MECHANICAL

5.1 INPUT CONNECTOR AND OUTPUT CABLE

5.1.1 INPUT CONNECTOR

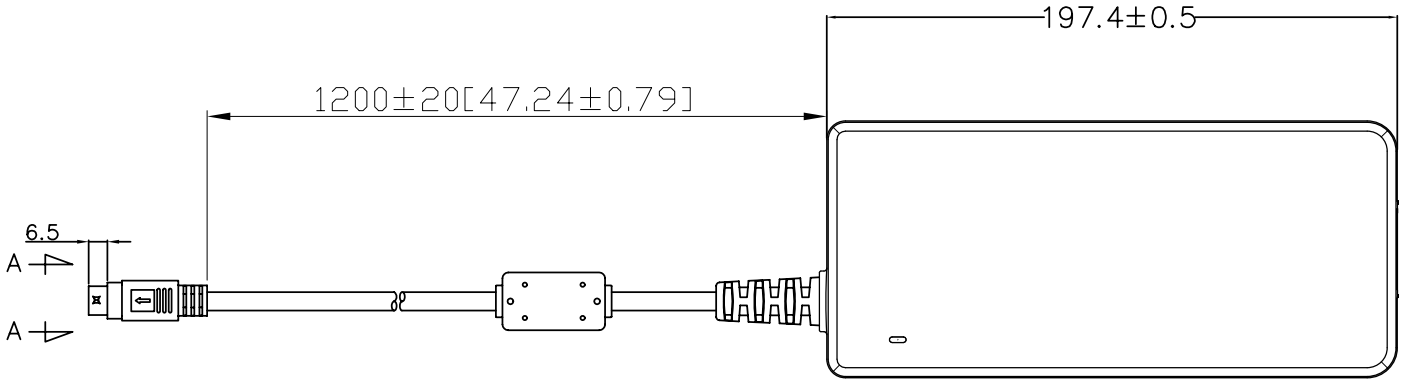
AC Input connector shall be IEC320 C14 or C6 power connector.

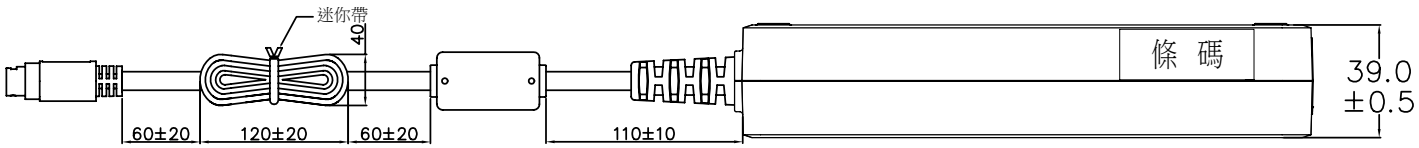
5.1.2 OUTPUT CABLE

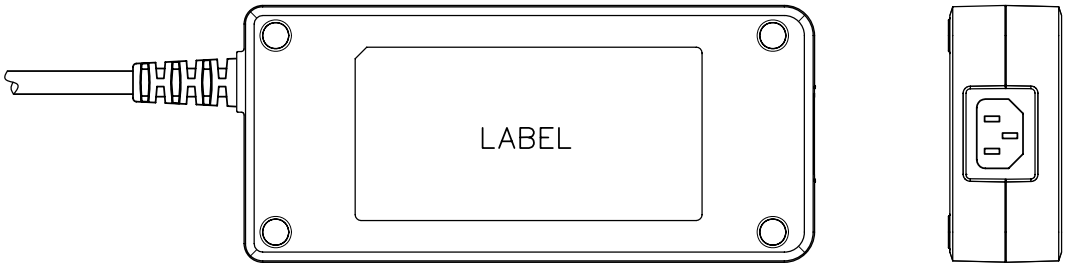
Please read the reference to FIG.

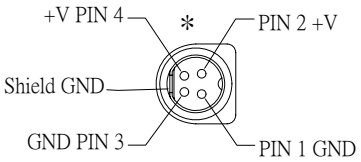
5.2 AC ADAPTER EXTERNAL DIMENSION

版本	修訂內容	修訂者	日期
A01	NEW DRAWING	yn,huang	2018.09.19







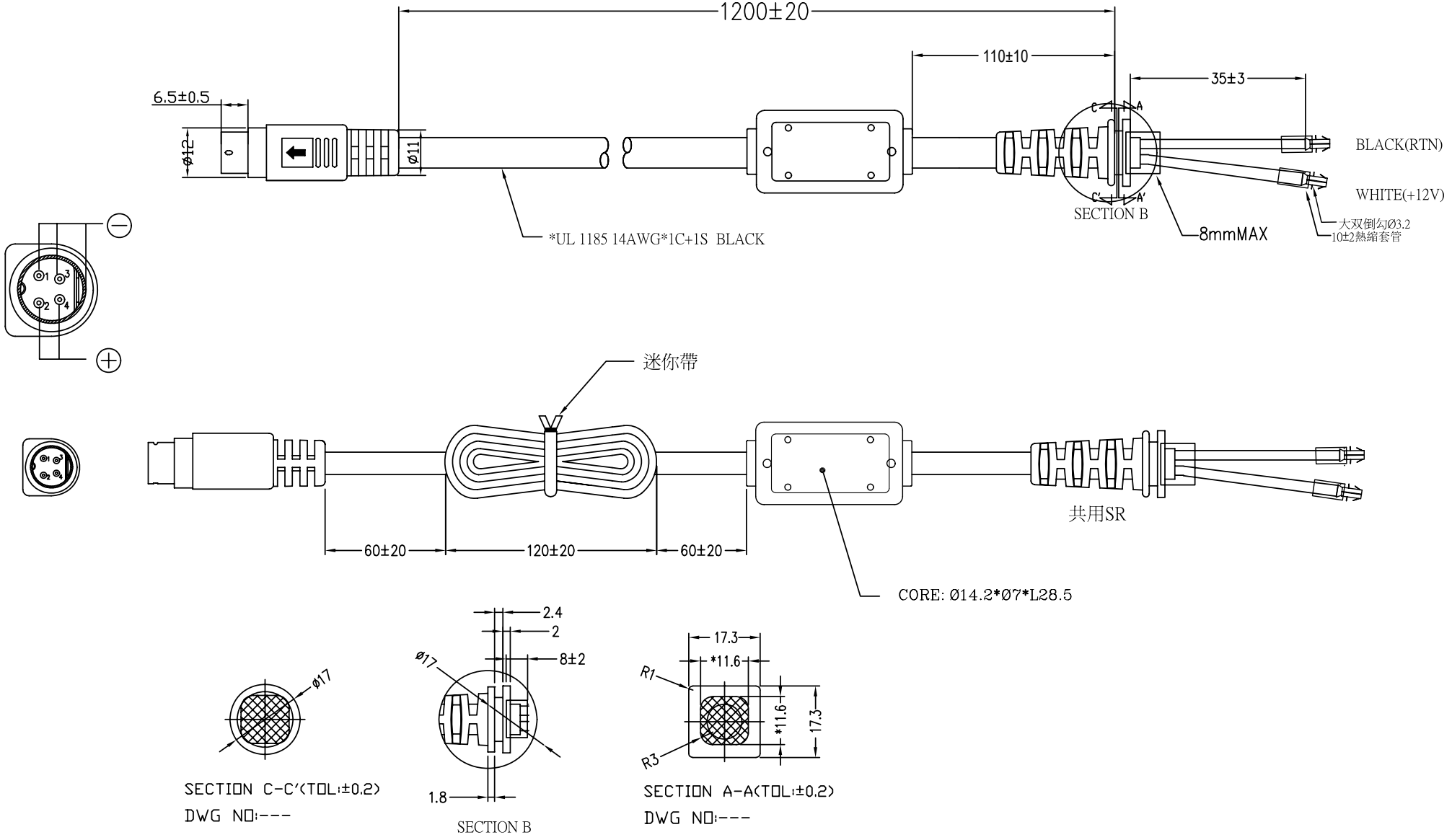


VIEW "A"
(SCALE 3:1)

NOTES:

1. CASE & CABLE COLOR : BLACK
2. INLET: C14
3. CABLE SPEC.: CABLE ARE UL 1185 14AWG*1C+S BLACK
4. MODEL: E99-KPM180F-N023
5. PART NO.: G18-B6A112A-MP00

CWT *Channel Well Technology CO., LTD.*	APPROVED jc,zou	DATE 2018.09.19	DRAWING NO. KPM-C14	UNIT INCHES (MM)	REV. A01
TITLE Switching Power Supply	DESIGNED cy,cai	DRAWING yn,huang	MODEL NO. KPM180F	TOLERANCES: .XX = ± .10 .XXX = ± .010	SHEET 1/1



SECTION C-C'(TOL:±0.2)
DWG NO:---

SECTION B

SECTION A-A(TOL:±0.2)
DWG NO:---

環保材料標準:

No	有害物質名稱	含量標準
1	鎘 (Cd)	<75ppm
2	鉛 (Pb)	<800ppm
3	汞 (Hg)	<800ppm
4	六價鉻 (Cr)+	<800ppm
5	多溴聯苯 (PBB)	<800ppm
6	多溴二苯醚 (PBDE)	<800ppm
7	鎘,鉛,汞,六價鉻,(包裝材料)	總含量<100ppm

SHEET METAL TOLERANCE (UNLESS OTHERWISE SPECIFIED)

DIMENSION	PIERCING	BENDING	ANGULAR
X < 8	±0.1	±0.15	±0.3°
8 ≤ X < 25	±0.1	±0.2	±0.5°
25 ≤ X < 100	±0.15	±0.25	±0.5°
100 ≤ X < 300	±0.2	±0.3	±1°
300 ≤ X < 800	±0.3	±0.5	±1.5°

REV.	DATE	APPROVED	DESCRIPTION
0.2	2018.03.09	cy,cai	應ECR NO:R18030056更新DC頭外形
0.1	2016.08.30	yw,wang	新繪製

CVI 僑威科技

APPROVED	CHECKED	DESIGNED
jc,zou	q,liu	yw,wang
DATE: 2016.08.30	DATE: 2016.08.30	DATE: 2016.08.30

UNIT: mm | MODEL NO.: KPM-220
MATERIAL | PART NO.: G18-B6A112A-MP00
--- | DC CABLE
SCALE: | SHEET 1 OF 1 | P/A3
THIRD ANGLE PROJECTION

NOTES:

1. MATERIAL:
   Base on grid 50# Dumb white PET(網格底50#啞白PET)
   WITH ADHESIVE ON THE BACK.
   THE BACK ADHESIVE MUST CONFORM TO THE UL REQUIREMENT.
   THE LABEL IS NOT ALLOWED TO CURLE UPWARDS OR WINKLE
   AT 80 °C FOR 2 HOURS.
2. PRINTED:
   BLACK BACKGROUND WITH WHITE CHARACTERS.
3. 表面處理:啞膜

環保材料標准:

No	有害物質名稱	含量標準
1	鎘 (Cd)	< 75 ppm
2	鉛 (Pb)	< 800 ppm
3	汞 (Hg)	< 800 ppm
4	六價鉻 (Cr⁶⁺)	< 800 ppm
5	多溴聯苯 (PBB)	< 800 ppm
6	多溴二苯醚 (PBDE)	< 800 ppm
7	鎘,鉛,汞,六價鉻,(包裝材料)	總含量 < 100 ppm

SHEET METAL TOLERANCE
(UNLESS OTHERWISE SPECIFIED)

DIMENSION	PIERCING	BENDING	ANGULAR
X < 8	± 0.1	± 0.15	± 0.3°
8 ≦ X < 20	± 0.1	± 0.2	± 0.5°
25 ≦ X < 100	± 0.15	± 0.25	± 0.5°
100 ≦ X < 300	± 0.2	± 0.3	± 1°
300 ≦ X < 800	± 0.3	± 0.5	± 1.5°

REV.	DESCRIPTION
D04	增加KC/PSE Mark
D03	依ERP最新要求，更正OUTPUT規格
D02	更新LOGO 白色 181023
D01	新製

僑威科技				UNIT: mm	MODEL NO.: KPM180F-VI
				MATERIAL	PART NO.: G35-DA00569-P400
					DRAWING NO.:
APPROVED	SAFETY	CHECKED	DESIGNED		
candy	kenhu	candy	yl.wang	SCALE:	SHEET 1 OF 1
DATE: Aug.02.18	DATE: Aug.02.18	DATE: Aug.02.18	DATE: Aug.02.18	THIRD ANGLE PROJECTION	M A4 L

版本	修訂內容	修訂者	日期
A	新發行	管典鋒	07.4.18
B	使用新料號，條碼內容修改	管典鋒	081231
C	在G35-I000048-P100基礎上修改材質(因包裝箱刀卡過緊造成條碼磨損問題改善)	王艷麗	150803

1:1

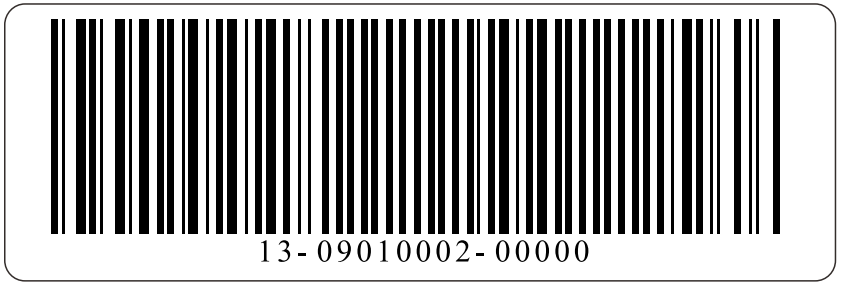
13-09010002-00000

生產年份　月份　工單流水號

五位流水號

工單號碼

實際工單號為：IMN13-0901000002-00000
因欄位不夠故工單流水號取後4位
以上號碼均為舉例說明用，生產時都為變數

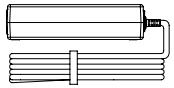


制作說明：
材質：50#珠光膜+OPP(厚度:0.1~0.15mm)
尺寸：30*10mm
條碼：CODE128碼
打印機分辯率：200dpi以上
字體：Arial

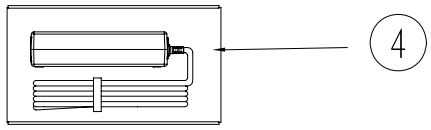
C	150803	王艷麗	在G35-I000048-P100基礎上修改材質 (因包裝箱刀卡過緊造成條碼磨損問題改善)
B	081231		流水號標示單
REV	DATE	APPROVED	DESCRIPTION

CWT 僑威科技		UNIT：mm	MODEL NO：全機種
		MATERIAL	PART NO: G35-I000048-P200
			舊GI1611-A
APPROVED	CHECKED	DESIGNED	
		管典鋒	SCALE: SHEET M
DATE:	DATE:	DATE: 081231	THIRD ANGLE PROJECTION OF A4L

