

# SPECIFICATION FOR APPROVAL

**Customer:** 29103

**Part No :** GVE1301030

**Rev:** A1.0

**Model No:** GM90-240400-F

**Description:** ADAPTER

**Issue Date:** 2013.01.15

**Sample Color:** Black  White

VENDOR			CUSTOMER		
APPROVED	CHECKED	PREPARED	APPROVED	CHECKED	PREPARED

客户确认签字, 盖章后请返回承认书一份

Please return to us one copy of "Specification for Approval" with your approved signature

<b>Item No.</b>		<b>page</b>
0	General -----	3
1	Input Characteristics -----	3
2	Output Characteristics -----	4
3	Protection -----	5
4	Environment -----	6
5	Immunity -----	6
6	Safety Approval -----	7
7	Reliability -----	7
8	Cooling -----	7
9	Test Report -----	8
10	Mechanical Specification -----	9
11	Dimension -----	9

## General

The specification defines the performance characteristics of a 96 W, Single Output level Switching Power Supply for GM90-240400-F. The power supply has designed highly reliable and meet international safety and electromagnetic compatibility requirements.

### 1. Input Characteristics.

#### 1.1 Normal Input Voltage:

It is normal for **100~240Vac** input AC voltage

#### 1.2 Input Voltage Range :

The Power shall operate form **90-264Vac**

#### 1.3 Input Current :

<u>2.5</u> Arms max	At AC low line input and DC output full load
---------------------	--

#### 1.4 Rated Input Frequency:

It is normal for **50Hz** or **60Hz** and single phase.

#### 1.5 AC Input Frequency Range:

The Power shall operate with an input frequency from **47Hz** to **63Hz**

#### 1.6 No Load Power Consumption:

Maximum non-load power consumption is less than 0.5W at 115Vac/60HZ and 230Vac/50HZ

**1.7 Inrush Current (cold start) :** 30A Max. @110Vac/60HZ

: 60A Max. @230Vac/50HZ

**1.8 Active Power Factor Correction:** Typical  $\geq 0.9$  (**115Vac/60HZ and 230Vac/50HZ full load**)

#### 1.9 Input protection

<u>3.15</u> A Fuse	The power supply shall be protected against power line surges and any abnormal condition.
--------------------	---

#### 1.10 Efficiency:

The efficiency of the Supply shall meet the following requirements (Warm up after 30 minutes test):

230Vac/50Hz	115Vac /60Hz	<b>115V/60HZ&amp;230V/50HZ</b>
Efficiency(Typical full load)	Efficiency(Typical full load)	Average Efficiency( 25%,50%,75%,100% rated load )
<b>86.0%</b>	<b>85.0%</b>	- min

## 2. Output Characteristics.

### 2.1 Rated Voltage

The rated output voltage is specified at 24V

### 2.2 Voltage Range

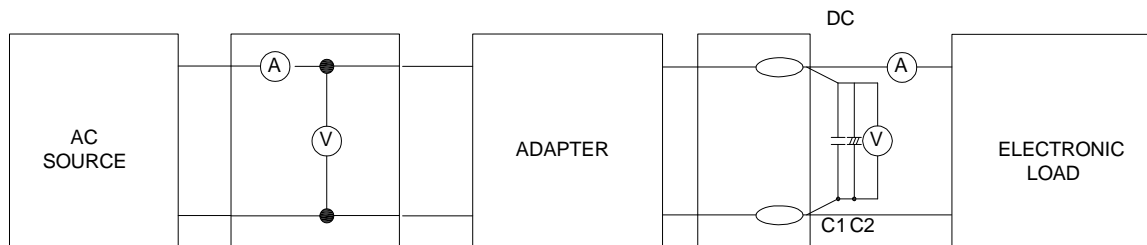
The output voltage will be performed 24V±5% when the load is 0A~4.0A steadily

### 2.3 Current

This Power can work from 0A~4.0A and output voltage is in section 2.2 specified range

### 2.4 Ripple/noise

Output Ripple voltage is 300mV peak to peak or less.(100Vac 60Hz/240Vac 50Hz)



#### Measured methods:

\* The ripple is measured from peak to peak with band width limit of 20MHZ (C1 : 0.1uF Ceramics capacitor C2 : 47uF/50V Aluminum capacitor under DC output full Load, AC nominal input 25°C ambient temperature).

