

Approval Sheet

FOR DISTRELEC

PART NO.: SA130D-12U (replace 69-797-52)

DESIGN NO.: A130D15404-2

DATE: Oct. 29. 2015

REMARK: change dc plug size to 5.5x2.5x11mm

APPROVED BY (PLEASE SIGN)

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ONTOP ELECTRONIC CO., LTD.
SACONTOP CO., LTD.

-DIV. OF SAC GROUP-



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EMAIL: sale@sac-ontop.com.tw

Our power supply itself is with EMC(EMI+EMS) approval. We don't have Customer's end-product, please double check EMC or peak current or any necessary request after mating with your product with our power supply.

We will produce the goods per the sample + the specification shown on this approval sheet, if you have any question on our sample or our approval sheet such as O/P, dc plug, polarity, safety, protection characteristic (OCP/OVP..etc.) please inform us before signing back the approval sheet. Thanks.

**** IMPORTANT ****

If you want to apply the safety for power supply only or complete set (your product + our power supply), pls contact us to check details in advance. Thanks.

CUSTOMER : _____

DATE : TBD _____

MODEL NO. : SA130D-12U _____

PART NO. : _____

CHANGE NOTICE

ORIGINAL DESIGN NO. A130D15404-1	REVISED DESIGN No. : A130D15404-2
DC PLUG : 2.1*5.5*11 S	DC PLUG : 2.5*5.5*11 S
Customer Approved by : _____	

PRODUCTION REVISION HISTORY :

REV.	DATE	BY:	DESCRIPTION OF CHANGE
-2	29-Oct-15	Customer	Change the DC PLUG .

Designed by : 陳鳳	Checked by : ~	Approved by : 李福祥
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SAC AC to DC SWITCHING ADAPTER SPECIFICATION	MODEL:	SA130D-12U	Design NO:	A130D15404-2
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1. DESCRIPTION.

- 1.1 This specification is suitable for :
- 1.2 This adapter is used for :
- 1.3 This product is AC to DC switching power transfer device, it can provide for a 30W dc output with constant voltage source.
- 1.4 The product complies with RoHS.
- 1.5 The product complies with EU Efficiency Level Tier2-2016 & U.S. DoE Level VI
- 1.6 The product complies with Reach.

2. SURFACE , STRUCTURE.

- 2-1 Surface damage , rusting etc. is not permitted.
- 2-2 Appearance , dimension and description : As drawing.

3. ELECTRICAL CHARACTERISTICS.

- 3-1 Input Voltage :
 - a. Rated Voltage, 100 ~ 240 Vac
 - b. Max. Voltage, 90 ~ 264 Vac
- 3-2 Input Frequency :
47~63Hz
- 3-3 Input Current :
1000 mA (Max.) @ 100Vac/50Hz with full load.
- 3-4 Output Voltage and Current(dc) :

	Voltage (Vdc)	Current (mA)	Voltage (Vdc)	Current (mA)
O/P	12±5%	0	12±5%	2500

3-4-1 Line Regulation :

The line regulation is less than ±2%, @ full load and ±10% input voltage.

3-4-2 Load Regulation :

The load regulation is less than $\pm 5\%$.

3-5-1 Efficiency :

82% (Min.) , @ AC Input 100Vac/50 Hz with full load.

82% (Min.) , @ AC Input 240Vac/50 Hz with full load.

3-5-2 Average Efficiency : (EU Efficiency Level Tier2-2016 & U.S. DoE Level VI)

87.699 % (Min.) (EU Efficiency Level : Tier 2 - 2016)

, @ AC Input 115Vac/60Hz and 230Vac/50Hz with 25%,50%,75% and 100% load.

, ambient 25°C .

The UUT shall be operated at 100% of nameplate current output for at least 30 minutes immediately conducting efficiency measurements.