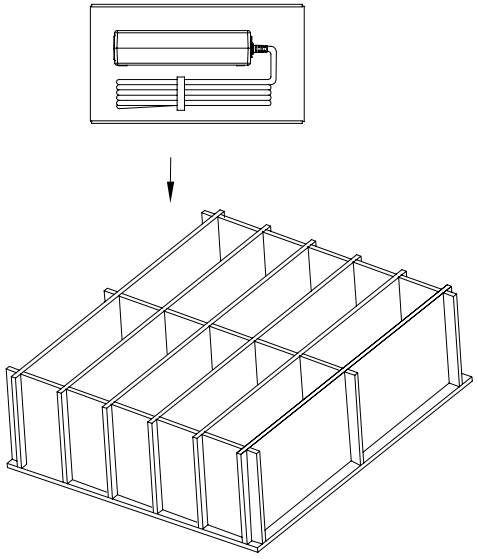
STEP1:將成品及線材整理如下圖,

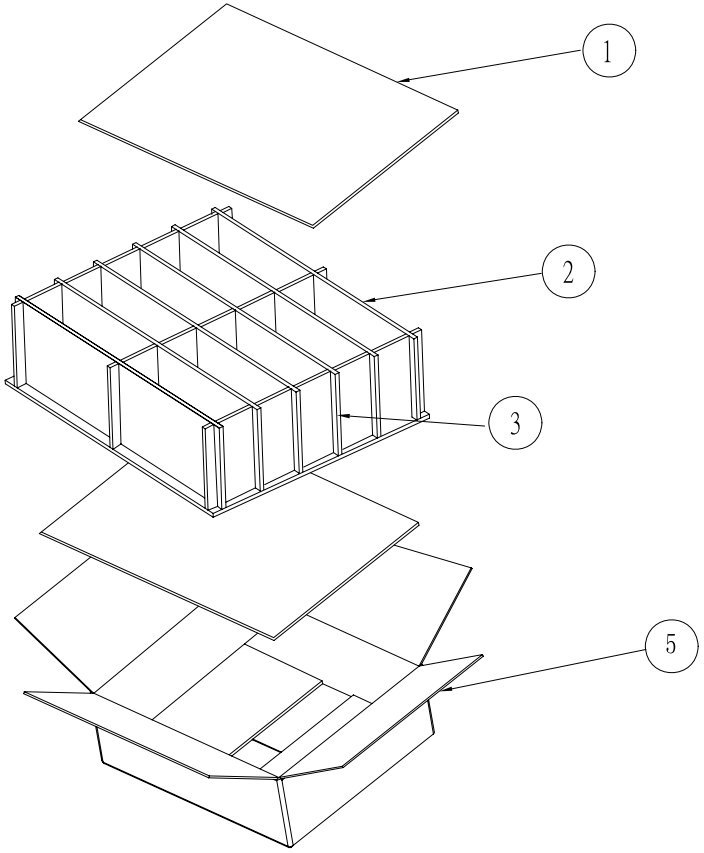


STEP2:將成品放入氣泡袋內如下圖,



STEP3:將成品如圖般放入格板內





1.組件:
- 1.1.:平卡:545*460mm
  用量:2PCS
- 1.2.:三刀卡: 545*130mm
  用量:6PCS
- 1.3.:六刀卡: 460*130mm
  用量:3PCS
- 1.4.:PE袋:200*370mm T=0.06mm
  用量:10PCS
- 1.5.:外箱:
  用量:1PCS

外箱尺寸 565*480*160mm
Q'TY.: 10PCS

環保材料標準:

No	有害物質名稱	含量標準
1	鎘 (Cd)	<75ppm
2	鉛 (Pb)	<800ppm
3	汞 (Hg)	<800ppm
4	六價鉻 (Cr)	<800ppm
5	多溴聯苯 (PBB)	<800ppm
6	多溴二苯醚 (PBDE)	<800ppm
7	鎘,鉛,汞,六價鉻,(包裝材料)	總含量<100ppm

SHEET METAL TOLERANCE (UNLESS OTHERWISE SPECIFIED)

DIMENSION	PIERCING	BENDING	ANGULAR
X < 8	±0.1	±0.15	±0.3°
8 ≤ X < 25	±0.1	±0.2	±0.5°
25 ≤ X < 100	±0.15	±0.25	±0.5°
100 ≤ X < 300	±0.2	±0.3	±1°
300 ≤ X < 800	±0.3	±0.5	±1.5°

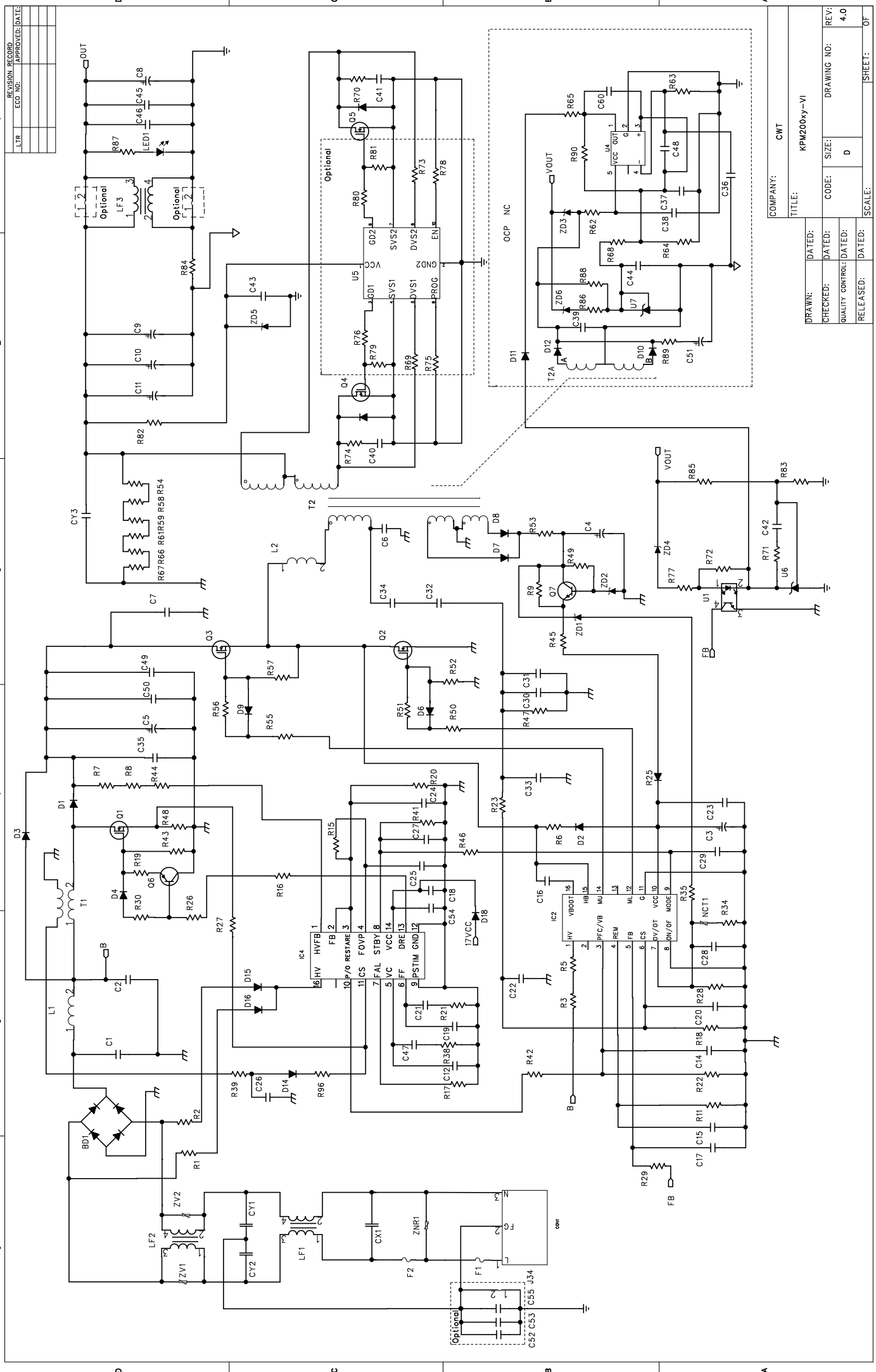
REV.	DESCRIPTION
0.1	

CWT 僑威科技

UNIT: mm	MODEL NO.: KPM	
MATERIAL	PART NO.: 565-480-160-04	
******	DRAWING NO.:	
DESIGNED	APPROVED	CHECKED
liniro		
DATE: 2018.08.06	DATE:	DATE:

SCALE: | SHEET 1 OF 1 | M/A4L

THIRD ANGLE PROJECTION


REVISION RECORD
LTR
ECO NO:
APPROVED:
DATE:
COMPANY: CWT
TITLE: KPM200xy-VI
DRAWING NO:
REV: 4.0
SIZE: D
CODE:
SHEET: OF
SCALE:
DRAWN: DATED:
CHECKED: DATED:
QUALITY CONTROL: DATED:
RELEASED: DATED:
OUT
VOUT
FB
Optional
OCP NC
T1
T2
T2A
L1
L2
LF1
LF2
LF3
IC2
IC4
U1
U4
U5
U6
U7
Q1
Q2
Q3
Q4
Q5
Q6
Q7
BD1
F1
F2
ZNR1
CN1
J34

成品料號: E99-KPM180F-N023 品名: KPM180F-VI 12V/15A 180W(PFC IC:NCP1615) 巢裝[10PCS] 規格: 1185#雙14*1C 4P固定(P1&P3-P2&P4+) MITAC 版本:

序號	品名	規格	單位	用量	插件位置	供應廠商
10	HEAT SINK	179*81.6mm t=0.8mm AL TOP	EA	1	FOR:上蓋	CWT AVL
20	HEAT SINK	184*80*20mm T=0.5mm AL HS-BOT	EA	1	FOR BOT CASE	CWT AVL
30	HEAT SINK	107.5*76.5mm t=2.0mm AL TOP-A	EA	1	鎖HS1.HS2上	CWT AVL
40	HEAT SINK	38.5*20.5mm t=4.0mm AL TOP-B	EA	1	TOP-B	CWT AVL
50	自粘腳墊	9*3mm (黑色橡膠)	EA	4	for:case4孔	CWT AVL
60	CASE TOP	197.4*88.9*32mm PC 94V-0 BLACK	EA	1		CWT AVL
70	CASE BOT	197.4*88.9*22mm PC 94V-0 BLACK	EA	1		CWT AVL
80	導熱矽膠片	138*36*1.0mm 膠粘型 灰白色	EA	1	FOR TOP-B	CWT AVL
90	十字平頭機械鍍藍白鋅	M3*6	EA	4	鎖頂部散熱片 (HS1*2, HS2*2)	CWT AVL
100	十字平頭機械鍍藍白鋅	M3*3.5	EA	2	鎖TOP-B 頂部	CWT AVL
110	十字圓頭自攻鍍黑鋅(割尾)	M3*15	EA	4	鎖上下蓋4孔	CWT AVL
120	瑪拉膠帶	20mmW 0.05T 66M/R	R	0	本體	CWT AVL
130	瑪拉膠帶	80mmW 0.05T 66M/R	R	0	FOR :TOP HS 三層	CWT AVL
20	PCB	192*180.8*1.6mmT CEM-1 2/0 OZ REV:8.0 2連板7刀 OSP下綠	EA	1		CWT AVL
30	PCB跳線 AI	6*7*6*0.56mm 7L	EA	5	J5,J7,J2,J21,J22	CWT AVL
40	PCB跳線 AI	6*9*6*0.8mm 9L	EA	2	J3,J34	CWT AVL
50	PCB跳線 AI	6*10*6*0.56mm 10L	EA	5	J8,J9,J11,J14,J6	CWT AVL
60	PCB跳線 AI	6*12*6*0.8mm 12L	EA	1	J13	CWT AVL
70	PCB跳線 AI	6*12*6*0.56mm 12L	EA	1	J4	CWT AVL
80	PCB跳線 AI	6*13*6*0.56mm 13L	EA	2	J15,J17	CWT AVL
90	PCB跳線 AI	6*14*6*0.56mm 14L	EA	1	J10	CWT AVL
100	PCB跳線 AI	6*15*6*0.8mm 15L	EA	2	J1,J16	CWT AVL
110	PCB跳線 AI	6*16*6*0.8mm 16L	EA	1	J12	CWT AVL
20	ELE. CAP.(105℃)	100uF/35V FH ϕ6.3*11mm 編帶式 5000Hrs	EA	1	C4	CAPXON
替代	ELE. CAP.(105℃)	100uF/35V EY ϕ6.3*11mm 編帶式 5000Hrs				ELITE
替代	ELE. CAP.(105℃)	100uF/35V HG ϕ6.3*11mm 編帶式 5000Hrs				SU'SCON
30	ELE. CAP.(105℃)	220uF/25V GH ϕ6.3*11mm 編帶式 4000Hrs P=2.5mm	EA	1	C3	CAPXON
替代	ELE. CAP.(105℃)	220uF/25V EY ϕ6.3*11mm 編帶式 5000Hrs P=2.5mm				ELITE
替代	ELE. CAP.(105℃)	220uF/25V GT ϕ6.3*11mm 編帶式 5000Hrs				SAMXON
40	保險絲帶腳	2010SERIES 方形 4A/250V 慢斷 編帶	EA	1	F2	Walter
替代	保險絲帶腳	MST方形 4A/250V 慢斷 編帶				Conquer
替代	保險絲帶腳	5TE 4A/250V 方形 編帶 抗雷擊4KV				XC
50	保險絲帶腳	5TE系列 6.3A/250V 方形 編帶式 慢斷	EA	1	F1	XC
替代	保險絲帶腳	MST系列 6.3A/250V 方型慢斷 編帶式				Conquer
替代	保險絲帶腳	2010系列 6.3A/250V 方形 編帶式 慢斷				Walter

20	SMD RESISTOR	0805 0Ω F	EA	2	R15,R23	CWT AVL
30	SMD RESISTOR	0805 13.7K F	EA	1	R22	CWT AVL
40	SMD RESISTOR	0805 19.6K F	EA	1	R83	CWT AVL
50	SMD RESISTOR	0805 2.21K F	EA	1	R18	CWT AVL
60	SMD RESISTOR	0805 41.2K F	EA	1	R20	CWT AVL
70	SMD RESISTOR	0805 7.5K F	EA	1	R11	CWT AVL
80	SMD RESISTOR	0805 76.8K F	EA	1	R85	CWT AVL
90	SMD RESISTOR	1206 1M F	EA	1	R44	CWT AVL
100	SMD RESISTOR	1206 2.7M F	EA	2	R7,R8	CWT AVL
110	SMD RESISTOR	2512 1mΩ F 2W 金屬散熱	EA	2	R84	CWT AVL
120	SMD RESISTOR	2512 40mΩ F 2W 金屬散熱	EA	1	R48	CWT AVL
130	SMD RESISTOR	0805 0Ω J	EA	9	R24,R75,J32,J35,J27,J25,R16,J39,J26	CWT AVL
140	SMD RESISTOR	0805 10Ω J	EA	2	R76,R80	CWT AVL
150	SMD RESISTOR	0805 100Ω J	EA	3	R73,R69,R77	CWT AVL
160	SMD RESISTOR	0805 10K J	EA	2	R71,R42	CWT AVL
170	SMD RESISTOR	0805 100K J	EA	4	R43,R52,R57,R78	CWT AVL
180	SMD RESISTOR	0805 120K J	EA	1	R21	CWT AVL
190	SMD RESISTOR	0805 15Ω J	EA	3	R30,R50,R55	CWT AVL
200	SMD RESISTOR	0805 200K J	EA	1	R87	CWT AVL
210	SMD RESISTOR	0805 220K J	EA	1	R41	CWT AVL
220	SMD RESISTOR	0805 27K J	EA	1	R38	CWT AVL
230	SMD RESISTOR	0805 270K J	EA	1	C19	CWT AVL
240	SMD RESISTOR	0805 33K J	EA	1	R28	CWT AVL
250	SMD RESISTOR	0805 47Ω J	EA	1	R29	CWT AVL
260	SMD RESISTOR	0805 4.7K J	EA	3	R27,R96,R49	CWT AVL
270	SMD RESISTOR	0805 510Ω J	EA	1	R35	CWT AVL
280	SMD RESISTOR	0805 5.6K J	EA	1	R72	CWT AVL
290	SMD RESISTOR	0805 68Ω J	EA	3	R26,R51,R56	CWT AVL
300	SMD RESISTOR	0805 680K J	EA	1	R46	CWT AVL
310	SMD RESISTOR	0805 6.8Ω J	EA	1	R19	CWT AVL
320	SMD RESISTOR	0805 8.2K J	EA	1	R34	CWT AVL
330	SMD RESISTOR	1206 0Ω J	EA	9	ZD4,J36,J37,J38,R53,J28,J24,R13,R45	CWT AVL
340	SMD RESISTOR	1206 1K J	EA	1	R39	CWT AVL
350	SMD RESISTOR	1206 10M J	EA	6	R54,R58,R59,R61,R66,R67	CWT AVL
360	SMD RESISTOR	1206 5.6Ω J	EA	2	R6,R82	CWT AVL