### 2.5 Turn on delay

The power shall switch on in less than 3 seconds at input voltage is 115Vac

### 2.6 Hold-up time

The output voltage shall be sustained 6mS within regulation requirement after loss 100Vac and maximum load

### 2.7 Rise time

DC output rise time from 10% to 90% of output voltage shall be less than 40mS at nominal line and maximum load

### 2.8 Surge load:

The power shall support 4.4A for 20S at 100~240Vac and 25°C

## 2.9 Load transient response:

The power must within regulation when applied a step load from 0% to 50% and 50% to 100% load at 0.5A/uS slew rate and 10mS time period.

The output voltage will be performed 22.8V~25.2V

## 2.10 Output regulation

Voltage	Loading(A)	Tolerance Range	Regulation	
	Normal	Total Regulation	Line	Load
<u>+24.0V</u>	<u>0~4.0A</u>	±5%	±1%	±5%

- \* Total regulation involved line regulation load regulation cross regulation---etc
- \* Line regulation is measured from 90Vac to 132Vac or 185vac to 264vac
- \* Load regulation is measured all output from min load to max load at 115vac or 230vac nominal AC input voltage.

## 3. Protection

### 3.1 Over Voltage Protection:

Over Voltage Protection	
The output shall be protection to latch off at over-voltage condition , maximum value can't be over 2 times the rated voltage ( <u>48 V</u> ) , That might be return to normal state by AC reset $\cong$ 3Minutes	<input checked="" type="checkbox"/>
The power supply will be auto recovered when faults remove	<input type="checkbox"/>

**3. 2 Over Current Protection:** The maximum constant current would be more than 4.4A

The power shall be auto-recovery

### 3. 3 Short Circuit:

Output can be shorted without damage No odor, smoke, fire, plastic deformation, and excessive heat happen. The power shall be auto-recovery. (It will enter into normal condition when then the fault condition is removed)

## 4. Environment (temperature and humidity)

4.1: Operating temperature 0°C~35°C

4.2: Operating humidity 20%~90% (Relative humidity).

4.3: Storage temperature -20°C ~ 80°C.

4.4: Storage humidity 0%~95%. (Relative humidity).

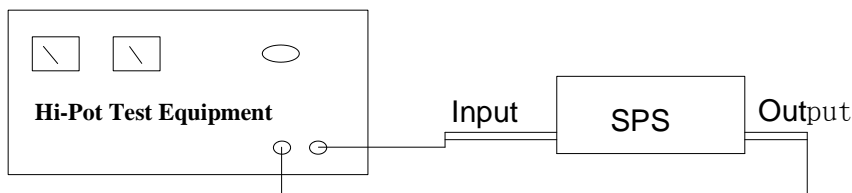
### 4.5: Dropping Packed:

Wall mount type and Height 76cm for desktop type as , the horizontal surface consists of hardwood at least 13mm thick , mounted on two layers of plywood each 19mm to 20mm thick , all supported on a concrete or equivalent non-resilient floor

## 5. Immunity

### 5.1 Dielectric Withstand Voltage ( HI-POT )

HI-POT---A	IEC 320 <b>3pin</b> primary to secondary ( FG ) 1500Vac 5mA 1min	<input checked="" type="checkbox"/>
HI-POT---B	IEC 320 <b>2pin</b> primary to secondary 3000Vac 5mA 1min	<input type="checkbox"/>



### 5.2 Leakage Current:

The AC leakage current is less than 3.5mA when power is connected to 240Vac/50Hz at normal condition

### 5.3 Insulation Resistance:

The insulation resistance shall be not less than 30M ohms after application of 500Vdc/10mA for 1 minute

### 5.4 Lightning Surge Immunity

This is to follow the norm of IEC-61000-4-5 Level 3 requirements

L-N 1KV/1.2\*50Us 5 times No function error

L-FG or N-FG 2KV/1.2\*50Us 5 times No damage

### 5.5 Electric Fast Transients (EFT)

This is to follow the norm of IEC-61000-4-4/1995

(EN 61000-4-4) Level 3 requirements

### 5.6 Electrostatic Discharge (ESD)

This Power is capable to withstand ESD test voltage at any point around the enclosure as

(EN 55024:1998+A1:2001+A2:2003,EN 61000-4-2)

±8KV air discharge No damage.

