2018 UHD 720p LCD TV Training Materials

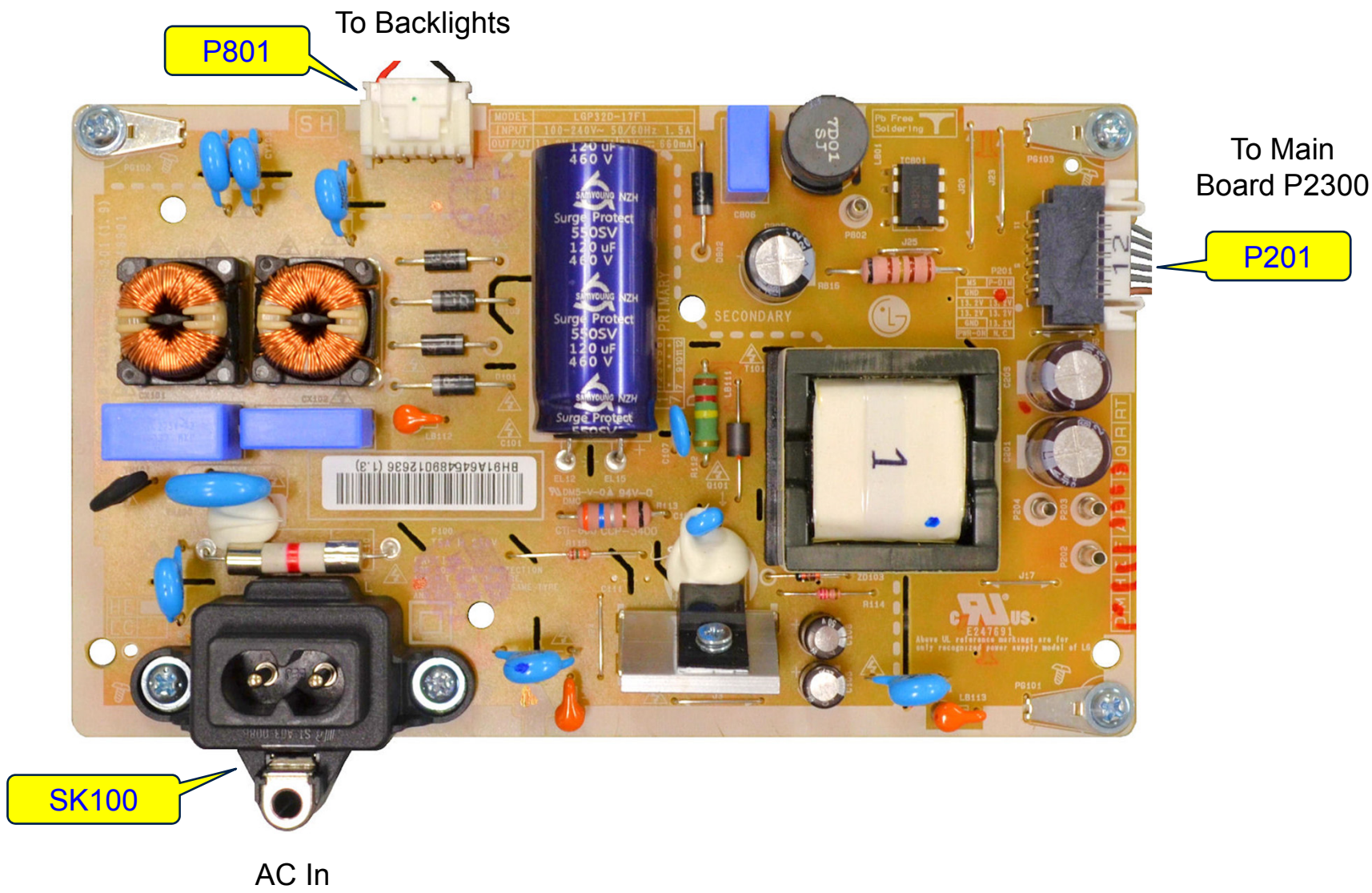
32LK610BPUA WebOS 4.0 FHD TV POWER SUPPLY TESTING

