

*1080P
Direct View LCD
Training*

37LK450

**LCD TV Troubleshooting
37" Class 1080P LCD TV
(37" diagonally)**



**This manual produced using model
37LK450-UB.CUSDLH as it's source.**



LG
Life's Good

*Published August 13th, 2011
Updated September 28th, 2011
(See last page for updates).*

Go

OUTLINE

SPECIAL NOTE: The 37LK450 utilizes two different panels, power supplies, inverters and Main boards. This manual is based upon the **37LK450-UB.CUSDLH** model.

37LK450-UB.CUSDLH Uses:

- Panel p/n: EAJ61754001 (AU OPTRONICS CORP)
- Power Supply p/n: EAY62170001
- Main Board p/n: EBT61525901 or p/n: EBT61542101

37LK450-UB.SUSYJK/CUSYLH Uses:

- Panel p/n: EAJ61768701 (LG DISPLAY CO. LTD.)
- Power Supply p/n: EAY60869307
- Main Board p/n: EBU61376604 or p/n: EBT61542109

Preliminary Section:

Contact Information, Preliminary Matters, Specifications, LCD Overview, General Troubleshooting Steps, Signal Distribution, Disassembly Instructions and Voltages

Disassembly Section: Removal of Circuit Boards

Troubleshooting Section: Board Operation Troubleshooting of :

- **Switch Mode Power Supply with on board Ballast**
 - Main Board
 - T-CON (TFT Panel Driver Board)
 - Front IR/Intelligent
 - Touch Key Board
 - Speaker

37LK450 LCD Direct View Display

Section 1

This Section will cover Contact Information and remind the Technician of Important Safety Precautions for the Customers Safety as well as the Technician and the Equipment.

Basic Troubleshooting Techniques which can save time and money sometimes can be overlooked. These techniques will also be presented.

This Section will get the Technician familiar with the Disassembly, Identification and Layout of the LCD Display Panel.

At the end of this Section the Technician should be able to Identify the Circuit Boards and have the ability and knowledge necessary to safely remove and replace any Circuit Board or Assembly.

Preliminary Matters (The Fine Print)

IMPORTANT SAFETY NOTICE

The information in this training manual is intended for use by persons possessing an adequate background in electrical equipment, electronic devices, and mechanical systems. In any attempt to repair a major Product, personal injury and property damage can result. The manufacturer or seller maintains no liability for the interpretation of this information, nor can it assume any liability in conjunction with its use. When servicing this product, under no circumstances should the original design be modified or altered without permission from LG Electronics. Unauthorized modifications will not only void the warranty, but may lead to property damage or user injury. If wires, screws, clips, straps, nuts, or washers used to complete a ground path are removed for service, they must be returned to their original positions and properly fastened.

CAUTION

To avoid personal injury, disconnect the power before servicing this product. If electrical power is required for diagnosis or test purposes, disconnect the power immediately after performing the necessary checks. Also be aware that many household products present a weight hazard. At least two people should be involved in the installation or servicing of such devices. Failure to consider the weight of an product could result in physical injury.

ESD Notice (Electrostatic Static Discharge)

Today's sophisticated electronics are electrostatic discharge (ESD) sensitive. ESD can weaken or damage the electronics in a manner that renders them inoperative or reduces the time until their next failure. Connect an ESD wrist strap to a ground connection point or unpainted metal in the product. Alternatively, you can touch your finger repeatedly to a ground connection point or unpainted metal in the product. Before removing a replacement part from its package, touch the anti-static bag to a ground connection point or unpainted metal in the product. Handle the electronic control assembly by its edges only. When repackaging a failed electronic control assembly in an anti-static bag, observe these same precautions.

Regulatory Information

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: Reorient or relocate the receiving antenna; Increase the separation between the equipment and the receiver; Connect the equipment to an outlet on a different circuit than that to which the receiver is connected; or consult the dealer or an experienced radio/TV technician for help.

LG Contacts Page

Customer Service (and Part Sales) (800) 243-0000

Technical Support (and Part Sales) (800) 847-7597

**USA Website (GSFS) <http://gsfs-america.lge.com>
or also GCSC <http://aic.lgservice.com>**

Customer Service Website <http://www.us.lgservice.com>

Knowledgebase Website <http://lgtechassist.com> ← Also 2010/11 Wireless Ready Models Software Downloads

LG Web Training <https://lge.webex.com> ← Presentations with Audio/Video and Screen Notations

**LG CS Learning Academy <http://ln.lge.com/ilearn> ← <http://136.166.4.200>
User Name/Password required Use <http://LGLearn.com>
No User Name/Password**

The following is available on the Learning Academy web site: Training Manuals, Schematics with Navigational Bookmarks, Start-Up Sequence, Owner's Guides, Interconnect Diagrams, Dimensions, Connector IDs, Product Pictures and Features.

Also available on the Plasma Page:
PDP Panel Alignment Handbook,
Plasma Control Board ROM Update (Jig required)

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LCD Direct View Overview

Safety and Handling Regulations

1. Approximately 20 minute pre-run time is required before making any picture performance adjustments from the Menu.
2. Refer to the Voltage/Current silk screening on the Switch Mode Power Supply.
3. C-MOS circuits are sensitive to static electricity.
Use caution when dealing with these IC and circuits.
4. Exercise care when making voltage and waveform checks to prevent costly short circuits from damaging the unit.
5. Be cautious of lost screws and other metal objects to prevent a possible short in the circuitry.

Checking Points to be Considered

1. Check the appearance of the Replacement Panel and Circuit Boards for both physical damage and part number accuracy.
2. Check the model label. Verify model names and board model matches.
3. Check details of defective condition and history. Example: Oscillator failure dead set, etc...

Basic Troubleshooting Steps

Define, Localize, Isolate and Correct

•**Define** Look at the symptom carefully and determine what circuits could be causing the failure. Use your senses Sight, Smell, Touch and Hearing. Look for burned parts and check for possible overheated components. Capacitors will sometimes leak dielectric material and give off a distinct odor. Frequency of power supplies will change with the load, or listen for relay closing etc. Observation of the front Power LED may give some clues.

•**Localize** After carefully checking the symptom and determining the circuits to be checked and after giving a thorough examination using your senses the first check should always be the DC Supply Voltages to those circuits under test. Always confirm the supplies are not only the proper level but be sure they are noise free. If the supplies are missing check the resistance for possible short circuits.

•**Isolate** To further isolate the failure, check for the proper waveforms with the Oscilloscope to make a final determination of the failure. Look for correct Amplitude Phasing and Timing of the signals also check for the proper Duty Cycle of the signals. Sometimes “glitches” or “road bumps” will be an indication of an imminent failure.

•**Correct** The final step is to correct the problem. Be careful of ESD and make sure to check the DC Supplies for proper levels. Make all necessary adjustments and lastly always perform a Safety AC Leakage Test before returning the product back to the Customer.

37LK450 PRODUCT INFORMATION SECTION



This section of the manual will discuss the specifications of the
37LK450
LCD Direct View Display

Key Features

- Full HD 1080p Resolution
- ENERGY STAR® Qualified
- Picture Wizard II
- Intelligent Sensor
- Smart Energy Saving
- ISFccc® Ready

IS IT A TV? OR SOMETHING BETTER?

If you been hearing about how amazing Blu-ray entertainment is, or how much better your favorite shows would look in HD, you've heard right. The thing is, you need 1080p Full HD to get the most out of both. With the LK450, you can.

Logo Familiarization Page 1 of 2



FULL HD RESOLUTION 1080P HD Resolution Pixels: 1920 (H) × 1080 (V)
This stunning picture is the reason you wanted HDTV in the first place. With almost double the pixel resolution, Full HD 1080p gives it superior picture quality over standard HDTV. You'll see details and colors like never before.



Save Energy, Save Money

ENERGY STAR qualified TVs use about 30% less energy than standard units. Earning the ENERGY STAR means a product meets strict energy efficiency guidelines set by the US Environmental Protection Agency and the Department of Energy.



AV Mode "One click" Cinema, Sport, Game mode.

TAKE IT TO THE EDGE is a true multimedia TV with an AV Mode which allows you to choose from 3 different modes of Cinema, Sports and Game by a single click of a remote control.



Picture Wizard. "Find the Perfect Picture"

Get easy self-calibration with on-screen reference points for key picture quality elements such as black level, color, tint, sharpness and backlight levels. Take the guesswork out of picture adjustments with this simple-to-use feature.

Logo Familiarization Page 2 of 2



Clear Voice Clearer Dialogue Sound

Automatically enhances and amplifies the sound of the human voice frequency range to provide high-quality dialogue when background noise swells.



Intelligent Sensor

Let your TV do the adjustments for you. Intelligent Sensor automatically optimizes the picture to the lighting and color conditions in the room for a more enjoyable viewing experience.



ISFccc ready

LG's **ISFccc Ready** HDTVs contain the detailed standards necessary for professional calibration of brightness, contrast, tint, sharpness, color levels and much more to meet local lighting conditions for both day and nighttime viewing. Settings are added to preset modes for easy access from your LG remote.

37LK450 Remote Control

p/n AKB72915239

TOP PORTION



BOTTOM PORTION



TV Rear Input / Output Jacks

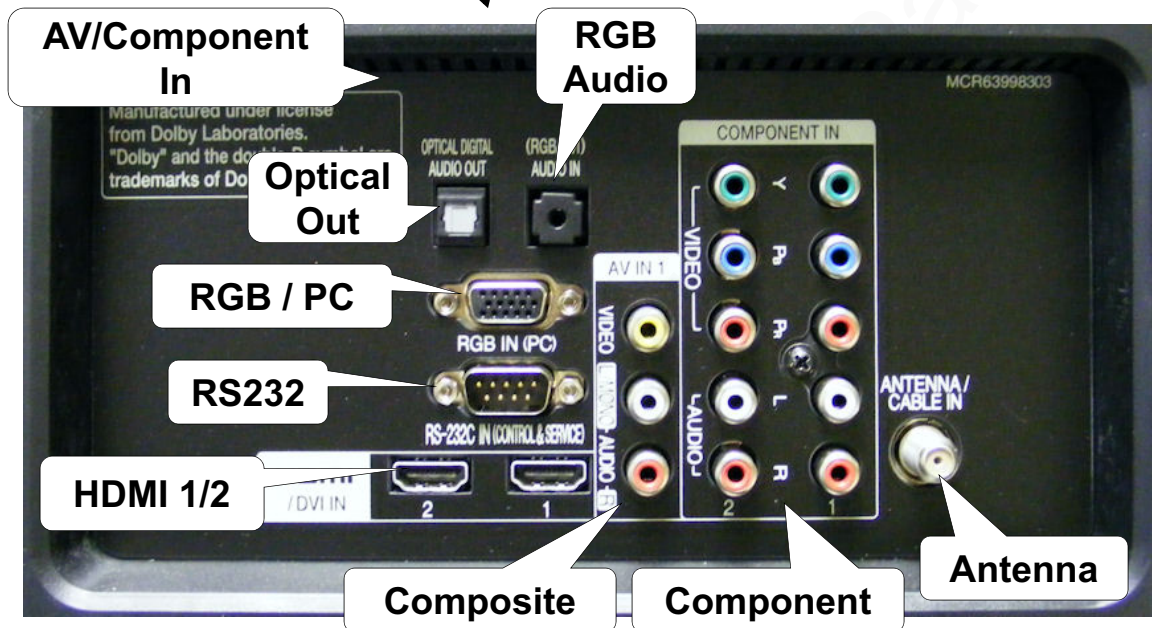


USB for Software Upgrades,
Music, Videos and Photos.

Side In/Out

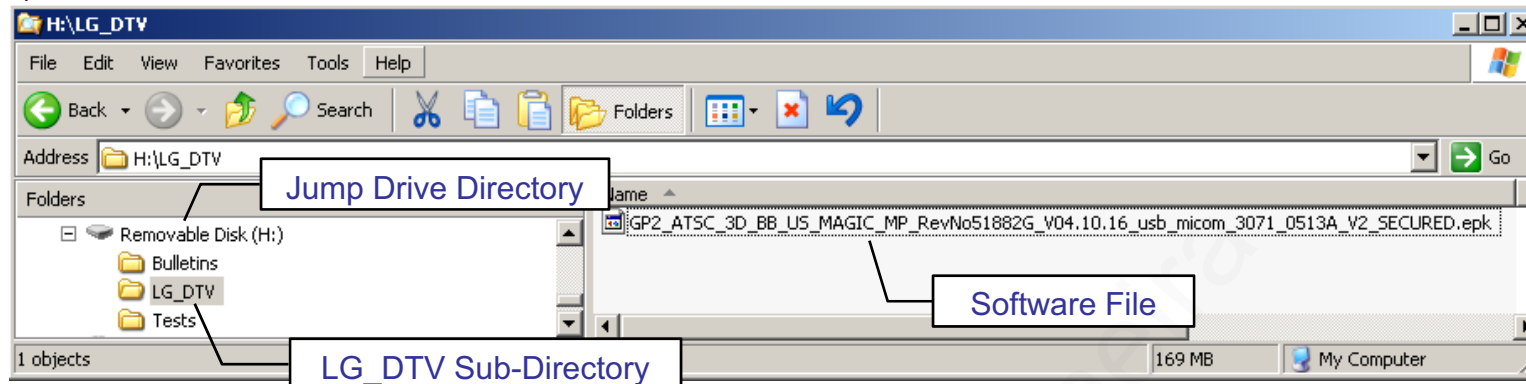


Rear In/Output Jacks



Generic Plasma USB Automatic Software Download Instructions

1) Download the Software File.



2) Copy new software (xxx.epk) to "LG_DTV" folder. Make sure to have correct software file.

3) With TV turned on, insert USB flash drive.

4) The "TV Software Upgrade" screen appears. (See figure to right) →

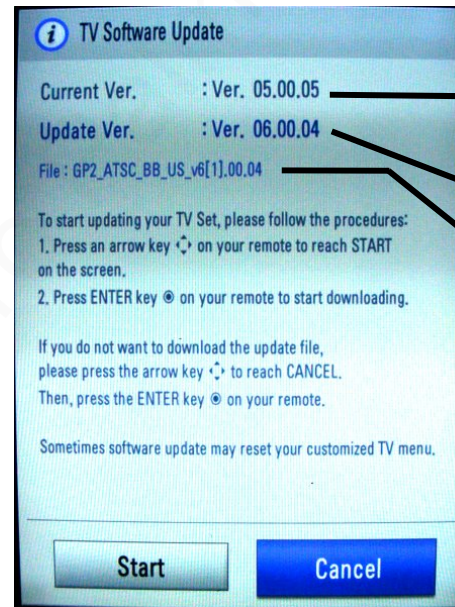
5) Cursor left and highlight "START" Button and push "Enter" button using the remote control.

6) You can see the download progress Bar.

7) Do not unplug until unit has automatically restarted.

8) When download is completed, you will see "COMPLETE".

9) Your TV will be restarted automatically.



Currently Installed Version

Software Version found on the USB Flash Drive

File found on the USB Flash Drive

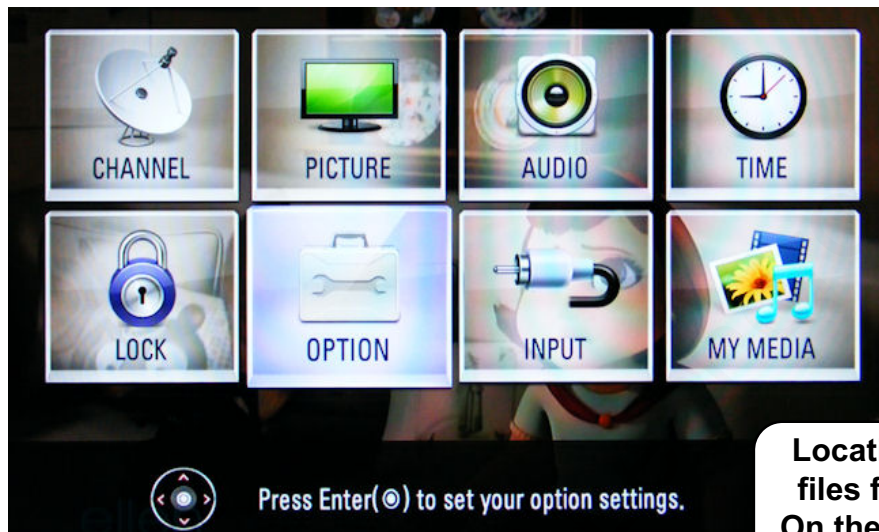
*** CAUTION:**
Do not remove AC power or the USB Flash Drive. Do not turn off Power, during the upgrade process.

Highlight Start Press Select

Software Files are now available from
LGTechassist.com

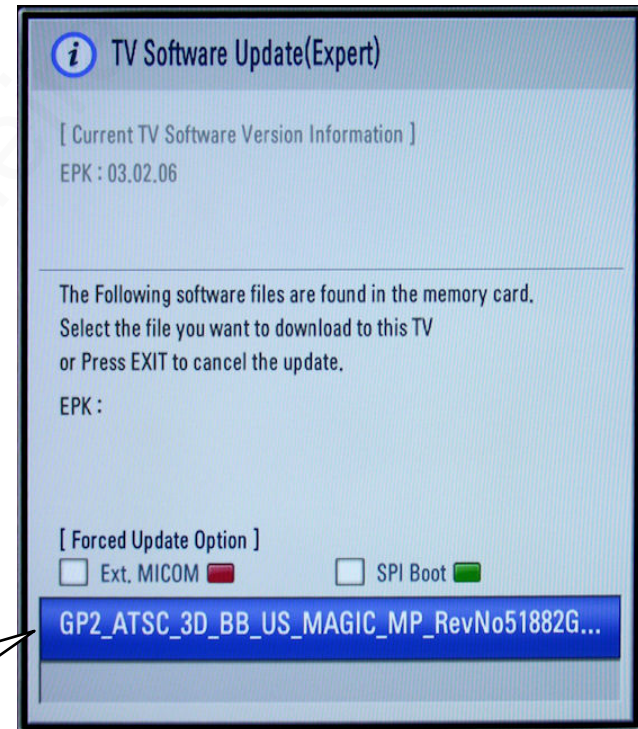
Manual Software Download:

- 1 Prepare the Jump Drive as described in the “USB Automatic Download” section and insert it into the USB port.
- 2 Bring up the Customer’s Menu and scroll to “**OPTIONS**”.
- 3 (Nothing should be highlighted on the right side.) Press the “FAV” key 7 times to bring up the first screen for Manual Download Screen (Expert Mode).



Location of files found On the Jump Drive

- 4 The Manual Software Download screen appears.
- 4 Highlight the Software update file and press “SELECT” to begin the download process.



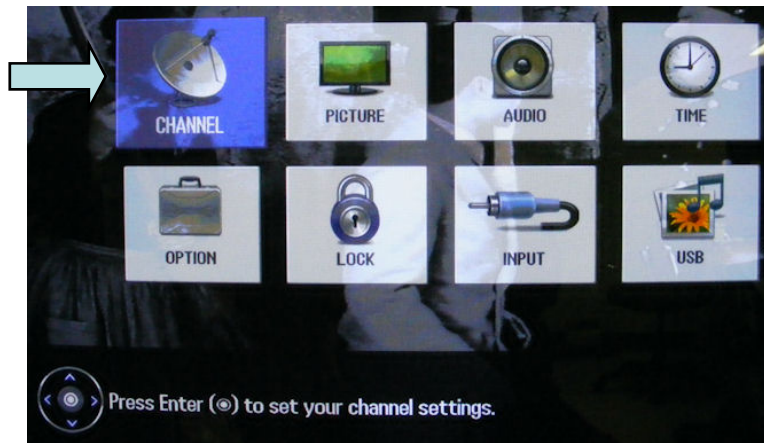
WARNING:

Use extreme Caution when using the Manual “Forced” Download Menu. Any file can be downloaded when selected and may cause the Main board to become inoperative if the incorrect file was selected.

Accessing the Host Diagnostic Screen (Page 1 of 2)

Use the Host Diagnostic screen to investigate the signal quality of a problem channel.

- 1) Place Television on the digital channel that may be showing problems.
- 2) Bring up the Customer's Menu. Highlight "CHANNEL". Press "ENTER" on the remote.



- 3) The "CHANNEL" Menu appears.



- 4) Press the (1) Key 5 to 8 times.
The Host Diagnostics screen appears.



See next page for more details.

37LK450 Understanding the Host Diagnostic Screen (Page 2 of 2)

Host Diagnostics

Host Information

Model Name : 37LK450-UA (Liquid Crystal Display)

Memory

FLASH : 131072 KB
DRAM : 262144 KB
NVM : 128 KB

Host Release Version

Firmware Version(MP) : 1.05.01.01(321) Software Version
Micom Version : V0.05.3
Compile Date & Time : 20101013 & 13:05:30
Compile User : chanhun.kum

FAT Status (Main)


Center Frequency : 663.00 MHz Channel Frequency
PCR lock : Locked Program Clock Reference (Locked or No)
Modulation mode : QAM 256 Channel Type (8VSB, QAM 64, 256)
Carrier lock status : Locked Channel (Locked or Unlocked)
SNR : 38 dB Channel Signal to Noise Ratio
Signal level : 99% Channel Signal Level (Above 80% good)

Current Channel (Main)

Channel Info : Digital 19-1 Blocked or Not Blocked
Parental Control : Channel is not blocked

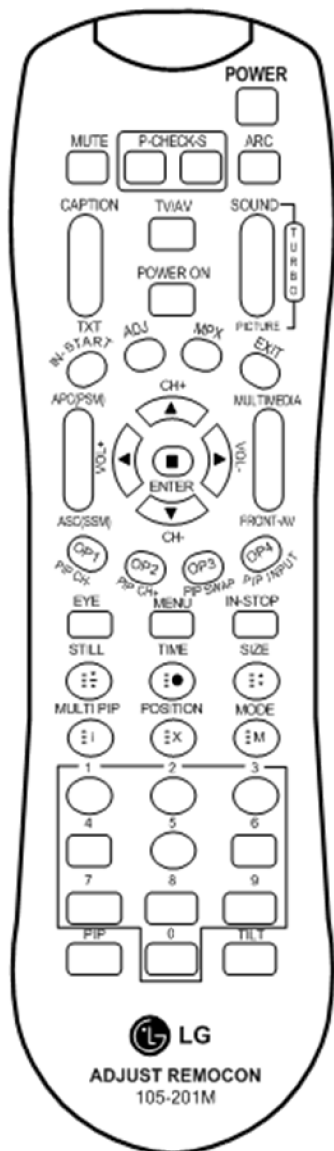
DVI/HDMI Status

Can't display this information now

 Exit



Accessing the Service Menu



105-201M

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; **0000**

Note: If **0000** does not work use **0413**.



MKJ39170828

37LK450 Service Menu First Page

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

<p>Model and S/N</p> <p>IN SART</p> <p>Model Name: 37LK450-UA Serial Number: 010LGPT00036 S/W Version: : 01.05.01.01 MICOM Version : 0.05.3 SPI Boot Version : 3.00.01 BOOT Version : 1.00.01 IR LED Version : 11.0 EDID Version (RGB) : 0.01 EDID Version (HDMI) : 0.02 Chip Type : SATURN 7R Debug Status : RELEASE</p> <p>UTT : 12 Unit's Total Time</p> <p>APP History Ver.:321 PQL DB:AUO_CF_LGT10_XXXXXX</p>	<p>SW Version</p> <p>Video Processor Chip Type</p> <p>Priority Audio Processing Mode</p> <ol style="list-style-type: none"> 1. Adjust Check 2. ADC Data 3. Power Off Status 4. System 1 5. System 2 6. Model Number D/L 7. Test Option 8. External ADC 9. Spread Spectrum 10. Sync Level 11. Stable Count 12. ODC Test 	<p>Country Group</p> <p>Adjust Check</p> <ol style="list-style-type: none"> 1. Country Group (Press OK to Save) <table border="1"> <tr><td>Country Group Code</td><td>02</td></tr> <tr><td>Country Group</td><td>US</td></tr> <tr><td>Country</td><td>US</td></tr> </table> 2. Tool Option <table border="1"> <tr><td>Tool Option 1</td><td>22152</td></tr> <tr><td>Tool Option 2</td><td>19478</td></tr> <tr><td>Tool Option 3</td><td>56324</td></tr> <tr><td>Tool Option 4</td><td>2828</td></tr> <tr><td>Tool Option 5</td><td>33</td></tr> </table> 3. Adjust White Balance : <table border="1"> <tr><td></td><td>OK</td></tr> </table> 4. Adjust ADC: <table border="1"> <tr><td>480i Component</td><td>OK</td></tr> <tr><td>1080p Component</td><td>OK</td></tr> <tr><td>RGB</td><td>OK</td></tr> </table> 5. EDID(PCM) : <table border="1"> <tr><td></td><td>OK</td></tr> <tr><td>RGB</td><td>OK (0x1D)</td></tr> <tr><td>HDMI1</td><td>OK (0x3,0xCC)</td></tr> <tr><td>HDMI2</td><td>OK (0x3,0xBC)</td></tr> <tr><td>HDMI3</td><td>OK (0x3,0xAC)</td></tr> </table> 	Country Group Code	02	Country Group	US	Country	US	Tool Option 1	22152	Tool Option 2	19478	Tool Option 3	56324	Tool Option 4	2828	Tool Option 5	33		OK	480i Component	OK	1080p Component	OK	RGB	OK		OK	RGB	OK (0x1D)	HDMI1	OK (0x3,0xCC)	HDMI2	OK (0x3,0xBC)	HDMI3	OK (0x3,0xAC)
Country Group Code	02																																			
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HDMI2	OK (0x3,0xBC)																																			
HDMI3	OK (0x3,0xAC)																																			

37LK450 Service Menu Power Off Status

- (1) Bring up the Service Menu using the Service Remote
- (2) And pressing "In-Start" enter password 0413.

- (3) Highlight Item 3. Power Off Status

IN SART		Power Off Status
Model Name: 37LK450-UA		0. POWER_OFF_BY_REMOTE_KEY
Serial Number: 010L CRT00036		1. POWER_OFF_BY_REMOTE_KEY
S/W Version:	Highlight 3. Power Off Status	2. POWER_OFF_BY_REMOTE_KEY
MICOM Version : 0.00.0		3. POWER_OFF_BY_INSTOP
SPI Boot Version : 3.00.01		4. POWER_OFF_BY_SW_DW
BOOT Version : 1.00.01		5. POWER_OFF_BY_REMOTE_KEY
IR LED Version : 11.0		6. POWER_OFF_BY_UNKNOWN
EDID Version (RGB) : 0.01		7. POWER_OFF_BY_UNKNOWN
EDID Version (HDMI) : 0.02		8. POWER_OFF_BY_UNKNOWN
Chip Type : SATURN 7R		9. POWER_OFF_BY_REMOTE_KEY
Debug Status : RELEASE		10. POWER_OFF_BY_LOCAL_KEY
UTT : 12		11. POWER_OFF_BY_INSTOP
APP History Ver.:321		12. POWER_OFF_BY_UNKNOWN
PQL DB:AUO_CF_LGT10_XXXXXX		13. POWER_OFF_BY_UNKNOWN
		14. POWER_OFF_BY_UNKNOWN
		15. POWER_OFF_BY_ACDET
		16. POWER_OFF_BY_REMOTE_KEY
		17. POWER_OFF_BY_REMOTE_KEY
		18. POWER_OFF_BY_REMOTE_KEY
		19. POWER_OFF_BY_REMOTE_KEY
		20. POWER_OFF_BY_REMOTE_KEY
		21. POWER_OFF_BY_REMOTE_KEY
		22. POWER_OFF_BY_REMOTE_KEY

See next page for Power Off Status Explained

In Start Menu "Power Off Status"

Factor	MODE	Contents
Micom	POWER_OFF_BY_CPUCMD	Power off by CPU Command
	POWER_OFF_BY_ABN	Power off by abnormal status
	POWER_OFF_BY_KEYTIMEOUT	Power off when TV is not turned off during a certain time
	POWER_OFF_BY_ACDET	Power off by not detecting AC (abnormal case)
	POWER_OFF_BY_RESET	Power off by Micom Reset
	POWER_OFF_BY_5VMNT	Power off by not detecting 5V monitoring
	POWER_OFF_BY_NO_POLLING	Power off when receiving no ack
CPU	POWER_OFF_BY_REMOTE_KEY	Power off by remote key
	POWER_OFF_BY_OFF_TIMER	Power off by Off timer
	POWER_OFF_BY_SLEEP_TIMER	Power off by sleep timer
	POWER_OFF_BY_FAN_CONTROL	Power off by fan control
	POWER_OFF_BY_INSTOP_KEY	Power off by Instop Key
	POWER_OFF_BY_AUTO_OFF	Power off by auto off function (10 Min off with no Signal)
	POWER_OFF_BY_ON_TIMER	Power off by On timer (2 hours off with no button press after auto on)
	POWER_OFF_BY_RS232C	Power off by RS232C command
	POWER_OFF_BY_SWDOWN	Power off by software download
	POWER_OFF_BY_LOCAL_KEY	Power off by local key
	POWER_OFF_BY_CPU_ABNORMAL	Power off by CPU Abnormal status
	POWER_OFF_BY_INV_ERROR	Power off by LCD module inverter error
	POWER_OFF_BY_OTA	Power off by OTA update
POWER_OFF_BY_UNKNOWN	Power off by the other causes	

37LK450 UTT Reset (IN START) Screen

IN SART	IN SART	SYSTEM 1
Model Name: 37LK450-UA	1. Adjust Check	0. Baudrate 9600
Serial Number: 010LGPT00036	2. ADC Data	1. 2 Hours Off (On Timer) On
S/W Version: : 01.05.01.01	3. Power Off Status	2. 2 Hours Off (Screen Mute) Off
MICOM Version : 0.05.3	4. System 1 ▶	3. 15Min Force Off On
SPI Boot Version : 3.00.01	5. System 2	4. Audio EQ On
BOOT Version : 1.00.01	6. Model Number D/L	5. Audio Bass EQ On
IR LED Version : 11.0	7. Test Option	6. A2 Threshold 11
EDID Version (RGB) : 0.01	8. External ADC	7. HDMI Sound(Port1) HDMI Port1
EDID Version (HDMI) : 0.02	9. Spread Spectrum	8. Lip Sync Adjust(DTV) 0
Chip Type : SATURN 7R	10. Sync Level	9. Dimming On
Debug Status : RELEASE	11. Stable Count	10. Tuner Option Enhanced Ghost
UTT : 12 Unit's Total Time	12. ODC Test	11. Atten RF Signal Off
APP History Ver.:321		12. UTT Reset Changes to "Doing"
PQL DB:AUO_CF_LGT10_XXXXXX		13. Channel Mute On
		14. Debug Status RELEASE
		15. NVRAM Type EEPROM
		16. HDEV Off
		17. Blue back On
		18. China Cable SO On
		19. Booster On (VHF) 0
		20. Booster Off (VHF) 0
		21. Booster On (UHF) 0
		22. Booster Off (UHF) 0

Note: After UTT is reset, the UTT time on the left will not reset to "0" until the Service Menu is exited.

Scroll to
(System 1)
then
Right Cursor

Scroll to
(UTT Reset)
Press (Select)
Reset changes to Doing
then back to Reset

After Reset (Doing) has
completed, Reset returns.
After Exit the UTT Timer is
"0"

37LK450 Model Number Download Screen

When the Main Board is replaced, the Model Number and Serial Number must be corrected. Follow these instructions

Bring up the Service Menu using the Service Remote. Scroll down to item 6. Model Number D/L to highlight. Press "ENTER" or "Cursor Right".

