



2015 OLED 4K UHD Training

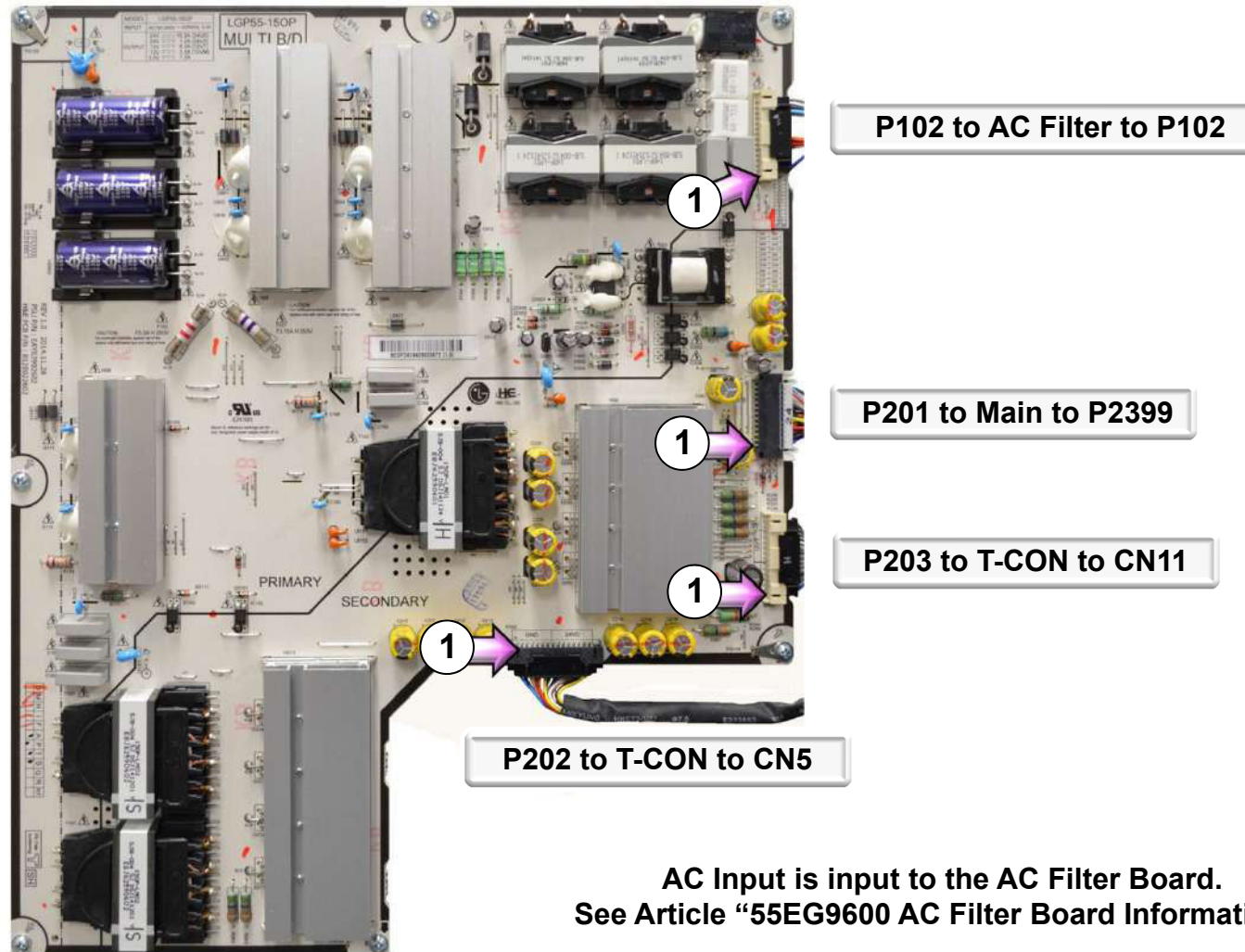
55EG9600 WebOS 2.0 UHD OLED TV

Power Supply Board Layout Troubleshooting the Power Supply

Published November 19th, 2018



55EG9600 SMPS (SWITCH MODE POWER SUPPLY) BOARD p/n: EAY62992602



55EG9600 Power Supply Board Component Layout

55EG9600 OLED (2015) Power Supply

SMPS BOARD

p/n: EAY62992602

POWER SUPPLY TEST

(Using Multi-Gender and Smart Jig):

Use the Smart TV Test Jig and the Multi-Gender Board and follow the procedure. See Article 9267.

Using the above Jigs you can also perform the OLED Panel Test. See Article 9268.

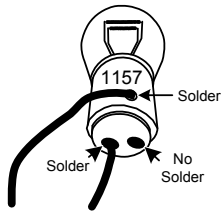
POWER SUPPLY TEST

(Using 3V Simple Jig):

See Article 55EG9600 Power Supply Testing.

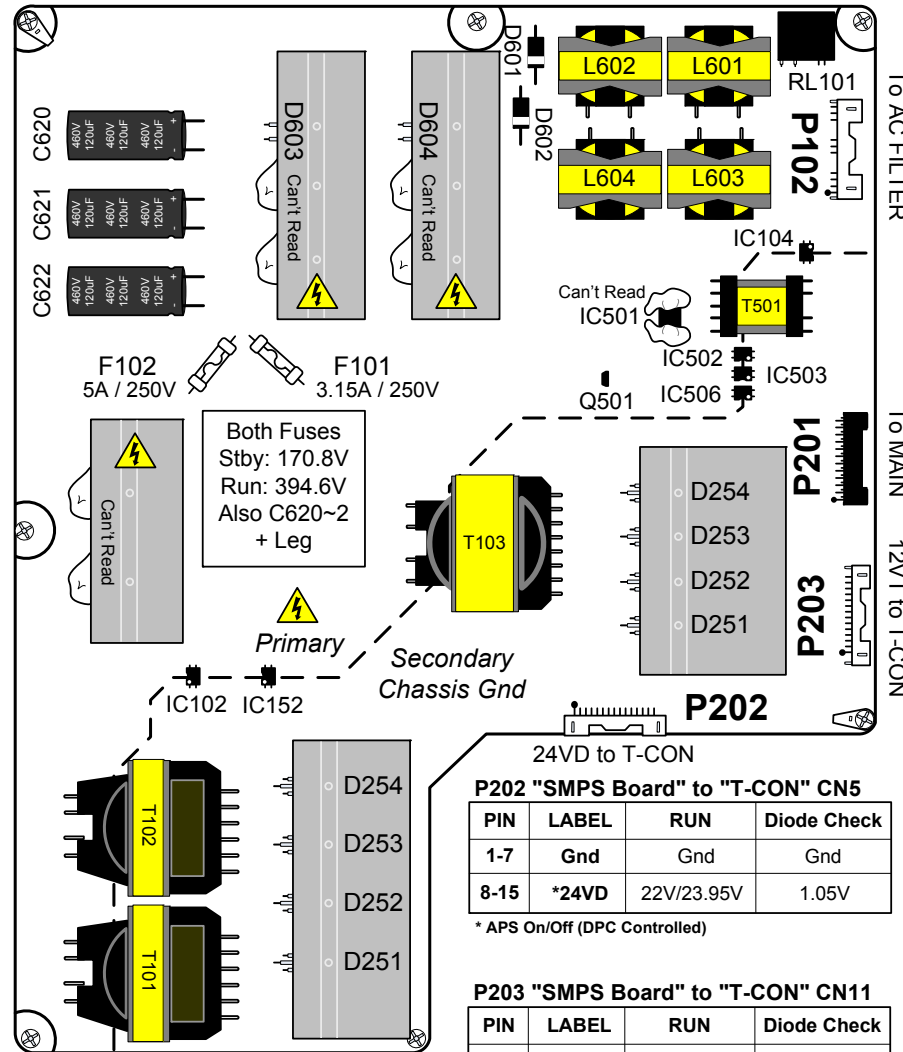
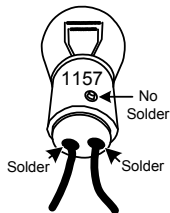
12VM TO MAIN TEST OR 12VT TO T-CON LOAD TEST:

Solder two leads to the terminals only on a 1157 auto bulb.
Place one lead on 24V and one on Gnd.



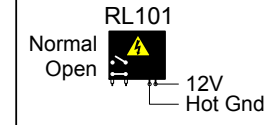
24VS TO MAIN TEST OR 24VD TO T-CON LOAD TEST:

Solder two leads to the terminals only on a 1157 auto bulb.
Place one lead on 24V and one on Gnd.



