



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

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

Channel Well Technology China
CWT Korea

VERSION: UPDATED	2AAL090M	24V/3.75A
Specification No.: 20170725	5.5x2.5x11(S)*1,200	



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MODEL NO : 2AAL090M
ENGINEERING SPECIFICATION SHEET

1 SCOPE

This document describes basic electrical characteristics and mechanical characteristic of 90W class I power adapter.

2 ELECTRICAL SPECIFICATION

2.1 INPUT REQUIREMENT

2.1.1 INPUT VOLTAGE AND FREQUENCY RANGE

	Minimum	Nominal	Maximum	Unit
Input Range	90	100-240	264	Vac, rms
	47	50 & 60	63	Hz

2.1.2 AC INRUSH CURRENT

Test Conditions:

1. Inrush current to be measured with bulk Caps discharged.
2. Ambient Temperature =25°C
3. The AC source to be a minimum 3KVA
4. AC input starting phase angle=90°
5. Vin=Vin(max),Frequency=Fin(min.)
6. Current to be measured using a non-saturating current probe or transformer.

Peak Inrush Current (I-peak)
$\leq 130A$

2.1.3 INPUT CURRENT

Input Voltage	Input Current (Iin)
90-264Vac	$\leq 1.5A$

2.1.4 LEAKAGE CURRENT

Input Voltage	Leakage Current
230Vac/50Hz	$\leq 3.5mA$

2.1.5 INSULATION RESISTANCE

between primary and secondary	Insulation Resistance
500Vdc	$\geq 50M\Omega$

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2.1.6 LOW POWER CONSUMPTION

Vin	Load	Power consumption
230Vac/50Hz 115Vac/60Hz	0A	≤ 0.15 W

2.1.7 POWER FACTOR

Vin	Load	Power factor
230Vac/50Hz 115Vac/60Hz	3.75A	> 0.9

2.1.8 HI-POT TEST

Primary to Secondary	Current
4242Vdc/3000Vac,3Secs	≤ 10 mA

2.2 INPUT PROTECTION

2.2.1 INPUT CURRENT PROTECTION

A fuse shall be installed on the input line side near the input connector.

2.3 OUTPUT REQUIREMENT

2.3.1 OUTPUT VOLTAGE AND CURRENT AND OUTPUT POWER

Peak load for AC start up.

Vout(nom)	Voltage Range	Current Range			Watt(Max)
		Minimum Load	Full load	Peak load	
+24.0V	$\pm 5\%$	0A	3.75A	4.5A	94.5W

2.3.2 RIPPLE AND NOISE

Measurements shall be made with an oscilloscope with minimum of 20MHz bandwidth. Output shall be bypassed at the connector with a 0.1 μ F ceramic disk capacitor and a 10 μ F electrolytic capacitor for general testing purpose.

Output Voltage	Ripple & Noise(Vp-p)
+24V	≤ 480 mV

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2.3.3 OVER VOLTAGE PROTECTION

Test Conditions:

1. $V_{in}=V_{in}(\text{nominal})$
2. No load.

Over voltage protection	$\leq 180\% V_{out \text{ Max.}}$
-------------------------	-----------------------------------

2.3.4 OVER CURRENT PROTECTION

Test Conditions:

1. $V_{in}=V_{in}(\text{nominal})$; Frequency= $F_{in}(\text{nominal})$
2. I_{out} is ramped using a CC mode load form 0A until current fold back..

Over current protection	Min	Max
	120%	200%

2.3.5 OVERSHOOT AND UNDERSHOOT

Overshoot and Undershoot	10% Max.
--------------------------	----------

2.3.6 SHORT CIRCUIT PROTECTION

Test Conditions:

1. Short is defined as a load resistance $<0.1\Omega$.
2. A short circuit load is applied for 10 seconds.

Requirement:

1. At the end of the test cycle, the short is replaced with a load equal to $I_{out}(\text{max.})$. Output voltage must return to limits defined in section 2.3.1.
2. Output must recover automatically within 3 seconds when short is removed.

2.4 PERFORMANCE REQUIREMENT

2.4.1 EFFICIENCY

Meet: Level 6

Active average efficiency	89.00% min.
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2.4.2 TURN ON DELAY TIME

Test Conditions:

1. CC mode load =100% Iout(max) .
2. Power adapter is connected to load before AC power is applied.

Turn on delay time	3secs max.
Rise time	100ms max.

