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SPECIFICATION FOR APPROVAL

- CUSTOMER : _____
- ITEM : Power Supply Unit. _____
- DESCRIPTION : LCD & LED Monitor Power Supply. _____
- CUSTOMER P/NO : _____
- SUPPLIER P/NO : BRK-6000A _____
- DATE : 2014-07-10 _____

* APPROVED

* REV NO: AB

CUSTOMER	EN'GR	CHKD	APPD

SUPPLIER	EN'GR	CHKD	APPD
BAROM KOREA Co., Ltd.	 2014.08.07	 2014.08.07	 2014.08.07

DOCUMENTATION FOR APPROVAL

Product	LCD & LED Monitor Power Supply
Model Name	BRK – 6000
Customer P/No.	

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Revision history

Documentation of Approval Revision history

Rev No.	Contents	Date of approval	Checked	Remark
AA	Enactment	2014/02/14		
AB	Normal mode operation at current Spec Modify 5Vst	2014/07/10		

POWER SPECIFICATION

1. INTRODUCTION

1.1 Product Description

This specification defines the input, output, performance characteristics, environment, noise and safety requirements for a LCD & LED Monitor (TV) power supply.

1.2 Parameter Specification

Unless specification otherwise, all parameters must be met over the limit of temperature Load, and input voltage.

2. ELECTRICAL REQUIREMENTS

2.1 Input Requirements

2.1.1 Input Voltages

- Normal Voltage: 100 ~ 240 Vrms
- Voltage Range : 90 ~ 264 Vrms

2.1.2 Input Frequency

- Normal Frequency: 50 ~ 60Hz
- Frequency range : 47 ~ 63Hz

2.1.3 Input Current

- under 7 Arms at 100Vac & Maximum Load

2.1.4 Power Factor

- PF \geq 0.9 at Maximum Load & 100Vac~240Vac condition.

2.1.5 Configuration

- 3 Conductors (Live, Neutral, F.G)

2.1.6 Input Fuse

- The live line side of the input shall have a fuse.

2.1.7 Primary Over Current Protection

- An adequate internal fuse on the AC input line shall be provided.

2.1.8 Inrush Current

The inrush current of power supply shall be less than the rating of its critical components (including bulk rectifiers and surge limiting device) for all condition of line voltage of 2.1.1

- Cold start: under 60Ap-p at AC 100Vac ~ 240Vac

2.1.9 Efficiency

The power supply efficiency shall be more than 85% measure at the 220Vac maximum load as specified in paragraph 2.2.1 with the AC input set at the nominal voltage.

2.2 Output Requirements

2.2.1 Maximum Output Voltage and Current

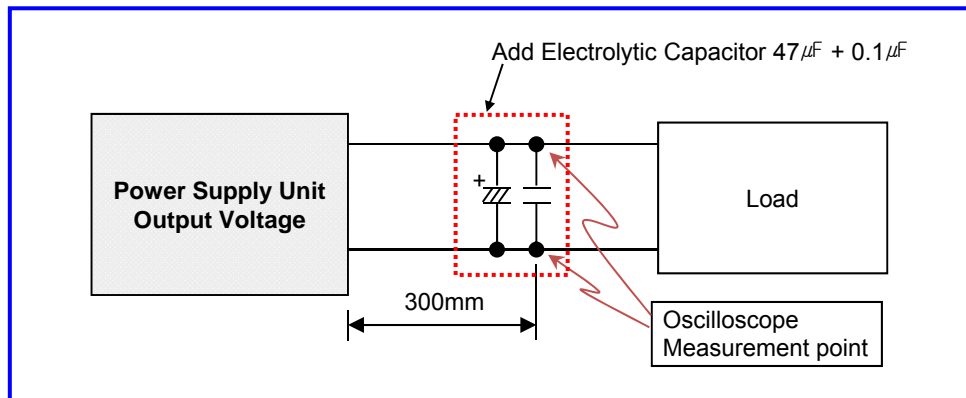
Output Name	Output Typical [V]	OUTPUT REGULATION LIMIT	Output Current(A)		
			Min.	Typ.	Max. *2)
+3.4VS	+3.4	3.27V ~ 3.62V	0	1	1.5
+5VS	+5.0	4.75V ~ 5.25V	0	1.2 *1)	1.5
+3.4VD	+3.4	3.27V ~ 3.62V	0	2	2.5
+5VD	+5.2	4.94V ~ 5.46V	0	3	3.5
+12VA	+12	11.4V ~ 12.6V	0	2	2.5
+12V	+12	11.4V ~ 12.6V	0.1	6	6.5
+24V	+24	21.6V ~26.4V	0	20	21