370	SMD RESISTOR	1206 6.8K J	EA	5	R1,R2,R14,R3,R5	CWT AVL
380	SMD CAP	101J/50V NPO 0805	EA	1	C28	SAMSUNG
替代	SMD CAP	101J/50V NPO 0805				HEC
替代	SMD CAP	101J/50V NPO 0805				YAGO
替代	SMD CAP	101J/50V NPO 0805				WALSIN
390	SMD CAP	101J/100V NPO 0805	EA	1	C26	SAMSUNG
替代	SMD CAP	101J/100V NPO 0805				HEC
替代	SMD CAP	101J/100V NPO 0805				YAGO
替代	SMD CAP	101J/100V NPO 0805				WALSIN
400	SMD CAP	101J/1KV NPO 1206	EA	2	C34,C32	HEC
替代	SMD CAP	101J/1KV NPO 1206				SAMSUNG
替代	SMD CAP	101J/1KV NPO 1206				YAGO
替代	SMD CAP	101J/1KV NPO 1206				WALSIN
410	SMD CAP	102J/50V NPO 0805	EA	6	C17,C22,R47,C24, C25,C42	SAMSUNG
替代	SMD CAP	102J/50V NPO 0805				HEC
替代	SMD CAP	102J/50V NPO 0805				YAGO
替代	SMD CAP	102J/50V NPO 0805				WALSIN
420	SMD CAP	103K/50V X7R 0805	EA	1	C29	SAMSUNG
替代	SMD CAP	103K/50V X7R 0805				HEC
替代	SMD CAP	103K/50V X7R 0805				YAGO
替代	SMD CAP	103K/50V X7R 0805				WALSIN
430	SMD CAP	103K/1KV X7R 1206	EA	2	C35,C50	HEC
替代	SMD CAP	103K/1KV X7R 1206				SAMSUNG
替代	SMD CAP	103K/1KV X7R 1206				YAGO
替代	SMD CAP	103K/1KV X7R 1206				WALSIN
440	SMD CAP	104K/50V X7R 0805 T=0.85±0.1mm	EA	6	C16,C23,C54,C27, C12,R17	SAMSUNG
替代	SMD CAP	104K/50V X7R 0805 T=1.25 ± 0.10mm				SAMSUNG
替代	SMD CAP	104K/50V X7R 0805				HEC
替代	SMD CAP	104K/50V X7R 0805				WALSIN
替代	SMD CAP	104K/50V X7R 0805				YAGO
450	SMD CAP	105K/50V X7R 0805	EA	3	C43,C47,C15	SAMSUNG
替代	SMD CAP	105K/50V X7R 0805				HEC
替代	SMD CAP	105K/50V X7R 0805				WALSIN
替代	SMD CAP	105K/50V X7R 0805				YAGO
460	SMD CAP	221J/50V NPO 0805	EA	1	C20	SAMSUNG
替代	SMD CAP	221J/50V NPO 0805				HEC

替代	SMD CAP	221J/50V NPO 0805				YAGO
替代	SMD CAP	221J/50V NPO 0805				WALSIN
470	SMD CAP	224K/50V X7R 0805	EA	2	C14,C21	TDK
替代	SMD CAP	224K/50V X7R 0805				SAMSUNG
替代	SMD CAP	224K/50V X7R 0805				HEC
替代	SMD CAP	224K/50V X7R 0805				WALSIN
替代	SMD CAP	224K/50V X7R 0805				YAGO
480	SMD CAP	331J/50V NPO 0805	EA	1	C30	SAMSUNG
替代	SMD CAP	331J/50V NPO 0805				HEC
替代	SMD CAP	331J/50V NPO 0805				YAGO
替代	SMD CAP	331J/50V NPO 0805				WALSIN
490	SMD ZENER DIODE	MMSZ5246B 1/2W 16V 15.2-16.8V SOD-123	EA	1	ZD2	GME
替代	SMD ZENER DIODE	MMSZ5246B 1/2W 16V 15.2-16.8V SOD-123				WILLAS
替代	SMD ZENER DIODE	MMSZ5246BG 1/2W 16V 15.2-16.8V SOD-123 VF 0.9 MAX				LISION
500	SMD ZENER DIODE	MMSZ5251B 1/2W 22V 20.9-23.1V SOD-123	EA	1	ZD1	GME
替代	SMD ZENER DIODE	MMSZ5251B 1/2W 22V 20.9-23.1V SOD-123				WILLAS
替代	SMD ZENER DIODE	MMSZ5251BG 1/2W 22V 20.9-23.1V SOD-123 VF 0.9				LISION
510	SMD FAST DIODE	RS1MR 1A/1000V SMA VF1.3MAX Trr:500ns	EA	4	D7,D8,D15,D16	PINWEI
替代	SMD FAST DIODE	RS1M 1A/1KV Trr500nS DO-214AC(SMA) VF 1.30 MAX Trr:500ns				GME
替代	SMD FAST DIODE	RS1M 1A/1000V SMA/DO-214AC Trr:500ns				HY
520	SMD U-FAST DIODE	ES1J 1A/600V DO-214AC(SMA) VF 1.7 MAX Trr:35ns	EA	1	D2	GME
替代	SMD U-FAST DIODE	ES1JGR 1A/600V SMA(DO-214AC) VF 1.7 MAX Trr:35ns				PINWEI
530	SMD FAST DIODE	MURS560 5A/600V SMC VF值 1.3MAX Trr:50ns	EA	1	D3	GME
替代	SMD FAST DIODE	MURS460C 4A/600V SMC VF值1.28MAX Trr:50ns				LITEON
540	SMD SWITCHING DIODE	1N4148W 0.15A(Io)/75V SOD-123 VF Max 1.25	EA	5	D6,D9,D18,R25,D14	BL
替代	SMD SWITCHING DIODE	L1N4148WT1G 0.15A(Io0.2A)/75V SOD-123 VF 1.25 MAX				LRC
替代	SMD SWITCHING DIODE	1N4148W 0.15A(Io)/75V SOD-123				WILLAS
替代	SMD SWITCHING DIODE	LS4148W Ifm0.3A(Io0.15A)/75V SOD-123				LISION
550	SMD SWITCHING DIODE	1N4148WS 0.15A/75V SOD-323 VF 1.25 MAX	EA	1	D4	GME
替代	SMD SWITCHING DIODE	1N4148WS 0.15A/75V SOD-323				WILLAS
替代	SMD SWITCHING DIODE	1N4148WS 0.2A/75V SOD-323				PANJIT
560	SMD TRANSISTOR PNP	LMBT2907ALT1G 0.6A/60V SOT-23	EA	1	Q6	LRC
替代	SMD TRANSISTOR PNP	PMBT2907A 0.6A/60V SOT-23				NXP/ NEXPERIA
替代	SMD TRANSISTOR PNP	MMBT2907ALT1G 0.6A/60V SOT-23				ON
替代	SMD TRANSISTOR PNP	MMBT2907AG 0.6A/60V SOT-23				UTC
替代	SMD TRANSISTOR PNP	MMBT2907A 0.6A/60V SOT-23				DIODES
570	SMD TRANSISTOR NPN	LMBT2222ALT1G 0.6A/40V SOT-23	EA	1	Q7	LRC
替代	SMD TRANSISTOR NPN	MMBT2222AL 0.6A/40V SOT-23				UTC

替代	SMD TRANSISTOR NPN	MMBT2222A 0.6A/40V SOT-23				DIODES
替代	SMD TRANSISTOR NPN	PMBT2222A 0.6A/40V SOT23				PHILIPS
替代	SMD TRANSISTOR NPN	PMBT2222A 0.6A/40V SOT23				NXP/ NEXPERIA
580	SMD.IC	NCP1399ACDR2G SOIC-16	EA	1	IC2	ON
590	SMD.IC	NCP1615C5DR2G SOIC-16	EA	1	IC4	ON
600	SMD.IC	SRK2001TR SSOP-10	EA	1	U5	ST
610	SMD.IC	NCP431BVSNT1G SOT-23-3 低功耗	EA	1	U6	ON
替代	SMD.IC	AP431iANTR-G1 SOT-23 低功耗				DIODES
30	雷擊管	SPG-161M-LF 編帶式	EA	2	ZV1,ZV2	SNE
40	THERMISTOR NTC	TTC3B104J4407EA3 ϕ3 100K PL=18±1mm	EA	1	NTC1	TKS
替代	THERMISTOR NTC	MF52A2 104J4450 ϕ3 100KΩ±5% PL=18±1mm				SHIHENG
50	MOV	STE14D471K1EN0 ϕ14mm 470V P=7.5mm 長腳 高能量	EA	1	ZNR1	STE
替代	MOV	TVR14471KSARY ϕ14mm 470V+/-10% 編帶式				TKS
替代	MOV	TUR14D471K ϕ14mm 470V~517V P=7.5mm 高能量編帶式				JOCOL
60	ELE. CAP.(105℃)	1000uF/35V EY 12.5*20mm 長腳 10000Hrs	EA	3	C10,C11,C9	ELITE
替代	ELE. CAP.(105℃)	1000uF/35V GH ϕ13*20mm 編帶式 10000Hrs				CAPXON
替代	ELE. CAP.(105℃)	1000uF/35V HG 13*21mm 長腳 10000Hrs				SU'SCON
70	ELE. CAP.(105℃)	180uF/450V MJ ϕ18*51mm 長腳 10000Hrs DF值0.055MAX	EA	1	C5	ELITE
替代	ELE. CAP.(105℃)	180uF/450V HE ϕ20*45mm P=7.5mm 長腳 10000Hrs DF值0.07MAX				SU'SCON
替代	ELE. CAP.(105℃)	180uF/450V FL ϕ18*51mm 長腳 10000Hrs DF值0.055MAX				CAPXON
80	ELE. CAP.(105℃)	220uF/25V GH ϕ6.3*11mm 編帶式 4000Hrs P=2.5mm	EA	1	C18	CAPXON
替代	ELE. CAP.(105℃)	220uF/25V EY ϕ6.3*11mm 編帶式 5000Hrs P=2.5mm				ELITE
替代	ELE. CAP.(105℃)	220uF/25V GT ϕ6.3*11mm 編帶式 5000Hrs				SAMXON
90	ELE. CAP.(105℃)	470uF/16V HG ϕ8*16mm 編帶式 7000Hrs	EA	1	C8	SU'SCON
替代	ELE. CAP.(105℃)	470uF/16V EY ϕ8*15mm 編帶式 7000Hrs				ELITE
替代	ELE. CAP.(105℃)	470uF/16V GH ϕ8*16mm 編帶式 7000Hrs				CAPXON
110	塑膠電容	104K/450V CBB21 W16.7*H9.8*T5mm P=15mm 直短腳 PL=3.5±0.5mm	EA	1	C7	EMF
替代	塑膠電容	104K/630V MPPN W18*H11*T5.5mm P=15mm 直短腳 PL=3.5±0.5mm				HJC
替代	塑膠電容	104K/450V RP W18*H11*T5mm P=15mm PL=26±3mm				UTX
120	塑膠電容	105K/450V CBB21-B W18*H17.5*T7.5mm P=15 PL=3.5±0.5mm	EA	1	C2	EMF
替代	塑膠電容	105K/450V MFTD P=15mm W18*H17*T7.5 長腳				HJC
替代	塑膠電容	105K/450V RP W18*H16*T8.5 P=15mm PL=3.6±0.5mm				UTX
130	塑膠電容	155K/450V MPN3 P=15mm PL=3.5mm W18*H18*T9mm 低噪音	EA	1	C1	HJC
替代	塑膠電容	155K/450V CBB21-B W18*H16*T10mm P=15mm PL=3.5±0.5mm 直腳				EMF
替代	塑膠電容	155K/450V RP P=15mmW17*H18.5*T9.5mm 直腳 PL=26±2mm				UTX
150	塑膠電容	473J/630V MMKP82 W18*H13.5*T7.5mm P=15mm 直短腳PL=3.5±0.5mm	EA	1	C6	EMF
替代	塑膠電容	473J/630V MP3S W18*H13*T7mm P=15mm 直短腳 PL=3.5±0.5mm				HJC
160	Y-CAP	222M/250V Y2 KL(Y5U) P=7.5mm 直腳短腳 PL=3.5±0.5mm	EA	2	CY1,CY2	WELSON

替代	Y-CAP	222M/250V Y2 SE(Y5U) P=7.5mm 直腳短腳 PL=3.5±0.5mm				SEC
替代	Y-CAP	222M/250V Y2 CE(Y5U) P=7.5mm 直腳短腳 PL=3.5±0.5mm				STE
180	X-CAP	474K/280V X2 MPX/MKP P=15mm 18*14.5*8.5mm PL=3.6mm	EA	1	CX1	EMF
替代	X-CAP	474K/275V MKP X2 18*14*8mm P=15mm PL=3.5mm				HJC
替代	X-CAP	474K/275V HQX X2 P=15mm 17*16*10.3 L=3.6mm				UTX
190	Y-CAP	222M/250V Y1 P=10mm 短腳:3.5mm Y5U	EA	1	CY3	WELSON
替代	Y-CAP	222M/250V Y1 P=10mm 直腳短腳 PL=3.5±0.5mm Y5U				SEC
替代	Y-CAP	222M/400V Y1 P=10mm 短直腳 PL=3.5±0.5mm Y5U				STE
200	LED LAMP	YL39B2S1CK28/EE33-C 3ϕ 透明發藍光 高亮 PL=3.3±0.5mm	EA	1	LED1	YL
210	O.P.T.O. IC	LTV817BN DIP-4 CTR:130-260	EA	1	U1	LITEON
220	TRANSFORMER	PQ20/20 ψ0.10mm*80P*26TS 100uH±5% 1KHZ 0.25V	EA	1	L2	CWT AVL
230	TRANSFORMER	PQ32/25 ψ0.10mm*90P*30TS 420uH±5% 60KHZ 1.0V	EA	1	T2	CWT AVL
240	TRANSFORMER	PQ32/25 ψ0.1*100P*37.5TS 190uH±5% 60KHZ 1.0V	EA	1	T1	CWT AVL
250	R CHOKE	CS172125 ψ1.0mm*40.5TS 150uH±15% 10KHZ 0.25V	EA	1	L1	CWT AVL
260	T COIL	T16*10*5C ψ0.9mm*1P*18.5TS 1.3mH MIN 1KHZ 0.25V	EA	1	LF1	CWT AVL
270	T COIL	T16*10*5C ψ1.0mm*2P*4.5TS雙線並繞 80uH MIN 1KHZ 0.25V	EA	1	LF3	CWT AVL
280	T COIL	T25*15*10-C(12K)ψ0.9mm*30.5TS 8mH MIN 1KHZ 0.25V	EA	1	LF2	CWT AVL
290	HEAT SINK	24.2*18.8*7.5mm t=0.8mm CU 鍍錫 黃銅	EA	1	J20	CWT AVL
300	自粘腳墊(黑色)	SF060425 6.0*4.0mm t=2.5mm	EA	3		CWT AVL
310	矽膠片	30*20*1.0mm	EA	1	L2的頂部	CWT AVL
320	MYLAR	184*161.7*0.43mmT GK-17 黑色 缺口尺寸不同	EA	1		CWT AVL
330	MYLAR	23*12mm*0.4mmT S10 透明	EA	1	FOR: 保險絲與螺絲柱之間	CWT AVL
340	MYLAR	ϕ18*0.4mmT S10 透明 部分背膠	EA	1	FOR:C5頂部	CWT AVL
350	WIRE	UL3135#18 90mmL 磁環加熱塑套管 一端加小雙倒鉤黃銅端子+TIN12	EA	1	棕線L孔/藍	CWT AVL
360	WIRE	1015#18 55L 一端小雙倒鉤黃銅端子 TIN:12(加熱塑套管20±3)	EA	1	FG	CWT AVL
370	卡式公座	TU-301-SP-SR012-POB(d) 3P 10A/250V	EA	1		CWT AVL
380	HEAT TUBE	ϕ20*20mm 130℃ 600V	EA	1	FOR C5本體	CWT AVL
10	BRIDGE DIODE	GBU606 6A/600V GBU VF 1.1 MAX	EA	1	BD1	PINWEI
替代	BRIDGE DIODE	GBU606 6A/600V				LITEON
替代	BRIDGE DIODE	GBU606 6A/600V				HY
20	HIGH EFF DIODE	CMPFCD86 8A/600V TO-220FP	EA	1	D1	CHAMPION
替代	HIGH EFF DIODE	STTH8L06FP 8A/600V TO-220FPAC				ST
替代	HIGH EFF DIODE	LTTH806LF 8A/600V ITO-220AC				LITEON
替代	HIGH EFF DIODE	QH08TZ600 8A/600V TO-220AC 內部絕緣				QSPEED/PI
30	MOSFET N-CHANNEL	IPA60R190P6 20.2A/600V PG-TO220 FullPAK	EA	1	Q1	INFINEON
替代	SUPER JUNCTION POWER MOSFETs(N)	WFF20N60S 20A/600V TO220F				WINSEMI
替代	MOSFET N-CHANNEL	FCPF190N60E 20A/600V TO-220F				FAIRCHILD

