



## *2015 4K OLED Training*

# **55EG9600 WebOS 2.0 OLED TV**

*Power On/Off Status*

*In-Start Service Menu Screens*

*Published November 12<sup>th</sup>, 2018*



**LG**

Life's Good

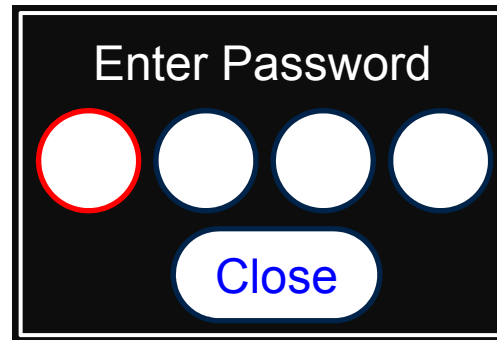


**105-201M**

### Accessing the Service Menu

To access the Service Menu.

- 1) You must have either Service Remote.  
p/n 105-201M or p/n MKJ39170828
- 2) Press “In-Start”
- 3) A Password screen appears.
- 4) Enter the Password.



**Note:** A Password is required to enter the Service Menu. Enter; **0413**

**Note 1:** Older sets used **0000**.

**Note 2 webOS Models:** While in the In-Start Menu, the Cursor Right or Cursor Left does not work with the 105-201M remote on the Left. Use the Customer's Remote Control Cursor Keys.



**MKJ39170828**

# 55EG9600 Service Menu First Page

55EG9600 (2015) Service Menu

Bring up the Service Menu using the Service Remote and pressing "In-Start" enter password 0413.

Status Plane: (Snap Shot) Not accessible	Selection Plane	This section will change dependant upon which item was selected in the Selection Plane	
<b>IN START</b> Model Name: :55EG9600-UA Serial Number: :508RMEN3C828 S/W Version : 04.05.60.01 MICOM Version :V2.21.0 BOOT Version :72/3.00.73-73 URSA Version :OK(0x6212) Chip Type :LM15U Wi-Fi Channel :1 Wi-Fi MAC : 4C:09:D4:CD:15:8E Wi-Fi Speed : USB 2.0 MAC Address : C8:08:E9:1E:3B:86 IP Address :192.168.50.78 SFU Key : OK Widevine : LGTV15CMSD002116399 ESN Num. : LGTV20154=41011841353 HDCP2(Miracast/HDMI) : OK/OK DTCP :OK RF Receiver Version :1.2.7.80 Wi-Fi/Magic Search :OK/OK Camera Ver. : NULL Debug Status :RELEASE SIGN Key :PRODKEY Eye Check :OK Control Key NG: Access USB Status: 1/-1(T)/-1(C) UTT : 25 OLED Last Compensation Done UTT:LV OLED Compensation Count : 7 APP History Ver : 2142 PQL DB: OLED SI2178B_BE_XXXXXX Video : NULL	<b>SW Version</b> <b>1. Adjust Check</b> 2. ADC Data 3. Power On/Off Status 4. System 1 5. System 2 6. System 3 7. Model Number D/L 8. Test Option 9. Spread Spectrum 10. Stable Count 11. SDP Server Selection 12. RF Remocon Test 13. OLED <b>ESN: Electronic Serial Number</b> <b>WiFi Board Communication</b>	<b>Country Group</b> <b>Adjust Check</b> <b>US</b> <b>1. Country Group (Press OK to Save)</b> Country Group Code <b>02</b> Country Group <b>US</b> Country <b>US</b> <b>2282</b> <b>2. Area Option</b> <b>3. Tool Option</b> Tool Option 1 <b>34406</b> Tool Option 2 <b>5140</b> Tool Option 3 <b>665</b> Tool Option 4 <b>64774</b> Tool Option 5 <b>18598</b> Tool Option 6 <b>2378</b> Tool Option 7 <b>44651</b> Tool Option 9 <b>512</b> <b>4. Adjust White Balance:</b> OK(0) <b>5. Adjust ADC(OTP):</b> OK Component <b>OK</b> <b>6. EDID:</b> OK HDMI1 <b>OK (0x49,0x7b)</b> HDMI2 <b>OK (0x49,0x6b)</b> HDMI3 <b>OK (0x49,0x5b)</b>	<b>Unit Total Time</b>

**Note 1: Many of the Tool Options are "Locked" in 2015 models EZ-Adjust Menu.**

**Note 2: While in the In-Start Menu, the Cursor Right or Cursor Left does not work. Use the Customer's Remote control cursor keys.**

## 55EG9600 Power On/Off Status (IN START) Screen

55EG9600 (2015) Service Menu

Bring up the Service Menu using the Service Remote by pressing "In-Start" enter password 0413 or 0000.

Note: You can scroll up or down to reveal the last 126 reasons for Turn On or Off.

IN START		Power On/Off Status <span>Most Recent</span>
Model Name: :55EG9600-UA	1. Adjust Check	0. POWER_ON_BY_REMOTE_KEY
Serial Number: :508RMEN3C828	2. ADC Data	1. POWER_OFF_BY_REMOTE_KEY1
S/W Version : ( <b>Select Item 3</b>	<b>3. Power Off Status</b> ▶	2. POWER_ON_BY_LAST_POWERON
MICOM Version :V.....		3. POWER_OFF_BY_LOCAL_KEY
BOOT Version :72/3.00.73-73	4. System 1	4. POWER_ON_BY_LAST_POWERON
URSA Version :OK(0x6212)	5. System 2	5. POWER_OFF_BY_ACDDET
Chip Type :LM15U	6. System 3	6. POWER_ON_BY_SW_DL
Wi-Fi Channel :1	7. Model Number D/L	7. POWER_OFF_BY_SW_DL
Wi-Fi MAC : 4C:09:D4:CD:15:8E	8. Test Option	8. POWER_ON_BY_REMOTE_KEY1
Wi-Fi Speed : USB 2.0	9. Spread Spectrum	9. POWER_OFF_BY_LOCAL_KEY
MAC Address : C8:08:E9:1E:3B:86	10. Stable Count	10. POWER_ON_BY_LOCAL_KEY
IP Address :192.168.50.78	11. SDP Server Selection	11. POWER_OFF_BY_REMOTE_KEY1
SFU Key : OK	12. RF Remocon Test	12. POWER_ON_BY_LAST_POWERON
Widevine : LGTV15CMSD002116399	13. Access Code	13. POWER_OFF_BY_ACDDET
ESN Num. : LGTV20154=41011841353		14. POWER_ON_BY_LOCAL_KEY
HDCP2(Miracast/HDMI) : OK/OK		15. POWER_OFF_BY_LOCAL_KEY
DTCP :OK		16. POWER_ON_BY_LOCAL_KEY
RF Receiver Version :1.2.7.80		17. POWER_OFF_BY_LOCAL_KEY
Wi-Fi/Magic Search :OK/OK		18. POWER_ON_BY_LOCAL_KEY
Camera Ver. : NULL		19. POWER_OFF_BY_REMOTE_KEY1
Debug Status :RELEASE		20. POWER_ON_BY_LAST_POWERON
SIGN Key :PRODKEY		21. POWER_OFF_BY_ACDDET
Eye Check :OK		22. POWER_ON_BY_SW_DL
Control Key NG:		23. POWER_OFF_BY_SW_DL
Access USB Status: 1/-1(T)/-1(C)		
UTT : 25		
OLED Last Compensation Done UTT:20		
OLED Compensation Count : 7		
APP History Ver : 2142		
PQL DB: OLED SI2178B_BE_XXXXXX		
Video : NULL		

The WebOS In-Start menu now includes the Power Off/On Status. In other words, the reason the TV turned On or Off the last time.

Example: POWER\_ON\_BY\_LAST\_POWERON indicates the TV was ON when AC was removed. When AC was returned, the TV turned on into the Last State in was in before power loss. So just below that entry should be POWER\_OFF\_BY\_AC\_DET.

# 55EG9600 IN-START “Power Off Status” Details (1 of 3)

55EG9600 (2015) In-Start Menu

MODE	Contents	Action
POWER_OFF_BY_17VOVP	17 V Over Voltage Protect (PDP Only)	Y, Z, SMPS
POWER_OFF_BY_17VUVP	17 V Under Voltage Protect (PDP Only)	SMPS
POWER_OFF_BY_1SEC_POWER_OFF	CONDITION: When power button is repeatedly pressed on, CPU does not complete the boot cycle	Main
POWER_OFF_BY_20V_DETECT	RESULT : Micom force to trigger TV power off. CONDITION : when OLED detects a drop in Drain (depending on panel design) voltage level (20V).	SMPS, Panel
POWER_OFF_BY_5VMNT	Power off by not detecting 5V monitoring RESULT : Micom triggers TV power off CONDITION : During AC on or DC on, stabilization check routine, the voltage level is incorrect.	Y, Z, Cntl, Main, SMPS
POWER_OFF_BY_ABN	Power off by abnormal status RESULT : Micom triggers TV power off CONDITION : when Display port model (Nano LED, LZ9600) does not detect port cable.	Main , IR, T-Con
POWER_OFF_BY_ABNORMAL1	Power off by abnormal status	Main, IR, Wifi
POWER_OFF_BY_ACDET	Power off by loss of AC-Detect RESULT : Micom triggers TV power off CONDITION : Power detect port drops to low while power in “on” status.	SMPS, Main
POWER_OFF_BY_AUTO_OFF	Power off by auto off function 1. When it lasts for 15 minutes that no signal and no remote key input. 2. When screen mute status lasts for 2 hours.	None
POWER_OFF_BY_CH_UPDATE_TIMER	start : get channel update in warm standby (for Italy model.)	None
POWER_OFF_BY_CH_UPDATE_TIMER_END	end : get channel update in warm standby (for Italy model.)	None
POWER_OFF_BY_CIPUS_SEARCH_END	CI+ search complete. (Log)	Main
POWER_OFF_BY_COMP_END	RESULT: Power off CONDITION: OLED Compensation (Threshold voltage degradation) completes, (OLED up to webOS 2.0)	None
POWER_OFF_BY_COMP_FAIL	A failure has been reported to the Micom from the OLED display or Compensation was interrupted. , (OLED up to webOS 2.0)	SW, Main, Panel
POWER_OFF_BY_COOLING	Power off for cool down the OLED t-con. (OLED) webOS 3.5 or later	None
POWER_OFF_BY_CPU_ABNORMAL	Power off by CPU Abnormal status	Main, IR, Wifi
POWER_OFF_BY_CPUCMD	Power off by CPU Command	Main, IR, Wifi
POWER_OFF_BY_DATA_FLASH	When Micom EEPROM is initialized, log for reference of EEPROM initialization error.	Main
POWER_OFF_BY_EDID_WRITE	Power off by EDID write done.	None
POWER_OFF_BY_EWBS	Power off by EWBS function.	Main
POWER_OFF_BY_FAN_CONTROL	Power off by fan control	Fan / Main
POWER_OFF_BY_FAN_CTRL_ERROR	power off by fan control error (for OLED/STB model)	Main, Fan
POWER_OFF_BY_HDMI_CEC	Power off by HDMI CEC command	None
POWER_OFF_BY_HOMING_COMPLETE	Power off by Cable Card Update (USA only)	N/A
POWER_OFF_BY_INSTOP_KEY	Power off by Instop Key	None
POWER_OFF_BY_INV_ERROR	Power off by LCD module inverter error (OLED)	SW, Main, Panel
POWER_OFF_BY_KEYTIMEOUT	Power off when TV is not turned off during a certain time RESULT : Micom force to trigger TV power off. CONDITION : When pressing power key while power on status, CPU does not response within 10 seconds or send delay command.	None
POWER_OFF_BY_MAIN_WDT		Main
POWER_OFF_BY_Micom_RESET	Main Micom Reset	None
POWER_OFF_BY_MICOM_UPDATE	Power off by micom update.	None

## 55EG9600 IN-START “Power Off Status” Details (2 of 3)

55EG9600 (2015) In-Start Menu

MODE	Contents	Action
POWER_OFF_BY_NO_POLLING	Power off when receiving no reply from a sub-micom RESULT: TV power off/on (Reboot) CONDITION: There is no I2C response from CPU for 15 seconds.	Main, IR, WiFi
POWER_OFF_BY_OFF_TIMER	Power off by Off timer	None
POWER_OFF_BY_OLED_AM_MODE	If the module cable is disconnected in W7 model, the micom is force power off TV.	None
POWER_OFF_BY_OLED_COMP_FAIL	A failure has been reported to the Micom from the OLED display or Compensation was interrupted. (All OLED webOS Before webOS 3.5)	Panel, Main, SW
POWER_OFF_BY_ON_TIMER	Power off by On timer Power off when no remote and local key input for 2 hours after power on by On timer.	None
POWER_OFF_BY_ONRF_FAIL	RESULT: Reboot CONDITION: OLED module compensation is running but fails.	Panel
POWER_OFF_BY_OVERHEATING	power off by overheating (for OLED model)	Installation / Panel
POWER_OFF_BY_PLLFAIL	RESULT: Micom triggers TV power off/on (reboot), due to Micro stops working. CONDITION: When power on, there is no reply from the Micro. This can be caused by a sub-Micom.	Main, IR, WiFi
POWER_OFF_BY_PNWASHDONE	Power off by panel noise wash function completed. (OLED after webOS 3.0)	None
POWER_OFF_BY_PNWASHFAIL	Power off by panel noise wash function fail case. (OLED after webOS 3.0)	Panel / SW
POWER_OFF_BY_PNWASHSTART	Power off for starting OLED panel noise function in warm state. (OLED after webOS 3.0)	None
POWER_OFF_BY_POWER_BD_PROTECT	RESULT: Micom triggers TV power off (for power board safety) CONDITION: when power board gets overloaded.	SMPS, Main
POWER_OFF_BY_POWERONLY	Request reset by p-only remote key. (condition: DC On)	None
POWER_OFF_BY_POWERSOUND	Power off by power off sound function. (When Accessibility, TV Power Sound turned On)	None
POWER_OFF_BY_QUICK_START	Power off by reboot to suspend function. When the user turns off the TV, reboot the TV with QSM+ as needed.	None
POWER_OFF_BY_REMOTE_KEY	Power off by remote key	None
POWER_OFF_BY_REMOTE_KEY2	RESULT: Micom force TV power off within 1 second.	IR, Keys
POWER_OFF_BY_REQUEST_RESET	Power off by request reset CONDITION 1: Run 'Initialization' through Smart TV setting CONDITION 2: Run 'App initialization'. CONDITION 3: Reset is required for Instart setting is changed.	None
POWER_OFF_BY_RESET	Power off by Micom Reset CONDITION 1: Run 'Initialization' through Smart TV setting CONDITION 2: Run 'App initialization'. CONDITION 3: Reset is required for In-Start setting is changed.	None
POWER_OFF_BY_RESUME_FAIL	Power off by resume fail when dc on case. If occur the resume fail, TV will be rebooted.	None
POWER_OFF_BY_RS232C	Power off by RS232C command	None
POWER_OFF_BY_SIG_DETECT	Signal command	None
POWER_OFF_BY_SLEEP_TIMER	Power off by sleep timer	None
POWER_OFF_BY_SWDOWN	Power off by software download	None
POWER_OFF_BY_TEMPERATURE_SENSOR_ERROR	power off by temperature sensor error (OLED and HECTO)	Installation / Fan
POWER_OFF_BY_VERIFY_FAIL	RESULT: System shut down. CONDITION: verification for LG application fails.	Main
POWER_OFF_BY_VSOVP	VS Over Voltage Protect (PDP Only)	SMPS, Y, Z
POWER_OFF_BY_VSUVP	VS Under Voltage Protect (PDP Only)	SMPS, Y, Z
POWER_OFF_BY_WARMCHECK	Power off by warm check thread. It's normal case. When DC on with warm condition, main SoC run the warm check thread. If the SoC has nothing to do, TV is power off by warmcheck.	Main
POWER_OFF_BY_WEAVE	Power off by IOT device.	External



## 55EG9600 IN-START “Power On Status” Details (3 of 3)

55EG9600 (2015) In-Start Menu

MODE	Contents	Action
POWER_ON_BY_AMAZON	power on by amazon hot key (webOS 3.5 or later)	None
POWER_ON_BY_CH_UPDATE_TIMER	Power on by channel update in warm stand-by (for Italy model.)	None
POWER_ON_BY_COMPENSATION_FAIL	Cancel the OLED compensation for user DC on. (OLED up to webOS 2.0)	SW, Main, Panel
POWER_ON_BY_COOLINGDONE	When completed the cooling action(t-con cooling), TV will be DC on with warm condition. , (OLED after webOS 3.0)	None
POWER_ON_BY_CPU_ABNORMAL	Power off by CPU checking abnormal behavior	Main, IR, Wifi
POWER_ON_BY_EITTIMER	Power on by Japan-model EIT (event information table).	None
POWER_ON_BY_EWBS	When detect the EWBS signal, TV is auto turn on by EWBS. (in warm condition)	None
POWER_ON_BY_EWBS_OK	Power on by EWBS alert function (hot condition)	None
POWER_ON_BY_HDMI_CEC	Power on by HDMI CEC message "image view on" and "text view on".	None
POWER_ON_BY_LAST_COOL	Cycle into muted power on for compensation activity, (after webOS 3.0)	None
POWER_ON_BY_LAST_POWERON	String for from HOT status to Power on automatically (In general, with Power On status, AC off/on happens.)	None
POWER_ON_BY_LAST_SUSPEND	Power on by suspend mode	None
POWER_ON_BY_LAST_WARM	When AC on after 1st in-stop, TV auto turn on warm state. (webOS3.5~)	None
POWER_ON_BY_LOCAL_KEY	Power on by local key function.	None
POWER_ON_BY_MICOM_PWR_OFF_ON	String for Auto Power Off/On (micom Reboots by PLL_FAIL / COMP_FAIL / RESET and so on. )	None
POWER_ON_BY_NETFLIX	Power on by netflix hot key	None
POWER_ON_BY_ON_TIMER	Power on by on timer function.	None
POWER_ON_BY_OPERATOR_SEARCH_TIMER	Power on at reservation time for CI plus operator search.	None
POWER_ON_BY_PNWASHDONE	Power on by panel noise wash function complete. (OLED)	None
POWER_ON_BY_PNWASHFAIL	Cancel the panel noise wash function for user DC on.	SW, Main, Panel
POWER_ON_BY_POWER_ONLY	Power on by p-only remote key or UART command	None
POWER_ON_BY_QUICK_START	Auto on by QSM+ function after power off by quick start.	None
POWER_ON_BY_REMIND	Power on by remind function.	None
POWER_ON_BY_REMOTE_KEY	Power on by remote Power Key.	None
POWER_ON_BY_RESERVE	Power on by reserve function.	None
POWER_ON_BY_RS232C	Power on by RS-232C command	None
POWER_ON_BY_STORE_POWERON	Power on by store-only remote.	None
POWER_ON_BY_SWDOWN	Reboot by s/w down load function	None
POWER_ON_BY_WEAVE	Power on by IOT device	None
POWER_ON_BY_WOBLE	When detect BLE signal, TV will be auto DC on.	None
POWER_ON_BY_WOL_ONOFF	Power on by Wake On Lan from external device through network.	None
POWER_ON_BY_WOW_ONOFF	Power on by Wake on Wifi	None
UNKNOWN	Power on/off by other reason. (abnormal case)	Main, IR, Wifi

### **POWER\_OFF\_BY\_INV\_ERROR (Cracked or Burnt Panel) See Service Bulletin GLZ201600040:**

Service Bulletin describes the process for the need to update the Software to 04.20.75 if INV\_ERROR happens randomly. It also describes how to “Unlock” the Main board if (when attempting to turn on the TV) the Power LED blinks 10 times. Remember, if the Main board is locked, it is locked permanently. It must be reset to work again, in any TV. Details to bypass Burn detection “INV\_ERROR and unlock the Main board found in Service Bulletin GLZ201600040.

### **POWER\_OFF\_BY\_20V\_DETECT (Panel 24V is loaded down):**

The 24V which is routed to the T-CON board then to the Panel is monitored by the T-CON board. If this voltage is missing, (Example: Loaded Down) the T-CON sends back a command EL\_VDD\_DETECT\_22V (high) to the microprocessor pin 44. The Micro shuts off the TV and then logs 20V\_DETECT in the Power Off History screen. Measure the 24V to the T-CON, if missing unplug the panel from the T-CON board and retest. If it returns, the Panel is defective. If not, check the Power Supply. (See 55EG9600-SMPS-Testing)

### **POWER\_OFF\_BY\_20V\_DETECT (Power Off because AC Power disappears During Run):**

Indicates a loss of “AC”. Because the 20V/24V to the T-CON (used by the Panel) drops faster and is detected quicker than the 3.5V which is monitored for AC\_DET.

Power Off History will look like the following;

POWER\_OFF\_BY\_20V\_DETECT

### **POWER\_OFF\_BY\_AC\_DETECT (Twice) (Power Off because AC Power disappears During Compensation):**

If the AC Power is lost while the TV is performing Compensation, it will log AC\_DET twice.

Power Off History will look like the following;

POWER\_OFF\_BY\_AC\_DET

POWER\_OFF\_BY\_AC\_DET

### **POWER\_OFF\_BY\_COMP\_END:**

The Term “Compensation” entry into the Power Off History indicates Compensation has completed. Compensation is run every 2 hours of consecutive run time when the TV is turned off. (See “OLED” in the In-Start menu for interval).

**Tip:** To know when Compensation is running, if a Jump Drive that has a power LED is inserted into the USB port, it will remain lit when the TV is powered off. When compensation completes, the Jump Drive LED will turn off.

*Compensation is an internal program that utilizes an algorithm to determine the operational characteristics of the OLED panel individual Cells and then compensate for changes that take place over time. This keeps the panel running at optimal performance.*





## *2015 OLED UHD Training*

# **55EG9600 WebOS 2.0 UHD OLED TV MAIN BOARD TROUBLESHOOTING**

## *Main Board Layout and Voltage Measurements*

*Published November 20<sup>th</sup>, 2018*



## 55EG9600 Main Board (With Shield)

55EG9600 (2015) Main Board Section

See next page for pictorial  
with Shield Removed.



### MAIN BOARD

Main Boards Used:

55EG9600-UA.

AUSYLJR p/n: EBT63756306

BUSYLJR p/n: EBT63756303

AUSZLJR p/n: EBT64004102

55EG9600-UB.

AUSZLJR p/n: EBT64080802

BUSZLJR p/n: EBT64080803

55EG9600-NA.

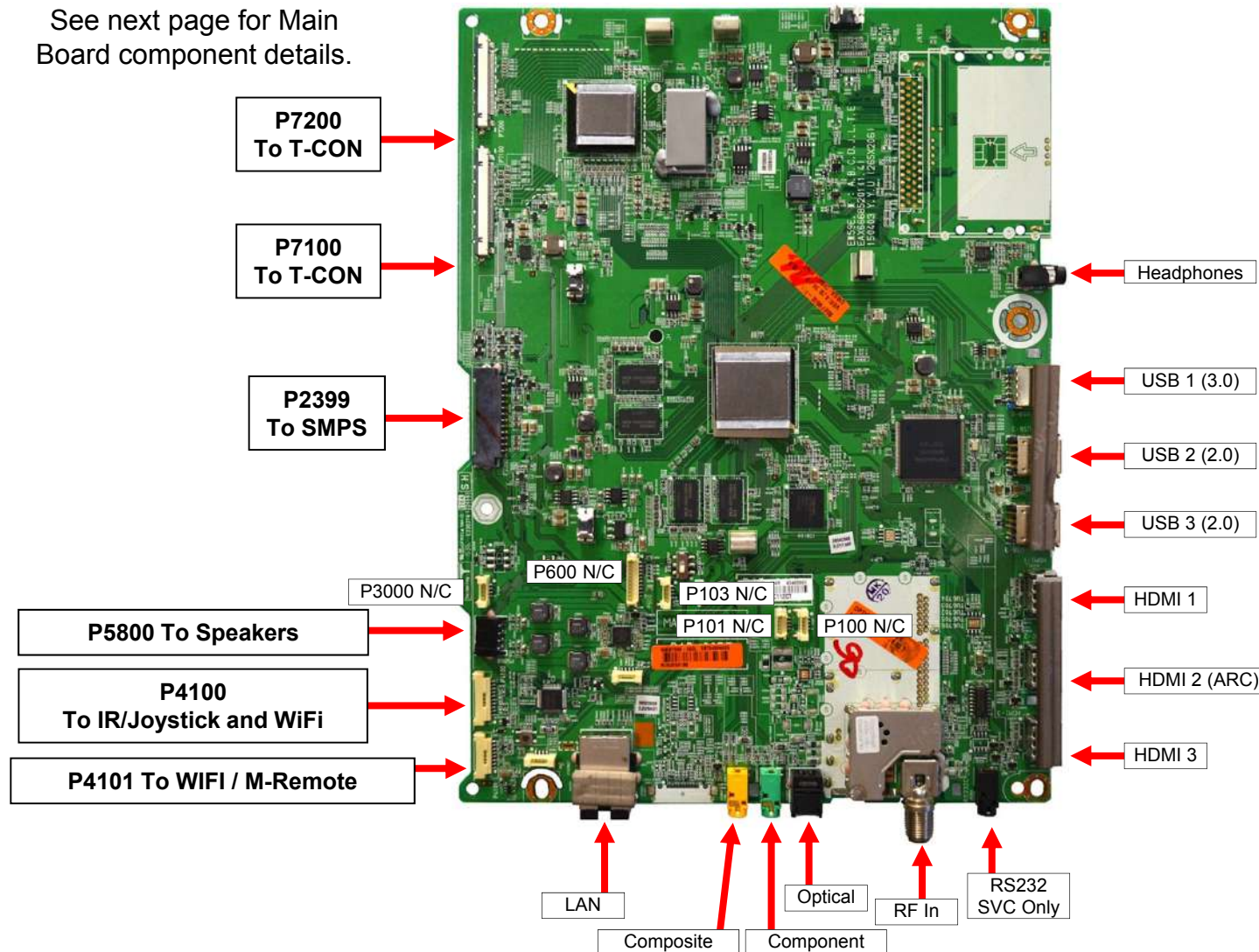
AKRYLH p/n: EBT63595501

AKRZLH p/n: EBT63595502

# 55EG9600 Main Board (No Shield)

55EG9600 (2015) Main Board Section

See next page for Main Board component details.



## MAIN BOARD

Main Boards Used:

55EG9600-UA.

AUSYLJR p/n: EBT63756306

BUSYLJR p/n: EBT63756303

AUSZLJR p/n: EBT64004102

55EG9600-UB.

AUSZLJR p/n: EBT64080802

BUSZLJR p/n: EBT64080803

55EG9600-NA.

AKRYLH p/n: EBT63595501

AKRZLH p/n: EBT63595502

# 55EG9600 Main Board Component Layout

55EG9600 (2015) Main Board

## P2399 "MAIN Board" to "SMPS Board" P201

PIN	LABEL	STBY	RUN	Diode Check
1	(1) PWR_ON	0V	3.42V	OL
2	(3) INV_CTL	0V	3.12V	1.20V
3	(5) DCP	0V	0V/3.40V	OL
4	(4) AC_DET	0V	3.32V	OL
5	3.5V_ST	3.52V	3.54V	1.25V
6	Gnd	Gnd	Gnd	Gnd
7-8	3.5V_ST	3.52V	3.54V	1.25V
9-10	Gnd	Gnd	Gnd	Gnd
11-15	(1) 12VM	0V	11.99V	OL
16-17	Gnd	Gnd	Gnd	Gnd
18	(2) 12V_ON	0V	3.52V	2.24V
19-22	(1) 24VS	0V	24.59V	OL
23-24	GND	Gnd	Gnd	Gnd

- (1) PWR\_ON (P\_ON on SMPS): Turns on the 12VM and 24VS lines to the Main. (Not the 12VT or 24VD to the T-CON)
- (2) 12V\_ON (12VT\_ON on SMPS): Turns on the 12VT (P202) to the T-CON (CN11).
- (3) INV\_CTL (DRV\_ON on SMPS): Turns on the 24VD (P203) to the T-CON (CN5).
- (4) AC\_DET (ACD on SMPS): If missing will prevent the TV from coming on. Power Light blinks 3 times, the relay clicks off.
- (5) DPC: Places the Power Supply in Power Saving Mode when APC is turned On. (0V Off / 3.4V On)

### DIODE CHECKS (Connected)

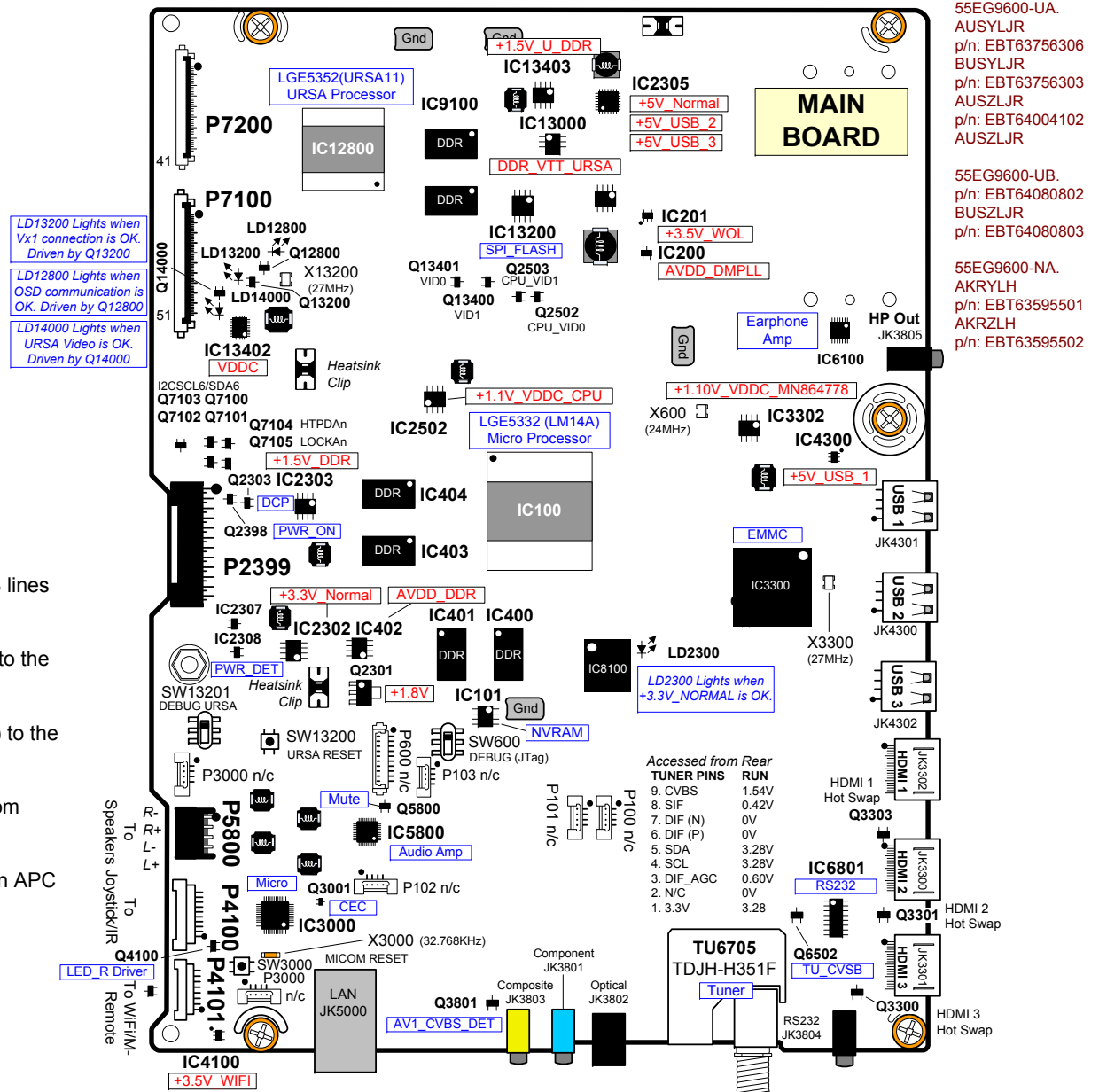
3.5V\_ST (0.36V)  
12VM (0.36V)  
24VS (0.76V)

### IR / JOYSTICK AND WIFI / M-REMOTE VOLTAGES

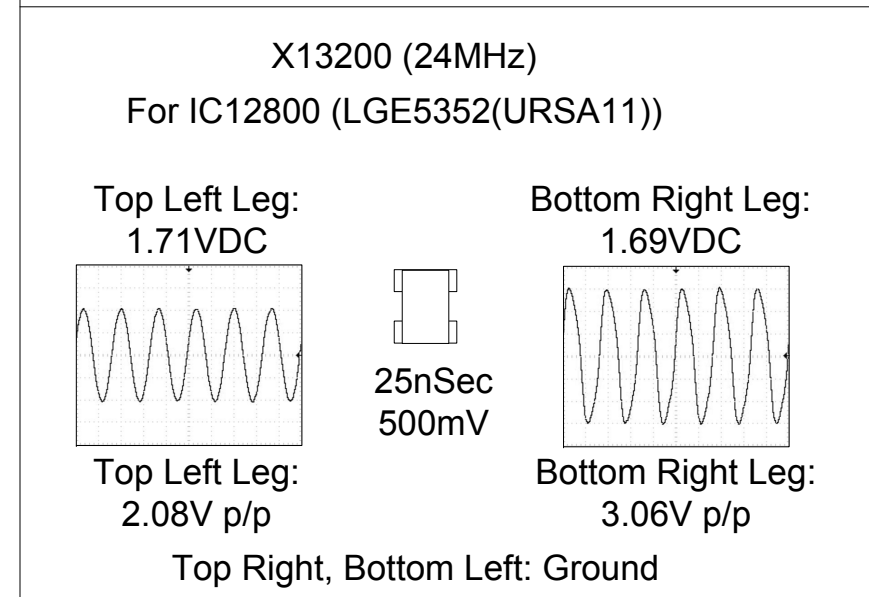
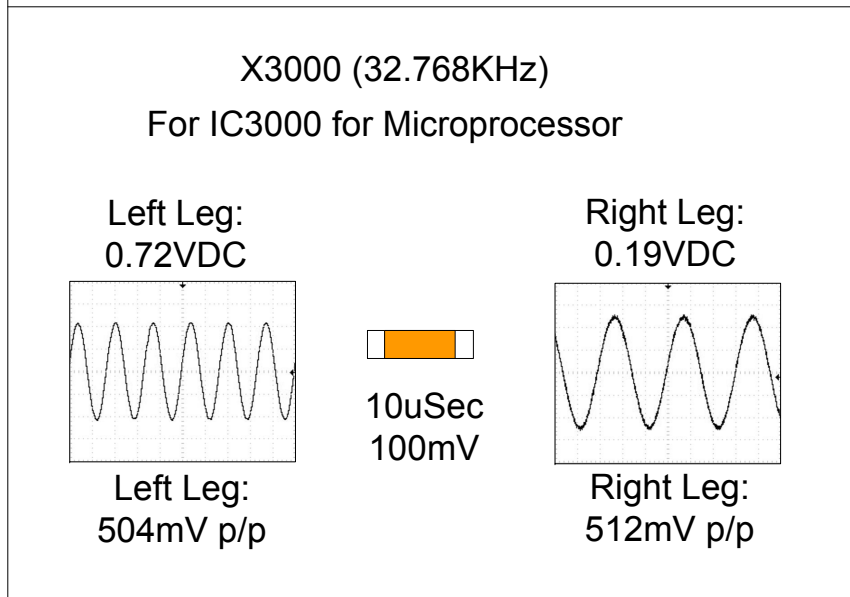
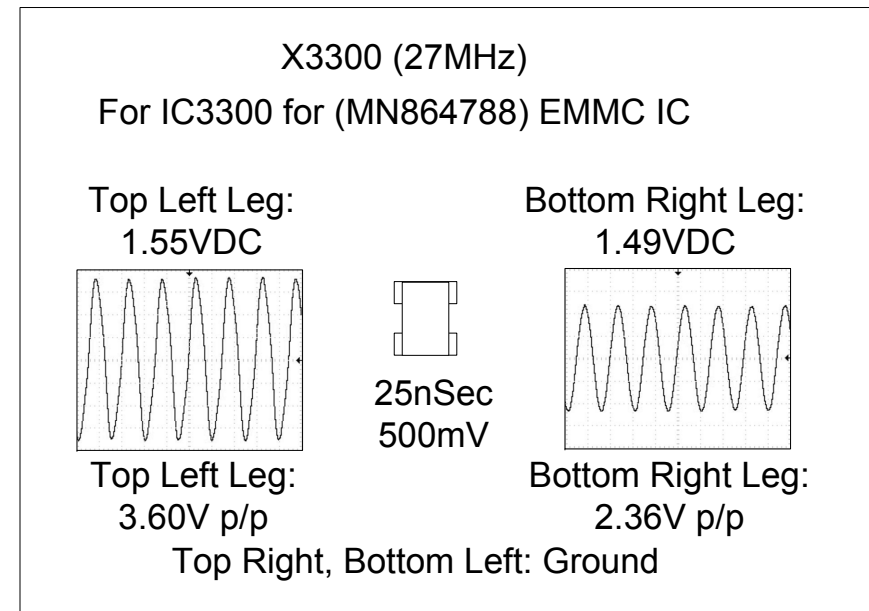
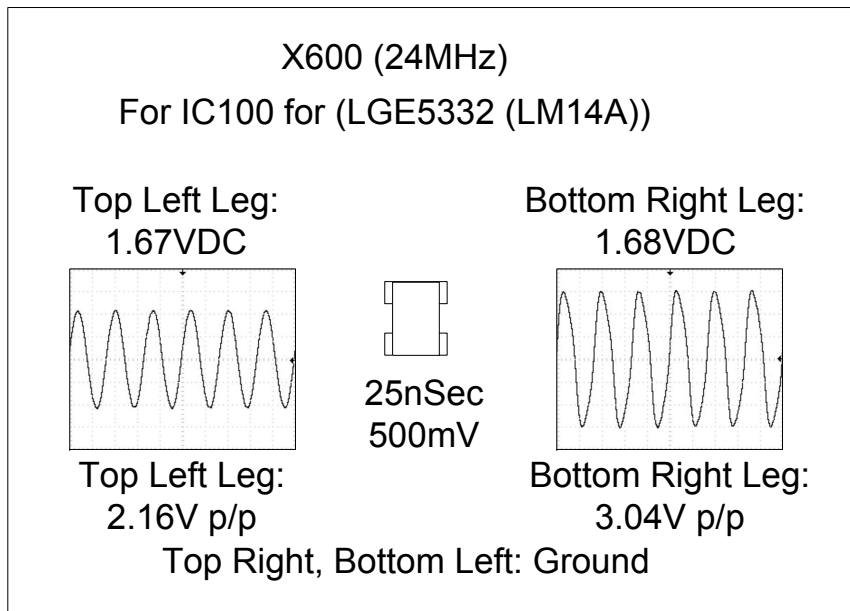
See next page for Main Board Crystal information.

P4000 and P4001

Voltages and Diode Checks







# 55EG9600 Main P4100, P4101 and P5800 Voltages Checks

55EG9600 (2015) Main Board

## P4100 "MAIN Board" to "IR/JOYSTICK"

PIN	LABEL	STBY	RUN	Diode Check	IR
10	EYE_SDA	3.55V	3.50V	1.99V	10
9	EYE_SCL	3.55V	3.50V	1.99V	9
8	GND	Gnd	Gnd	Gnd	8
7	IR	3.50V	3.49V	1.89V	7
6	Logo LED_R	1.44V	1.50V	OL	6
5	Gnd	Gnd	Gnd	Gnd	5
4	+3.5V_ST	3.52V	3.51V	1.26V	4
3	KEY2	3.52V	3.50V	1.98V	3
2	KEY1	3.52V	3.50V	1.98V	2
1	GND	Gnd	Gnd	Gnd	1

**Pin 7 IR:** 3.78V p/p when transmitted

**Pin 7 IR:** Voltage drops to 2.8V when IR received

**Pin 3 Key 2:** drops to 0.58V with the Joystick pressed in

Item 500: IR / Joystick / Power LED Board, p/n: EBR80303801 (Excludes Bracket)

Wire Harness CA6: 10 pin Wire Harness for Joystick / IR Board: p/n: EAD63367003

12507HS-10L To 12507HS-10L\_L=400MM... 12507HS-10L 12507HS-10L 400MM 1.25MM 10P

UL21503 AWG#28 N Tube, Ferrite Sheet, PVC+Halogen Free HAENG SUNG CO., LTD

## +3.5V\_ST DIODE CHECK

CONNECTED "OL"

## P5800 "MAIN Board" to "SPEAKERS"

PIN	LABEL	STBY	RUN	Diode Check
1	SPK_R-	0V	2.63V	OL
2	SPK_R+	0V	2.63V	OL
3	SPK_L-	0V	2.63V	OL
4	SPK_L+	0V	2.63V	OL

## P4101 "MAIN Board" to "WIFI / M-REMOTE" Bluetooth Module

PIN	LABEL	STBY	RUN	Diode Check	WIFI
8	+3.5V_WIFI	0V	3.51V	OL	8
7	WIFI_DM	0V	0.02V	0.64V	7
6	WIFI_DP	0V	0.02V	0.64V	6
5	Gnd	Gnd	Gnd	Gnd	5
4	WOL/WIFI_PWR_ON	0V	0.02V	1.98V	4
3	N/C	n/c	n/c	n/c	3
2	M_Module_Reset	0V	3.30V	OL	2
1	GND	Gnd	Gnd	Gnd	1

Item 570 WIFI/Bluetooth Module: p/n: EAT62093301 LGSBW4-1 2.7VTO3.6V  
MODULE 0P 54.0x34.0x4.95MM LG INNOTEK CO., LTD

S5 Wire Harness: p/n: EAD63366903

12507HS-08L To 12507HS-08L\_L=330MM. 12507HS-08L 12507HS-08L

330MM 1.25MM 8P UL21503 AWG28\*8C N PVC+Halogen Free, Absorband

HAENG SUNG CO., LTD

## +3.5V\_WIFI DIODE CHECK

CONNECTED 1.08V

120 p/n: EAB63768302 K0920202 EG95/EF95 Speaker\_Right 10W,  
90Hz, 76dB EMSONIC CORPORATION

121 p/n: EAB63768301 K0920201 EG95/EF95 Speaker\_Left 10W,  
90Hz, 76dB EMSONIC CORPORATION



## TUNER B+ SOURCES:

### Pin 1:

**+3.3V\_LAN\_TU** (Made from IC2302 out pin 6 through L2306 it becomes (+3.3V\_Normal). Through L6504 it becomes +3.3V\_TU. Then through L6500 to the Tuner pin 1.

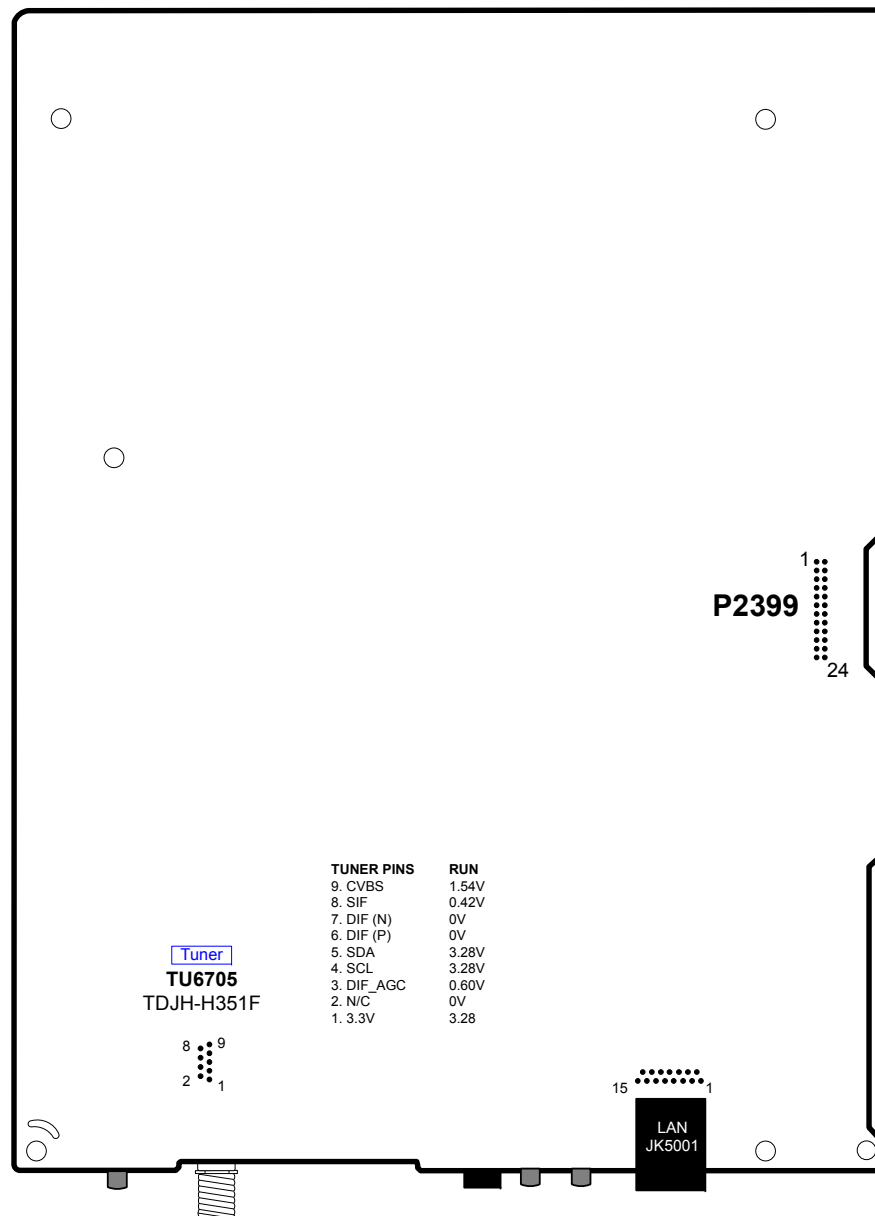
## TUNER SIGNALS:

**Pin 6, 7 Dig Video:** 230mV p/p  
(Only when receiving 8VSB and QAM digital signals)

**Pin 8 SIF:** 150mV p/p

**Pin 9 CVBS:** 1V p/p  
(Only when receiving 8VSB Signals Antenna)

**Pin 4 Clock and Pin 5 Data:**  
Only present during channel change. Run Auto Programming to keep them engaged.  
Both approx. 3.2V p/p





## *2015 OLED 4K UHD Training*

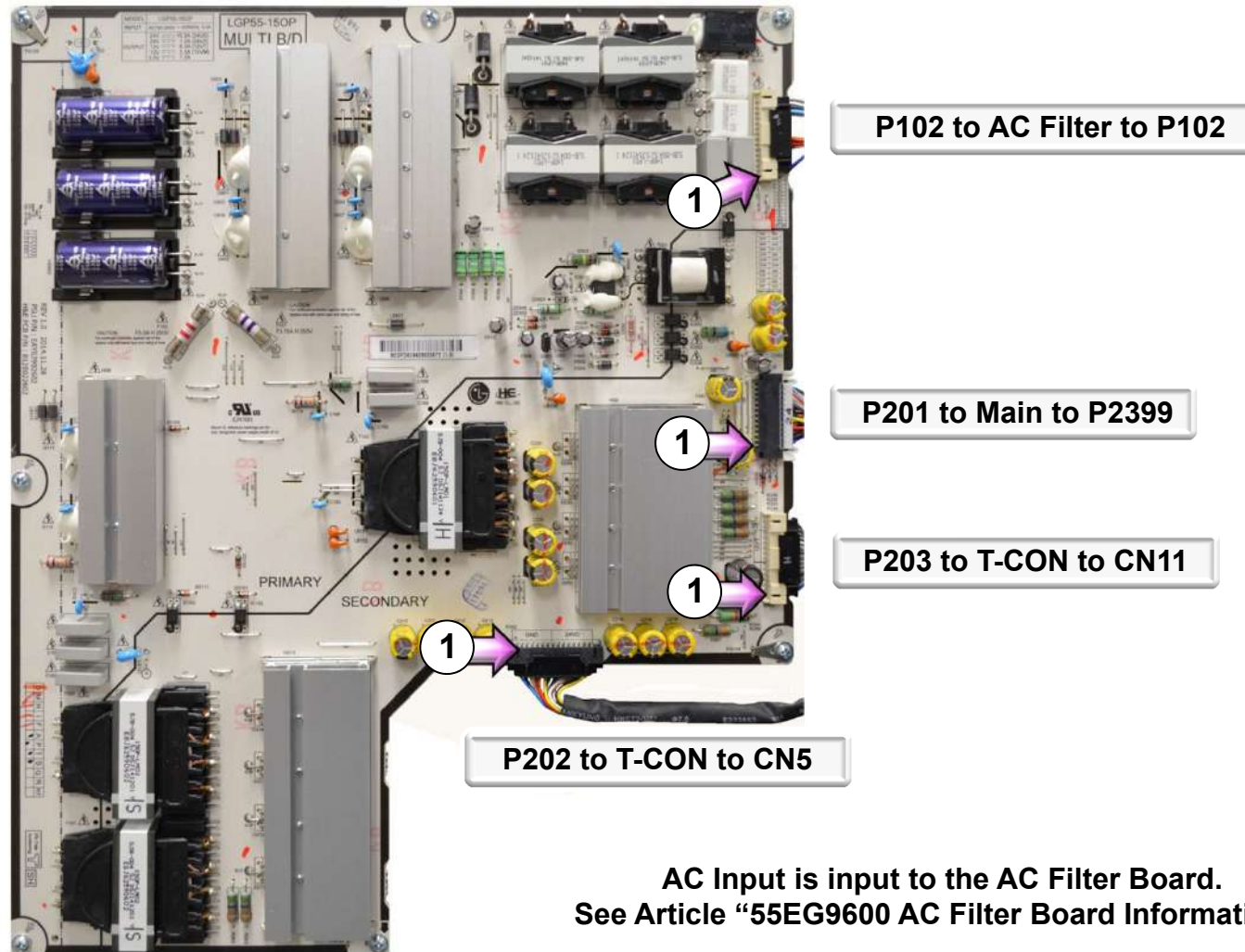
# **55EG9600 WebOS 2.0 UHD OLED TV**

## *Power Supply Board Layout Troubleshooting the Power Supply*

*Published November 19<sup>th</sup>, 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.

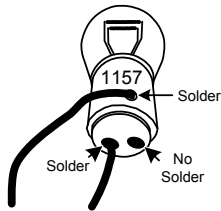
### POWER SUPPLY TEST

#### (Using 3V Simple Jig):

See Article 55EG9600 Power Supply Testing.

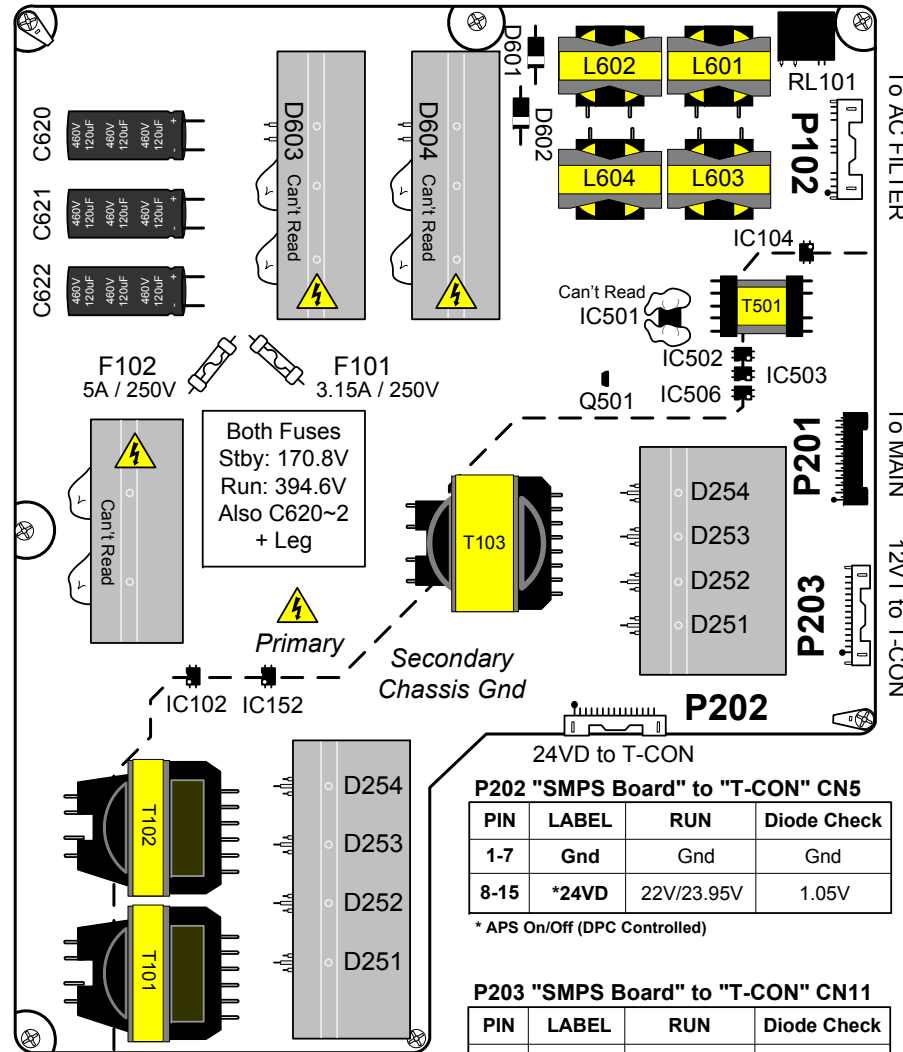
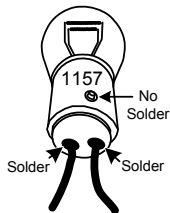
#### 12VM TO MAIN TEST OR 12VT TO T-CON LOAD TEST:

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



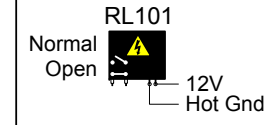
#### 24VS TO MAIN TEST OR 24VD TO T-CON LOAD TEST:

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

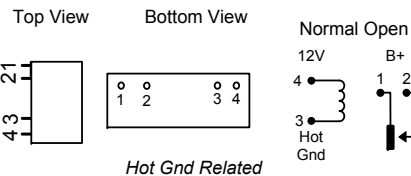
**Hot Ground:** Use (-) leg of either C620, C621 or C622. ⚡

**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



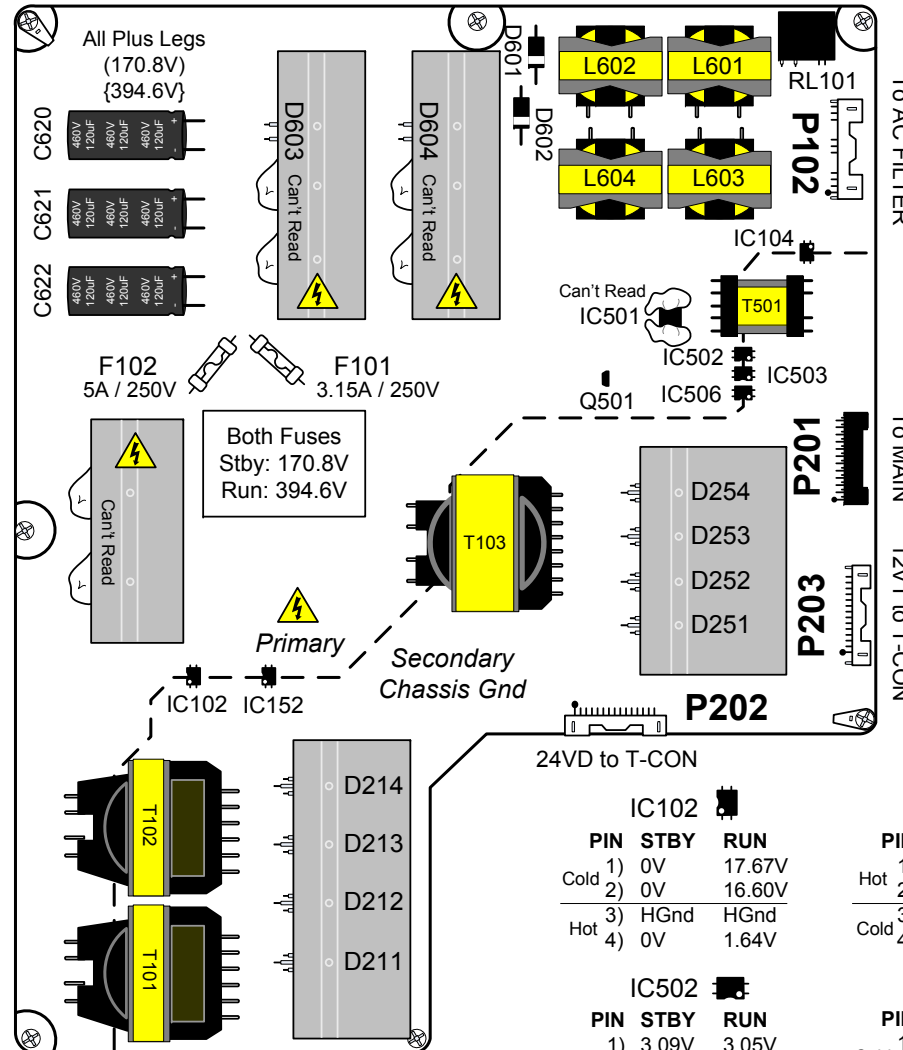
PIN	STBY	RUN
3)	HGnd	HGnd
4)	0V	Relay 12V
1)	Coil	B+
2)	B+	B+

### 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)  
12VT P202: 0.47V (Blk on Gnd) 0.37V (Red on Gnd)  
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}

## OPTOCOUPERS

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

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

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

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

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

IC506			
PIN	STBY	RUN	
1)	3.56V	1.15V	Cold
2)	2.09V	0V	
3)	HGnd	HGnd	Hot
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	<sup>(2)</sup> 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	<sup>(4)</sup> ACD	0V	3.32V	OL
3	<sup>(5)</sup> DPC	0V	0V/3.40V	1.20V
2	<sup>(3)</sup> DRV-ON	0V	3.12V	1.20V
1	<sup>(1)</sup> 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 20<sup>th</sup>, 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.

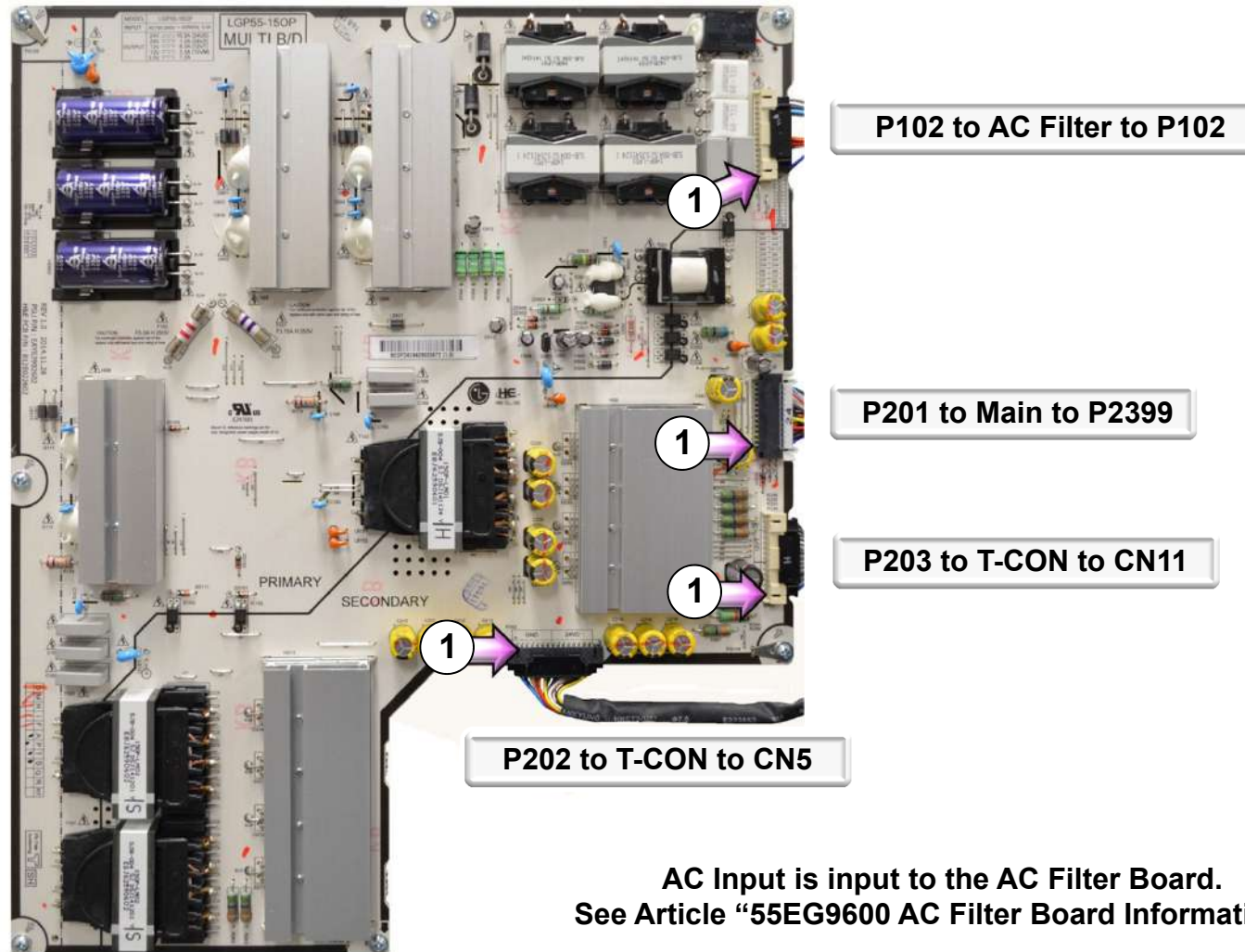
### If the OLED TV Shuts Off Intermittently: (See Service Bulletin: GLZ201600041)

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.

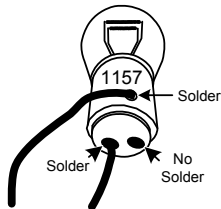
### POWER SUPPLY TEST

(Using 3V Simple Jig):

See Article 55EG9600 Power Supply Testing.

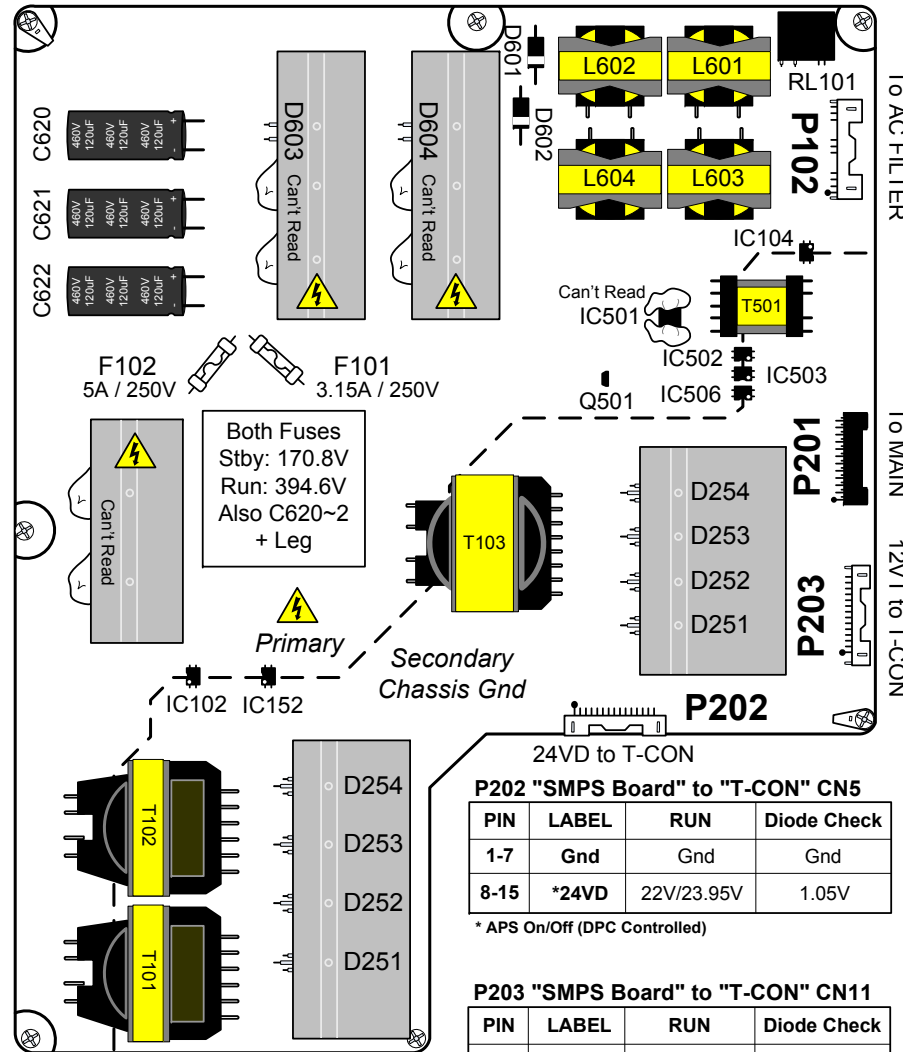
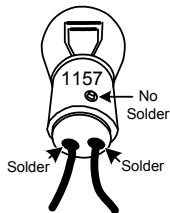
#### 12VM TO MAIN TEST OR 12VT TO T-CON LOAD TEST:

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.



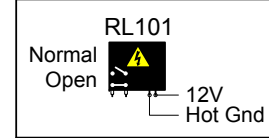
#### VOLTAGE LABEL

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

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



#### 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)

# 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)

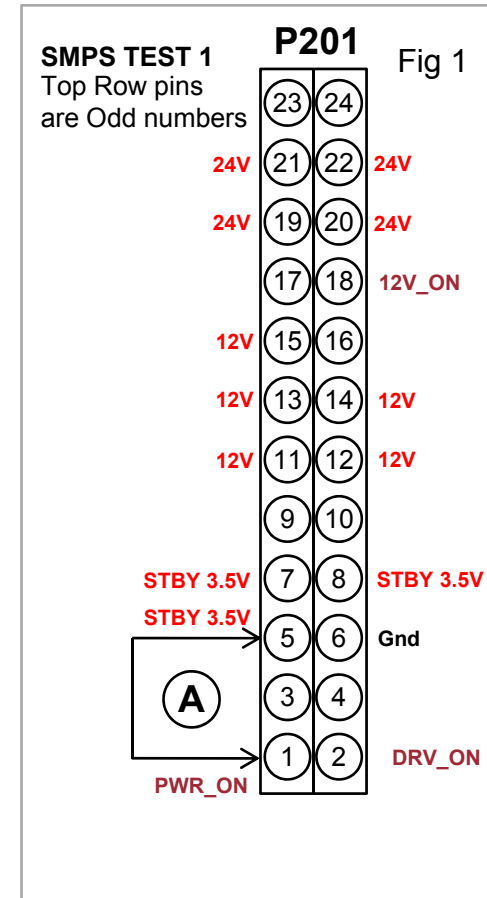
(1) Add a jumper (**A**) between (3.5V STBY) pin 5 and (PWR\_ON) Pin 1, (See Fig 1). Apply AC, this will turn on the SMPS. Relay click will be heard. Check that the 24V and 12V power supplies to the Main board are turned on,

### 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.

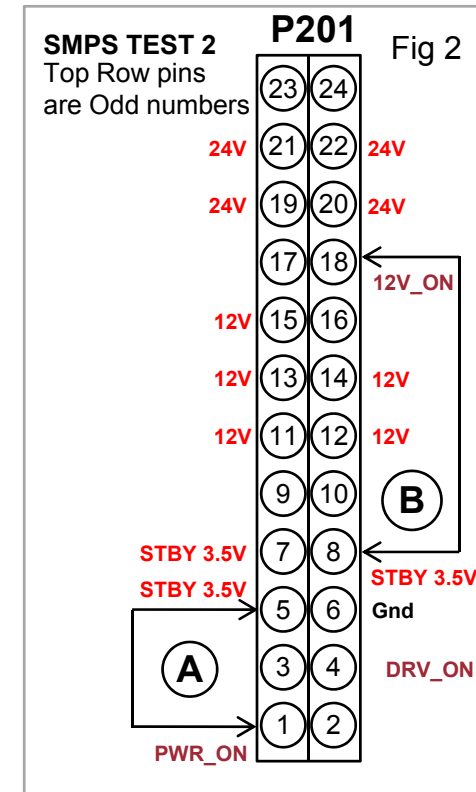
### T-CON 12V Abnormal:

- 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.**

## TEST 3 Power Supply Board 24VD/12VT to T-CON Voltage Check

55EG9600 (2015 OLED) Power Supply

**Continue if Test 1 and Test 2 were OK.**

Leave jumpers (A) and (B) in place. AC Power is removed at this time.  
The T-CON should be connected, SMPS P202 and P203 to T-CON.

### TEST 3: T-CON 24V POWER SECTION TEST:

(3) (B) Add another jumper between (STBY\_3.5V) pin 5 and (DRV\_ON) Pin 2.  
(See Fig. 3), Simulating **PWR\_ON**, **DRV\_ON** and **12V\_ON** command.

(4) Apply AC Power.

(5) Check 24V on pins 8-14 on P203.

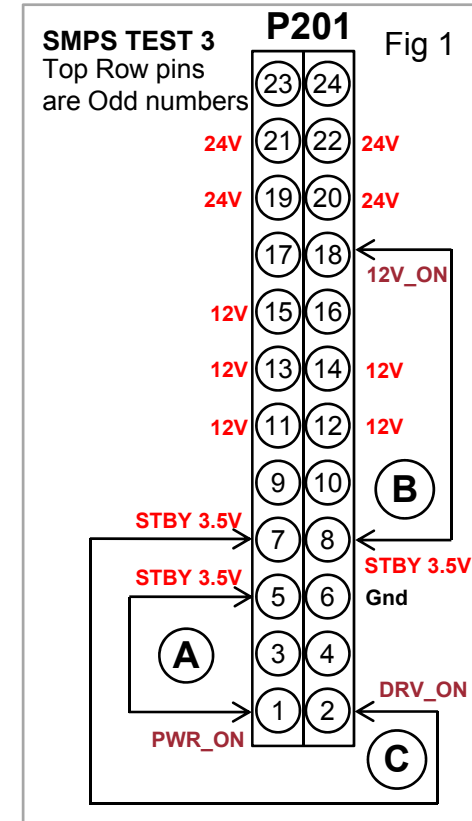
#### T-CON 24V Normal:

a) If normal (24.16V), the SMPS is OK, T-CON load test OK.

#### T-CON 24V Abnormal:

- a) Recheck all connections.
- b) Confirm the **DRV\_ON** line pulling up to at least 3V.
- c) Check SMPS P202 pins 8-14 for an excessive load, diode check should be "1.00V" P202 connected or "1.05V" P202 disconnected.  
Check CN5 pins 8-14 on the T-CON for an excessive load, CN5 unplugged.  
Diode check should be;
  - "OL" (Blk lead on Gnd) Panel connected, "OL" Panel Disconnected.
  - "0.36V" (Red lead on Gnd) Panel Connected, "0.54V" Panel Disconnected.

**See Next page to Test the Power Supply's T-CON 24V line  
using a light bulb test jig.**



**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.**

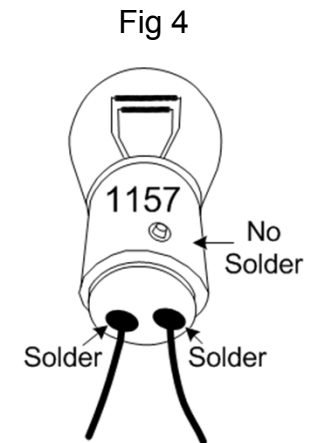
## 24VD, 24VS or 12VT, 12VM Load Test

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	<sup>(2)</sup> 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	<sup>(4)</sup> ACD	0V	3.32V	OL
3	<sup>(5)</sup> DPC	0V	0V/3.40V	1.20V
2	<sup>(3)</sup> DRV-ON	0V	3.12V	1.20V
1	<sup>(1)</sup> 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)

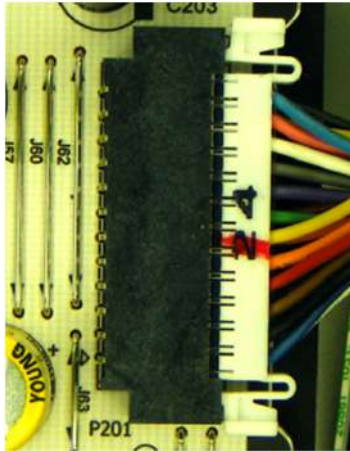
#### Disconnected

1.05V (Blk on Gnd)

0.22V (Red on Gnd)

(See Article 9267 for complete details)

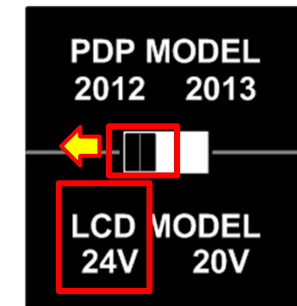
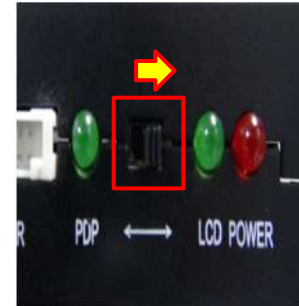
1



► 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



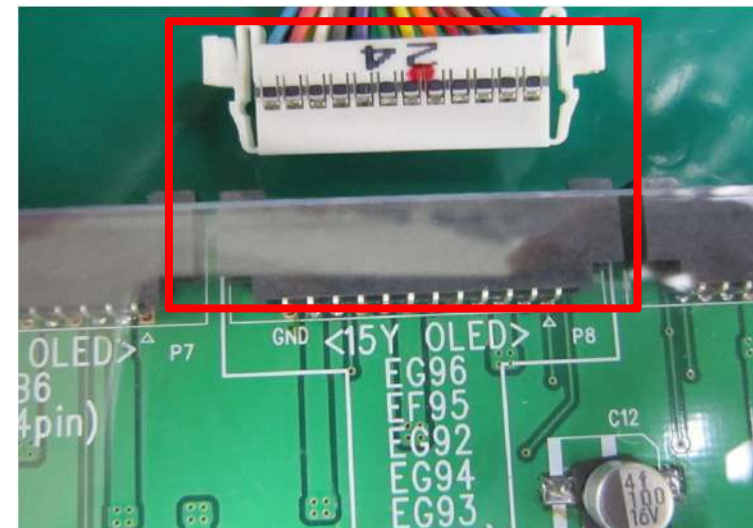
- Set the PRODUCT SWITCH on SMART JIG to LCD.
- LCD MODEL SWITCH: Set the switch to 24V.

3



► Disconnect the Main Board 24Pin Power Cable connector.

4



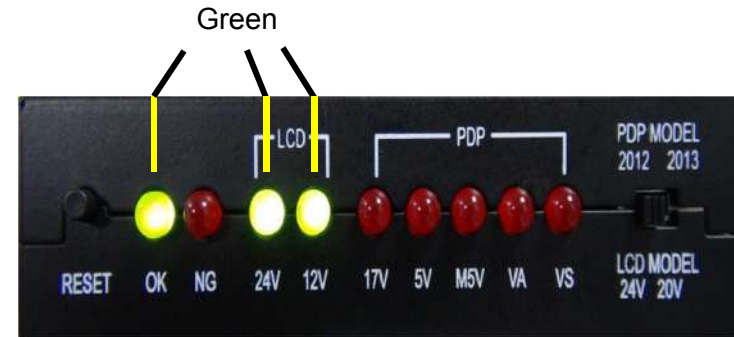
► Connect the 24Pin Power Cable connector to the Multi Gender JIG (P7 Port) 24Pin connector.

5



► Apply Power to the Set.

6



- 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)