2.4.3 HOLD-UP TIME

Test Conditions:

1. CC mode load =100% Iout(max) .
2. Vin 115V/60Hz & 230Vac/50Hz.

Hold up time	Vin 115Vac/60Hz	Vin 230Vac/50Hz
	8ms min.	16ms min.

2.4.4 DYNAMIC LOAD (LOAD TRANSIENT)

Test Conditions:

1. CC Load cycling between 100% Iout(max) and 50% Iout(max.).
2. Cycling frequency is 120Hz
3. Load slew rate is 500mA/uS

Dynamic	±10% (Vout)
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3 ENVIRONMENTAL SPECIFICATION

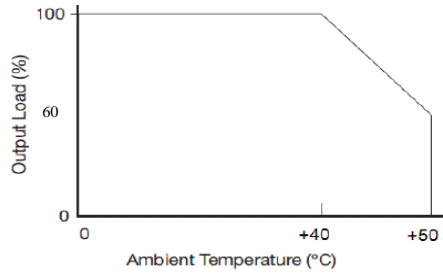
3.1 TEMPERATURE

PARAMETER	OPERATING	NON-OPERATING
Ambient temp	0 to 40°C	-40 to 70°C

***Note: High Temperature Test**

Evaluate the maximum percentage of output load at 50°C and create derating curve.

Derating curve template



Test condition

Ambient Temperature from 40°C to 50°C

Requirement: Find out the maximum percentage of output load at 50°C Required

E-CAP and componets derating are same as the table

Component Type	Component Rated Value
E-Cap Ripple Current	100%
Magnetics (Temperature Only)	100%
Input bulk and XC capacitors, switching MOSFET, Output Rectifier Diode	95%
All Others	90%

3.2 HUMIDITY

PARAMETER	OPERATING	NON-OPERATING
Humidity	5-95% non condensing	0-95% non condensing

3.3 VIBRATION AND SHOCK

VIBRATION	0.25G RMS, 1Hour
SHOCK	0.5G RMS, 5 repetitions

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MODEL NO : 2AAL090M
ENGINEERING SPECIFICATION SHEET

3.4 ALTITUDE

PARAMETER	OPERATING	NON-OPERATING
Altitude	Sea level to 5000M	Sea level to 12,300M

3.5 CALCULATED MEAN TIME BETWEEN FAILURES (MTBF)

Test Conditions:

1. Operational temperature=25°C
2. Altitude=5000m
3. Confidence level =90%
4. Predictive standard=MIL-HDBK-217F
5. Load current is =0.8*Iout(max)
6. Vin(nom)

MTBF	100,000 hours min.
------	---------------------------

3.6 DROP TEST

PARAMETER	OPERATING	NON-OPERATING
Drop test	N/A	IEC-60068-2-32 ED, 100cm UNBOXED

4 APPLICATION STANDARD & RELATED SPECIFICATION

4.1 STANDARD & SAFETY CERTIFICATION

4.1.1 SAFETY STANDARD(MEET)

COUNTRY CODE	STANDARD	TEST REPORTS
NA	UL60950	UL60950
GE	EN60950-1:2006	CB,LVD
JP	J60950	CB,PSE
AU	AS/NZS 60950-1	CB
UK	EN 60950-1:2006	CB,LVD
KO	IEC60950-1:2006	CB
PR	IEC 60950-1:2006	CB,CCC
BZ	IEC 60950-1:2006	CB
NJ	J60950,UL60950	CB,PSE,UL60950

4.1.2 EMI

FCC CFR 47 Part 15, Subpart J, Class B, resistive load.

EN55022/CISPR 22, Class B , resistive load.

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4.1.3 EMS

The Supplier must confirm compliance to the following standards:

EN55024: Immunity

EN61000-3-2: Harmonic Current Emission.

EN61000-3-3: Voltage fluctuations and Flicker.

EN61000-4-2: Electrostatic Discharge, level 4: $\geq 8\text{KV}$, contact $\geq 15\text{KV}$ air discharge.

EN61000-4-3: Radiated Electromagnetic field, 3V/m.

EN61000-4-4: Electrical Fast Transient, $\geq 1\text{KV}$. Criterion B.

