TEN PAO INTERNATIONAL LTD.

SPECIFICATION FOR APPROVAL

CUSTOMER:	OLFER	TEN PAO MODEL NO.:	S024DP1200200
CUSTOMER P/N:		TEN PAO P/N:	R015795V-N
CUSTOMER MAINFRAME MODEL:		REV. NO.:	0
		DATE:	Nov. 15,2011

DESCRIPTION: Input:100-240Vac ;Output: 12.0Vdc 2.0A, SMPS Adaptor

Dear Customer:

Please send one copy of this specification back after you sign and approve for production

Approved By: _____

Date: _____

ISSUED BY		CHECKED BY		APPROVED BY	
	刘彩霞				林榜

E0-3-011 B/3

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Design Revision History

Mark	Description of Change		Changed Date	Reason of Change	Revised By	Approved By
	Before	After				
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SAMPLE DESCRIPTION

THE PURPOSE OF THE SAMPLE(REMARK IN THE RIGHT PLACE)	(NO-SAMPLE)	☐	(WORK-SAMPLE)	☐	(FUNCTION-SAMPLE)	☑	(FINALLY-SAMPLE)	☐

THE ITEMS NEED BE CONTINUED OF THESE SAMPLES CONFIRMED BY CLIENT

EMI MODIFICATION	☐	SAFETY APPROVAL	☐	PCB MODIFICATION	☐	MOULD	☐ PCB ☐ DC CORD ☐ CASE	PILOT RUN	☑

DIFFERENCE OF THE SAMPLE WITH FINALLY-SAMPLE:

POSITION NO.	PART TYPE	MATERIAL OF THIS SAMPLE	MASS-PRODUCTION MATERIAL(MATERIAL OF BOM)	REMARK

DIFFERENCE OF THE SAMPLE WITH BOM:

HONORIFIC GUEST:THIS TIME(DATE:Nov.15,2011)THE SAMPLES ARE(2)PCS,NUMBER IS (A1-A2);DIFFERENCE WITH SAMPLES OF LAST TIME ARE:

NO.	ITEM OF LAST TIME	CHANGED ITEM OF THIS TIME	CHANGE REASON
1			
2			
3			
4			
5			
6			

1. SCOPE

This document details the electrical, mechanical and environmental specifications of a switching power supply.

1.1 Description

☐ Wall Mount ☑ Desk-Top

☐ Open Frame ☐ Others

2. INPUT REQUIREMENTS

2.1 Input Voltage & Frequency

The range of input voltage is from **90Vac** to **264Vac**

	Min.	Normal	Max.
Input Voltage	90Vac	100-240Vac	264Vac
Input Frequency	47Hz	50/60Hz	63Hz

2.2 Input Current

The maximum input current is **600mA** max. at **100-240Vac** .

2.3 Inrush Current

The inrush current will not exceed **80A** at **100-240Vac** input and Max load for a cold start at 25˚C.

2.4 Stand-By Power

The input power should be less than ／ with No-Load.

3. OUTPUT FEATURES

3.1 Output Parameters

	Output Data	Spec. Limit			Test Condition
3.1.1	12.0Vdc	Min. Value	Typical	Max. Value	
3.1.2	Output Voltage	11.4Vdc	12.0Vdc	12.6Vdc	0 ～ 2.0A Loading
3.1.3	Output Load	0.0A	—	2.0A	
3.1.4	Ripple and Noise	—	—	150mVp-p	20MHz Bandwidth 10uF Ele. Cap.0.1uF Cer. Cap.
3.1.5	Output Overshoot	—	—	10%	MAX. load(2.0A) & 100-240Vac

3.2 Turn On Delay

During turn on and turn off, no output voltage shall exceed its nominal voltage by more than **10%** and no output shall change its polarity with respect to its return line. All outputs shall reach their steady state values within **3** seconds of turn on.

3.3 Hold Up Time

10 ms minimum at **115Vac/60Hz** input at maximum load, and **20** ms minimum at **230Vac/50Hz** input at maximum load.

3.4 Typical Efficiency

The efficiency (watts out / watts in) shall be higher than ___ typical while measuring at nominal line and maximum load condition, test in 1 minute after power on.

3.5 Output Transient Response

The power supply shall maintain output transient response time within **10ms** with a loading current change from 20% to 80% of maximum current and 0.5A/μs rise up /drop down test at end of output terminal.