替代	MOSFET N-CHANNEL	SIHF22N60E 21A/600V TO-220 FULLPAK				VISHAY
替代	MOSFET N-CHANNEL	TK20A60W 20A/600V TO-220SIS				TOSHIBA
40	HEAT SINK	95*73.5*26*12 t=3.0mm AL HS1	EA	1	HS1	CWT AVL
50	十字圓頭機械鍍鎳+雙墊	M3*7	EA	2	FOR:D1,Q1	CWT AVL
60	十字圓頭機械鍍鎳+雙墊	M3*8	EA	1	FOR BD1	CWT AVL
70	BEAD CORE	NI-ZN RH 3.5*2.0*1.5	EA	2	for: D1 兩腳	CWT AVL
10	SUPER JUNCTION POWER MOSFETs(N)	WFF20N60S 20A/600V TO220F	EA	2	Q2,Q3	WINSEMI
替代	MOSFET N-CHANNEL	IPA50R140CP 23A/500V TO-220FP				INFINEON
替代	MOSFET N-CHANNEL	TK20A60W 20A/600V TO-220SIS				TOSHIBA
替代	MOSFET N-CHANNEL	SIHF22N60E 21A/600V TO-220 FULLPAK				VISHAY
替代	MOSFET N-CHANNEL	FCPF190N60E 20A/600V TO-220F				FAIRCHILD
20	HEAT SINK	95*26*12mm t=3.0mm AL HS2	EA	1	HS2	CWT AVL
30	十字圓頭機械鍍鎳+雙墊	M3*7	EA	2	FOR:Q2,Q3	CWT AVL
10	MOSFET N-CHANNEL	IPP032N06N3G 120A/60V TO-220	EA	2	Q4,Q5	INFINEON
替代	MOSFET N-CHANNEL	SUP60030E 120A/80V TO-220AB				VISHAY
20	HEAT SINK	76*28*12mm t=3.0mm AL HS3	EA	1	HS3	CWT AVL
30	絕緣粒(乳白色)	6.0*3.5*1.6mmT 240℃	EA	2	FOR Q4,Q5	CWT AVL
40	矽膠片	19*13*0.3mmT TO-220	EA	2	FOR Q4,Q5	CWT AVL
50	十字圓頭機械鍍鎳+雙墊	M3*7	EA	2	FOR Q4,Q5	CWT AVL
20	DC WIRE	1185#14*1C 1200mm (ADD CORE)	EA	1		CWT AVL
40	中性外箱	565*480*160mm t=6mm 五層瓦楞紙A//A(B+C楞) ROHS 紅黑印刷	EA	0.1		CWT AVL
50	六刀卡	460*130mm t=6mm A//A(B+C楞)	EA	0.3		CWT AVL
60	三刀卡	545*130mm t=6mm A//A(B+C楞)	EA	0.6		CWT AVL
70	平卡	545*460mm T=6mm A//A(B+C楞)	EA	0.2		CWT AVL
80	PE袋	200*370mm T=0.06mm 印刷深綠色環保標誌	EA	1		CWT AVL
90	干燥劑	60*45mm ±5% 包裝材質网型紙	BAG	0.3		CWT AVL
100	LABEL-物料標示單	90*85mm 廣州貴冠科技有限公司物料標識單	EA	0.1		CWT AVL
110	LABEL-外箱條碼	82*103mm BB101007XXXXXXXXXX MITAC	EA	0.1		CWT AVL
120	大貼紙	59*119mm 12V/15A 4P(1,3,SHIELD-,2,4+) VI	EA	1		CWT AVL
130	序號貼紙	30*10mm CODE128碼 XX-XXXXXXXX-XXXXX	EA	1		CWT AVL

Ref. Certif. No.
US-TUVR-10449-A1

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

SYSTEME CEI D' ACCEPTATION MUTUELLE DE CERTIFICATS D'ESSAIS DES EQUIPEMENTS ELECTRIQUES (IECEE) METHODE OC

CB TEST CERTIFICATE

CERTIFICAT D'ESSAI OC

Product Produit	AC Adapter
Name and address of the applicant Nom et adresse du demandeur	Channel Well Technology Co., Ltd. No.222, Sec. 2, Nankan Rd. 33855 LUJHU TOWNSHIP, TAOYUAN HSIEN TAIWAN - R.O.C.
Name and address of the manufacturer Nom et adresse du fabricant	same as applicant
Name and address of the factory Nom et adresse de l'usine Note: *When more than one factory, please report on page 2* Note: *Lorsque il y plus d'une usine, veuillez utiliser le 2ème page*	Channel Well Technology (Guangzhou) Co., Ltd. Zengjiang Street Bld B, Eastern Hi-Tech Industrial Base 511300 GUANGZHOU, ZENGCHENG CHINA
Ratings and principal characteristics Valeurs nominales et caractéristiques principales	AC 100-240V, 50-60Hz; 4A Class I Output Ratings: see associated test report
Trademark (if any) Marque de fabrique (si elle existe)	CWT
Model / Type Ref. Ref. De Type	KPMxy-VI (x = 180, 200, 220, y = F, H, W, J, K, L, M, S, T, R, U)
Additional information (if necessary, may also be reported on page 2) Les informations complémentaires (si nécessaire, peuvent être indiqués sur la 2ème page)	Re-issuance of CB Certificate US-TUVR-10449 due to 1st modification (updates in test report). See associated test report for details.
A sample of the product was tested and found to be in conformity with IEC Un échantillon de ce produit a été essayé et a été considéré conforme à la CEI	IEC 60950-1+Amd1+Amd2 2nd Edition (2005)
As shown in the Test Report Ref. No. which forms part of this Certificate Comme indiqué dans le Rapport d'essais numéro de référence qui constitue partie de ce Certificat	31781830.003

This CB Test Certificate is issued by the National Certification Body
Ce Certificat d'essai OC est établi par l'Organisme **National de Certification**

TÜVRheinland®
Precisely Right.

Martin Glagla

Date: August 21, 2017 Page 1 of 1 Signature: Martin Glagla

Certificate of Conformity

No. ESTE-E1709027

The following products have been tested by us with the listed standards and found in compliance with the council EMC directive 2014/30/EU. It is demonstrative for the compliance with this EMC Directive.

Applicant : Channel Well Technology Co., Ltd.

Address : No. 222, Sec. 2, Nankan Rd., Lujhu Township, Taoyuan Hsien, 33855 Taiwan.

Trade Name : NETGEAR

Product : AC Adapter

Model No. : KPMxy-VI
(x, y, are variable, Please see section 1.3 of the report)

Test Standards :	
EN 55032:2015	Electromagnetic compatibility of multimedia equipment – Emission requirements
EN 61000-3-2:2014	Electromagnetic compatibility (EMC) – Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)
EN 61000-3-3:2013	Electromagnetic compatibility (EMC) – Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated currents 16 A per phase and not subject to conditional connection
EN 55024:2010+A1:2015	Information technology equipment-Immunity characteristics limits and methods of measurement

CE

Leeman Hu
Manager
Date: Sep. 13, 2017

EST Technology Co., Ltd.
http://www.gdest.cn TEL:86-769-83081888
Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China

Verification of Compliance

No. ESTE-F1709015

We hereby certify that the below product has been tested by us and complied with the FCC requirements and Industry Canada requirements.

Applicant	:	Channel Well Technology Co., Ltd.
Address	:	No. 222, Sec. 2, Nankan Rd., Lujhu Township, Taoyuan Hsien, 33855 Taiwan.
Test Standard	:	FCC Part 15 Subpart B Class B: 2016 ICES-003:2016
Test Procedure	:	ANSI C63.4:2014
Trade Name	:	CWT NETGEAR
Product	:	AC Adapter
Model No	:	KPMxy-VI (x, y, are variable, Please see section 1.3 of the report)

Leeman_hu
Manager
Date: Sep.13, 2017

EST Technology Co., Ltd.
TEL:86-769-83081888 Fax:86-769-83081878
Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China

CERTIFICATE OF COMPLIANCE

Certificate Number	20170829-E161451
Report Reference	E161451-A122-UL
Issue Date	2017-AUGUST-29
Issued to:	CHANNEL WELL TECHNOLOGY CO LTD 222 SEC 2 NANKAN RD LUJHU TOWNSHIP TAOYUAN HSIEN, 33855 TAIWAN
This is to certify that representative samples of	POWER SUPPLIES, INFORMATION TECHNOLOGY EQUIPMENT INCLUDING ELECTRICAL BUSINESS EQUIPMENT AC ADAPTER, Model KPMxy-VI where x = 180, 200, 220; y = F, H, W, J, K, L, M, S, T, R, U. Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.
Standard(s) for Safety:	UL 60950-1 and CAN/CSA C22.2 No. 60950-1-07, Information Technology Equipment - Safety - Part 1: General Requirements
Additional Information:	See the UL Online Certifications Directory at www.ul.com/database for additional information

Only those products bearing the UL Certification Mark should be considered as being covered by UL's Certification and Follow-Up Service.

Look for the UL Certification Mark on the product.

Bruce Mahrenholz, Director North American Certification Program

UL LLC

Certificate of

Conformance

Energy Efficiency Certification

UL conducted an independent evaluation on behalf of:

Channel Well Technology Co Ltd

222 Sec 2 Nankan Rd., Lujhu Township, Taoyuan Hsien, 33855, Taiwan

for the following products:

External Power Supply

Brand: CWT

Model(s): KPMxy-VI; x = 180;
y = F, H, W, J, K, L, M, S, T, R, U

This product meets all of the necessary qualifications pursuant to:

-NRCan: Amendment 11 to the Energy Efficiency Regulations for External Power Supplies, published on October 12, 2011 in the Canada Gazette, Part II
- CEC: Appliance Efficiency Regulations (California Code of Regulations, Title 20, Sections 1601 through 1608) dated July 2015
-DoE: Office of Energy Efficiency and Renewable Energy 10 CFR Parts 429 and 430
-Australian (GEMS) and New Zealand: AS/NZS4665.1-2005+A1:2009; AS/NZS4665.2-2005+A1:2009
-EU Directive for Energy-related Products ErP 2009/125/EC and Implementing Measure (IM) no. EC278/2009 for External Power Supply
- International Efficiency Marking Protocol for External Power Supplies, Version 3.0
-EU: Code of Conduct on Energy Efficiency of External Power Supplies, Version 5.0

Energy Verified
Rendement
Énergétique Vérifié

2017-08-24
Certification Date

N/A
Certification Revision Date

Issued by

4788063210
UL Product Number

Zertifikat *Certificate*

TÜVRheinland®

Zertifikat Nr. *Certificate No.*
S 72171446

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0001

Ihr Zeichen *Client Reference*	**Unser Zeichen** *Our Reference*	**Längstens gültig bis**	*Latest expiration date*
Shawn Chen	-JA-31781830 002	20.06.2019	*(day/mo/yr)*

Genehmigungsinhaber *License Holder*
Channel Well Technology Co., Ltd.
No.222, Sec. 2, Nankan Rd.
33855 Lujhu Township, Taoyuan Hsien
Taiwan - R.O.C.

Fertigungsstätte *Manufacturing Plant*
Channel Well Technology
(Guangzhou) Co., Ltd.
Zengjiang Street Bld B,
Eastern Hi-Tech Industrial Base
511300 Guangzhou, Zengcheng
China

Prüfzeichen *Test Mark*

TÜVRheinland CERTIFIED
www.tuv.com
ID 1234501093

GS geprüfte Sicherheit

Geprüft nach *Tested acc. to*
EN 60950-1:2006+A11+A1+A12+AC+A2
AfPS GS 2014:01 Par. 3.1

Zertifiziertes Produkt (Geräteidentifikation)
Certified Product (Product Identification)

Lizenzentgelte - Einheit
License Fee - Unit

Netzgerät AC Adapter

Bezeichnung (Model Designation): KPMxy-VI 7
(x=180, 200, 220; y= F, H, W, J, K, L, M, S, T, R, U)

Nennspannung (Rated Voltage): AC 100-240V, 50-60Hz
Nenntrom (Rated Current): 4A
Schutzklasse (Protection Class): I
Ausgangswerte (Output Ratings) DC:
siehe Anlage (Aufbauübersicht)/
see Appendix (Constr. Data Form)

7

ANLAGE (Appendix): 1, 1-18

Dem Zertifikat liegt unsere Prüf- und Zertifizierungsordnung zugrunde.
Produkt und Fertigungsstätte erfüllen § 20 und § 21 des Produktsicherheitsgesetzes.
This certificate is based on our Testing and Certification Regulation.
Product and production fulfill par § 20 and § 21 of the Product Safety Law.

TÜV Rheinland LGA Products GmbH, Tillystraße 2, 90431 Nürnberg
Tel.: +49 221 806-1371 e-mail: cert-validity@de.tuv.com
Fax: +49 221 806-3935 http://www.tuv.com/safety

Ausstellungsdatum *Date of Issue* : 27.06.2017 **(day/mo/yr)**

TÜV Rheinland LGA Products GmbH Zertifizierungsstelle

Zertifizierungsstelle

Dipl.-Ing. M. Glagla

ENERGY EFFICIENCY CERTIFICATION (EEC):Test Report - Cover Page

Customer Name:	Channel Well Technology Co Ltd
Address:	222 Sec 2 Nankan Rd Lujhu Township Taoyuan Hsien, 33855 Taiwan

Laboratory Name:	UL LLC
Address:	47173 Benicia St., Fremont, CA 94538, US
Brand name(s):	CWT
Model name(s):	KPMxy-VI; x = 180; y = F, H, W, J, K, L, M, S, T, R, U
Product category:	External Power Supply
Electrical Ratings:	See attachment for details
Representative (tested) Model:	See attachment for details
Model differences:	KPMxy-VI; x = 180; y = F, H, W, J, K, L, M, S, T, R, U. The output voltage and current ratings are different.
Construction details:	Unit is a power adapter.

The Sample(s) tested is(are) compliant with the following applied standards/regulations:

International Efficiency Marking Protocol for External Power Supplies, Version 3.0

US DoE: Office of Energy Efficiency and Renewable Energy 10 CFR Parts 429 and 430

NRCan: Amendment 11 to the Energy Efficiency Regulations for External Power Supplies, published on October 12, 2011 in the Canada Gazette, Part II

US CEC: Appliance Efficiency Regulations (California Code of Regulations, Title 20, Sections 1601 through 1608) dated July 2015

Australian (GEMS) and New Zealand : AS/NZS4665.1-2005+A1:2009; AS/NZS4665.2-2005+A1:2009

EU Directive for Energy-related Products ErP 2009/125/EC and Implementing Measure (IM) no. EC278/2009 for External Power Supply

EU: Code of Conduct on Energy Efficiency of External Power Supplies Version 5

UL Project No. - Report ID:	4788063210 (11856704)		
Project Handler:	Bich Thao Nguyen	**Reviewed by:**	Benjamin Huey / Jennifer Smith
Issued: (yyyy-mm-dd)	2017-08-24	**Revised:** (yyyy-mm-dd)	N/A

ATTACHMENT(S)

- Results Summary of International Efficiency Marking Protocol.
  Models KPMxy-VI; x = 180; y = F, H, W, J, K, L, M, S, T, R, U are Direct Operation, AC-DC, Basic-Voltage, standard type EPS.

