

# 75W LCD TV POWER BOARD SPECIFICATION

Date: Dec. 31, 2008

Rev: 1.00

## 1. Adapter Input Specification:

### 1.1 Input Voltage Range:

The power module must operate at sinusoidal input voltage range 90Vac – 132Vac..

### 1.2 Input Current Range:

The input current is  $\leq 3.0A$

### 1.3 Input Frequency Range:

The input frequency range will be 47Hz ~ 63Hz.

### 1.4 Inrush Current:

The inrush current shall not be exceed 70App (132V \_ 90deg 、 270deg)

### 1.5 Power Saving:

The power saving shall not be exceed 1watt at 132Vac when the power only supply 5V/100mA.

### 1.6 Efficiency:

The efficiency (watts output/watts input) shall not be less than 85% on 110Vac full load condition

### 1.7 The output power shall not be less than 75W on 110Vac full load condition

### 1.8 Without PFC

## 2. DC Output Specification:

### 2.1 Static Output Characteristics

No	Symbol	Output Current	Ripple & Noise	Min.	Type.	Max.	Remark
1	5 V	0A~2.5A (12.5W)	50mV	4.75V	5V	5.25V	System Power
2	12V <sub>IO/A</sub>	0A~1.53A(18.36W)	100mV	11.4V	12V	12.6V	LCD & Audio Power
3	24V <sub>I</sub>	0A~ 1.84A(44.16W)	240mV	22.8V	24V	25.2V	Inverter Power

**Notes :** Noise could tolerate 2%, but design needs to consider 1% tolerance. At the final system integration stage, the related components can be decided to be mounted or removed.

### 2.2 Overshoot :

Any overshoot at turn on or turn off of AC input shall be less than 10% of the nominal value

### 2.3 Rising time :

The rising time shall be not exceeding 50ms for all output.

### 2.4 Hold up time :

The hold up time shall not be less than 16ms.

Applied the AC input voltage is 110Vac and system load, output voltage shall remain regulation.

### 2.5 Dynamic Load :

A square wave dynamic load with minimum to maximum of the static load plus dynamic load does not exceed any output range. This dynamic load change shall be applies to a single output at frequency 100Hz and 1 KHz.

## 2.6 Turn On delay time:

Applied the AC input voltage is 110Vac and system load, output voltage shall remain regulation.

2.6.1 The turn on delay time 5V with respect to Vac < 1sec.

2.6.2 The turn on delay time main power with respect to PS\_ON < 150mS.

(\*Main power include 5V、12V<sub>IO/A</sub> & 24V<sub>I</sub> \*)

## 3. Protection:

### 3.1 Over Voltage Protection :

The occurrence of an over-voltage on the any output and the subsequent protection shall not cause damage to the power module.

Output	Over Voltage Limit	Function
5V	+6.0V~+7.0V	Latch-off
12V	+13V~+16V	Latch-off
24V	+28V~+33V	Latch-off

### 3.2 Short Circuit Protection:

If any of the main power outputs are shorted to secondary common. The “main power “shall latch-off and no damage shall occur and the supply must not over heat, The supply shall resume normal operation once the short is removed and the AC off/on cycle is applied.

### 3.3 Over Temperature Protection:

The power supply shall contain thermal protection circuitry that will shut down the supply in the event of excessive temperature conditions. Once thermal shutdown has occurred, the power supply shall remain disabled until the temperature returns to within normal operating specifications and until AC has been recycled.

No parts damage and the output should be recovery by PS\_ON on/off .

### 3.4 Over Current Protection :

When an overload is applied to the main power output, the “main power” shall latch-off and no damage shall occur and the supply must not over heat; the supply shall resume normal operation once the short is removed and the AC off/on cycle is applied.

Output	Over Current Limit	Function
5V	3.5A ~ 4.5A if sustain 100ms	Latch-off
12V	2.5A ~ 3.5A if sustain 100ms	Latch-off
24V	2.5A ~ 3.5A if sustain 100ms	Latch-off

## 4. Environment:

4.1 Operating Temperature: 0°C to 60°C (for system power apply)

0°C to 50°C Only for safety apply(full load).

4.2 Storage Temperature: -20°C to +85°C .

4.3 Operating Relative Humidity: 20% to 90%.

4.4 Storage Relative Humidity: 5% to 95%.

## 5. Safety & EMC:

5.1 Hi Pot test: (a) Primary to Secondary: 3000Vac 1sec. Working current . 10mA.

(b) Primary to F.G: 1800Vac 1sec. Working current . 10mA.