±4KV contact discharge No damage

## 5.7 Electrostatic Interference (EMI)

The power supply shall comply to:

FCC part 15 : Class B for radiated and conducted emissions.

EN55022:2006+A1:2007 , Class B for radiated and conducted emissions.

GB9254-1998,GB17625.1-2003

## 6. Safety Approval:

### 6.1 Safety Certification Standards

The power supply shall comply the following international regulatory standards

Trademark	Country	Certified Status	Standard
CCC	CHINA	<input checked="" type="checkbox"/>	GB4943
UL/CUL	USA/ Canada	<input checked="" type="checkbox"/>	UL 60950
TUV	Europe	<input checked="" type="checkbox"/>	TUV/VDE-EN60950
TUV	Europe	<input type="checkbox"/>	TUV/VDE-EN61347
CE	Europe	<input checked="" type="checkbox"/>	Declared& CE Mark
PSE	Japan	<input checked="" type="checkbox"/>	EN60950
SAA	Australia	<input type="checkbox"/>	EN60950
KC	Korea	<input type="checkbox"/>	EN60950

## 7. Reliability:

### 7.1 MTBF (Mean-Time-Between-Failures) Calculation

The calculated MTBF shall be 50K hours of continuous operation at 20°C, maximum load and normal voltage.

### 7.2 MTBF Verification

The MTBF shall be verified from life testing performed by factory Quality department. The operating conditions are: 40°C ambient temperature , sea level , both nominal line voltage ranges (115Vac or 230Vac) and a minimum load of 70% of the maximum load

**7.3 Burn-in** 24hrs,40+/-5°C 240Vac

ON/OFF cycling full load nominal line

## 8. Cooling:

### 8.1 Cooling Method

By fan force air cooling	<input type="checkbox"/>
By nature air.	<input checked="" type="checkbox"/>

## 9. Sample Test Report

### 9.1 Electrical Test

No.	Test Item	Test condition	Standard SPEC	Test value per sample reading			Unit	Judge
				1#	2#	3#		Pass/Fail
1	Output voltage	Vin 100Vac/60Hz Io=0	<u>24V</u> ±5%	24.01	24.05	24.15	V	Pass
2	Output voltage	Vin 100Vac/60Hz Io= Rated current	<u>24V</u> ±5%	23.59	23.64	23.73	V	Pass
3	Efficiency (full load)	Vin 115Vac/60Hz	<u>85%</u> min.	87.4	87.5	87.6	%	Pass
4	Average Efficiency	Vin 115Vac/60Hz 25%,50%,75%,100% rated load	= min				%	Pass
5	Ripple & Noise peak-peak	Vin 100Vac/60Hz Full load	<u>300mV</u> p-p max.	120	108	145	mV	Pass
6	OCP	Vin 115Vac/60Hz	≥ <u>4.4</u>	6.1	6.1	6.2	A	Pass
7	Standby Power	Vin 115Vac/60Hz Io=0	≤ <u>0.5W</u>	0.16	0.16	0.17	W	Pass
8	Output voltage	Vin 240Vac/50Hz Io=0	<u>24V</u> ±5%	24.04	24.05	24.15	V	Pass
9	Output voltage	Vin 240Vac/50Hz Io= Rated current	<u>24V</u> ±5%	23.59	23.64	23.73	V	Pass
10	Efficiency(full load)	Vin 230Vac/50Hz	<u>86%</u> min.	89.4	89.4	89.6	%	Pass
11	Average Efficiency	Vin 230Vac/50Hz 25%,50%,75%,100% rated load	= min				%	Pass
12	Ripple & Noise peak-peak	Vin 240Vac/50Hz full load	<u>300mV</u> p-p max.	100	130	112	mV	Pass
13	OCP	Vin 240Vac/50Hz	≥ <u>4.4</u>	6.2	6.2	6.2	A	Pass
14	Standby Power	Vin 230Vac/50Hz Io=0	≤ <u>0.5W</u>	0.29	0.31	0.30	W	Pass
15	Burn in	Input 220Vac full load 24hours		OK	OK	OK	-	Pass
1	Hi-pot Test	<u>1.5K</u> Vac 5mA 3 Seconds Between input and output test		Pass	Pass	Pass	-	Pass
2	Insulation Resistance	The insulation resistance shall be not less 30M ohms after application of 500Vdc/10mA for 3 Seconds		Pass	Pass	Pass	-	Pass
3	Drop test	Heigh:760mm Three*faces(once on each plane)		OK	OK	OK	-	Pass
Remark		With LED ,without GVE						