EN61000-4-5: Surge $\geq 2\text{KV}$ common mode (Class I only), $\geq 1\text{KV}$ differential mode. Criterion B.

EN61000-4-6: Conducted Immunity, 3A/m

EN61000-4-11: Voltage dips and interruption.

4.1.4 LPS

Meet IEC60950-1

4.1.5 ENVIRONMENT STANDARDS

RoHS & REACH regulation

4.1.6 ENERGY SAVING

European CoC – EPS Version 5 Tier2

U.S. DOE – Level VI

5 MECHANICAL

5.1 INPUT CONNECTOR AND OUTPUT CABLE

5.1.1 INPUT CONNECTOR

See mechanical drawing

5.1.2 OUTPUT JACK AND CABLE

See mechanical drawing

5.2 AC ADAPTER EXTERNAL DIMENSION

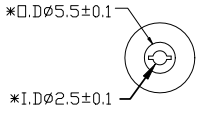
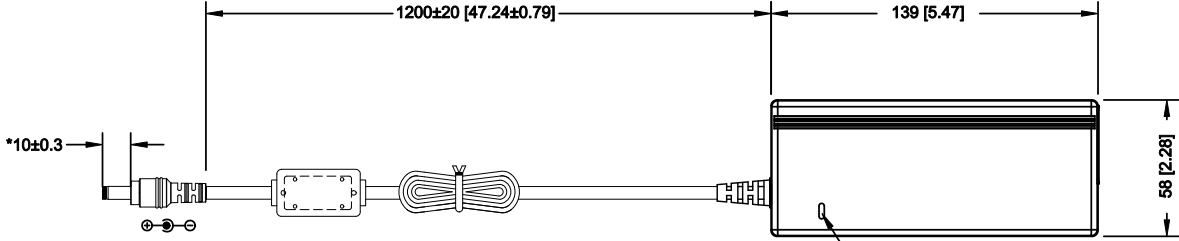
See mechanical drawing

5.3 LABEL DRAWING

See mechanical drawing

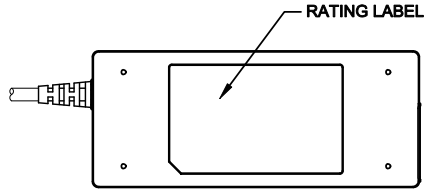
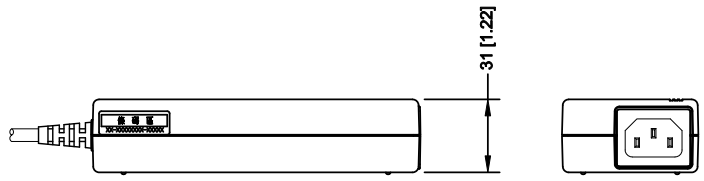
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版本	修訂內容	修訂者	日期
A01	新製	yw,wang	2016.05.05



PLUG TYPE: $\phi 5.5 * \phi 2.5 * L10$ 音叉插溝式, 內縮為 0.5mm

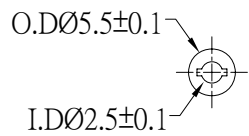
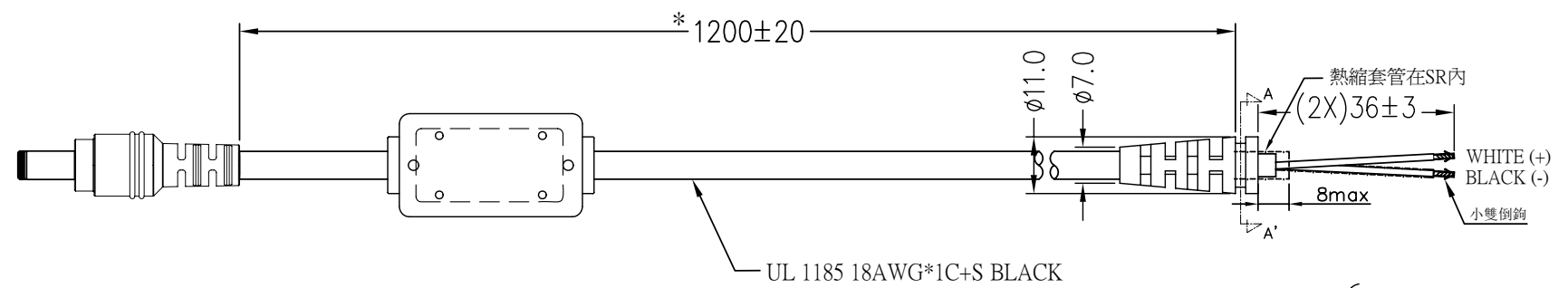
LED INDICATOR