Model & Serial Number

IN SART

Model Name: 37LK450-UA
Serial Number: 010LGPT00036
S/W Version: : 01.05.01.01
MICOM Version : 0.05.3
SPI Boot Version : 3.00.01
BOOT Version : 1.00.01
IR LED Version : 11.0
EDID Version (RGB) : 0.01
EDID Version (HDMI) : 0.02
Chip Type : SATURN 7R
Debug Status : RELEASE

Select Item 6

1. Adjust Check
2. ADC Data
3. Power Off Status
4. System 1
5. System 2
- 6. Model Number D/L**
7. Test Option
8. External ADC
9. Spread Spectrum
10. Sync Level
11. Stable Count
12. ODC Test

Model Number D/L

0. Model Name
1. Serial Num.

37LK450-UA

010LGPT00036

Press OK to Save

Note: The Model and Serial Number will not change until "IN-START" is pressed or exiting the In-Start Menu and then returning to the In-Start Menu.

TO CHANGE THE MODEL/SERIAL NUMBERS:

- 1) Use the cursor right or left to select the area to change.
- 2) Use the cursor up or down to change.
- 3) Press "ENTER" to Save the new data.
- 3) Cursor right until there is no text cursor blinking.
- 4) Cursor down to highlight "Serial Number" and change according to steps 1 and 2 above.
- 5) Press "ENTER" to Save, then press "EXIT".

34LK450 EDID Download Screens

- EZ ADJUST**
- 0. Tool Option1
 - 1. Tool Option2
 - 2. Tool Option3
 - 3. Tool Option4
 - 4. Tool Option5
 - 5. Country Group
 - 6. ADC Calibration
 - 7. White Balance
 - 8. 10 Point WB
 - 9. Test Pattern
 - 10. PCM EDID D/L
 - 11. AC3 EDID D/L
 - 12. Sub B/C
 - 13. Touch Sensitivity Setting

When Item 11 was selected

PCM EDID D/L	
HDMI1	OK/(PCM)
HDMI2	OK/(PCM)
HDMI3	OK/(PCM)
RGB	OK/(PCM)
Start	Reset

If Item 5 on Adjust Check in the 1st page of the Service Menu shows **EDID PCM** this shows **OK(PCM)**

If Item 5 on Adjust Check in the 1st page of the Service Menu shows **AC3**, this shows **NG**.

If **NG** was shown, highlight "**Start**" and press Select on the remote. "**Writing**" appears, then **OK/(PCM)** shows here. Now Item 5 on Adjust Check in the 1st page of the Service Menu shows **EDID PCM**.

If **Reset** is selected, **Erasing** will appear and then this shows "**NG**".

When Item 12 was selected

AC3 EDID D/L	
HDMI1	OK/(AC3)
HDMI2	OK/(AC3)
HDMI3	OK/(AC3)
RGB	OK/(AC3)
Start	Reset

If Item 5 on Adjust Check in the 1st page of the Service Menu shows **EDID AC3** this shows **OK(AC3)**

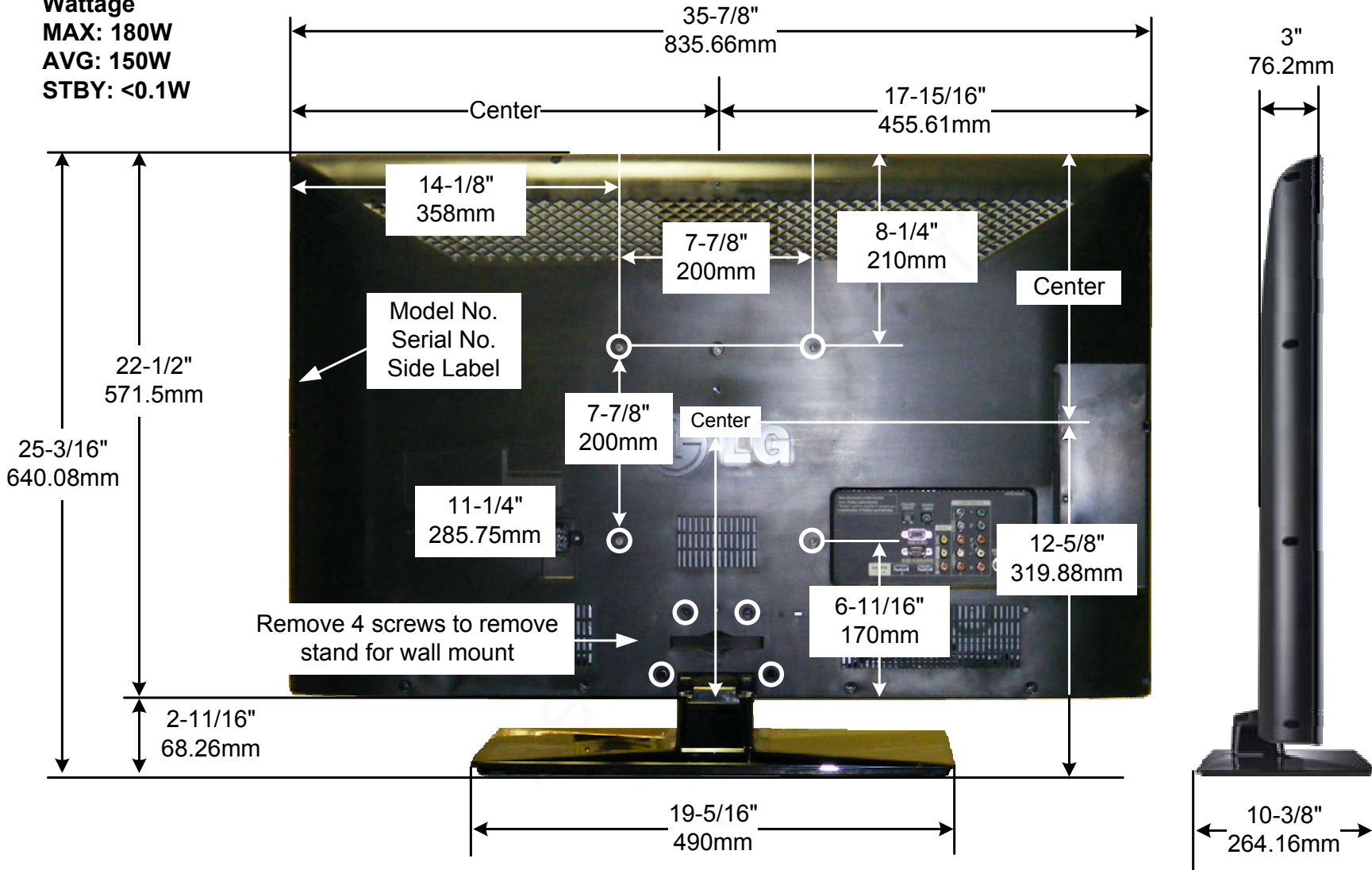
If Item 5 on Adjust Check in the 1st page of the Service Menu shows **PCM**, this shows **NG**.

If **NG** was shown, highlight "**Start**" and press Select on the remote. "**Writing**" appears, then **OK/(AC3)** shows here. Now Item 5 on Adjust Check in the 1st page of the Service Menu shows **EDID AC3**.

If **Reset** is selected, **Erasing** will appear and then this shows "**NG**".

37LK450 Product Dimensions

Wattage
MAX: 180W
AVG: 150W
STBY: <0.1W



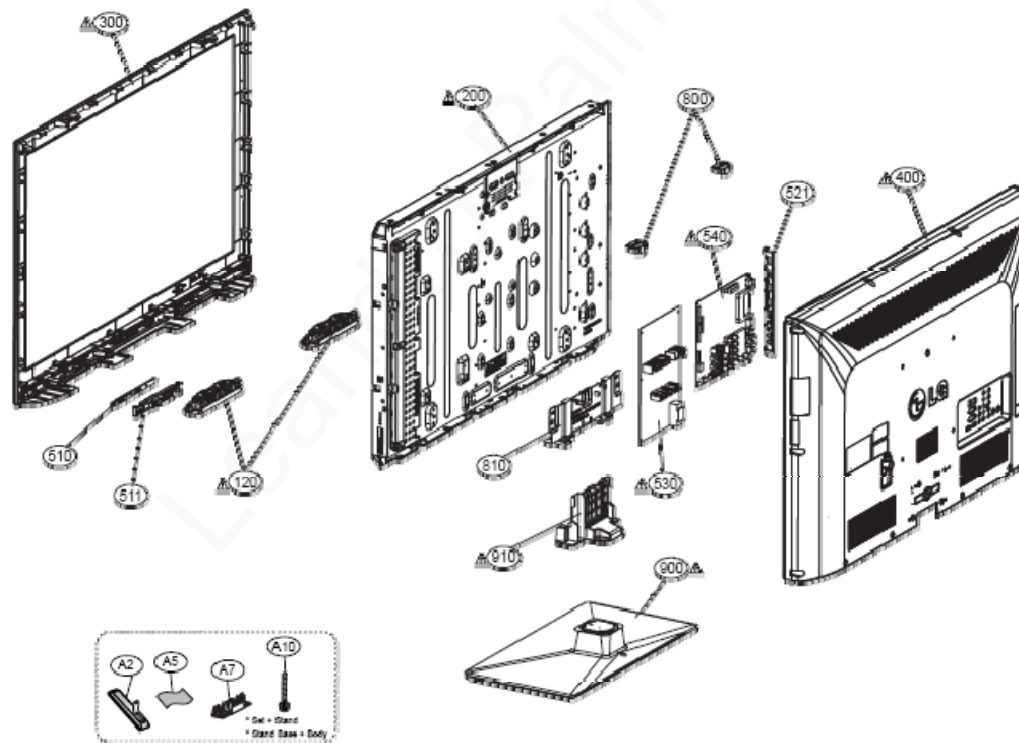
Weight without Stand: 24.5 lb
Weight with Stand: 28.2 lb

DISASSEMBLY SECTION

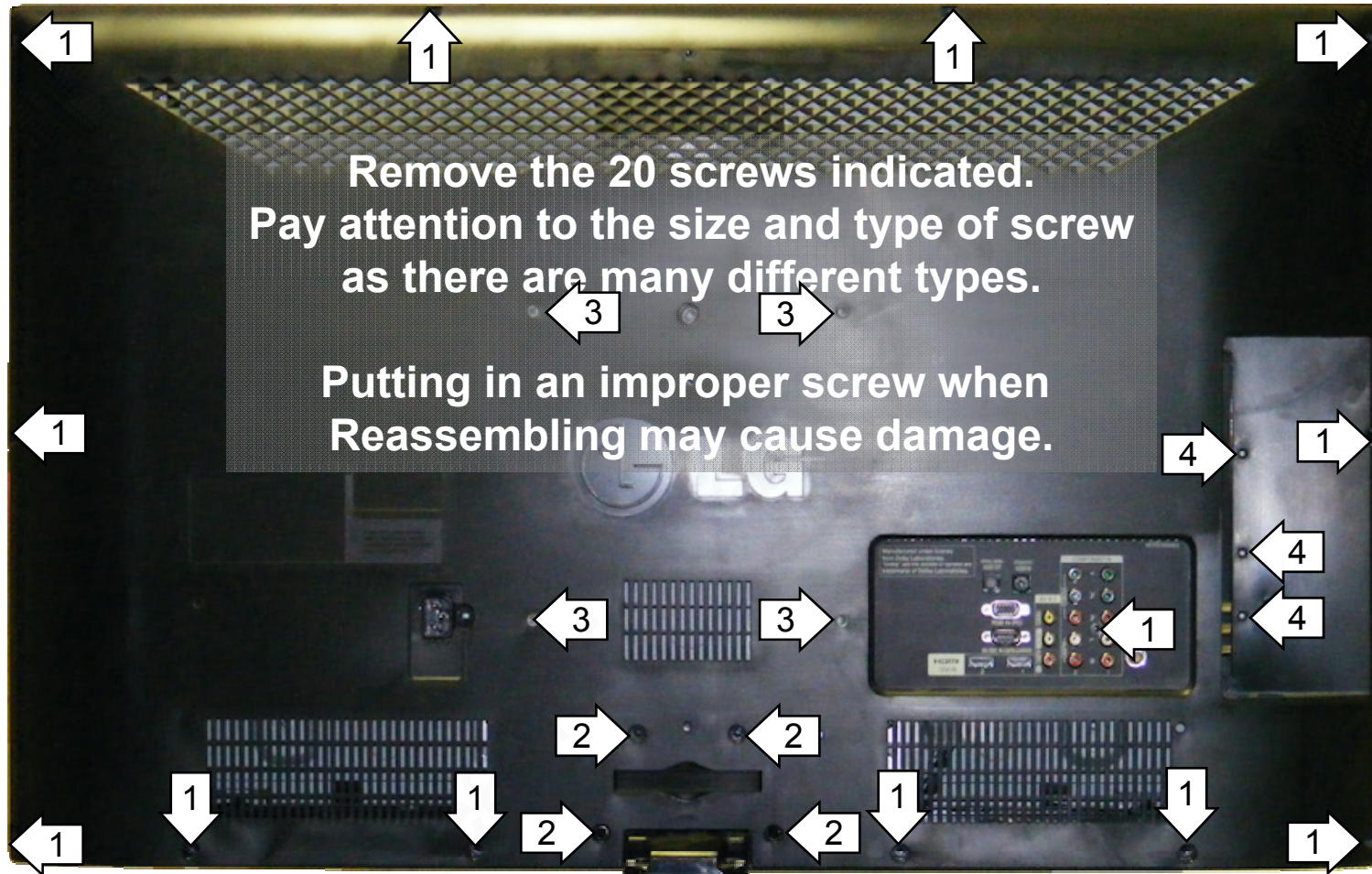
Disassembly:

This section of the manual will discuss Disassembly, Layout (Circuit Board Identification) of the 37LK450 LCD Direct View Television.

Upon completion of this section the Technician will have a better understanding of the disassembly procedures, the layout of the printed circuit boards and be able to identify each board.



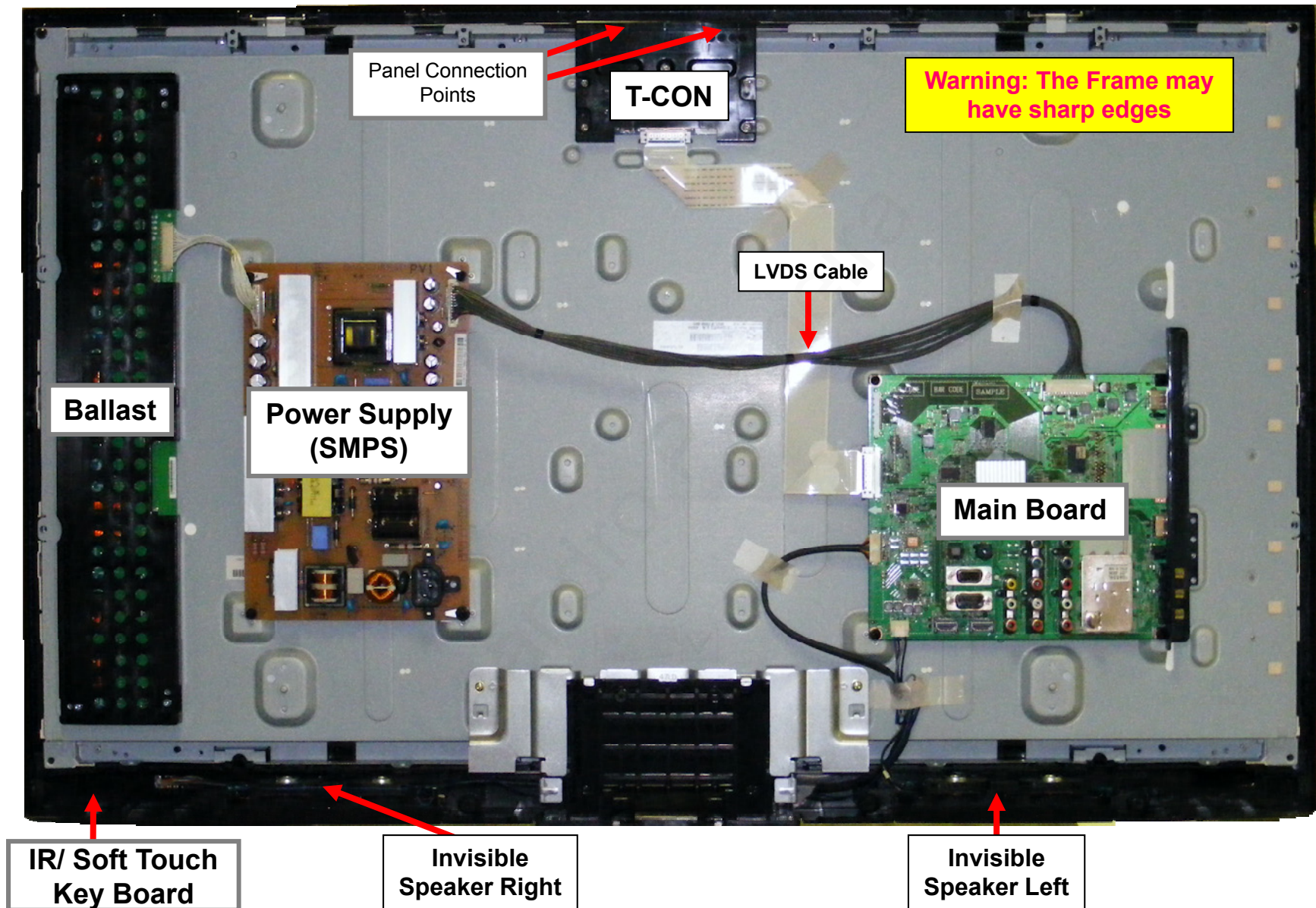
Removing the Back Cover



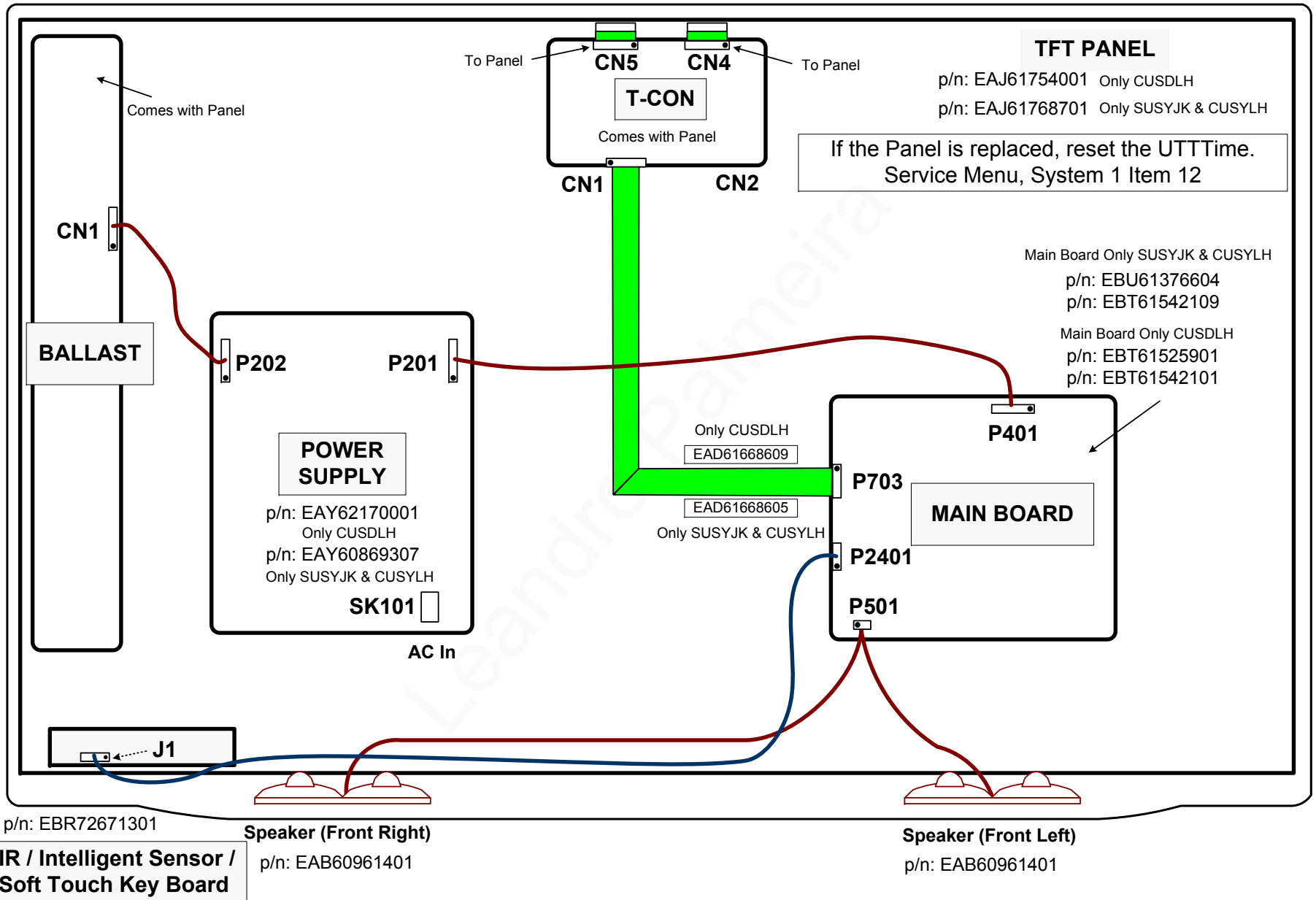
- 1: (12) 10mm plastic tap
- 2: (4) 27mm stand metal thread
- 3: (1) 9mm plastic tap
- 4: (3) 4mm counter sunk
Metal thread

The Stand does not need to be removed before removing the back.

Circuit Board Layout



37LK450 Connector Identification Diagram



Power Supply Board Removal

1

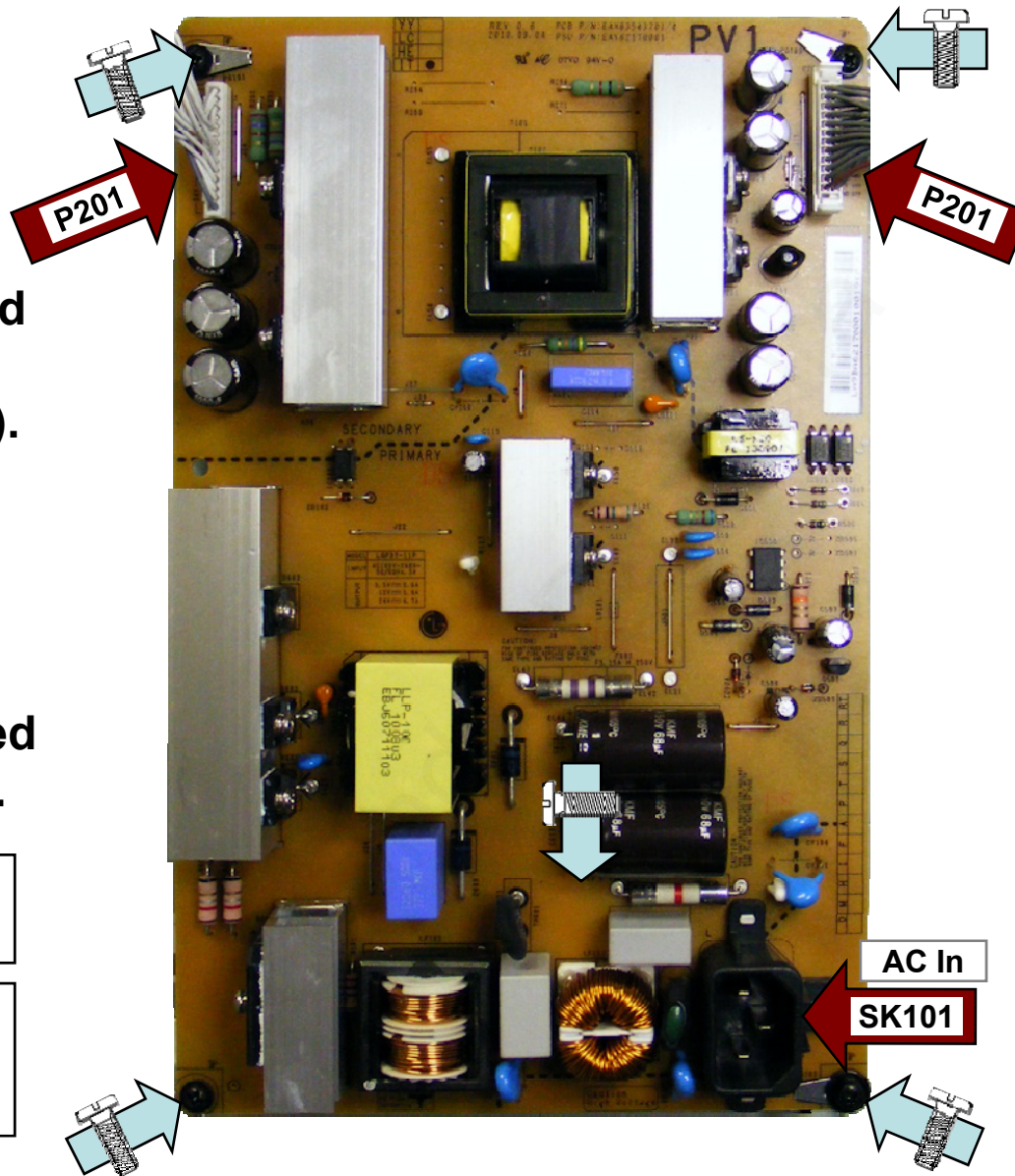
Disconnect P201, P202 and AC In SK101 (If Connected).

2

Remove the 4 screws indicated by the arrows.

p/n: EAY62170001
Only CUSDLH

p/n: EAY60869307
Only SUSYJK & CUSYLH



Press in gently on the two tabs to release lock

Removing the Main Board

p/n: EBR73114006

1

Disconnect P401, P703, P501 and P2401.

2

Remove any tape holding down any cables. Remove the 4 screws indicated by the arrows.

3

Remove the board.

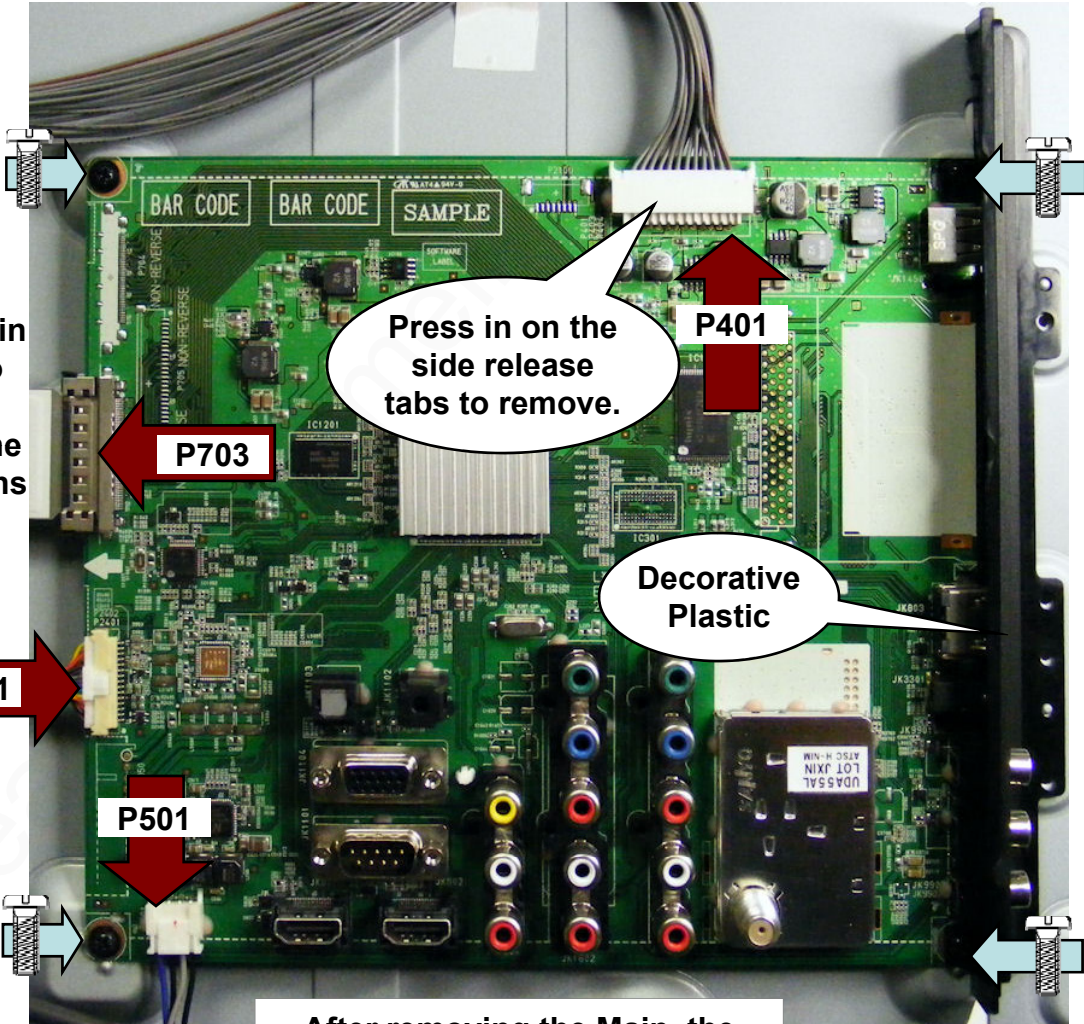
4

Then Remove the decorative Plastic piece.

P703 Press in on the two releasing tabs, pull the LVDS ribbons out.

Press in on the side release tabs to remove.

Decorative Plastic



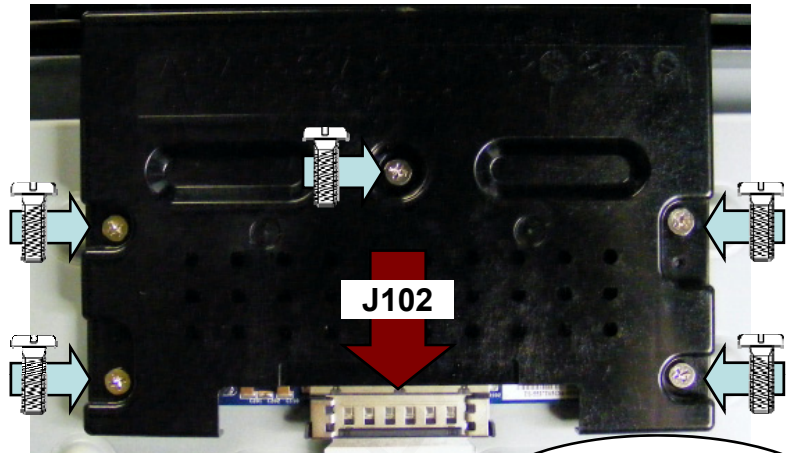
After removing the Main, the decorative plastic piece can be removed.

Removing the T-CON (1 of 2)

Comes with the Panel

1 T-CON is under a Shield.
Remove the T-CON Shield (5 Screws).

See next page for specifics about removing Connectors.

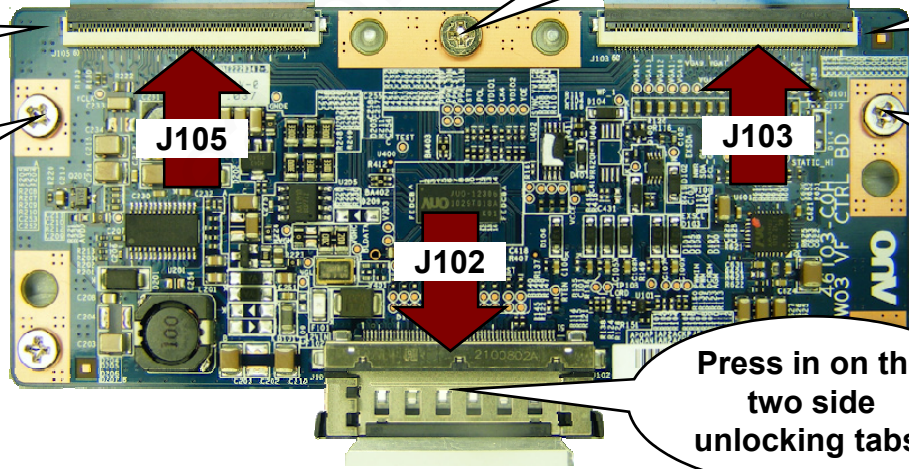


2

Disconnect J102, J103 and J105.