Test	Result	Compliant, Y/N
Power Factor Correction at 115V > 90%	Input > 100W	Yes
The roman numeral mark of International efficiency marking protocol, if applicable	V, VI	Yes

- Model list:

Model	Representative tested model	Input	Output
KPM180F-VI	KPM180U-VI KPM180F-VI	100-240Vac, 4.0A, 50-60Hz	12.0Vdc, 15.00A
KPM180H-VI			15.0Vdc, 12.00A
KPM180W-VI			17.0Vdc, 10.59A
KPM180J-VI			18.0Vdc, 10.00A
KPM180K-VI			19.0Vdc, 9.47A
KPM180L-VI			20.0Vdc, 9.00A
KPM180M-VI			24.0Vdc, 7.50A
KPM180S-VI			48.0Vdc, 3.75A
KPM180T-VI			52.0Vdc, 3.46A
KPM180R-VI			54.0Vdc, 3.33A
KPM180U-VI			56.0Vdc, 3.21A

Annex A1 – for model KPM180F-VI						
Regulatory Body	**Test Method, Regulation or Program Evaluated to**	**Test Limit per Regulation or Program Requirement**		**Measurements**		**Other**
		Average Efficiency In Active Mode	**No-Load Mode Power**	**Average Efficiency In Active Mode**	**No-Load Mode Power**	
NRCan	CSA-C381.1-08	≥ 85%	≤ 0.5 W	89.32%	0.12 W	Complied
DoE	10 CFR Parts 429 and 430	≥ 88.0%	≤ 0.21 W	89.32%	0.12 W	Complied
CEC	2015 Appliance Efficiency Regulations	≥ 85%	≤ 0.5 W	89.32%	0.12 W	Complied
Australian (GEMS) and New Zealand	AS/NZS4665.1-2005+A1:2009; AS/NZS4665.2-2005+A1:2009	≥ 87%	≤ 0.5 W	90.29%	0.05 W	'High efficiency' performance mark V
ErP	Annex I(b) Of 2009/125/EC and Commission Regulation (EC) No 278/2009	≥ 87%	≤ 0.5 W	90.29%	0.05 W	Complied
CoC	Code of Conduct on Energy Efficiency of External Power Supplies, Version 5	≥ 89%	≤ 0.15 W	90.29%	0.05 W	Complied
Additional Information: See Energy Efficiency Laboratory Data Package of Project No: 4788063210.1 for further details and test results N/A = Not Applicable						

Annex A2 – for model KPM180U-VI						
Regulatory Body	**Test Method, Regulation or Program Evaluated to**	**Test Limit per Regulation or Program Requirement**		**Measurements**		**Other**
		Average Efficiency In Active Mode	**No-Load Mode Power**	**Average Efficiency In Active Mode**	**No-Load Mode Power**	
NRCan	CSA-C381.1-08	≥ 85%	≤ 0.5 W	90.88%	0.12 W	Complied
DoE	10 CFR Parts 429 and 430	≥ 88.0%	≤ 0.21 W	90.88%	0.12 W	Complied
CEC	2015 Appliance Efficiency Regulations	≥ 85%	≤ 0.5 W	90.88%	0.12 W	Complied
Australian (GEMS) and New Zealand	AS/NZS4665.1-2005+A1:2009; AS/NZS4665.2-2005+A1:2009	≥ 87%	≤ 0.5 W	91.93%	0.05 W	'High efficiency' performance mark V
ErP	Annex I(b) Of 2009/125/EC and Commission Regulation (EC) No 278/2009	≥ 87%	≤ 0.5 W	91.93%	0.05 W	Complied
CoC	Code of Conduct on Energy Efficiency of External Power Supplies, Version 5	≥ 89%	≤ 0.15 W	91.93%	0.05 W	Complied
Additional Information: See Energy Efficiency Laboratory Data Package of Project No: 4788063210.2 for further details and test results N/A = Not Applicable						

DATA PACKAGE INFORMATION SHEET

Applicant Information	Name:	Channel Well Technology Co Ltd.
	Address:	222 Sec 2 Nankan Rd Lujhu Township, Taoyuan Hsien, 33855 Taiwan

Product Information	Standard(s):	☐ "Test Method for Calculating the Energy Efficiency of Single-Voltage External AC-DC and AC-AC Power Supplies" dated August 11, 2004
		☒ International Efficiency Marking Protocol for External Power Supplies, Version 3.0
		☒ NRCan: Amendment 11 to the Energy Efficiency Regulations for External Power Supplies, published on October 12, 2011 in the Canada Gazette, Part II
		☒ US CEC: Appliance Efficiency Regulations (California Code of Regulations, Title 20, Sections 1601 through 1608) dated July 2015
		☒ US DoE: Office of Energy Efficiency and Renewable Energy 10 CFR Parts 429 and 430
		☒ Australian (GEMS) and New Zealand : AS/NZS4665.1-2005+A1:2009; AS/NZS4665.2-2005+A1:2009
		☒ EU Directive for Energy-related Products ErP 2009/125/EC and Implementing Measure (IM) no. EC278/2009 for External Power Supply
		☒ EN50563-2011/A1:2013, External a.c. - d.c. and a.c. - a.c. power supplies – Determination of no-load power and average efficiency of active modes
		☒ EN50564-2011, Electrical and electronic household and office equipment - Measurement of low power consumption
		☒ EU: Code of Conduct on Energy Efficiency of External Power Supplies Version 5
		☐ Mexico: Secretaría de Energía, Director General de la Comisión Nacional para el Uso Eficiente de la - Catálogo de equipos y aparatos para los cuales los fabricantes, importadores, distribuidores y comercializadores deberán incluir información sobre su consumo energético
		☐ Other:
	CCNs:	ENVP
	Product Name/Type:	External Power Supply ☒ AC-DC ☐ AC-AC
	Model Number (s):	KPM180F-VI

Test Location Information	DAP and UL: ☐ CTDP ☐ TCP ☐ TPTDP ☐ WTDP ☒ UL	
	Test Location Name: UL LLC	
	Test Location Address:	47173 Benicia Street Fremont, CA 94538 USA
	Tests Conducted By**:	Sign *Daniel Ng*
		Print Daniel Ng
	**When all tests are conducted by one person, the printed name and signature can be inserted here instead of on each page containing data.	
	Authorized Signatory or TCP Reviewer:	Sign
		Print
		Date
	UL WTDP / WMT Witness:	Sign
		Print

Reviewed & Accepted	Qualified Project Handler:	Sign *Bich Thao Nguyen*
		Print Bich Thao Nguyen

LIST OF TESTS

Test Name **Page**

Special Instructions:

Unless specified otherwise in the individual Methods, the tests shall be conducted under the following ambient conditions. Confirmation of these conditions shall be recorded at the time the test is conducted.

Standard	Ambient Temperature °C	Relative Humidity RH %	Supply Voltage Tolerance%	Total Harmonic Distortion THD %	Airspeed, room m/s	Supply Frequency Tolerance %
the agencies other than US DoE	23±5	10-80 (For lab references)	±1	<2	≤0.5	±1
US DoE: 10 CFR Parts 429 and 430	20±5					

NOTE:
1. The input voltage source shall be capable of delivering at least 10 times the nameplate input power of the UUT (as is specified in IEEE 1515-2000).
2. Per chapter 4.2 in EN 50564:2011, where the product has an ambient light sensor that affects the power consumption, the test shall be carried out with controlled ambient light conditions. Where the illuminance levels are externally defined (in a test procedure or in the instructions for use), these values shall be used. Where no illuminance levels are stated or defined, reference illuminance levels of more than 300 lux and less than 10 lux shall be used.

Witness Test Data Program (WTDP) Information:

Environment:	
Accommodations and Environmental conditions, including proper power source meet the requirements of the test standard or UL default criteria (ISO/IEC 17025 Clause 5.3.1, 5.3.2, 5.3.3)	☐ Yes ☐ No ☐ N/A
Equipment:	
Testing is being conducted within the test equipment calibration dates. (See Test Instrument Information Page and ISO/IEC 17025 5.6.2.2)	☐ Yes ☐ No
Critical Consumables:	
Critical consumables are compliant with test standard requirements. (ISO/IEC 17025 Clause 4.6)	☐ Yes ☐ No ☐ N/A
Sample Identification:	
Identification of items to be tested has been made (e.g. model no., Serial No., etc.) (See Test Sample Identification page and ISO/IEC 17025 Clause 5.8.2)	☐ Yes ☐ No
Summary:	
The test facility was deemed to have the environment and capabilities necessary to perform the tests included in this data package.	☐ Yes ☐ No

TEST SAMPLE IDENTIFICATION

The table below is to provide correlation of sample numbers to specific product related information. Refer to this table when a test identifies a test sample by "Sample No." only.

Sample Number	Sample Card Number	Date Received	Manufacturer, Product Identification and Ratings
1	1051226	2017-08-03	Channel Well Technology, Model KPM180F-VI, Input: 100-240V, 4.0A, 50-60Hz Output: 12Vdc, 15A
2	1051226	2017-08-03	Channel Well Technology, Model KPM180F-VI, Input: 100-240V, 4.0A, 50-60Hz Output: 12Vdc, 15A
3	1051226	2017-08-03	Channel Well Technology, Model KPM180F-VI, Input: 100-240V, 4.0A, 50-60Hz Output: 12Vdc, 15A
Sampling Procedure (if used) :			

TEST INSTRUMENTS REFERENCE LIST

Instr. Code	Instrument I.D.	Instrument Type	Range Used Or ***	Make and Model **	Calibration Date	
					Last	Due

"Chamber setting(s) ☐ was ☐ were monitored to ensure that the setting(s) ☐ was ☐ were stable throughout the test time frame. Any deviations from the setting(s) are noted below.

Date	Test	Instrument Code	Time period of deviation	Setting(s)

** Information to be recorded when tests are conducted at a non-UL facility.
*** Refer to specific data sheet for individual scale used.

☒ UL test equipment information is recorded on Meter Use in UL'S Aurora database.

POWER SUPPLY REFERENCE PAGE (ENGINEERING TO COMPLETE)

Product Name/Type:	External AC/DC Power Supply (EPS)	
Manufacturer:	Channel Well Technology Co Ltd.	
Brand Name:	CWT	
Model Number/Designation:	KPM180F-VI	
Model differences:	KPMxy-VI; x = 180; y = F, H, W, J, K, L, M, S, T, R, U. The output voltage and current ratings are different.	
Class A external power supply	☒ Yes ☐ No	
Adaptive external power supply	☐ Yes ☒ No	
Switch-selectable single voltage external power supply	☐ Yes ☒ No	
External Power Supply Product Class ID	☐ B	Direct Operation, AC-DC, Basic-Voltage
	☐ C	Direct Operation, AC-DC, Low-Voltage (except those with nameplate output voltage less than 3 volts and nameplate output current greater than or equal to 1,000 milliamps that charge the battery of a product that is fully or primarily motor operated)
	☐ D	Direct Operation, AC-AC, Basic-Voltage
	☐ E	Direct Operation, AC-AC, Low-Voltage
	☐ H	Direct Operation, High-Power
	☐ N	Indirect Operation

Nameplate Rating:	Input:	100-240V, 4.0A, 50-60Hz
	Output:	12Vdc, 15A

Each sample was tested at:	☒ 115V, 60Hz	☒ 230V, 50Hz	☐ 240V, 50Hz
	☐ 127V, 60Hz	☐ 220V, 60Hz	
UUT Output Cord Length (± 1 cm):	120		
UUT is a Replacement EPS:	☐ Yes	☒ No	☐ N/A
Presence of Input Power Switch (Y/N):	☐ Yes	☒ No	
Input Power Switch (ON/OFF):	☐ ON	☐ OFF	☒ N/A
End Product Powered by the UUT:	Information Technology Equipment		

Notes/Comments:

☐ ~~For Mexico EE - Las pruebas realizadas en 115/230 Vac eran consideradas representativas al 127/220 Vac. (Tests performed on 115/230 Vac were considered representative to 127/220 Vac.)~~

TECHNICIAN'S REFERENCE PAGE

DEFINITIONS

"UUT": an acronym for "unit under test," which in this case refers to the power supply sample being tested.

"Active mode": A condition in which the input of a power supply is connected to the line voltage ac and the output is connected to an ac or dc load, drawing a fraction of the power supply's nameplate output power.

"Active mode efficiency": The ratio which is expressed as a percentage, of the total active output power (ac or dc) produced by a power supply to the active input power (ac) required to produce the total active output power.

"Ambient temperature": The temperature which is the air immediately surrounding the unit under test (UUT).

"Average Active-Mode Efficiency": The average of the loading conditions (100%, 75%, 50%, and 25% of its nameplate output current) for which it can sustain the output current.

"Manual on-off switch": a switch activated by the user to control power reaching the device. This term does not apply to any mechanical, optical, or electronic switches that automatically disconnect mains power from the device when a load is disconnected from the device, or that control power to the load itself.

"Power Factor (True), PF": The true power factor is the ratio of the active or real power (P) consumed in watts to the apparent power (S), drawn in volt-amperes (VA).

"Nameplate output current": The current output of the power supply as specified by the manufacturer on the label on the housing of the power supply, if absent from the housing, as provided by the manufacturer. This is also called rated output current. Alternatively, it is the nameplate output power divided by nameplate output voltage.

"Nameplate output power": the power output of the power supply as specified on the manufacturer's label on the power supply housing or, if absent from the housing, as specified in documentation provided by the manufacturer, or calculated by multiplying the nameplate output voltage by the nameplate output current (V•A).

"Nameplate Output Voltage": The voltage output of the power supply as specified by the manufacturer on the label on the housing of the power supply (either dc or ac). This is also called rated output voltage.

"No load" a condition in which the input of a power supply is connected to the ac reference source, where the output of the power supply is not connected to a product or any other load.

"No-load power": the wattage of active power (ac) consumed by a power supply operating in the no-load condition.

"Basic-Voltage external power supply": An external power supply is not a low-voltage external power supply.

"Low voltage external power supply": An external power supply with a nameplate output voltage of less than 6 volts and a nameplate output current greater than or equal to 550 milliamperes.

"Direct Operation external power supply": An external power supply can operate a consumer product that is not a battery charger without the assistance of a battery.

"Indirect Operation external power supply": An external power supply cannot operate a consumer product that is not a battery charger without the assistance of a battery.

"Adaptive external power supply": An external power supply that can alter its output voltage during active-mode based on an established digital communication protocol with the end-use application without any user-generated action.

"Switch-selectable single voltage external power supply": A single-voltage AC-AC or AC-DC power supply that allows users to choose from more than one output voltage.

TECHNICIAN'S REFERENCE PAGE (Cont'd)

POWER MEASUREMENT EQUIPMENT AND UNCERTAINTY

Any power measurements recorded, as well as any power measurement equipment utilized for testing, shall conform to the following:
(A) Resolution requirements are outlined in Section 4, "General conditions for measurements," as well as Annexes B, "Notes on the measurement of low power modes," of IEC 62301:2011 and EN50564:2011.
(B) Uncertainty requirements are outlined in Annexes D, "Determination of uncertainty of measurement," of IEC 62301:2011 and EN50564:2011.

The measurement uncertainty related to determination of input power due to the measuring instrument (Ue) is given in 4.4.1 and Annex D of IEC62301:2011 and EN 50564:2011.
Ue = (0.15 + 0.01 / PF) % of input power reading + 0.1 % of input power range;
For example: WT210/WT230
Ue = A+B+C
A: measuring instrument accuracy = 0.1% of input power reading + 0.1 % of input power range
B: influence of power factor = input power reading x (tan ϕ x 0.2%)
C: one year accuracy = 0.1% of input power reading x 0.5

$$\tan \emptyset = \frac{\sqrt{1 - PF^2}}{PF}$$

For example: WT310/WT330
Ue = A+B
A: measuring instrument accuracy = 0.1% of input power reading + 0.1 % of input power range x PF
B: influence of power factor = input power reading x (tan ϕ x 0.2%)

$$\tan \emptyset = \frac{\sqrt{1 - PF^2}}{PF}$$

Input power range = voltage range x current range of power meter.

Measurement of output power shall be calculated or measured power due to the measuring instrument has an uncertainty at the 95 % confidence level of
(1) ≤ 2 % for powers of 0.5 W or greater;
(2) ≤ 0.01W for powers of less than 0.5 W.

EFFICIENCY CALCULATION

Efficiency shall be calculated by dividing the UUT's measured active output power at a given load condition by the active ac input power measured at that load condition. Average efficiency shall also be calculated and reported as the arithmetic mean of the efficiency values calculated at Load Conditions 1, 2, 3, and 4 in Table 1. This is a simple arithmetic average of active mode efficiency values, and is not intended to represent weighted average efficiency, which would vary according to the duty cycle of the product powered by the UUT.