3-6 Ripple and Noise Voltage : (At ambient 25°C full load)

At O/P= 12.0 Vdc ≤ 150 mVp-p

The measuring terminated with a 47uF EC-Capacitor and 0.1uF CC-Capacitor

, and measurement is done by 20MHz band-width.@ambient 25°C

3-7 Safety Test :

3-7-1 Hi -Pot Test :

3000 Vac, 5mA, 1 Sec. between Primary and Secondary circuit and chassis.

3-7-2 Insulation Test :

500Vdc, 1 minute between Primary and Secondary circuit and chassis,

IR should $\geq 20M\Omega$.

3-7-3 Leakage Current : ≤ 0.25 mA , at 240Vac / 50Hz

3-8 Temperature Rise : (Use thermometer).

AC input 100 ~ 240Vac / 50 Hz with full load, shall not exceed 45K on case surface

@ ambient 25°C.

3-9 Transient Response : $< 10\%$,@ output change between 50% and 100% of full load, slew rate is 0.5A/us, frequency is 100Hz and 10KHz.

3-10 Hold Up Time : ≥ 8 mSec., @ 100Vac/50Hz, ambient 25°C with full load

3-11 Rise Time : ≤ 30 mSec., @ 100Vac/50Hz, ambient 25°C with full load from 5% to 95% of Vo.

3-12 Inrush Current : $\leq 120A$ at 100 ~ 240Vac.
At cold start, Maximun Load, ambient 25°C.

3-13 No load Power Consumption (Off Mode) : ≤ 0.075 Watts,
At 115Vac/60Hz and 230V/50Hz, ambient 25°C
(As perEU Efficiency Level Tier2-2016 & U.S. DoE Level VI guideline.)

3-14 PROTECTION CHARACTERISTICS :

3-14-1 Over Voltage Protection 20Vo Max ,Latch shut down

3-14-2 Over Load Protection Current : 3 ~ 5A @ 100~240Vac, ambient 25°C.

3-14-3 Short Protection :

The adapter can withstand continuous short at DC output and no damage. It will enter into normal condition if the fault condition is removed.

4. ENVIRONMENT.

4-1 Operating Temperature : 0°C ~ + 40°C

4-2 Operating Humidity : 20% to 80 %R.H.

4-3 Storage Temperature : -20°C ~ + 80°C

4-4 Storage Humidity : 10% to 95 %R.H.

5. RELIABILITY.

5-1 MTBF : (When calculated using MIL-HDBK-217F)
50,000 hours at 25°C

6. SAFETY.

Safety Status : Applicable V Not applicable

Agency	Standards	Note

7. EMS & EMI.

7-1 EMS :

Items	Specification	Reference
ESD	Contact : <u>±4KV</u>	IEC61000-4-2
	Non-Contact : <u>±8KV</u>	
RS	Frequency : 80MHz~1.0GHz, Field Strength : 3V/M	IEC61000-4-3
EFT	1.0KV on input ac power ports.	IEC61000-4-4
SURGE	Line to line : <u>±1KV (peak)</u>	IEC61000-4-5
	Line to earth (ground) : <u>±2KV (peak)</u>	

7-2 EMI for both Conduction & Radiation (At Resistor load)

Comply with Standards
CISPR22 ; EN55022, Class B

8. MECHANICAL CHARACTERISTICS.

8-1 Physical Size : 110mm(L) x 50mm(W) x 31mm(H)

8-2 Enclosure material : 94V-0, minimum

8-3 Output Cable : 1500mm UL 1185 AWG18*2C , with Plug : 2.5*5.5*11 S
Polarity : Center "+"

8-4 Strain Relief Test :

9 Kg to the output cord for 60 seconds each , there should be no breakage of the cord or plug .

8-5 Vibration Test :

The vibration frequencies are set at 10-55-10 Hz. with total amplitude of 1.5 mm along the 3 directions namely X-Y-Z. The each direction should be vibrated for 30 minutes, after testing no abnormal electrical or mechanical should occur.

8-6 Drop Test : (Referring to CSA C22.2 No.60950 / UL6950 / EN60950)

Products shall be dropped from a height of 1M onto a horizontal surface consists of hardwood at 13mm thick, mounted on two layers of plywood each 19mm to 20mm thick, all supported on a concrete or equivalent non-resilient floor.

