

TEN PAO INTERNATIONAL LTD.

# SPECIFICATION FOR APPROVAL



DATE:

DESCRIPTION: Input:100-240Vac ;Output: 24.0Vdc 1.0A, SMPS Adaptor

Dear Custor	ner:	
Please s	end one copy o	f this specification back after you sign and approve for
production		
		Approved By:
		Date:
		/
ISSUED BY	刘华振	CHECKED BY THAT DAPPROVED BY THE TE

TEN PAO INTERNATIONAL LTD.

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Dec. 13,2023

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			Design Re	vision History	*		
		Release	* Description of Change			Revised	Approved
Rev.	Mark	Date	Ву	Ву			
0		Dec. 12,2019		Creation		张雄鑫	白德向
0	a	Aug. 07,2020	CE/EN60950-1(2006/A2:2013	) EN 62368-1(2014/A	11.2017)	张雄鑫	白德向
0	b	Dec. 13,2023		Add:Label、Instructio	ns for use	钟巧飞	熊先宝
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			Sample Delive	ery Information		
	n <b>ple Background</b> cuit Diagram Revi		B Layout Revision No:	1 BOM Revision No:	0 Transformer F	Revision No.: 0
2. San	n <b>ple Purpose:</b> A. F	Function Sample	B. Final s	ample	C. Other Sample	
3. San	nples material in	stead of information				
No.	Position No	Original de	sign materials	The sample use	e material	Change Reason
1	none	r	none	none		none
2						
3						
4						
5						
4. The	Change List Co	mpare To Last Time Sam	ples was:			
The	e( <b>First</b> )Sa	mples,This Time Samples	' Tracking Number was:( A0	1-A08), Delivery Date:(	Dec.12,2019 ).	
No.	Wha	t is At Last Time Samples	Wł	nat Is At This Time Samples		Change Reason
1		none		none		none
2						
3						
4						
Rema	ark: 1. Final sa	ample can be used to a	approve			
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### 1. SCOPE

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

1.1 Description



Cription Wall Mount Desk-Top

### 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 **120A** at **100-240Vac** input and Max load for a cold start at  $25^{\circ}$ C.

2.4 Stand-By Power (at 115/230Vac 60/50Hz) The input power should be less than **0.1W** with No-Load.

### 3. OUTPUT FEATURES

3.1 Output Parameters

	Output Data		Spec. Limit			est Conc	dition		
3.1.1	24.0Vdc	Min. Value	Typical	Max. Value					
3.1.2	Output Voltage	22.8Vdc	24.0Vdc	25.2Vdc	0 ~	$0\sim$ 1.0A Loading			
3.1.3	Output Load	0.0A		1.0A					
3.1.4	Ripple and Noise	_	_	250mVp-p	20MHz Bandwidth 10uF Ele. Cap.0.1uF Cer. Cap. (at 100-240Vac)		uF		
3.1.5	Output Overshoot	_	_	10%	MAX. load(1.0A) & 100-240Vac		&		
	·	·							
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3.2 Turn On Delay

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

3.3 Hold Up Time

10 ms minimum at115Vac/60Hzinput at maximum load, and20ms minimum at230Vac/50Hzinput at maximum load.

- 3.4 Typical Efficiency (at 115/230Vac 60/50Hz) The efficiency (watts out / watts in) shall be higher than <u>82.22%</u> typical while measuring at nominal line and 75% 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:  $0^{\circ}C \sim 40^{\circ}C$  (Can operate normally) Relative Humidity:  $10\% \sim 90\%$ 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.

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- 5.2.1 Storage Temperature: -30  $^\circ$ C  $\sim$  70  $^\circ$ C
- 5.2.2 Relative Humidity:  $10\% \sim 90\%$
- 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 <u>MIL–STD-810D</u>, 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 2 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 B.

7.3 Drop test

Dropped freely from 1 m (for wall mount product) height onto the surface is consisted of hardwood 13 mm thick, mounted on two layers of plywood each 19-20 mm thick, all supported on concrete floor 1 time from 3 different surface, after test, it's no safety damage for product.

#### 8. SAFETY

8.1 Safety Standard

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

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	Item	Country	Certified	Standard
	UL	USA	Approved	UL60950-1.(2nd edition 2014-10-14)
	CUL	Cariada	Approved	CSA C22.2 NO.60950-1(2nd edition 2014-10)
	CE	Europe	Approved	EN 62368-1(2014/A11.2017)
Γ				

- 8.2 Insulation ResistanceInput to output: <u>10 MΩ</u> min. at <u>500 VDC</u>.
- 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 **FCC PART 15 CLASS B**,(10-2-2014)EN55032.

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  $330\Omega$ . <u>8KV</u> air discharge, <u>4KV</u> 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: <u>1KV</u>
 Performance Criterion B.