VOLTAGE LABEL

MODEL	LGP55-150P
INPUT	AC 100V-240V ~. 50/60Hz. 5A
OUTPUT	3.5V = 1.2A To Main 12V = 3.5A (12VM) To Main 12V = 6.0A (12VT) To T-CON 24V = 1.0A (24VS) To Main 24V = 10.6A (24VD) To T-CON



P102 "SMPS Board" to "Filter board" P102

PIN	LABEL	STBY	RUN	Diode Check
14	ACD_Line	22.14V	22.18V	OL
12-13	No Pin	—	—	—
8-11	B-	*Hot_Gnd	*Hot_Gnd	*Hot_Gnd
5-7	No Pin	—	—	—
1-4	B+	169.7V	111.6V	OL

B- (Hot Ground) Pins 4~7 (Referenced – Leg BD101~4)

B+ Pins 11~14 (+ Leg of BD101~4)

Pins 11~14 referenced to Hot Gnd (B-)

P201 "SMPS Board" to P2399 "MAIN Board"

PIN	LABEL	STBY	RUN	Diode Check
23-24	Gnd	Gnd	Gnd	Gnd
19-22	24VS	0V	24.59V	0.82V
18	(3)12VT_ON	0V	3.52V	OL
16-17	Gnd	Gnd	Gnd	Gnd
11-15	12VM	0V	11.99V	1.03V
9-10	Gnd	Gnd	Gnd	Gnd
7-8	3.5V_ST	3.56V	3.54V	OL
6	Gnd	Gnd	Gnd	Gnd
5	3.5V_ST	3.56V	3.54V	OL
4	(4)ACD	0V	3.32V	OL
3	(5)DPC	0V	0V/3.40V	1.20V
2	(2)DRV_ON	0V	*3.12V	1.20V
1	(1)PWR_ON	0V	3.42V	1.20V

Main Board P2399 pins are the same as shown here.

(1): Pin 1 (PWR_ON): Turns on 12VM and 24VS to the Main. It does not turn on T-CON 24VD or 12VT. If the 12VM is missing, the set will click on and then click back off. (Shows up as 5VMNT on the Power Off Status).

(2): Pin 18 (12VT_ON): is (Panel_CTL) from Main. This turns on the T-CON 12VT, (which is T-CON 12VT P202 pin 7-12).

(3): Pin 2 (DRV_ON): is (INV_ON) from Main. This turns on the T-CON 24VD, (which is also T-CON 24V P203 pins 8-15). This 24VD is then routed directly to the Panel.

(4) ACD (AC_DET): This pin monitors the AC input. If it is missing the TV will not turn on. Power_Off_by_AC_DET is registered in the Power Off Status.

(5) Pin 3 (DPC): Places the Power Supply in Power Saving Mode when APC in the Customer's Picture Menu is turned On. (0V Off / 3.4V On)

P202 "SMPS Board" to "T-CON" CN5

PIN	LABEL	RUN	Diode Check
1-7	Gnd	Gnd	Gnd
8-15	*24VD	22V/23.95V	1.05V

* APS On/Off (DPC Controlled)

P203 "SMPS Board" to "T-CON" CN11

PIN	LABEL	RUN	Diode Check
1-6	Gnd	Gnd	Gnd
7-12	12VT	11.96V	0.50V
13	N/C	n/c	n/c
14	Gnd	Gnd	Gnd

DIODE CHECK CONNECTORS CONNECTED.

3.5V_ST P201: 1.13V (Blk on Gnd) 0.20V (Red on Gnd)
12VM P201: 1.02V (Blk on Gnd) 0.12V (Red on Gnd)
24VS P201: 0.77V (Blk on Gnd) 0.39V (Red on Gnd)
12VT P202: 0.47V (Blk on Gnd) 0.37V (Red on Gnd)
24VD P203: 1.0V (Blk on Gnd) 0.22V (Red on Gnd)

55EG9600 Power Supply Component DC Voltages

55EG9600 OLED (2015) Power Supply

SMPS BOARD

p/n: EAY62992602

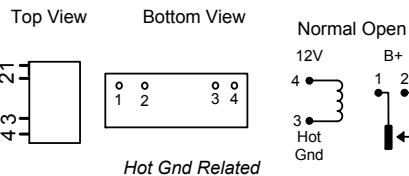
Hot Ground: Use (-) leg of either C620, C621 or C622. ⚡

Cold Ground: Use Chassis

⚡ Hot Gnd
IC501 Can't Read
Remove Silicone

PIN	STBY	RUN
1)	0.91V	0.91V
2)	1.84V	1.88V
3)	HGnd	HGnd
4)	0.02V	0.03V
5)	388V	388.7V
6)	15.07V	15.08V
7)	HGnd	HGnd

RL101 Module



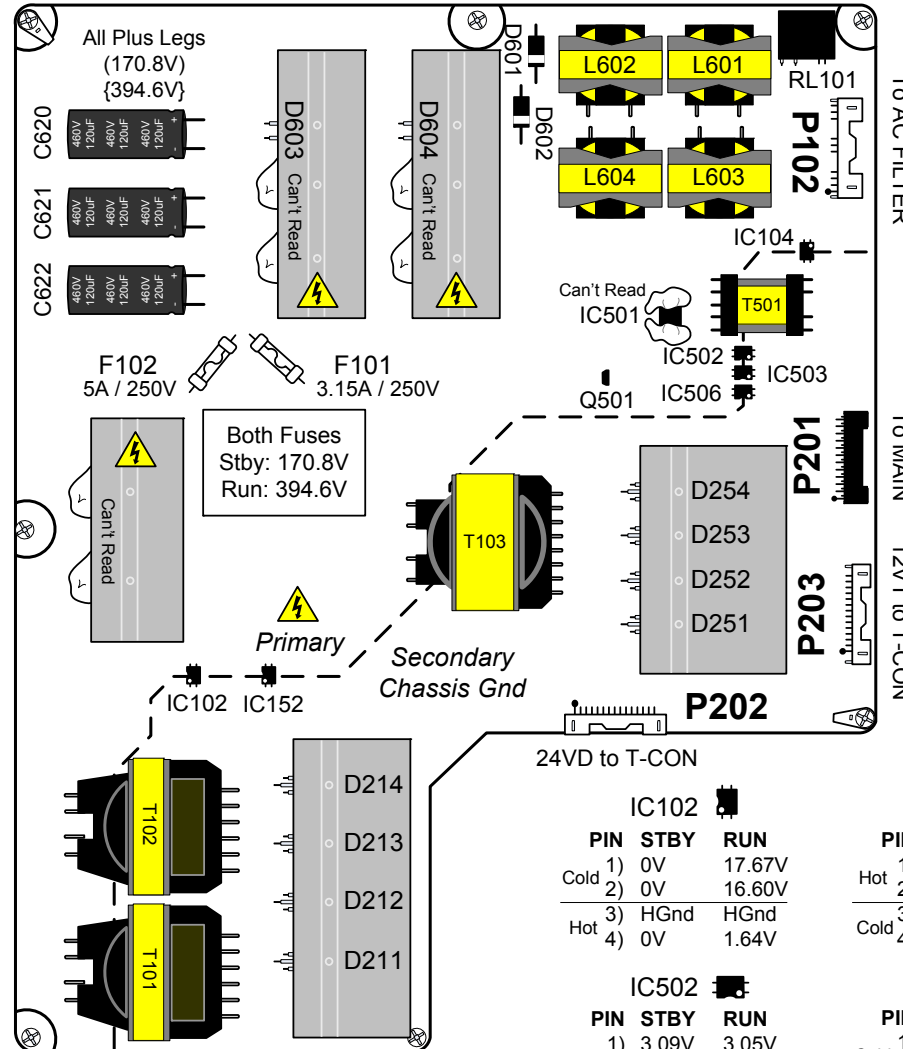
PIN	STBY	RUN
3)	HGnd	HGnd
4)	0V	Relay 12V
1)	Coil	B+
2)	B+	B+

D211~214 (Center Leg)

All (111V) {23.85V}

D251~254 (Center Leg)

All (111V) {11.90V}



DIODE CHECK CONNECTORS CONNECTED.