*1 Up to a maximum current 0.4A standby mode and normal mode is available up to a maximum possible current 1.2A.

*2 This power supply is a 60-minute period, the maximum current that can be used for about 10-minutes with a maximum current.

2.2.2 Ripple and Noise

Ripple and noise are defined as periodic or random signal over frequency band of 10Hz to 20MHz. Measurements shall be made with an oscilloscope with 20MHz bandwidth.



Output Voltage	+3.4VS	+5VS	+3.4VD	+5VD	+12VA	+12V	+24V
Ripple Voltage Range (mVp-p)	100	150	100	150	250	250	500

※ Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uF & 47uF parallel capacitor.

☞ Test condition

- Temperature: 25°C room temperature
- Test equipment: Resistance load

2.2.3 Overshoot

The output overshoot at turn –on shall not exceed 20% of normal voltage value with or without the load connected.

2.2.4 Hold up Time

The power supply shall maintain voltage regulation within the specified limits in paragraph 2.2.1 for at least 10ms after lost of input voltage measure at 220Vac and at maximum output load.

2.2.5 Output Rise Time

At turn on the rise time of output voltage shall be less than 2000msec.

※ Measured from the 10% point to the 90% point of the normal

☞ Test condition

- Temperature: 25°C room temperature
- Test equipment: Resistance load

2.3 Power Output Protection

2.3.1 Over Current Protection(OCP)

The power supply shall not be damaged by a over current from the output to return Line.

Protection type : Constant current limiting, recovers automatically after fault condition is removed

2.3.2 Over Voltage Protection(OVP)

The voltage will not exceed the upper trip limit.

Noise spikes that exceed the lower trip limit for less than 10µs will not clamp the output voltage to zero.

2.3.3 Short Circuit Protection(SCP)

An output short circuit is defined as output impedance of less than 0.1 ohms.

The power supply shall not be damaged by short between DC output and DC ground.

2.3.4 Specification of Protection operating

NO	Output Voltage Name	Over Current Protection *1)		Over Voltage Protection		Short Circuit Protection
		Range [A]	Protection	Range [V]	Protection	
1	+3.3VS	2.0A more	Auto Recovery	-	-	Auto Recovery
2	+5VS	-	-	-	-	Auto Recovery
3	+3.3VD	3.0A more	Auto Recovery	-	-	Auto Recovery
4	+5VD	3.7A more	Auto Recovery	5.6V ~ 7V	Auto Recovery	Auto Recovery
5	+12VA & +12V	10A more	Auto Recovery	14V ~ 18V	Auto Recovery	Auto Recovery
6	+24V	22A more	Auto Recovery	28V ~ 37V	Auto Recovery	Auto Recovery

*1 The O.C.P point is measured when other output load is a maximum.

No hardware failure and No fire, when the output voltage decrease to 10%(Voltage Drop)

3. RELIABILITY

3.1 Mean Time Between Failure(MTBF)

The power supply shall be designed and produced to have a mean time between failures (MTBF) Of 40,000 operating hours at 90% confidence – level while operating under the following condition.