4. PROTECTION REQUIREMENT

4.1 Over-Voltage Protection

Over-voltage protection shall be included in the adaptor circuit. A single component failure must not cause an over voltage.

4.2 Over-Current Protection

The adaptor must have a current limiting function on the output voltage. in overload mode, the output must drop to a low voltage.

4.3 Short-Circuit Protection

The adaptor must withstand a continuous short circuit on the output without damage.

5. ENVIRONMENTAL CONDITIONS

5.1 Operating

The power supply shall be capable of operating normally in any mode without malfunction happens in the following environmental conditions.

5.1.1 Operating Temperature: 0℃ ～40℃ (Can operate normally)

Relative Humidity: 10% ～ 90%

Altitude: Sea level to 2,000 m.

5.1.2 Vibration: 1.0mm, 10 –55Hz, 15 minutes per cycle for each axis (X, Y, Z).

5.1.3 Cooling: Natural convection cooling

5.2 Non - Operating

The power supply shall be capable of withstanding the following environmental conditions extended periods of time, without sustaining electrical or mechanical damage and subsequent operational deficiencies.

5.2.1 Storage Temperature: -30˚C ～ 70˚C

5.2.2 Relative Humidity: 10% ～ 90%

5.2.3 Altitude: Sea level to 2,000 m.

5.2.4 Vibration and Shock:

The power supply shall be designed to withstand normal transportation vibration per MIL–STD-810D, method 514 and procedures X, as it is mounted in the chassis assembly and packed for shipping.

6. RELIABILITY AND QUALITY CONTROL

6.1 MTBF

When the power supply is operating within the limits of this specification the MTBF shall be at least **50,000** hours at 25˚C (MIL-HDBK-217F).

6.2 Burn-In

The power supply shall withstand a minimum of **4** hours Burn-In test under full load at 35˚C ~40˚C room temperatures, after test, product shall operate normally.

6.3 Component Derating

Semiconductor junction temperatures shall not exceed the manufacturer's maximum thermal rating.

7. MECHANICAL CHARACTERISTICS

7.1 Physical Dimensions

The detail dimension of the power supply is drawed on APPENDIX A.

7.2 Nameplate

The label of the power supply, please see APPENDIX C.

7.3 Impact test

Sample is to be subjected to a single impact of 5 foot-pounds(6.78N.m) on any surface that is exposed to a blow during intended use. This impact is to be produced by dropping a steel sphere, 2 inches(51 mm) in diameter and weighing approximately 1.18 pounds(535 g), from a height of 51 inches(1.30 m). The steel sphere is to strike the surface in a location different from those in the other two impacts. For surfaces other than the top of an enclosure, the steel sphere is to be suspended by a cord and allowed to swing as a pendulum dropping through a vertical distance of 51 inches(1.30 m).

8. SAFETY

8.1 Safety Standard

The power supply shall be certified under the following international regulatory standards

Item	Country	Certified	Standard
UL	USA	Approved	UL60950-1
GS	Europe	Approved	EN60950-1
CE	Europe	Approved	EN60950-1

8.2 Insulation Resistance

Input to output: **10 MΩ** min. at **500 VDC**.

8.3 Dielectric Strength (Hi-Pot)

Primary to Secondary **DC4242V,3.5mA** 1 minute for type test,

DC4500V,3.5mA 2 seconds for product.

8.4 Leakage Current

The leakage current shall be less than **0.25mA** for **Class** II when the power supply is operated maximum input voltage and maximum frequency.

9. EMC STANDARDS

9.1 EMI Standards

The power supply shall meet the radiated and conducted emission requirements for **EN55022,FCC PART 15 CLASS B.**

9.2 EMS Standards**(EN55024)**

The power supply shall meet the following EMS standards

9.2.1 IEC61000-4-2 Electrostatic Discharge (ESD)

Static – discharge test by contact or air should be conducted with Static – discharge tester, energy storage capacitance of 150pF, and discharge resistance of 330Ω.

8KV air discharge, **4KV** contact discharge, Performance Criterion B.

9.2.2 IEC61000-4-3 Radiated Electromagnetic Fields(RS)

Radio- frequency Electromagnetic Field Susceptibility Test, RS, 80-1000MHz,3V/m, 80%AM(1KHz), Performance Criterion A.