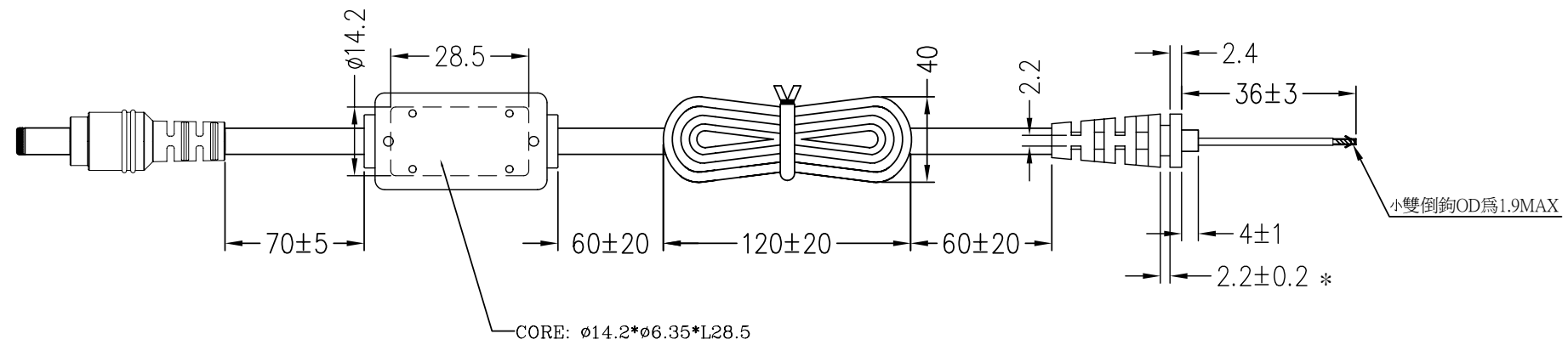
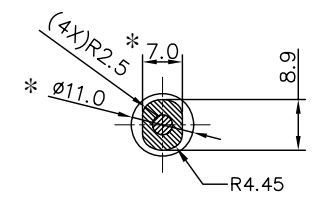
NOTES:

1. CASE & CABLE COLOR : BLACK
2. INLET : IEC320-C14
3. CABLE SPEC. : CABLE ARE UL 1185 18AWG
4. MODEL: G99-AAL090M-N026
5. PART NO: G18-BCA312A-MU00

	APPROVED	DATE	DRAWING NO.	UNIT	REV.
		2016.05.05		INCHES (MM)	A01
TITLE	DESIGNED	DRAWING	MODEL NO.	TOLERANCES:	SHEET
Desktop Switching Adapte 90W	q,liu	yw,wang	2AAL090M	.XX = ± .10 .XXX = ± .010	1/1