- AC input voltage : 220Vac
- Duty cycle : 6hours ON, 2hours OFF
- Ambient Temp. : $25 \pm 2^{\circ}\text{C}$
- Humidity : prevailing condition

3.2 Life/Power On Hours

The power supply must be designed to operate for 40,000 power on hours.
About 5 years at an ambient temperature of 25°C

3.3 Burn-in Test Condition

More than 2 hours at $40^{\circ}\text{C}(\pm 5^{\circ}\text{C})$, Normal input voltage.
AC on/off must be test 1 time after burn-in.

Output Voltage	+3.4VS	+5VS	+3.4VD	+5VD	+12VA & +12V	+24V
Aging Load [A]	0.5	0.1	1	2	3.5	15

☞ Test condition

- Test equipment: Resistance load

4. SAFETY & EMS

4.1 Earth Leakage current

The power supply leakage current shall be less than 0.5mA

4.2 Hi-Pot Test (Dielectric withstand voltage)

- ① Primary to Secondary : 3.0KVac for 1 minute
→ 3.6KVac for 1 seconds (mass production)
 - ② Primary to F.G : 1.5KVac for 1 minute
→ 1.8KVac for 1 seconds (mass production)
- ※ Cut-off current : 10mA

4.3 Insulation Resistance

Insulation resistance shall be $8\text{M}\Omega$ or more at 500Vdc between primary Live, Neutral line and secondary.

4.4 Input AC Surge

The power supply withstand 300Vrms input for 10 seconds.

4.5 Surge & Impulse Test

- ① Lightning Surge : $\pm 4\text{kV}$ (L1 ~ L2) 6 time, $\pm 4\text{kV}$ (L1 ~ FG, L2 ~ FG) 6 times
- ② Impulse Noise Test : 2kV, Normal/Common mode, Polarity(+,-) / Phase($0^\circ \sim 360^\circ$)

4.6 RFI / EMI Standards

The power supply shall comply with a following RFI/EMI standards when tested in a system configuration.

- CISPR, class B

The limits shall be met with a margin of at least more than 5dB at all applicable frequencies.

4.7 Safety Standards

The Power Supply Unit shall be tested with the following safety standards.

- UL60950, UL6500
- IEC60950, IEC60065
- EN60950, EN60065

5. ENVIRONMENT REQUIREMENTS

5.1 Temperature

- Operating Temp. : $-20 \sim 50^\circ\text{C}$
- Storage Temp. : $-20 \sim 60^\circ\text{C}$

5.2 Humidity

- Operation humidity : 30 ~ 85% non-condensing
- Storage humidity : 5 ~ 90% non-condensing

6. POWER ON/OFF SIGNAL

6.1 LOW Signal

- Power On Level : 0V ~ 0.5V
- Power Off Level : 2.5V ~ 5V

6.2 HIGH Signal

- Power On Level : 2.5V ~ 5V
- Power Off Level : 0V ~ 0.5V

6.3 AUTO Signal

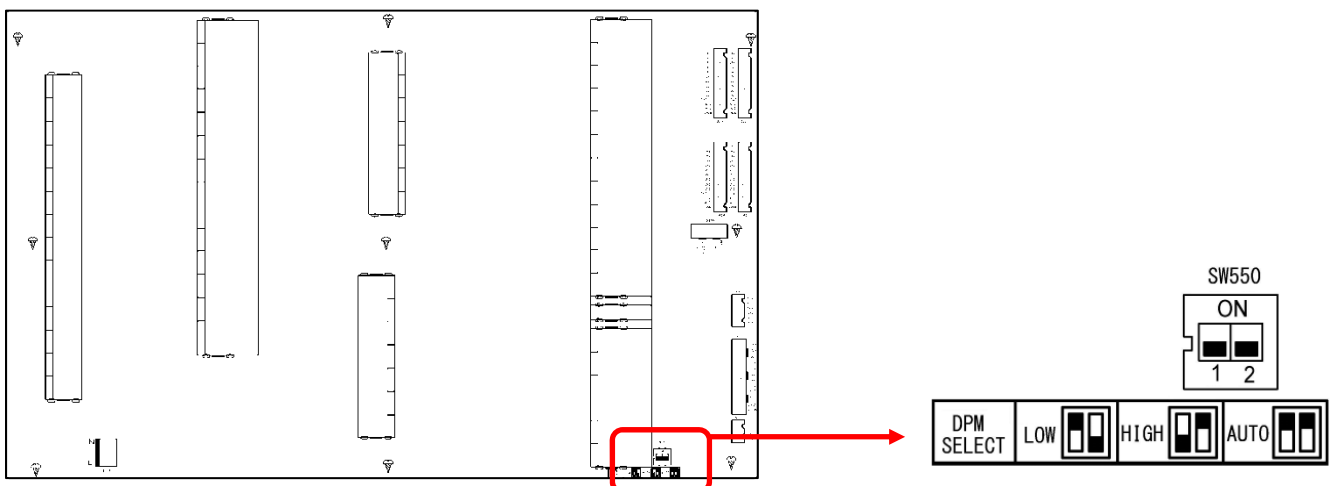
- Power On Level : Pin open (Always On Mode)
- Power Off Level : Mode does not exist