9.2.3 IEC61000-4-4 Electrical Fast Transient / Burst (EFT)

Power Line to Line: **1KV**

Performance Criterion B.

9.2.4 IEC61000-4-5 Lightning Surge Attachment
Lightning Surge voltage of differential and common modes shall be applied across AC input lines and across input and frame ground.
Power Line to Line: **1KV**
Performance Criterion B.

9.2.5 IEC61000-4-6 Conducted Radio Frequency Disturbances (CS)
Conducted Radio Frequency Disturbances Test, CS, 0.15-80 MHz, 3V/m, 80%AM, 1KHz, Performance Criterion A.

9.2.6 IEC61000-4-11 Voltage Dips/Short Interruption/Variations
Voltage Dips, 30% reduction- 10ms, Performance Criterion B, 60% Reduction – 100ms, Performance Criterion C, Voltage Interruptions>95% Reduction- 5000ms, Performance Criterion C.

10. OTHER REQUIREMENTS

10.1 Hazardous Substances
The components and used materials shall be in compliance with

- [√] EU Directive 2002/95/EC "RoHS"
- [√] EU Directive 2002/96/EC "WEEE"
- [ ] Halogen Free
- [√] REACH

10.2 Energy Efficiency

10.2.1 The No-Load power consumption shall be less than **0.3W** at input **115/230Vac,60/50Hz.**

10.2.2 The average active mode efficiency shall be higher than **82.22%** at input **115/230Vac,60/50Hz.**

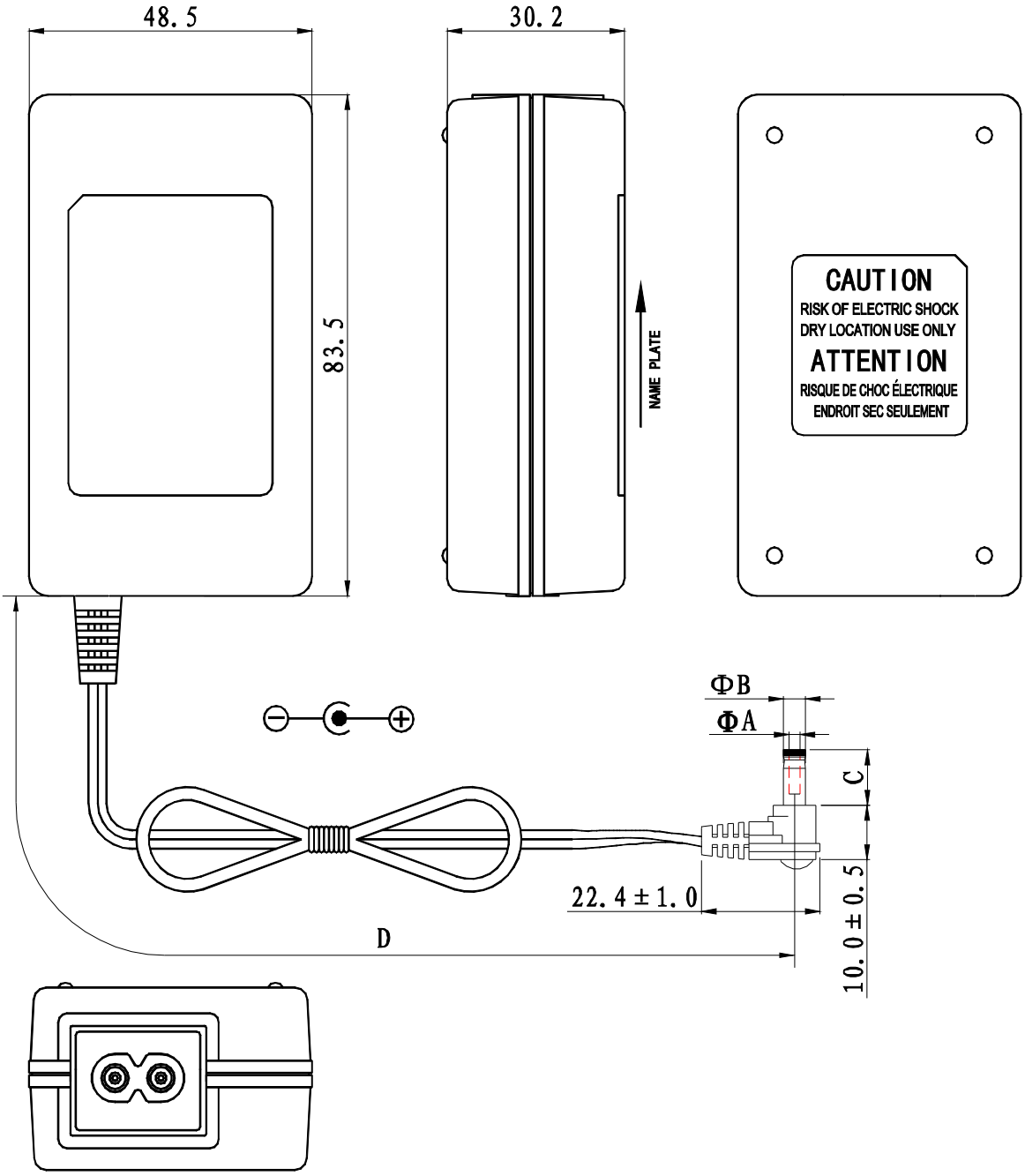
10.2.3 [√] International Efficiency Level V .
[ ] Korea Energy Efficiency Label