POWER CONSUMPTION CALCULATION

Power consumption of the UUT at each Load Condition 1 – 4 is the difference between the active output power (W) at that Load Condition and the ac active input power (W) at that Load Condition. The power consumption of Load Condition 5 (no load) is equal to the ac active input power (W) at that Load Condition.

TECHNICIAN'S REFERENCE PAGE (Cont'd)

INSTRUCTIONS – TEST PREPARATION AND LOADING
There shall be no intentional cooling of the UUT such as by use of separately powered fans, air conditioners, or heat sinks. The UUT shall be conditioned, rested, and tested on a thermally non-conductive surface. A readily available material such as Styrofoam will be sufficient.

Any built-in switch in the UUT controlling power flow to the AC input must be in the "on" position for this measurement.

Test power supplies packaged for consumer use to power a product with the DC output cord supplied by the manufacturer. There are two options for connecting metering equipment to the output of this type of power supply: Cut the cord immediately adjacent to the DC output connector, or attach leads and measure the efficiency from the output connector itself.

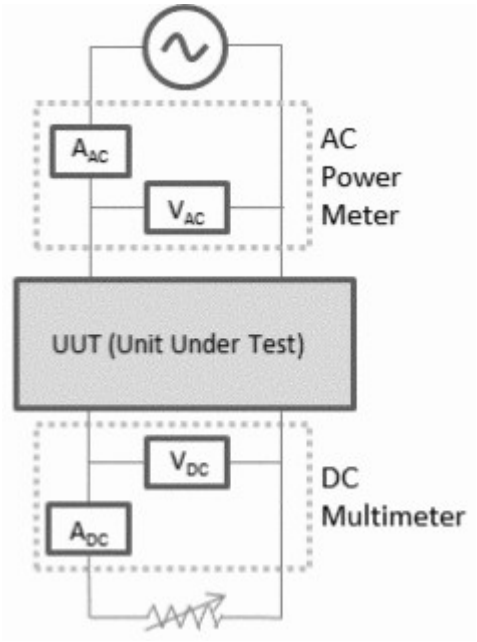
If the power supply is attached directly to the product that it is powering, cut the cord immediately adjacent to the powered product and connect DC measurement probes at that point. Any additional metering equipment such as voltmeters and/or ammeters used in conjunction with resistive or electronic loads must be connected directly to the end of the output cable of the UUT.

If the product has more than two output wires, including those that are necessary for controlling the product, the manufacturer must supply a connection diagram or test fixture that will allow the testing laboratory to put the unit under test into active-mode. Figure 1 provides one illustration of how to set up an EPS for test.

In order to load the power supply to produce all four active-mode load conditions, use a set of variable resistive or electronic loads. Although these loads may have different characteristics than the electronic loads power supplies are intended to power, they provide standardized and readily repeatable references for testing and product comparison.

Note that resistive loads need not be measured precisely with an ohmmeter; simply adjust a variable resistor to the point where the ammeter confirms that the desired percentage of nameplate output current is flowing. For electronic loads, adjust the desired output current in constant current (CC) mode rather than adjusting the required output power in constant power (CP) mode.

Figure 1 – Example connection diagram for EPS efficiency measurement.



Tested by: _____ Tested by: _____ Test Date: _____
signature print

Sample # : _____ Instrument Code / Range: _____

ACTIVE/NO-LOAD MODE POWER CONSUMPTION TEST:

TESTING SEQUENCE:
The UUT shall be tested at each load condition specified in Table 1, testing consecutively from Load Condition 1 to 5. The UUT shall be operated at 100% of nameplate current output (Load Condition 1) for at least 30 minutes immediately prior to conducting efficiency measurements.

For the agencies other than NRCan, after this warm-up period, the technician shall monitor AC input power for a period of 5 minutes to assess the stability of the UUT. If the power level does not drift by more than 5% from the maximum value observed, the UUT can be considered stable and the measurements can be recorded at the end of the 5 minute period. Subsequent load conditions (see Table 1) can then be measured under the same 5 minute stability guidelines. Note that only one warm-up period of 30 minutes is required for each UUT at the beginning of the test procedure.

If AC input power is not stable over a 5 minute period, the technician shall follow the guidelines established by IEC 62301[(1)] for measuring average power or accumulated energy over time for both ac input and dc output. Specifically in EU Directive for ErP, the stability shall be determined in accordance with EN 50564:2011, 5.3.
Efficiency measurements shall be conducted in sequence from Load Condition 1 to Load Condition 5 as indicated in Table 1. If testing of additional, optional load conditions is desired, that testing should be conducted in accordance with this test procedure and subsequent to completing the sequence described above.

For NRCan, the UUT shall be operated for 30 minutes at each load condition prior to measurement. The input and output power shall be measured using the Accumulated Energy Approach specified in CAN/CSA 62301 clause 5.3.2 b) for at least 5 minutes. No load power shall be recorded for Load Condition 5.
NOTE: To ensure consistent unit, it is recommended that watt-hours and hours be used above, to give watts.

For Australia/New Zealand requirements, if the power supply nameplate input voltage is 240V only, conduct the testing at 240V ac, 50Hz and record in the 230V ac tables for ACTIVE/NO-LOAD MODE POWER CONSUMPTION TEST. The testing voltage, 240V ac, 50 Hz shall be recorded.

The above testing sequence shall be repeated on three UUT in total of the same model.

Test switch-selectable single-voltage external power supplies twice, once at the highest nameplate output voltage and once at the lowest.

Test adaptive external power supplies twice, once at the highest achievable output voltage and once at the lowest.

(1) Same as AS/NZS 62301.

Tested by: _____ Tested by: _____ Test date: _____
signature print

Sample # : _____ Instrument Code / Range: _____

ACTIVE/NO-LOAD MODE POWER CONSUMPTION TEST: (Cont'd)

Table 1 – Load Conditions

Load Conditions for UUT	Percentage of Nameplate Output Current
1	100% ± 2%(2)
2	75% ± 2%
3	50% ± 2%
4	25% ± 2%
5	0%

Note(s):
1. (2) The 2% allowance is of nameplate output current, not of the calculated current value.
2. For example, a UUT at Load Condition 3 may be tested in a range from 48% (min) to 52% (max) of rated output current.
3. It is mandatory for CoC. The UUT shall be considered 10% ± 2% of nameplate output current after load condition 4, warm up period is 0 minute and 5 minutes is for assessment period, and then continue load condition 5.

Comments:
1. If test has not been performed in accordance with requirements in NRCan: Amendment 11 to the Energy Efficiency Regulations for External Power Supplies, published on October 12, 2011 in the Canada Gazette, Part II; technician shall fill all cells related to NRCan results with "-" or leave them "blank".

2. If test has been performed in accordance with requirements in NRCan program only, technician shall fill all cells related to results for all other Agencies other than NRCan with "-"or leave them "blank".

3. If instantaneous power measurement is acceptable, technician record the instantaneous power measurement under the column "**Avg. Power (W)" and then shall fill cells of columns "Wh" and "Wh Interval" with "-"or leave them "blank.

Tested by: _____ Tested by: _____ Test date: 2017-08-04

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Sample # : 1 Instrument Code / Range: _____

ACTIVE/NO-LOAD MODE POWER CONSUMPTION TEST: (Cont'd)

RESULTS FOR SAMPLE 1:

Ambient Temperature (°C): 23.7 **Relative Humidity (%):** 49.0 **Airspeed, room (m/s) :** <0.5
Input Test Voltage (V ac): 115 **Input Test Frequency (Hz):** 60 **Rated Output Current (A):** 15

	External Power Supply Input Electric Data												Power Supply Output Electric Data			
Load	V	HZ	A	PF	THD	Wh	**Avg. Power (W)	Wh Interval [min]	***Ue	Minimum Warm-up time [minutes]	Stability Assessment %	*Measurement method used	Slope value (mW/h)	V	A	Wh	**Avg. Power (W)
1 (100%)	115.0850	59.9982	1.7541	0.9908	0.1106	16.7140	200.0060	5	0.2811	30 (All)	0.0460	Accumulated Energy	-	11.7835	14.9855	14.7534	176.5931
2 (75%)	115.1800	59.9983	1.3157	0.9871	0.1092	12.5040	149.5522	5	0.2100	0 (others)	0.0207	Accumulated Energy	-	11.9387	11.2446	11.2160	134.1466
	115.1800	59.9983	1.3157	0.9871	0.1092	12.5040	149.5522	5	-	30 (NRCan)	0.0207	Accumulated Energy	-	11.9387	11.2446	11.2160	134.1466
3 (50%)	115.2720	59.9983	0.8857	0.9790	0.0997	8.3441	99.9258	5	0.1414	0 (others)	0.0472	Accumulated Energy	-	12.0647	7.5009	7.5557	90.3973
	115.2720	59.9983	0.8857	0.9790	0.0997	8.3441	99.9258	5	-	30 (NRCan)	0.0472	Accumulated Energy	-	12.0647	7.5009	7.5557	90.3973
4 (25%)	115.3680	59.9982	0.4667	0.9548	0.0899	4.2906	51.3956	5	0.0727	0 (others)	0.0971	Accumulated Energy	-	12.1785	3.7535	3.8216	45.6914
	115.3680	59.9982	0.4667	0.9548	0.0899	4.2906	51.3956	5	-	30 (NRCan)	0.0971	Accumulated Energy	-	12.1785	3.7535	3.8216	45.6914
Optional (10%)	115.3790	59.9982	0.2198	0.8745	0.0872	1.8525	22.1652	5	0.0310	0 (others)	0.1141	Accumulated Energy	-	12.2175	1.5069	1.5355	18.3987
	115.3790	59.9982	0.2198	0.8745	0.0872	1.8525	22.1652	5	-	30 (NRCan)	0.1141	Accumulated Energy	-	12.2175	1.5069	1.5355	18.3987
5 (0%)	115.4680	59.9982	0.0243	0.0642	0.0461	-	0.0892	30	0.0002	0 (others)	438.3707	Sampling	2.3000				
	115.4680	59.9982	0.0243	0.0642	0.0461	-	0.0892	30	-	30 (NRCan)	438.3707	Sampling	2.3000				

Other than NRCan - Efficiency of Power Supply (after 5 min warm-up)						NRCan - Average results Efficiency of Power Supply (after 30 min warm-up)					
100%	75%	50%	25%	10%	Arithmetic Average of Efficiency at load 1 ~ 4	100%	75%	50%	25%	10%	Arithmetic Average of Efficiency at load 1 ~ 4
88.29391	89.69887	90.46442	88.9013	83.00707	89.33962513	88.29390919	89.69886709	90.46442453	88.9013	83.00707	89.33962513

Other than NRCan - Power Consumed by UUT (W)						NRCan - Power Consumed by UUT (W)					
100%	75%	50%	25%	10%	No Load	100%	75%	50%	25%	10%	No Load
23.41288	15.40557	9.528495	5.704249	3.76651	0.089246102	23.41288	15.40557	9.528495	5.704248814	3.766509609	0.089246102

* The measurement methods are defined in 5.3.2 or 5.3.3 of the standards, EN 50564:2011 and IEC62301:2011.

** The average power is calculated by the following equation: Avg. Power (Watts) = [Wh X 60 minutes / hours] / Wh Interval (minutes)

*** The calculated measurement uncertainty (Ue) is defined in Annex D and complied with 4.4.1 in IEC62301:2011 and EN 50564:2011.

Tested by: _____ Tested by: _____ Test date: 2017-08-04

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Sample # : 2 Instrument Code / Range: _____

ACTIVE/NO-LOAD MODE POWER CONSUMPTION TEST: (Cont'd)

RESULTS FOR SAMPLE 2:

Ambient Temperature (°C): 23.7 **Relative Humidity (%):** 49.0 **Airspeed, room (m/s) :** <0.5
Input Test Voltage (V ac): 115 **Input Test Frequency (Hz):** 60 **Rated Output Current (A):** 15

	External Power Supply Input Electric Data												Power Supply Output Electric Data			
Load	V	HZ	A	PF	THD	Wh	**Avg. Power (W)	Wh Interval [min]	***Ue	Minimum Warm-up time [minutes]	Stability Assessment %	*Measurement method used	Slope value (mW/h)	V	A	Wh	**Avg. Power (W)
1 (100%)	115.1000	59.9983	1.7607	0.9912	0.1080	16.7708	200.8992	5	0.2811	30 (All)	0.0418	Accumulated Energy	-	11.8364	14.9857	14.8226	177.3452
2 (75%)	115.1860	59.9982	1.3198	0.9876	0.1122	12.5469	150.1068	5	0.2100	0 (others)	0.0246	Accumulated Energy	-	11.9764	11.2442	11.2454	134.5713
	115.1860	59.9982	1.3198	0.9876	0.1122	12.5469	150.1068	5	-	30 (NRCan)	0.0246	Accumulated Energy	-	11.9764	11.2442	11.2454	134.5713
3 (50%)	115.2780	59.9981	0.8876	0.9797	0.1007	8.3611	100.2294	5	0.1414	0 (others)	0.0479	Accumulated Energy	-	12.0974	7.4995	7.5794	90.6764
	115.2780	59.9981	0.8876	0.9797	0.1007	8.3611	100.2294	5	-	30 (NRCan)	0.0479	Accumulated Energy	-	12.0974	7.4995	7.5794	90.6764
4 (25%)	115.3660	59.9982	0.4677	0.9558	0.0917	4.3083	51.5473	5	0.0727	0 (others)	0.0880	Accumulated Energy	-	12.1989	3.7531	3.8327	45.8253
	115.3660	59.9982	0.4677	0.9558	0.0917	4.3083	51.5473	5	-	30 (NRCan)	0.0880	Accumulated Energy	-	12.1989	3.7531	3.8327	45.8253
Optional (10%)	115.3820	59.9983	0.2209	0.8733	0.0903	1.8597	22.2464	5	0.0310	0 (others)	0.1101	Accumulated Energy	-	12.2557	1.5084	1.5438	18.4732
	115.3820	59.9983	0.2209	0.8733	0.0903	1.8597	22.2464	5	-	30 (NRCan)	0.1101	Accumulated Energy	-	12.2557	1.5084	1.5438	18.4732
5 (0%)	115.4660	59.9983	0.0220	0.0095	0.0461	-	0.1104	16.7	0.0002	0 (others)	319.4867	Sampling	1.6052				
	115.4660	59.9983	0.0220	0.0095	0.0461	-	0.1104	16.7	-	30 (NRCan)	319.4867	Sampling	1.6052				

Other than NRCan - Efficiency of Power Supply (after 5 min warm-up)						NRCan - Average results Efficiency of Power Supply (after 30 min warm-up)					
100%	75%	50%	25%	10%	Arithmetic Average of Efficiency at load 1 ~ 4	100%	75%	50%	25%	10%	Arithmetic Average of Efficiency at load 1 ~ 4
88.27573	89.65041	90.46882	88.8995	83.03892	89.32361297	88.27573079	89.65040857	90.46881618	88.8995	83.03892	89.32361297

Other than NRCan - Power Consumed by UUT (W)						NRCan - Power Consumed by UUT (W)					
100%	75%	50%	25%	10%	No Load	100%	75%	50%	25%	10%	No Load
23.55396	15.53544	9.553052	5.722007	3.773227	0.110380566	23.55396	15.53544	9.553052	5.722007128	3.773227255	0.110380566

* The measurement methods are defined in 5.3.2 or 5.3.3 of the standards, EN 50564:2011 and IEC62301:2011.

** The average power is calculated by the following equation: Avg. Power (Watts) = [Wh X 60 minutes / hours] / Wh Interval (minutes)

*** The calculated measurement uncertainty (Ue) is defined in Annex D and complied with 4.4.1 in IEC62301:2011 and EN 50564:2011.