Using a Simple 3V Jig or
Smart TV Test Jig and Multi-Gender Board

Published October 09th, 2018

Life's Good

Power Supply (SMPS) Board Layout (EAY64548901)



32LK610BPUA SMPS (Power Supply) Drawing

P801 To Panel Backlight Power pin 7.
P801 Pin 1 goes to Backlight Driver
Q801 (Back of SMPS)

LED- (95.8V) 50%
LED+ (118.5V) 50%

P801 "SMPS Board" To "LED Backlights"

PIN	LABEL	RUN	Diode
1 ←	LED-	110.4V~89V	OL
3	N/C	n/c	n/c
5	N/C	n/c	n/c
7 →	LED+	134.8V~113.2V	OL

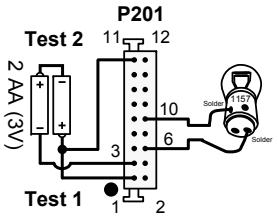
In ← Out → Dim to Bright

AC 1st applied 168V (30sec) then fall to 76V
During Stand-By LED+ will fluctuate 76V
Main Board Disconnected: 69V
Backlight Setting Dim 0% to Bright 100%
Pins 2-6 are not connection.
Direct Lit Backlights (8 LEDs on 1 Array Strip)

SMPS TEST: Forcing SMPS On.
This test requires simple 3V jig.
See below or Multi-Gender Board, use Port P16 (12pin), See Article 9627.

Using 3V Simple Jig: Remove AC Power.
Disconnect P2300 on Main Board.
Test 1: Using a 3V jig, Jump 3V to pin 1 (PWR_ON).
Apply AC Power. (No Backlights in Test 1)
(Pins 4-8) rises to 13.13V. Backlight Power LED+ 114.8V. LED- 95.6V. PDIM will be 3.42V.
Remove AC Power.

Test 2: Using a 3V jig, Jump 3V to pin 11 (DRV_ON).
Place a 12V Light Bulb on 13.2V to Gnd.
Apply AC Power. All Voltages should be produced. (13.2V) 12.95V to Main and
"LED+" 119.2V to the Backlights), "LED-" 94.3V.
This will also force the Backlights to come on. PDIM will be 3.77V



Test Set Up

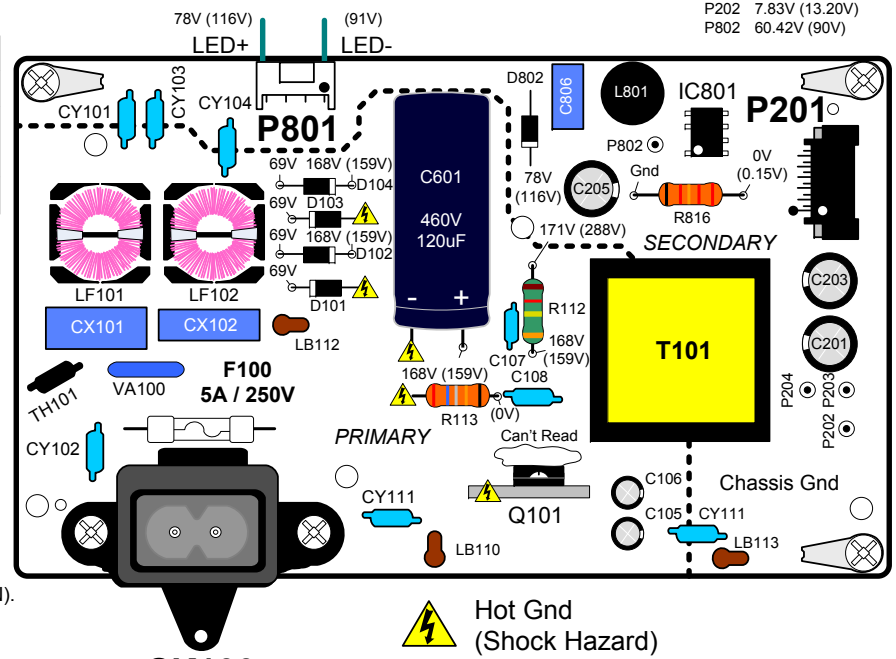
Note:
P201 still inserted. P2300 removed.
Use P2300 side to insert needles from the Jig.
Note: STBY 7.83V (Pins 4-8)
Must be present when AC is applied before beginning test which indicates Standby voltage is OK.