10.2.4 This power supply is therefore in compliance with the requirements of

- [ ] California Energy Commission Energy Efficiency requirements for external power supplies (CEC)
- [√] Energy Star Energy Efficiency requirements for external power supplies (EPS Version 2.0)
- [ ] EU Code of Conduct on Energy Efficiency of External Power Supplies((Version 4)
- [ ] Australian and New Zealand Energy Performance Requirements for external power supplies (MEPS,AS/NZS 4665.1,AS/NZS 4665.2)
- [ ] China Energy Efficiency requirements for external power supplies (GB20943-2007)
- [ ] Korea regulation on Energy Efficiency Labeling and Standards for external power supplies (MKE's Notification 2008-99)
- [√] Implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for no-load condition electric power consumption and average active efficiency of external power supplies (No 278/2009, Stage 2)

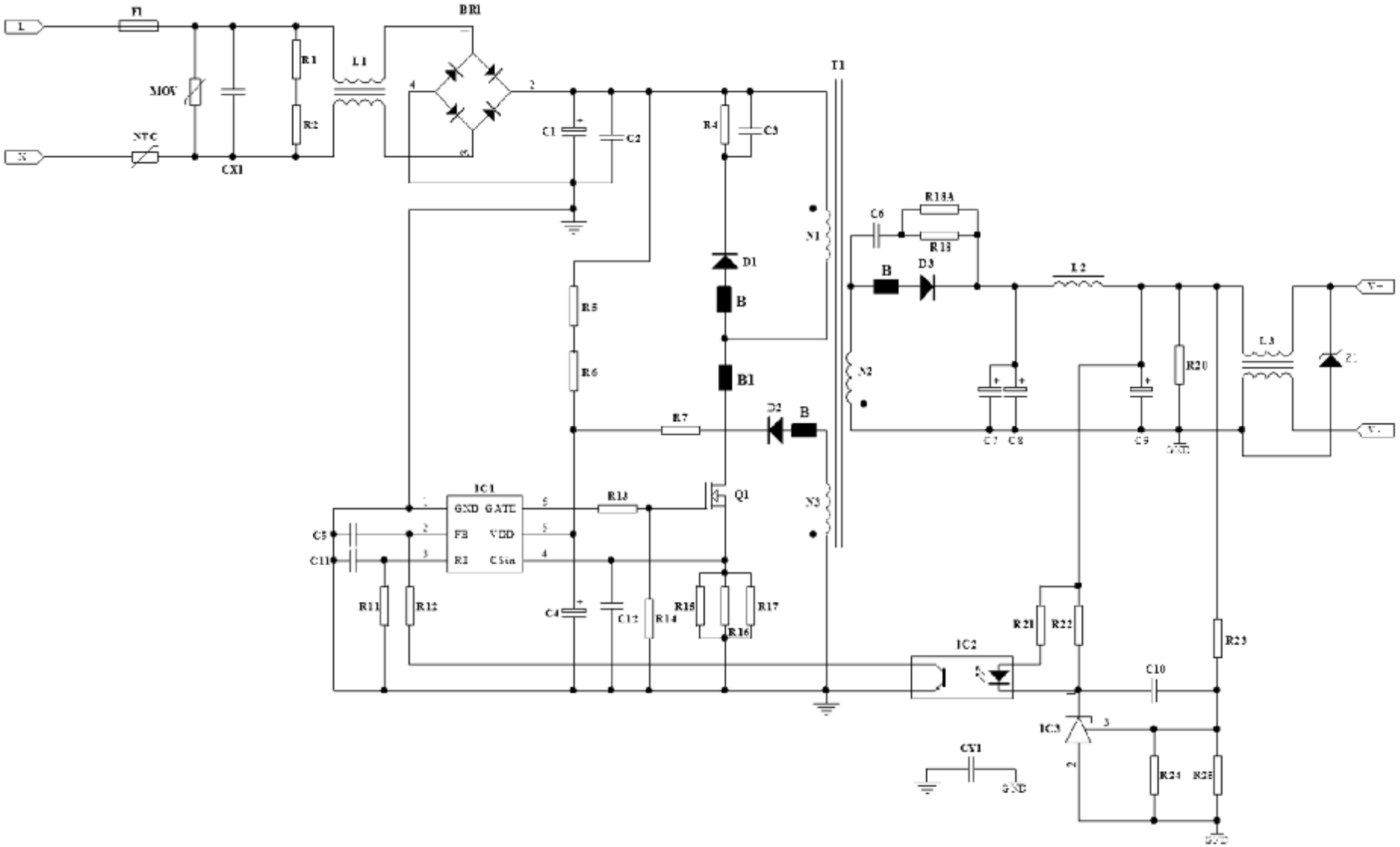
APPENDIX A

Mechanical Dimensions(Unit: mm) Tolerance Of unspecified Parts:±1.5mm



	ΦA	ΦB	C	D
DIMENSION	2.5	5.5	9.5	1500
TOLERANCE	+0.1/-0	±0.1	±0.5	min.
REMARK	AWG20#/2C UL2468 BLACK			

APPENDIX B



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APPENDIX C