5.2 Insulation Resistance: Primary to safety ground: 500Vdc, 25 M ohms min.

5.3 Leakage Current: less than 0.25mA at 132Vac/60Hz.

5.4 Insulation distance: follow IEC60065

IEC	
AC-AC	4mm or more
primary fuse	3.5mm or more
primary-secondary	7mm or more

5.5 Line Surge Test:

5.5.1 Between power cords is  $\pm 2$ KV (line to line)

Applied differential mode, pulse rise time 1.2us and duty time 50us , 5 times for each one

5.5.2 Between power cords and ground  $\pm 4$ KV (line to ground)

Applied differential mode, pulse rise time 1.2us and duty time 50us , 5 times for each one

5.5.3 No degradation of performance during the test.

5.6 AC Noise Simulation Test:

Pulse width 1 $\mu$ s , 100ms/cycle and 400mS/cycle , impress + and -.	
$\pm 0 \sim 1.0$ kV	( confirm at 2kv as ability value)
* $\pm 0 \sim 500$ v	No abnormal phenomenon for output
* $\pm 0 \sim 700$ v	No breakdown, No malfunction.
* $\pm 0 \sim 1.0$ kV	No parts destruction, No latch up

5.7 AC power instant stoppage test:

Cut 100% of AC voltage for 120ms at 110Vac

Cut 40% of AC voltage for 180ms.at 110Vac

Must no abnormal phenomenon for TV set condition

Output	Current rating
5V	1.25A
12V <sub>IO/A</sub>	0.77A
24V <sub>I</sub>	0.92A

5.8 Lighting Surge Test:

AC current $\pm 2.4$ kA 、 AC voltage $\pm 12$ kV (Between AC and secondary)

The testing can accept components damage, no fire, no smoke

5.9 Safety certificate: UL/cUL 60065 7th

5.10 EMI:

5.10.1 Harmonics: EN61000-3-2 Class D limits with 5% minimum margin.

5.10.2 Disturbance voltage at the mains terminals: -6dB

5.10.3 Radiated Disturbances: -6dB

5.10.4 FCC CLASS B

## 5.11 EMS

- 5.11.1 ESD : Contact discharge  $\pm 8\text{KV}$  ; Air discharge  $\pm 15\text{KV}$
- 5.11.2 RS : FR: 26 MHz~1 GHz ; Field/Strength: 3 V/M
- 5.11.3 EFT : 2 KV on AC power line
- 5.11.4 CS : 3 V / M
- 5.11.6 DIPS : 0 % 250 Cy. / 40% 5 Cy. / 70% 5 Cy.

## 7. Operational Life:

- 6.1 The power supply shall be designed for a minimum life of 50,000 MTBF.
- 6.2 Burn-in time : Power supply shall be burn in under  $40^{\circ}\text{C} \pm 5^{\circ}\text{C}$  , with 110Vac and full load.

## 8. Reliability

- 8.1 EFT (Electrical Fast Transient)
- 8.2. Close loop gain (gain margin & phase margin)
- 8.3 HALT (Highly Accelerated Life Testing)
- 8.4 CMTBF (Component Mean Time Between Failure)
- 8.5 Key component stress
- 8.6 Burn-in 8 hours for each module with loading 80% to 100%.

## 9. Pin Assignment:

### 9.1 Pin assignment of CON101:

Pin No.	Signal Name	Feature
1	12V/24V Signal ON/OFF Control	Low (0V): OFF High (5V): ON
2	Backlight ON/OFF	ON : 2.0V ~ 5.0V OFF : 0V ~ 0.8V
3	Brightness DC	0V ~ 3.3V
4	Brightness PWM	20% ~ 100%
5	GND	GND
6		
7	5V	+5/2.5A
8		
9		
10	GND	GND
11		
12	12V <sub>IO/A</sub>	+12V/1.53A
13		

**Note:** .

1. Signal ON/OFF → Low (OFF): 5V always exist, +12V/+24V shutdown.
2. Signal ON/OFF → High (ON): All of power is on.
3. Backlight ON/OFF 、Brightness DC and PWM (pin2.3.4) bypass to CON102 pin8.9.10

### 9.2 Pin assignment of CON102:

Pin No.	Signal Name	Feature
1	24V <sub>I</sub>	+24V/1.84A
2		
3		
4	NC	NC
5	GND	GND
6		
7		
8	Backlight ON/OFF	ON : 2.0V ~ 5.0V OFF : 0V ~ 0.8V
9	Brightness DC	0V ~ 3.3V
10	Brightness PWM	20% ~ 100%

### 9.3 Connector Specification:

Item	Description	Remark
CON100	INALWAYS 0707-1-C7C1 10A,250V(VDE,D,S,FI,N,UL,CSA) or Equivalent	AC Socket
CON101	JOWLE A2501WV2-13P Wafer connector, DIP, Vertical type, Pitch 2.50mm, 13 pin	DC Connector
CON102	JOWLE A2501WV2-10P Wafer connector, DIP, Vertical type, Pitch 2.50mm, 8 Pin	DC Connector

CON100 , spec file link



Adobe Acrobat  
Document

CON101 & CON102 spec file link



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Specification\Connect

10 Dimension : (pdf & dxf file format)



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