Tested by: _____ Tested by: _____ Test Date: 2017-08-04

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Sample # : 3 Instrument Code / Range: _____

ACTIVE/NO-LOAD MODE POWER CONSUMPTION TEST: (Cont'd)

RESULTS FOR SAMPLE 3:

Ambient Temperature (°C): 23.7 **Relative Humidity (%):** 49.0 **Airspeed, room (m/s) :** <0.5
Input Test Voltage (V ac): 115 **Input Test Frequency (Hz):** 60 **Rated Output Current (A):** 15

	External Power Supply Input Electric Data												Power Supply Output Electric Data			
Load	V	HZ	A	PF	THD	Wh	**Avg. Power (W)	Wh Interval [min]	***Ue	Minimum Warm-up time [minutes]	Stability Assessment %	*Measurement method used	Slope value (mW/h)	V	A	Wh	**Avg. Power (W)
1 (100%)	115.0990	59.9982	1.7509	0.9911	0.1188	16.6697	199.7235	5	0.2811	30 (All)	0.0420	Accumulated Energy	-	11.7915	14.9855	14.7398	176.6320
2 (75%)	115.1890	59.9981	1.3130	0.9875	0.1102	12.4813	149.3377	5	0.2100	0 (others)	0.0201	Accumulated Energy	-	11.9324	11.2453	11.2077	134.1239
	115.1890	59.9981	1.3130	0.9875	0.1102	12.4813	149.3377	5	-	30 (NRCan)	0.0201	Accumulated Energy	-	11.9324	11.2453	11.2077	134.1239
3 (50%)	115.2820	59.9983	0.8833	0.9796	0.0979	8.3362	99.7145	5	0.1414	0 (others)	0.0509	Accumulated Energy	-	12.0599	7.5007	7.5564	90.4157
	115.2820	59.9983	0.8833	0.9796	0.0979	8.3362	99.7145	5	-	30 (NRCan)	0.0509	Accumulated Energy	-	12.0599	7.5007	7.5564	90.4157
4 (25%)	115.3680	59.9984	0.4651	0.9558	0.0941	4.2847	51.2726	5	0.0727	0 (others)	0.0932	Accumulated Energy	-	12.1665	3.7552	3.8190	45.6731
	115.3680	59.9984	0.4651	0.9558	0.0941	4.2847	51.2726	5	-	30 (NRCan)	0.0932	Accumulated Energy	-	12.1665	3.7552	3.8190	45.6731
Optional (10%)	115.3820	59.9982	0.2185	0.8759	0.0880	1.8448	22.0619	5	0.0310	0 (others)	0.1137	Accumulated Energy	-	12.2142	1.5060	1.5365	18.3830
	115.3820	59.9982	0.2185	0.8759	0.0880	1.8448	22.0619	5	-	30 (NRCan)	0.1137	Accumulated Energy	-	12.2142	1.5060	1.5365	18.3830
5 (0%)	115.4650	59.9983	0.0221	0.0079	0.0481	-	0.1205	56.7	0.0002	0 (others)	368.4261	Sampling	9.3737				
	115.4650	59.9983	0.0221	0.0079	0.0481	-	0.1205	56.7	-	30 (NRCan)	368.4261	Sampling	9.3737				

Other than NRCan - Efficiency of Power Supply (after 5 min warm-up)						NRCan - Average results Efficiency of Power Supply (after 30 min warm-up)					
100%	75%	50%	25%	10%	Arithmetic Average of Efficiency at load 1 ~ 4	100%	75%	50%	25%	10%	Arithmetic Average of Efficiency at load 1 ~ 4
88.43828	89.81248	90.67463	89.07896	83.32456	89.50108957		89.81248354	90.6746275	89.07896	83.32456	

Other than NRCan - Power Consumed by UUT (W)						NRCan - Power Consumed by UUT (W)					
100%	75%	50%	25%	10%	No Load	100%	75%	50%	25%	10%	No Load
23.09146	15.2138	9.298746	5.599496	3.678917	0.120457608	23.09146	15.2138	9.298746	5.599496479	3.678916639	0.120457608

* The measurement methods are defined in 5.3.2 or 5.3.3 of the standards, EN 50564:2011 and IEC62301:2011.

** The average power is calculated by the following equation: Avg. Power (Watts) = [Wh X 60 minutes / hours] / Wh Interval (minutes)

*** The calculated measurement uncertainty (Ue) is defined in Annex D and complied with 4.4.1 in IEC62301:2011 and EN 50564:2011.

Tested by: _____ Tested by: _____ Test Date: 2017-08-04

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Sample # : 1 Instrument Code / Range: _____

ACTIVE/NO-LOAD MODE POWER CONSUMPTION TEST: (Cont'd)

RESULTS FOR SAMPLE 1:

Ambient Temperature (°C): 23.7 **Relative Humidity (%):** 49.0 **Airspeed, room (m/s) :** <0.5
Input Test Voltage (V ac): 230 **Input Test Frequency (Hz):** 50 **Rated Output Current (A):** 15

	External Power Supply Input Electric Data												Power Supply Output Electric Data			
Load	V	HZ	A	PF	THD	Wh	**Avg. Power (W)	Wh Interval [min]	***Ue	Minimum Warm-up time [minutes]	Stability Assessment %	*Measurement method used	Slope value (mW/h)	V	A	Wh	**Avg. Power (W)
1 (100%)	230.0380	49.9981	0.8896	0.9635	0.2095	16.4603	197.1907	5	0.2789	30	0.0502	Accumulated Energy	-	11.7780	14.9823	14.7516	176.4596
2 (75%)	230.1670	49.9982	0.6778	0.9489	0.2118	12.3719	147.9767	5	0.2096	0	0.0473	Accumulated Energy	-	11.9196	11.2438	11.2011	133.9840
3 (50%)	230.2990	49.9981	0.4729	0.9128	0.2233	8.3087	99.3700	5	0.1407	0	0.0745	Accumulated Energy	-	12.0572	7.4982	7.5457	90.3686
4 (25%)	230.3810	49.9982	0.2780	0.7894	0.2288	4.2230	50.5226	5	0.0707	0	0.0760	Accumulated Energy	-	12.1684	3.7537	3.8156	45.6259
Optional (10%)	230.4720	49.9980	0.1356	0.6912	0.1476	1.8036	21.5760	5	0.0301	0	0.1802	Accumulated Energy	-	12.2137	1.5068	1.5361	18.3771
5 (0%)	230.5520	49.9980	0.0372	0.0130	0.0441	-	0.0364	16.7	0.0004	0	887.8530	Sampling	3.9197				

Other than NRCan - Efficiency of Power Supply (after 5 min warm-up)					
100%	75%	50%	25%	10%	Arithmetic Average of Efficiency at load 1 ~ 4
89.48676	90.54398	90.94158	90.30786	85.17413	90.32004782

Other than NRCan - Power Consumed by UUT (W)					
100%	75%	50%	25%	10%	No Load
20.73113	13.9927	9.001345	4.896718	3.198823	0.03644567

* The measurement methods are defined in 5.3.2 or 5.3.3 of the standards, EN 50564:2011 and IEC62301:2011.

** The average power is calculated by the following equation: Avg. Power (Watts) = [Wh X 60 minutes / hours] / Wh Interval (minutes)

*** The calculated measurement uncertainty (Ue) is defined in Annex D and complied with 4.4.1 in IEC62301:2011 and EN 50564:2011.

Tested by: _____ Tested by: _____ Test Date: 2017-08-04

signature print

Sample # : 2 Instrument Code / Range: _____

ACTIVE/NO-LOAD MODE POWER CONSUMPTION TEST: (Cont'd)

RESULTS FOR SAMPLE 2:

Ambient Temperature (°C): 23.7 **Relative Humidity (%):** 49.0 **Airspeed, room (m/s) :** <0.5
Input Test Voltage (V ac): 230 **Input Test Frequency (Hz):** 50 **Rated Output Current (A):** 15

	External Power Supply Input Electric Data													Power Supply Output Electric Data			
Load	V	HZ	A	PF	THD	Wh	**Avg. Power (W)	Wh Interval [min]	***Ue	Minimum Warm-up time [minutes]	Stability Assessment %	*Measurement method used	Slope value (mW/h)	V	A	Wh	**Avg. Power (W)
1 (100%)	230.037	49.9982	0.891281	0.964314	0.213031	16.5257	197.6761	5	0.2789	30	0.046531797	Accumulated Enerdy	-	11.8128	14.9855	14.7845	177.0834
2 (75%)	230.166	49.9983	0.679559	0.949934	0.209714	12.4162	148.5241	5	0.2096	0	0.036348937	Accumulated Enerdy	-	11.9593	11.2442	11.231	134.395
3 (50%)	230.298	49.9983	0.472916	0.915684	0.215064	8.33573	99.7048	5	0.1407	0	0.060568124	Accumulated Enerdy	-	12.0917	7.50115	7.57041	90.57573
4 (25%)	230.378	49.9981	0.278362	0.791603	0.225275	4.23453	50.75189	5	0.0707	0	0.06364322	Accumulated Enerdy	-	12.1984	3.75537	3.8276	45.79362
Optional (10%)	230.475	49.9981	0.13786	0.680979	0.148085	1.80733	21.61847	5	0.0301	0	0.164621253	Accumulated Enerdy	-	12.2533	1.50599	1.54225	18.45432
5 (0%)	230.545	49.9981	0.035985	0.003129	0.04687	-	0.048209	23.4	0.0004	0	860.9311591	Sampling	-				

Other than NRCan - Efficiency of Power Supply (after 5 min warm-up)					
100%	75%	50%	25%	10%	Arithmetic Average of Efficiency at load 1 ~ 4
89.58263	90.48699	90.8439	90.23036	85.36369	90.28596908

Other than NRCan - Power Consumed by UUT (W)					
100%	75%	50%	25%	10%	No Load
20.59265	14.12912	9.12907	4.958277	3.164146	0.048208663

* The measurement methods are defined in 5.3.2 or 5.3.3 of the standards, EN 50564:2011 and IEC62301:2011.

** The average power is calculated by the following equation: Avg. Power (Watts) = [Wh X 60 minutes / hours] / Wh Interval (minutes)

*** The calculated measurement uncertainty (Ue) is defined in Annex D and complied with 4.4.1 in IEC62301:2011 and EN 50564:2011.

Tested by: _____ Tested by: _____ Test Date: 2017-08-04

signature print

Sample # : 3 Instrument Code / Range: _____

ACTIVE/NO-LOAD MODE POWER CONSUMPTION TEST: (Cont'd)

RESULTS FOR SAMPLE 3:

Ambient Temperature (°C): 23.7 **Relative Humidity (%):** 49.0 **Airspeed, room (m/s) :** <0.5
Input Test Voltage (V ac): 230 **Input Test Frequency (Hz):** 50 **Rated Output Current (A):** 15

	External Power Supply Input Electric Data													Power Supply Output Electric Data			
Load	V	HZ	A	PF	THD	Wh	**Avg. Power (W)	Wh Interval [min]	***Ue	Minimum Warm-up time [minutes]	Stability Assessment %	*Measurement method used	Slope value (mW/h)	V	A	Wh	**Avg. Power (W)
1 (100%)	230.0340	49.9982	0.8878	0.9642	0.2120	16.4549	196.8909	5	0.2789	30	0.0462	Accumulated Energy	-	11.7816	14.9863	14.7580	176.5123
2 (75%)	230.1650	49.9982	0.6763	0.9498	0.2053	12.3564	147.7976	5	0.2096	0	0.0440	Accumulated Energy	-	11.9243	11.2436	11.2051	134.0743
3 (50%)	230.1920	49.9983	0.4725	0.9124	0.2325	8.2930	99.2101	5	0.1407	0	0.0330	Accumulated Energy	-	12.0508	7.5006	7.5510	90.3485
4 (25%)	230.3750	49.9981	0.2771	0.7903	0.2216	4.2141	50.4258	5	0.0707	0	0.0656	Accumulated Energy	-	12.1616	3.7535	3.8171	45.6540
Optional (10%)	230.4690	49.9982	0.1345	0.6936	0.1424	1.7966	21.4772	5	0.0301	0	0.2183	Accumulated Energy	-	12.2031	1.5057	1.5356	18.3720
5 (0%)	230.5590	49.9981	0.0362	0.0030	0.0496	-	0.0472	23.4	0.0004	0	925.8041	Sampling	5.2441				

Other than NRCan - Efficiency of Power Supply (after 5 min warm-up)					
100%	75%	50%	25%	10%	Arithmetic Average of Efficiency at load 1 ~ 4
89.64981	90.71479	91.06787	90.5369	85.54192	90.49234296

Other than NRCan - Power Consumed by UUT (W)					
100%	75%	50%	25%	10%	No Load
20.37858	13.72332	8.861571	4.771844	3.105196	0.047243309

* The measurement methods are defined in 5.3.2 or 5.3.3 of the standards, EN 50564:2011 and IEC62301:2011.

** The average power is calculated by the following equation: Avg. Power (Watts) = [Wh X 60 minutes / hours] / Wh Interval (minutes)

*** The calculated measurement uncertainty (Ue) is defined in Annex D and complied with 4.4.1 in IEC62301:2011 and EN 50564:2011.

WORKSHEETS

The measured is the following:

		☒ ~~115V, 60Hz #~~	☐ 115V, 60Hz ##	☐ 230V, 50Hz	☐ 115/230V, 50/60Hz	☒ ~~Other: V, Hz~~
Minimum Average Efficiency in Active Mode	Input Voltage (V ac):					
	Sample No.:	--	2	2	2	--
	Efficiency (%):	--	89.3236	90.2860	89.3236	--
Minimum 10% Load Average Efficiency in Active Mode	Sample No.:	--	1	1	1	--
	Efficiency (%):	--	83.0071	85.1741	83.0071	--
Maximum Power In No-Load Condition	Sample No.:	--	3	2	3	--
	Power (W) :	--	0.1205	0.0482	0.1205	--

Note:

☐ # - The measurement is performed by the test method of CSA C381.1-08 only.

☒ ## - The measurement is performed by the test methods other than CSA C381.1-08.

☒ For NRCan testing, according to guidance form the letter to CB for EPS testing 4-16-12, the test procedure is following "Test Method for Calculating the Energy Efficiency of Single-Voltage External Ac-Dc and Ac-Ac Power Supplies,'' August 11, 2004, in APPENDIX Z to SUBPART B of PART 430 instead of CSA C381.1-08. The results are more than .8 (>) above the minimum efficiency standard.

International Efficiency Marking Protocol (IEMP) for External Power Supplies:

Base on Table 2, this EPS is complied with the requirements for level: VI at 115V ac; level: VI at 230V ac;
The calculated Minimum Average Efficiency in Active Mode is: 0.88 (88.00 %) at 115V ac; 0.88 (88.00 %) at 230V ac and Maximum Energy Consumption in No-Load Mode is not greater than 0.21 Watt at 115V ac; 0.21 Watt at 230V ac.
☒ The true power factor was 0.9 or greater at 100% of rated load when tested at 115V, 60Hz. This requirement applies only to Level V power supplies with input power greater than or equal to 100W at 115V, 60Hz.

Canada NRCan Energy Efficiency Requirements: (at 115V ac, 60Hz)

Base on Table 2, the calculated Minimum Average Efficiency in Active Mode is: 0.85 (85.00 %), and Maximum Energy Consumption in No-Load Mode is not greater than 0.5 Watt.
This ☒ complies ☐ does not comply with requirements in:

Amendment 11 to the Energy Efficiency Regulations for External Power Supplies, published on October 12, 2011 in the Canada Gazette, Part II

CEC Requirements for Class A external power supply: (at 115V ac, 60Hz)

Base on Table 2, the calculated Minimum Average Efficiency in Active Mode is: 0.85 (85.00 %), and Maximum Energy Consumption in No-Load Mode is not greater than 0.5 Watt.
This ☒ complies ☐ does not comply with requirements in:

Appliance Efficiency Regulations (California Code of Regulations, Title 20, Sections 1601 through 1608) dated July 2015

WORKSHEETS (CONT'D)

US DoE Requirements for external power supply: (at 115V ac, 60Hz)

Base on Table 2, the calculated Minimum Average Efficiency in Active Mode is: 0.88 (88.00 %), and Maximum Energy Consumption in No-Load Mode is not greater than 0.21 Watt.
This ☒ complies ☐ does not comply with requirements in:
Office of Energy Efficiency and Renewable Energy 10 CFR Parts 429 and 430

Australian and New Zealand: (at 230V ac or 240V ac, 50Hz)

Base on Table 2, the calculated Minimum Average Efficiency in Active Mode is: 0.87 (87.00 %), and Maximum Energy Consumption in No-Load Mode is not greater than 0.5 Watt.
This ☒ complies ☐ does not comply with performance mark ☐ III; ☐ IV; ☒ V requirements in:
Australian Greenhouse and Energy Minimum Standards (External Power Supplies) Determination 2014 and New Zealand Energy Efficiency (Energy Using Products) Regulations 2002

Note:
For **Australian**, according to Clause 8(1)(b) in Greenhouse and Energy Minimum Standards (External Power Supplies) Determination 2014, if a product exceeds the energy performance requirements for Mark V as mentioned in Appendix A of AS/NZS 4665.1:2005 and meets the performance requirements for Mark VI mentioned in the IEMP then the product may be labelled in accordance with the requirements for:
(i) Mark V mentioned in Appendix A of AS/NZS 4665.1:2005 and sections 4.2 and 5 of AS/NZS 4665.2:2005 (Energy Performance Mark); or (ii) Mark VI mentioned in the IEMP.