Name Plate:

DATE CODE:

YYWW X

PRODUCTION LINE A - Z

WEEK 01 - 53

YEAR 00 - 99

Unit: mm

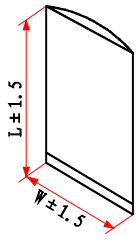
Word Color: **Grey (Laser Print)**

* Please Advise If Any Comments About The Name Plate Information.
Otherwise, This Information Is Defaulted As Customer Approval,
And Will Be Applied To Production .

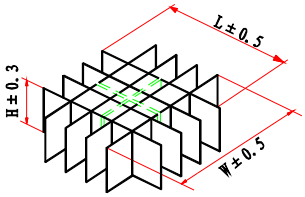
APPENDIX D

PRODUCT:

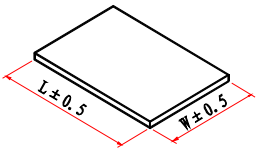
PLASTIC BAG:



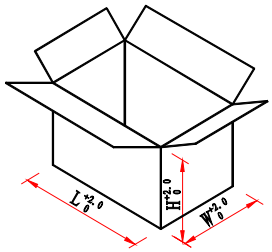
CARDBOARD:



PAPERBOARD:



CARTON:



DIMENSION(UNIT IN cm):

	L	W	H
PLASTIC BAG	22.0	15.0	
CARDBOARD	48.0	38.0	5.0
PAPERBOARD	48.0	38.0	
CARTON	49.0	39.0	24.0

PACKING METHOD:

PAPERBOARD PLACEMENT METHOD	PUT A PAPERBOARD OVER AND UNDER THE PRODUCTS OF EACH LAYER, TOTAL 5PCS.
PACKING METHOD	20PCS/LAYER X 4 LAYERS
QTY	80PCS
N.W./PC	149g
G.W./CARTON	13.4Kg

REMARK:

1. STORAGE CONDITION

   TEMPERATURE: -10˚C～+60˚C

   RELATIVE HUMIDITY: 30%～80%

2. STORAGE PERIOD: 6 MONTHES

3. ANLISTATIG: NO REQUIREMENT

4. PLEASE ADVISE IF ANY COMMENTS ABOUT THE PACKING INFORMATION.

   OTHERWISE,THIS INFORMATION IS DEFAULTED AS CUSTOMER APPROVAL,

   AND WILL BE APPLIED TO PRODUCTION.