3.5V_ST P201: 1.13V (Blk on Gnd) 0.20V (Red on Gnd)
12VM P201: 1.02V (Blk on Gnd) 0.12V (Red on Gnd)
24VS P201: 0.77V (Blk on Gnd) 0.39V (Red on Gnd)
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24VD P203: 1.0V (Blk on Gnd) 0.22V (Red on Gnd)

D601

Anode (169.7V) {119.407V}
Cathode (169.2V) {109.8V}

D602

Anode (169.4V) {120.2V}
Cathode (169.4V) {394.8V}

D604

Top Leg (170.5V) {107V}
Bottom Leg (169.4V) {394.8V}

D603

Top Leg (170.5V) {107V}
Bottom Leg (169.4V) {394.8V}

Q501

B: (0V) {14.36V}
C: (17.14V) {17.57V}
E: (0V) {15.01V}

OPTOCOUPLERS

IC102		
PIN	STBY	RUN
1)	0V	17.67V
2)	0V	16.60V
3)	HGnd	HGnd
4)	0V	1.64V

IC502		
PIN	STBY	RUN
1)	3.09V	3.05V
2)	2.07V	2.03V
3)	HGnd	HGnd
4)	3.03V	1.84V

IC104		
PIN	STBY	RUN
1)	0.05V	2.96V
2)	0.05V	1.91V
3)	3.56V	3.53V
4)	0V	3.44V

IC503		
PIN	STBY	RUN
1)	3.56V	1.34V
2)	3.56V	0.18V
3)	0V	15.09V
4)	17.59V	15.23V

IC152		
PIN	STBY	RUN
1)	0V	9.78V
2)	0V	8.74V
3)	HGnd	HGnd
4)	0V	1.11V

IC506		
PIN	STBY	RUN
1)	3.56V	1.15V
2)	2.09V	0V
3)	HGnd	HGnd
4)	0V	0.11V

LEGEND: (**) STBY
{**} RUN

- (1) When AC is applied to the AC Filter the AC is filtered to prevent Switching noise from the Power Supply radiating back out into the AC Power lines. This filtered AC is then output P102 to the Power Supply (SMPS) P102. During Standby, the SMPS outputs 3.5V_ST (3.56V) via P201, 24pin connector pins 5, 7 and 8 to the Main board P2399. It then goes through coil L2395 and is filtered by C2395. Note, this line is now Labeled +3.5V_ST. The output 3.5V_ST is routed to the Microprocessor IC3000 pin 48 as its main power source. It also goes to the Reset circuit R3030, C3004. At the moment 3.5V arrives at C3004 (+) side, the capacitor isn't charged, so pin 40 of the Micro is low while the power input pin 48 is high. This is known as the reset state, where the Microprocessor is reset to the first operational state. As C3004 charges through R3030, pin 40 pulls up and the Micro comes out of Reset. The TV is now in the Stand-By state.
The 3.5V_ST is also routed to pull-up resistors to the Key 1 and 2 lines pulling them up to 3.54V. It is also sent to the IR receiver and as source voltage for the Power on switch Q2502, but it is not on at this time.
- (2) The 3.5V_ST line is also routed to Q3001 CEC buffer, IC4100 +3.5V_WIFI regulator (in case "LG Connect Apps" is turned on, IC6801 RS-232C Buffer, IC201 +3.5V_WOL regulator (to activate WiFi processing during Standby if "LG Connect Apps is turned on, IC2307 Power Det IC. It is also pull-up voltage for Q2398 RL_ON driver, Q2303 DCP_CTRL Driver, for the Key 1 and 2 lines, IR and the Room light sensor data lines EYE SDA/SCL. It is also Power for the IR/Joystick Board P4100 pin 4.
- (3) When the Power on is pressed on the Joy Stick (Press in and hold), the Key2 line of P4101 drops to 0.58V so pin 32 of the Micro drops. This notifies the Micro that the TV should turn on. If the Power On key on the Customer's Remote is pressed, The IR receiver sends this signal (3.76V p/p) to the Microprocessor pin 6 and the TV knows by this signal to turn on.
- (4) The Micro outputs a low on pin 36 (RL_ON) which is routed through R2389 to pin 2 of Q2398 turning it on. The +3.5V_ST on pin 1 is then switched out pin 3 and on to the SMPS via pin 1 of P2399. This high arrives at P201 pin 1 and on to the Controller on the SMPS. This command turns on the 12VM and the 24VS (which is sent back to the Main). 12VM (Main) for all Video /Audio processing and 24VS for (Sound).
- (5) The 12VM (11.99V) and the 24VS (24.59) lines are routed out P201 (12VM pins 11-15 and 24VS pins 19-22) and on to the Main board P2399. The 24VS (labeled +24V on schematic) is used for the Audio amplifier IC5800 (Main).
The 12VM (Labeled +12V) is routed to many different regulators, but for this "Power On" circuit discussion it goes through two coils L2396 and L2397 and on to the different regulators.
- (6) When the 12VM (+12V) is routed to IC2307 (Power Detector pin 3). The +24V is also monitored by IC2308 and tied to the same POWER_DET Line. These ICs then outputs a high (POWER_DET) to the Micro pin 14 to notify the Micro that the 12V and 24V voltage has arrived. So the Micro can continue turning on the rest of the set. If missing, the TV will click on and then Click off. This fault shows up in the Power Off Status as "5VMNT".
- (7) Once the Micro knows the 12VM and 24VS has arrived, it outputs a high on pin 33 (Power_ON/OFF2_1) which is routed through R2303 to pin 1 of IC2302 turning it on. This IC is the +3.3V_NORMAL regulator. The 3.3V output is routed to many different circuits, but one of them is as a pull-up voltage through R2394 to the INV_CTL (DRV_ON) line. However, the Micro is holding down INV_CTL P2399 pin 2 at this time.

- (8) Next, the Micro (pin 4) turns on the PANEL_CTL. This line is pulled up by R2321 to (+3.52V). This leave P2399 pin 18 as 12V_ON and arrives on the SMPS P201 pin 18. This turns on the 12VT to the T-CON. 12VT is output P203 pins 7-12 which arrives at the T-CON board CN11 pins 7-12. This 12VT is routed through the fuse and turns on the DC-to-DC converters for a variety of voltages for the T-CON board, both operational and Panel voltages.
- (9) The next step for the Micro (pin 19) is to turn on the INV_CTL line, (Inverter Control). This line is pulled up by R2394 to (+3.12V). This high is routed through R2393. INV_CTL leaves P2399 pin 2 and arrives on the SMPS P201 pin 22 and is now labeled DRV_ON (Drive On). This high is then routed to the Controller IC. The controller turns on 24VD (Voltage for Display) which is output P202 (pins 8-15) and on to the T-CON board CN5 (pins 8-15). It is routed through a fuse and out to the Panel itself for the Panel's operational voltage.

NOTE1 (ACD) (AC_DET_OLED on the Main): ACD monitors the AC input to the Power Supply. At Turn On, when AC is available, this pin go high to 3.33V. This is output P201 pin 4 to P2399 pin 4, routed through R2395 and then sent to IC2307 pin3 which is the "Power_Det" IC. This keep the output pin 2 Low which is sent to the Microprocessor IC3000 pin 14. If the AC_DET line goes low, IC2307 output a 3.5V high from pin 2 and into the Microprocessor pin 14. The Microprocessor turn off the TV and enters Power_Off_by_AC_DET into the Power Off Status log. If the AC_DET line doesn't go high during turn on, the TV will not turn on.

NOTE2 (Panel 20V Loss Detection): The Panel 24VD is monitored by the Main board. There is a line on the Vx1 cable P7100 pin 32 called "EL_VDD_DETECT_22V". It is routed through R7103 and the name is changed to POWER_DET_1 and sent to the Micro pin 44. This line is normally 3.2V when the 24VD is normal. If the 24VD is missing or low, this line drops, the TV set shuts off and logs "POWER_OFF_BY_20V_DET in the Power Off Status menu in IN-START. If 20V_DET is discovered in the Power Off Status, suspect connection errors between the Power Supply and the T-CON. If all connectors are normal, suspect a loss of "DRV_ON" P201 pin 2 from the Main P2399 pin 2 INV_CTL, possibly the Connector harness (Intermittent). Also possible the SMPS isn't producing 24VD to the T-CON.