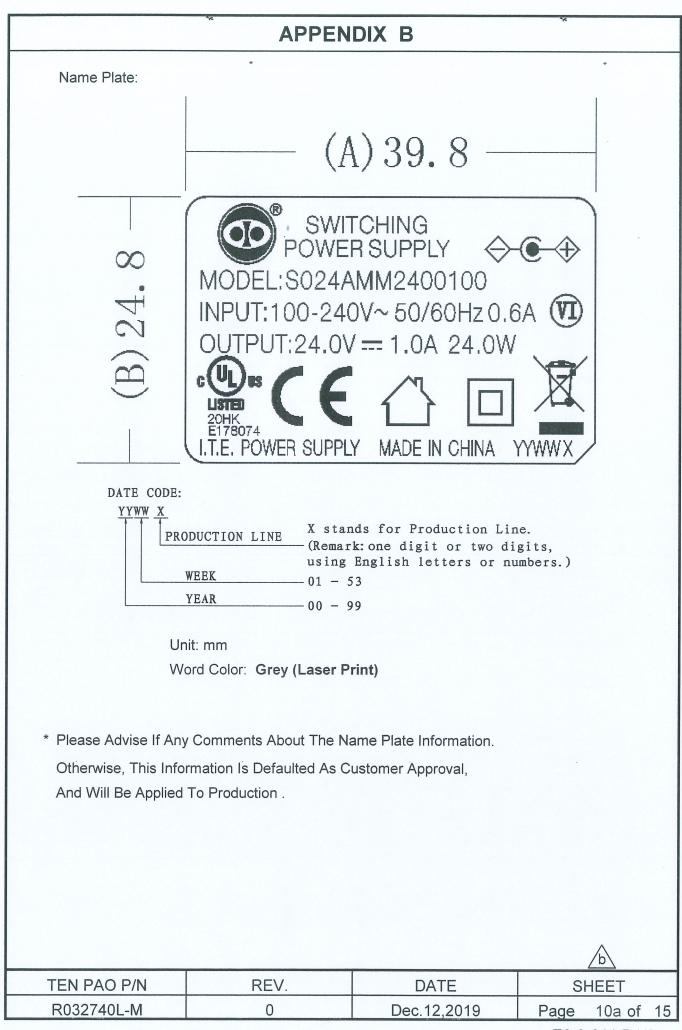
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	-5 Lightning Surge Attachm		
	Irge voltage of differential a nput lines and across input a		e applied
	to Line: <u>1KV</u>	ana mamo ground.	
Performance	e Criterion B.		
	-6 Conducted Radio Freque	•	o) //
	Radio Frequency Disturband Hz, Performance Criterion A		z, 3V/m,
	-11 Voltage Dips/Short Inte		
	s, 30% reduction- 10ms, Pe	•	6
Reduction –	100ms, Performance Criter	rion C, Voltage Interruption	is>95%
Reduction-	5000ms, Performance Crite	rion C.	
10. OTHER REQUIR	EMENTS		
10.1 Hazardous Su	bstances		
	nts and used materials shal	l be in compliance with	
	ive 2011/65/EU "RoHS"		
	ive 2012/19/EU "WEEE"		
Halogen	FIEE		
10.2 Energy Efficie 10.2.1 The No-Loa	ncy d power consumption shall	be less than <b>0.10W</b> at inp	ut 115/230Vac.60/50Hz.
	e active mode efficiency sha	·	
115/230Vac	e,60/50Hz.		
Efficiency at	10% rated output current:	76.80% at input 115/2	30Vac,60/50Hz.
10.2.3 🗸 Internati	onal Efficiency Level VI	·	
Korea E	nergy Efficiency Label		
10.2.4 This power	supply is therefore in compl	ance with the requirement	s of
	ver Supply are in accordance	e with U.S. Department o	f Energy(DOE)
	Part 430 .		
	s Energy Efficiency Regula		
	an and New Zealand Energy	-	
	upplies (MEPS,AS/NZS 466	,	,
	nergy Efficiency requiremer		``````````````````````````````````````
	egulation on Energy Efficien upplies (MKE's Notification		s for external
· · · · · ·	SSION REGULATION (EU)		019laving down
	gn requirements for externa		
2009/12	5/EC of the European Parlia	ament and of the Council a	ind repealing
Commis	sion Regulation (EC) No 27	8/2009	
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## APPENDIX A

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

48.5 17.5±0.5 PATENTED 18.6±0.6 PUSH NAME FLATE				<b>04</b> 0±0 <b>6</b>			
	ФА	ΦВ	С	D			
DIMENSION	2.1	5.5	10.0	2000	)	,	
TOLERANCE	+0.1/-0	±0.1	±0.4	min			
REMARK	AWG24#/2C	UL2468 BLACK					
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### APPENDIX B





Imported by: DIGIMAX S.R.L. Via dei Laghi, 31 36077 – Altavilla Vicentina (VI) - Italy Manufacturer: TENPAO ELECTRONICS (HUIZHOU) CO., LTD Dongjiang Industrial Estate, Shuikou Street, Huizhou City 516005, Guangdong Province, P.R.C.