APPROVAL	CHECK	TEST



## 10. Mechanical Specification:

10.1: Net Weight (g) : 386 g/pcs

10.2: Outline Dimension: 141\*60\*30.8 mm

10.3: Outline Color: Black  White

10.4: DC Cable: 18AWG 2464 L1500mm±20mm 4pin power din plug(1、4+2、3-、Metal Shell-GND) SR7.8\*6.8

10.5: DC Connector Dimension:

LD= \_\_\_\_\_mm

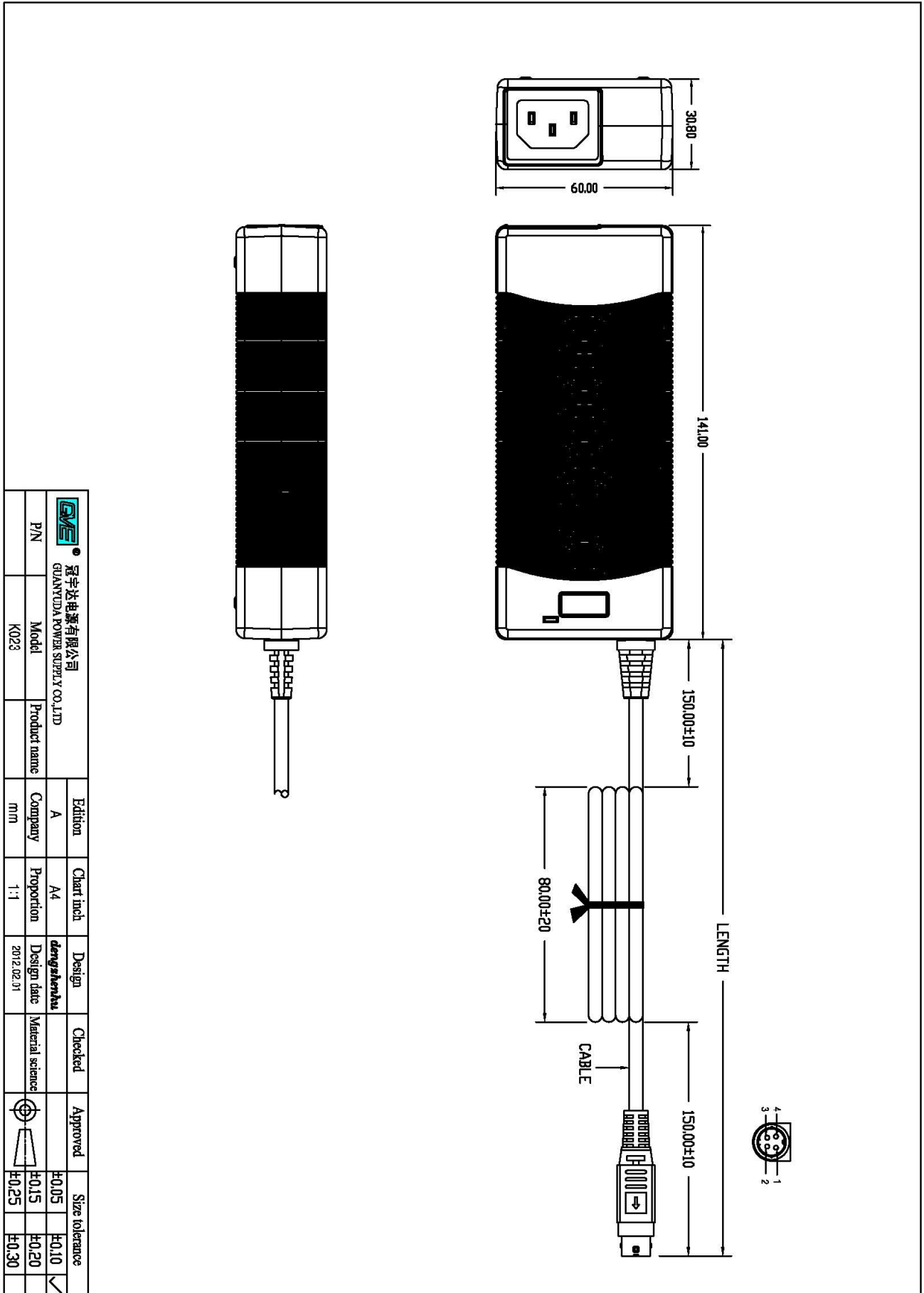
OD= \_\_\_\_\_mm

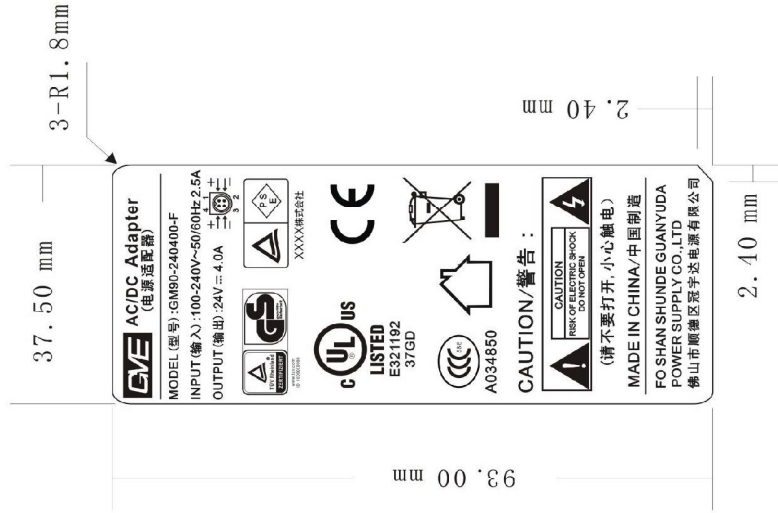
ID= \_\_\_\_\_mm