Special Note:
The 13.2V Line "Must" be loaded using a 12V light Bulb when using the 3V Simple Jig).

SMPS
P/N: EAY64548901

To Backlight LEDs

P204 7.83V (13.20V)
P203 7.83V (13.20V)
P202 7.83V (13.20V)
P802 60.42V (90V)



Hot Gnd
(Shock Hazard)

VOLTAGE LABEL

MODEL	LGP32D-17F1
INPUT	AC100V~240Vac 50/60Hz. 1.5A
OUTPUT	13.2V = 1.8A
	31V – 660mA

3V SIMPLE JIG: Made from 2 (AA) batteries.
Jump + to – on one side.
On the other side, solder two red wires (needle tipped) to the + and one black wire (needle tipped) to the – side.
See Article 8979
Note: For Ground you can use Panel Back.

Note: The Smart Test Jig and Multi-Gender Board "Can" be used in this model for testing. Use Port P16. 13.2V Line does not have to be loaded in this case, Jig Switch set to 24V / LCD Power (See Article 9627).

P201 "SMPS Board" To P2300 "MAIN Board"

PIN	LABEL	STBY	RUN	Diode	MAIN
(3) 12	P-DIM	0V	*0.16V-3.18V	OL	12
(2) 11	MS (Drv_On)	0V	1.97V	OL	11
9-10	Gnd	Gnd	Gnd	Gnd	9-10
4-8	13.2V	7.83V	13.10V	OL	8-4
3	Gnd	Gnd	Gnd	Gnd	3
2	N/C	n/c	n/c	n/c	2
(1) 1	PWR_ON	0V	3.35V	1.20V	1

*Dim to Bright

Voltages below for Backlight Power (LED+) are with Main disconnected and using Simple 3V Jig to supply turn-on commands on-at-a-time.
(Special Note: 13.2V Line "Must" be loaded using a 12V light Bulb when using the 3V Simple Jig).

(1) **PWR-On Pin 1:** Turns on 13.2V to the Main. No backlights at this time. Backlight Power is 114.6V.

(2) **MS (DRV_On) Pin 11:** Turns on the Backlights. Backlight power goes to 119.3V.

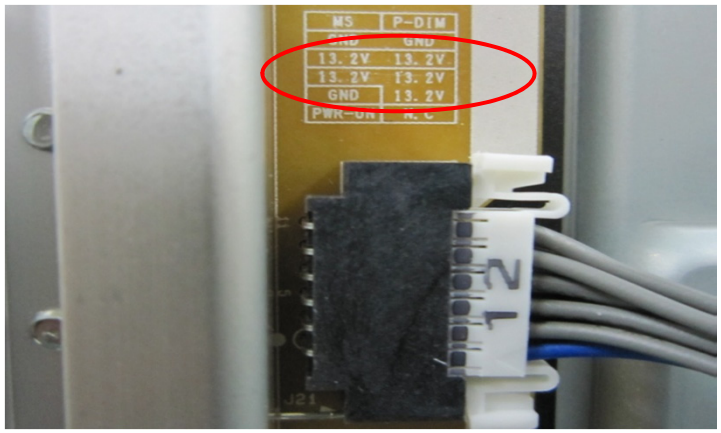
Voltages given below for PDIM are with Main connected and receiving normal Digital Antenna Signal.