Flip up the unlocking tabs.

Return Screw if testing board.



Return Screw if testing board.

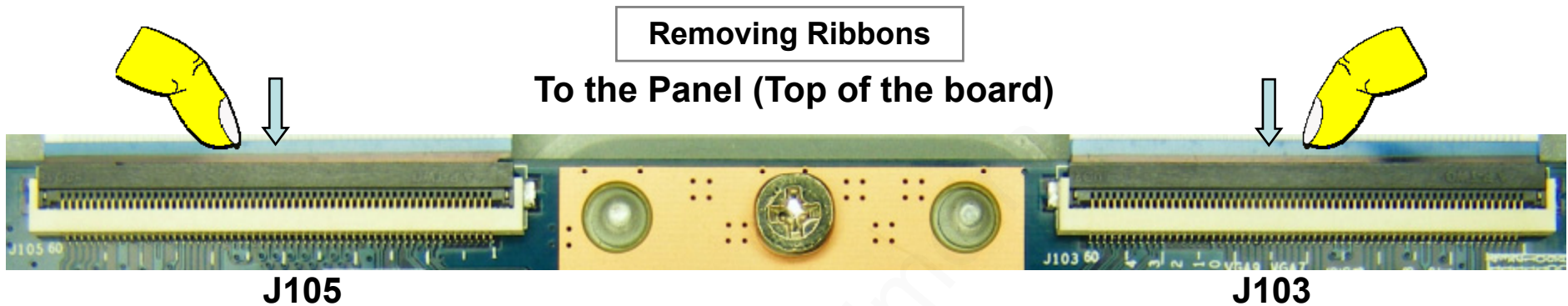
Flip up the unlocking tabs.

Return Screw if testing board.

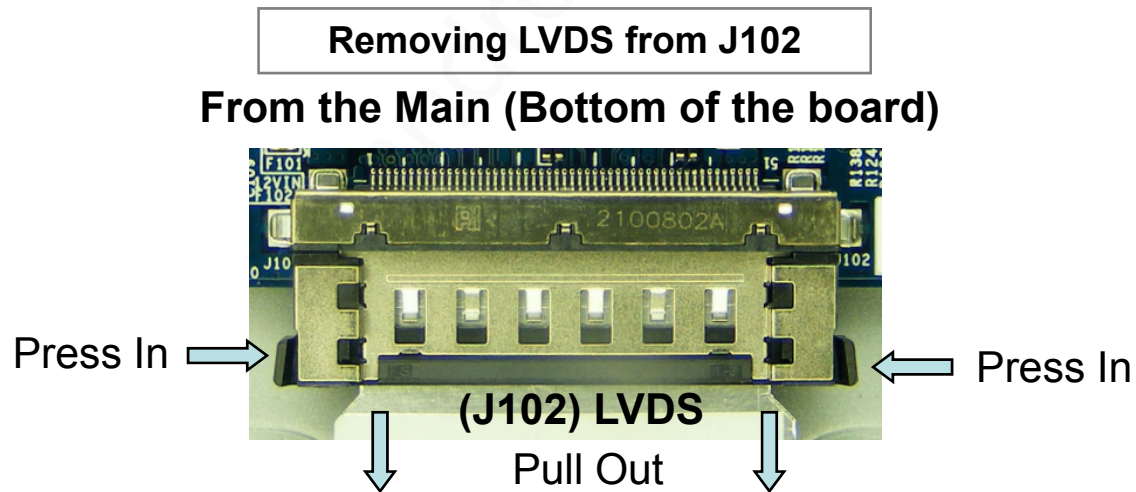
Press in on the two side unlocking tabs.

T-CON Board Removal Continued (2 of 2)

- 3 Flip the locking tabs upward and pull out the ribbon cables.



- 4 To remove the LVDS cables CN1 and CN2; Press in on the two tabs and slowly rock the cable out of the connector. (Shown by the arrows in Figure above)



Removing the Inverter (Ballast)

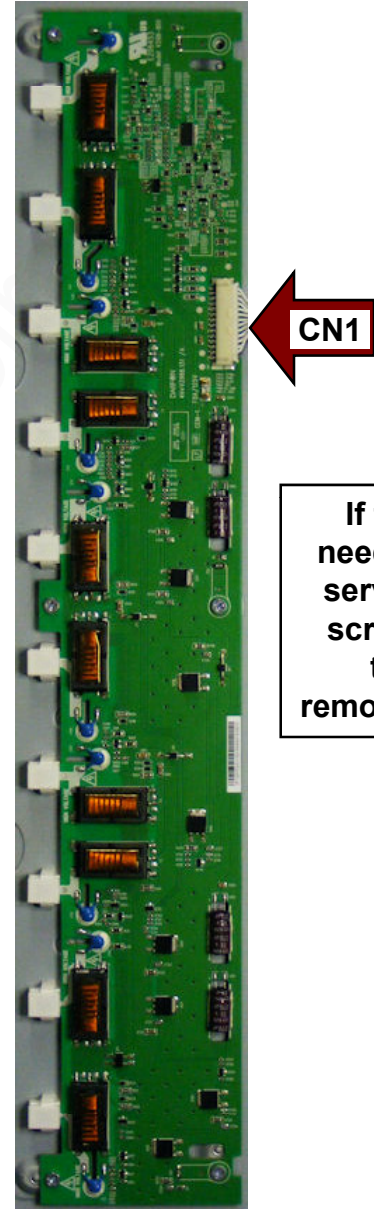
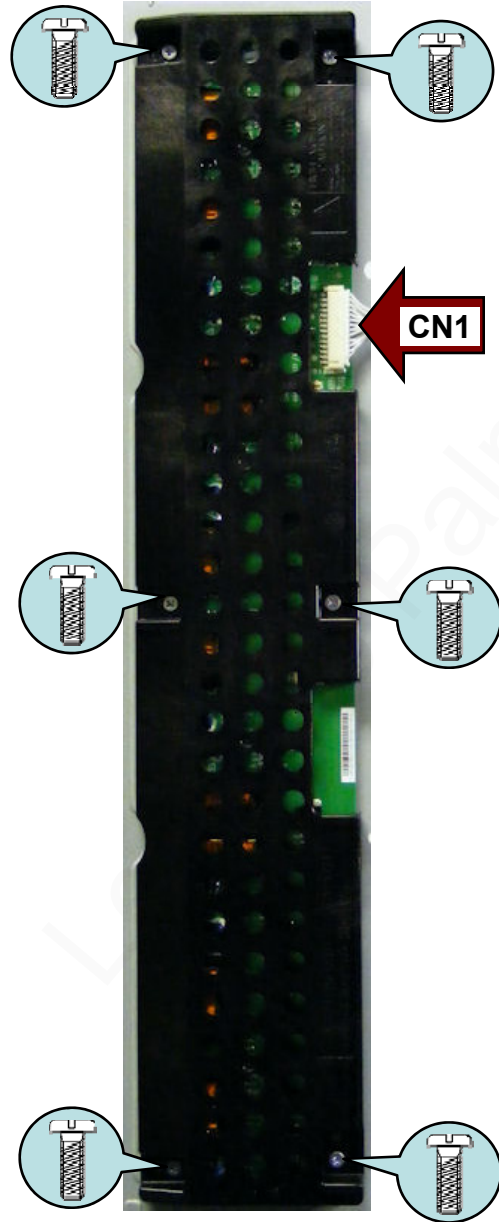
May come with the Panel. Check parts description.

1
Disconnect CN1

2
Remove the 6 screws.

3
Pull off the Shield.

4
Pull off the Ballast by lifting up slightly on the right side and then pulling the board to the right to disengage the bulb connectors.

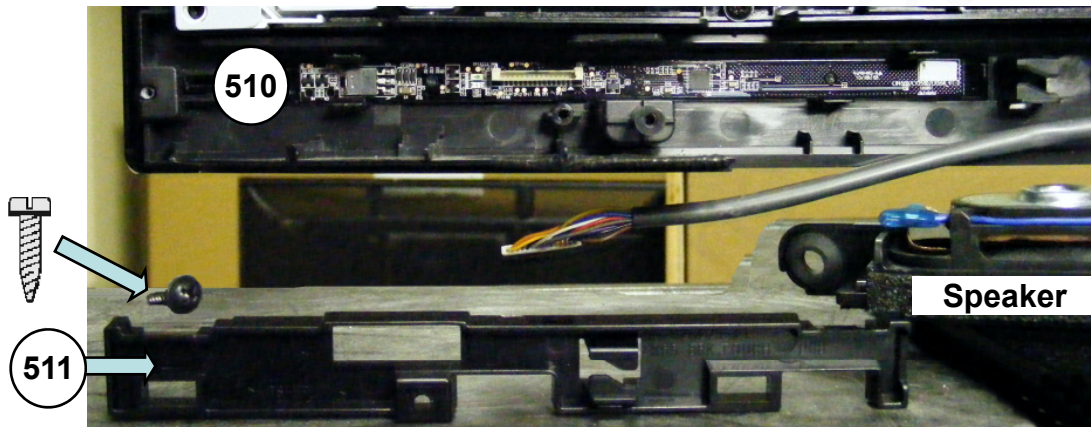
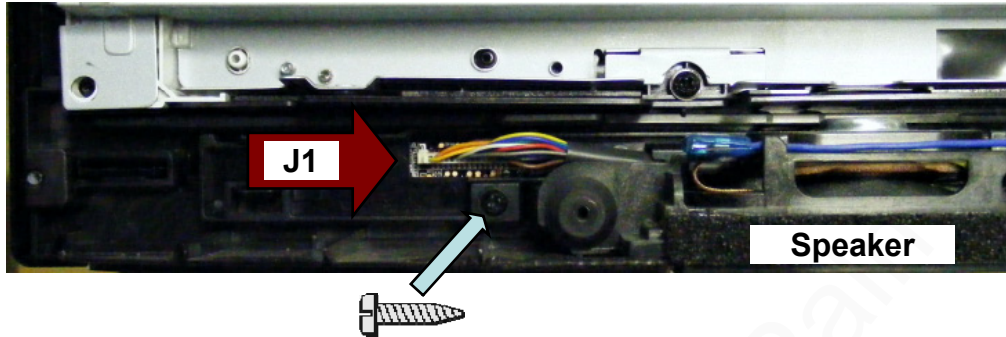


If the Ballast needs testing or service, put the screws back in that were removed in step 2.

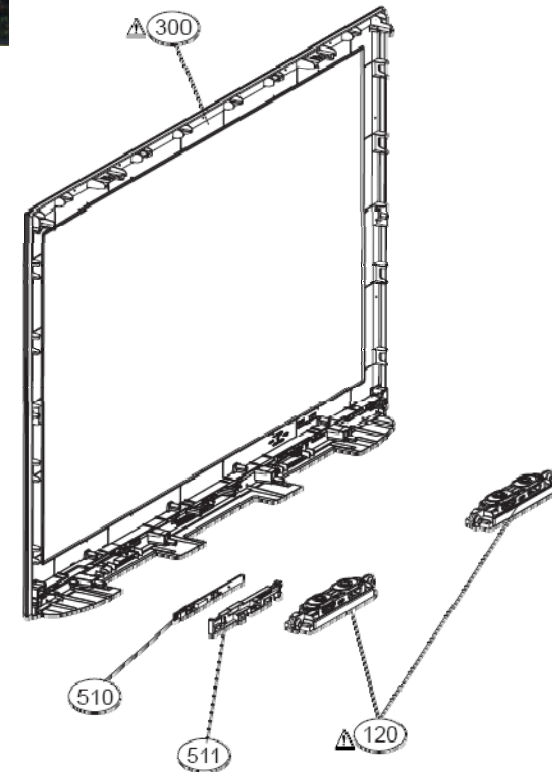
Removing the Front IR

p/n: EBR72671301 Item 510 on the Parts Breakdown

- 1 Remove the left speaker (as viewed from the rear) by pulling it straight out.
- 2 Remove the one Screw and Pull the wire guide Bracket off by releasing the tabs.
- 2 Disconnect the connector J1. (See picture below showing after basic disassembly).



The Front IR/Soft Touch Key board assembly is actually attached to the Front Frame Item 300.



TROUBLESHOOTING SECTION

Troubleshooting:

This section of the manual will discuss troubleshooting.

Upon completion of this section the Technician will have a better understanding of how to diagnosis and resolve problems.

POWER SUPPLY SECTION

This switch mode power supply develops Stand By 3.5V at all times when AC is applied. At power on, it develops 12V and 24V for the Main board. It also develops 24V for the backlight ballast.

This power supply draws less than 1 watt during stand by mode. The fuse F501 reads approximately 163V (from hot ground) during this time. The transformer T501 delivers an AC signal which is rectified by D201 and filtered which generates Stand-By voltage of 3.53V. This is used by the SMPS Controller circuit and is also sent to the Main Board. STBY_3.5V is output P201 pins 9~12 and sent to the P401 on the Main Board.

When the controller chip on the back side of the SMPS receives the PWR-ON command 3.38V via P201 Pin 1, it turns on AC to the bridge rectifier BD101. The primary section increases it's current supplying ability. The Primary fuse F501 now read 387V. 12V and 24V are sent to the Main board via P201 to P401 and 24V is sent to the Ballast via P202 to CN1. But the backlights are not on at this time.

When the SMPS receives the INV_ON/OFF command from the Main board via P201 Pin 18 (3.09V) it routes the INV_On command out P202 to CN1 on the ballast to start driving the backlights. The backlight brightness is controlled by the Main board via P-DIM Pin 22 of P201 and out P202 to CN1.

P201 Connector: (To Main Board)

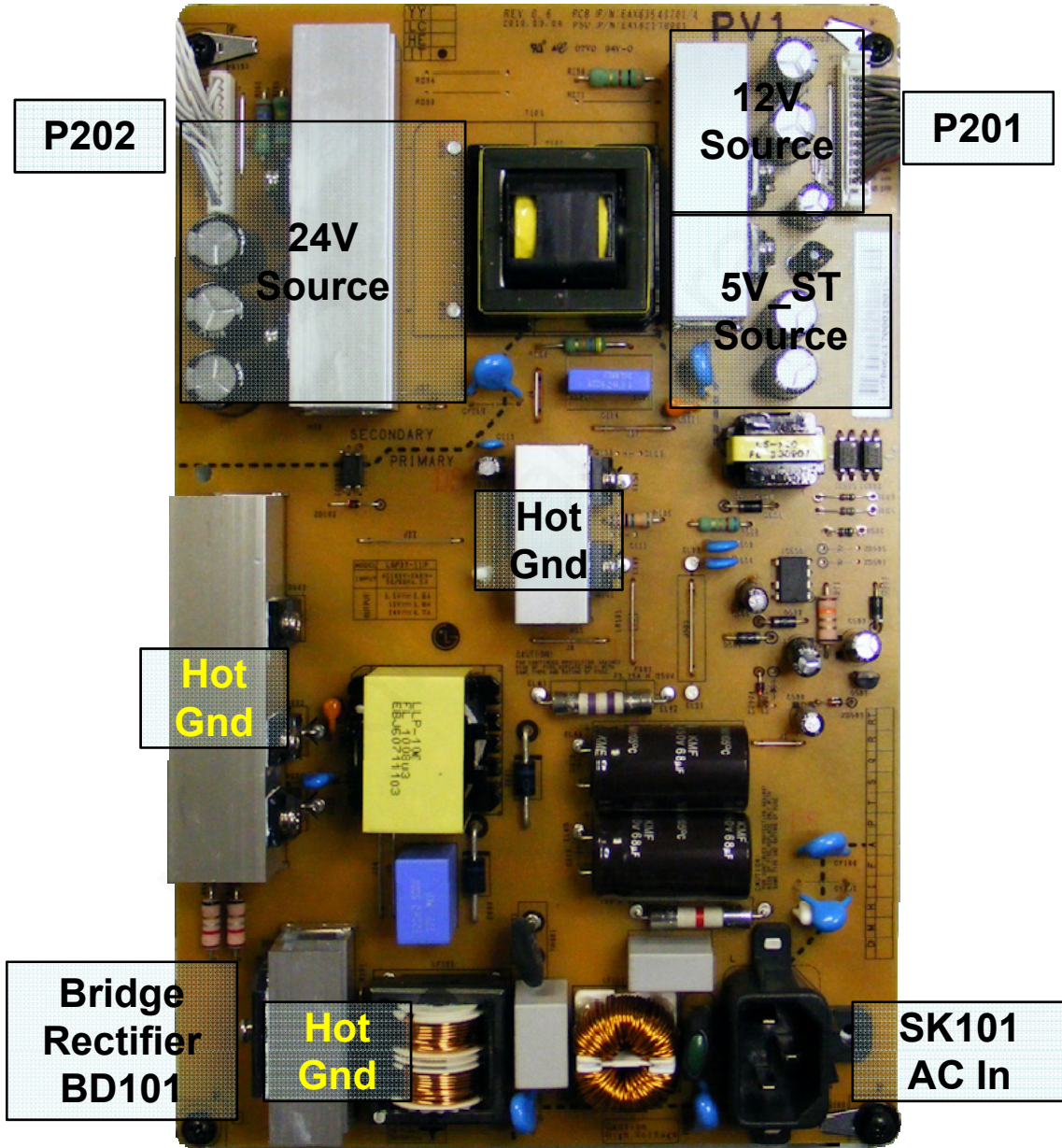
3.5V_ST (3.5V) output P201 pins 9~12
12V (12.23V) output P201 pins 17, 19 and 21
24V (24.17V) output P201 pins 2, 3 and 4.

P202 Connector: (To Ballast)

Delivers 24V the backlight Ballast pins 1~5. (24.17V)

Power Supply (SMPS) Board Layout

p/n EAY62170001



37LK450 SMPS (Power Supply) Drawing

P202 "SMPS Board" To CN1 "Ballast Board"

Pin	Label	STBY	Run	Diode Check
14	EPWM	0V	0.46V~3.2V	OL
13	IPWM	0.02V	3.31V	OL
12	INV_On/Off	0V	3.09V	OL
11	DET	0V	0V	OL
6~10	Gnd	Gnd	Gnd	Gnd
1~5	24V	0.05V	24.17V	1.27V

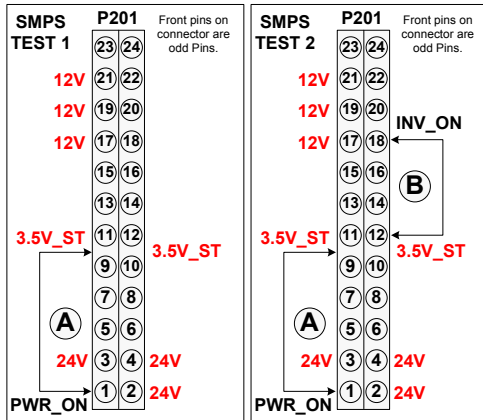
Pin 14 is P_DIM, Pin 13 is A_DIM, Pin 11 is Error.

SMPS TEST 1 : Forcing SMPS On.

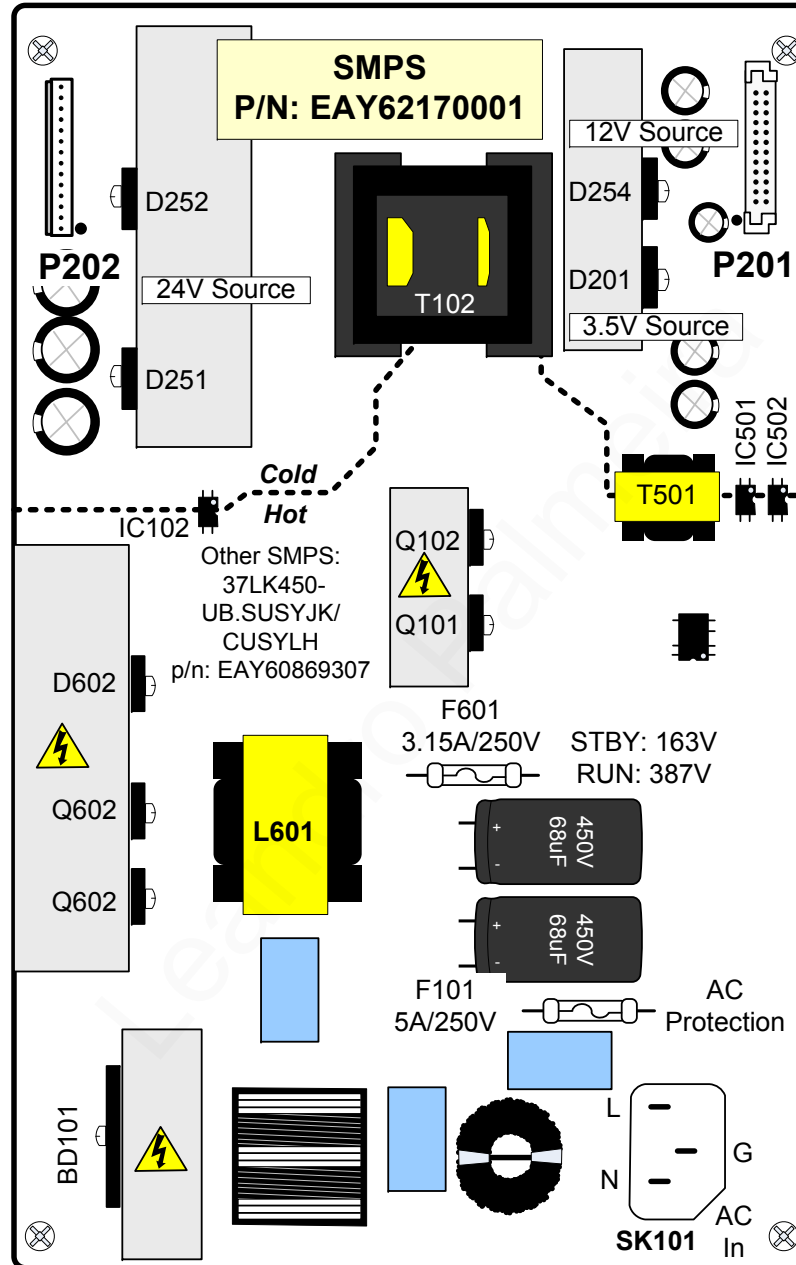
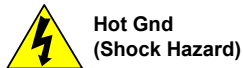
Remove AC Power.
Disconnect **P401** on Main Board.
Jump pin 1 (**PWR_ON**) to pin 9, 10, 11 or 12.
Apply AC Power. This should force the SMPS to the on state. All Voltages should be produced. (24V and 12V to Main). Backlights are not on. The Backlights should come on. Disconnect AC Power.

SMPS TEST 2 : Forcing Backlights On.

Leave connector from Test 1 in place.
Jump pin 18 (**INV_ON**) to pin 9, 10, 11 or 12.
Apply AC Power. This should force the Backlights to come on.



Note: STBY 3.5V Must be present when AC applied.



P201 "SMPS Board" To P401 "MAIN Board"

Pin	Label	STBY	Run	No Load	Diode Check
24	ERROR	0V	0V	0V	OL
23	n/c	n/c	n/c	n/c	OL
22	P-DIM	0.02V	0.46V~3.2V	0V	OL
21	12V	0.06V	12.23V	12.18V	2.09V
20	A-DIM	0.02V	3.31V	0V	OL
19	12V	0.06V	12.23V	12.18V	2.09V
18	INV_On/Off	0.52V	3.09V	0V	OL
17	12V	0.06V	12.23V	12.18V	2.09V
13~16	Gnd	Gnd	Gnd	Gnd	Gnd
9~12	3.5V_STBY	3.53V	3.5V	3.53V	2.62V
5~8	Gnd	Gnd	Gnd	Gnd	Gnd
2~4	24V	0.05V	24.17V	24.36V	1.27V
1	PWER_ON	0V	3.38V	3.53V	1.16V

(1) PWR-On Pin 1: Turns on 12V, 24V to the Main and 24V to the Inverter. (Backlights not on).

(2) INV-On Pin 18: Turns on the Backlights

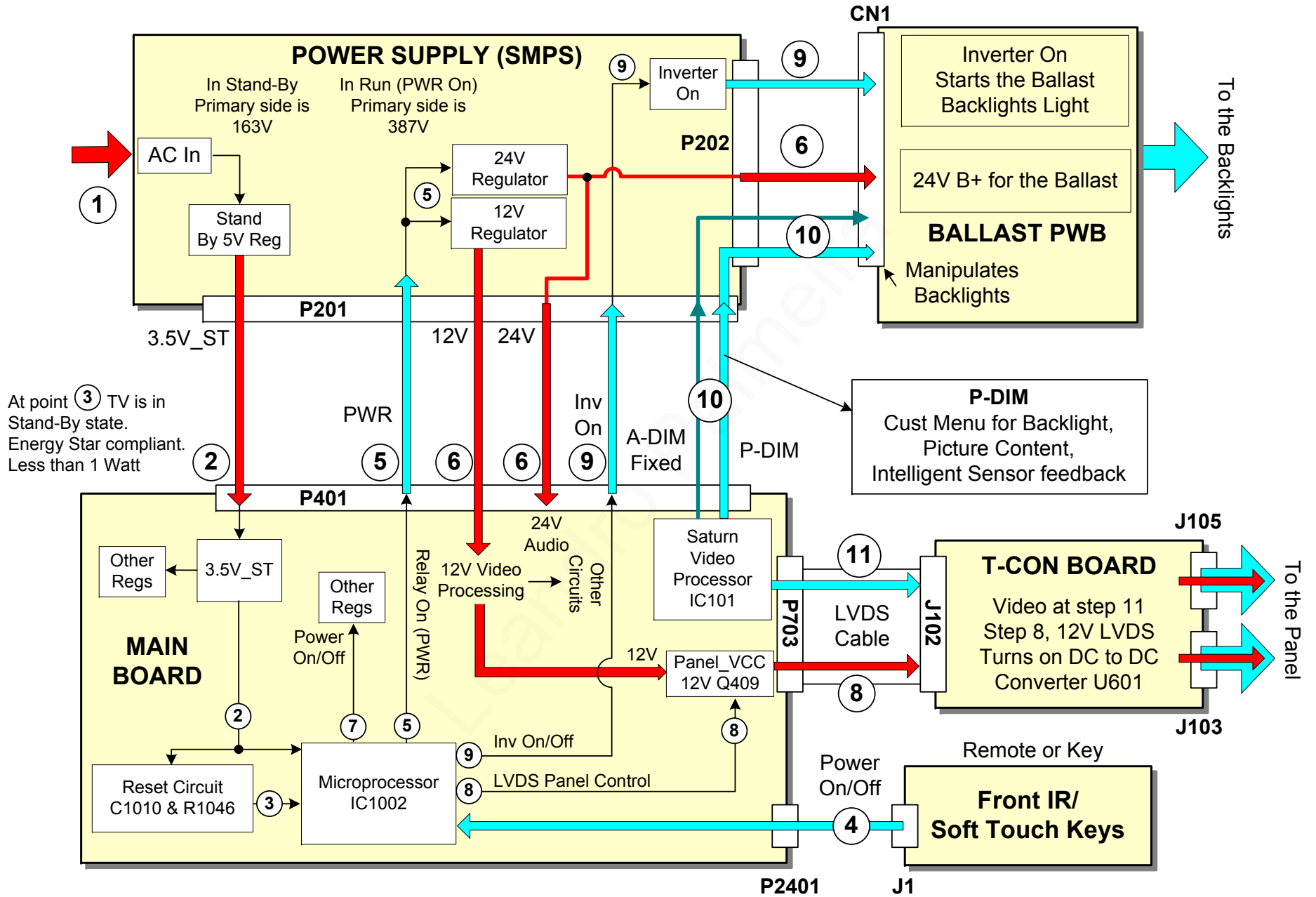
(3) Error_Out Pin 24: Goes high when the backlights are told to come on. Goes back low when they come on. If it goes high again on the 5th attempt to fire the backlights, the set shuts off.

(4) A-DIM Pin 20: Is not used. It is a fixed Voltage.

(5) P-DIM Pin 22 Will vary according to OSD Backlight setting, incoming video IRE level and Ambient room light conditions. It is output from the Video Processor. Range 0.46V to 3.2V.

INPUT	AC100V~240V~50/60Hz. 3A
OUTPUT	3.5V = 2.0A 12V = 3.0A 24V = 4.7A

37LK450 Television Start Up Sequence



37LK450 P401 on Main to SMPS P201 Television Turn On Circuit

THREE STEP TURN ON PROCESS:

Stand-By: STBY_3.5V arrives on main. Powers up Microprocessor IC1002, Reset occurs. Then when a power on from the Key board or IR arrives, a 3 step process begins:

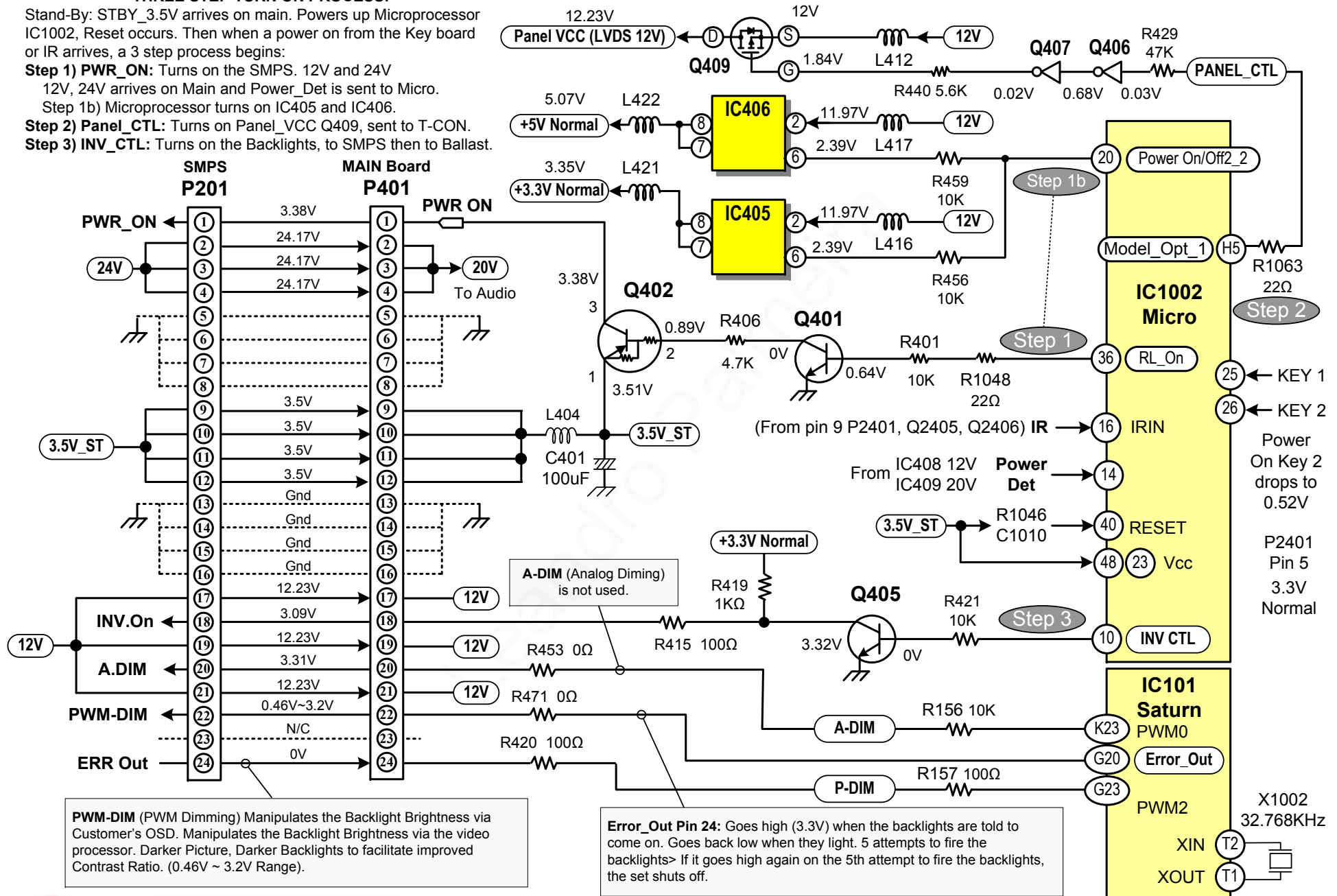
Step 1) PWR_ON: Turns on the SMPS. 12V and 24V

12V, 24V arrives on Main and Power_Det is sent to Micro.