PLUG TYPE: Ø5.5*Ø2.5*11±0.3 音叉叉溝式,內縮3.0±0.5mm ⊕ ⊙ ⊖

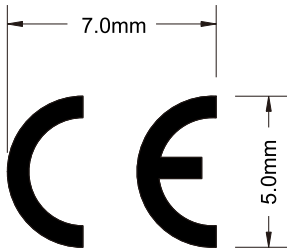
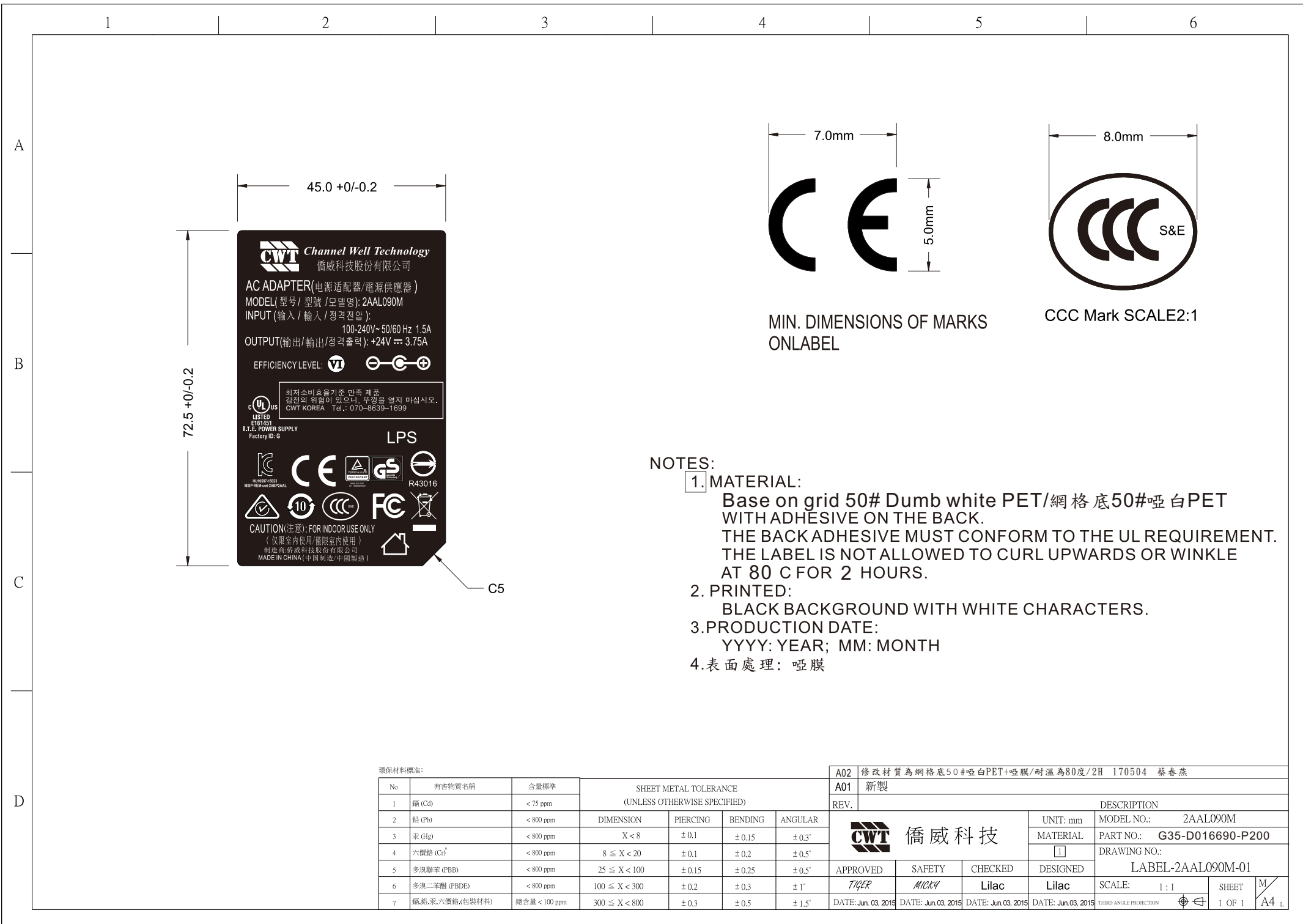


- 註:
- 一.電性測試:
 - 1.耐電壓:AC 500V/秒,測試無異常.
 - 2.絕緣抵抗:DC 500V 50MΩ以上.
 - 3.導通測試:無斷線、短路、極性反(芯線接內極).
 - 二.拉力測試:電線與S/R間吊重 9Kg經過1分鐘無斷線脫落等異常.
 - 三.折曲測試:依昌聖最新測試標準.

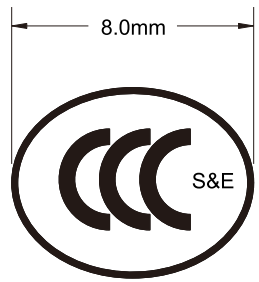
標註 "*" 為 IQC 必須檢驗的尺寸或內容.