10.6: AC Line: C14 input pedestal. Match 3×0.5mm\*2 L1500mm±20mm 3PIN (USA、C14)

## 11. Dimension :


11.1: Physical Dimension	-----	page10
11.2: Label Drawing	-----	page11
11.3: PE Bag	-----	page12
11.4: Packing List	-----	page13

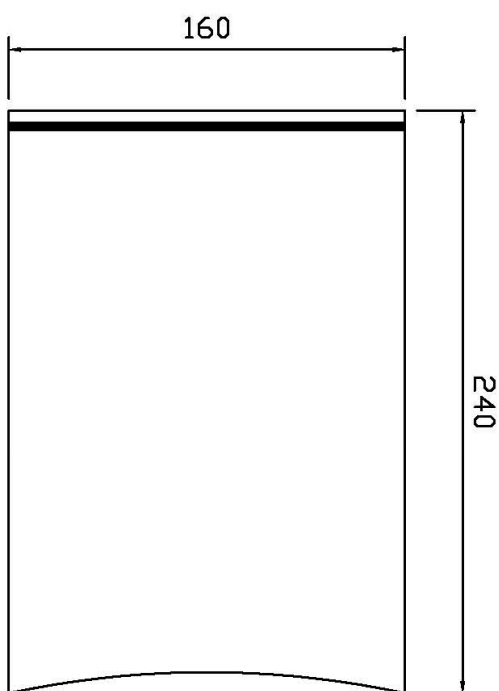




**Technical requirements of:**








- 1.This figure is 1: 1
- 2.Thickness:0.15mm
- 3.Material science: PET
- 4.Permanent adhesive
- 5.RoHS

