2016 (OLED55C6P Series)
Power Supply Testing
Forcing on the Power Supply

Testing the Power Supply

OLED55C6P

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Read First Before Beginning the Power Supply Testing Procedure

(1) When AC is applied to the SMPS, it outputs 3.5V_ST to the Main board, P1000 pins 3, 5 and 6. This 3.5V is routed through L1000 and on to the Microprocessor IC3000 pin 48 as its main power source. The 3.5V also goes to the Reset circuit. At the moment 3.5V arrives at C3005 (+) 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 C3005 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 is also routed to pull-up resistors to the Key 1 and 2 lines. It is also sent to the IR receiver and as source voltage for the Power on switch Q1001, but it is not on at this time.

(2) When the Power on key is pressed on the Joy Stick (Press in and hold), pin 31 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 (3.4V p/p) to the Microprocessor pin 6 and the TV knows by this signal to turn on.

(3) The Micro outputs a low on pin 36 (RL_ON) which is routed to pin 2 of Q1001 turning it on. The 3.5V on pin 1 is then switched out pin 3 and on to the SMPS via pin 23 of P1000. This high arrives at P201 pin 1 and on to the Controller on the SMPS. This command turns on the 12V and the 24V (back to the Main).

(4) The 12V and 24V lines are routed out P201 (12V pins 11-15 and 24V pins 19-22) and on to the Main board P1000, (24V pins 3-6 and 12V pins 9, 11 and 14). The 24V (labeled A13V on schematic) is used for the two Audio amplifiers. The +12V is routed to many different regulators, but for this "Power On" circuit discussion it goes through two coils L1001 and L1002 and on to the different regulators.

(5) When the 12V and 24V arrives on the Main board, it is also routed to IC1302 and IC1300 (Power Detectors). These ICs then outputs a high (POWER_DET) to the Micro pin 14 to notify the Micro that the voltage 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".

(6) Once the Micro knows the 12V and 24V has arrived, it outputs a high on pin 15 which is routed to pin 6 of IC1400 turning it on. This IC is the +3.3V_NORMAL regulator. This 3.3V is routed to many different circuits, but one of them is as a pull-up voltage through R1008 to the INV_CTL (DRV_ON) line. However, the Micro is holding down INV_CTL via pin 4 at this time.

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(7) Next, the Micro (pin 19) turns on the PANEL_CTL. This leave P1000 pin 8 and arrives on the SMPS P201 pin 18. This turns on the 12V to the T-CON. 12V is output P202 pins 7-12 which arrives at the T-CON board CN11 pins 7-12. This 12V is routed through the fuse and turns on the DC-to-DC converters for a variety of voltages for the T-CON board.

(8) The next step for the Micro (pin 4) is to turn on the INV_CTL line, (Inverter Control). This high leaves P1000 pin 24 and now becomes DRV_ON (Drive On). When this high arrives on the SMPS P201 pin 2, it is routed to the controller IC, the controller turns on 24V which is output P203 (pins 8-15) and on to the T-CON board CN7. This voltage is then routed to the T-CON, through a fuse and out to the Panel itself for the Panel's operational voltage.

NOTE: The Panel 24V is monitored by the Main board. There is a line on the Vx1 cable P7600 pin 32 called OLED_ELVDD_DET. The name is changed to POWER_DET_1 and sent to the Micro pin 44. This line is normally 3.29V when the 24V is normal. If the 24V 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.

TEST 1 (OLED55C6P Series) Power Supply Board 12V/24V to Main Voltage Check

Note: The numbers on the right refer to the "Main" board connector (from the SMPS) that has been unplugged. Use this end for easy insertion of jumpers. Numbers shown in brackets [ ] are SMPS connector pins.

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 (3.53V) on pins 17, 18 and 19 of P1000. [Pins 5, 7 and 8 SMPS P201].

Remove connector from SMPS on Main board. If STBY is still missing, SMPS is defective. 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 and +3.5V_ST is not loaded down by the Main Board or the Joy Stick/IR Board.

II) With P1000 on the Main Board unplugged, it will make insertion of the Jumpers easier. Use P1000 (Main board side) to insert jumpers in these tests.

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

(1) Add a jumper (**A**) between (3.5V STBY) pin 19 [SMPS 5] and (PWR_ON) Pin 23 [SMPS 1], (See Fig 1).
Apply AC, this will turn on the SMPS. Relay click will be heard.
Check that the 24V and 12V supplies to the Main board;

To Main Board Power:

- P1000 (11.99V pins 9, 11-14) [P201 11 ~ 15]
- P1000 (23.9201V pins 3 ~ 6) [P201 19 ~ 22]

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

(2) Remove AC Power

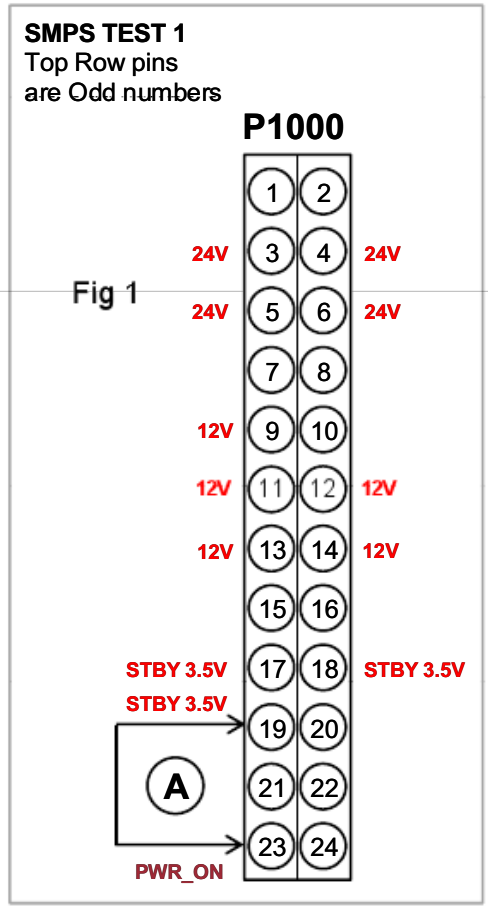

Fig 1

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

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

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

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TEST 2 (OLED55C6P Series) Power Supply Board T-CON 12V Power Check

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 to the Power Supply.

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

(3) Add another jumper (**B**) between (STBY_3.5V) pin 18 and (12V_ON) Pin 8.
SMPS [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 (11.92V) to the T-CON, (SMPS P202 pins 7-11),
(T-CON Board, CN11 pins 7-11).

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

T-CON 12V Abnormal:
a) Recheck all connections.
b) Confirm the **12V_ON** line pulling up to at least 3V.
c) Check SMPS P202 pins 7-11 for an excessive load, normal diode check should be 0.65V P202 connected "0.69V" disconnected.
With T-CON disconnected, check CN11 pins 7-12 on the T-CON for an excessive load. Diode check should be "1.19V". (CN11 unplugged from the SMPS, the panel can be connected or disconnected).
Note: With Red lead on Chassis ground, reading is T-CON "OL" SMPS 1.00V.

See Next page to Test the Power Supply's T-CON 24V line.

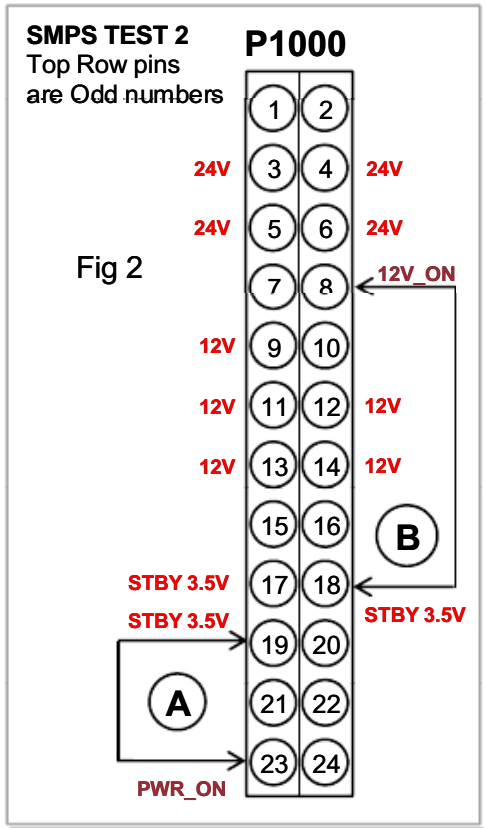


Fig 2

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

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

TEST 3 (OLED55C6P Series) Power Supply Board T-CON 24V Power Check

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 to the Power Supply.

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

(6) Add another jumper (**C**) between (STBY_3.5V) pin 17 and (DRV_ON) Pin 24.
SMPS [STBY_3.5V pin 5] and [DRV_ON Pin 2].
(See Fig. 3), Simulating **PWR_ON, 12V_ON** and **DRV_ON** commands.

(7) Apply AC Power.

(8) Check 24V (23.98V) to the T-CON, (SMPS P203 pins 8-15). (T-CON Board, CN5 pins 8-15).

T-CON 24V Normal:
a) If normal (23.98V), the SMPS is OK, T-CON/Panel 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 P203 pins 8-15 for an excessive load, diode check should be "0.56V" connected and P203 "0.54V" disconnected.
Check CN5 pins 8-15 on the T-CON for an excessive load.
(CN5 unplugged from the SMPS, Panel connected). Diode check should be "OL" (Blk lead on Gnd) 0.37V (Red lead on Gnd).
(CN5 unplugged from the SMPS, Panel also disconnected). Diode check should be "OL" (Blk lead on Gnd) 0.66V (Red lead on Gnd).

See Next Page for Voltage Readings during Test 1, 2 and 3.
See Page 7 to Test the Power Supply's T-CON 12V and 24V line using a light bulb test jig.

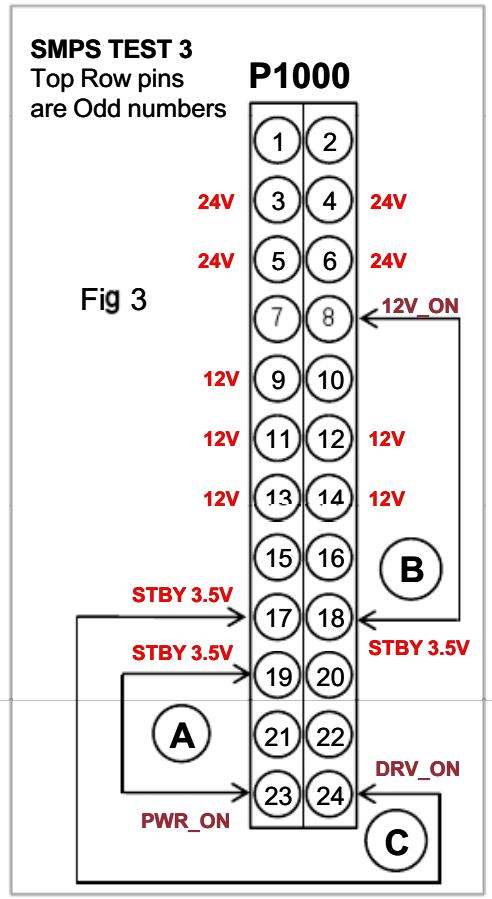


Fig 3

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

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

OLED55C6P Power Supply Test 1, 2 and 3 Voltage Checks

	MAIN	P201 "POWER SUPPLY TEST"			11.92V to T-CON	11.92V to T-CON 23.98V to T-CON
	Pin	Pin	Label	Test 1 (Jumper A)	Test 2 (Jumper B)	Test 3 (Jumper C)
	2	24	Gnd	Gnd	Gnd	Gnd
	1	23	Gnd	Gnd	Gnd	Gnd
	4	22	24VS	23.91V	24.48V	24.48V
	3	21	24VS	23.91V	24.48V	24.48V
	6	20	24VS	23.91V	24.48V	24.48V
	5	19	24VS	23.91V	24.48V	24.48V
	8	18	12VT_ON	0V	3.53V	3.54V
	7	17	Gnd	Gnd	Gnd	Gnd
	10	16	Gnd	Gnd	Gnd	Gnd
	9	15	12VM	11.99V	11.96V	11.96V
	12	14	12VM	11.99V	11.96V	11.96V
	11	13	12VM	11.99V	11.96V	11.96V
	14	12	12VM	11.99V	11.96V	11.96V
	13	11	12VM	11.99V	11.96V	11.96V
	16	10	Gnd	Gnd	Gnd	Gnd
	15	9	Gnd	Gnd	Gnd	Gnd
	18	8	3.5V	3.54V	3.53V	3.54V
	17	7	3.5V	3.54V	3.53V	3.54V
	20	6	Gnd	Gnd	Gnd	Gnd
	19	5	3.5V	3.54V	3.53V	3.54V
PDIM#2	22	4	ACD	3.76V	3.75V	3.75V
PDIM#1	21	3	DPC	0V	0V	0V
INV_CTL	24	2	DRV-ON	0V	0V	3.54V
PWR_ON	23	1	P-ON	3.54V	3.53V	3.54V

TEST 4: (2016 OLED55C6P Series) Power Supply Board T-CON 12V and 24V Power

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:

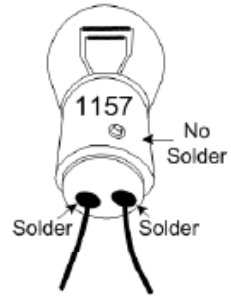
(1) (No AC): Leave all Jumpers in place on P1000 to P201 of the Power Supply and Disconnect CN5 on the T-CON board.

(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: 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 any pin 8-15 of CN5 side. Push the other needle end of the other wire into any pin 1-7 of CN5 or go to Chassis Ground.

Fig 4



(5) Apply AC power, the light bulb should light and remain lit. Measure the 24V line to confirm it's correct. The bulb should be very 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: (P202 pins 7-11 or CN11 pins 7-11).
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. The bulb should be very bright.