環保材料標準:

No	有害物質名稱	含量標準	SHEET METAL TOLERANCE (UNLESS OTHERWISE SPECIFIED)				0.1 REV.	在G18-B7A312A-M500基礎上DC頭改為5.5*2.5*10mm		
			DIMENSION	PIERCING	BENDING	ANGULAR		DESCRIPTION		
1	鎘 (Cd)	<75ppm					僑威科技	UNIT: mm	MODEL NO.: 2AAL090M	
2	鉛 (Pb)	<800ppm				MATERIAL		PART NO.: G18-BCA312A-MU00		
3	汞 (Hg)	<800ppm	X < 8	±0.1	±0.15	±0.3°		DRAWING NO.:		
4	六價鉻 (Cr)	<800ppm	8 ≤ X < 25	±0.1	±0.2	±0.5°		APPROVED	CHECKED	DESIGNED
5	多氯聯苯 (PBB)	<800ppm	25 ≤ X < 100	±0.15	±0.25	±0.5°		jc.zou	q.liu	yw.wang
6	多溴二苯醚 (PBDE)	<800ppm	100 ≤ X < 300	±0.2	±0.3	±1°		DATE: 2016.06.30	DATE: 2016.06.30	DATE: 2016.06.30
7	鎘,鉛,汞,六價鉻(包裝材料總含量)	<100ppm	300 ≤ X < 800	±0.3	±0.5	±1.5°		THIRD ANGLE PROJECTION		



MIN. DIMENSIONS OF MARKS ON LABEL



CCC Mark SCALE:2:1

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 CURL UPWARDS OR WINKLE AT 80 C FOR 2 HOURS.
2. PRINTED:
 BLACK BACKGROUND WITH WHITE CHARACTERS.
3. PRODUCTION DATE:
 YYYY: YEAR; MM: MONTH
4. 表面處理: 啞膜

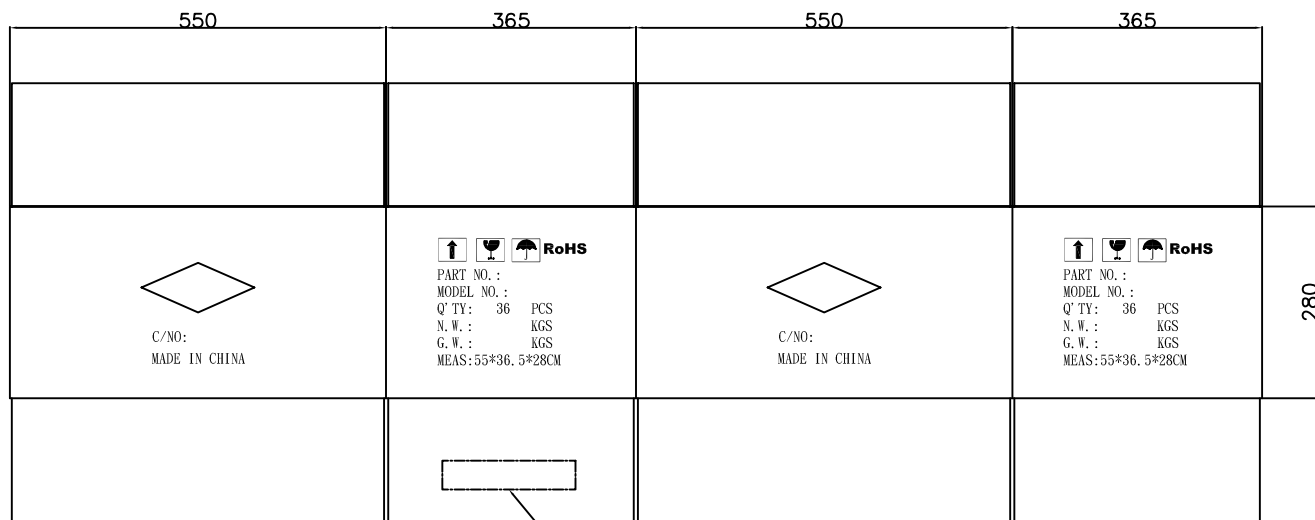
環保材料標準:

No	有害物質名稱	含量標準	SHEET METAL TOLERANCE (UNLESS OTHERWISE SPECIFIED)			
			DIMENSION	PIERCING	BENDING	ANGULAR
1	錳 (Cd)	< 75 ppm				
2	鉛 (Pb)	< 800 ppm				
3	汞 (Hg)	< 800 ppm	X < 8	± 0.1	± 0.15	± 0.3°
4	六價鉻 (Cr ⁶⁺)	< 800 ppm	8 ≤ X < 20	± 0.1	± 0.2	± 0.5°
5	多溴聯苯 (PBB)	< 800 ppm	25 ≤ X < 100	± 0.15	± 0.25	± 0.5°
6	多溴二苯醚 (PBDE)	< 800 ppm	100 ≤ X < 300	± 0.2	± 0.3	± 1°
7	錳,鉛,六價鉻(包裝材料)	總含量 < 100 ppm	300 ≤ X < 800	± 0.3	± 0.5	± 1.5°

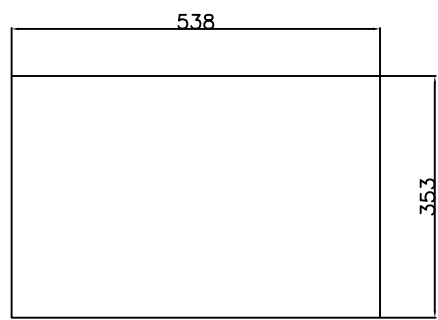
A02	修改材質為網格底50#啞白PET+啞膜/耐溫為80度/2H 170504 蔡春燕						
A01	新製						
REV.	DESCRIPTION						
	CWT 僑威科技		UNIT: mm	MODEL NO.: 2AAL090M			
			MATERIAL	PART NO.: G35-D016690-P200			
				DRAWING NO.: LABEL-2AAL090M-01			
	APPROVED	SAFETY	CHECKED	DESIGNED	SCALE: 1:1		
	TIGER	MICKY	Lilac	Lilac	SHEET	M	
	DATE: Jun. 03, 2015	DATE: Jun. 03, 2015	DATE: Jun. 03, 2015	DATE: Jun. 03, 2015	THIRD ANGLE PROJECTION	1 OF 1	A4 L

A
B
C
D

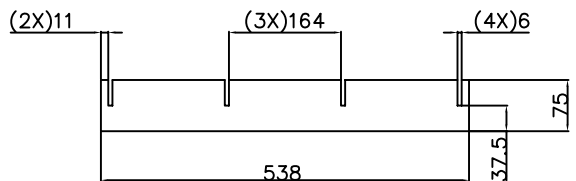
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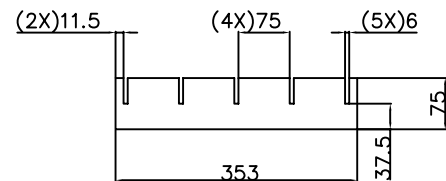
↑ 易碎 防雨 RoHS
THE ABOVE PRINTED IN RED
OTHERS PRINTED IN BLACK



SPACER A (4X)
G24-C543011-PI00



SPACER B (15X)
G24-B540711-PI00



SPACER C (12X)
G24-B300711-PI00

NOTES:

- MATERIAL: 6mm THICK CORRUGATED BOARD (3 LINERS + 2 FLUTINGS)
BURSTING STRENGTH: 16KG / CM²
QUANTITY: 36 PCS / CARTON
- 與2010CTN019尺寸相同, 但印刷不同。

環保材料標準:

No	有害物質名稱	含量標準	SHEET METAL TOLERANCE (UNLESS OTHERWISE SPECIFIED)				0.1 REV.	DESCRIPTION			
			DIMENSION	PIERCING	BENDING	ANGULAR		UNIT: mm	MODEL NO.:	DESIGNED	SHEET
1	鎘 (Cd)	<75ppm									
2	鉛 (Pb)	<800ppm									
3	汞 (Hg)	<800ppm	X < 8	±0.1	±0.15	±0.3*					
4	六價鉻 (Cr ⁶⁺)	<800ppm	8 ≤ X < 25	±0.1	±0.2	±0.5*					
5	多環聯苯 (PBB)	<800ppm	25 ≤ X < 100	±0.15	±0.25	±0.5*		APPROVED	CHECKED		
6	多溴二苯醚 (PBDE)	<800ppm	100 ≤ X < 300	±0.2	±0.3	±1*		SAM		JASON	
7	銅鉛汞六價鉻 (包裝材料)	總含量<100ppm	300 ≤ X < 800	±0.3	±0.5	±1.5*		DATE: Aug. 12, 2010	DATE:	DATE: Aug. 12, 2010	SCALE: 1 : 1