(3) **PDIM Pin 12:** Will vary according to incoming video IRE level and OSD Backlight setting Output from the Video Processor. And the Backlight settings in the Customer's Menu 0% TO 100%. It is then routed out P1001 to P201 and sent to the LED Driver IC on the Back of the SMPS. The Range is: Dim 0.17V ~ Bright 3.28V. (1.76V at 50%) PDIM is actually a 3.44V p/p pulse (PWM Control).

	Pin	Run	Pin	Run
IC801	4)	0.86V	5)	3.19V
	3)	13.1V	6)	Gnd
	2)	n/c	7)	1.95V
	1)	89V	8)	Gnd

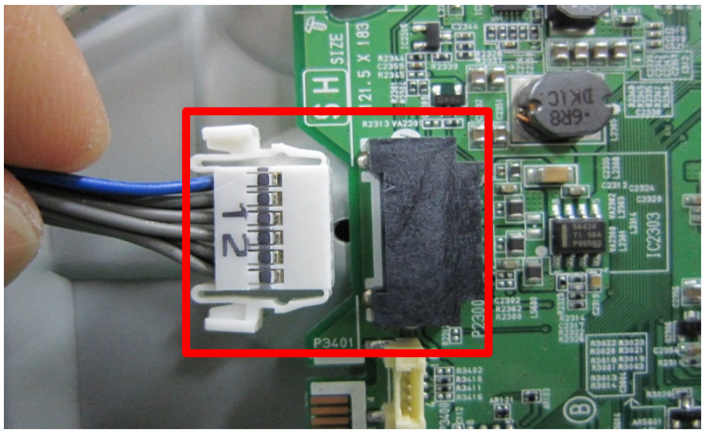
Test Using Multi-Gender Board and Smart TV Test Jig

1



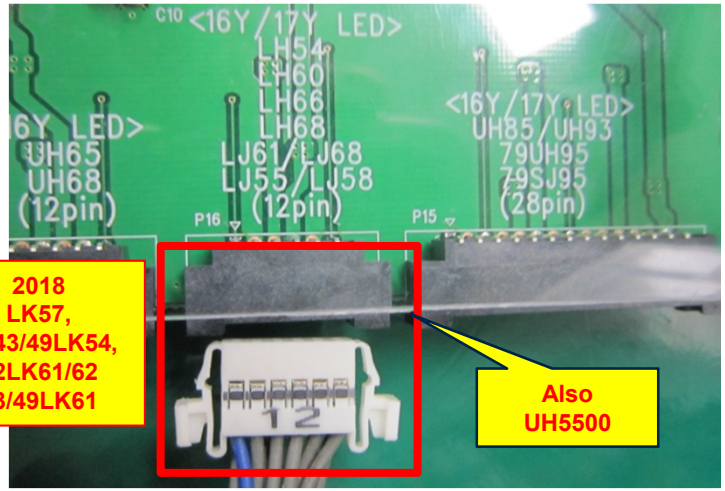
▶ Check power board voltage, (13.2V).

2



▶ Disconnect the Main Board 12Pin Power Cable connector.

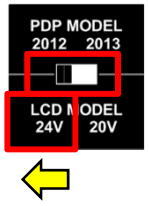
3



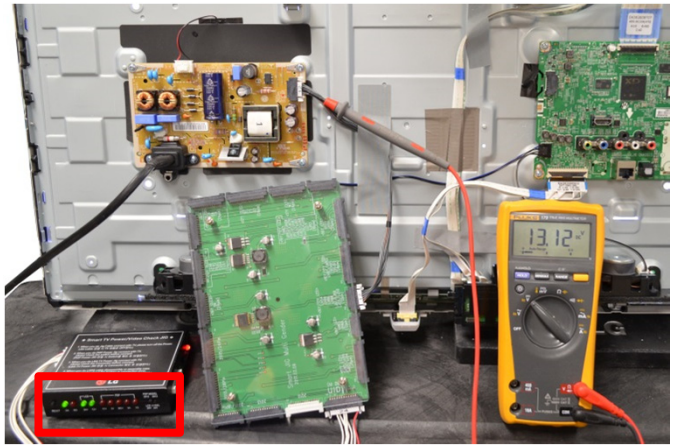
▶ Connect the 12Pin Power Cable connector to the Multi Gender JIG (P16 port) 12Pin connector.