APPENDIX E

SAMPLE PRIMARY TEST REPORT

CUSTOMER	**OLFER**		
MODEL NO.	**S024DP1200200**	**PRODUCT NO.**	**R015795V-N**

Test Items.	Test Condition	Unit	Sample Number and Test Result										Pass/ Fail
			1#	2#									
Unload output voltage/ (0.0A) 11.4Vdc - 12.6Vdc	90Vac	V	12.01	12.02									Pass
	132Vac	V	12.01	12.02									Pass
	180Vac	V	12.01	12.02									Pass
	264Vac	V	12.01	12.02									Pass
Rated load output voltage/ (2.0A) 11.4Vdc - 12.6Vdc	90Vac	V	11.68	11.69									Pass
	132Vac	V	11.68	11.69									Pass
	180Vac	V	11.68	11.69									Pass
	264Vac	V	11.68	11.69									Pass
Output ripple & noise voltage≤150mV (test at full loading)	90Vac	mV	32	32									Pass
	132Vac	mV	28	30									Pass
	180Vac	mV	30	28									Pass
	264Vac	mV	31	28									Pass
Short-circuit protection test (Short at end of DC plug)	90Vac	W	0.24	0.20									_
	264Vac	W	0.87	0.99									_
Over current protection (Ocp≤A)	90Vac	A	2.67	2.62									_
	264Vac	A	3.28	3.17									_
IC Vcc voltage test/ /Max. load (Specs≤30V)	90Vac	v	19.90	19.98									Pass
	264Vac	v	19.84	19.91									Pass
IC Vcc voltage test/Min. load (Specs≥8.1V)	90Vac	v	12.16	12.11									Pass
	264Vac	v	10.61	10.64									Pass
Hi-pot test	4242Vdc/3.5mA/ 1Minute		OK	OK									Pass

APPENDIX F

SAMPLE TEST REPORT

CUSTOMER:		**OLFER**								
TEN PAO MODEL NO.:		**S024DP1200200**			**TEN PAO P/N:**				**R015795V-N**	
Items No.	Test Items	Unit	Test condition & result						Spec. Limit	Pass/ Fail
			90Vac	115Vac	132Vac	180Vac	230Vac	264Vac		
1	Unload input current	mA	11.51	14.45	16.52	18.77	23.86	27.45	-	-
2	Unload input power	W	0.06	0.07	0.07	0.09	0.12	0.16	≤0.3W (115/230Vac)	Pass
3	Rated load input current	mA	531.4	438.9	406.2	347.7	282.5	254.1	≤600mA (100 - 240Vac)	Pass
4	Rated load input power	W	28.93	28.46	28.91	28.68	28.15	28.35	-	-
5	Unload output voltage(0.0A)	V	12.08	12.08	12.08	12.08	12.08	12.08	11.4V -12.6V	Pass
6	Rated load output voltage(2.0A)	V	11.72	11.72	11.72	11.72	11.72	11.72	11.4V -12.6V	Pass
7	Output ripple&noise voltage(2.0-0A)	mV	53.80	60.20	55.70	49.30	47.50	44.90	≤150.0mVp-p	Pass
8	Output transient response (20%-80%)	mS	5.2	5.2	5.2	5.2	5.2	5.2	≤10mS	Pass
9	Short-circuit test (Pin&Iout)	W	0.02	0.19	0.12	0.22	1.04	2.57	-	-
		A	hiccup	hiccup	hiccup	hiccup	hiccup	hiccup	-	-
10	Over current protection	A	2.96	3.28	3.05	2.45	3.32	3.88	-	-
11	Over voltage protection	V	18.88	18.88	18.88	18.88	18.88	18.88	-	-
12	Output overshoot/Max load	%	2.80%	2.80%	2.80%	2.80%	2.80%	2.80%	≤10.0% (100-240Vac)	Pass
13	Turn on delay time	mS	2478.8	2053.0	1698.0	1335.0	983.0	765.0	≤3000.0mS	Pass
14	Hold up time	mS	7.80	14.30	22.70	45.80	76.20	105.90	≥10mS/(115Vac) ≥20mS/(230Vac)	Pass
15	Efficiency(Full load)	%	81.02%	82.36%	81.08%	81.73%	83.27%	82.68%		-
16	Mech. Dimension	mm	83.5			48.5			**L**:83.5±1.5; **W**:48.5±1.5	Pass
			30.3			-			**H**:30.2±1.5	Pass
17	DC cord and DC connector	mm	**DC cord**:AWG20#/2C UL2468,**LENGTH**:1535mm.						1500mm Min.	Pass
			DC conn.:Inside(+) Outside(-),Dimension conform with spec. limit.							Pass
18	Hi-pot test		**Pri. to Sec**:4242VDC,1Minute, Cut off current≤3.5mA(**Test result: 0.03mA**)							Pass
19	Max. and Light load change test		Max. load to Light load：OK Light load to max. load: OK (90-264Vac)							
20	Appe. label and fusion		Appearance: OK, Label: OK, Fusion: OK							
21	Mosfet(IC)/Vds(normal:95% ,other:100%)	V	515.0	525.0	528.0	531.0	531.0	Mosfet spec. 600V	Derating≤95% &100% Max. Volt.	Pass
			normal	start up	short	ocp	max/min			
22	Diode /Vrr(normal:90% ,other:100%)	V	89.5	95.0	99.0	99.2	99.5	Diode spec. 100V	Derating≤90% &100% Max. Volt.	Pass
			normal	start up	short	ocp	max/min			