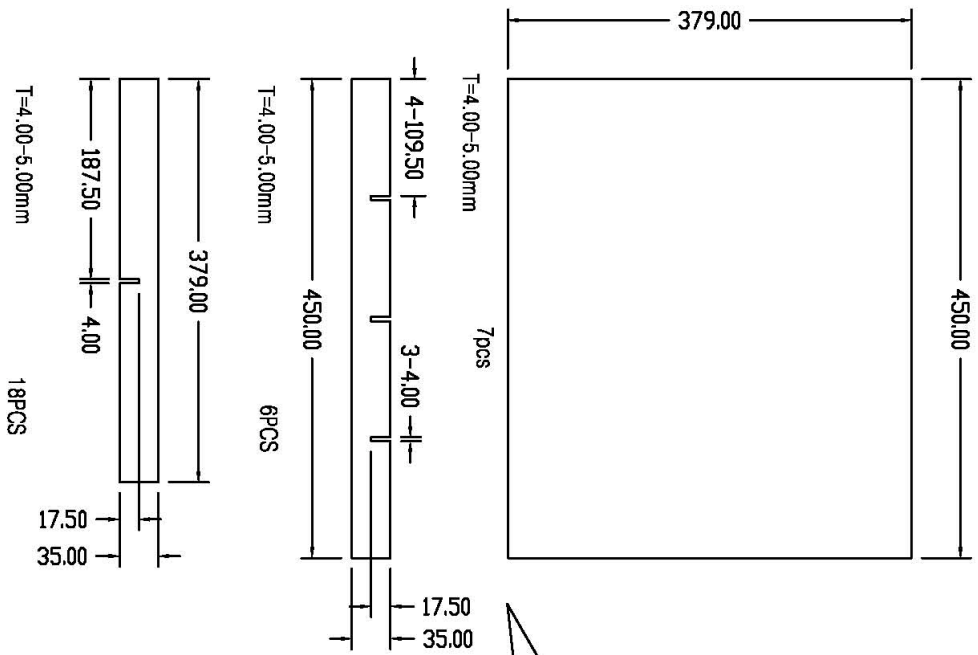
 冠宇达电源有限公司 GUANYUDA POWER SUPPLY CO.,LTD		Edition	Chart inch	Design	Checked	Approved	Size tolerance		
		A	A4					±0.05	±0.10
P/N	Model	Company	Proportion	Design date	Material science			±0.15	±0.20
		mm	1:1	2012.02.10	PET			±0.25	±0.30