▶ Set the PRODUCT SWITCH on SMART JIG to LCD.

▶ LCD MODEL SWITCH: Set the switch to 24V.



4



▶ Apply Power; when the OK LED turns on, Power Board is normal. Backlights should be On.

▶ Check all voltage out to the Main board.

▶ When the NG LED turns on, the Power Board can be judged as defective.

Power Supply Board Test 1 (Using 3V Simple Jig)

Note: The numbers in Fig 1 refer to the "Main" board connector (from the SMPS) that has been unplugged. Use this end for easy insertion of needles. Count the Pins from the SMPS side.

AC "Must Not" be applied at any time while adding jumpers or while unplugging connectors, damage to the circuit Board may occur.

I) When AC is applied, the SMPS "MUST" be producing STBY 7.8V on pins 4-8, of P201. Note (If Main board is Connected): When AC 1st applied, Backlight Power is 168V for 30sec. Then falls to 76V. (Main Disconnected: Backlight Power is 69V.

If STBY 7.80V is missing, STBY voltage may be loaded down by the Main Board or the Joy Stick/IR Board. Remove connector P2300 on Main board from SMPS. If STBY is still missing, SMPS is defective but make sure AC is arriving at the connector SK100.

II) With P2300 on the Main Board unplugged, it will make insertion of the Needle tips easier. Use P2300 (Main Board side) to insert connections during these tests. Pin numbers will be given from P201 side.

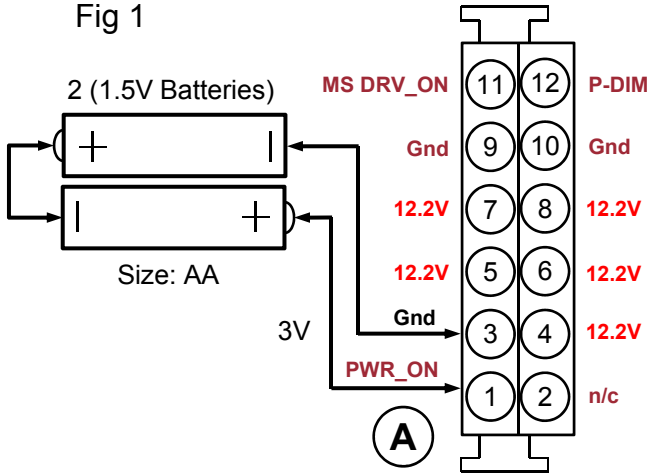
TEST 1: TESTING THE POWER SUPPLY TURN-ON CIRCUIT. (See Fig 1)
No Backlights during this test.

(1) Using two AA 1.5V batteries hooked in series (3V supply) jump the negative lead to ground (pin 3) [Main pin 9] and the positive lead to PWR-ON (pin 1) [Main pin 11] as shown in example (**A**) in Fig 1 on the right.
Apply AC, this will turn on the SMPS. No Relay click will be heard.
Check that the 13.2V supplies that go to the Main board have turned on;
To Main Board Power:
- **13.2V:** (P201 "13.12V" pins 4-8)
- Backlight Power will read 114.6V (No Backlights)

(2) Remove AC Power (Leave Battery connected in this configuration).

SMPS TEST 1
Top Row pins
are Odd numbers

Fig 1



STAND-BY VOLTAGE:
7.80V in STBY, 13.12V with PWR_ON.

Pin 1 Top Pin on Bottom (SMPS Side)
Top row is odd pins, bottom row is even pins.

Use SMPS side for pin count.

WARNING:
Do not to let the leads touch positive (+) to negative (–) at any time as this will cause battery to overheat creating a fire hazard.

Pin Numbers on Main are the same as pins on SMPS.

Power Supply Board Test 2 (Using 3V Simple Jig)

Continue if the 1st test was OK. Leave original jumper (A) in place. AC Power is removed at this time.