TEST BY	CHECKED BY	APPROVED BY	DATE	REV	SHEET
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APPENDIX F

SAMPLE TEST REPORT

CUSTOMER:	**OLFER**		
TEN PAO MODEL NO.:	**S024DP1200200**	**TEN PAO P/N:**	**R015795V-N**

1.TEST STANDARD: Energy Star Energy Efficiency requirements for external power supplies(EPS Version 2.0)

2. Product Specification:

Input voltage, frequency, current: 100-2404VAC 50HZ 600mA Output voltage, current: 12.0VDC/2.0A

3.TEST METHOD:

3.1. Under input 230VAC / 50Hz, output normal load, the EUT continuous operating for 30 minutes .

3.2. Under input 115VAC / 60Hz and 230VAC / 50Hz, the EUT is measured at 100%, 75%, 50% and 25% of rated output current.Record values are output voltage, output current, input power, input current. Then calculating average efficiency at four active mode load conditions.

3.3. Input 115VAC / 60Hz and 230VAC / 50Hz, test the input power, input current, output voltage in the no-load condition.

4.TEST DATA: (Room temperature: 25-30℃, relative humidity : 10-90%).

4.1 Input voltage, frequency 115V,60Hz:

Sample No.	Item		Unload	25%*I_L	50%*I_L	75%*I_L	100%*I_L	Average
1#	Output	Current(mA)	0	500	1000	1500	2000	/
		Voltage(V)	12.03	11.95	11.87	11.80	11.72	/
		Power(W)	/	/	/	/	/	/
	Input	Power(W)	0.07	7.05	14.06	21.06	28.25	/
		THD_V (%)	/	/	/	/	/	/
		True PF	0.0416	0.4332	0.4832	0.5215	0.5513	/
		Current(mA)	13.90	140.20	251.70	349.30	443.40	/
	Efficiency(%)		/	84.75%	84.42%	84.05%	82.97%	84.05%
2#	Output	Current(mA)	0	500	1000	1500	2000	/
		Voltage(V)	12.03	11.95	11.88	11.80	11.72	/
		Power(W)	/	/	/	/	/	/
	Input	Power(W)	0.06	7.04	14.05	21.04	28.25	/
		THD_V (%)	/	/	/	/	/	/
		True PF	0.0391	0.4308	0.4813	0.5206	0.5516	/
		Current(mA)	14.30	141.20	252.40	349.50	442.90	/
	Efficiency(%)		/	84.87%	84.56%	84.13%	82.97%	84.13%
3#	Output	Current(mA)	0	500	1000	1500	2000	/
		Voltage(V)						/
		Power(W)	/	/	/	/	/	/
	Input	Power(W)						/
		THD_V (%)	/	/	/	/	/	/
		True PF						/
		Current(mA)						/
	Efficiency(%)		/	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Energy Efficiency (Min.) :84.05%			Efficient Level V: 82.22%			JUDGEMENT	Pass/Fail	Pass