8-7 Cord Bending Test :

The cord shall withstand a weight of 200 g, when swung from left to right at an angle of 120 deg. For testing total of 1000 times.

9. Product Warranty :

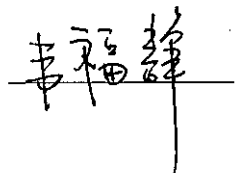
12 months after production, under normal use condition.

10. Net Weight (Reference) : 181 ±10g

Tested By: 陳鳳

Checked By: _____

Approved By: _____



Engineering Sample Electrical Testing Data

Customer :

Date: 2015/9/20

Part No. : SA130D-12U

Design No. : A130D15404-2

Test Ambient : 25 °C

Test Instruments : 1. Elec. Load : Chroma 63010

2. Power Meter : HIOKI 3332

3. Digitizin Osc. : LeCroy LT354

ITEM	TEST SPEC.	Sample No.												
		1	2	3	4	5	6	7	8	9	10			
At 100Vac/50Hz No loading power	≤ 0.075 Watts (Max.)	0.029												
Input Current At Full Load	1000 mA (Max.)	641												
O/P DC-Voltage At Load 0 mA	12±5% Vdc	12.3												
O/P DC-Voltage At Load 2500 mA	12±5% Vdc	12.078												
Ripple & Noise At full Load	≤ 150 mVp-p	68												
Efficiency	82% (Min.)	87.1												
Over Load Current	3 ~ 5A	4.1												
At 240Vac/50Hz No loading power	≤ 0.075 Watts (Max.)	0.054												
Input Current At Full Load	1000 mA (Max.)	331												
O/P DC-Voltage At Load 0 mA	12±5% Vdc	12.3												
O/P DC-Voltage At Load 2500 mA	12±5% Vdc	12.07												
Ripple & Noise At full Load	≤ 150 mVp-p	64												
Efficiency	82% (Min.)	88.7												
Over Load Current	3 ~ 5A	4												

Remark :

Output ripple and noise are measured by oscilloscope (20MHz bandwidth) and output in parallel with one EC 47uF/50V and one 0.1uF/50V ceramic capacitor,@ambient 25°C

Engineering Sample Electrical Testing Data For EU Requirement

Customer : _____
 Model No. : SA130D-12U

Date: 2015/10/29
 Design No. : A130D15404-2

Input Voltage (V)	Frequency (Hz)	Output Voltage (Vdc)	Output Current (A)	Output Power (W)
100-240	50-60	12	2.5	30

Input 115V / 60Hz	Output Load		Sample No.									
	(%)	(A)	1	2	3	4	5	6	7	8	9	10
Input Power (W)	0%	0.000	0.025									
	10%	0.250	3.41									
	25%	0.625	8.44									
	50%	1.250	16.71									
	75%	1.875	25.31									
	100%	2.500	34.15									
Output Power (W)	10%	0.250	3.04									
	25%	0.625	7.6									
	50%	1.250	15.08									
	75%	1.875	22.31									
	100%	2.500	29.55									
Efficiency (%)	10%	0.250	89.15									
	25%	0.625	90.05									
	50%	1.250	90.25									
	75%	1.875	88.15									
	100%	2.500	86.53									
Average Efficiency (%)			88.745									
Max. No-Load Energy Consumption (W)	0.075	(Max.)	Pass									
MIN Average Active Mode Efficiency (%) - 4 Point Avg. Eff.	87.699	(Min.)	Pass									
MIN Active Mode Efficiency (%) - 10% Load Eff.	77.699	(Min.)	Pass									