TEST 2: Backlight Section (Using P2300 side)

(3) (B) Jump the 3V to Pin 11 MS (DRV_ON). (See Fig. 2), Simulating a Power On and Backlight On command.

(4) (C) Add a 12V Light Bulb to the 13.2V Line and Ground.

(5) Apply AC Power.

Backlights Normal: Backlight Power 119.3V

a) If normal, the backlights will be on.
SMPS OK, Backlight Section OK. Backlight power P801 pin 7 (119.3V). Backlight Ground Return Pin 1: (94.3V)

Backlights Abnormal:

a) Recheck all connections.
b) Confirm the **PWR_ON** and **DRV_ON** lines are pulling up to at least 3V.
c) Confirm Light Bulb isn't open and connected to 13.2V line.
d) Check the connections to the Panel's Backlights.

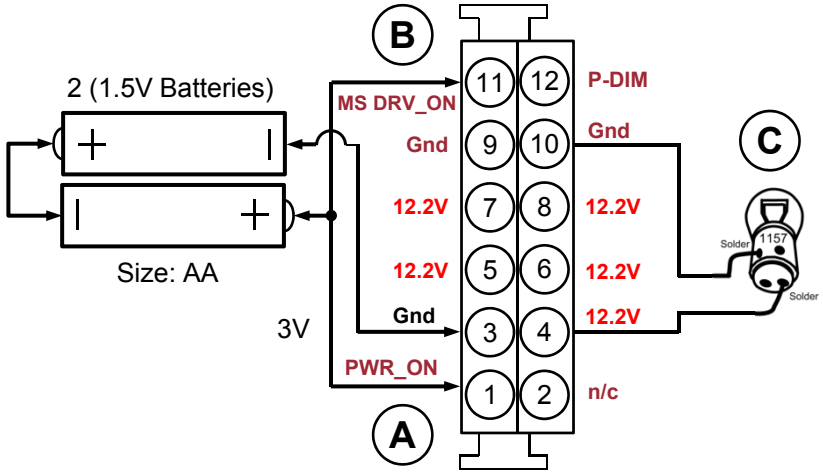
If the DRV_On command is pulling up to 3V and the 142.8 is being Generated at P801, suspect a Panel's Backlight Section problem.
Note: (Using Simple Jig), If P801 is disconnected (Backlights Open), the backlight power will come on at 115.3V, and stay there.
(Main Connected), If P801 is disconnected (Backlights Open), the backlight power will come on at 173V, and stay there.
Warning: Backlight Power is Slow to bleed down.

If test is successful, remove AC Power, Remove all Jumpers. Reconnect P2300 on the Main and confirm PWR_ON and DRV_ON lines.

SMPS TEST 2
Top Row pins
are Odd numbers

Fig 2

Female side of P2300



13.2V Line: 13.12V with PWR_ON and DRV_ON.
Failure to add Light Bulb, Backlights "Blink" rapidly.

Pin 1 Top Pin on Bottom (SMPS Side)
Top row is odd pins, bottom row is even pins.

Use SMPS side for pin count.

WARNING:
Do not to let the leads touch positive (+) to negative (–) at any time as this will cause battery to overheat creating a fire hazard.

Pin Numbers on Main are the same as pins on SMPS.

Power Supply Board Voltage Reading During Test Modes

Note: With the Main board disconnected from the SMPS:
The Backlight Power is 69V.
(13.2V) is 7.83V in STBY (Main Disconnected).

P201 "SMPS Board" Stand-Alone Test (Simple 3V Jig)

Pin	Label	Test 1	Test 2	Main
12	**P-DIM**	3.42V	3.77V	12
11	**MS (DRV-ON)**	0.0V	3.11V	11
9-10	**Gnd**	Gnd	Gnd	9-10
4-8	**13.2V**	13.12V	12.95V	4-8
3	**Gnd**	Gnd	Gnd	3
2	**N/C**	n/c	n/c	2
1	**PWR-ON**	3.13V	3.12V	1
		BL Off	BL On	

ADDITIONAL DETAILS

LED Power during TEST 1. **Pin 7 P801 114.6V**

LED Power during TEST 2. **Pin 7 P801 119.3V (13.2V Loaded)**

Test 1 LED Ground Return Line **Pin 1 P801 95.6V**

Test 2 LED Ground Return Line **Pin 1 P801 94.3V (13.2V Loaded)**

Failure to add Light Bulb, Backlights “Blink” rapidly.