European Union (EU) Energy-related Products (ErP): (at 230V ac, 50Hz)

Base on Table 3, 4 and 5, the calculated Minimum Average Efficiency in Active Mode is: 0.87 (87.00 %), and Maximum Energy Consumption in No-Load Mode is not greater than 0.5 Watt.
This ☒ complies ☐ does not comply with requirements for **EU Directive for Energy-related Products 2009/125/EC and Implementing Measure no. EC 278/2009 for External Power Supply.**

European Union (EU) Code of Conduct: (at 230V ac, 50Hz)

Base on Table 6, 7, 8, 9, and 10, the calculated Minimum Average Efficiency in Active Mode is: 0.89 (89.00 %), at 10% Load is: 0.79 (79.00 %), and Maximum Energy Consumption in No-Load Mode is not greater than 0.15 Watt.
This ☒ complies ☐ does not comply with requirements for **Code of Conduct on Energy Efficiency of External Power Supplies, Version 5**.

MEXICO CONUEE and PROFECO: Energy Consumption Information

1) Energy consumption by unit of time under normal operating conditions of the equipment or appliance [1]: _____ Wh.
If applicable[2]:
2) Consumption of energy in idle mode in unit of time of the equipment or appliance [3]: _____ Wh.

Notes:
(1) This is the consumption under full charge conditions and for a 1 hour period of time. The consumption must be indicated in the following units: kW-h/year, kW-h /month W-h /day.
(2) In accordance with Article 26, section II, of the Regulation of the Law for the Sustainable Use of Energy, if applicable, it must indicate the consumption of energy in idle mode by unit of time. If not applicable, write "not applicable."
(3) This is the passive electric energy consumption, when the appliance or equipment is connected to the electrical power circuit, even when the equipment is off, and not performing its main function. The consumption must be indicated in the following units: kW-h/year, kW-h /month W-h /day.
(4). The energy consumption for a hour (Wh) is calculated by the following equation:
The Maximum Avg. Power (Watts) at 100% load x 1 hour (h).

Table 2: International Efficiency Marking Protocol for External Power Supplies, Version 3.0

Mark	Performance Requirements				
	Nameplate Output Power (P_{no})[2]	No-Load Mode Power[3]	Nameplate Output Power (P_{no})	Average Efficiency in Active Mode[4]	Power Factor
I	Used if none of the other criteria are met.				
II	0 to ≤ 10 W	≤ 0.75	0 to < 1 W	≥ 0.39 * P_{no}	Not Applicable
	> 10 to 250 W	≤ 1.0	1 to < 49 W	≥ 0.107 * ln(P_{no}) + 0.39	
			> 49 W	≥ 0.82	
III	0 to < 10 W	≤ 0.5	0 to 1 W	≥ 0.49 * P_{no}	Not Applicable
	10 to 250 W	≤ 0.75	> 1 to 49 W	≥ 0.09 * ln(P_{no}) + 0.49	
			> 49 to 250 W	≥ 0.84	
IV	0 to 250 W	≤ 0.5	0 to < 1 W	≥ 0.5 * P_{no}	Not Applicable
			1 to 51 W	≥ 0.09 * ln(P_{no}) + 0.5	
			> 51 to 250 W	≥ 0.85	
V	0 to < 50 W	AC-DC: ≤ 0.3 AC-AC: ≤ 0.5	0 to ≤ 1 W	Basic Voltage: ≥ 0.480 * P_{no} + 0.140 Low Voltage[5]: ≥ 0.497 * P_{no} + 0.067	EPSs with ≥ 100 watts **input** power must have a true power factor ≥ 0.9 at 100% of rated load when tested at 115 volts/60Hz.
			> 1 to ≤ 49 W	Basic Voltage: ≥ 0.0626 * ln(P_{no}) + 0.622 Low Voltage: ≥ 0.0750 * ln(P_{no}) + 0.561	
	≥ 50 to ≤ 250 W	≤ 0.5	> 49 to 250 W	Basic Voltage: ≥ 0.870 Low Voltage: ≥ 0.860	
VI	Single-Voltage				Not Applicable
	0 to ≤ 49 W	AC-DC: ≤ 0.100 AC-AC: ≤ 0.210	0 to ≤ 1 W	Basic Voltage: ≥ 0.5 * P_{no} + 0.16 Low Voltage: ≥ 0.517 * P_{no} + 0.087	
			> 1 to ≤ 49 W	Basic Voltage: ≥ 0.071 * ln(P_{no}) – 0.0014 * P_{no} + 0.67 Low Voltage: ≥ 0.0834 * ln(P_{no}) – 0.0014 * P_{no} + 0.609	
	> 49 to ≤ 250 W	≤ 0.210	> 49 to ≤ 250 W	Basic Voltage: ≥ 0.880 Low Voltage: ≥ 0.870	
	> 250 W	≤ 0.500	> 250 W	≥ 0.875	
	Multiple-Voltage				
	Any	≤ 0.300	0 to ≤ 1 W	≥ 0.497 * P_{no} + 0.067	
			> 1 to ≤ 49 W	≥ 0.075 * ln(P_{no}) + 0.561	
			> 49 W	≥ 0.860	
VII	Reserved for future use.				

[2] P_{no} is the Nameplate Output Power of the unit under test.
[3] In Australia and New Zealand, AC-AC external power supplies are not required to meet the no-load mode power requirements.
[4] "ln" refers to the natural logarithm.
[5] A low-voltage model is an EPS with nameplate output voltage of less than 6 volts and nameplate output current greater than or equal to 550 milliamperes. A basic-voltage model is an EPS that is not a low-voltage model.

Table 3: ErP Energy-Efficiency Criteria for AC-AC and AC-DC EPS in Active Mode: Standard Models

Nameplate Output Power (P_o)	Minimum Average Efficiency in Active Mode (expressed as a decimal)
0 to ≤ 1 Watt	≥ 0.480 * P_o + 0.140
> 1 to ≤ 51 Watts	≥ [0.063 * Ln (P_o)] + 0.622
> 51 Watts	≥ 0.870
Note: All efficiency values shall be rounded to the hundredths place.	

Table 4: ErP Energy-Efficiency Criteria for AC-AC and AC-DC EPS in Active Mode: Low Voltage Models

Nameplate Output Power (P_o)	Minimum Average Efficiency in Active Mode (expressed as a decimal)
0 to ≤ 1 Watt	≥ 0.497 * P_o + 0.067
> 1 to ≤ 51 Watts	≥ [0.0750 * Ln (P_o)] + 0.561
> 51 Watts	≥ 0.860
Note: All efficiency values shall be rounded to the hundredths place.	

Table 5: ErP Power Consumption Criteria for No-Load

Nameplate Output Power (P_o)	Maximum Power in No-Load		
	Ac-Ac EPS	Ac-Dc EPS	Low Voltage EPS
0 to ≤ 51 watts	≤ 0.5 watts	≤ 0.3 watts	≤ 0.3 watts
> 51 watts	≤ 0.5 watts	≤ 0.5 watts	n/a

Table 6: CoC Energy-Efficiency Criteria for AC-AC and AC-DC EPS in Active Mode: Standard Models

Nameplate Output Power (P_{no})	Minimum Four Point Average Efficiency in Active Mode (expressed as a decimal)	
	Tier 1 – Jan 1st, 2014	Tier 2 – January 1st, 2016
0.3 to ≤ 1 Watt	≥ 0.500 * P_{no} + 0.146	≥ 0.500 * P_{no} + 0.169
> 1 to ≤ 49 Watts	≥ 0.0626 * Ln (P_{no}) + 0.646	≥ 0.071 * Ln (P_{no}) – 0.00115 * P_{no} + 0.670
> 49 to ≤ 250 Watts	≥ 0.890	≥ 0.890
Note: All efficiency values shall be rounded to the hundredths place.		

Table 7: CoC Energy-Efficiency Criteria for AC-AC and AC-DC EPS in Active Mode: Low Voltage Models

Nameplate Output Power (P_{no})	Minimum Four Point Average Efficiency in Active Mode (expressed as a decimal)	
	Tier 1 – Jan 1st, 2014	Tier 2 – January 1st, 2016
0.3 to ≤ 1 Watt	≥ 0.500 * P_{no} + 0.086	≥ 0.517 * P_{no} + 0.091
> 1 to ≤ 49 Watts	≥ 0.0755 * Ln (P_{no}) + 0.586	≥ 0.0834 * Ln (P_{no}) – 0.0011 * P_{no} + 0.609
> 49 to ≤ 250 Watts	≥ 0.880	≥ 0.880
Note: All efficiency values shall be rounded to the hundredths place.		

Table 8: CoC Energy-Efficiency Criteria for AC-AC and AC-DC EPS in Active Mode: Standard Models

Nameplate Output Power (P_{no})	Minimum 10% Load Average Efficiency in Active Mode (expressed as a decimal)	
	Tier 1 – Jan 1st, 2014	Tier 2 – January 1st, 2016
0.3 to ≤ 1 Watt	≥ 0.500 * P_{no} + 0.046	≥ 0.5 * P_{no} + 0.060
> 1 to ≤ 49 Watts	≥ 0.0626 * Ln (P_{no}) + 0.546	≥ 0.071 * Ln (P_{no}) – 0.00115 * P_{no} + 0.570
> 49 to ≤ 250 Watts	≥ 0.790	≥ 0.790
Note: All efficiency values shall be rounded to the hundredths place.		

Table 9: CoC Energy-Efficiency Criteria for AC-AC and AC-DC EPS in Active Mode: Low Voltage Models

Nameplate Output Power (P_{no})	Minimum 10% Load Average Efficiency in Active Mode (expressed as a decimal)	
	Tier 1 – Jan 1st, 2014	Tier 2 – January 1st, 2016
0.3 to ≤ 1 Watt	≥ 0.500 * P_{no}	≥ 0.517 * P_{no}
> 1 to ≤ 49 Watts	≥ 0.072 * Ln (P_{no}) + 0.500	≥ 0.0834 * Ln (P_{no}) – 0.00127 * P_{no} + 0.518
> 49 to ≤ 250 Watts	≥ 0.780	≥ 0.780
Note: All efficiency values shall be rounded to the hundredths place.		

Table 10: CoC Power Consumption Criteria for No-Load

Nameplate Output Power (P_{no})	Maximum Power in No-Load	
	Tier 1 – Jan 1st, 2014	Tier 2 – January 1st, 2016
≥ 0.3 to < 49 Watts	≤ 0.150 watts	≤ 0.075 watts
≥ 49 to < 250 Watts	≤ 0.250 watts	≤ 0.150 watts
Mobile handheld battery driven and < 8 W	≤ 0.075 watts	≤ 0.075 watts

========== END OF DATASHEET PACKAGE. ==========

中国国家强制性产品认证证书

证书编号：2017010907014290

委托人名称、地址

侨威科技股份有限公司

台湾桃园市芦竹区南崁路2段222号

生产者（制造商）名称、地址

侨威科技股份有限公司

台湾桃园市芦竹区南崁路2段222号

生产企业名称、地址

广州贵冠科技有限公司

广州市增城市增江街东区高科技工业基地B栋

产品名称和系列、规格、型号

电源适配器

见附件；仅适用于海拔5000米及以下；销售时不含电线组件

产品标准和技术要求

GB17625.1-2012;GB4943.1-2011;GB/T9254-2008

上述产品符合强制性产品认证实施规则CNCA-C09-01:2014的要求，特发此证。

发证日期：2017年10月23日　　有效期至：2022年10月23日

证书有效期内本证书的有效性依据发证机构的定期监督获得保持。

本证书的相关信息可通过国家认监委网站www.cnca.gov.cn查询

主　任：

中国质量认证中心

http://www.cqc.com.cn　　中国·北京·南四环西路188号9区 100070　　电话：+86 10 83886666

Q 1817928

CERTIFICATE FOR CHINA COMPULSORY PRODUCT CERTIFICATION

CERTIFICATE NO.: 2017010907014290

NAME AND ADDRESS OF THE APPLICANT

CHANNEL WELL TECHNOLOGY CO.,LTD

No.222,Sec.2,Nankan RD.,Lujhu Township, Taoyuan ,County 338, TAIWAN

NAME AND ADDRESS OF THE MANUFACTURER

CHANNEL WELL TECHNOLOGY CO.,LTD

No.222,Sec.2,Nankan RD.,Lujhu Township, Taoyuan ,County 338, TAIWAN

NAME AND ADDRESS OF THE FACTORY

Channel Well Technology (Guangzhou) Co., Ltd.

Bld. B, Eastern Hi-tech Industrial Base, Zengjiang Street, Zengcheng, Guangzhou, Guangdong Province China.

PRODUCT NAME, MODEL AND SPECIFICATION

AC Adapter

See appendix, Altitude up to 5000m, Sale without cord sets.

THE STANDARDS AND TECHNICAL REQUIREMENTS FOR THE PRODUCTS

GB17625.1-2012;GB4943.1-2011;GB/T9254-2008

This is to certify that the above mentioned product(s) complies with the requirements of implementation rules for compulsory certification(REFNO.CNCA-C09-01:2014).

Valid from: Oct.23,2017 **Valid until:** Oct.23,2022

The validity of the certificate is subject to positive result of the regular follow up inspection by issuing certification body until the expiry date.

The certificate information is available through CNCA's website: www.cnca.gov.cn

President:

Wang Kejiao

CHINA QUALITY CERTIFICATION CENTRE 中国质量认证中心

CHINA QUALITY CERTIFICATION CENTRE

http://www.cqc.com.cn Section 9, No. 188, Nansihuan Xilu, Beijing 100070 P. R. China Tel: +86 10 83886666

Q 1817928

中国国家强制性产品认证证书

附　录

证书编号：2017010907014290

纸　号：1817928

型号	直流输出	
	电压	电流
KPM180F-VI	12V	15.00A
KPM180H-VI	15V	12.00A
KPM180W-VI	17V	10.59A
KPM180J-VI	18V	10.00A
KPM180K-VI	19V	9.47A
KPM180L-VI	20V	9.00A
KPM180M-VI	24V	7.50A
KPM180S-VI	48V	3.75A
KPM180T-VI	52V	3.46A
KPM180R-VI	54V	3.33A
KPM180U-VI	56V	3.21A
KPM200F-VI	12V	16.67A
KPM200H-VI	15V	13.33A
KPM200W-VI	17V	11.76A
KPM200J-VI	18V	11.11A
KPM200K-VI	19V	10.53A
KPM200L-VI	20V	10.00A
KPM200M-VI	24V	8.33A
KPM200S-VI	48V	4.17A
KPM200T-VI	52V	3.85A
KPM200R-VI	54V	3.70A
KPM200U-VI	56V	3.57A
KPM220F-VI	12V	18.33A
KPM220H-VI	15V	14.67A
KPM220W-VI	17V	12.94A
KPM220J-VI	18V	12.22A
KPM220K-VI	19V	11.58A

注：此附录与证书同时使用时有效。

主　任：

中国质量认证中心

中国国家强制性产品认证证书

附　录

证书编号：2017010907014290　　纸　号：1817928

KPM220L-VI	20V	11.00A
KPM220M-VI	24V	9.17A
KPM220S-VI	48V	4.58A
KPM220T-VI	52V	4.23A
KPM220R-VI	54V	4.07A
KPM220U-VI	56V	3.93A

注：此附录与证书同时使用时有效。

主　任：

中国质量认证中心