Input 230V / 50Hz	Output Load		Sample No.									
	(%)	(A)	1	2	3	4	5	6	7	8	9	10
Input Power (W)	0%	0.000	0.045									
	10%	0.250	3.59									
	25%	0.625	8.5									
	50%	1.250	17.01									
	75%	1.875	25.31									
	100%	2.500	33.65									
Output Power (W)	10%	0.250	3.05									
	25%	0.625	7.62									
	50%	1.250	15.1									
	75%	1.875	22.39									
	100%	2.500	29.74									
Efficiency (%)	10%	0.250	84.96									
	25%	0.625	89.65									
	50%	1.250	88.77									
	75%	1.875	88.46									
	100%	2.500	88.38									
Average Efficiency (%)			88.815									
MAX No-Load Energy Consumption (W)	0.075	(Max.)	Pass									
MIN Average Active Mode Efficiency (%) - 4 Point Avg. Eff.	87.699	(Min.)	Pass									
MIN Active Mode Efficiency (%) - 10% Load Eff.	77.699	(Min.)	Pass									

EU Requirement : Standards for EPS Power Supplies (Efficiency Level : Tier 2 - 2016)

Models	Proposed Energy-Efficiency Criteria for Active Mode			Proposed Energy Consumption Criteria for No Load	
	Output Power (Po)	Minimum Average Efficiency		Output Power (Po)	Max. Power in No-Load
		4 Point Average Active Eff.	10% Load Active Eff.		
Standard	0.3W ≤ Pno ≤ 1W	≥ 0.5 * Pno + 0.169	≥ 0.5 * Pno + 0.06	0.3W ≤ Pno < 49W	0.075W
	1W < Pno ≤ 49W	≥ 0.071 * Ln(Pno) - 0.00115*Pno + 0.670	≥ 0.071 * Ln(Pno) - 0.00115*Pno + 0.570		
	49W < Pno ≤ 250W	≥ 0.890	≥ 0.790		
Low Voltage	0.3W < Pno ≤ 1W	≥ 0.517 * Pno + 0.091	≥ 0.517 * Pno	49W ≤ Pno < 250W	0.150W
	1W < Pno ≤ 49W	≥ 0.0834 * Ln(Pno) - 0.0011*Pno + 0.609	≥ 0.0834 * Ln(Pno) - 0.00127*Pno + 0.518		
	49W < Pno ≤ 250W	≥ 0.880	≥ 0.780		
				Mobile handeld Battery Driven and < 8W	0.075W

* Test unit had warmed up 30 minutes .

Tested By: 陳鳳

Checked By: ~

Approved By: 李福祥

QA By: _____

Engineering Sample Electrical Testing Data For DOE/MEPS Requirement

Customer : _____
 Model No. : SA130D-12U

Date: 2015/10/29
 Design No. : A130D15404-2

Input Voltage (V)	Frequency (Hz)	Output Voltage (Vdc)	Output Current (A)	Output Power (W)
100-240	50-60	12	2.5	30

Input 115V / 60Hz	Output Load		Sample No.									
	(%)	(A)	1	2	3	4	5	6	7	8	9	10
Input Power (W)	0%	0.000	0.025									
	25%	0.625	8.44									
	50%	1.250	16.71									
	75%	1.875	25.31									
	100%	2.500	34.15									
Output Power (W)	25%	0.625	7.6									
	50%	1.250	15.08									
	75%	1.875	22.31									
	100%	2.500	29.55									
Efficiency (%)	25%	0.625	90.05									
	50%	1.250	90.25									
	75%	1.875	88.15									
	100%	2.500	86.53									
Average Efficiency (%)			88.745									
Max. No-Load Energy Consumption (W)	0.100	(Max.)	Pass									
Min. Average Active Mode Efficiency (%)	86.949	(Min.)	Pass									