Step 1b) Microprocessor turns on IC405 and IC406.

Step 2) Panel_CTL: Turns on Panel_VCC Q409, sent to T-CON.

Step 3) INV_CTL: Turns on the Backlights, to SMPS then to Ballast.



Power Supply Board Low Voltage Test 1

AC Should not be applied at any time while adding jumpers or While unplugging connectors as damage to the circuit Board July occur.

- a) When AC is applied, the SMPS “MUST” be producing STBY 3.5V on pins 9, 10, 11 or 12 of P201.

If 3.5V Standby is not being generated, the SMPS is defective and must be replaced. There is no need to continue with the next test.

But, make sure AC is arriving at the connector SK101.

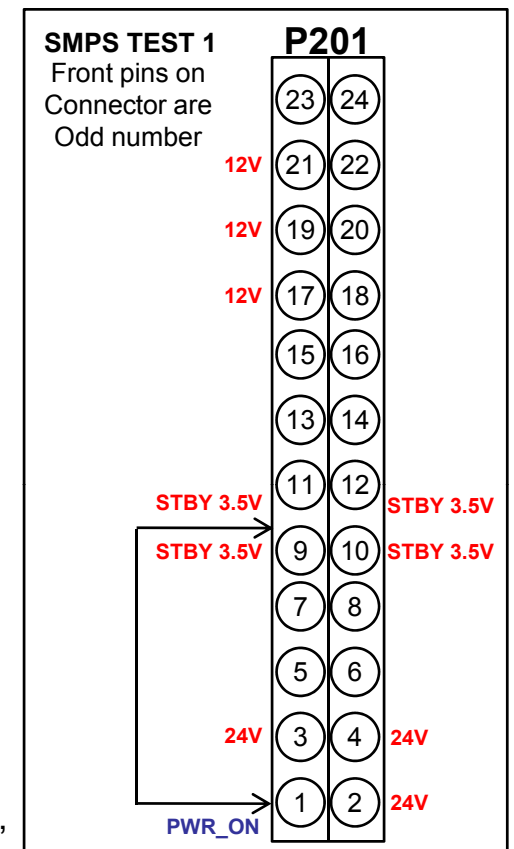
- (b) Unplug P402 on the Main Board to make insertion of the Jumpers easier. Use P402 Side to insert resistors

TEST 1:

- (1) Add a jumper between (3.5V STBY) pin 7, 8, 9 or 10 and Pin 1 (PWR_ON). Apply AC. This will turn on the power supply, relay will click.
- a) Check that the 24V (24.36V) and 12V (12.18V) power supplies are turned on,
- P201 (12V pins 17, 19 and 21)
 - P201 (24V pins 2, 3 and 4)
 - P202 24V (24.36V pins 1~5) to the Ballast.

(2) Remove AC power

No Backlights during this test



Power Supply Board Backlights Test 2

Continue if the 1st test was OK. Leave original jumper in place.

(3) Add another jumper between (STBY_3.5V) pin 9, 10, 11 or 12 and Pin 18 (DRV_ON).

(4) Apply AC Power. Simulating a Power and Backlight On command.

Backlights Normal:

- If normal, the backlights should turn on.
SMPS OK, Inverter OK.

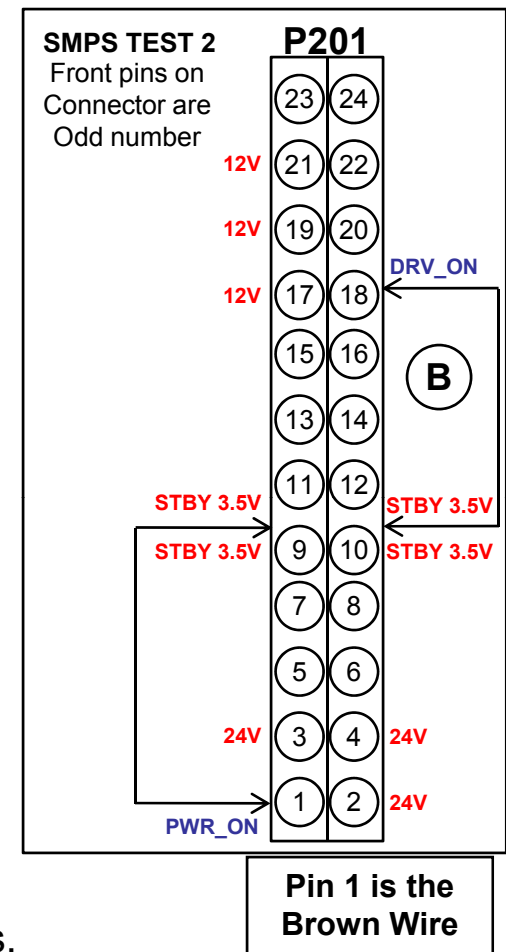
Backlights Abnormal:

- Recheck all connections.
- Confirm the **DRV_ON** line pulling up to at least 3V and 24V is making it to the Inverter.
- Check the connections to the Panel Backlights.

If the DRV_On command is pulling up to at least 3V and the 24V is reaching the Inverter, see the Ballast section for additional checks.

Note: If any of the backlights are disconnected, the backlights will come on, The Error line will go high, then the backlights shut off in 20 seconds.

REMOVE AC POWER and ALL JUMPERS. Reinsert P401 to the Main board:

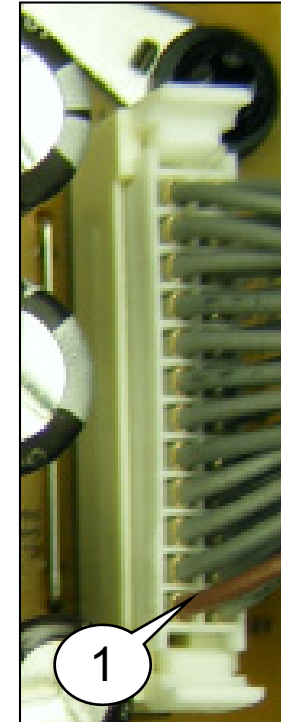


P201 Power Supply Connector Voltage and Diode Check

P201 "SMPS Board" To P401 "MAIN Board"

Pin	Label	STBY	Run	No Load	Diode Check
24	ERROR	0V	0V	0V	OL
23	n/c	n/c	n/c	n/c	OL
22	P-DIM	0.02V	0.46V~3.2V	0V	OL
21	12V	0.06V	12.23V	12.18V	2.09V
20	A-DIM	0.02V	3.31V	0V	OL
19	12V	0.06V	12.23V	12.18V	2.09V
18	INV-ON/OFF	0.52V	3.09V	0V	OL
17	12V	0.06V	12.23V	12.18V	2.09V
13-16	Gnd	Gnd	Gnd	Gnd	Gnd
9-12	3.5V (Stby)	3.53V	3.5V	3.53V	2.62V
5-8	Gnd	Gnd	Gnd	Gnd	Gnd
2-4	24V	0.05V	24.17V	24.36V	1.27V
1	PWR_ON	0V	3.38V	3.53V	1.16V

P201 Connector



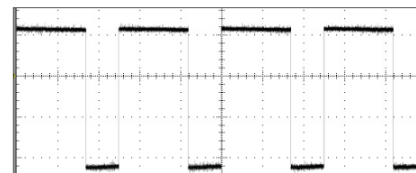
Odd pins
are on top
row

PWR_ON Pin 1: This turns on the 12V and 24V line. Also the 24V to the Ballast out P202 pins 1~5.

INV-On/Off Pin 18: This turns on the Ballast.

ERROR Pin 24: If this line is high, the Set shuts off.

PDIM1 Pin 22 can vary according to incoming video IRE level, OSD Backlight setting and then Intelligent Sensor (room light condition) Output from the Video Processor IC101. Range 0.34V to 3.2V.



P-DIM1
3.66V p/p 50IRE

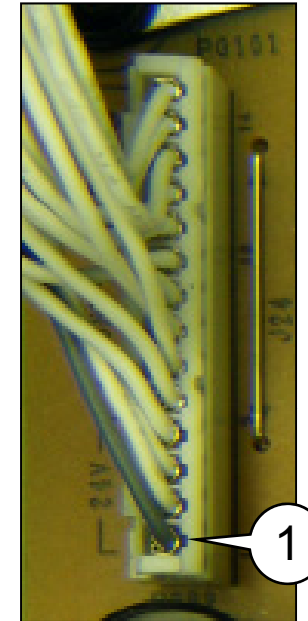
Diode Mode values taken with all Connectors Removed

P202 Power Supply Connector Voltage and Diode Check

P202 "SMPS Board" To CN1 "Ballast"

Pin	Label	STBY	Run	Diode Check
14	PWM_DIM	0V	0.46V~2.3V	OL
13	A_DIM	0.02V	3.31V	OL
12	INV_On/Off	0V	3.09V	OL
11	ERROR	0V	0V	OL
6~10	Gnd	Gnd	Gnd	Gnd
1~5	24V	0.05V	24.17V	1.27V

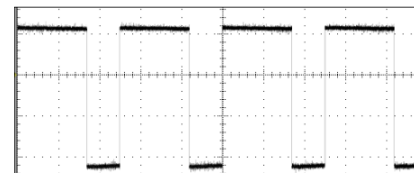
P202 Connector



INV-On/Off Pin 12: This turns on the Ballast Backlight drive signal.

ERROR Pin 11: If this line is high, the Set shuts off.

PWM_DIM Pin 14 can vary according to incoming video IRE level, OSD Backlight setting and then Intelligent Sensor (room light condition) Output from the Video Processor IC101. Range 0.34V to 3.2V.



P-DIM1
3.66V p/p 50IRE

Diode Mode values taken with all Connectors Removed

SK100 and AC Fuse Power Supply Voltage and Diode Check

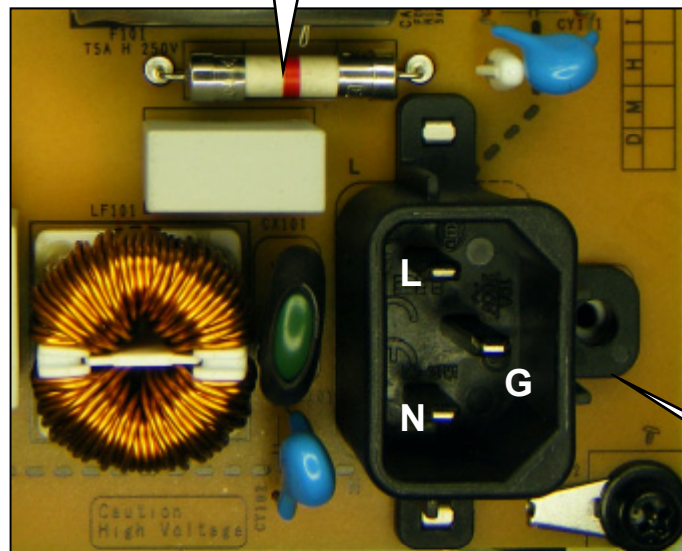
SK100 "SMPS" to AC IN

Label	STBY	Run	Diode Check
L	120Vac		OL
N	0V		OL

AC Voltage Readings (From Hot Ground)
Pins 1 and 2 for STBY and RUN.

F100
5A/250V
AC IN

F100



Bottom Right of SMPS

SK101

F100 (Diode Check)
Red Lead on Fuse (Open)
Black Lead on Fuse (0.57V)

Other Lead on Hot Ground

Diode Mode values taken with all Connectors Removed

F501 Power Supply Fuse Voltage Checks

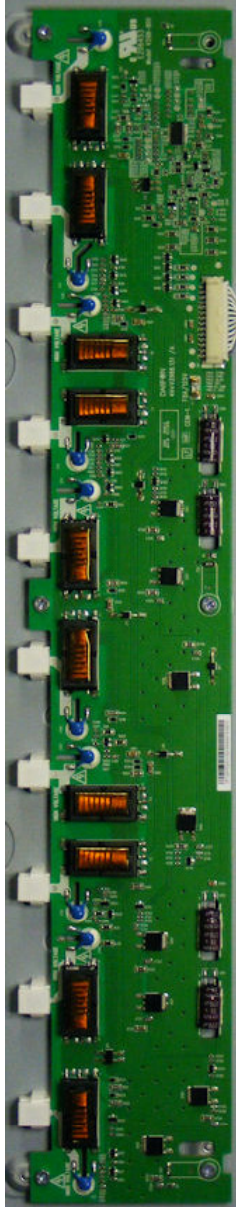


F501
3.15A/250V

From Hot Gnd
STBY 167.9V
Run 390V

If the set was on and then turned off, the voltage takes a while to bleed down.

BACKLIGHT SECTION



The Ballast is responsible for developing 2.9Kv of drive signal to the 10 CCFL backlight bulbs. There is a transformer for each bulb which steps up the input drive signal sufficiently to drive the backlights.

Input Voltage: 24V from the SMPS

Backlight Turn On Signal:

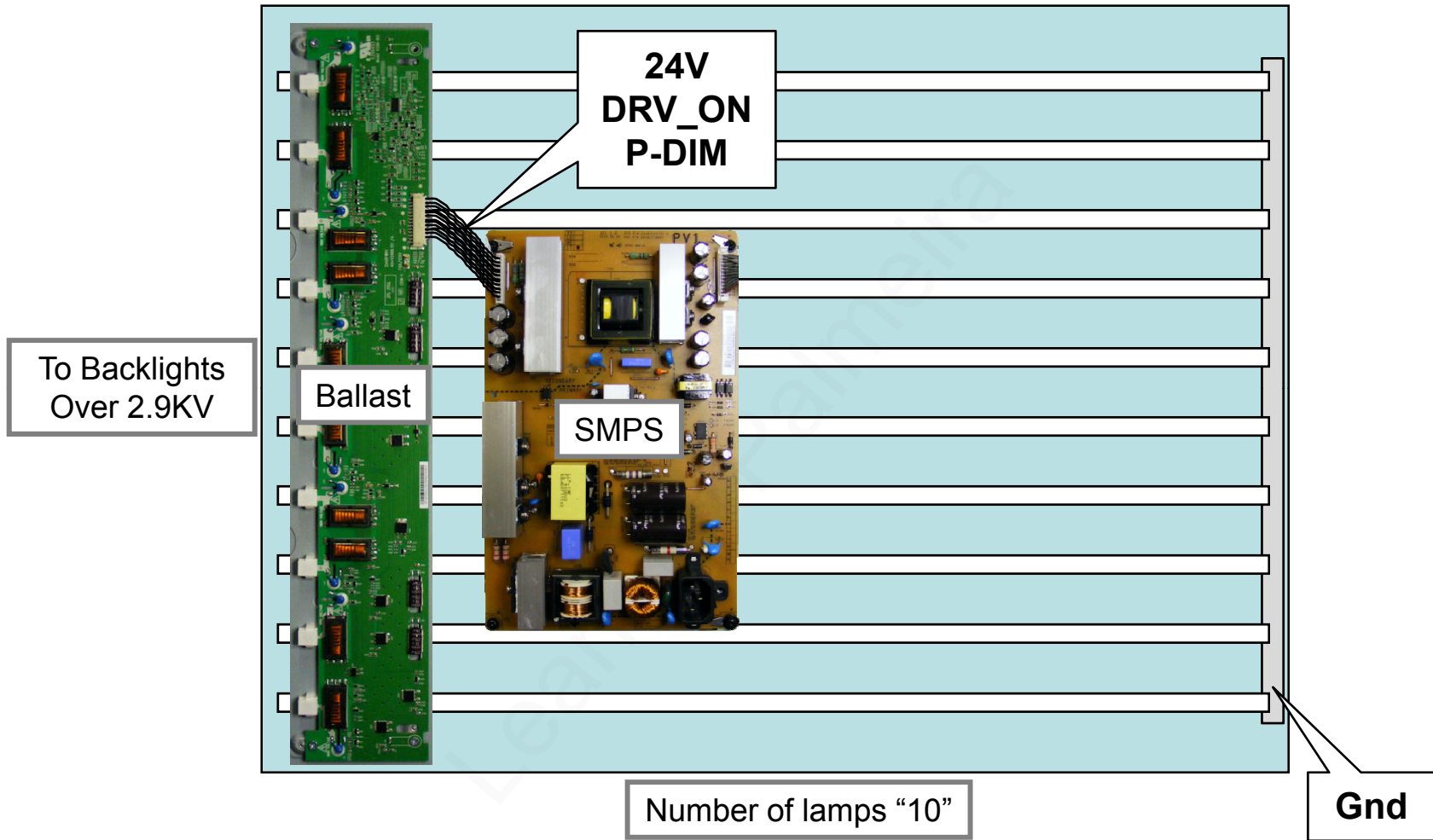
BLON (INVERTER ON/OFF): Supplied from the Main board through the Power Supply.

Backlight Brightness Control Signal:

EPWM (PWM-DIM/P-DIM): Supplied from the Main board through the Power Supply.

DET (ERROR):

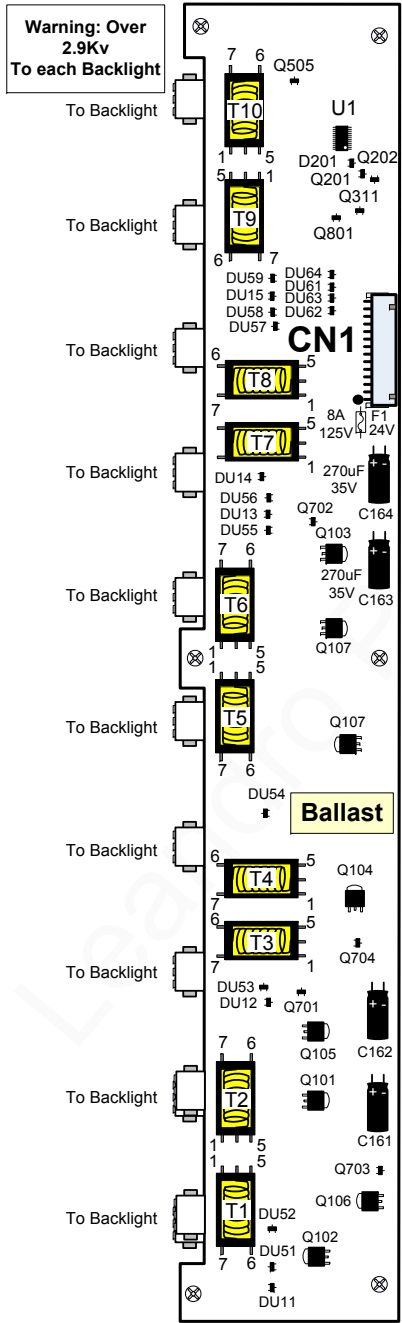
Backlight Configuration



CCFL (Cold Cathode Fluorescent Lamps)

37LK450 Ballast (Inverter) Drawing

Q101 PIN Run 1) 10.86V 2) 24V 3) 8.96V	Q701 PIN Run B) 11.03V C) 8.97V E) 10.87V	DU52 PIN Run 1) 0V 2) 0.8V 3) 2.6V
Q102 PIN Run 1) 3.17V 2) 8.9V 3) 0V	Q702 PIN Run B) 11.43V C) 9.08V E) 3.14V	DU53 PIN Run 1) 0V 2) 1.66V 3) 2.63V
Q103 PIN Run 1) 11.23V 2) 24V 3) 9.07V	Q703 PIN Run B) 3.29V C) 0V E) 3.16V	DU54 PIN Run 1) 2.6V 2) 0.9V 3) 2.66V
Q104 PIN Run 1) 3.14V 2) 9.08V 3) 0V	Q704 PIN Run B) 3.27V C) 0V E) 3.14V	DU5 PIN Run 1) 0V 2) 1.6V 3) 2.61V
Q105 PIN Run 1) 10.86V 2) 24V 3) 10.86V	Q801 PIN Run B) 5V C) 0V E) 0V	DU5 PIN Run 1) 0V 2) 1.26V 3) 2.61V
Q106 PIN Run 1) 0V 2) 8.9V 3) 0V	D201 PIN Run 1) 15.49V 2) 5.48V 3) 14.59V	DU5 PIN Run 1) 0V 2) 0.91V 3) 2.65V
Q107 PIN Run 1) 11.27V 2) 24V 3) 9.08V	DU11 PIN Run 1) 0V 2) 1.58V 3) 0V	DU5 PIN Run 1) 0V 2) 1.23V 3) 2.66V
Q108 PIN Run 1) 3.15V 2) 9.06V 3) 0V	DU12 PIN Run 1) 0V 2) 1.59V 3) 0V	DU5 PIN Run 1) 0V 2) 1.41V 3) 2.66V
Q201 PIN Run B) 0V C) 1.49V E) 0V	DU13 PIN Run 1) 0V 2) 1.57V 3) 0V	DU6 PIN Run 1) 0V 2) 0V 3) 24.12V
Q202 PIN Run B) 2.9V C) 0V E) 0V	DU14 PIN Run 1) 0V 2) 1.6V 3) 0V	DU6 PIN Run 1) 0V 2) 3.09V 3) 24.12V
Q311 PIN Run B) 0.58V C) 0.06V E) 0V	DU15 PIN Run 1) 0V 2) 1.54V 3) 0V	DU6 PIN Run 1) 0V 2) 3.32V 3) 24.12V
Q505 PIN Run B) 0V C) 1.51V E) 0V	DU51 PIN Run 1) 2.6V 2) 0.52V 3) 0V	DU6 PIN Run 1) 0V 2) 3.15V 3) 24.12V

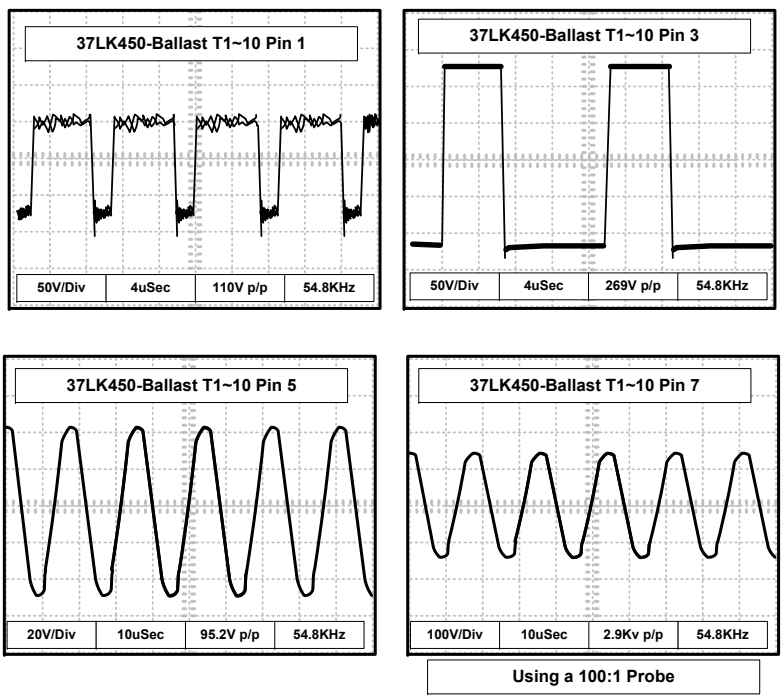


PIN Run	PIN Run		PIN Run	PIN Run
1) 15.41V	7) 5.48V		13) 1.04V	19) 0V
2) 9.12V	8) 2.9V		14) 1.98V	20) 0V
3) 9.12V	9) 14.41V		15) 0.1V	21) 1.36V
4) 0V	10) 14.44V		16) 1.44V	22) 0V
5) 3.28V	11) 1.48V		17) 1.48V	23) 9.06V
6) 3.3V	12) 0V	18) 2.33V	24) 14.7V	

P202 "SMPS Board" To CN1 "Ballast Board"

Pin	Label	STBY	Run	Diode Check
14	EPWM	0V	0.46V~3.2V	OL
13	IPWM	0.02V	3.31V	OL
12	INV_On/Off	0V	3.09V	OL
11	DET	0V	0V	OL
6~10	Gnd	Gnd	Gnd	Gnd
1~5	24V	0.05V	24.17V	1.27V

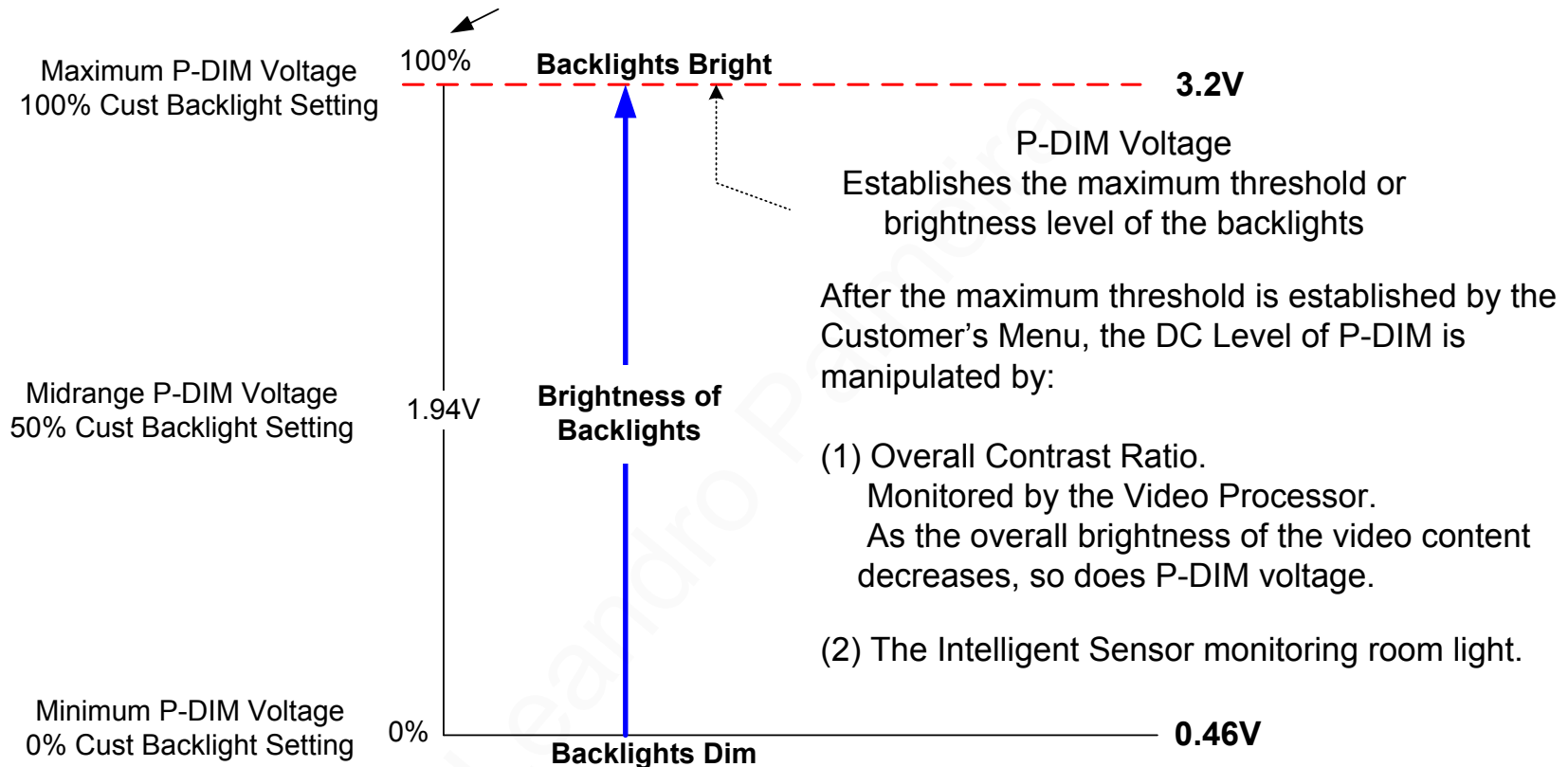
Pin 14 is P_DIM, Pin 13 is A_DIM, Pin 11 is Error.



P-DIM (Global Dimming) Explained:

P-DIM (May also be called PWM-DIM, VBR-B, PDS, BCM-VBR-B or BR-B)

The Video Processor has the output that controls P-DIM. If the Microprocessor is separate from the video processor, then the customer's menu Backlights setting is communicated to the video processor via I2C.



Brightness and Contrast adjustments do not affect P-DIM

Analog Dimming is not used, it is open on the Main Board.

It is a fixed voltage on the SMPS. May also be called BR1, VBR-A, BCM-VBR-A, ADM

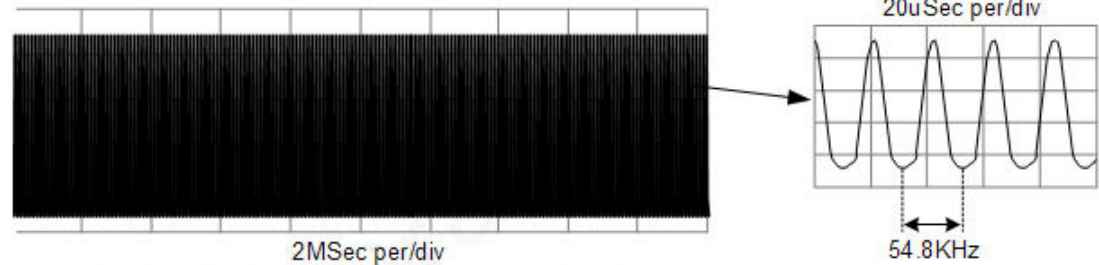
Power Supply Backlight Drive Signal Effects

Waveform taken from Ballast Transformer on the Primary Side Pin 5. Slow scope setting to 2mS to see PWM results. The PWM amount may make it difficult to take a frequency measurement.

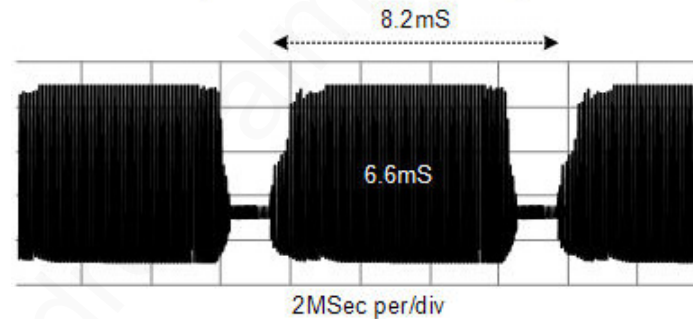
P-DIM P201 pin 22
PWM_DIM manipulates the Burst Triangle Oscillator in the ballast drive IC.