6.4 ACD (AC Detect) Output Signal

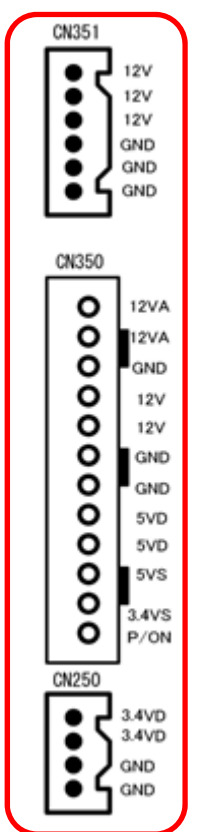
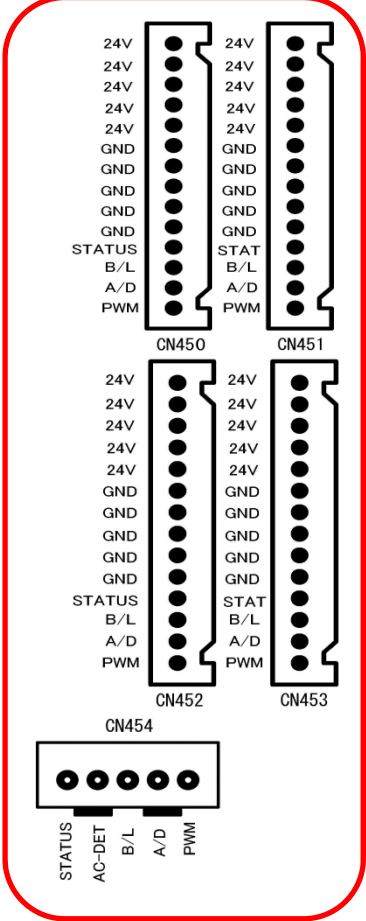
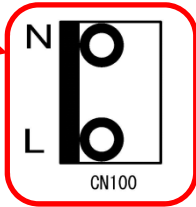
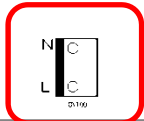
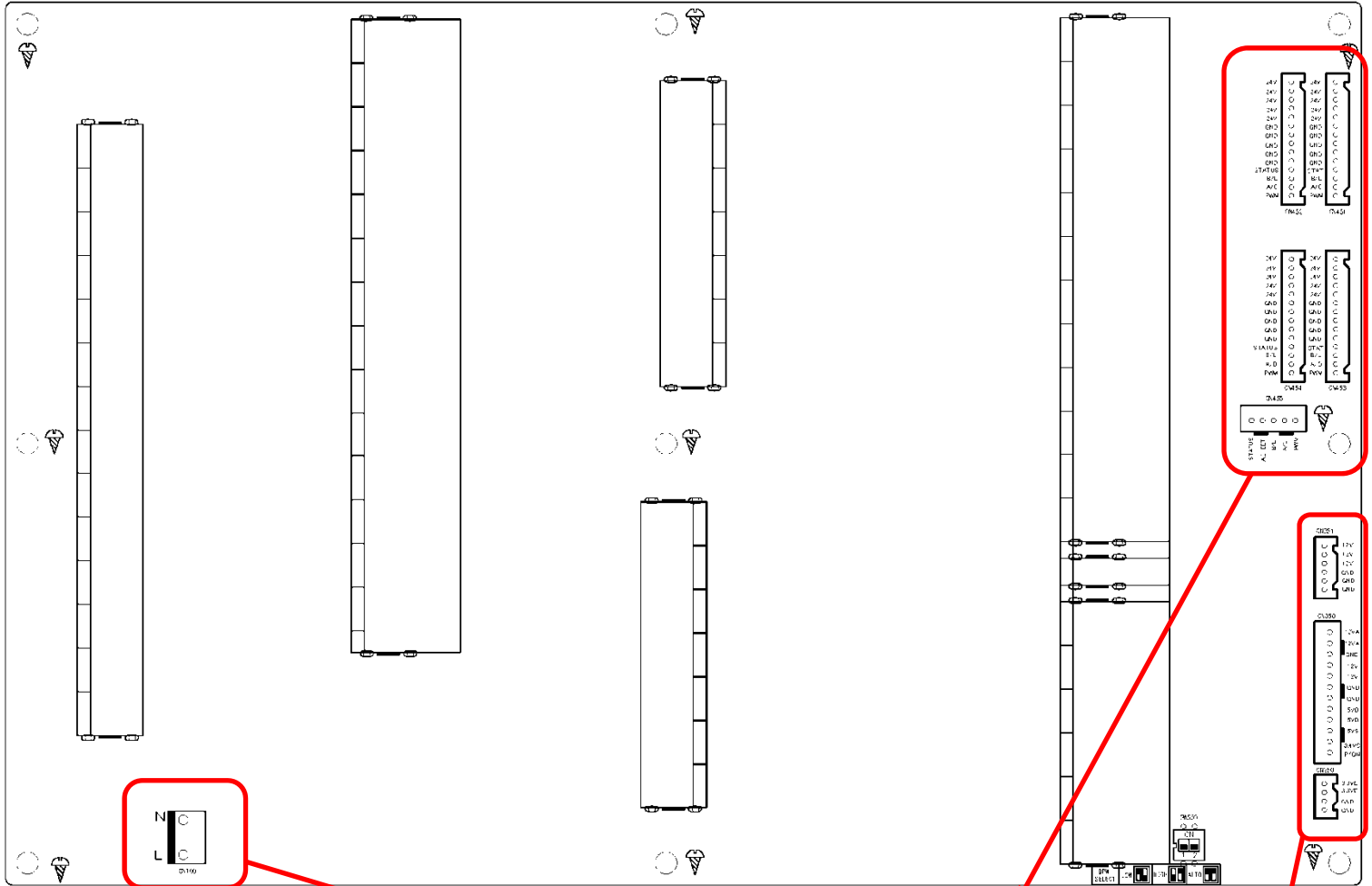
- High logic more than 2.5V
- Low logic less than 0.7V

6.5 Power on/off signal select

- Depends on the switch on the PCB components L/N. SW 550



7. CONNECTOR PIN ASSIGNMENT & SPECIFICATION



No.	Location No.	PART-NO.	VENDOR
1	CN100	YW396-03AV	YEONHO
2	CN250	SMW200-04	YEONHO
3	CN350	SMW250-12	YEONHO
4	CN351	SMW200-06	YEONHO
5	CN450	SMW200-14	YEONHO
6	CN451	SMW200-14	YEONHO
7	CN452	SMW200-14	YEONHO
8	CN453	SMW200-14	YEONHO
9	CN454	SMW250-05	YEONHO

8. POWER SUPPLY ASSEMBLY DIMENSION

- Size : 310(W) × 202(L) Height : MAX. 31mm (From the top of P.C.B)
- Weight : 1000g max