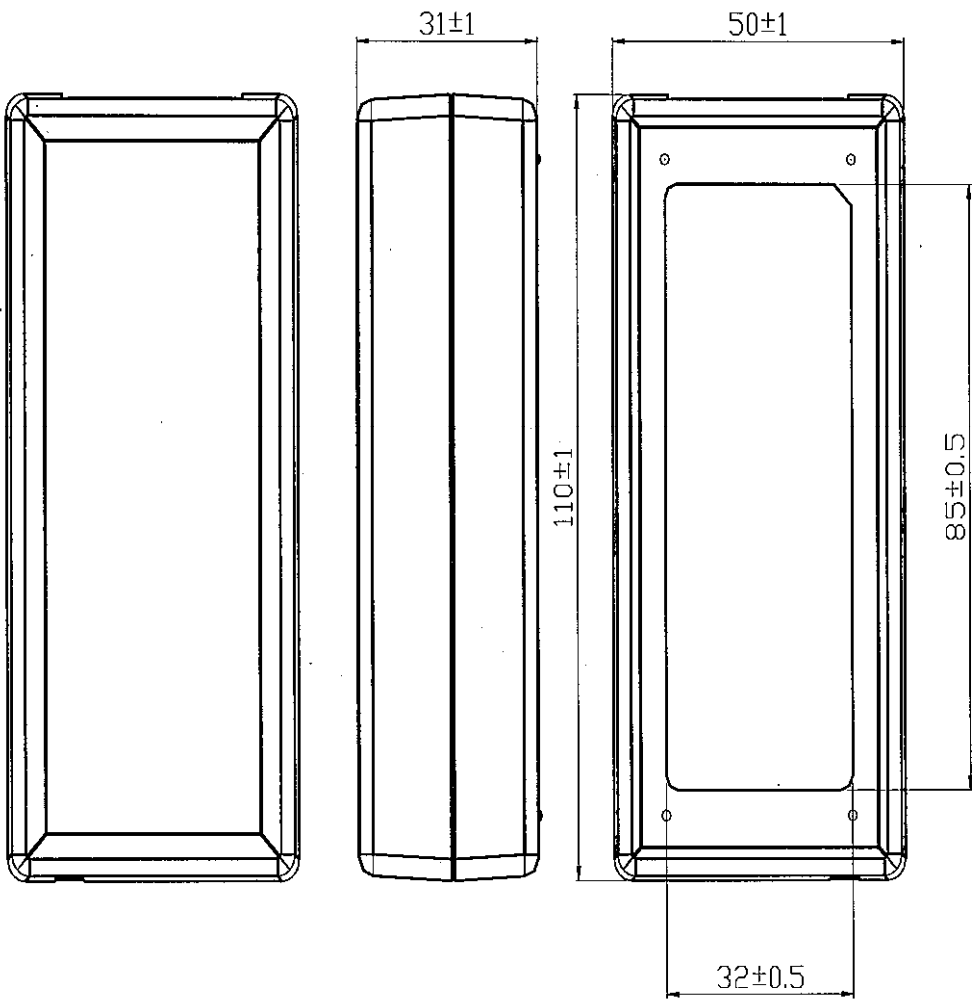
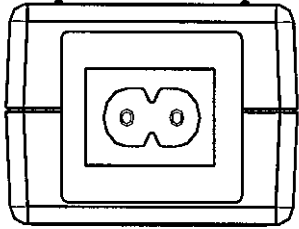
Input 230V / 50Hz	Output Load		Sample No.									
	(%)	(A)	1	2	3	4	5	6	7	8	9	10
Input Power (W)	0%	0.000	0.045									
	25%	0.625	8.5									
	50%	1.250	17.01									
	75%	1.875	25.31									
	100%	2.500	33.65									
Output Power (W)	25%	0.625	7.62									
	50%	1.250	15.1									
	75%	1.875	22.39									
	100%	2.500	29.74									
Efficiency (%)	25%	0.625	89.65									
	50%	1.250	88.77									
	75%	1.875	88.46									
	100%	2.500	88.38									
Average Efficiency (%)			88.815									
MAX No-Load Energy Consumption (W)	0.100	(Max.)	Pass									
MIN Average Active Mode Efficiency (%)	86.949	(Min.)	Pass									

DOE/MEPS Requirement : Standards for Power Supplies Effective (Efficiency Level : VI)