A-DIM P201 pin 20
(IDIM) CN1 pin 13 also **manipulates** the Burst Triangle Oscillator
But it is not used.

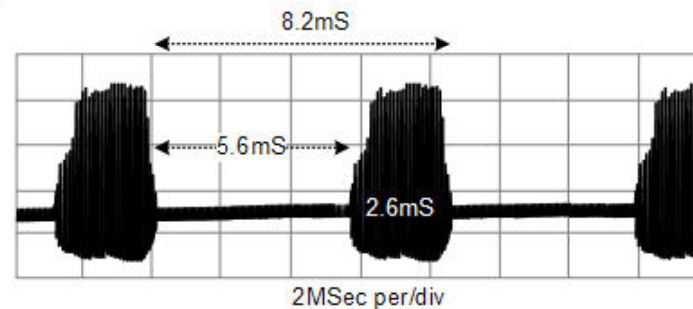
100% on Backlight Bar In Customer's OSD
(3.2V PDIM Pin 22 P201)



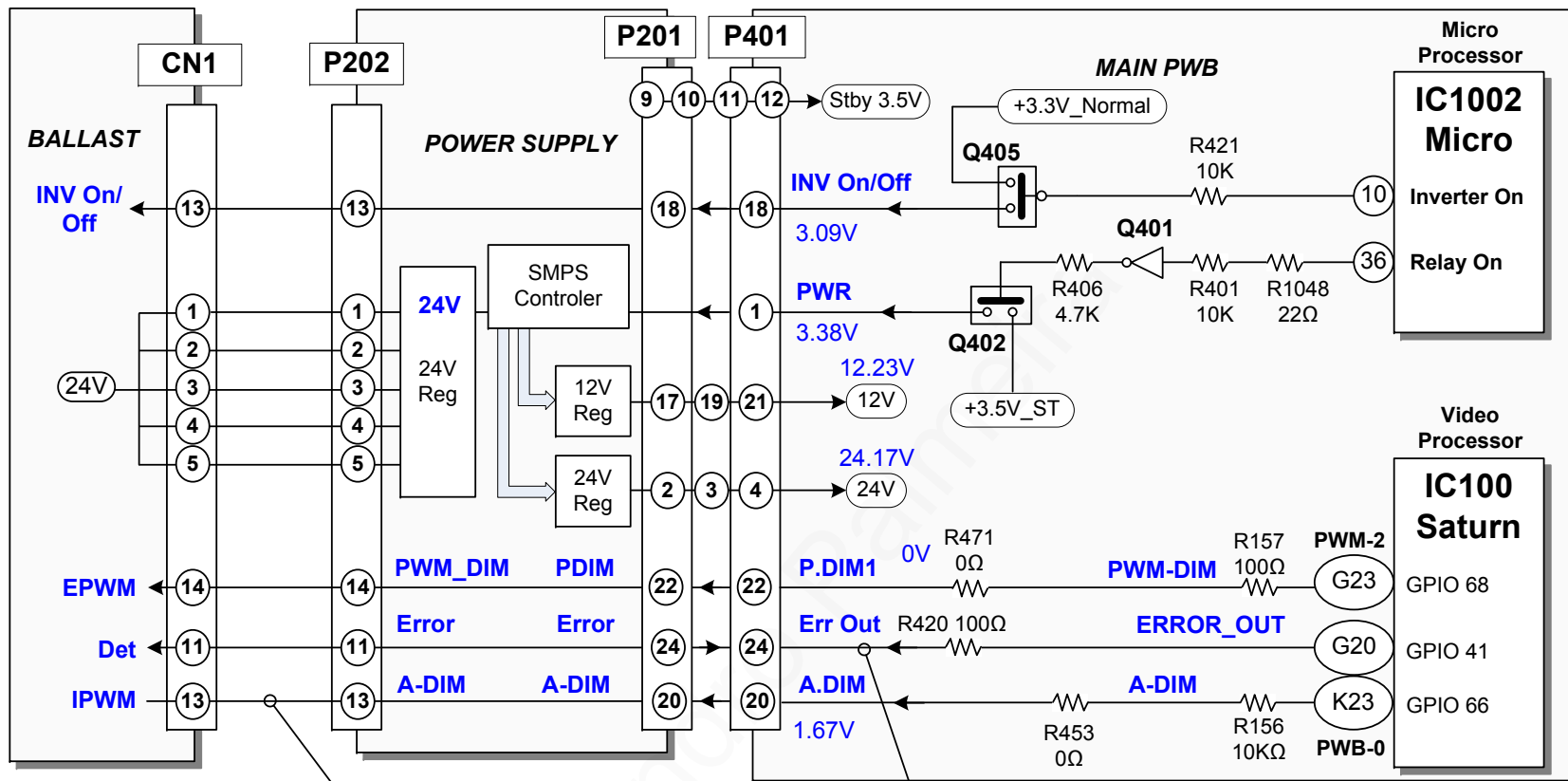
80% on Backlight Bar In Customer's OSD
(2.8V PDIM Pin 22 P201)



10% on Backlight Bar In Customer's OSD
(0.91V PDIM Pin 22 P201)



37LK450 Main Board to Ballast Turn On Commands



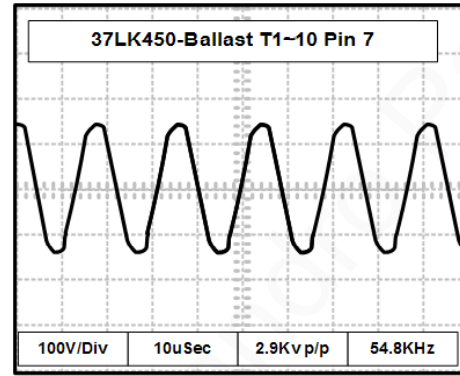
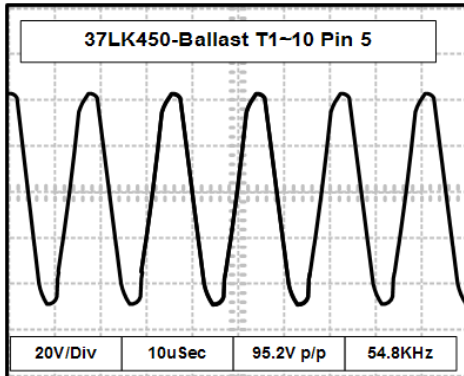
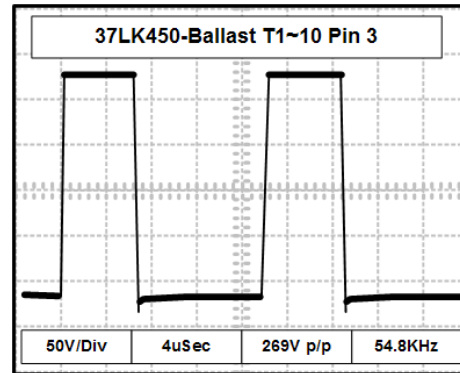
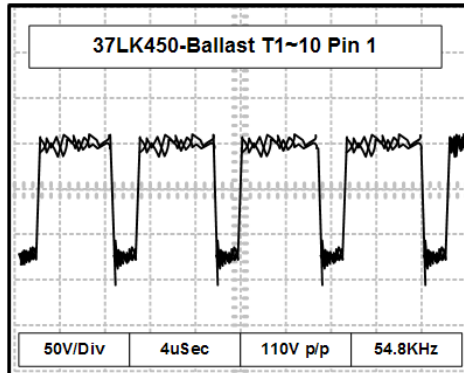
PWM-DIM (PWM Dimming) Manipulates the Backlight Brightness via Customer's OSD. Manipulates the Backlight Brightness via the video processor IC100. Darker Picture, Darker Backlights to facilitate improved Contrast Ratio. 0.46V~3.2V Range

VBR-A (Analog Dimming) Manipulates the Backlight Brightness as well. But this line is not used.

Ballast Section Waveform

There are 10 transformers like the one shown here.

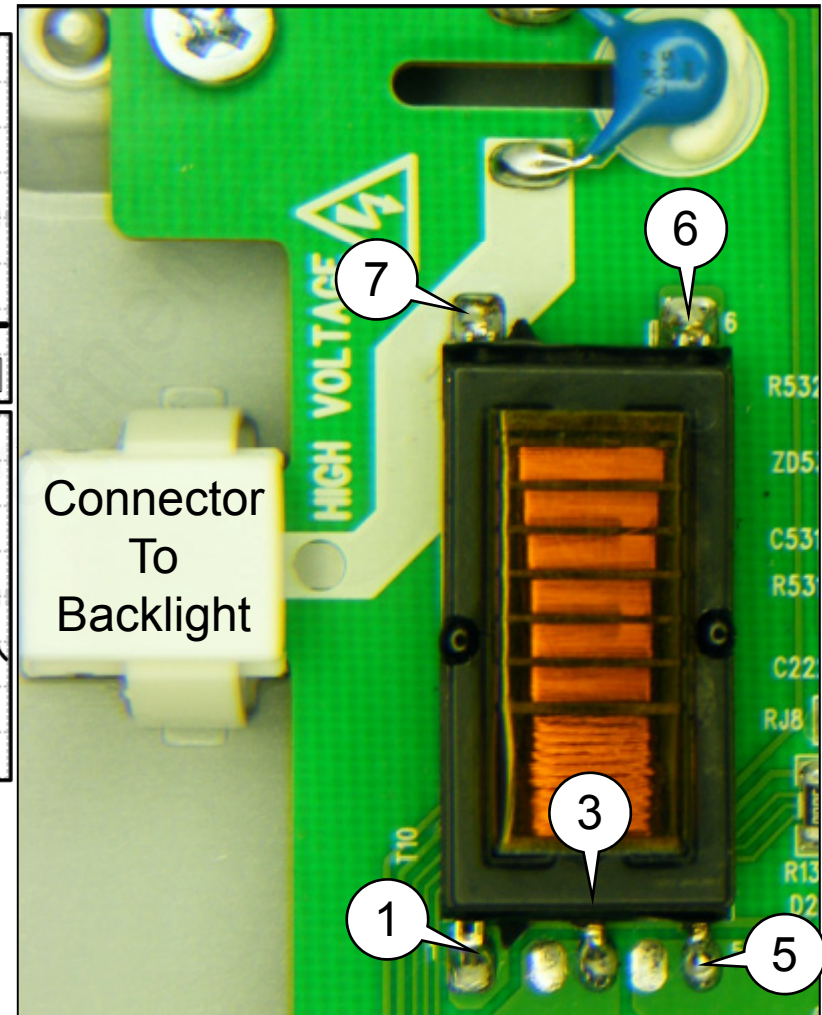
Their configuration may be different but the pin numbers are all the same.



100:1 Scope Probe.

P-DIM will vary this waveform.

As P-DIM goes down in voltage, the number of pulses inside the 8mSec envelop will decrease.



Warning: Pin 7 has a 2.9Kv signal. Use a 100:1 Scope Probe.

CN1 Ballast Connector Voltage and Diode Check

CN1 "Ballast" to P202 "SMPS Board"

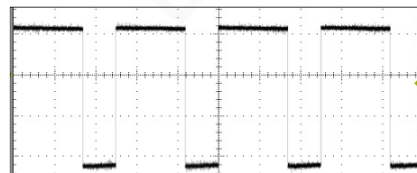
Pin	Label	STBY	Run	Diode Check
14	EPWM	0V	0.46V~2.3V	OL
13	IPWM	0.02V	3.31V	OL
12	INV_On/Off	0V	3.09V	OL
11	DET	0V	0V	OL
6~10	Gnd	Gnd	Gnd	Gnd
1~5	24V	0.05V	24.17V	1.27V

Pin 14 is P_DIM, Pin 13 is A_DIM, Pin 11 is Error.

INV-On/Off Pin 12: This turns on the Ballast Backlight drive signal.

DET (ERROR) Pin 11: If this line is high, the Set shuts off.

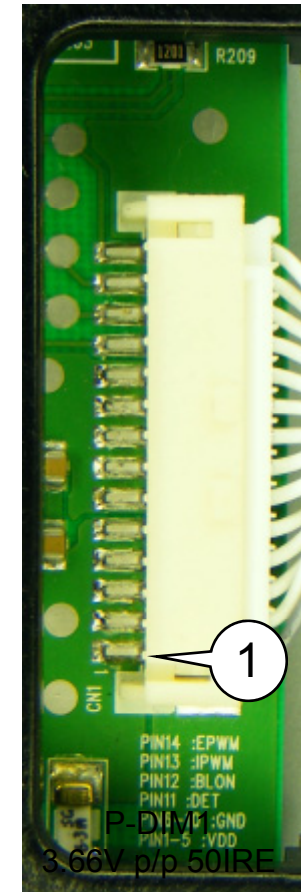
EPWM (PDIM1) Pin 14 can vary according to incoming video IRE level, OSD Backlight setting and then Intelligent Sensor (room light condition) Output from the Video Processor IC101. Range 0.34V to 3.2V.



EPWM (P-DIM)
3.66V p/p 50IRE

Diode Mode values taken with all Connectors Removed

P202 Connector

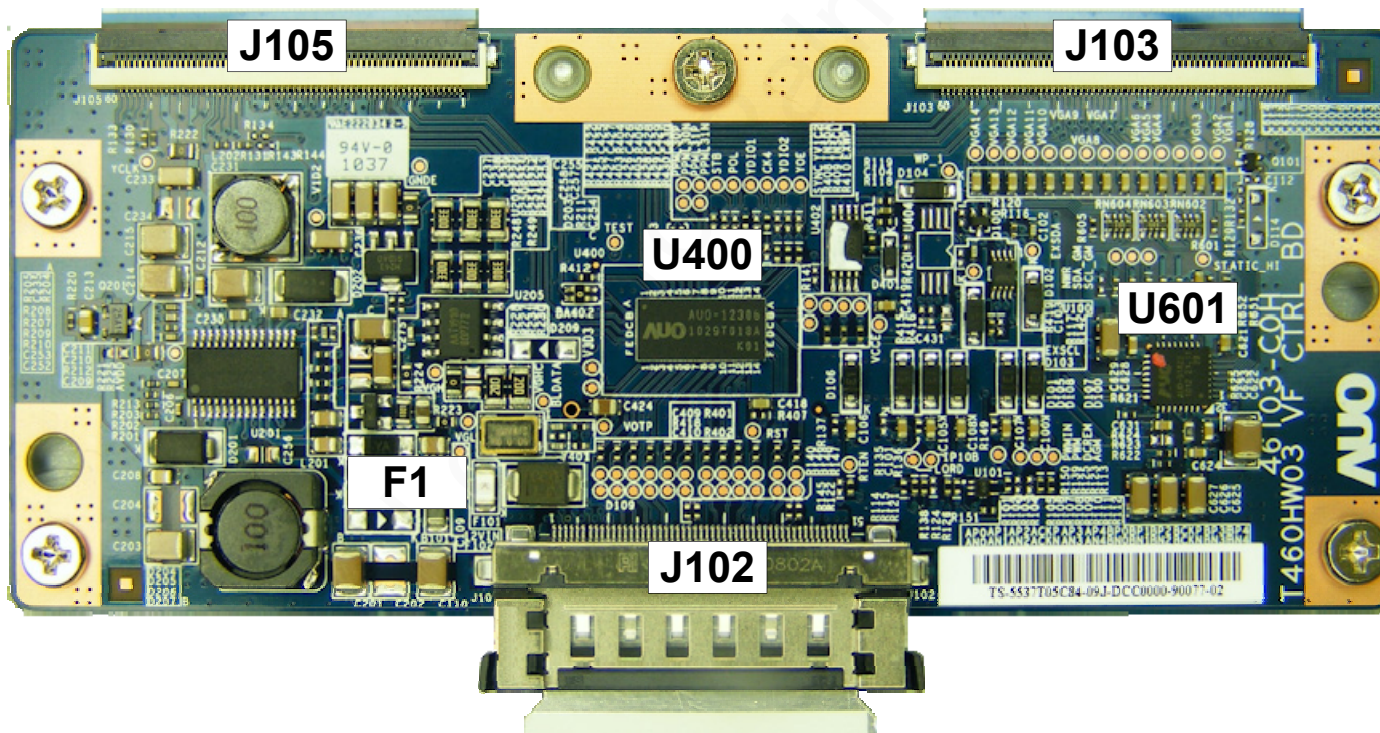


T-CON (TFT DRIVE) BOARD SECTION

The T-CON is covered by a shield which is removed in the picture below. Note: replace the screws when servicing the T-CON with the shield removed.

The T-CON IC U400 receives on J102 from the Main Board P702 20 Bit LVDS (Low Voltage Differential Signals) “Video” which it processes into TFT Drive Signals And delivers them through connectors J103 and J105 to the LCD Panel.

IC U601 is a “DC-to-DC converter which generates the voltages necessary for the panel to operate. 12V generated on the Power Supply is switched and supplied to the T-CON Board via connector J102 from the Main Board, (easily measured at fuse F1).

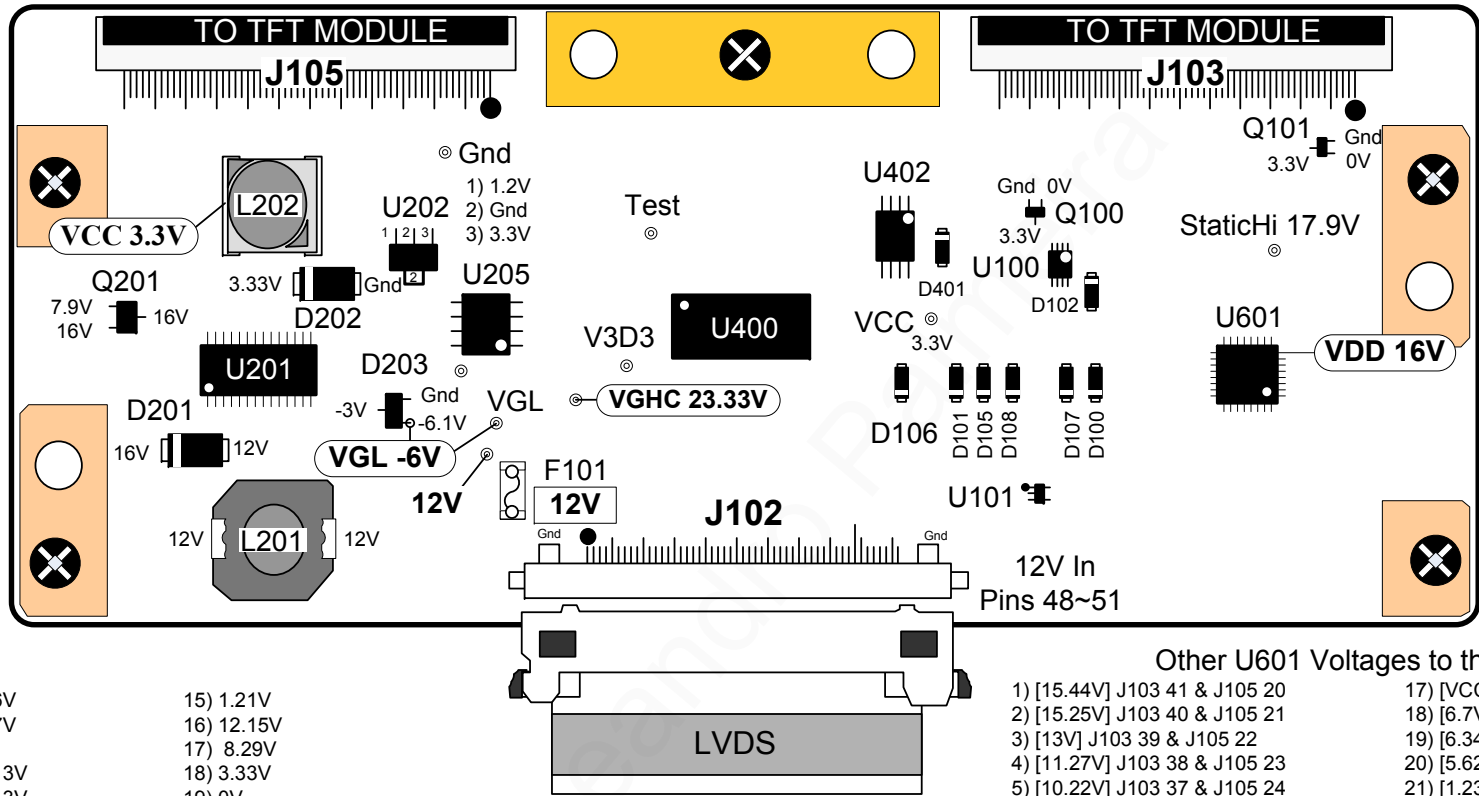


37LK450 T-CON (TFT Drive) with (Shield Removed) Components Identified

Warning: T-Con Board under shield. Be sure to reinsert screws before operating set with shield removed.

- VCC 3.3V pins 52, 53
- VDD 16V pins 35,36,37
- VGL -6V pin 50
- VGHC 23.33V pins 47, 48

- VCC 3.3V pins 8, 9
- VDD 16V pins 24, 25, 26
- VGL -6V pin 11
- VGHC 23.33V pins 13, 14



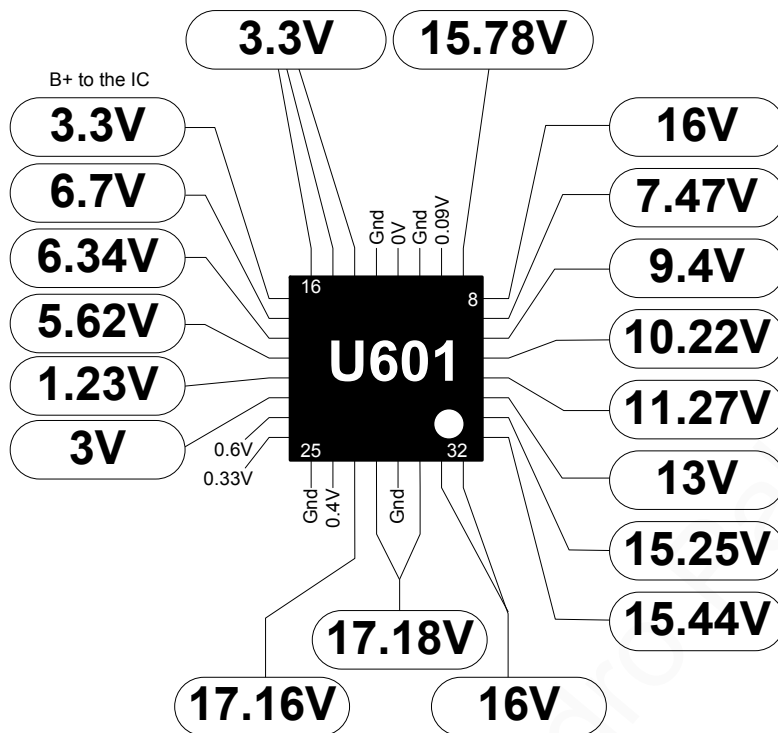
- U601
- | | |
|-----------|-----------|
| 1) 15.44V | 17) 3.3V |
| 2) 15.25V | 18) 6.7V |
| 3) 13V | 19) 6.34V |
| 4) 11.27V | 20) 5.62V |
| 5) 10.22V | 21) 1.23V |
| 6) 9.4V | 22) 3V |
| 7) 7.47V | 23) 0.6V |
| 8) 16V | 24) 0.33V |
| 9) 15.78V | 25) Gnd |
| 10) 0.09V | 26) 0.4V |
| 11) Gnd | 27) 7.16V |
| 12) 0V | 28) 7.18V |
| 13) Gnd | 29) Gnd |
| 14) 3.3V | 30) 7.18V |
| 15) 3.3V | 31) 16V |
| 16) 3.3V | 32) 16V |

- | | |
|------------|------------|
| 1) 1.16V | 15) 1.21V |
| 2) 0.97V | 16) 12.15V |
| 3) 16V | 17) 8.29V |
| 4) 12.13V | 18) 3.33V |
| 5) 12.13V | 19) 0V |
| 6) 0V | 20) 12.15V |
| 7) 0V | 21) 12.15V |
| 8) 16.04V | 22) 12.15V |
| 9) 12.15V | 23) 0V |
| 10) 11.52V | 24) 1.21V |
| 11) 12.62V | 25) 2.06V |
| 12) 12.15V | 26) 2.06V |
| 13) 0.19V | 27) 0.01V |
| 14) 1.21V | 28) 1.93V |

- U100
- | | |
|----------|---------|
| 1) 0.02V | 5) 3.3V |
| 2) 3.3V | 6) 3.3V |
| 3) 0V | 7) 3.3V |
| 4) Gnd | 8) 3.3V |
- U101
- | | |
|----------|----------|
| 1) 0.28V | 5) 0.13V |
| 2) 0.13V | 3) Gnd |
| 3) Gnd | 4) 3.3V |
- U205
- | | |
|-----------|----------|
| 1) 26.45V | 5) 31.7V |
| 2) 3.39V | 6) 35V |
| 3) 3.3V | 7) 0V |
| 4) 3.3V | 8) 2.35V |
- U202
- | |
|---------|
| 1) 1.2V |
| 2) Gnd |
| 3) 3.3V |
- U402
- | | |
|---------|---------|
| 1) 3.3V | 5) 3.3V |
| 2) 3.3V | 6) 3.3V |
| 3) 3.3V | 7) 3.3V |
| 4) Gnd | 8) 3.3V |

- Other U601 Voltages to the Panel
- | | |
|--|--------------------------------------|
| 1) [15.44V] J103 41 & J105 20 | 17) [VCC 3.3V] J103 8,9 & J105 52,53 |
| 2) [15.25V] J103 40 & J105 21 | 18) [6.7V] J103 35 & J105 27 |
| 3) [13V] J103 39 & J105 22 | 19) [6.34V] J103 36 & J105 28 |
| 4) [11.27V] J103 38 & J105 23 | 20) [5.62V] J103 33 & J105 29 |
| 5) [10.22V] J103 37 & J105 24 | 21) [1.23V] J103 38 & J105 30 |
| 6) [9.4V] J103 36 & J105 25 | 22) [3V] J103 30 & J105 31 |
| 7) [7.47V] J103 35 & J105 26 | 28) [7.18V] J103 16 & J105 45 |
| 8) [16V] J103 24,25,26 & J105 35,36,37 | 29) [7.18V] J103 16 & J105 45 |
- D100
- | |
|--------|
| A) Gnd |
| C) 0V |
- D101
- | |
|--------|
| A) Gnd |
| C) 3V |
- D102
- | |
|--------|
| C) 0V |
| A) Gnd |
- D105
- | |
|--------|
| A) Gnd |
| C) 0V |
- D106
- | |
|--------|
| A) Gnd |
| C) 0V |
- D107
- | |
|--------|
| A) Gnd |
| C) 3V |
- D108
- | |
|----------|
| A) Gnd |
| C) 0.13V |
- D401
- | |
|----------|
| C) 0V |
| A) 0.02V |

37LK450 T-CON U601 Pin Voltages



U601

- | | |
|-----------|-----------|
| 1) 15.44V | 17) 3.3V |
| 2) 15.25V | 18) 6.7V |
| 3) 13V | 19) 6.34V |
| 4) 11.27V | 20) 5.62V |
| 5) 10.22V | 21) 1.23V |
| 6) 9.4V | 22) 3V |
| 7) 7.47V | 23) 0.6V |
| 8) 16V | 24) 0.33V |
| 9) 15.78V | 25) Gnd |
| 10) 0.09V | 26) 0.4V |
| 11) Gnd | 27) 7.16V |
| 12) 0V | 28) 7.18V |
| 13) Gnd | 29) Gnd |
| 14) 3.3V | 30) 7.18V |
| 15) 3.3V | 31) 16V |
| 16) 3.3V | 32) 16V |

U601 Voltages to the Panel

- | | |
|--|--------------------------------------|
| 1) [15.44V] J103 41 & J105 20 | 17) [VCC 3.3V] J103 8,9 & J105 52,53 |
| 2) [15.25V] J103 40 & J105 21 | 18) [6.7V] J103 35 & J105 27 |
| 3) [13V] J103 39 & J105 22 | 19) [6.34V] J103 36 & J105 28 |
| 4) [11.27V] J103 38 & J105 23 | 20) [5.62V] J103 33 & J105 29 |
| 5) [10.22V] J103 37 & J105 24 | 21) [1.23V] J103 38 & J105 30 |
| 6) [9.4V] J103 36 & J105 25 | 22) [3V] J103 30 & J105 31 |
| 7) [7.47V] J103 35 & J105 26 | 28) [7.18V] J103 16 & J105 45 |
| 8) [16V] J103 24,25,26 & J105 35,36,37 | 29) [7.18V] J103 16 & J105 45 |

J102 Connector "T-CON" to Main Board Voltage and Diode Check

J102 "T-CON" to "MAIN Board" P703

Pin	Label	Run	Diode Check
1	Gnd	Gnd	1.94V
2~6	n/c	n/c	Open
7	LVDS_Sel	2.99V	1.95V
8	n/c	n/c	1.68V
9	n/c	n/c	1.92V
10	n/c	n/c	1.92V
11	Gnd	Gnd	Gnd
12	RXB0+	1.28V	1.24V
13	RXB0-	1.15V	1.26V
14	RXB1+	1.28V	1.24V
15	RXB1-	1.15V	1.26V
16	RXB2+	1.28V	1.22V
17	RXB2-	1.15V	1.27V
18	Gnd	Gnd	Gnd
19	RXBCK+	1.20V	1.24V
20	RXBCK-	1.23V	1.27V
21	Gnd	Gnd	Gnd
22	RXB3+	1.28V	1.24V
23	RXB3-	1.15V	1.26V
24	RXB4+	1.22V	1.24V

Pin	Label	Run	Diode Check
25	RXB4-	1.21V	1.26V
26	Gnd	Gnd	Gnd
27	Bit Select	3.27V	2.00V
28	RXA0+	1.28V	1.24V
29	RXA0-	1.15V	1.26V
30	RXA1+	1.28V	1.24V
31	RXA1-	1.15V	1.26V
32	RXA2+	1.22V	1.24V
33	RXA2-	1.21V	1.26V
34	Gnd	Gnd	Gnd
35	RXACK+	1.20V	1.24V
36	RXACK-	1.23V	1.27V
37	Gnd	Gnd	Gnd
38	RXA3+	1.28V	1.24V
39	RXA3-	1.15V	1.26V
40	RXA4+	1.22V	1.24V
41	RXA4-	1.21V	1.26V
42~46	Gnd	Gnd	Gnd
47	n/c	n/c	Open
48~51	PANEL_VCC	12.14V	Open

**20 Bit LVDS
Video signal in
Bold text**

**Switched
LVDS 12V**

Diode Mode values taken with all Connectors Removed

J103 and J105 Connector "T-CON" to the Panel Voltage Checks

J105 "T-CON" to "Panel"

Pin	Voltage	Pin	Voltage		
1	Gnd	31	3V	U601 Pin 22	
2	0.14V	32	0.63V		
3	0.14V	33	0.33V		
4	0.14V	34	0V		
5	0.14V	35	16V	U601 Pin 8	
6	0.14V	36	16V	U601 Pin 8	
7	0.14V	37	16V	U601 Pin 8	
8	Gnd	38	0V		
9	1.14V	39	0.28V		
10	1.14V	40	Gnd		
11	Gnd	41	1.64V		
12	1.14V	42	0.25V		
13	0.89V	43	2.46V		
14	1.39V	44	0V		
15	0.9V	45	7.18V	U601 Pin 28,30	
16	1.37V	46	0V		
17	0.9V	47	23.33V	VGHC TP	
18	Gnd	48	23.33V	VGHC TP	
19	0V	49	0V		
U601 Pin 1	20	15.44V	50	(-6.1V)	D203 VGL TP
U601 Pin 2	21	15.25V	51	0V	
U601 Pin 3	22	13V	52	3.3V	L202
U601 Pin 4	23	11.27V	53	3.3V	L202
U601 Pin 5	24	10.22V	54	Gnd	
U601 Pin 6	25	9.4V	55	0V	
U601 Pin 7	26	7.47V	56	2.35V	
U601 Pin 18	27	6.71V	57	1.84V	
U601 Pin 19	28	6.33V	58	0V	
	29	5.6V	59	0V	
	30	4.6V	60	0.15V	

J103 "T-CON" to "Panel"

Pin	Voltage	Pin	Voltage		
1	0.15V	31	4.6V		
2	0V	32	5.6V		
3	0V	33	6.33V	U601 Pin 19	
4	1.84V	34	6.71V	U601 Pin 18	
5	2.35V	35	7.47V	U601 Pin 7	
6	0V	36	9.4V	U601 Pin 6	
7	Gnd	37	10.22V	U601 Pin 5	
8	3.3V	38	11.27V	U601 Pin 4	
9	3.3V	39	13V	U601 Pin 3	
10	0V	40	15.25V	U601 Pin 2	
11	(-6.1V)	41	15.44V	U601 Pin 1	
12	0V	42	0V		
VGHC TP	13	23.33V	43	Gnd	
VGHC TP	14	23.33V	44	0.9V	
U601 Pin 28,30	15	0V	45	1.37V	
	16	7.18V	46	0.9V	
	17	0V	47	1.39V	
	18	2.46V	48	0.89V	
	19	0.25V	49	1.14V	
	20	1.64V	50	0V	
	21	Gnd	51	1.14V	
	22	0.28V	52	1.14V	
	23	0V	53	Gnd	
U601 Pin 8	24	16V	54	0.14V	
U601 Pin 8	25	16V	55	0.14V	
U601 Pin 8	26	16V	56	0.14V	
	27	0V	57	0.14V	
	28	0.33V	58	0.14V	
	29	0.63V	59	0.14V	
U601 Pin 22	30	3V	60	Gnd	

MAIN BOARD SECTION

The Main board receives its operational B+ from the Power Supply via P401.