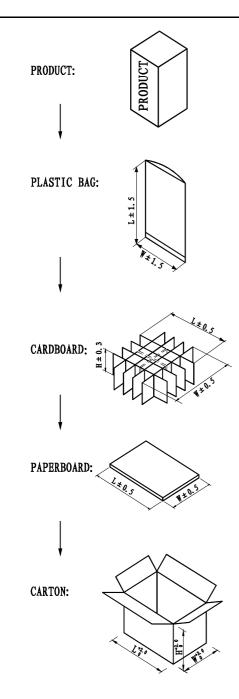
Unit: mm

Tolerance: +0/-0.1 Dimension: 26.0x7.5 Back Color : **Black** Word Color: **White** 

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## APPENDIX C



DIMENSION(UNIT IN cm):

	L	W	Н
PLASTIC BAG	22.0	15.0	
CARDBOARD	47.0	37.0	5.5
PAPERBOARD	48.0	36.0	
CARTON	49.0	38.0	27.0

PACKING METHOD:

PAPERBOARD PLACEMENT METHOD	PUT A PAPERBOARD BETWEEN THE TOP AND BOTTOM,TOTAL 5PCS.
PACKING METHOD	15PCS/LAYER X 4 LAYERS
QTY	60PCS
N.W./PC	
G.W./CARTON	

**REMARK:** 

1. STORAGE CONDITION

TEMPERATURE: -10℃ ~ +60℃ 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.

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## APPENDIX D

## SAMPLE PRIMARY TEST REPORT

CUSTOMER	DEGIMX												
MODEL NO.	S024AMM2400100 TEM						) P/N			R0	R032740L-M		
Taat Itama	Test Canditian	1 1 14			-	Sample	Number	and Tes	st Result				Pass/
Test Items.	Test Condition	Unit	1#	2#	3#	4#	5#						Fail
	90Vac	V	23.88	23.76	23.9	0 23.78	23.88						Pass
Unload output voltage/	132Vac	V	23.88	23.76	23.9	0 23.78	23.88						Pass
(0.0A) 22.8Vdc - 25.2Vdc	180Vac	V	23.88	23.76	23.9	0 23.78	23.88						Pass
	264Vac	V	23.88	23.76	23.9	0 23.78	23.88						Pass
	90Vac	V	23.71	23.58	23.7	3 23.60	23.71						Pass
Rated load output voltage/	132Vac	V	23.71	23.58	23.7	3 23.60	23.71						Pass
(1.0A) 22.8Vdc - 25.2Vdc	180Vac	V	23.71	23.58	23.7	3 23.60	23.71						Pass
	264Vac	V	23.71	23.58	23.7	3 23.60	23.71						Pass
	90Vac	mV	110	114	116	143	108						Pass
Output ripple & noise	132Vac	mV	98	120	123	127	110						Pass
voltage≪250mV (test at 100-240Vac)	180Vac	mV	114	120	125	117	114						Pass
	264Vac	mV	102	111	112	116	104						Pass
Short-circuit protection test (Short at end of	90Vac	W	0.04	0.07	0.04	0.03	0.06						-
DC plug)	264Vac	W	0.29	0.40	0.39	0.33	0.25						-
Over current protection	100Vac	А	1.76	1.77	1.75	5 2.00	1.74						Pass
(Ocp:1.4-2.2A)	240Vac	A	1.57	1.63	1.58	3 1.63	1.60						Pass
IC Vcc voltage test/ /Max. load	90Vac	v	17.00	17.06	17.1	7 17.25	17.16						_
(Specs≤V)	264Vac	v	16.84	16.87	16.9	8 16.98	16.85						_
IC Vcc voltage test/Min. load	90Vac	v	14.70	14.47	14.4	8 14.43	14.79						_
(Specs≥V)	264Vac	v	14.45	14.22	14.1	6 14.34	14.65						-
Hi-pot test 4242Vdc/3.5mA/ 1Minute		ОК	ОК	ОК	ОК	ОК						Pass	
					<u>.</u>								
TEST BY	CHECKE	) BY	APP	ROVE	DΒ	Y	DATE			V.	Ś	SHEE	Т
张侠	张雄鑫			白德向	]	De	c.12,2	019	0		Pag	e 12	of 15