Models	Proposed Energy-Efficiency Criteria for Active Mode		Proposed Energy Consumption Criteria for No Load	
	Output Power (Po)	Minimum Average Efficiency	Maximum Power in No-Load	
Standard	0 to ≤ 1 watt	≥ 0.5 * Po + 0.16	Ac-Dc EPS	Ac-Ac EPS
	> 1 to ≤ 49 watts	≥ 0.071 * Ln (Po) - 0.0014* (Po) + 0.67	≤ 0.10 watts	≤ 0.21 watts
	> 49 to ≤ 250 watts	≥ 0.880	≤ 0.21 watts	≤ 0.50 watts
	> 250 watts	≥ 0.875	≤ 0.50 watts	≤ 0.50 watts
Low Voltage	0 to ≤ 1 watt	≥ 0.517 * Po + 0.087	≤ 0.10 watts	≤ 0.21 watts
	> 1 to ≤ 49 watts	≥ 0.0834 * Ln (Po) - 0.0014* (Po) + 0.609	≤ 0.21 watts	≤ 0.50 watts
	> 49 to ≤ 250 watts	≥ 0.870	≤ 0.50 watts	≤ 0.50 watts
	> 250 watts	≥ 0.875	≤ 0.50 watts	≤ 0.50 watts

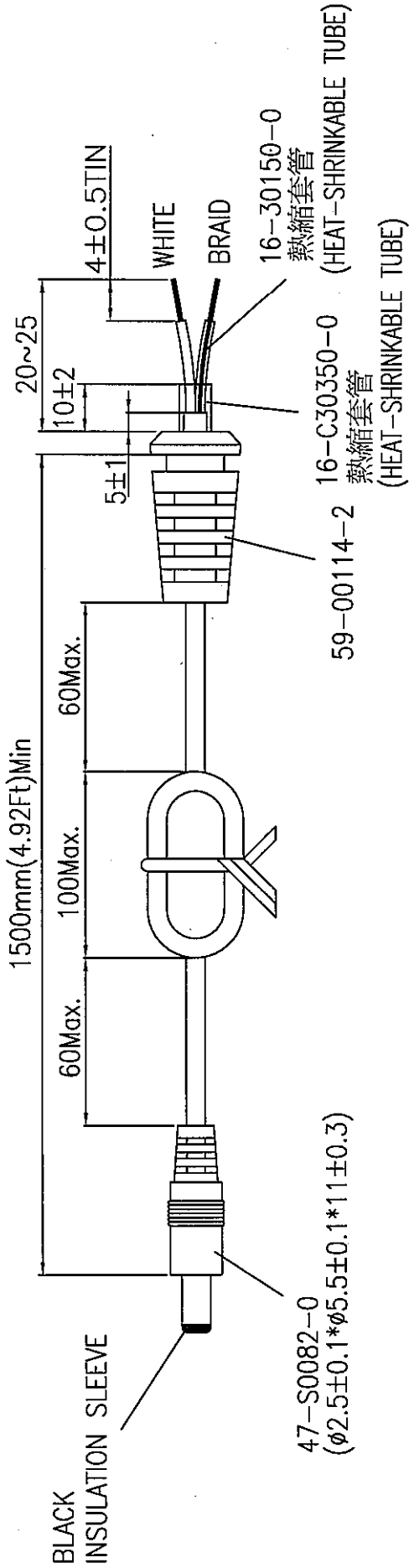
* Test unit had warmed up 30 minutes .

Tested By: 陳鳳 Checked By: ~ Approved By: 李和群 QA By: _____



SA130D-12U

UNIT : mm



UL 1185 AWG18 80°C

REV.	DESCRIPTION				DATE\REVISER		DWG. NAME	
	DRAWER	DESIGN	CHECK	APPROVED	Q'TY	UNIT	MODEL	DC CORD
						MM	MATERIAL	P.V.C
						1/1	TREATMENT	
							DWG. NO.	S89-C3BXX8-1Z/
							ORIG. DATE	2015.09.08
							MANUFACTORY	
ONTOP ELEC. CO., LTD.								

