Approval Sheet

FOR DISTRELEC

PART NO.: SA124H-12G (300-47-510)

DESIGN NO.: A124H15010-2

DATE: Sept. 22. 2016

REMARK: add ferrite core and components

APPROVED BY (PLEASE SIGN)			

ONTOP ELECTRONIC CO., LTD.
SACONTOP CO., LTD.
-DIV. OF SAC GROUP-

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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 aupply 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 : 2016/9/22

MODEL NO. : SA124H-12G PART NO. : _____

CHANGE NOTICE

ORIGINAL DESIGN NO. : A124H15010-1	REVISED DESIGN No. : A124H15010-2
	BOM ADD: R13: R SMD 10R +-5% 1/4W 1206 C17: X7R +-10% SMD CC 470PF/200V 0805 DC CORD: add the core. **Customer Approved by :**

PRODUCTION REVISION HISTORY :

REV.	DATE	BY:	DESCRIPTION OF CHANGE
-2	22-Sep-16	SAC	Design Change .

Designed by : 陳 鳳	Checked by :	Approved by :

SAC AC to DC SWITCHING ADAPTER SPECFICATION	MODEL:	SA124H-12G	Design NO:	A124H15010-2

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 24W dc output with constant voltage source.

1-4 The product complies with RoHS & REACH.

1-5 The product complies with EU Efficiency Level Tier 2 - 2016 & US DoE Level VI.

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 :

800 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%	2000

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 ±5%.

3-5-1 Efficiency :

80% (Min.) , @ AC Input 100Vac/50 Hz with full load.

80% (Min.) , @ AC Input 240Vac/50 Hz with full load.

3-5-2 Average Efficiency : (As per EU Efficiency Level Tier 2 - 2016)

86.804 % (Min.)

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

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 full load)

At O/P= 12Vdc, ≦100mVp-p

The measuring terminated with a 47uF EC-Capacitor and 0.1uF CC-Capacitor , and measurement is done by 20MHz band-width.

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 ≧ 20MΩ.

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

3-8 Temperature Rise : (Use thermometer).
AC input 100 V / 50 Hz with full load, shall not exceed 45K on case surface @ ambient 25℃.

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 : ≧ 10 mSec., @ 100Vac/50Hz, ambient 25℃ with full load.

3-11 Rise Time : ≦ 20 mSec., @ 100Vac/50Hz, ambient 25℃ with full load from 5% to 95% of Vo.

3-12 Inrush Current : ≦ 120A ,at cold start, 240Vac/50Hz, full load, ambient 25℃.

3-13 No load Power Consumption (Off Mode) : ≦0.075 Watts,
At 115Vac/60Hz and 230V/50Hz, ambient 25℃
(As per EU Efficiency Level Tier 2 - 2016)

3-14 PROTECTION CHARACTERISTICS :

3-14-1 Over Voltage Protection : 120%~180% Vo (At full load)

3-14-2 Over Load Protection Current : 2.4 ~ 3.6 A @ 100~240Vac, ambient 25℃.

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℃ ~ + 40℃
4-2 Operating Humidity : 10% to 90 %R.H.
4-3 Storage Temperature : -20℃ ~ + 80℃
4-4 Storage Humidity : 5% to 95 %R.H.

5. RELIABILITY.

5-1 MTBF : (When calculated using MIL-HDBK-217F)

50,000 hours at 25℃

6. SAFETY.

Safety Status : V Applicable ___ Not applicable

Agency	Standards	Note
UL/cUL	UL 60950-1, CSA C22.2 No. 60950-1	
TUV/GS	EN60950-1	
CB	IEC 60950-1	
CE	EN 55022 / EN 55024	

7. EMS & EMI.

7-1 EMS :

Items	Specification	Reference
ESD	Contact : ±4KV	IEC61000-4-2
	Non-Contact : ±8KV	
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 : ±1KV (peak)	IEC61000-4-5
	Line to earth (ground) : ±2KV (peak)	

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

Comply with Standards
CISPR22 ; EN55022, Class B

8. MECHANICAL CHARACTERISTICS.

8-1 Physical Size：75mm(L) x 34.2mm(W) x 49mm(H)

8-2 Enclosure material： 94V-1, minimum

8-3 Output Cable：1500 mm UL2468 #20*2C , with Plug： 2.1*5.5*11 S(TIP可換式)
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：(Refering to CSA C22.2 No.60950 / UL60950 / 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.
Upon conclusion of test, the equipment need not be operational.

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)： 135 ±10 g

Tested By: 陳鳳 Checked By: 〃 Approved By: 韋福賢

Engineering Sample Electrical Testing Data

Customer : Date: 2016/9/22

Part No. : SA124H-12G Design No. : A124H15010-2

Test Ambient : 25 ℃

Test Instruments : 1. Elec. Load : Chroma 63030
2. Power Meter : Topward 1310
3. Digital Osc. : Iwatsu DS-8812

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.)	0.030	0.040								
Input Current At Full Load	800 mA (Max.)	486	486								
O/P DC-Voltage At Load 0 mA	12±5% Vdc	12.17	12.21								
O/P DC-Voltage At Load 2000 mA	12±5% Vdc	11.75	11.80								
Ripple & Noise At full Load	≦100mVp-p	66	62								
Efficiency	80%	83	84.2								
Over Load Current	2.4 ~ 3.6	2.7	2.8								
At 240Vac/50Hz No loading power	≦0.075 Watts (Max.)	0.067	0.066								
Input Current At Full Load	800 mA (Max.)	248	248								
O/P DC-Voltage At Load 0 mA	12±5% Vdc	12.17	12.21								
O/P DC-Voltage At Load 2000 mA	12±5% Vdc	11.75	11.80								
Ripple & Noise At full Load	≦100mVp-p	68	67								
Efficiency	80%	84	85								
Over Load Current	2.4 ~ 3.6	2.6	2.6								

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

Engineering Sample Electrical Testing Data For EU Requirement

Customer : _____ Date: 2016/9/22

Model No. : SA124H-12G Design No. : A124H15010-2

Input Voltage (V)	Frequency (Hz)	Output Voltage (Vdc)	Output Current (A)	Output Power (W)
100-240	50-60	12	2	24

Input 115V / 60Hz	Output Load (%)	Output Load (A)	Sample No. 1	2	3	4	5	6	7	8	9	10
Input Power (W)	0%	0.000	0.032	0.035								
	10%	0.200	2.84	2.85								
	25%	0.500	6.88	6.88								
	50%	1.000	13.75	13.72								
	75%	1.500	20.62	20.65								
	100%	2.000	27.67	27.82								
Output Power (W)	10%	0.200	2.445	2.443								
	25%	0.500	6.092	6.086								
	50%	1.000	12.114	12.081								
	75%	1.500	18.061	18.018								
	100%	2.000	23.92	23.851								
Efficiency (%)	10%	0.200	86.09	85.72								
	25%	0.500	88.55	88.46								
	50%	1.000	88.10	88.05								
	75%	1.500	87.59	87.25								
	100%	2.000	86.45	85.73								
Average Efficiency (%)			87.673	87.373								
Max. No-Load Energy Consumption (W)	0.075	(Max.)	Pass	Pass								
MIN Average Active Mode Efficiency (%) - 4 Point Avg. Eff.	86.804	(Min.)	Pass	Pass								
MIN Active Mode Efficiency (%) - 10% Load Eff.	76.804	(Min.)	Pass	Pass								

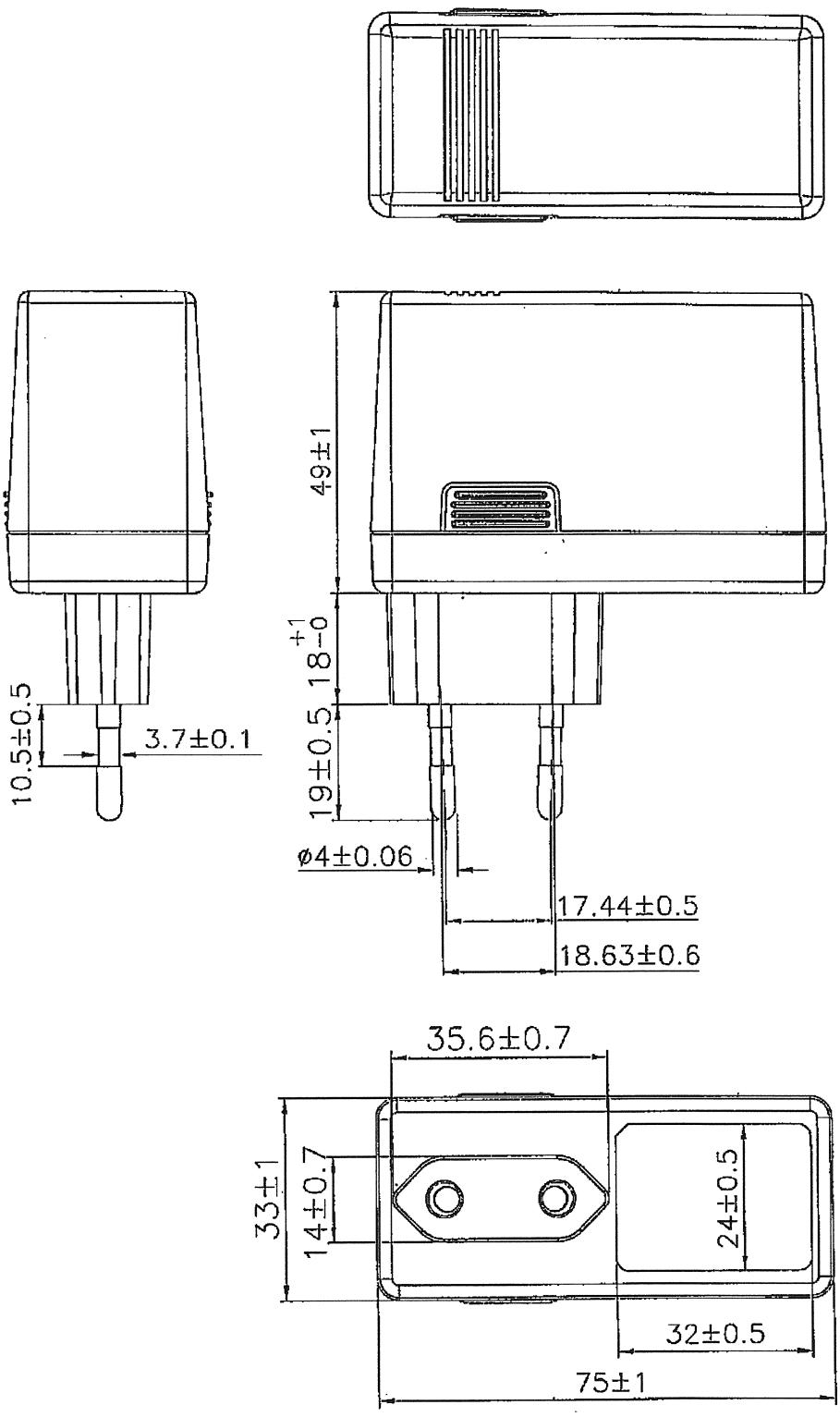
Input 230V / 50Hz	Output Load (%)	Output Load (A)	Sample No. 1	2	3	4	5	6	7	8	9	10
Input Power (W)	0%	0.000	0.063	0.063								
	10%	0.200	2.98	3.01								
	25%	0.500	6.96	6.97								
	50%	1.000	13.75	13.77								
	75%	1.500	20.55	20.56								
	100%	2.000	27.67	27.58								
Output Power (W)	10%	0.200	2.443	2.444								
	25%	0.500	6.088	6.085								
	50%	1.000	12.105	12.098								
	75%	1.500	18.046	18.042								
	100%	2.000	23.923	23.86								
Efficiency (%)	10%	0.200	81.98	81.20								
	25%	0.500	87.47	87.30								
	50%	1.000	88.04	87.86								
	75%	1.500	87.82	87.75								
	100%	2.000	86.46	86.51								
Average Efficiency (%)			87.448	87.355								
MAX No-Load Energy Consumption (W)	0.075	(Max.)	Pass	Pass								
MIN Average Active Mode Efficiency (%) - 4 Point Avg. Eff.	86.804	(Min.)	Pass	Pass								
MIN Active Mode Efficiency (%) - 10% Load Eff.	76.804	(Min.)	Pass	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	49W ≦ Pno < 250W	0.150W
Low Voltage	0.3W < Pno ≦ 1W	≧0.517 * Pno + 0.091	≧0.517 * Pno	Mobile handeld Battery Driven and < 8W	0.075W
	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		

* Test unit had warmed up 30 minutes .

Tested By: 陳 鳳 Checked By: _____ Approved By: _____ QA By: _____



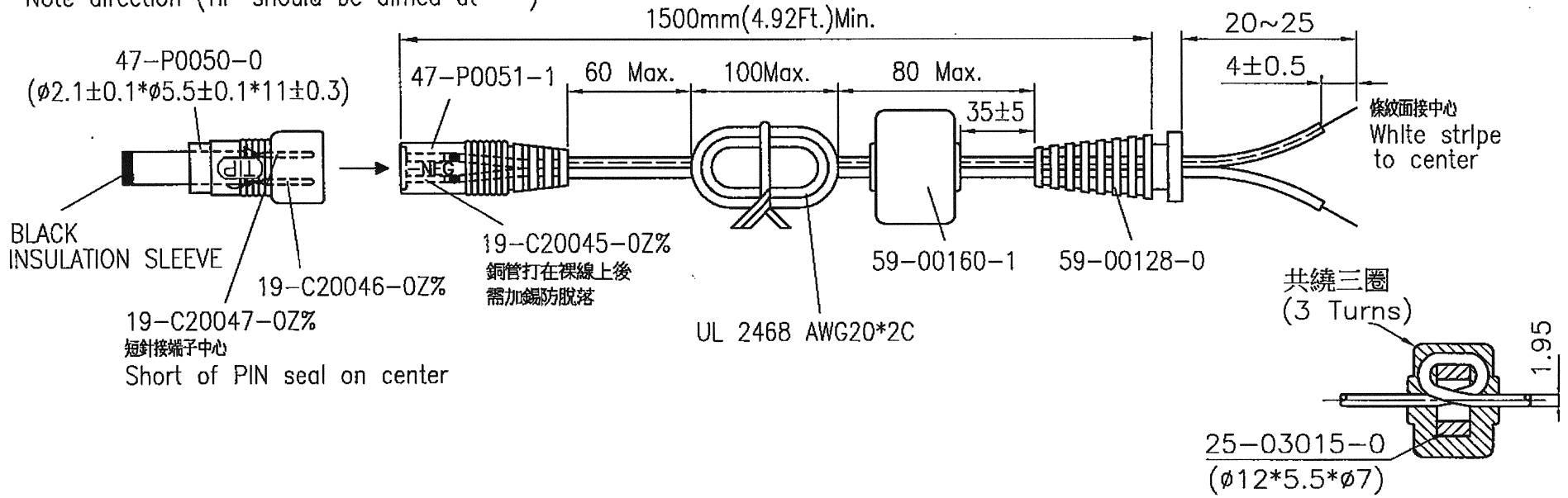
SA124H-12G
UNIT:mm

入料時47-P0050-0需套入47-P0051-1之配合拉拔力為0.5-3.0KG/F

* 注意方向性 (TIP對準 -NEG)

Part no 47-P0050-0 should be tubed in 47-P0051-1

* Note direction (TIP should be aimed at "-")



REV.	DESCRIPTION					DATE\REVISER		DWG. NAME	DC CORD
								MODEL	
DRAWER	DESIGN	CHECK	APPROVED	DIMENSION	TOLERANCE	Q'TY		MATERIAL	P.V.C
Patrick				0 ~ 5	±0.1	UNIT	mm	TREATMENT	
				5 ~ 60	±0.2	SCALE	/	DWG. NO.	S89-P0050-004%
				60 ~ 200	±0.3	ORIG. DATE	2016.9.13	ONTOP ELECTRONIC CO., LTD.	
				200 ~ 350	±0.6	MANUFACTORY			