No.         Test items         Unit 90Vac         115Vac         120Vac         120Vac         230Vac         264Vac         Limit         Fail           1         Unload input current         mA         Image: Comparison of the com						APPE	NDIX	D				
Tend         S024AMM2400100         TEN PAO P/N:         R0327401-M           Test Items         Unit         90/ac         115/ac         132/ac         180/ac         230/ac         244/ac         Limit         Pass           1         Unload input current         mA         115/ac         132/ac         180/ac         230/ac         244/ac         Limit         Pass           2         Unload input current         mA         1 <th></th> <th></th> <th></th> <th>;</th> <th>SAMP</th> <th></th> <th>EST R</th> <th>EPOF</th> <th>RT</th> <th></th> <th></th> <th></th>				;	SAMP		EST R	EPOF	RT			
Items         Test Items         Unit         Test condition & result         Spac.         Pass Fail           1         Unload input current         mA         1         132Vac         130Vac         230Vac         264Vac         264Vac         Fail         Fail           1         Unload input current         mA         Image: Constraint of the	CUST	OMER:		DIG	MX							
Herns         Unit         90Vac         115Vac         132Vac         130Vac         200Vac         200Vac         1132Vac         130Vac         200Vac         200Vac         1132Vac         130Vac         200Vac         264Vac         Elinit         Fail           1         Unload input current         mA            264Vac         264Vac         264Vac         235mA         Pass           3         Rated load input power         W	TEN P		EL NO.:	S024	AMM240	0100	TEN PAG	) P/N:			R032740L-M	
No.       Use lense       Unit       90/vac       115/vac       132/vac       180/vac       230/vac       264/vac       Limit       Fail         1       Unload input current       mA	Items	-				-	Test condit	ion & resu	ılt		Spec.	Pass/
2       Unload input power       W       W       Second Secon	No.	I	estitems	Unit	90Vac	115Vac	132Vac	180Vac	230Vac 264Vac			Fail
2       Unicad input power       W       M	1	Unload inp	ut current	mA	$\setminus$						≤35mA	Pass
3         Rated load input current         mA	2	Unload inp	ut power	W								Pass
5         Unload output voltage(0.0A)         V         V         Pass           6         Rated load output voltage(1A)         V         V         V         22.8V -25.2V         Pass           7         Output ripple&noise voltage(1-0A)         mV         V	3	Rated load	l input current	mA								Pass
6       Rated load output voltage(1A)       V       22.8V -25.2V       Pass         7       Output ripple&noise voltage(1-0A)       mV       Status       Status       Status       Pass         8       Output transient response(20-80%)       mS       Status       Status       Status       Status       Pass         9       Short-circuit test (Pin&lout)       W       A       hiccup       hiccup       hiccup       Status       Pass         10       Over current protection       A       hiccup       hiccup       hiccup       Status       Pass         11       Over voltage protection       V       Image       Image       Status       Pass         12       Output overshoot/Max load       %       Image       Image       Status       Pass         13       Turn on delay time       mS       Image       Image       Image       Status       Pass         14       Hold up time       mS       Image       Image       Image       Image       Image       Image       Pass         13       Turn on delay time       mS       Image       Image       Image       Image       Image       Image       Image       Image       Image       Image </td <td>4</td> <td>Rated load</td> <td>l input power</td> <td>W</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>≪35W</td> <td>Pass</td>	4	Rated load	l input power	W							≪35W	Pass
b       voltage(1A)       V       V       Pass         7       Output ripple&noise voltage(1-0A)       mV       MV       Sector 20,000 Pp- (100-240Vac)       Pass         8       Output transient response(20-60%)       mS       M       Sector 20,000 Pp- (100-240Vac)       Pass         9       Short-circuit test (Pin&lout)       M       M       Sector 20,000 Phice       Pass         10       Over current protection       A       hiccup       hiccup       hiccup       hiccup       Pass         11       Over voltage protection       V       V       Sector 20,000 Pp- (100-240Vac)       Pass         12       Output overshoot/Max load       %       V       Sector 20,000 Pass       Pass         13       Turn on delay time       mS       Sector 20,000 Pass       Pass       Sector 20,000 Pass         14       Hold up time       mS       Sector 20,000 Pass       Pass       Sector 20,000 Pass       Pass         15       Efficiency(Full load)       %       #DIV/01       #DIV/01       #DIV/01       #DIV/01       MAX.NA       NA         16       Mech. Dimension       mm       DC cord:AWG24#/2C UL2468.LENGTH:1840mm.       1830mm Min.       Pass         17       DC cord and DC	5	Unload out	tput voltage(0.0A)	V							22.8V -25.2V	Pass
1         voltage(1-0A)         mV         mS         (100-240Vac)         Pass           8         Output transient response(20-80%)         mS            ≤10mS         Pass           9         Short-circuit test (Pin&lout)         M         A         hiccup         hicu         hiccu	6			V	1	$\setminus$					22.8V -25.2V	Pass
8         response(20-80%)         INS         W         S         W         S         W         S         W         S	7			mV								Pass
9       Short-circuit test (Pin&lout)       A       hiccup       hicup       hiccup	8			mS							≤10mS	Pass
10       Over current protection       A       Image: constraint of the state of the stat	9	Short-circu	iit test (Pin&lout)		hiccup	hiccup	hiccup	hiccup	hiccup	hiccup	≪8W	Pass
12       Output overshoot/Max load       %	10	Over curre	nt protection								1.4-2.2A	Pass
12       Output overshoot/Max load       %	11	Over voltag	ge protection	V			$\backslash$				36V Max	Pass
14       Hold up time       mS       mS       ims	12	Output ove	ershoot/Max load	%								Pass
14       Hold up time       Ims	13	Turn on de	lay time	mS							≤3000mS	Pass