There is one LVDS (Low Voltage Differential Signal) Cable that feeds 20 bit video and 12V to the T-CON (TFT Driver). The video signals have already been prepared for the T-CON board. The Main board also includes the Tuner, Audio and Audio/Video inputs and selection circuits.

INPUT VOLTAGES FROM THE SMPS.

STAND-BY

- STBY 3.5V (P401 pins 9~12)

RUN

- 12V (P401 pins 17, 19 and 21).
- 24V (P401 pins 2~4).

THE MAIN BOARD ALSO DEVELOPS OTHER VOLTAGES:

STAND-BY VOLTAGES

- 3.3V_ST (Direct from SMPS through L404).

LVDS

- Panel_VCC (12V Not generated, but switched by Q409 from the 12V arriving from the SMPS).

TUNER TU3702 CIRCUIT

- 5V_TU (Made from 5V_Normal through L3702)
- 3.3V_TU (Made from 3.3V_Normal L3703).
- 1.26V_TU (IC3703 Made from 3.3V_Normal).

AUDIO IC1702

- 3.3V_Normal (Filtered by L504).
- 1.8V (IC404 Made from 3.3V_Normal).
- 24V (Direct from SMPS through L407).

GENERAL

- 5V_Normal IC406 (Made from 12V In).
- 3.3V_Normal IC405 (Made from 12V In).
- 5V USB IC401 (Made from 12V In).

IC101 (Saturn) Video Processor

- 3.3V_Normal (From IC405).

Other voltages made from 3.3V_Normal

- VDD33 (Through L204)
Made from VDD33
- FRC_VDD33_DDR (Through L222)
- AU33 (Through L217)

+2.5V_Normal IC402 used to make:

- AU25 (Through L212) • FRC_AVDD (Through L211)
- AVDD25_PGA (Through L219)

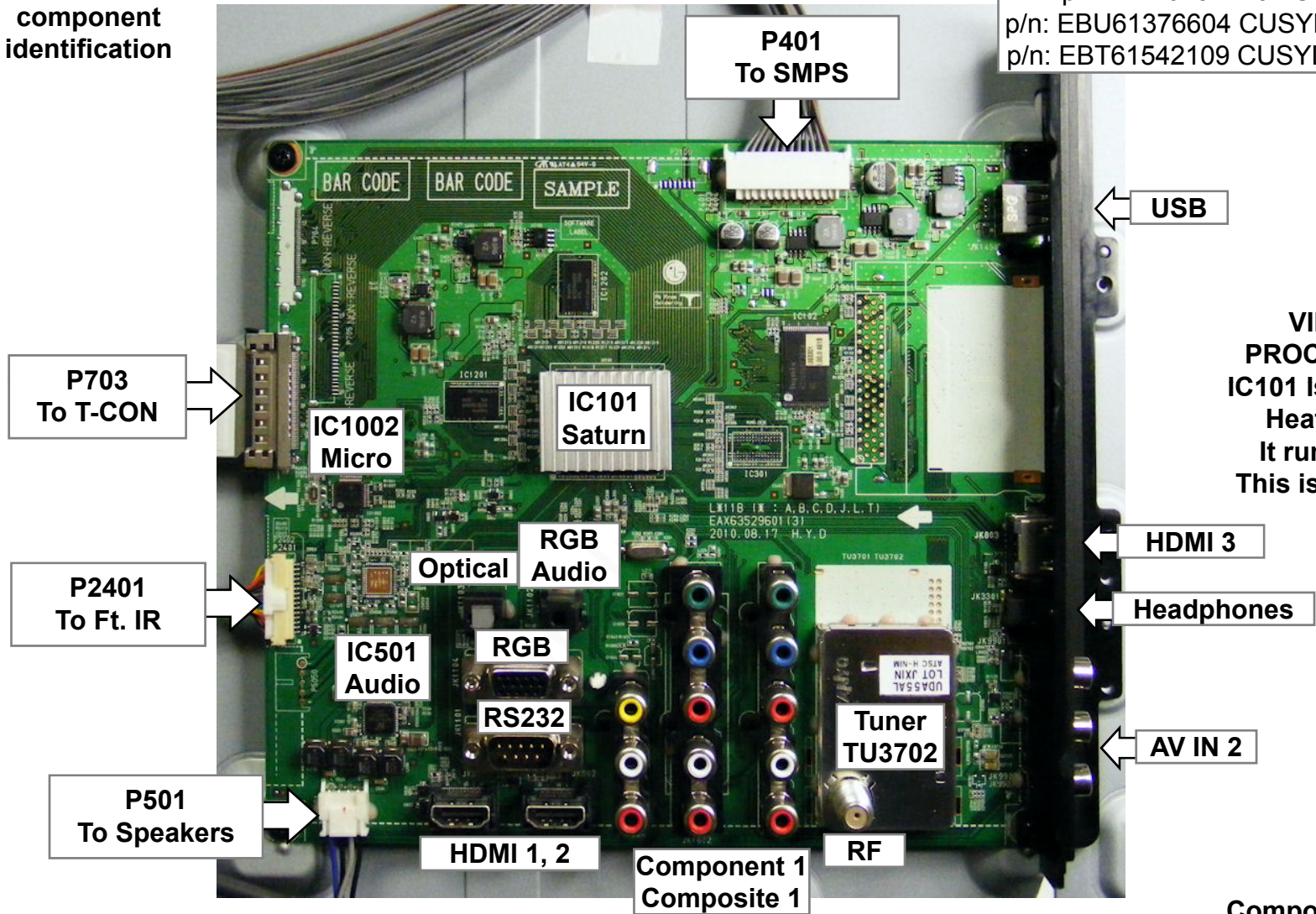
+1.26V_VDDC IC403 used to make:

- MIU0VDDC (Through L228)
- FRCVDDC (Through L225)

Main Board Layout

See next page for component identification

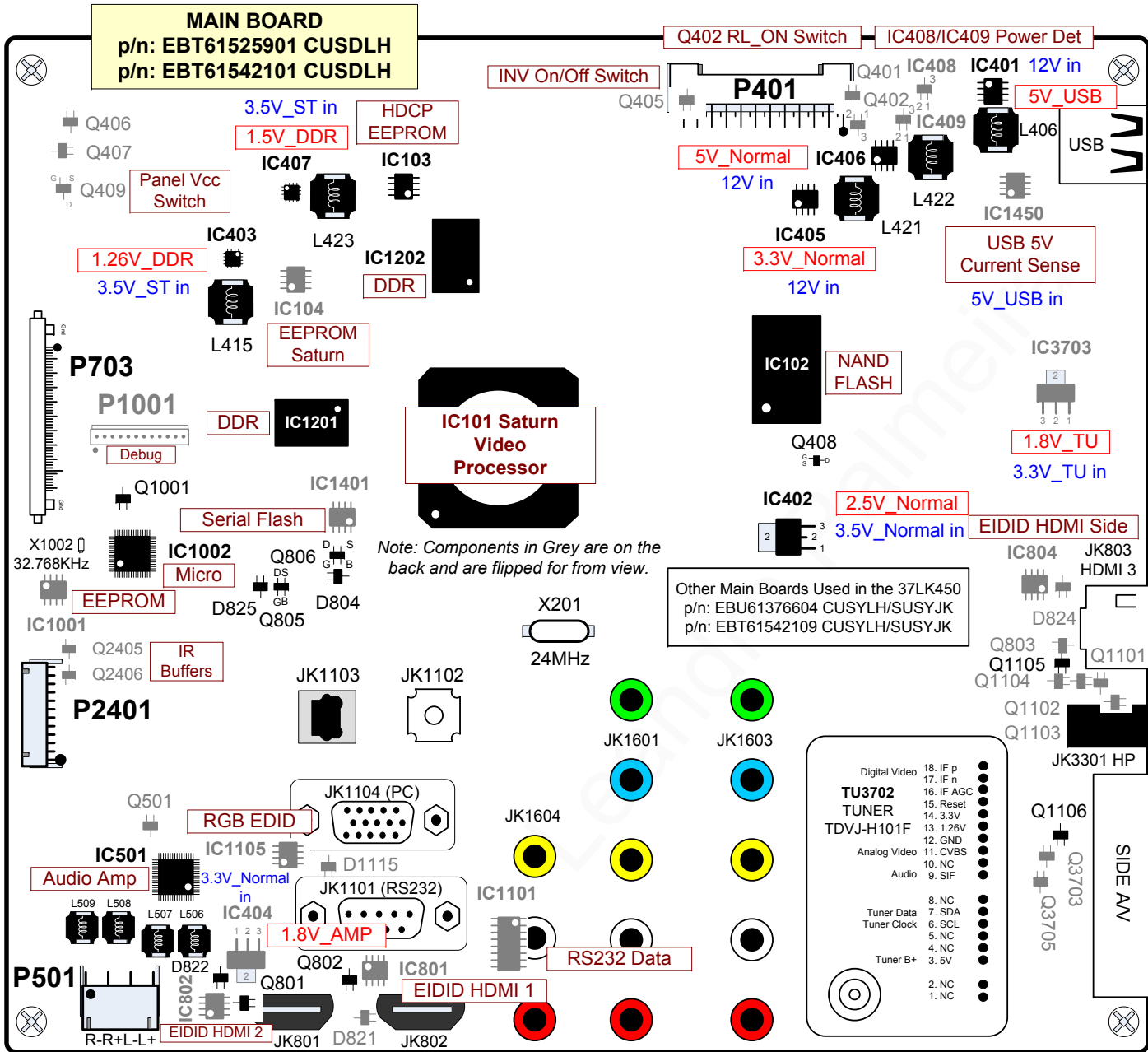
Main Boards Used in the 37LK450
 p/n: EBT61525901 CUSDLH
 p/n: EBT61542101 CUSDLH
 p/n: EBU61376604 CUSYLH/SUSYJK
 p/n: EBT61542109 CUSYLH/SUSYJK



VIDEO PROCESSOR
 IC101 is under a Heat Sink.
 It runs Hot.
 This is normal.

Component In
 These connectors are Mini plug type

37LK450 Main Board (Front and Back Side) Component Locations



P401 "MAIN Board" To P201 "SMPS Board"

Pin	Label	STBY	Run	Diode Check
1	PWER_ON	0V	3.38V	2.9V
2-4	24V	0.05V	24.17V	2.37V
5-8	Gnd	Gnd	Gnd	Gnd
9-12	3.5V_STBY	3.53V	3.5V	1.15V
13-16	Gnd	Gnd	Gnd	Gnd
17	12V	0.06V	12.23V	2.3V
18	INV_On/Off	0.52V	3.09V	1.57V
19	12V	0.06V	12.23V	2.3V
20	A-DIM	0.02V	3.31V	OL
21	12V	0.06V	12.23V	2.3V
22	P-DIM	0.02V	0.46V~3.2V	OL
23	n/c	n/c	n/c	Gnd
24	ERROR	0V	0V	OL

- (1) PWR-On Pin 1: Turns on 12V, 24V to the Main and 24V to the Inverter. (Backlights not on).
- (2) INV-On Pin 18: Turns on the Backlights
- (3) Error_Out Pin 24: Goes high when the backlights are told to come on. Goes back low when they come on. If it goes high again on the 5th attempt to fire the backlights, the set shuts off.
- (4) A-DIM Pin 20: Is not used. It is a fixed Voltage.
- (5) P-DIM Pin 22 Will vary according to OSD Backlight setting, incoming video IRE level and Ambient room light conditions. It is output from the Video Processor. Range 0.46V to 3.2V.

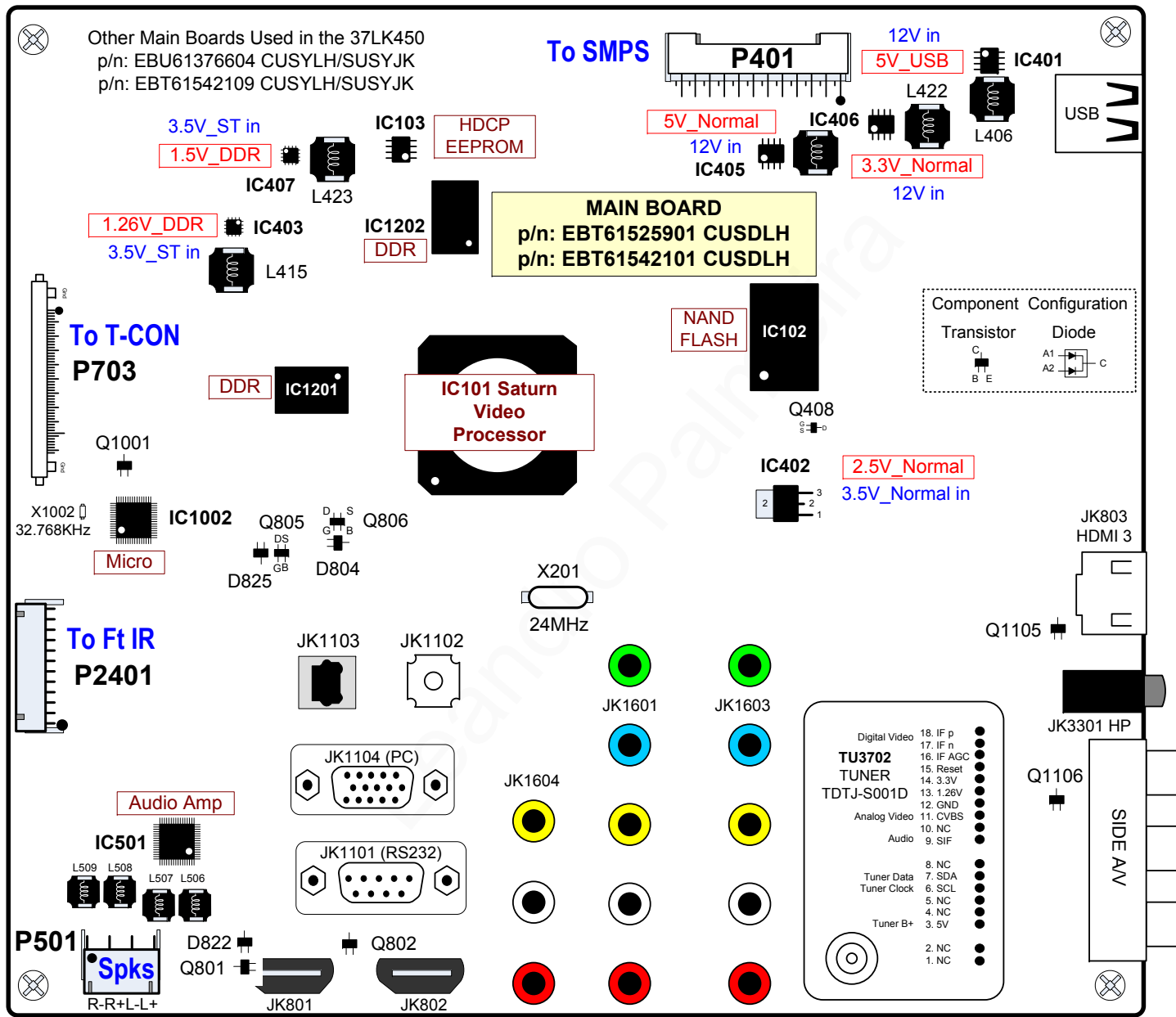
P2401 "Main" to J1 "Fr. IT/SoftTouch Key Board"

Pin	Label	STBY	Run	Diode Check
15	SDA	3.53V	3.29V	1.97V
14	SCL	3.52V	3.29V	1.97V
13	Gnd	Gnd	Gnd	Gnd
12	LED_R	0V	0V	2.67V
11	+3.3V_NORMAL	0.56V	3.08V	0.56V
10	Gnd	Gnd	Gnd	Gnd
9	IR	1.96V	1.93V	OL
8	LED_B	0V	0V	2.67V
7	Gnd	Gnd	Gnd	Gnd
6	3.5V_ST	3.33V	3.49V	1.16V
5	KEY 2	3.3V	3.29V	1.83V
4	KEY 1	3.3V	3.29V	1.83V
3	Gnd	Gnd	Gnd	Gnd
2	NEC_EEPROM SDA	3.13V	3.48V	3.29V
1	NEC_EEPROM SCL	2.12V	3.48V	3.29V



















Component Configuration



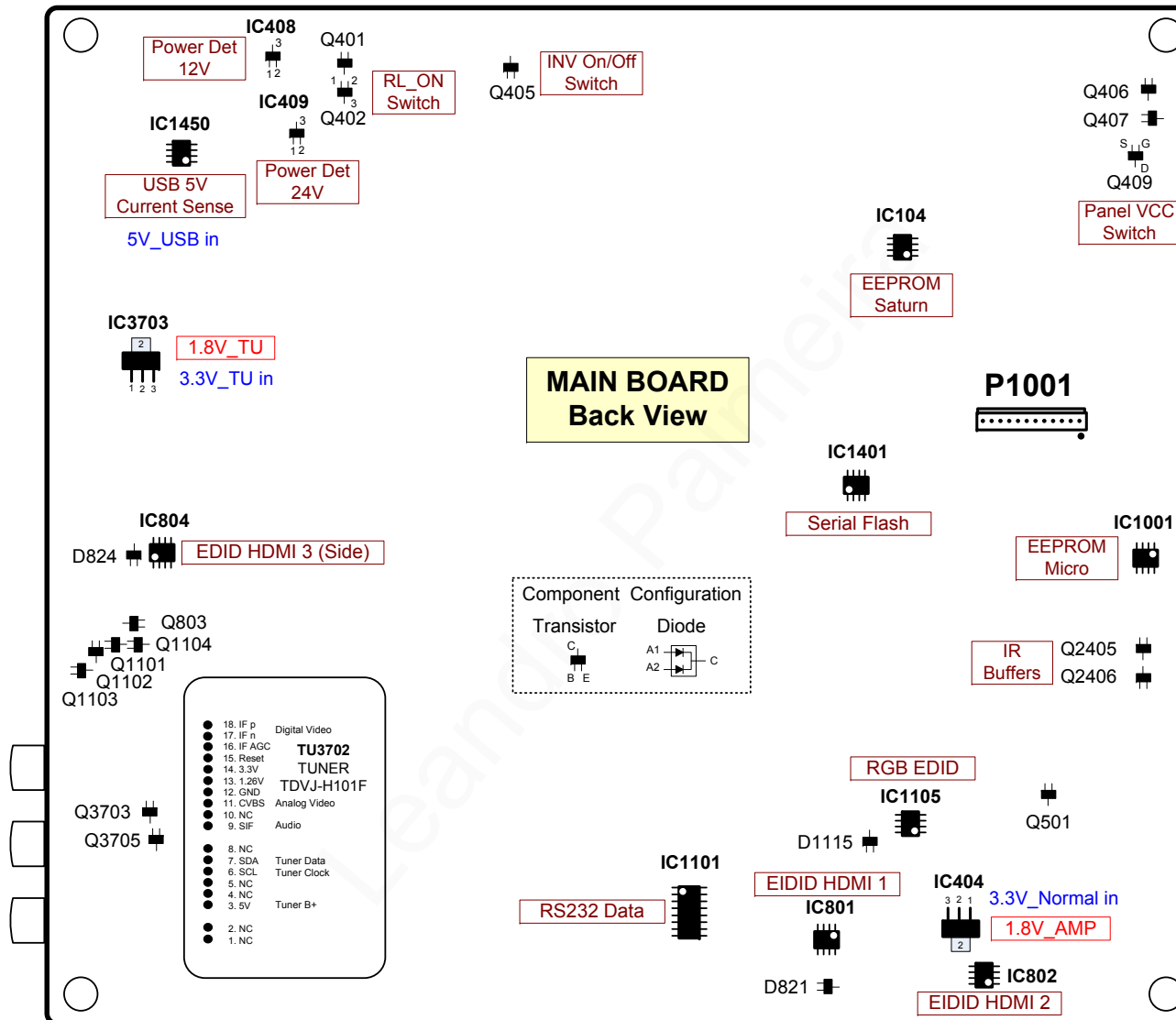
37LK450 Main Board (Front Side) Component Locations



37LK450 Main (Front Side) Component Voltages


IC103  HDCP EEPROM Pin [1] 0V (Gnd) [2] 0V (Gnd) [3] 3.29V (B+) [4] 0V (Gnd) [5] 0V [6] 3.29V [7] 0V (Gnd) [8] 3.29V (B+)	IC403  (+1.26V_VDDC) Regulator Pin [1] 3.28V (In) [2] 3.28V (In) [3] 0V (Gnd) [4] 0V (Gnd) [5] 0V (Gnd) [6] 0.8V [7] 0.86V [8] 0.54V [9] 1.75V [10] 1.33V (Out) [11] 1.33V (Out) [12] 1.33V (Out) [13] 4.72V [14] n/c [15] 3.29V [16] 3.28V (In)	IC406  (+5V_Normal) Regulator Pin [1] 0V (Gnd) [2] 12.23V (In) [3] 0V (Gnd) [4] 0.8V [5] 0.86V [6] 3.32V (PWR On/Off1) [7] 5V (Out) [8] 5V (Out)	Q408  (+1.5V_FRC_DDR) Switch Pin G 3.3V (PWR On/Off2_1) S 1.51V (In) D 1.52V (Out)	Q1105  Head Phone MUTE Pin B 2.82V C 0V E 3.34V
IC401  5V Regulator for USB Pin [1] 0V (Gnd) [2] 12.24V (In) [3] 0V (Gnd) [4] 0.8V [5] 0.8V [6] 3.3V (PWR On/Off2_1) [7] 4.99V (Out) [8] 4.99V (Out)	IC407  (+1.5V_DDR) Regulator Pin [1] 3.32V (In) [2] 3.32V (In) [3] 0V (Gnd) [4] 0V (Gnd) [5] 0V (Gnd) [6] 0.83V [7] 0.7V [8] 0.51V [9] 1.93V [10] 1.52V (Out) [11] 1.52V (Out) [12] 1.52V (Out) [13] 4.87V [14] n/c [15] 3.31V [16] 3.32V (In)	Q801  HDMI 2 Hot Swap Pin B 0.63V C 0V E Gnd	Q802  HDMI 2 Hot Swap Pin B 0.63V C 0V E Gnd	Q1106  Head Phone Mute Driver Pin B 0V C 2.82V E Gnd
IC402  (+2.5V_Normal) Regulator Pin [1] 3.29V (In) [2] 0V (Gnd) [3] 2.5V (Out)	IC405  (+3.3V_NORMAL) Regulator Pin [1] 0V (Gnd) [2] 12.23V (In) [3] 0V (Gnd) [4] 0.8V [5] 0.87V [6] 3.32V (PWR On/Off1) [7] 3.34V (Out) [8] 3.34V (Out)	Q805  CEC Remote HDMI CEC Pin [B] 3.17V [G] 0V [S] 0V [D] 0.06VV	Q806  CEC Remote HDMI CEC Pin [B] 3.17V [G] 0V [S] 3.28V [D] 3.29V	D804  Source Bias Q806 Pin [A1] 0V [A2] 3.27V [C] 3.17V
			Q1001  EDID Write Protect Pin B 0V C 4.7V E Gnd	D822  5V Routing for IC802 Pin [A1] 5V [A2] 0V [C] 4.7V
				D825  Source Bias Q805 Pin [A1] 0V [A2] 0.06V [C] 3.17V

37LK450 Main Board (Back Side) Component Locations



37LK450 Main (Back Side) Component Voltages


IC104 EEPROM Saturn



Pin

- [1] 0V (n/c)
- [2] 0V (Gnd)
- [3] 0V (Gnd)
- [4] 0V (Gnd)
- [5] 3.29V (SDA)
- [6] 3.29V (SCL)
- [7] 0V (Gnd)
- [8] 3.29V (B+)


IC804 EDID Data HDMI4



Pin

- [1] 0V (Gnd)
- [2] 0V (Gnd)
- [3] 0V (Gnd)
- [4] 0V (Gnd)
- [5] 4.7V (SDA)
- [6] 4.7V (SCL)
- [7] 4.7V (WP)
- [8] 4.7V (Vcc)


IC1105 (+5V_Normal) PC



Pin

- [1] 0V (Gnd)
- [2] 0V (Gnd)
- [3] 0V (Gnd)
- [4] 0V (Gnd)
- [5] 4.7V (SDA)
- [6] 4.7V (SCL)
- [7] 4.7V (WP)
- [8] 4.7V (Vcc)


Q401 Power On/Off Driver for Q402



Pin

- B 0.65V (RL_ON)
- C 0V
- E Gnd


Q803 HDMI 4 Hot Swap



Pin

- B 0.65V
- C 0V
- E Gnd


IC404 (+1.8V_Amp) Regulator



Pin

- [1] Gnd
- [2] 1.79V (Out)
- [3] 3.29V (In)


IC1001 Micro EEPROM



Pin

- [1] 0V (Gnd)
- [2] 0V (Gnd)
- [3] 3.3V (B+)
- [4] 0V (Gnd)
- [5] 3.3V (SDA)
- [6] 3.3V (SCL)
- [7] 0V (Gnd)
- [8] 3.3V (B+)


IC1401 Serial Flash Memory



Pin

- [1] 0.0V
- [2] 3.3V
- [3] 3.3V
- [4] 0V (Gnd)
- [5] 0V
- [6] 0V
- [7] 3.3V (B+)
- [8] 3.3V (B+)


Q402 Power On/Off Switch



Pin

- 1 3.3V (In)
- 2 0.8V (Ctl)
- 3 3.16V (Out)


Q1101 Head Phone MUTE



Pin

- B 0V
- C 0V
- E Gnd


IC408 Power_Det 24V, 12V, 3.5V



Pin

- [1] 0V (Gnd)
- [2] 3.30V (Reset)
- [3] 3.33V (In)


IC1101 RS232 Data Buffer



Pin

- [1] 3.3V
- [2] 5.4V
- [3] 0V
- [4] 0V
- [5] (-5.4V)
- [6] 0V
- [7] n/c (0V)
- [8] n/c (0V)
- [9] n/c (3.3V)
- [10] n/c (0V)
- [11] n/c (3.3V)
- [12] 3.3V
- [13] 0V
- [14] (-5.4V)
- [15] 0V (Gnd)
- [16] 3.3V


IC1450 5V Short Protection for USB



Pin

- [1] 0V (Gnd)
- [2] 4.98V (In)
- [3] 4.98V (In)
- [4] 3.3V (USB-En)
- [5] 4.96V
- [6] 4.98V (Out)
- [7] 4.98V (Out)
- [8] n/c (0V)


Q405 Inverter On/Off Switch



Pin

- B 0.0V
- C 3.0V (INV_On)
- E Gnd


Q1102 Head Phone MUTE



Pin

- B 0V
- C 0V
- E Gnd


IC409 Power_Det 24V



Pin

- [1] 0V (Gnd)
- [2] 3.30V (Reset)
- [3] 3.33V (In)


D821 5V Routing for IC801



Pin

- [A1] 0V
- [A2] 5.0V
- [C] 4.7V


IC3703 (+1.2V_TU) Regulator



Pin

- [1] 0V (Gnd)
- [2] 1.26V (Out)
- [3] 3.3V (In)


Q406 PANEL_VCC Control 1st Driver



Pin

- B 0.0V
- C 0.68V
- E Gnd


Q1103 Head Phone MUTE



Pin

- B 0V
- C 0V
- E Gnd


IC801 EDID Data HDMI1



Pin

- [1] 0V (Gnd)
- [2] 0V (Gnd)
- [3] 0V (Gnd)
- [4] 0V (Gnd)
- [5] 4.7V (SDA)
- [6] 4.7V (SCL)
- [7] 4.7V (WP)
- [8] 4.7V (Vcc)


D824 5V Routing for IC804



Pin

- [A1] 0V
- [A2] 5V
- [C] 4.7V


D824 5V Routing for IC804



Pin

- [A1] 0V
- [A2] 5V
- [C] 4.7V


Q407 PANEL_VCC Control 2nd Driver



Pin

- B 0.68V
- C 0V
- E Gnd


Q1104 Head Phone MUTE



Pin

- B 0V
- C 0V
- E Gnd

IC802 EDID Data HDMI2



Pin

- [1] 0V (Gnd)
- [2] 0V (Gnd)
- [3] 0V (Gnd)
- [4] 0V (Gnd)
- [5] 4.7V (SDA)
- [6] 4.7V (SCL)
- [7] 4.7V (WP)


D1115 5V Routing for IC1105



Pin

- [A1] 0.0V
- [A2] 5V
- [C] 4.7V


D1115 5V Routing for IC1105



Pin

- [A1] 0.0V
- [A2] 5V
- [C] 4.7V


Q409 PANEL_VCC Switch



Pin

- S 12.2V (In)
- G 1.84V (Enable)
- D 12.2V (Out)


Q2405 IR Buffer



Pin

- B 0.0V
- C 3.0V (INV_On)
- E Gnd


Q501 AMP_MUTE Pin 25 IC600



Pin

- B 0.0V
- C 3.35V
- E Gnd


Q2406 IR Buffer



Pin

- B 0.0V
- C 0.68V
- E Gnd


Q3703 Tuner CVSB (Video) Buffer



Pin

- B 3.4V
- C Gnd
- E 4.1V

Q3705 Tuner SIF (Sound) Buffer



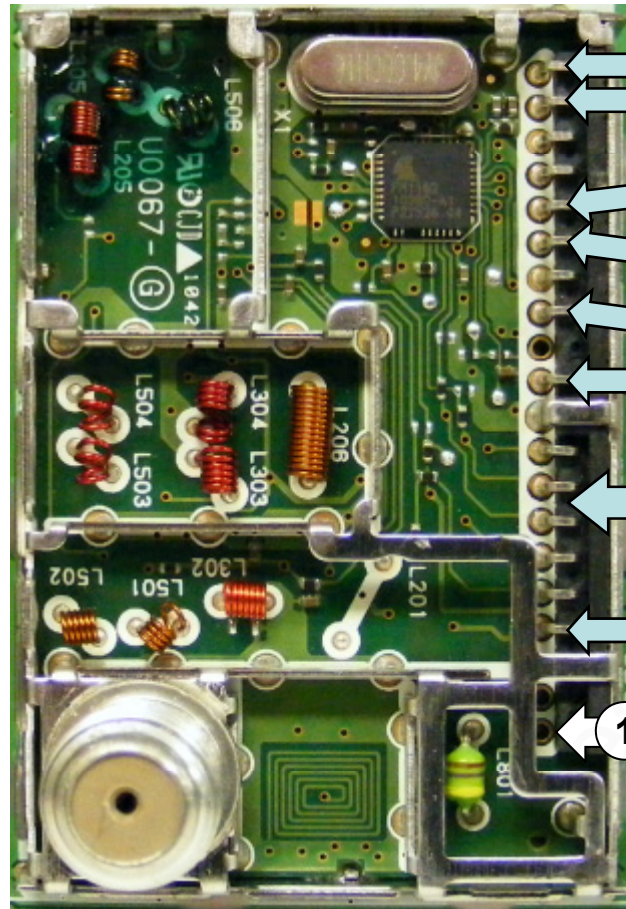
Pin

- B 0.2V
- C Gnd
- E 0.9V

Main Board Tuner Check (Shield Off) Pins Exposed TDTJ-S001D Pins Identified

The pins can be accessed from the front with the cover removed.