240\*160mm

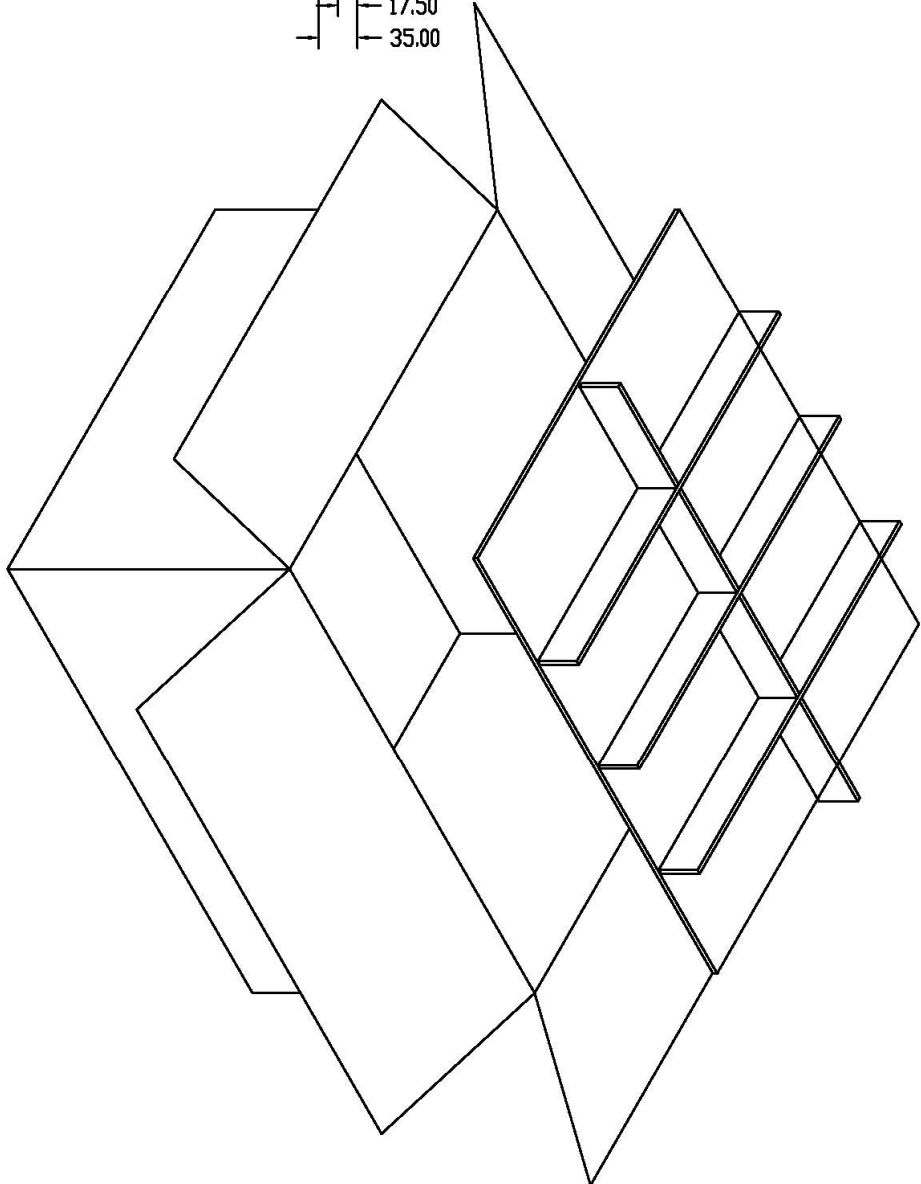
Color: Transparent

 ● 冠宇达电源有限公司 GUANYUDA POWER SUPPLY CO.,LTD		Edition		Chart inch		Design		Checked		Approved		Size tolerance	
P/N	Model	Product name	Company	A	A4	<i>dergshshsh</i>						±0.05	±0.10
240*160	240*160	PE bag	mm		1:1	2012.02.01	Material science					±0.15	±0.20
												±0.25	±0.30
													✓



Technical requirements of:  
A layer of 8 pcs , a total 6 layer , 48pcs.

460\*390\*256mm



冠宇达电源有限公司 GUANYUDA POWER SUPPLY CO.,LTD		Edition		Chart inch		Design		Checked		Approved		Size tolerance	
P/N	Model	Product name	Company	A	A4	dengshankui						±0.05	±0.10
109.5*187.5*35			mm		1:1	2012.02.01						±0.15	±0.20
												±0.25	±0.30

1	主变压器：		
2	PCB 板：	GA-90W	
3	开关管：	3568、3569	
4	肖特基：	868C15	
5	输入电容：	450V 82U	
6	输出电容：	35V 1000u*2	35V 100U
7	过流取样电阻：	0.27R 并 2R7	43K 串 1.2K 5.1K
8	整流管：	406	
9	其它变动记录：		
	带灯无 GVE		
	R44-1K R62、R63-4.7K		
	DC line:18# 1.5M 4P 组装头 1、4 正 2、3 负，金属外壳接地 SR7.8*6.8		

Producer: Yangbo He

更改标贴，增加 PSE 认证标志。刘静梅 2013-3-14