16       Mech. Dimension       mm       L:82.5±1.5; W:48.5±1.5       Pass         17       DC cord and DC connector       mm       DC cord:AWG24#/2C UL2468,LENGTH:1840mm.       1830mm Min.       Pass         18       Hi-pot test       Pri. to Sec:4242Vdc,1Minute, Cut off current≤3.5mA(Test result: 0.03mA)       Pass         19       Drop test       Drop test       Drop test 3 Times (High 1000mm), The sample OK       Pass         20       Max. and Light load change test       Max. load to Light load: OK       Light load to max. load: OK       (90-264Vac)         21       Appe. label and fusion       Appearance: OK, Label: OK, Fusion: OK       22       Mosfet(IC)/Vds(normal:95% other:100%)       V       Inormal       start up       short       ocp       max/min       600V       Max. Volt.       Pass         23       Diode /Vrr(normal:90% other:100%)       V       Inormal       start up       short       ocp       max/min       200V       Max. Volt.       Pass         23       Diode /Vrr(normal:90% other:100%)       V       Inormal       start up       short       ocp       max/min       200V       Max. Volt.       Pass         24       Diode /Vrr(normal:90% other:100%)       V       Inormal       start up       short       ocp       max/min	14	Hold up tin	ne	mS								Pass
16       Mech. Dimension       mm	15	Efficiency(	Full load)	%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	NA	NA
17       DC cord and DC connector       PC cord:AWG24#/2C UL2468,LENGTH:1840mm.       1830mm Min.       Pass         18       Hi-pot test       Pri. to Sec:4242Vdc,1Minute, Cut off current 3.5mA(Test result: 0.03mA)       Pass         19       Drop test       Pri. to Sec:4242Vdc,1Minute, Cut off current 3.5mA(Test result: 0.03mA)       Pass         20       Max. and Light load change test       Max. load to Light load: OK       Light load to max. load: OK       (90-264Vac)         21       Appe. label and fusion       Appearance: OK, Label: OK, Fusion: OK       Pass       Start up       Short       Oc         22       Mosfet(IC)/Vds(normal:95% other:100%)       V       Image: Start up       Short       Ocp       Max/min       Diode spec.       Start up       Short       Ocp       Diode spec.       Start up       Short       Ocp       Max. Volt.       Pass         23       Diode /Vrr(normal:90% other:100%)       V       Image: Start up       Short       Ocp       Max/min       Diode spec.       Start up       Short       Soud       Short       Short       Short       Soud       Pass         23       Diode /Vrr(normal:90% other:100%)       V       Image: Short       Image: Short       Ocp       Max/min       Short       Short       Soud       Short       So	16	Mech. Dim	ension	mm				$\backslash$			L:82.5±1.5; W:48.5±1.5	Pass
17       DC cord and DC connector       mm       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       Drop test       Drop test       Drop test 3 Times (High 1000mm), The sample OK       Pass         20       Max. and Light load change test       Max. load to Light load: OK       Light load to max. load: OK       (90-264Vac)         21       Appe. label and fusion       Appearance: OK, Label: OK, Fusion: OK       Derating ≤ 95% & 100% &									-			Pass
18       Hi-pot test       Pri. to Sec:4242Vdc,1Minute, Cut off current ≤3.5mA(Test result: 0.03mA)       Pass         19       Drop test       Drop test 3 Times (High 1000mm), The sample OK       Pass         20       Max. and Light load change test       Max. load to Light load: OK       Light load to max. load: OK       (90-264Vac)         21       Appe. label and fusion       Appearance: OK, Label: OK, Fusion: OK       Pass         22       Mosfet(IC)/Vds(normal:95% other:100%)       V       Image: Start up is short is short is short is spec.       Mosfet is spec.       Berating≤95% is spec.       & 100% is spec.	17	DC cord a	nd DC connector	mm				· \				Pass
19       Drop test       Drop test       Drop test       3 Times (High 1000mm), The sample OK         20       Max. and Light load change test       Max. load to Light load: OK       Light load to max. load: OK       (90-264Vac)         21       Appe. label and fusion       Appearance: OK, Label: OK, Fusion: OK       Fusion: OK         22       Mosfet(IC)/Vds(normal:95% other:100%)       V       Image: test other in the start up is the short ocp is the short ocp is the start up is the short ocp is the shor						. ,	.,	<u> </u>		•		
20       Max. and Light load change test       Max. load to Light load: OK       Light load to max. load: OK       (90-264Vac)         21       Appe. label and fusion       Appearance: OK, Label: OK, Fusion: OK       Fusion: OK         22       Mosfet(IC)/Vds(normal:95%, other:100%)       V       Image: constraint of the start up is th		-		Pri. to	<b>5 Sec</b> :4242				-		-	Pass
20       test       Max. load to Light load: OK       Light load to max. load: OK       (90-264Vac)         21       Appe. label and fusion       Appearance: OK, Label: OK, Fusion: OK       Fusion: OK         22       Mosfet(IC)/Vds(normal:95%, other:100%)       V       Imax. load to Light load: ot max. load: OK       Mosfet spec.       Mosfet spec.       Berating <95% & 100% & Pass	19	-	ight load change			Dro	p test 3 fi	mes (High	1000mm)	, The sam	IPIE UK	
22       Mosfet(IC)/Vds(normal:95% ,other:100%)       V       inormal       start up       short       ocp       max/min       Mosfet spec. 600V       Derating <95% &100% Max. Volt.       Pass         23       Diode /Vrr(normal:90% ,other:100%)       V       Image: Comparison of the comp	_	test	-									
22       Mosret(IC)/Vds(normal:95% other:100%)       V       Image: constraint of the start up is th	21	Appe. lab	el and fusion			/	Appearanc	e: OK, L	_abel: OK,			
23     Diode /Vrr(normal:90%, other:100%)     ∨     Image: mormal start up is the	22			V	normal	start up	short	оср	max/min	spec.	&100%	Pass
normal     start up     short     ocp     max/min     200V     Max. Volt.       TEST BY     CHECKED BY     APPROVED BY     DATE     REV     SHEET	23			v						Diode	Derating≪90%	Pass
		,other:100	%)		normal	start up	short ocp					
张侠 Dec.12,2019 0 Page13 of 15	TE	ST BY	CHECKED BY	A	PPROVE	DBY	DA	TE	R	EV	SHEET	
	弓	长侠					Dec.12	2,2019	(	C	Page13 of	15