Data Pin 7 Clock Pin 6 Only present during Channel Change. See next page for more information.



DIF2 Pin 18 Dif (P)
DIF1 Pin 17 Dif (N)

Digital Video (Differential Video) to the BCM chip IC101.

Pin 14 B+ (+3.3V_TU)

+3.3V_TU from IC405.
(Source Voltage for IC405 is +12V.)

Pin 13 B+ (+1.26V_TU)

+1.26V_TU from IC3703
(Source for IC3703 is 3.3V_TU).

Analog Video Pins 11

Analog Video to Q3703 CVBS buffer
SIF Audio to Q3705 TU_SIF buffer

TU_SIF Pin 9 Audio

Data Pin 7 (SDL0_3.3V)
Clock Pin 6 (SCL0_3.3V)

Clock and Data from the BCM chip IC101.

Pin 3 Tuner B+ (5V_TU)

5V_TU from +5V_Normal IC406.
Generated when 12V arrives.

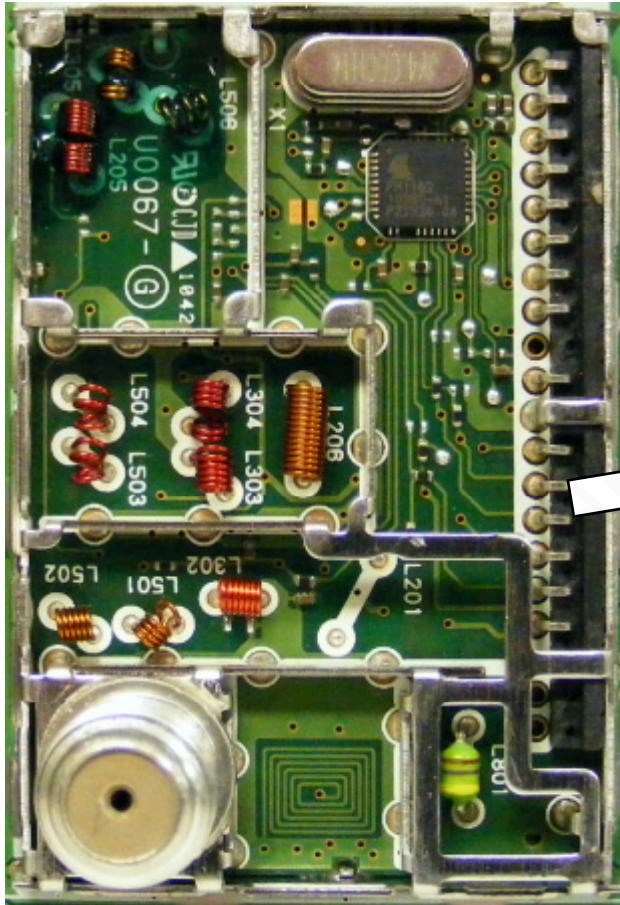
1

TU3702 (TDTJ-S001D)
Bottom right hand side of Main Board Tuner shown on Page 6 of Schematic

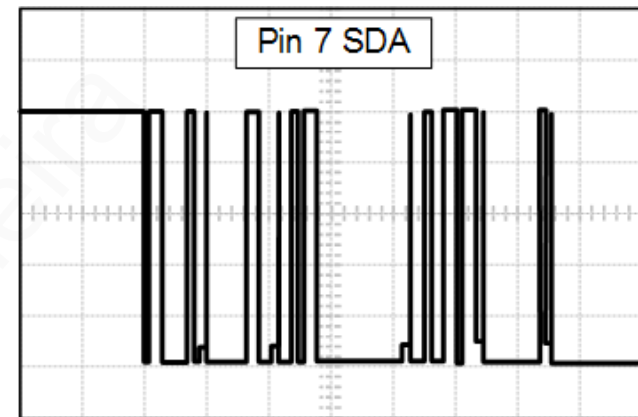
Main Board Tuner Check (Shield Off) Pins Exposed TDTJ-S001D

You must take off the Tuner Cover for Test Points.

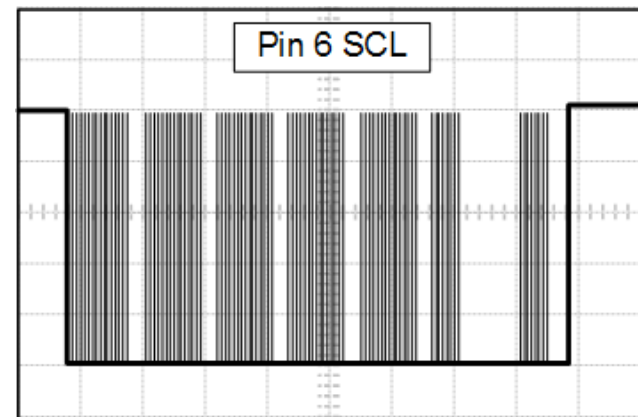
To keep the Data and Clock lines running so they can be measured easily, place the unit into "Auto Tuning".



Data Pin 7 Clock Pin 6
Only present during
Channel Change

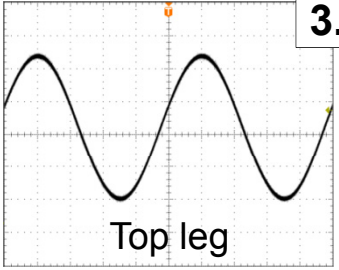


1V per/div 100uSec 3.82V p/p



1V per/div 100uSec 3.45V p/p

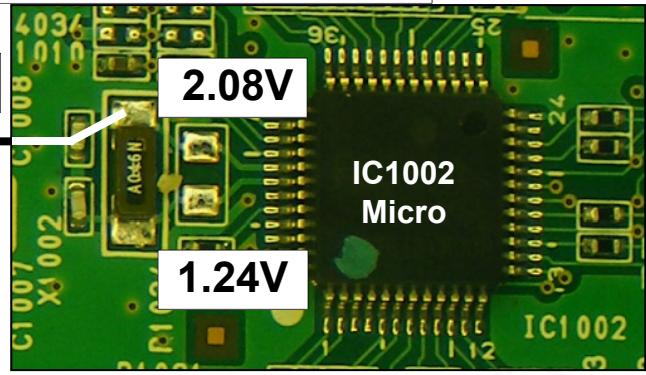
X1002 and X201 Main Board Crystal Checks



3.25V p/p

Top leg

X1002 Micro Crystal




2.08V

1.24V

IC1002 Micro

X201 Video Processor Crystal

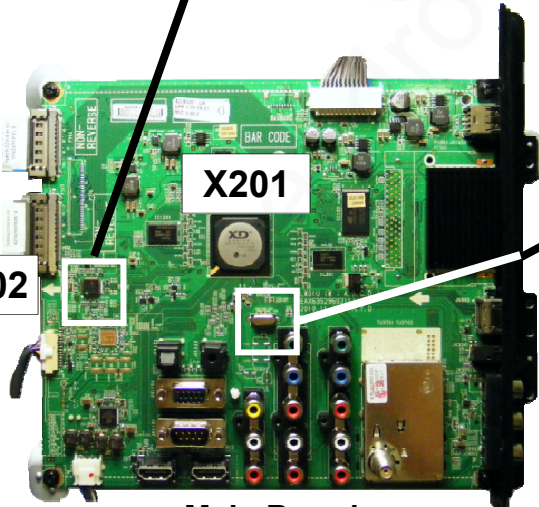


1.56V

1.55V

24Mhz

2.49V p/p



X1002

X201

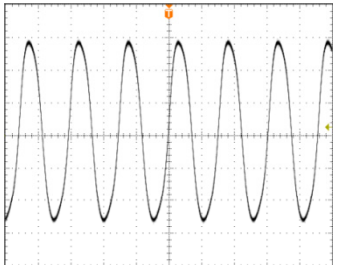
Main Board

The Bottom leg of X1002 has no waveform.

32.768Mhz
Runs all the time

The Left leg of X201 has no waveform.

Runs only when the set is on.



Right leg

IC501 Audio Amplification for Speakers Information

IC501 VOLTAGES

3.3V_Normal pin 8
from IC405

1.8V_AMP pin 12, 13,
and 16 from IC404

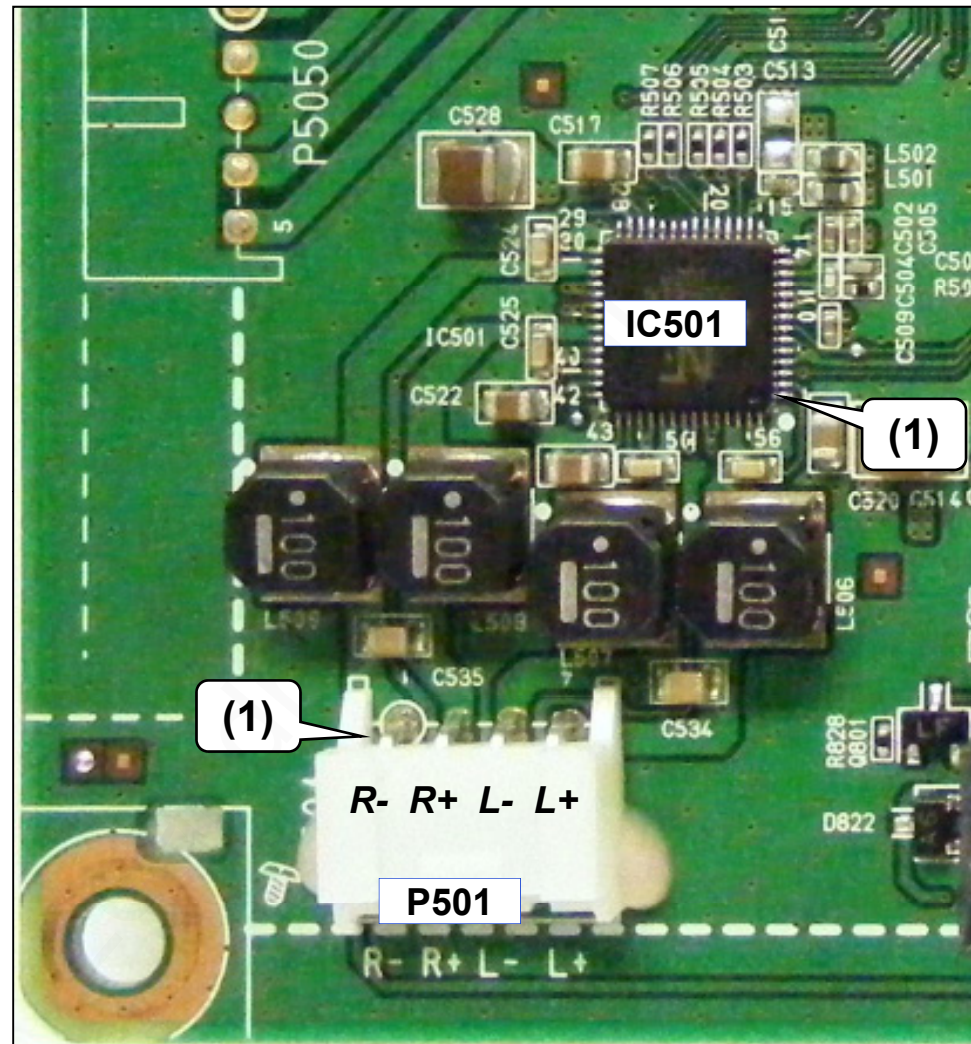
Right Channel:

24V pin 32, 33 (R-)
24V pin 34, 35 (R+)

Left Channel:

24V pin 49, 50 (L-)
24V pin 51, 52 (L+)

Use speaker out to test for
defective Audio Amp IC501
Note: (Normal, ½ Audio B+)
12.05V on each pin.

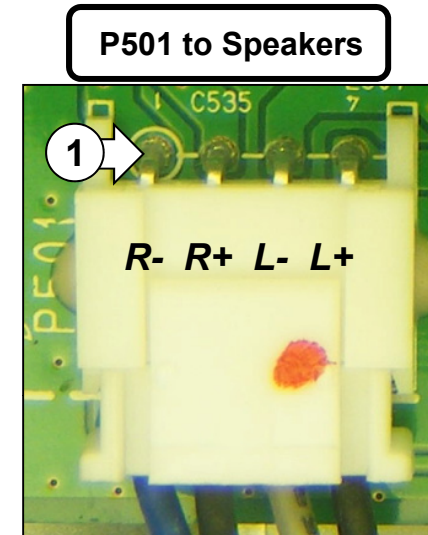


Amp_Reset pin 25 Q501 Back side of the board is (Mute) Active Low.
3.3V_ST Collector to AMP_MUTE Pin 25

P501 Main Board Connector to Speakers Voltage and Diode Check

P501 Connector "Main" To "Speakers"

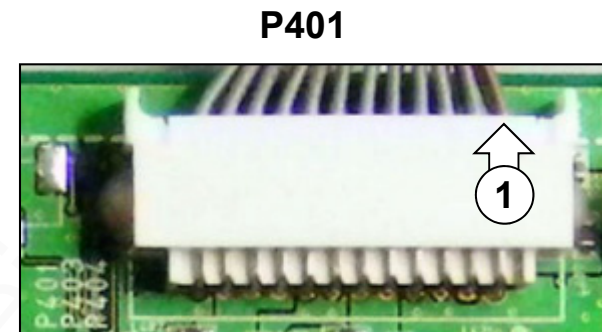
Pin	Label	SBY	Run	Diode Check
1	SPK-R(-)	0V	12.05V	Open
2	SPK-R(+)	0V	12.05V	Open
3	SPK-L(-)	0V	12.05V	Open
4	SPK-L(+)	0V	12.05V	Open



Diode Mode values taken with all Connectors Removed

P401 Main Board Connector to Power Supply Voltage and Diode Check

Pin	Label	STBY	Run	Diode Check
1	PWR_ON	0V	3.38V	2.9V
2-4	24V	0.05V	24.17V	2.37V
5-8	Gnd	Gnd	Gnd	Gnd
9-12	3.5V (Stby)	3.53V	3.5V	1.15V
13-16	Gnd	Gnd	Gnd	Gnd
17	12V	0.06V	12.23V	2.3V
18	INV_ON/OFF	0.52V	3.09V	1.57V
19	12V	0.06V	12.23V	2.3V
20	A-DIM	0.02V	3.31V	OL
21	12V	0.06V	12.23V	2.3V
22	P_DIM	0.02V	0.46V~3.2V	OL
23	n/c	n/c	n/c	Gnd
24	ERROR	0V	0V	OL



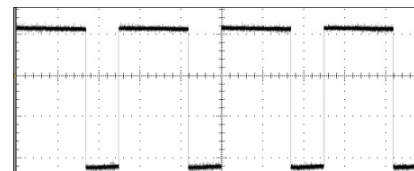
Odd Pins Top Row

Pin 1: PWR_ON: Turns on the 12 and 24V to the Main and 24V to the Ballast. No backlights.

Pin 18: INV_ON: Turns on the backlights.

Pin 23: When the Backlights are told to fire, Error goes to 2.97V. After they fire, 0V.

Pin 22 P_DIM can vary according to incoming video IRE level, OSD Backlight setting and Intelligent Sensor (room light condition). Range 0.34V to 3.2V.



P-DIM1
3.66V p/p 50IRE

Diode Mode values taken with all Connectors Removed

P2401 Main Board to (Ft. IR/Intelligent Sensor) Voltage and Diode Check

P2401 "MAIN Board" To J1 "IR Board"

Pin	Label	STBY	Run	Diode Check
15	SDA	3.53V	3.29V	1.79V
14	SCL	3.52V	3.29V	1.79V
13	Gnd	Gnd	Gnd	Gnd
12	LED_R	0V	0V	2.67V
11	+3.3V_Normal	0.56V	3.08V	0.56V
10	Gnd	Gnd	Gnd	Gnd
9	IR	1.96V	1.93V	OL
8	LED_B	0V	0V	2.67V
7	Gnd	Gnd	Gnd	Gnd
6	3.5V_ST	3.33V	3.49V	1.16V
5	KEY 2	3.3V	3.29V	1.83V
4	KEY 1	3.3V	3.29V	1.83V
3	Gnd	Gnd	Gnd	Gnd
2	NEC_EEPROM_SDA	3.13V	3.48V	3.29V
1	NEC_EEPROM_SCL	2.12V	3.48V	3.29V



(1) Clock & Data pulses only present when Intelligent Sensor is turned on. (4.49V p/p)

(2) IR pulses (4.9V p/p)

Diode Mode values taken with all Connectors Removed

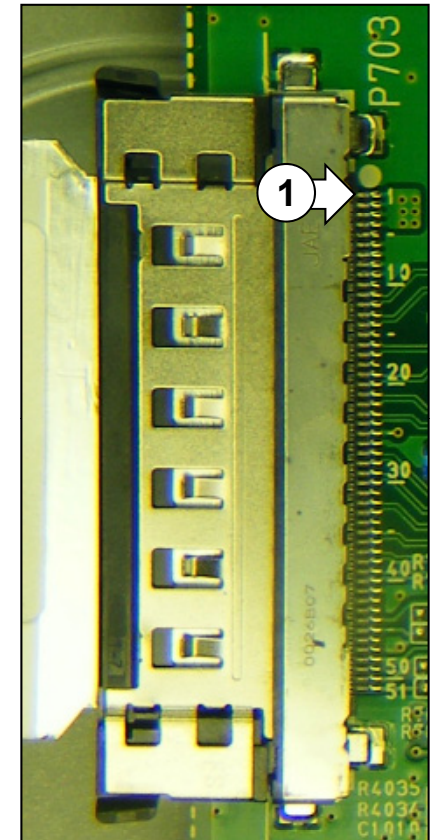
P703 "Main" to "T-CON" CN1 Voltage and Diode Check

Bold text is Video

P703 "MAIN Board" To "T-CON" J102

Pin	Label	Run	Diode Check	Pin	Label	Run	Diode Check
1~4	PANEL_VCC	12.14V	2.35V	27	RXB4-	1.21V	2.16V
5	n/c	n/c	n/c	28	RXB4+	1.22V	2.16V
6~10	Gnd	Gnd	Gnd	29	RXB3-	1.15V	2.16V
11	RXA4-	1.21V	2.16V	30	RXB3+	1.28V	2.16V
12	RXA4+	1.22V	2.16V	31	Gnd	Gnd	Gnd
13	RXA3-	1.15V	2.16V	32	RXBCK-	1.23V	2.16V
14	RXA3+	1.28V	2.16V	33	RXBCK+	1.20V	2.16V
15	Gnd	Gnd	Gnd	34	Gnd	Gnd	Gnd
16	RXACK-	1.23V	2.16V	35	RXB2-	1.21V	2.16V
17	RXACK+	1.20V	2.16V	36	RXB2+	1.22V	2.16V
18	Gnd	Gnd	Gnd	37	RXB1-	1.15V	2.16V
19	RXA2-	1.21V	2.16V	38	RXB1+	1.28V	2.16V
20	RXA2+	1.22V	2.16V	39	RXB0-	1.15V	2.16V
21	RXA1-	1.15V	2.16V	40	RXB0+	1.28V	2.16V
22	RXA1+	1.28V	2.16V	41	Gnd	Gnd	Gnd
23	RXA0-	1.15V	2.16V	42~44	n/c	n/c	n/c
24	RXA0+	1.28V	2.16V	45	LVDS_Sel	2.99V	Open
25	Bit Select	0V	Open	46~50	n/c	n/c	n/c
26	Gnd	Gnd	Gnd	51	Gnd	Gnd	Gnd

P703



There are no Stand-By Voltages for the Connector
Diode Mode values taken with all Connectors Removed

FRONT IR / SOFT TOUCH KEY BOARD SECTION

The Ft. IR/Soft Touch Key board (located on the bottom left as viewed from the rear) contains the IR (Infrared Remote Sensor) and the Intelligent Sensor. It also has the Soft Touch Key Board attached.

The IR board receives its operating B+ pin 6 from the Main P2401 (STBY 3.5V).

The IR (Infrared) remote receiver can be measured (1.96V) at pin 9 of connector P2401 on the Main board in Stand-By. During run pin 9 reads (1.93V).

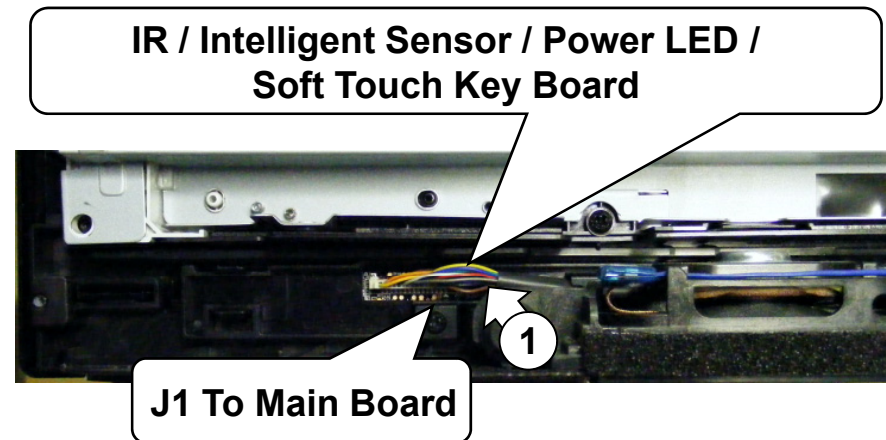
The IR pulses (3.29V p/p) are sent to the Main board Q2405, Q2406 and on to the Microprocessor (IC1002) pin 16.

The Front Power LEDs are controlled by J1 pin 8 "LED_B" (set on) and pin 12 "LED_R" (set off).

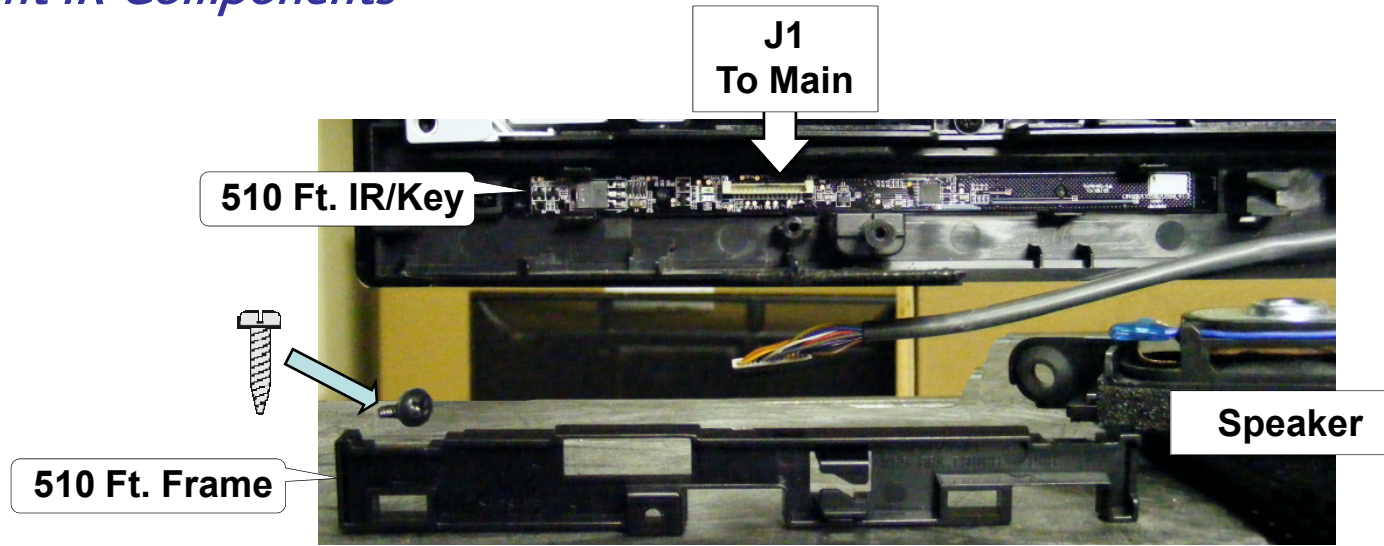
The Key board outputs on J1 Key 1 (pin 4) and Key 2 (pin 5). Arriving at P2401 on the Main Board, then to the Microprocessor 25 and 26 lines.

The Intelligent Sensor communicates with the Micro Processor IC1002 pins 3 & 4 via NEC_EEPROM_SCL/SDA clock and data lines J1 pins 1 & 2. Arriving on connector P2401 pins 1 and 2 on the Main board.
The Intelligent Sensor circuit receives its operational voltage when the set turns on via pin 11 (3.3V_Normal) IC405.

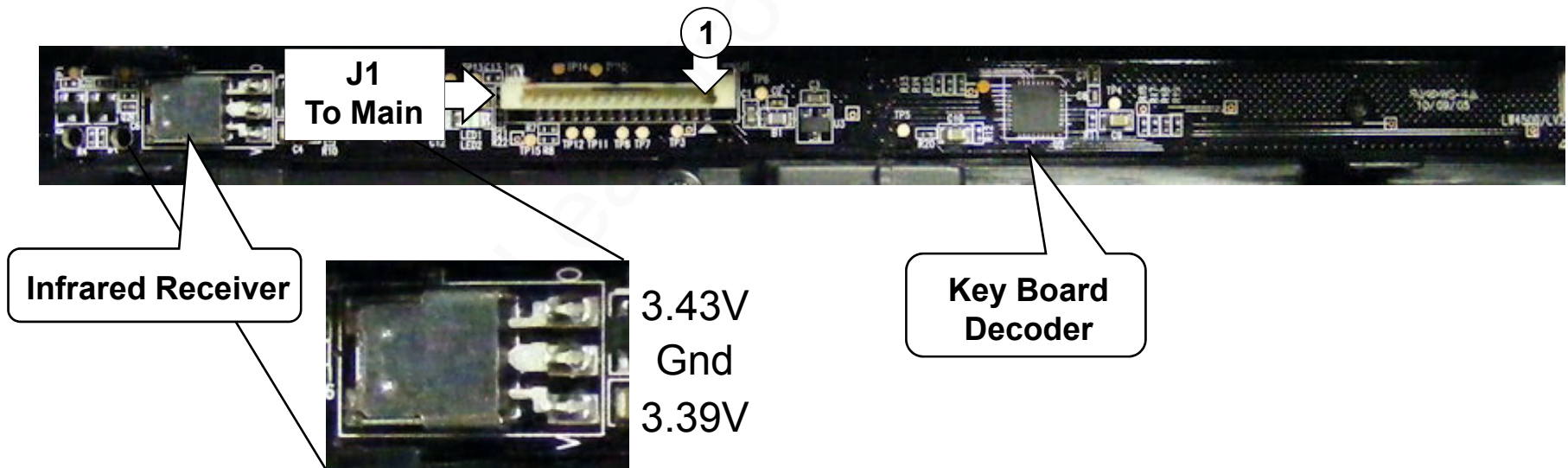
Front IR Board
p/n: EBR72671301
But actually comes with the Front
Frame item 300.
See Disassembly Section.



Front IR Components



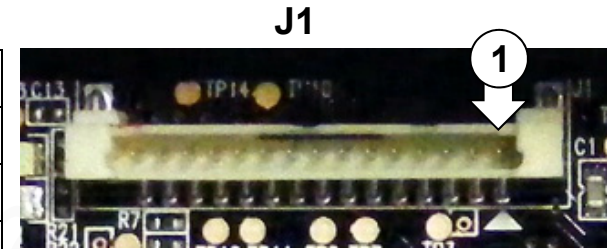
The Front IR/Soft Touch Key board assembly is actually attached to the Front Frame Item 300.



J1 Front IR Board Voltage and Diode Check

J1 "IR Board" To P2401 "Main Board"

Pin	Label	STBY	Run	Diode Check
1	NEC_EEPROM_SCL	2.12V	3.48V	OL
2	NEC_EEPROM_SDA	3.13V	3.48V	OL
3	Gnd	Gnd	Gnd	Gnd
4	KEY 1	3.3V	3.29V	OL
5	KEY 2	3.3V	3.29V	OL
6	3.5V_ST	3.33V	3.49V	OL
7	Gnd	Gnd	Gnd	Gnd
8	LED_B	0V	0V	OL
9	IR	1.96V	1.93V	0.93V
10	Gnd	Gnd	Gnd	Gnd
11	+3.3V_Normal	0.56V	3.08V	OL
12	LED_R	0V	0V	OL
13	Gnd	Gnd	Gnd	Gnd
14	SCL	3.52V	3.29V	OL
15	SDA	3.53V	3.29V	OL



(1) Clock & Data pulses only present when Intelligent Sensor is turned on. (4.49V p/p)

(2) IR pulses (4.9V p/p)

Key Board Key Press Resistance and Voltages

Key 1 Line J1 or P2401 pin 1

Resistance		Voltage	
Volume (+)	1.96M Ω	Volume (+)	1.69V
Volume (-)	1.24M Ω	Volume (-)	1.14V
Menu	550K Ω	Menu	0.53V
Enter	11.5 Ω	Enter	0.02V

Key 2 Line J1 or P2401 pin 3

Resistance		Voltage	
CH (Up)	1.96M Ω	CH (Up)	1.63V
CH (Dn)	1.24M Ω	CH (Dn)	1.11V
Power	550K Ω	Power	0.53V
Input	11.5 Ω	Input	0.02V

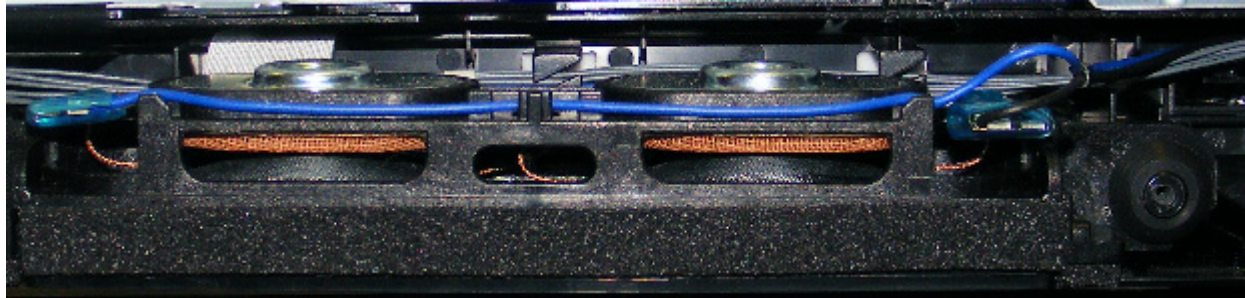
**Voltage and Resistance taken with
AC applied to the set.**

No Button pressed Resistance is 16.7M
Voltage for Key 1 or Key 2 is Off 3.3V / On 3.29V.