Backlight Controller and Driver IC801

D802 Anode Backlight Power Source P801 pin 7

D204 13.2V Source

SMPS Controller IC is IC101

Test 1 = PWR_ON only
Test 2 = PWR_ON and DRV_ON (13.2V Loaded with 12V Bulb)
Failure to use Light Bulb, Backlights will Blink On/Off.
During Test, Main board is disconnected
BL = Backlights

P201 Power Supply Connector Voltage and Diode Check

P201 "SMPS Board" to "MAIN Board" P2300

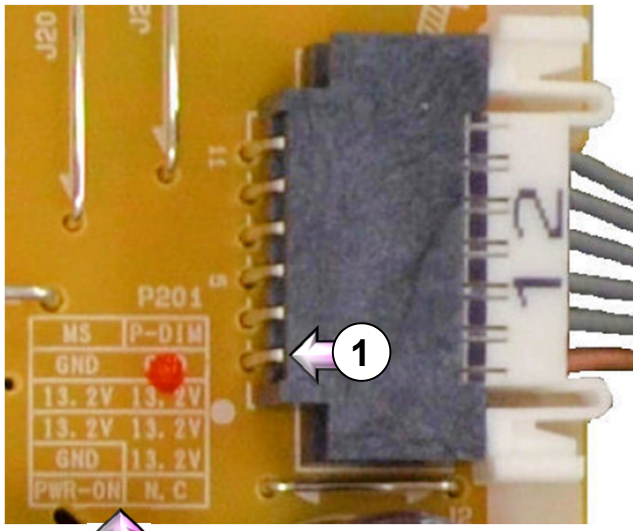
Pin	Label	STBY	Run	Diode Check	Main
12	[3] **P-DIM**	0.05V	0.16V~3.18V	OL	12
11	[2] **MS (DRV_ON)**	0V	1.97V	OL	11
9-10	**Gnd**	Gnd	Gnd	Gnd	9-10
4-8	**13.2V**	7.83V	13.10V	OL	4-8
3	**Gnd**	Gnd	Gnd	Gnd	3
2	**N/C**	n/c	n/c	n/c	2
1	[1] **PWR-ON**	0V	3.35V	0.94V	1

[3] Dim to Bright

[1] **PWR-On Pin 1:** Turns on 13.2V to the Main.
Backlight Power is 114.8V, No backlights at this time.

[2] **MS (DRV_On) Pin 11:** Turns on the Backlights. Backlight power goes to 119.3V.

P201 to Main



Pin Silk Screen Label

Top Row of pins are odd numbers

Pin Numbers on Main are the same as pins on SMPS.

P801 "SMPS Board" To "Panel LEDs"

Pin	Label	Run	Diode Check	50% PDIM
1 ←	**LED-**	**110.4V~89.0V**	OL	95.8V
3	**N/C**	n/c	n/c	n/c
5	**N/C**	n/c	n/c	n/c
7 →	**LED+**	**134.8V~113.2V**	OL	118.5V

←In
→Out

*Dim (0%) to Bright (100%)

Note: During STBY, LED+ is 76V. With Main disconnected 69V.
When AC 1st applied, LED+ is 168V (30sec) then fall to 76V

[3] **P-DIM Pin 12:** Will vary according to incoming video IRE level and OSD Backlight setting Output from the Video Processor. And the Backlight settings in the Customer's Menu 0% TO 100%. It is then routed out P2300 to P201 and sent to the LED Driver IC on the Back of the SMPS.

Diode Mode values taken with all Connectors Removed