NOTE3 (Panel Burn Detection): The Panel is also monitored by the Main board for "Burn Detection". This indicates an internal short on its grid lines. There is a line on the Vx1 cable P7100 pin 40 called "T_CON_SYS_POWER_OFF". This line is routed through R7101 and renamed to "LED_R" sent to the Micro pin 16. This line is normally 0V when the Panel is operating normally. If the Panel's internal grids short, this line rises to 3.5V, the TV set shuts off and logs "POWER_OFF_BY_INV_ERROR" in the Power Off Status menu in IN-START.

Additional Note: If the Burn_Det (INV_ERROR) repeats 3 times consecutively when trying to turn on the TV, the Main board will "Lock" and will no longer turn on the TV, (Even if the Main board were put in a different TV it will still remain locked).

To Un-Lock the Main Board: It has to be turned on by using the service remote "P-Only" button. This by-passes the Burn detection. You can check the Power off status by pressing "Exit" then entering the In-Start service menu and Scroll to Power Off Status. Look for 3 consecutive "INV_ERROR" entries. If burn detection is the cause, make sure Software is up to date. If yes the Panel is defective and needs to be replaced. To "Exit" P-Only mode press "In-Stop" button on the Service remote and now the Main board will be unlocked.

P201 Connector Voltage Measurements

55EG9600 (2015 OLED) Power Supply

P201 "SMPS Board" to "MAIN Board" P2399

Pin	Label	STBY	Run	Diode Check
24	Gnd	Gnd	Gnd	Gnd
23	Gnd	Gnd	Gnd	Gnd
22	24VS	0V	24.59V	0.82V
21	24VS	0V	24.59V	0.82V
20	24VS	0V	24.59V	0.82V
19	24VS	0V	24.59V	0.82V
18	⁽²⁾ 12VT_ON	0V	3.52V	OL
17	Gnd	Gnd	Gnd	Gnd
16	Gnd	Gnd	Gnd	Gnd
15	12VM	0V	11.99V	1.03V
14	12VM	0V	11.99V	1.03V
13	12VM	0V	11.99V	1.03V
12	12VM	0V	11.99V	1.03V
11	12VM	0V	11.99V	1.03V
10	Gnd	Gnd	Gnd	Gnd
9	Gnd	Gnd	Gnd	Gnd
8	3.5V_ST	3.56V	3.54V	OL
7	3.5V_ST	3.56V	3.54V	OL
6	Gnd	Gnd	Gnd	Gnd
5	3.5V_ST	3.56V	3.54V	OL
4	⁽⁴⁾ ACD	0V	3.32V	OL
3	⁽⁵⁾ DPC	0V	0V/3.40V	1.20V
2	⁽³⁾ DRV-ON	0V	3.12V	1.20V
1	⁽¹⁾ P-ON	0V	3.42V	1.20V

**For Additional Troubleshooting procedures, see
55EG9600 Power Supply Testing**

(1): Pin 1 (P_ON) is (PWR_ON from Main: Turns on 12VM and 24VS to the Main. It does not turn on T-CON 24VD or 12VT. If the 12VM is missing, the set will click on and then click back off. (Shows up as 5VMNT on the Power Off Status).

(2): Pin 18 12VT_ON) is (Panel_CTL) from Main: This turns on the T-CON 12VT, (which is T-CON 12VT P202 pin 7-12).

(3): Pin 2 (DRV_ON) is (INV_ON) from Main: This turns on the T-CON 24VD, (which is also T-CON 24V P203 pins 8-15). This 24VD is then routed directly to the Panel.

(4): ADC (AC_DET): This pin monitors the AC input. If it is missing the TV will not turn on. Power_Off_by_AC_DET is registered in the Power Off Status.

(5): Pin 3 (DPC): Places the Power Supply in Power Saving Mode when APC in the Customer's Menu is turned On. (0V Off / 3.4V On)

3.5V_ST Diode Checks

Connected

3.5V_ST to Main

OL (Blk on Gnd)

0.20V (Red on Gnd)

12VM Diode Checks

Connected

12VM to Main

0.36V (Blk on Gnd)

0.12V (Red on Gnd)

24VS Diode Checks

Connected

24VS to Main

0.76V (Blk on Gnd)

0.29V (Red on Gnd)

P202 and P203 Connector Voltage Measurements

55EG9600 (2015 OLED) Power Supply

12VT Turned on by 12VT_ON

P203 "SMPS Board" to "T-CON Board" CN11

Pin	Label	STBY	Run	Diode Check
14	Gnd	Gnd	Gnd	Gnd
13	N/C	n/c	n/c	n/c
12	12VT	0V	11.96V	0.50V
11	12VT	0V	11.96V	0.50V
10	12VT	0V	11.96V	0.50V
9	12VT	0V	11.96V	0.50V
8	12VT	0V	11.96V	0.50V
7	12VT	0V	11.96V	0.50V
6	Gnd	Gnd	Gnd	Gnd
5	Gnd	Gnd	Gnd	Gnd
4	Gnd	Gnd	Gnd	Gnd
3	Gnd	Gnd	Gnd	Gnd
2	Gnd	Gnd	Gnd	Gnd
1	Gnd	Gnd	Gnd	Gnd

12VT Diode Checks

Connected

12VT to T-CON

OL (Blk on Gnd)

0.43V (Red on Gnd)

Disconnected

0.50V (Blk on Gnd)

0.51V (Red on Gnd)

24VD Turned on by DRV_ON

P202 "SMPS Board" to "T-CON Board" CN5

Pin	Label	STBY	Run	Diode Check
15	*24VD	0V	22V/23.95V	1.05V
14	*24VD	0V	22V/23.95V	1.05V
13	*24VD	0V	22V/23.95V	1.05V
12	*24VD	0V	22V/23.95V	1.05V
11	*24VD	0V	22V/23.95V	1.05V
10	*24VD	0V	22V/23.95V	1.05V
9	*24VD	0V	22V/23.95V	1.05V
8	*24VD	0V	22V/23.95V	1.05V
7	Gnd	Gnd	Gnd	Gnd
6	Gnd	Gnd	Gnd	Gnd
5	Gnd	Gnd	Gnd	Gnd
4	Gnd	Gnd	Gnd	Gnd
3	Gnd	Gnd	Gnd	Gnd
2	Gnd	Gnd	Gnd	Gnd
1	Gnd	Gnd	Gnd	Gnd

*APS On/Off (DPC On/Off)

24VD Diode Checks

Connected

24VD to T-CON

OL (Blk on Gnd)

0.09V (Red on Gnd)

Disconnected

01.05V (Blk on Gnd)

0.22V (Red on Gnd)



2015 OLED 4K UHD Training

55EG9600 WebOS 2.0 UHD OLED TV

Power Supply Board (SMPS) Testing and Troubleshooting

Test using standard Needle to Needle Jumper Wire..... Pages 1-10

Test using TV Smart Test Jig and Multi-Gender Board Pages 1 and 11-12

Published November 20th, 2018



When servicing an OLED TV and you need to Test the Power Supply, due to the symptoms the **TV Won't Come On** or **TV Intermittent Powers Off**, before beginning the Power Supply Testing **READ THE BELOW FIRST**.

Check the Front Power Indicator:

Take note of the front Power LED. If it begins to "Blink" (about once a second) continually for 30 seconds and the TV makes no attempt to turn on, it means that the Main board is "Latched" and no functions work.

If this happens, the Main board will not function again normally until it is unlatched even if the Main board is placed in another identical OLED model.

To Unlatch the Main Board:

Press the "Power Only" button using the Service Remote. This will place the TV into P-Only mode. P-Only = TV comes on in Full White Raster. A P-Only black box with text appears in the upper left hand side of the screen. P-Only mode will also bypass the "Burn_Det" circuit, which will allow the TV to turn on normally.

If the TV Comes on Normally in P-Only Mode (See Service Bulletin: GLZ201600041)

Press Exit on any remote and the screen is not full white raster. Press the "In-Start" button and enter the Service Menu. Scroll down to "**Power_Off_History**" and look at the events that shut off the TV. If you find three consecutive "INV_ERROR" this indicates activation of the Burn_Det circuit which is what "Latched" the Main board. If this is the case, look for the Service Bulletin for this model; "**Improved Auto Power Off / No Power issue**". This bulletin requires you to update the Software via USB only. (Software has passed this version, make sure the TV SW is up to date).

If the TV Still Won't Come On:

In this case follow the Power Supply Testing, check the Main board. If both are OK, replace the Panel.

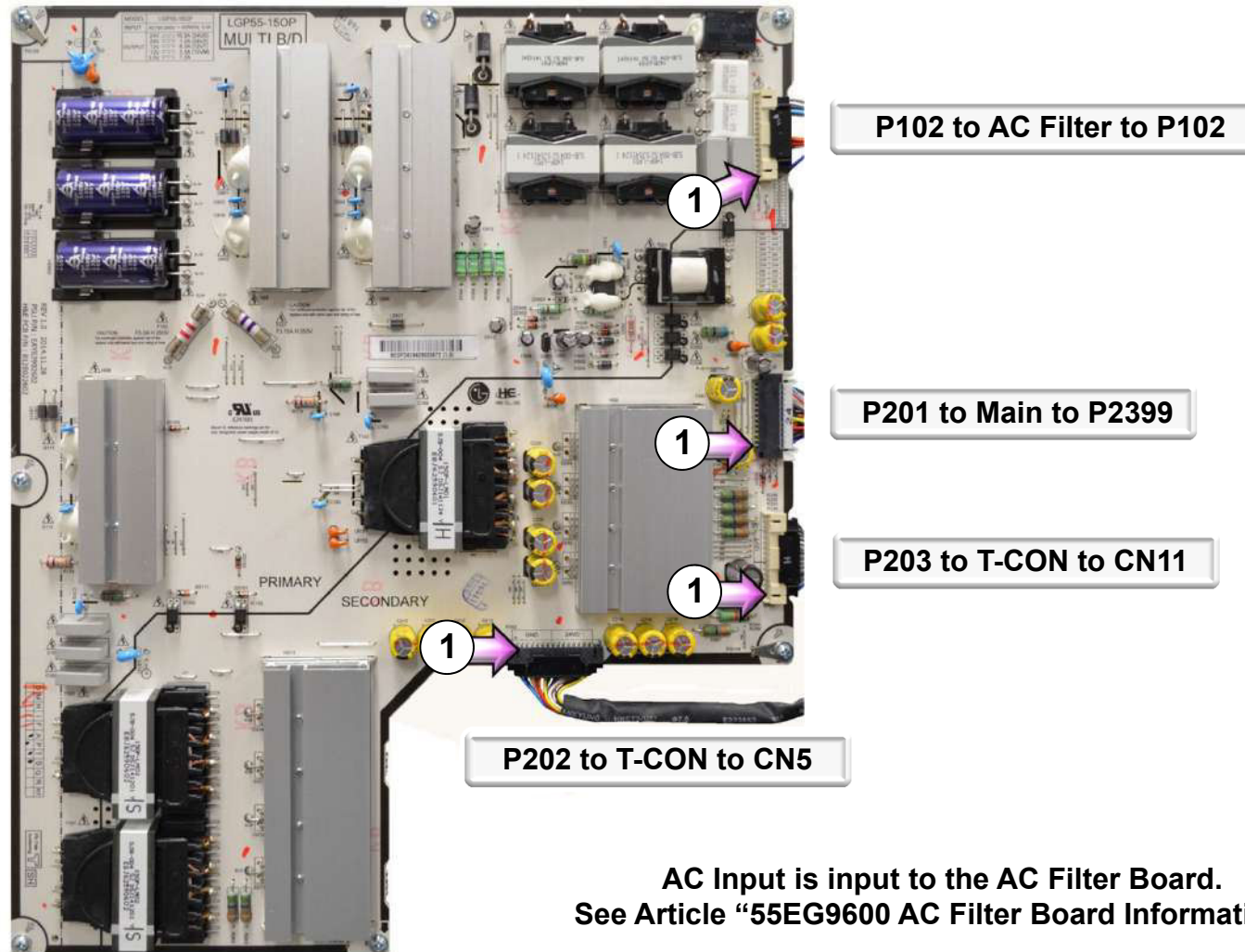
If the OLED TV Shuts Off Intermittently: (See Service Bulletin: GLZ201600041)

With the OLED turned on, press the "In-Start" button and enter the Service Menu. Scroll down to "**Power_Off_History**" and look at the events that shut the TV off. If you find "PWR_OFF_by_20V_DET or PWR_OFF_by_INV_ERROR", look for the Service Bulletin for this model; "**Improved Auto Power Off / No Power issue**". This bulletin requires you to update the Software via USB only. (Software has passed this version, make sure the TV SW is up to date).

If the TV Still Continues to Intermittently Shut Off: (INV_ERROR Continues)

In this case follow the Power Supply Testing, check the Main board. If both are OK, replace the Panel.

55EG9600 SMPS (SWITCH MODE POWER SUPPLY) BOARD p/n: EAY62992602



55EG9600 Power Supply Board Component Layout

55EG9600 OLED (2015) Power Supply

SMPS BOARD

p/n: EAY62992602

POWER SUPPLY TEST

(Using Multi-Gender and Smart Jig):

Use the Smart TV Test Jig and the Multi-Gender Board and follow the procedure. See Article 9267.

Using the above Jigs you can also perform the OLED Panel Test. See Article 9268.

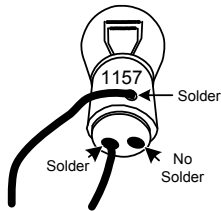
POWER SUPPLY TEST

(Using 3V Simple Jig):

See Article 55EG9600 Power Supply Testing.

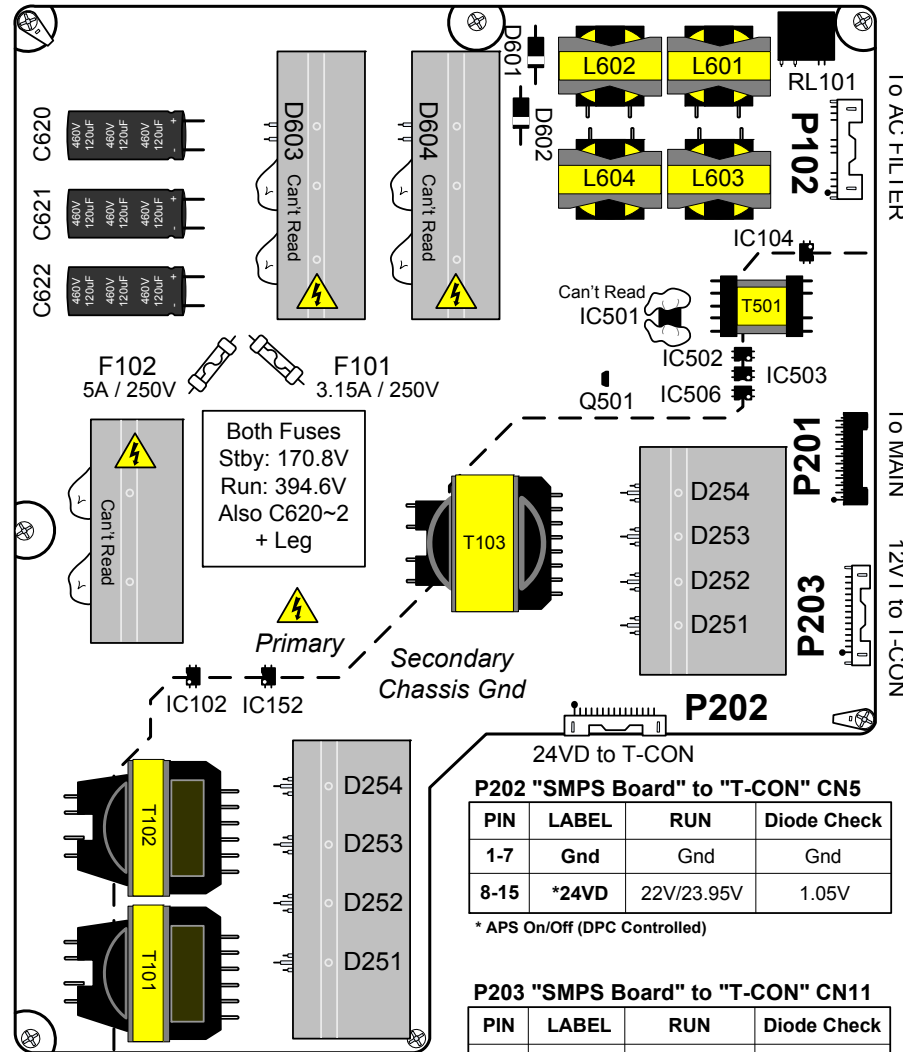
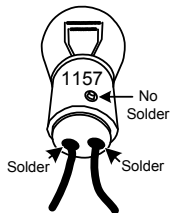
12VM TO MAIN TEST OR 12VT TO T-CON LOAD TEST:

Solder two leads to the terminals only on a 1157 auto bulb.
Place one lead on 24V and one on Gnd.



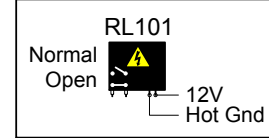
24VS TO MAIN TEST OR 24VD TO T-CON LOAD TEST:

Solder two leads to the terminals only on a 1157 auto bulb.
Place one lead on 24V and one on Gnd.



VOLTAGE LABEL

MODEL	LGP55-150P
INPUT	AC 100V-240V ~. 50/60Hz. 5A
OUTPUT	3.5V = 1.2A To Main 12V = 3.5A (12VM) To Main 12V = 6.0A (12VT) To T-CON 24V = 1.0A (24VS) To Main 24V = 10.6A (24VD) To T-CON



P102 "SMPS Board" to "Filter board" P102

PIN	LABEL	STBY	RUN	Diode Check
14	ACD_Line	22.14V	22.18V	OL
12-13	No Pin	—	—	—
8-11	B-	*Hot_Gnd	*Hot_Gnd	*Hot_Gnd
5-7	No Pin	—	—	—
1-4	B+	169.7V	111.6V	OL

B- (Hot Ground) Pins 4~7 (Referenced – Leg BD101~4)

B+ Pins 11~14 (+ Leg of BD101~4)

Pins 11~14 referenced to Hot Gnd (B-)

P201 "SMPS Board" to P2399 "MAIN Board"

PIN	LABEL	STBY	RUN	Diode Check
23-24	Gnd	Gnd	Gnd	Gnd
19-22	24VS	0V	24.59V	0.82V
18	(3)12VT_ON	0V	3.52V	OL
16-17	Gnd	Gnd	Gnd	Gnd
11-15	12VM	0V	11.99V	1.03V
9-10	Gnd	Gnd	Gnd	Gnd
7-8	3.5V_ST	3.56V	3.54V	OL
6	Gnd	Gnd	Gnd	Gnd
5	3.5V_ST	3.56V	3.54V	OL
4	(4)ACD	0V	3.32V	OL
3	(5)DPC	0V	0V/3.40V	1.20V
2	(2)DRV_ON	0V	*3.12V	1.20V
1	(1)PWR_ON	0V	3.42V	1.20V

Main Board P2399 pins are the same as shown here.

(1): Pin 1 (PWR_ON): Turns on 12VM and 24VS to the Main. It does not turn on T-CON 24VD or 12VT. If the 12VM is missing, the set will click on and then click back off. (Shows up as 5VMNT on the Power Off Status).

(2): Pin 18 (12VT_ON): is (Panel_CTL) from Main. This turns on the T-CON 12VT, (which is T-CON 12VT P202 pin 7-12).

(3): Pin 2 (DRV_ON): is (INV_ON) from Main. This turns on the T-CON 24VD, (which is also T-CON 24V P203 pins 8-15). This 24VD is then routed directly to the Panel.

(4) ACD (AC_DET): This pin monitors the AC input. If it is missing the TV will not turn on. Power_Off_by_AC_DET is registered in the Power Off Status.

(5) Pin 3 (DPC): Places the Power Supply in Power Saving Mode when APC in the Customer's Picture Menu is turned On. (0V Off / 3.4V On)

P202 "SMPS Board" to "T-CON" CN5

PIN	LABEL	RUN	Diode Check
1-7	Gnd	Gnd	Gnd
8-15	*24VD	22V/23.95V	1.05V

* APS On/Off (DPC Controlled)

P203 "SMPS Board" to "T-CON" CN11

PIN	LABEL	RUN	Diode Check
1-6	Gnd	Gnd	Gnd
7-12	12VT	11.96V	0.50V
13	N/C	n/c	n/c
14	Gnd	Gnd	Gnd

DIODE CHECK CONNECTORS CONNECTED.

3.5V_ST P201: 1.13V (Blk on Gnd) 0.20V (Red on Gnd)
12VM P201: 1.02V (Blk on Gnd) 0.12V (Red on Gnd)
24VS P201: 0.77V (Blk on Gnd) 0.39V (Red on Gnd)
12VT P202: 47V (Blk on Gnd) 0.37V (Red on Gnd)
24VD P203: 1.0V (Blk on Gnd) 0.22V (Red on Gnd)

TEST 1 Power Supply Board 12VM/24VS to Main Voltage Check

55EG9600 (2015 OLED) Power Supply

AC Should 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 3.5V (3.52V) on pins 5 and 7, 8 of P201.

If 3.5V Standby is not being generated, the SMPS is defective and may need to be replaced. Make sure AC is arriving at the connector SK100, make sure 112V (HGnd) is arriving at P102 pins 11~14 and +3.5V_ST is not loaded down by the Main Board or the Joy Stick/IR Board. Remove connector on Main board. If STBY is still missing, SMPS is defective.

II) Unplug P2399 on the Main Board to make insertion of the Jumpers easier.
Use P2399 side to insert jumpers.

TEST 1: TESTING THE POWER SUPPLY TURN-ON CIRCUIT. (See Fig 1)

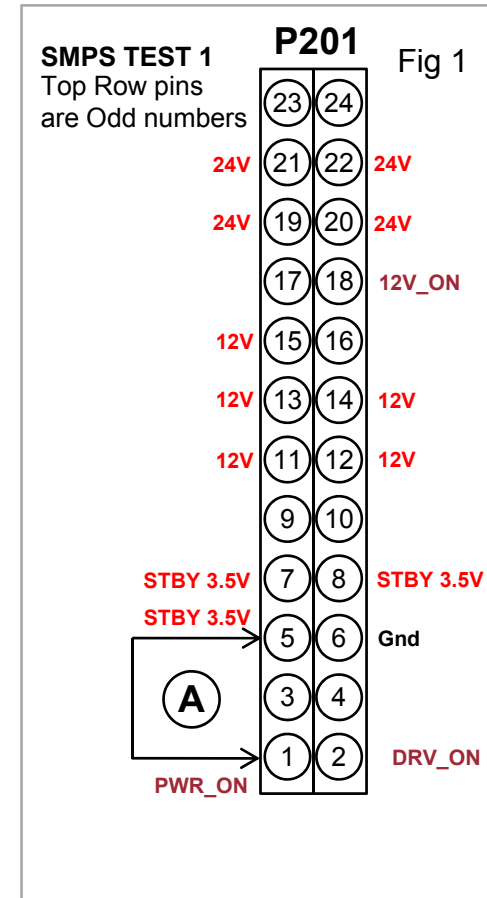
(1) Add a jumper (**A**) between (3.5V STBY) pin 5 and (PWR_ON) Pin 1, (See Fig 1). Apply AC, this will turn on the SMPS. Relay click will be heard. Check that the 24V and 12V power supplies to the Main board are turned on,

To Main Board Power:

- P201 (11.96V pins 11-15)
- P201 (23.72V pins 19-22)

(2) Remove AC power

No 12VT or 24VD to T-CON at this time.



**Pin 1 is Bottom on SMPS
Pin 1 is Top on Main**

See Next page to Test the Power Supply's T-CON 12VT line.

TIP: If you are concerned that you may accidentally connect the jumpers in the incorrect locations, please use a 100 ohm 1/8W resistor instead.

TEST 2 Power Supply Board 12VT to T-CON Voltage Check

55EG9600 (2015 OLED) Power Supply

Continue if Test 1 was OK.

Leave original jumper (A) in place.

AC Power is removed at this time.

The T-CON should be connected, SMPS P202 and P203 to T-CON.

TEST 2: T-CON 12V POWER SECTION TEST:

(3) Add another jumper (B) between (STBY_3.5V) pin 8 and (12V_ON) Pin 18.
(See Fig. 2), Simulating **PWR_ON** and **12V_ON** commands.

(4) Apply AC Power.

(5) Check 12V (11.87V) on pins 7-12 on P202.

T-CON 12V Normal:

a) If normal, the SMPS is OK, T-CON 12V load test OK.

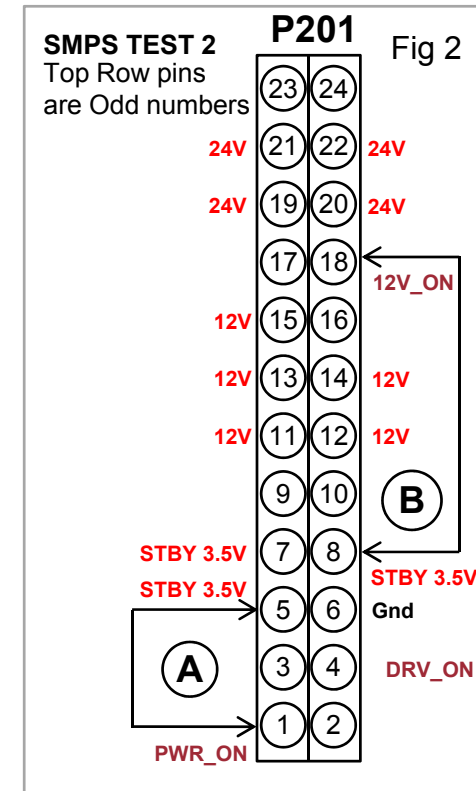
T-CON 12V Abnormal:

- Recheck all connections.
- Confirm the **12V_ON** line pulling up to at least 3V.
- Check SMPS P203 pins 7-12 for an excessive load, normal diode check should be;
 - 0.47V P203 connected
 - "0.50V" P203 disconnected.

Also, check CN11 pins 8-12 on the T-CON for an excessive load.

- 1.89V (Blk on Gnd) Panel Connected or Disconnected.
- 0.42V (Red on Gnd) Panel Connected or Disconnected.

See Next page to Test the Power Supply's T-CON 12VT and 24VD line.



Pin 1 is Bottom on SMPS
Pin 1 is Top on Main

TIP: If you are concerned that you may accidentally connect the jumpers in the incorrect locations, please use a 100 ohm 1/8W resistor instead.

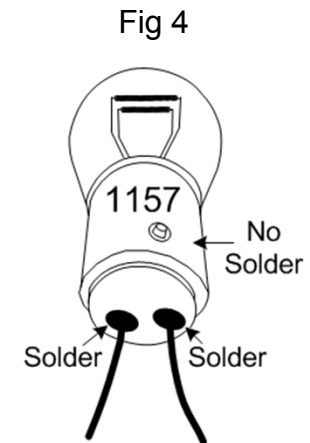
24VD, 24VS or 12VT, 12VM Load Test

55EG9600 (2015 OLED) Power Supply

In this case, the Power Supply needs to be tested to see if it can supply the T-CON 24V and 12V when loaded.

TEST 4: 24V T-CON POWER LOAD CHECK:

- (1) Leave all Jumpers in place on P2399 to P201 of the Power Supply and disconnect CN5 on the T-CON board.
 - (2) Make a 24V load test jig by using a standard 1157 automobile light bulb, (dual element). Solder two wires from the buttons on the bottom of the bulb. Do not solder any wire to the actual ground of the bulb. (See Fig 4).
 - (3) Attach one end of the Jig to the 24V line from P203 pins 8-15 from the SMPS.
 - (4) Attach the other wire from the Jig to Chassis Ground.
Tip: To make insertion easy, cut the sharp end of a safety pin off and solder it to each end of the wires coming from the light bulb Jig. Push one needle end into one of the pins 8-14 of CN5. Push the other needle end of the wire into any pin 1-7 of CN5.
 - (5) Apply AC to the power supply, the light bulb should light and remain lit. Measure the 24V line to confirm it's correct. The bulb should be bright. Let the SMPS run for several minutes to confirm its operating correctly. (Do not let wires or light bulb touch any metal parts).
- Note: You can also use two single element automotive bulbs (each 6W) tied in series.



- a: If the Light Bulb remains lit, the panel is defective because the T-CON and/or the panel is providing too much of a load causing the power supply to shut off.
- b: If the SMPS shuts off, Replace the Power Supply.

TEST 5: 12V T-CON POWER LOAD CHECK:

Note: You can test the 12V to the T-CON line using the same procedure, but you only need one bulb. Use same bulb, but solder one lead to a button and the other to the case.

P201 Connector Voltage Measurements During Tests

55EG9600 (2015 OLED) Power Supply

P201 "POWER SUPPLY TEST"					23.88V to T-CON	
					11.90V to T-CON	
					11.89V to T-CON	
					F101 and F501	
Pin	Label	Test 1 (Jumper A)	Test 2 (Jumper B)	Test 3 (Jumper C)	STBY	170.8V
24	Gnd	Gnd	Gnd	Gnd	RUN	394.6V
23	Gnd	Gnd	Gnd	Gnd	Diode Check Both Fuses	
22	24V	23.72V	24.11V	24.10V		
21	24V	23.72V	24.11V	24.10V		
20	24V	23.72V	24.11V	24.10V	OL (Blk on HGnd)	
19	24V	23.72V	24.11V	24.10V	0.61V (Red on HGnd)	
18	12V_ON	0V	3.13V	3.13V		
17	Gnd	Gnd	Gnd	Gnd		
16	Gnd	Gnd	Gnd	Gnd		
15	12VM	11.96V	11.93V	11.93V		
14	12VM	11.96V	11.93V	11.93V		
13	12VM	11.96V	11.93V	11.93V		
12	12VM	11.96V	11.93V	11.93V		
11	12VM	11.96V	11.93V	11.93V		
10	Gnd	Gnd	Gnd	Gnd		
9	Gnd	Gnd	Gnd	Gnd		
8	3.5V_ST	3.55V	3.54V	3.52V		
7	3.5V_ST	3.55V	3.54V	3.52V		
6	Gnd	Gnd	Gnd	Gnd		
5	3.5V_ST	3.55V	3.54V	3.52V		
4	ACD	3.48V	3.44V	3.44V		
3	DPC	0V	0V	0V		
2	DRV-ON	0V	0V	3.13V		
1	RL-ON	3.13V	3.13V	3.13V		

Note: During STBY, with no Jumpers inserted, +3.5V_ST is 3.55V

Note2: Depending on how fresh the batteries are in your 3V Simple Jig, pins 1, 2 and 18 may vary slightly.

P201 Connector Voltage Normal Measurements

55EG9600 (2015 OLED) Power Supply

P201 "SMPS Board" to "MAIN Board" P2399

Pin	Label	STBY	Run	Diode Check
24	Gnd	Gnd	Gnd	Gnd
23	Gnd	Gnd	Gnd	Gnd
22	24VS	0V	24.59V	0.82V
21	24VS	0V	24.59V	0.82V
20	24VS	0V	24.59V	0.82V
19	24VS	0V	24.59V	0.82V
18	⁽²⁾ 12VT_ON	0V	3.52V	OL
17	Gnd	Gnd	Gnd	Gnd
16	Gnd	Gnd	Gnd	Gnd
15	12VM	0V	11.99V	1.03V
14	12VM	0V	11.99V	1.03V
13	12VM	0V	11.99V	1.03V
12	12VM	0V	11.99V	1.03V
11	12VM	0V	11.99V	1.03V
10	Gnd	Gnd	Gnd	Gnd
9	Gnd	Gnd	Gnd	Gnd
8	3.5V_ST	3.56V	3.54V	OL
7	3.5V_ST	3.56V	3.54V	OL
6	Gnd	Gnd	Gnd	Gnd
5	3.5V_ST	3.56V	3.54V	OL
4	⁽⁴⁾ ACD	0V	3.32V	OL
3	⁽⁵⁾ DPC	0V	0V/3.40V	1.20V
2	⁽³⁾ DRV-ON	0V	3.12V	1.20V
1	⁽¹⁾ P-ON	0V	3.42V	1.20V

**For Additional Troubleshooting procedures, see
55EG9600 Power Supply Testing**

(1): Pin 1 (P_ON) is (PWR_ON from Main: Turns on 12VM and 24VS to the Main. It does not turn on T-CON 24VD or 12VT. If the 12VM is missing, the set will click on and then click back off. (Shows up as 5VMNT on the Power Off Status).

(2): Pin 18 12VT_ON) is (Panel_CTL) from Main: This turns on the T-CON 12VT, (which is T-CON 12VT P202 pin 7-12).

(3): Pin 2 (DRV_ON) is (INV_ON) from Main: This turns on the T-CON 24VD, (which is also T-CON 24V P203 pins 8-15). This 24VD is then routed directly to the Panel.

(4): ADC (AC_DET): This pin monitors the AC input. If it is missing the TV will not turn on. Power_Off_by_AC_DET is registered in the Power Off Status.

(5): Pin 3 (DPC): Places the Power Supply in Power Saving Mode when APC in the Customer's Menu is turned On. (0V Off / 3.4V On)

3.5V_ST Diode Checks

Connected

3.5V_ST to Main

1.13V (Blk on Gnd)

0.20V (Red on Gnd)

12VM Diode Checks

Connected

12VM to Main

1.02V (Blk on Gnd)

0.12V (Red on Gnd)

24VS Diode Checks

Connected

24VS to Main

0.77V (Blk on Gnd)

0.39V (Red on Gnd)

P202 and P203 Connector Voltage Measurements

55EG9600 (2015 OLED) Power Supply

12VT Turned on by 12VT_ON

P203 "SMPS Board" to "T-CON Board" CN11

Pin	Label	STBY	Run	Diode Check
14	Gnd	Gnd	Gnd	Gnd
13	N/C	n/c	n/c	n/c
12	12VT	0V	11.96V	0.50V
11	12VT	0V	11.96V	0.50V
10	12VT	0V	11.96V	0.50V
9	12VT	0V	11.96V	0.50V
8	12VT	0V	11.96V	0.50V
7	12VT	0V	11.96V	0.50V
6	Gnd	Gnd	Gnd	Gnd
5	Gnd	Gnd	Gnd	Gnd
4	Gnd	Gnd	Gnd	Gnd
3	Gnd	Gnd	Gnd	Gnd
2	Gnd	Gnd	Gnd	Gnd
1	Gnd	Gnd	Gnd	Gnd

12VT Diode Checks

Connected

12VT to T-CON

0.47V (Blk on Gnd)

0.37V (Red on Gnd)

Disconnected

0.50V (Blk on Gnd)

0.51V (Red on Gnd)

24VD Turned on by DRV_ON

P202 "SMPS Board" to "T-CON Board" CN5

Pin	Label	STBY	Run	Diode Check
15	*24VD	0V	22V/23.95V	1.05V
14	*24VD	0V	22V/23.95V	1.05V
13	*24VD	0V	22V/23.95V	1.05V
12	*24VD	0V	22V/23.95V	1.05V
11	*24VD	0V	22V/23.95V	1.05V
10	*24VD	0V	22V/23.95V	1.05V
9	*24VD	0V	22V/23.95V	1.05V
8	*24VD	0V	22V/23.95V	1.05V
7	Gnd	Gnd	Gnd	Gnd
6	Gnd	Gnd	Gnd	Gnd
5	Gnd	Gnd	Gnd	Gnd
4	Gnd	Gnd	Gnd	Gnd
3	Gnd	Gnd	Gnd	Gnd
2	Gnd	Gnd	Gnd	Gnd
1	Gnd	Gnd	Gnd	Gnd

*APS On/Off (DPC On/Off)

24VD Diode Checks

Connected

24VD to T-CON

1.00V (Blk on Gnd)

0.22V (Red on Gnd)

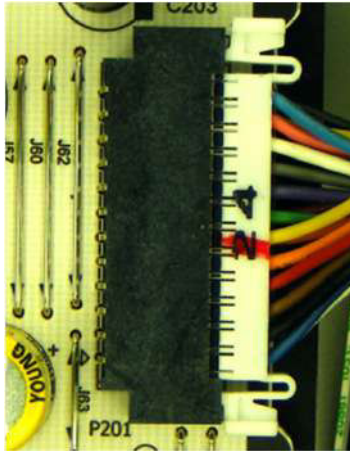
Disconnected

1.05V (Blk on Gnd)

0.22V (Red on Gnd)

(See Article 9267 for complete details)

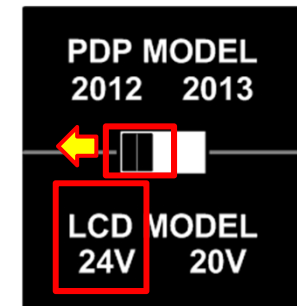
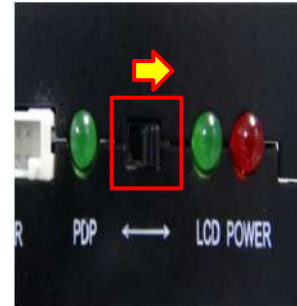
1



► Check power board voltage, (12VM and 24VS).

2

GND	GND
24VS	24VS
24VS	24VS
GND	12VT_ON
12VM	GND
12VM	12VM
12VM	12VM
GND	GND
3.5V	3.5V
3.5V	GND
DPC	ACD
PWR-ON	DRV-ON



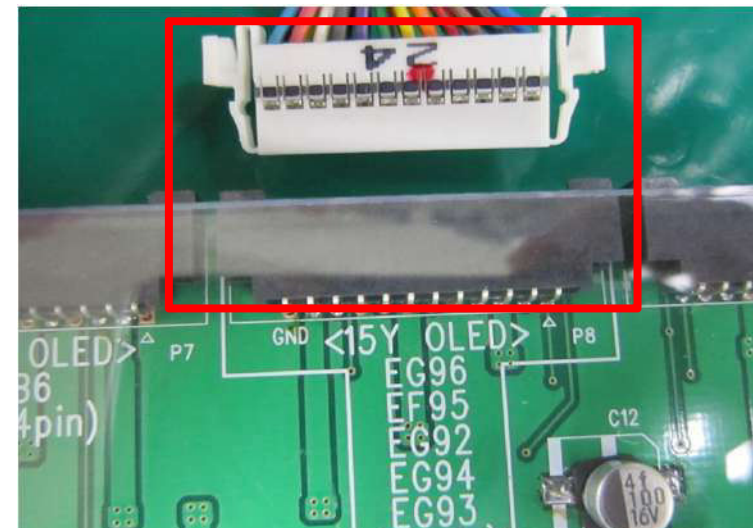
- Set the PRODUCT SWITCH on SMART JIG to LCD.
- LCD MODEL SWITCH: Set the switch to 24V.

3



► Disconnect the Main Board 24Pin Power Cable connector.

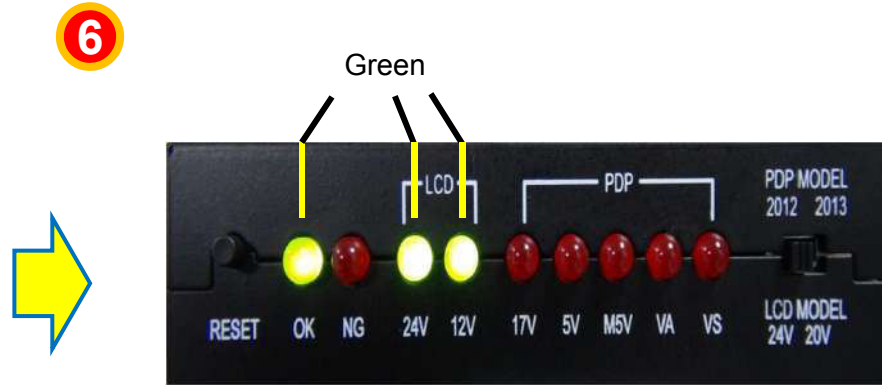
4



► Connect the 24Pin Power Cable connector to the Multi Gender JIG (P7 Port) 24Pin connector.



► Apply Power to the Set.



- When the OK LED turns on, Power Board is normal.
- When the NG LED turns on, the Power Board can be judged as defective.

7

Be sure to check all voltages from the Power Supply to the Main Board and to the T-CON Board.

MAIN VOLTAGES:

- 3.5V, (P201 pins 5, 7, 8)
- 12VM, (P201 pins 11-15)
- 24VS, (P201 pins 19-22)

T-CON VOLTAGES:

- 12VT, (P203 pins 7-12)
- 24VD, (P202 pins 8-14)

NOTE: EG91 SERIES: Only necessary if you want to run the Panel Diagnostic Test. (See Article 9268)

In the EG91 Series OLED, the 12VT for the T-CON is routed out of the Main board through the LVDS Cable. 12VT is routed from the Power Supply to the Main Board and to the T-CON Board. To run the OLED Video Panel Test (rolling test patterns) it will require an additional step. You will have to Jump 12V from the Power Supply to the T-CON Fuse.

MAIN VOLTAGES:

- 3.5V, (P201 pins 5, 7, 8)
- 12VM, (P201 pins 11-15)
- 24VS, (P201 pins 19-22)

T-CON VOLTAGES:

- 12VT, (P7200 (LVDS) pins 1-4) Not active when using the Smart Jig test. (You will have to Jump 12V from the Power Supply to the T-CON Fuse).
- 24VD, (P203 pins 8-15)