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					APPEN	DIX D	)					
				SAMP	LE TES	T RE	PO	RΤ				
CUSTOME	ER:		DIGIM	X								
TEN PAO MODEL NO.:         S024AMM2400100         TEN PAO P/N:         R032740L-M												
1.TEST STA	NDARD:	The F	ower S	upply are i	n accordanc	ce with	U.S. [	Departm	ent of Ener	gy(DOE)		
2. Product S	pecificat			11.2						0, ( )		
Input volta	age, frequ	iency, curi	rent: 100	0-240VAC 50	)/60HZ 600m/	4 C	Dutput	voltage, c	urrent: 24.0	VDC/1A		
3.TEST MET	HOD:											
3.1. Under in	put <u>230V</u>	<u>AC / 50Hz</u>	, output r	ormal load, t	he EUT contin	uous opei	rating f	or <u>30 min</u>	utes .			
3.2. Under in	put <u>115V</u>	AC / 60Hz	and 230	VAC / 50Hz, 1	the EUT is me	asured at	100%,	75%, 509	% and 25% of	rated output		
current.Re	ecord val	ues are ou	tput volta	ige, output cu	ırrent, input po	wer, input	t currer	nt. Then c	alculating ave	erage efficienc	y	
at four ac	tive mode	load cond	ditions.			•			C C			
3.3. Input 11	5VAC / 6(	)Hz and 2:	30VAC /	50Hz. test the	e input power, i	input curre	ent. ou	tout volta	ae in the no-lo	ad condition.		
					e humidity : 1		- ,					
4.1 Input volt	-	-			, <b>,</b>	,						
Sample No.	- 5-7 - 1	Item		Unload	10%*I <sub>L</sub>	25%*l	L 5	50%*I L	75%*I ∟	100%*I _	Average	
		Curre	ent(mA)	0	100	250	-	500	750	1000	/	
	Output	Output	t Volta	age(V)	2387	23.98	23.75		23.69	23.44	23.41	/
		Pow	er(W)	/	2.396	/		/	/	/	/	
4.11		Pow	er(W)	0.041	2.85	6.664		13.33	20.03	26.75	/	
1#	المعربة	THD	<sub>v</sub> (%)	/	95.92	/		/	/	/	/	
	Input	Tru	e PF	0.21	0.26	0.42		0.47	0.51	0.54	/	
		Curre	ent(mA)	1.605	11.11	1.11 133.39 241.98		241.98	335.33	423.29	/	
	Ef	ficiency( <sup>9</sup> /	ó)	/	84.08%	89.11%	6 ε	88.85%	87.78%	87.52%	88.31%	
		Curre	ent(mA)	0	100	250		500	750	1000	/	
	Output	Output Volt		23.97	23.95	23.90		23.85	23.80	23.75	/	
		Pow	ver(W)	/	2.395	/		/	/	/	/	
2#			er(W)	0.026	2.85	6.69		13.39	20.13	26.9	/	
20	Input	THD	<sub>V</sub> (%)	/	96	/		/	/	/	/	
	input		le PF	0.21	0.26	0.41		0.46	0.51	0.54	/	
		Curre	ent(mA)	1.032	11.13	136.65	5 2	243.36	337.06	425.82	/	
	Ef	ficiency( <sup>0</sup> ⁄		/	84.04%	89.30%	6 8	39.04%	88.67%	88.29%	88.83%	
			ent(mA)	0	100	250		500	750	1000	/	
	Output		age(V)	23.98	23.80	23.94		23.89	23.84	23.80	/	
			er(W)	/	2.38	/		/	/	/	/	
3#	3#		ver(W)	0.032	2.82	6.7		13.42	20.17	26.96	/	
	Input		∨(%)	/	95.89	/		/	/	/	/	
			e PF	0.21	0.27	0.42		0.47	0.50	0.54	/	
			ent(mA)	1.269	11.15	136.13		242.72	335.70	423.20	/	
	Efficiency(%)         /         84.46%         89.31%         89.01%         88.66%         88.28%         88.82%           Energy Efficiency (Min.) : 88.31%         Efficient Level VI: 86.20%         JUDGEMENT         Pass/Fail         Pass											
Energy Efficie	ency (Min	.) : 88.31%	ά	Efficient Lev	el VI: 86.20%				JUDGEMENT	Pass/Fail	Pass	
		<b></b>		. [		.80%			_			
TEST		CHECI		Y AF	PROVED	BY		DATE	REV.		0	
张侠		张加	雄鑫		白德向		Dec	.12,201	9 0	Page 2	14 of 15	

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## APPENDIX D SAMPLE TEST REPORT

				SAMP	PLE TE	ST RE	PORT				
CUSTOME	R:		DIGIM	AX					1		
TEN PAO I	MODEL	NO.:	S024A	MM24001	00		TEN PAO	P/N:	R032740L-M		
4.2 Input volta	age, frequ	ency <u>230V,</u>	50Hz:								
Sample No.		Item		Unload	10%*l <sub>L</sub>	25%*l <sub>L</sub>	50%*l <sub>L</sub>	75%*l <sub>L</sub>	100%*l <sub>L</sub>	Average	
		Curren	nt(mA)	0	100	250	500	750	1000	/	
	Output	Voltaç	ge(V)	23.82	23.98	23.74	23.66	23.55	23.47	/	
		Powe	er(W)	/	2.396	/	/	/	/	/	
		Powe	er(W)	0.074	2.85	6.80	13.45	20.03	26.70	/	
1#		THDV	(%)	/	95.92	/	/	/	/	/	
	Input	True	PF	0.19	0.26	0.34	0.36	0.38	0.40	/	
		Curren	nt(mA)	1.66	11.11	85.3	157.81	220.00	281.36	/	
	Eff	iciency(%)	)	/	84.08%	87.28%	87.96%	88.18%	87.90%	87.83%	
		Curren	nt(mA)	0	100	250	500	750	1000	/	
	Output	Voltag	ge(V)	23.95	23.95	23.90	23.86	23.81	23.77	/	
		Powe	r(W)	/	2.395	/	/	/	/	/	
		Powe	r(W)	0.06	2.85	6.815	13.48	20.13	26.82	/	
2#		THDV	(%)	/	96	/	/	/	/	/	
	Input Tru		PF	0.20	0.26	0.34	0.37	0.40	0.41	/	
		Curren	nt(mA)	1.295	11.13	84.6	154.3	215.42	275.00	/	
-	Efficiency(%)		)	/	84.04%	87.69%	88.49%	88.72%	88.61%	88.38%	
	Curre		nt(mA)	0	100	250	500	750	1000	/	
	Output	Voltag	ge(V)	23.98	23.80	23.93	23.88	23.83	23.79	/	
		Powe	r(W)	/	2.38	/	/	/	/	/	
		Powe	r(W)	0.07	2.82	6.827	13.52	20.13	26.77	/	
3#		THDV	(%)	/	95.89	/	/	/	/	/	
	Input	True	PF	0.20	0.27	0.34	0.38	0.41	0.42	/	
		Curren	nt(mA)	1.495	11.15	83.58	148.97	206.62	270.37	/	
-	Eff	iciency(%)	)	/	84.46%	87.63%	88.32%	88.80%	88.86%	88.40%	
nergy Efficiency (Min.) : 87.83%			Efficient Level VI: 86.20%				JUDGEMENT	Pass/Fail	Pass		
5.EQUIPMEN	ITS LIST:				10% 76	.80%					
Power meter		AC s	ource:	AFC-500W			rodigit 3311F				
B.REMARK:		tion San		-			~				
TEST BY CHECKED				Y APPROVED BY			DATE RE		. SHEET		
TEST E	SY I	UNEUN	ED B.	APPROVED BY 白德向			DAIE		Page 15 of15		

## EPS BASIC MODEL COMPLIANCE STATEMENT



Basic Model: S024AMM2400100

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 C.F.R. Parts 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 10 C.F.R. Parts 430.

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 there under, 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 Offi	cial: zhanyunzhang
Signature: <u>z. Y. z</u>	Zhang
Title: Manager	8
Firm or Organization:	Ten Pao Electronics (Huizhou) Co., Ltd.
Address: Dong Jiang Ir	ndustrial Area, Shui Kou Town, Huizhou City, Guangdong Province, P.R.China
Telephone Number:	0752-2312899
Facsimile Number:	0752-2313888
Date: Feb.03,2015	

Third Party Representation (if applicable)

For certification reports prepared and submitted by a third party organization under the provision of
10 C.F.R. 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:

Instructions for use  $\wedge$ 

Obverse

Manufactures: TEN NALO ELECTRONICS (HUIZHOU) CO., LTD. Droglang Industrial Estate, Shukou Sireet, Huizhuu Cay 518006. Gungorop Province, PR C. Fabbricamte: TEN Mon. ELECTRONICS (HULZHOU) CO., LTD. Dongjiang Inclusted Estate. Shukou Street. Hutahon City 516005, Guangjang Pholma, karpertado da: DiGIMAX S.R.L. Via dei Laghi, 31 36977 – Atavilia Vicentina (VI) - Ilaña. imported by: DiGIRAX S.R.L. Via dei Laph, 31 3607 – Aitavita Vicentina (VI) - Italy Scattegare Lurais data presa niatirca di altrentiscane dopto frasta.
 Scategare Lurais data gaisa presa elettica di altrentiscane afferendo il corpo dell'unità o afferendo il ocupo della presa.
 Pat'non dervegigiene relationatione evidane caduta scatenta e afferendo il noneccio.
 Pat'non dervegigiene relationatione della presa.
 Pat'eriane contocincui impedre il contacio dei torminali dell'ammissione della presa. Make sure the current and voltage of the unit matches that of the sould.
 Discontoot the unit there the well outles and the equipment after unit.
 Discontate the unit from the AC outlet by pulling on the unit. Lo not drop or alterwise cause a mechanical shock to the unit or order to prevent damage. Do not allow the terminal of the unit to rouch any longyn meral object in order to avoid short-erval. Prime di occlegare l'atmentatore alla rete ejotorica assizuarati che la corregione e la spreciona indicane sulla surgivella corrispondano a quelle fonnia dalla preso elettrica. Operazione Operation csharat. vibrations, treathanical pressure, incluter, finannable vapous or scholars, and a point operate the switching power supply it here is any taimage or delective benzi found. • Do not disesserable or modify the switching ta temperatura arribiente. • Mon estrarre mai l'almeriatore dalla presa elotteta lisandolo dai cavo Laggere attentiamente la latruzioni di sicurezza e ul iumanimento dei utapositivi collegati allatimentatore.
 Nan esporte 7 elimentatore a fortportaviri.
 Nan esporte 1 cue solare diretta, son vibrazioni. extreme temperatures, direct surlight, shong Non utilizzare l'almentatore in caso di danni, difetti (llevali o se viskolmente danneggiato.
 Non smoothrane i alimentatore. meccanica, umidilà, vapon inflationabili o solvenii. Addres sawed pressione **USB.**  Kaop the switching power supply and its and doubt persist away transmit entitletien.
 Carly use the switching power supply indexs. Never operate it in champ reconst on the rain.
 Never up the switching power supply in the rain.
 Never the switching power supply in the rain.
 Keep the switching power supply undit is listine and hold subject the operation.
 If the switching power supply undit is example power supply move from a contect by the moleculocity for which can durage power supply undit is restricted the cross interpristure.
 Never put the switching power supply undit is restricted the cross marks of the contect of the switching power supply undit is restricting the switching power supply undit is example of the switching power supply undit operation. piogga. • Non utilizzare mai l' almentatore nelle aree in superfici calde. • Se l'intervisione passas de un artibiente freudo a uno casto, pué formars concentas che può danneggare falettronica. Nun calegare l'atimetristiore fino a quardor ron viete ragguerria Taraste l'almertatione, tutte le sue singcle parti e il materiale di stritaliagge, lortanto dalla portata del barrónik. • Unitzoare Fairmentatore solo in arrónent chiusi. Non unlizzario mai in arranenti umidi o solto la · Tersee Patrisonatore torkano da fiamina e cui esiste il nachio di esplosione. teruzioni di sicurezza Sefety instruction Precautions Precauzioni Non inumergere falimentakkue in socqua o in alm hoyuk, Non valizaram ani daimentakkue in modo ethe postas radkere in uras vassa, o in un contectine con socqua o alm ilquidi. Non pestutanare oggetti piend di liquidi postas paraecarlo. Do not install the switching power supply in a contined space such as built-in cabinet or bucknase. Per ridure il nachia di incendia s scesse elettriche, non espore questo alimentance a goociolamenti o schizzi di acqua o atri iquas. To reduce the risk of fine or electric shock, do not expose this switching power supply to dilpping or spleating. Connext the switching power supply to an easily accessible AC sublet. In case of any abnormality in it, disconnect it from the mans immediately. Collegare l' aimentatore switching a una presa elettros factimente accessabile in caso di uncernale, scoliegado immediatemente data rote Non installare l'atmeniatore in uno spazio netretto come un armadio chiusio o una libreria. Do not place objects filled with liquids such as vases on the apparatus. **AVVERTIMENTO MARNING** elettrca. Before operating the unit, please read this marual thoroughly and keep it for heave reference. Prima di utilizzare l'unità, leggare attentantente questo manuale e conservario per rifecinanto luturo. OF HELO Switching Power Supply Alimentatore switching **USER MANUAL** 9 MANUALE

R032740L-M

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Reverse