APPENDIX F

SAMPLE TEST REPORT

CUSTOMER:	**OLFER**		
TEN PAO MODEL NO.:	**S024DP1200200**	**TEN PAO P/N:**	**R015795V-N**

4.2 Input voltage, frequency 230V,50Hz：

Sample No.	Item		Unload	25%*I_L	50%*I_L	75%*I_L	100%*I_L	Average
1#	Output	Current(mA)	0	500	1000	1500	2000	/
		Voltage(V)	12.03	11.95	11.87	11.80	11.72	/
		Power(W)	/	/	/	/	/	/
	Input	Power(W)	0.13	7.17	14.11	21.05	28.02	/
		THD_V (%)	/	/	/	/	/	/
		True PF	0.0252	0.3598	0.3951	0.4174	0.4293	/
		Current(mA)	23.00	86.20	154.50	218.30	282.30	/
	Efficiency(%)		/	83.33%	84.12%	84.09%	83.65%	83.80%
2#	Output	Current(mA)	0	500	1000	1500	2000	/
		Voltage(V)	12.03	11.95	11.88	11.80	11.72	/
		Power(W)	/	/	/	/	/	/
	Input	Power(W)	0.13	7.16	14.08	21.04	28.04	/
		THD_V (%)	/	/	/	/	/	/
		True PF	0.0241	0.3585	0.3934	0.4161	0.4285	/
		Current(mA)	23.70	86.50	154.80	218.90	283.10	/
	Efficiency(%)		/	83.45%	84.38%	84.13%	83.59%	83.89%
3#	Output	Current(mA)	0	500	1000	1500	2000	/
		Voltage(V)						/
		Power(W)	/	/	/	/	/	/
	Input	Power(W)						/
		THD_V (%)	/	/	/	/	/	/
		True PF						/
		Current(mA)						/
	Efficiency(%)		/	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Energy Efficiency (Min.) : 83.80%			Efficient Level V: 82.22%			JUDGEMENT	Pass/Fail	Pass

5.EQUIPMENTS LIST：

Power meter: WT210 **AC source: AFC-500W** **Electronic load: Prodigit 3311F**

6.REMARK：

First Function Sample

TEST BY	CHECKED BY	APPROVED BY	DATE	REV.	SHEET
李兰兰	魏俊颖	雷顺海	Nov. 15，2011	0	Page 16 of 16

EPS BASIC MODEL COMPLIANCE STATEMENT

Basic Model: S024DP1200200

Manufacturer's or Private Labeler's Name and Address:

Ten Pao Electronics (Huizhou) Co., Ltd.

Dong Jiang Industrial Area, Shui Kou Town, Huizhou City, Guangdong Province, P.R.China

This compliance statement and all certification reports submitted are in accordance with 10 CFR Part 430 (Energy or Water Conservation Program for Consumer Products) and the Energy Policy and Conservation Act, as amended. The compliance statement is signed by a responsible official of the above named company. The basic model(s) listed in the certification reports comply with the applicable energy conservation standard. All testing on which the certification reports are based was conducted in conformance with applicable test requirements prescribed in 1- CFR Part 430 Subpart B.

All information reported in the certification report(s) is true, accurate, and complete. The company is aware of the penalties associated with violations of the Act and the regulations thereunder, and is also aware of the provision contained in 18 U.S.C. 1001, which prohibits knowingly making false statements to the Federal Government.

Name of Company Official: zhanyunzhang

Signature: Z.Y.Zhang

Title: Manager

Firm or Organization: Ten Pao Electronics (Huizhou) Co., Ltd.

Address: Dong Jiang Industrial Area, Shui Kou Town, Huizhou City, Guangdong Province, P.R.China

Telephone Number: 0752-2312899

Facsimile Number: 0752-2313888

Date: Nov. 15,2011

Third Party Representation (if applicable)

For certification reports prepared and submitted by a third party organization under the provision of Sec. 430.62 of 10 CFR Part 430 the company official who authorized said third party representation is:

Name:

Title:

Address:

Telephone Number:

Facsimile Number:

The third party organization submitting the certification report on behalf of the company is:

Third Party Organization:

Telephone Number:

Facsimile Number: