

Approval Sheet

FOR DISTRELEC

PART NO.: SA130D-24U (replace 69-797-37)

DESIGN NO.: A130D15401-2

DATE: Oct. 27. 2015

REMARK: change to UL2468 wire

APPROVED BY (PLEASE SIGN)

--	--	--	--



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

-DIV. OF SAC GROUP-



台北市中山北路六段一六一號二樓之二

2F-2, NO.161, SEC.6, CHUNG SHANG N. RD., TAIPEI, TAIWAN

TEL: +886-2-2838-2606

FAX: +886-2-2838-2604

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.

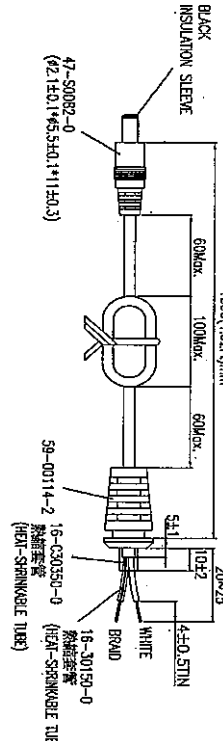
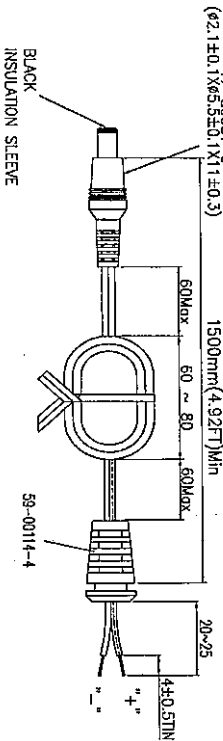
**** IMPORTANT ****

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

CUSTOMER : _____
 MODEL NO. : SA130D-24U

DATE : 2015/10/27
 PART NO. : _____

CHANGE NOTICE

ORIGINAL DESIGN NO. : A130D15401-1	REVISED DESIGN No. : A130D15401-2
<p>DC CORD : 4.92 Ft UL 1185 18*2C</p>  <p>UL 1185 AMG18 80°C</p>	<p>DC CORD : 4.92Ft UL 2468 22*2C</p>  <p>UL 2468 AMG22*2C</p>
Customer Approved by :	

PRODUCTION REVISION HISTORY :

REV.	DATE	BY:	DESCRIPTION OF CHANGE
-2	27-Oct-15		Change the DC CORD.

Designed by : 陳鳳	Checked by :	Approved by : 艾邦亮
------------------	--------------	-------------------

SAC AC to DC SWITCHING ADAPTER SPECIFICATION	MODEL:	SA130D-24U	Design NO:	A130D15401-2
-----------------------------------------------------	---------------	------------	------------	--------------

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 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	24±5%	0	24±5%	1250

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 :

85% (Min.) , @ AC Input 100Vac/50 Hz with full load.

85% (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= 24.0 Vdc ≤ 240 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 : $\leq 0.25mA$, 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 : ≤ 40 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
(EU Efficiency Level Tier2-2016 & U.S. DoE Level VI)

3-14 PROTECTION CHARACTERISTICS :

3-14-1 Over Voltage Protection 43.2Vo Max ,Latch shut down

3-14-2 Over Load Protection Current : 1.4 ~ 2.6A @ 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 : $\pm 4KV$	IEC61000-4-2
	Non-Contact : $\pm 8KV$	
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 : $\pm 1KV$ (peak)	IEC61000-4-5
	Line to earth (ground) : $\pm 2KV$ (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 : 110mm(L) x 50mm(W) x 31mm(H)

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

8-3 Output Cable : 1500mm UL 2468 AWG22*2C , with Plug : 2.1*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) : 160 ±10g

Tested By: 陳鳳

Checked By: _____

Approved By: 艾邦虎

Engineering Sample Electrical Testing Data

Customer : _____
 Part No. : SA130D-24U

Date: 2015/10/27
 Design No. : A130D15401-2

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.)	0.04	0.03								
Input Current At Full Load	1000 mA (Max.)	609	610								
O/P DC-Voltage At Load 0 mA	24±5% Vdc	24.17	24.3								
O/P DC-Voltage At Load 1250 mA	24±5% Vdc	24.06	24.11								
Ripple & Noise At full Load	≤240 mVp-p	40	44								
Efficiency	85% (Min.)	89	88.9								
Over Load Current	1.4 ~ 2.6A	2	2.05								
At 240Vac/50Hz No loading power	≤ 0.075 Watts (Max.)	0.055	0.056								
Input Current At Full Load	1000 mA (Max.)	315	322								
O/P DC-Voltage At Load 0 mA	24±5% Vdc	24.17	24.3								
O/P DC-Voltage At Load 1250 mA	24±5% Vdc	24.05	24.09								
Ripple & Noise At full Load	≤240 mVp-p	40	42								
Efficiency	85% (Min.)	90	90								
Over Load Current	1.4 ~ 2.6A	2.02	2.07								

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 DOE/MEPS Requirement

Customer : _____
 Model No. : SA130D-24U

Date: 2015/9/21
 Design No. : A130D15401-1

Input Voltage (V)	Frequency (Hz)	Output Voltage (Vdc)	Output Current (A)	Output Power (W)
100-240	50-60	24	1.25	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	0.033	0.034								
	25%	0.313	8.28	8.42								
	50%	0.625	16.72	16.32								
	75%	0.938	25.09	25.19								
	100%	1.250	33.74	33.89								
Output Power (W)	25%	0.313	7.598	7.617								
	50%	0.625	15.146	15.175								
	75%	0.938	22.696	22.72								
	100%	1.250	30.181	30.175								
Efficiency (%)	25%	0.313	91.76	90.46								
	50%	0.625	90.59	92.98								
	75%	0.938	90.46	90.19								
	100%	1.250	89.45	89.04								
Average Efficiency (%)			90.565	90.668								
Max. No-Load Energy Consumption (W)	0.100	(Max.)	Pass	Pass								
Min. Average Active Mode Efficiency (%)	86.949	(Min.)	Pass	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	0.058	0.056								
	25%	0.313	8.49	8.56								
	50%	0.625	16.8	16.93								
	75%	0.938	25.12	25.32								
	100%	1.250	33.25	33.56								
Output Power (W)	25%	0.313	7.596	7.614								
	50%	0.625	15.096	15.164								
	75%	0.938	22.67	22.697								
	100%	1.250	30.158	30.049								
Efficiency (%)	25%	0.313	89.47	88.95								
	50%	0.625	89.86	89.57								
	75%	0.938	90.25	89.64								
	100%	1.250	90.70	89.54								
Average Efficiency (%)			90.070	89.425								
MAX No-Load Energy Consumption (W)	0.100	(Max.)	Pass	Pass								
MIN Average Active Mode Efficiency (%)	86.949	(Min.)	Pass	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	
			Ac-Dc EPS	Ac-Ac EPS
Standard	0 to ≤ 1 watt	$\geq 0.5 * Po + 0.16$	≤ 0.10 watts	≤ 0.21 watts
	> 1 to ≤ 49 watts	$\geq 0.071 * Ln (Po) - 0.0014 * (Po) + 0.67$		
	> 49 to ≤ 250 watts	≥ 0.880	≤ 0.21 watts	
	> 250 watts	≥ 0.875	≤ 0.50 watts	≤ 0.50 watts
Low Voltage	0 to ≤ 1 watt	$\geq 0.517 * Po + 0.087$	≤ 0.10 watts	≤ 0.21 watts
	> 1 to ≤ 49 watts	$\geq 0.0834 * Ln (Po) - 0.0014 * (Po) + 0.609$		
	> 49 to ≤ 250 watts	≥ 0.870	≤ 0.21 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: 吳輝

QA By: _____

Engineering Sample Electrical Testing Data For EU Requirement

Customer : _____
 Model No. : SA130D-24U

Date: 2015/10/27
 Design No. : A130D15401-2

Input Voltage (V)	Frequency (Hz)	Output Voltage (Vdc)	Output Current (A)	Output Power (W)
100-240	50-60	24	1.25	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	0.033	0.034								
	10%	0.125	3.4	3.42								
	25%	0.313	8.28	8.42								
	50%	0.625	16.72	16.32								
	75%	0.938	25.09	25.19								
	100%	1.250	33.74	33.89								
Output Power (W)	10%	0.125	2.913	3.047								
	25%	0.313	7.598	7.617								
	50%	0.625	15.146	15.175								
	75%	0.938	22.696	22.72								
	100%	1.250	30.181	30.175								
Efficiency (%)	10%	0.125	85.68	89.09								
	25%	0.313	91.76	90.46								
	50%	0.625	90.59	92.98								
	75%	0.938	90.46	90.19								
	100%	1.250	89.45	89.04								
Average Efficiency (%)			90.565	90.668								
Max. No-Load Energy Consumption (W)	0.075	(Max.)	Pass	Pass								
MIN Average Active Mode Efficiency (%) - 4 Point Avg. Eff.	87.699	(Min.)	Pass	Pass								
MIN Active Mode Efficiency (%) - 10% Load Eff.	77.699	(Min.)	Pass	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	0.058	0.056								
	10%	0.125	3.48	3.63								
	25%	0.313	8.49	8.56								
	50%	0.625	16.8	16.93								
	75%	0.938	25.12	25.32								
	100%	1.250	33.25	33.56								
Output Power (W)	10%	0.125	3.037	3.046								
	25%	0.313	7.596	7.614								
	50%	0.625	15.096	15.164								
	75%	0.938	22.67	22.697								
	100%	1.250	30.158	30.049								
Efficiency (%)	10%	0.125	87.27	83.91								
	25%	0.313	89.47	88.95								
	50%	0.625	89.86	89.57								
	75%	0.938	90.25	89.64								
	100%	1.250	90.70	89.54								
Average Efficiency (%)			90.070	89.425								
MAX No-Load Energy Consumption (W)	0.075	(Max.)	Pass	Pass								
MIN Average Active Mode Efficiency (%) - 4 Point Avg. Eff.	87.699	(Min.)	Pass	Pass								
MIN Active Mode Efficiency (%) - 10% Load Eff.	77.699	(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	$0.3W \leq P_{no} \leq 1W$	$\geq 0.5 * P_{no} + 0.169$	$\geq 0.5 * P_{no} + 0.06$	$0.3W \leq P_{no} < 49W$	0.075W
	$1W < P_{no} \leq 49W$	$\geq 0.071 * \ln(P_{no}) - 0.00115 * P_{no} + 0.670$	$\geq 0.071 * \ln(P_{no}) - 0.00115 * P_{no} + 0.570$		
	$49W < P_{no} \leq 250W$	≥ 0.890	≥ 0.790	$49W \leq P_{no} < 250W$	0.150W
Low Voltage	$0.3W < P_{no} \leq 1W$	$\geq 0.517 * P_{no} + 0.091$	$\geq 0.517 * P_{no}$	Mobile handeld Battery Driven and < 8W	0.075W
	$1W < P_{no} \leq 49W$	$\geq 0.0834 * \ln(P_{no}) - 0.0011 * P_{no} + 0.609$	$\geq 0.0834 * \ln(P_{no}) - 0.00127 * P_{no} + 0.518$		
	$49W < P_{no} \leq 250W$	≥ 0.880	≥ 0.780		

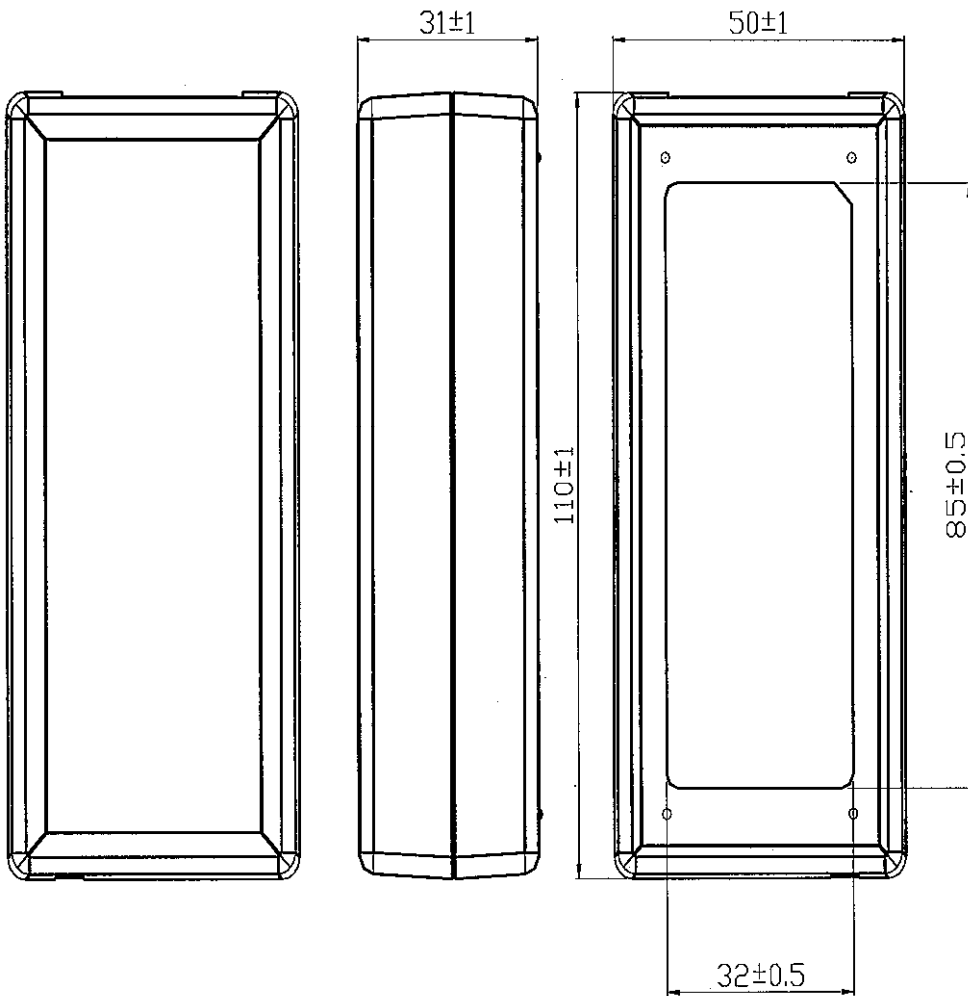
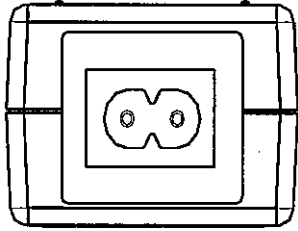
* Test unit had warmed up 30 minutes .

Tested By: 陳鳳

Checked By: _____

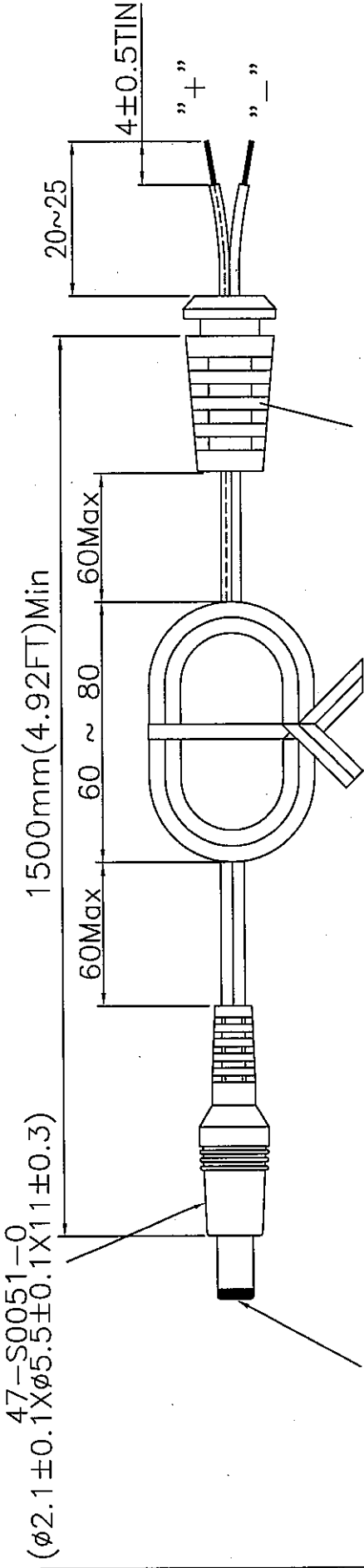
Approved By: 支軒龍

QA By: _____



SA130D-24U

UNIT : mm



59-00114-4

UL 2468 AWG22*2C

REV.	DESCRIPTION				DATE\REVISER	DWG. NAME	DC CORD
DRAWER	DESIGN	CHECK	APPROVED	DIMENSION TOLERANCE	Q'TY	MATERIAL	P.V.C.
				0 ~ 5 ±0.1	UNIT	TREATMENT	
				5 ~ 60 ±0.2	SCALE	DWG. NO.	S89-C3GXX2-17%
				60 ~ 200 ±0.3	ORIG. DATE	2015.10.23	
				200 ~ 350 ±0.6	MANUFACTORY	2015.10.23	
HN						ONTOP ELEC. CO., LTD.	