INVISIBLE SPEAKER SECTION

Speaker
p/n EAB60961401

The 37LK450 contains the Invisible Speaker system.
The Full Range Speakers point downward, so there is no front viewable speaker grill or air ports.
It uses the split magnet thin profile speaker.



Installed

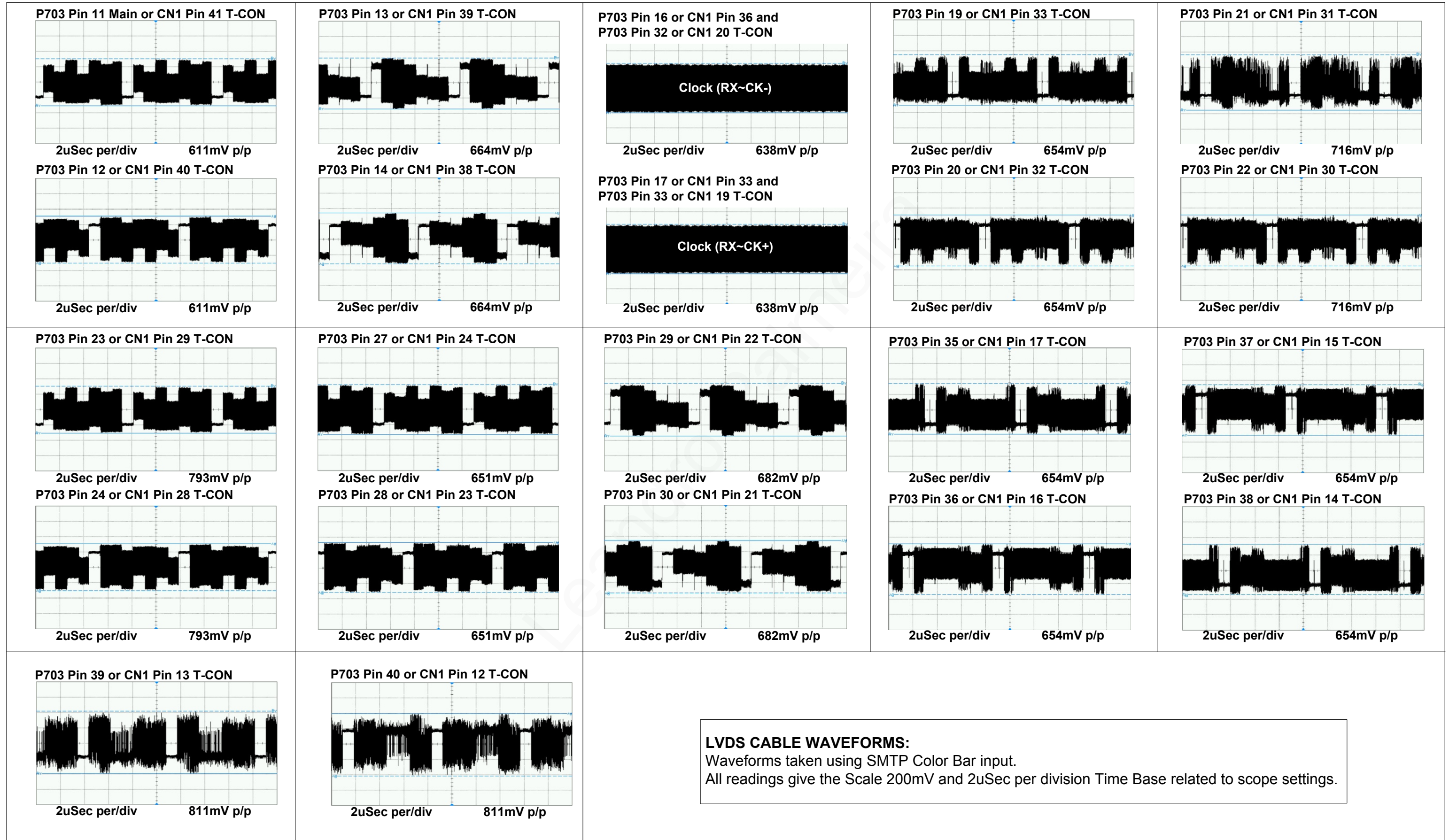
INTERCONNECT DIAGRAM (11 X 17 FOLDOUT SECTION)

This section shows the 11X17 foldout that's available in the Paper and Adobe version of the Training Manual.

The Adobe version of this Training Manual allows the viewer to zoom in and out making reading of the small text easier.

This Power Point shows a graphical representation of the 11 X 17 foldout page so clarity is limited.

37LK450 LVDS P703 WAVEFORMS



37LK450 MAIN (FRONT SIDE) SIMICONDUCTORS





































<p>IC103 HDCP EEPROM</p> <p>Pin</p> <p>[1] 0V (Gnd) [2] 0V (Gnd) [3] 3.29V (B+) [4] 0V (Gnd) [5] 0V [6] 3.29V [7] 0V (Gnd) [8] 3.29V (B+)</p>	<p>IC403 (+1.26V_VDDC) Regulator</p> <p>Pin</p> <p>[1] 3.28V (In) [2] 3.28V (In) [3] 0V (Gnd) [4] 0V (Gnd) [5] 0V (Gnd) [6] 0.8V [7] 0.86V [8] 0.54V [9] 1.75V [10] 1.33V (Out) [11] 1.33V (Out) [12] 1.33V (Out) [13] 4.72V [14] n/c [15] 3.29V [16] 3.28V (In)</p>	<p>IC406 (+5V_Normal) Regulator</p> <p>Pin</p> <p>[1] 0V (Gnd) [2] 12.23V (In) [3] 0V (Gnd) [4] 0.8V [5] 0.86V [6] 3.32V (PWR On/Off1) [7] 5V (Out) [8] 5V (Out)</p>	<p>Q408 (+1.5V_FRC_DDR) Switch</p> <p>Pin</p> <p>G 3.3V (PWR On/Off2_1) S 1.51V (In) D 1.52V (Out)</p>	<p>Q1001 EDID Write Protect</p> <p>Pin</p> <p>B 0V C 4.7V E Gnd</p>	<p>D804 Source Bias Q806</p> <p>Pin</p> <p>[A1] 0V [A2] 3.27V [C] 3.17V</p>
<p>IC401 5V Regulator for USB</p> <p>Pin</p> <p>[1] 0V (Gnd) [2] 12.24V (In) [3] 0V (Gnd) [4] 0.8V [5] 0.8V [6] 3.3V (PWR On/Off2_1) [7] 4.99V (Out) [8] 4.99V (Out)</p>	<p>IC405 (+3.3V_NORMAL) Regulator</p> <p>Pin</p> <p>[1] 0V (Gnd) [2] 12.23V (In) [3] 0V (Gnd) [4] 0.8V [5] 0.87V [6] 3.32V (PWR On/Off1) [7] 3.34V (Out) [8] 3.34V (Out)</p>	<p>IC407 (+1.5V_DDR) Regulator</p> <p>Pin</p> <p>[1] 3.32V (In) [2] 3.32V (In) [3] 0V (Gnd) [4] 0V (Gnd) [5] 0V (Gnd) [6] 0.83V [7] 0.7V [8] 0.51V [9] 1.93V [10] 1.52V (Out) [11] 1.52V (Out) [12] 1.52V (Out) [13] 4.87V [14] n/c [7] 3.34V (Out) [16] 3.32V (In)</p>	<p>Q801 HDMI 2 Hot Swap</p> <p>Pin</p> <p>B 0.63V C 0V E Gnd</p>	<p>Q1105 Head Phone MUTE</p> <p>Pin</p> <p>B 2.82V C 0V E 3.34V</p>	<p>D822 5V Routing for IC802</p> <p>Pin</p> <p>[A1] 5V [A2] 0V [C] 4.7V</p>
<p>IC402 (+2.5V_Normal) Regulator</p> <p>Pin</p> <p>[1] 3.29V (In) [2] 0V (Gnd) [3] 2.5V (Out)</p>			<p>Q802 HDMI 1 Hot Swap</p> <p>Pin</p> <p>B 0.63V C 0V E Gnd</p>	<p>Q1106 Head Phone Mute Driver</p> <p>Pin</p> <p>B 0V C 2.82V E Gnd</p>	<p>D825 Source Bias Q805</p> <p>Pin</p> <p>[A1] 0V [A2] 0.06V [C] 3.17V</p>

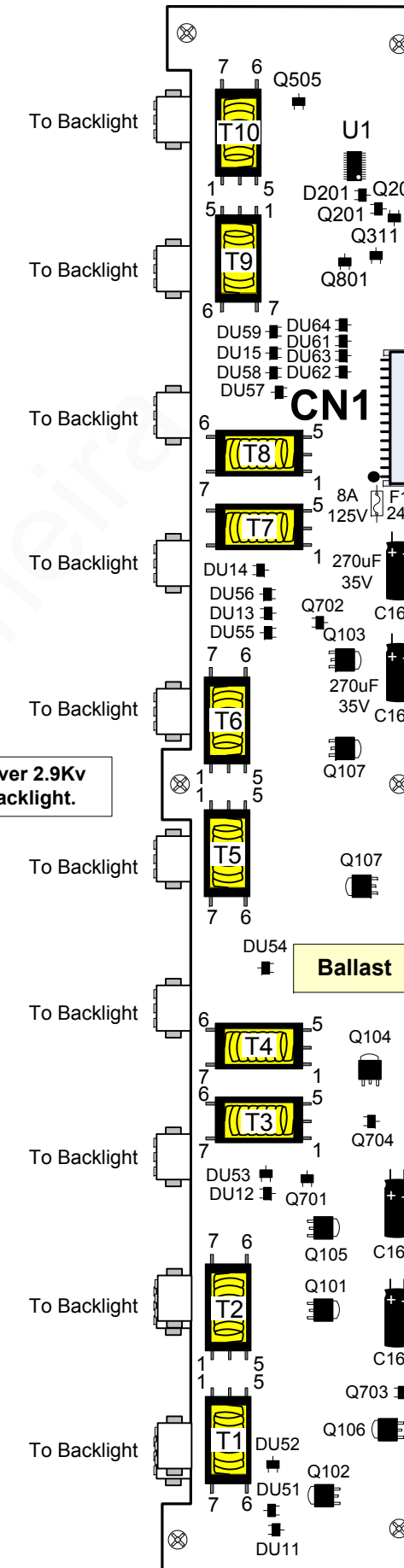
37LK450 MAIN (BACK SIDE) SIMICONDUCTORS

<p>IC104 Microprocessor EEPROM</p> <p>Pin</p> <p>[1] 0V (n/c) [2] 0V (Gnd) [3] 0V (Gnd) [4] 0V (Gnd) [5] 3.29V (SDA) [6] 3.29V (SCL) [7] 0V (Gnd) [8] 3.29V (B+)</p>	<p>IC804 EDID Data HDMI4</p> <p>Pin</p> <p>[1] 0V (Gnd) [2] 0V (Gnd) [3] 0V (Gnd) [4] 0V (Gnd) [5] 4.7V (SDA) [6] 4.7V (SCL) [7] 4.7V (WP) [8] 4.7V (Vcc)</p>	<p>IC1105 EDID Data PC</p> <p>Pin</p> <p>[1] 0V (Gnd) [2] 0V (Gnd) [3] 0V (Gnd) [4] 0V (Gnd) [5] 4.7V (SDA) [6] 4.7V (SCL) [7] 4.7V (WP) [8] 4.7V (Vcc)</p>	<p>Q401 Power On/Off Driver for Q402</p> <p>Pin</p> <p>B 0.65V (RL_ON) C 0V E Gnd</p>	<p>Q803 HDMI 4 Hot Swap</p> <p>Pin</p> <p>B 0.65V C 0V E Gnd</p>	<p>D821 5V Routing for IC801</p> <p>Pin</p> <p>[A1] 0V [A2] 5.0V [C] 4.7V</p>
<p>IC404 (+1.8V_Amp) Regulator</p> <p>Pin</p> <p>[1] Gnd [2] 1.79V (Out) [3] 3.29V (In)</p>	<p>IC1001 Micro EEPROM</p> <p>Pin</p> <p>[1] 0V (Gnd) [2] 0V (Gnd) [3] 3.3V (B+) [4] 0V (Gnd) [5] 3.3V (SDA) [6] 3.3V (SCL) [7] 0V (Gnd) [8] 3.3V (B+)</p>	<p>IC1401 Serial Flash Memory</p> <p>Pin</p> <p>[1] 0.0V [2] 3.3V [3] 3.3V [4] 0V (Gnd) [5] 0V [6] 0V [7] 3.3V (B+) [8] 3.3V (B+)</p>	<p>Q402 Power On/Off Switch</p> <p>Pin</p> <p>1 3.3V (In) 2 0.8V (Ctl) 3 3.16V (Out)</p>	<p>Q1101 Head Phone MUTE</p> <p>Pin</p> <p>B 0V C 0V E Gnd</p>	<p>D824 5V Routing for IC804</p> <p>Pin</p> <p>[A1] 0V [A2] 5V [C] 4.7V</p>
<p>IC408 Power_Det 12V</p> <p>Pin</p> <p>[1] 0V (Gnd) [2] 3.30V (Reset) [3] 3.33V (In)</p>	<p>IC1101 RS232 Data Buffer</p> <p>Pin</p> <p>[1] 3.3V [2] 5.4V [3] 0V [4] 0V [5] (-5.4V) [6] 0V [7] n/c (0V) [8] n/c (0V) [9] n/c (3.3V) [10] n/c (0V) [11] n/c (3.3V) [12] 3.3V [13] 0V [14] (-5.4V) [15] 0V (Gnd) [16] 3.3V</p>	<p>IC1450 5V Short Protection for USB</p> <p>Pin</p> <p>[1] 0V (Gnd) [2] 4.98V (In) [3] 4.98V (In) [4] 3.3V (USB-En) [5] 4.96V [6] 4.98V (Out) [7] 4.98V (Out) [8] n/c (0V)</p>	<p>Q405 Inverter On/Off Switch</p> <p>Pin</p> <p>B 0.0V C 3.0V (INV_On) E Gnd</p>	<p>Q1102 Head Phone MUTE</p> <p>Pin</p> <p>B 0V C 0V E Gnd</p>	<p>D1115 5V Routing for IC1105</p> <p>Pin</p> <p>[A1] 0.0V [A2] 5V [C] 4.7V</p>
<p>IC409 Power_Det 24V</p> <p>Pin</p> <p>[1] 0V (Gnd) [2] 3.30V (Reset) [3] 3.33V (In)</p>		<p>IC3703 (+1.2V_TU) Regulator</p> <p>Pin</p> <p>[1] 0V (Gnd) [2] 1.26V (Out) [3] 3.3V (In)</p>	<p>Q406 PANEL_VCC Control 1st Driver</p> <p>Pin</p> <p>B 0.0V C 0.68V E Gnd</p>	<p>Q1103 Head Phone MUTE</p> <p>Pin</p> <p>B 0V C 0V E Gnd</p>	<p>Q2405 IR Buffer</p> <p>Pin</p> <p>B 0.0V C 3.0V (INV_On) E Gnd</p>
<p>IC801 EDID Data HDMI1</p> <p>Pin</p> <p>[1] 0V (Gnd) [2] 0V (Gnd) [3] 0V (Gnd) [4] 0V (Gnd) [5] 4.7V (SDA) [6] 4.7V (SCL) [7] 4.7V (WP) [8] 4.7V (Vcc)</p>			<p>Q407 PANEL_VCC Control 2nd Driver</p> <p>Pin</p> <p>B 0.68V C 0V E Gnd</p>	<p>Q1104 Head Phone MUTE</p> <p>Pin</p> <p>B 0V C 0V E Gnd</p>	<p>Q2406 IR Buffer</p> <p>Pin</p> <p>B 0.0V C 0.68V E Gnd</p>
<p>IC802 EDID Data HDMI2</p> <p>Pin</p> <p>[1] 0V (Gnd) [2] 0V (Gnd) [3] 0V (Gnd) [4] 0V (Gnd) [5] 4.7V (SDA) [6] 4.7V (SCL) [7] 4.7V (WP) [8] 4.7V (Vcc)</p>			<p>Q409 PANEL_VCC Switch</p> <p>Pin</p> <p>S 12.2V (In) G 1.84V (Enable) D 12.2V (Out)</p>	<p>Q3703 Tuner CVSB (Video) Buffer</p> <p>Pin</p> <p>B 3.4V C Gnd E 4.1V</p>	
			<p>Q501 AMP_MUTE Pin 25 IC600</p> <p>Pin</p> <p>B 0.0V C 3.35V E Gnd</p>	<p>Q3705 Tuner SIF (Sound) Buffer</p> <p>Pin</p> <p>B 0.2V C Gnd E 0.9V</p>	

37LK450 Ballast (Inverter) Drawing

BALLAST COMPONENT VOLTAGE TABLE

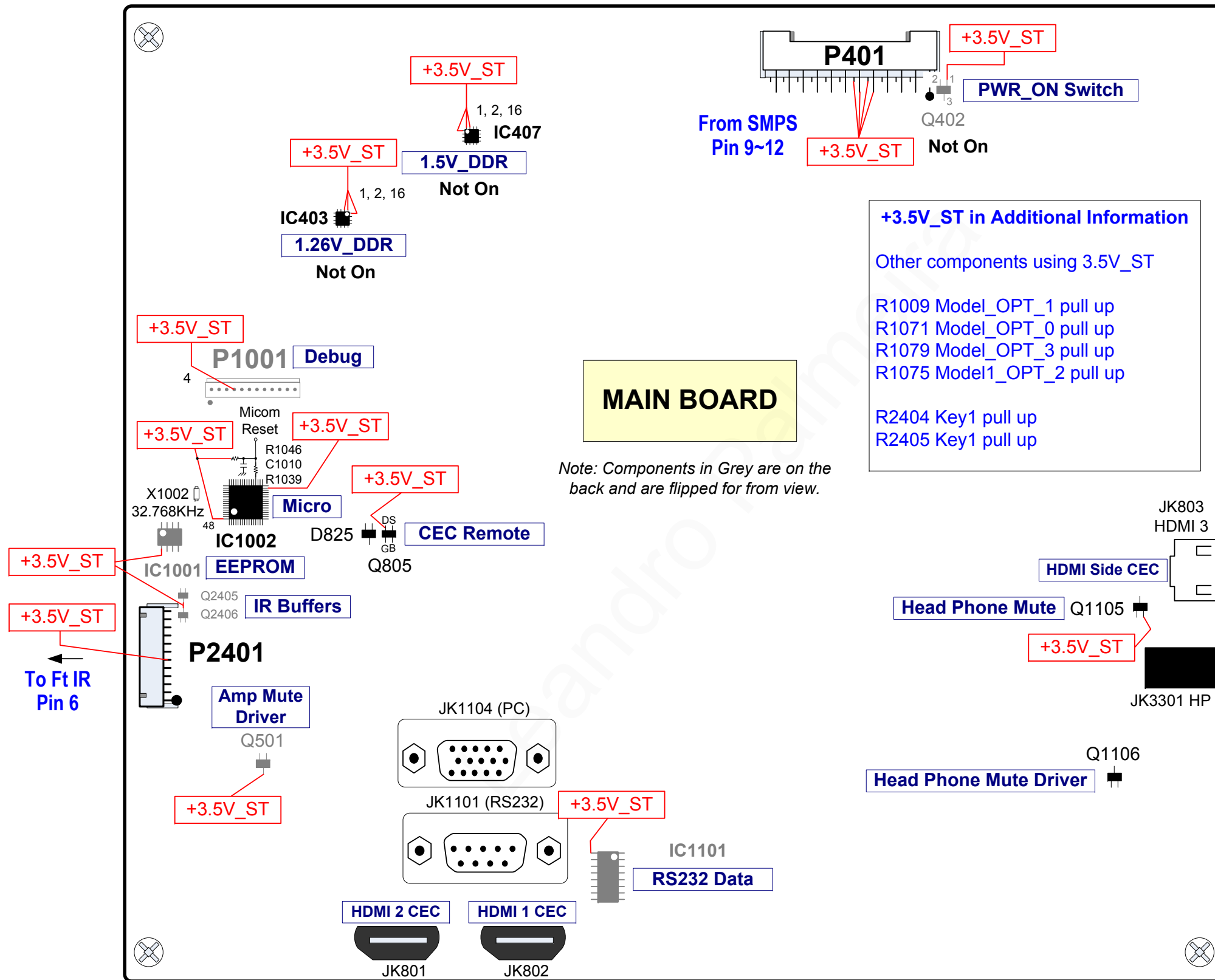
Q101 PIN Run  1) 10.86V 2) 24V 3) 8.96V	Q202 PIN Run  B) 2.9V C) 0V E) 0V	DU11 PIN Run  1) 0V 2) 1.58V 3) 0V	DU55 PIN Run  1) 0V 2) 1.6V 3) 2.61V
Q102 PIN Run  1) 3.17V 2) 8.9V 3) 0V	Q311 PIN Run  B) 0.58V C) 0.06V E) 0V	DU12 PIN Run  1) 0V 2) 1.59V 3) 0V	DU56 PIN Run  1) 0V 2) 1.26V 3) 2.61V
Q103 PIN Run  1) 11.23V 2) 24V 3) 9.07V	Q505 PIN Run  B) 0V C) 1.51V E) 0V	DU13 PIN Run  1) 0V 2) 1.57V 3) 0V	DU57 PIN Run  1) 0V 2) 0.91V 3) 2.65V
Q104 PIN Run  1) 3.14V 2) 9.08V 3) 0V	Q701 PIN Run  B) 11.03V C) 8.97V E) 10.87V	DU14 PIN Run  1) 0V 2) 1.6V 3) 0V	DU58 PIN Run  1) 0V 2) 1.23V 3) 2.66V
Q105 PIN Run  1) 10.86V 2) 24V 3) 10.86V	Q702 PIN Run  B) 11.43V C) 9.08V E) 11.26V	DU15 PIN Run  1) 0V 2) 1.54V 3) 0V	DU59 PIN Run  1) 0V 2) 1.41V 3) 2.66V
Q106 PIN Run  1) 0V 2) 8.9V 3) 0V	Q703 PIN Run  B) 3.29V C) 0V E) 3.16V	DU51 PIN Run  1) 2.6V 2) 0.52V 3) 0V	DU61 PIN Run  1) 0V 2) 0V 3) 24.12V
Q107 PIN Run  1) 11.27V 2) 24V 3) 9.08V	Q704 PIN Run  B) 3.27V C) 0V E) 3.14V	DU52 PIN Run  1) 0V 2) 0.8V 3) 2.6V	DU62 PIN Run  1) 0V 2) 3.09V 3) 24.12V
Q108 PIN Run  1) 3.15V 2) 9.06V 3) 0V	Q801 PIN Run  B) 5V C) 0V E) 0V	DU53 PIN Run  1) 0V 2) 1.66V 3) 2.63V	DU63 PIN Run  1) 0V 2) 3.32V 3) 24.12V
Q201 PIN Run  B) 0V C) 1.49V E) 0V	D201 PIN Run  1) 15.49V 2) 5.48V 3) 14.59V	DU54 PIN Run  1) 2.6V 2) 0.9V 3) 2.66V	DU64 PIN Run  1) 0V 2) 3.15V 3) 24.12V



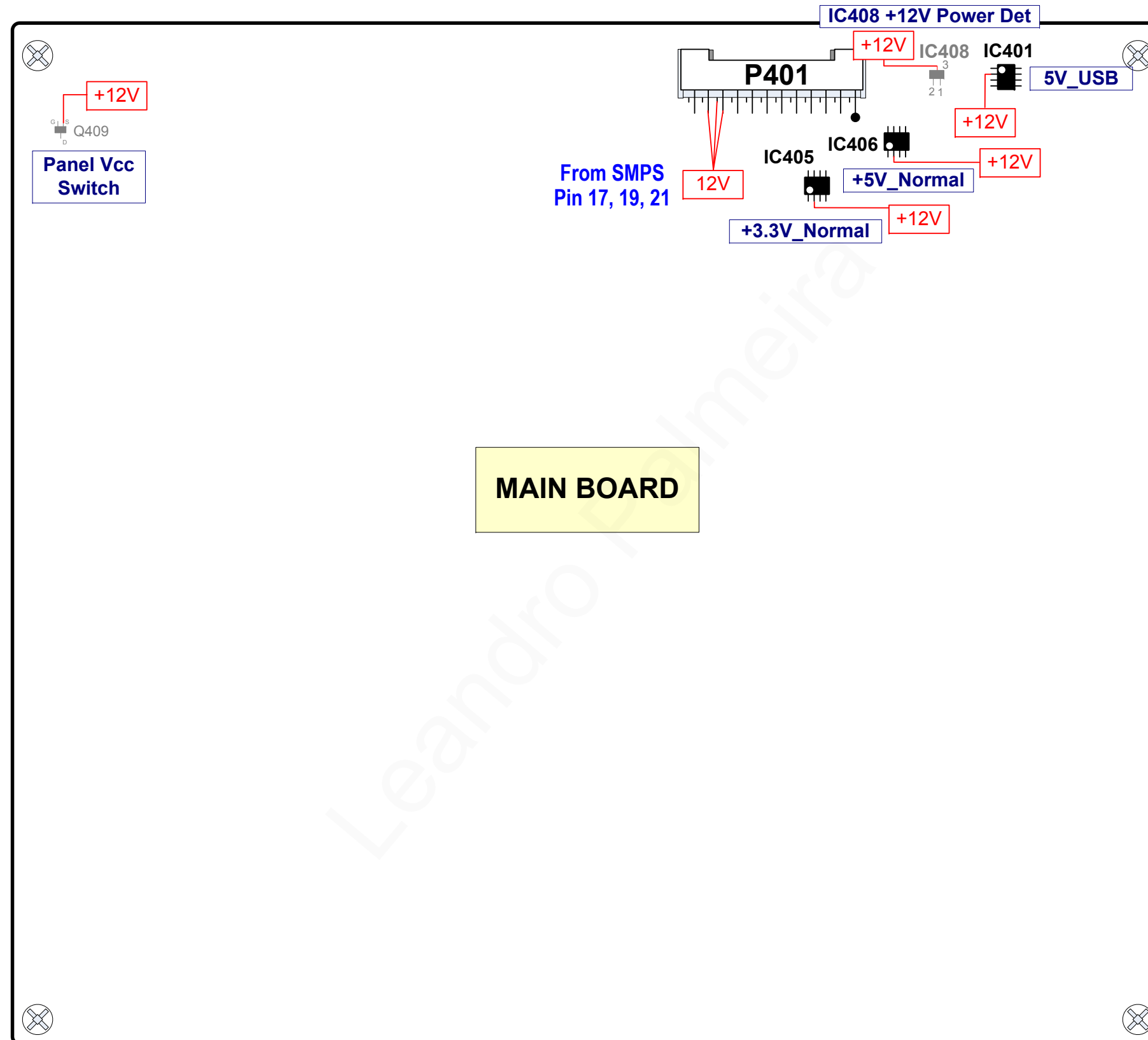
**Warning: Over 2.9Kv
To each Backlight.**

U1		U1	
PIN	Run	PIN	Run
1)	15.41V	13)	1.04V
2)	9.12V	14)	1.98V
3)	9.12V	15)	0.1V
4)	0V	16)	1.44V
5)	3.28V	17)	1.48V
6)	3.3V	18)	2.33V
7)	5.48V	19)	0V
8)	2.9V	20)	0V
9)	14.41V	21)	1.36V
10)	14.44V	22)	0V
11)	1.48V	23)	9.06V
12)	0V	24)	14.7V

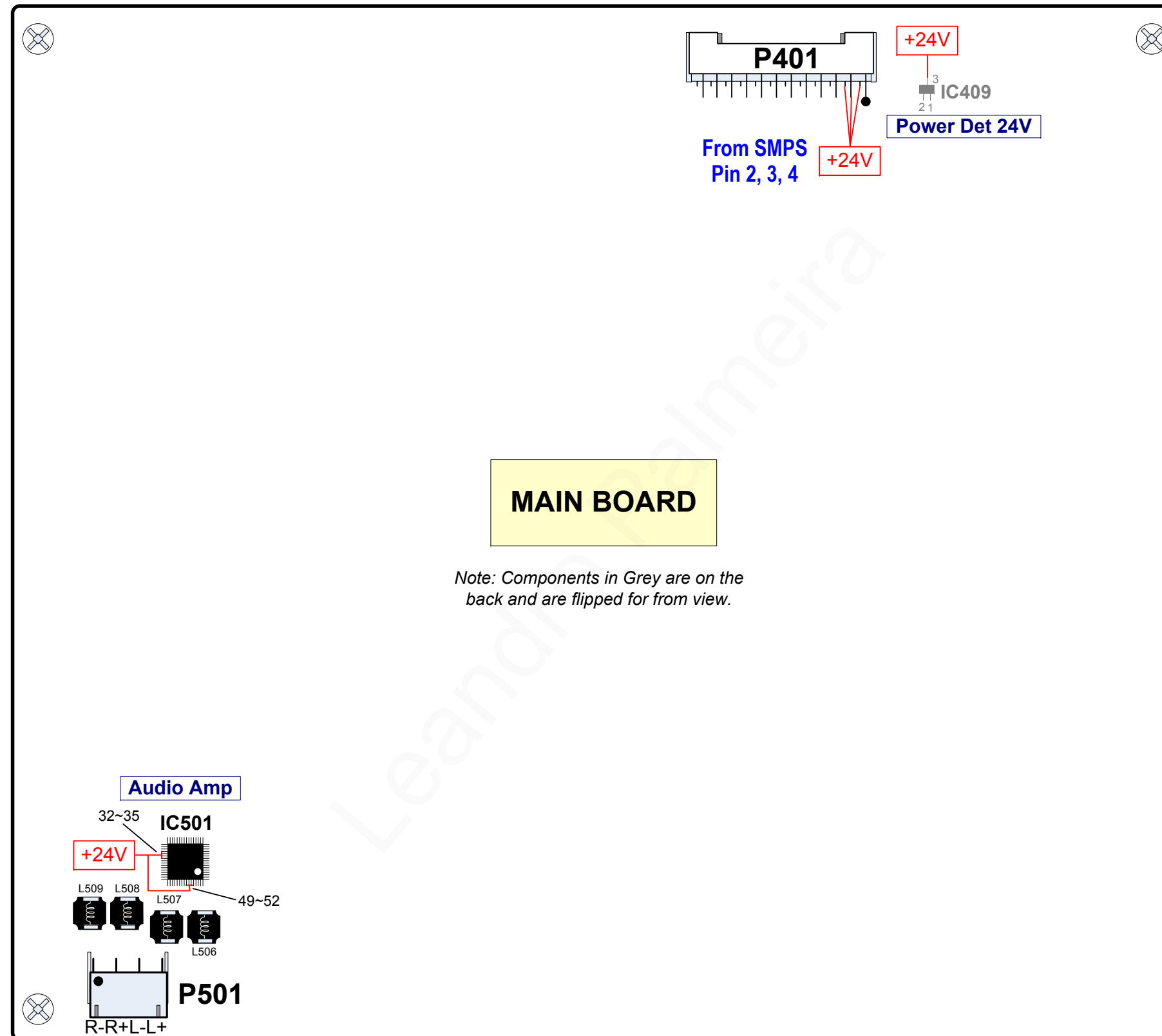
37LK450 Components Using +3.5V_ST



37LK450 Components Using 12V



37LK450 Components Using 24V



37LK450 Other Voltage Distributions

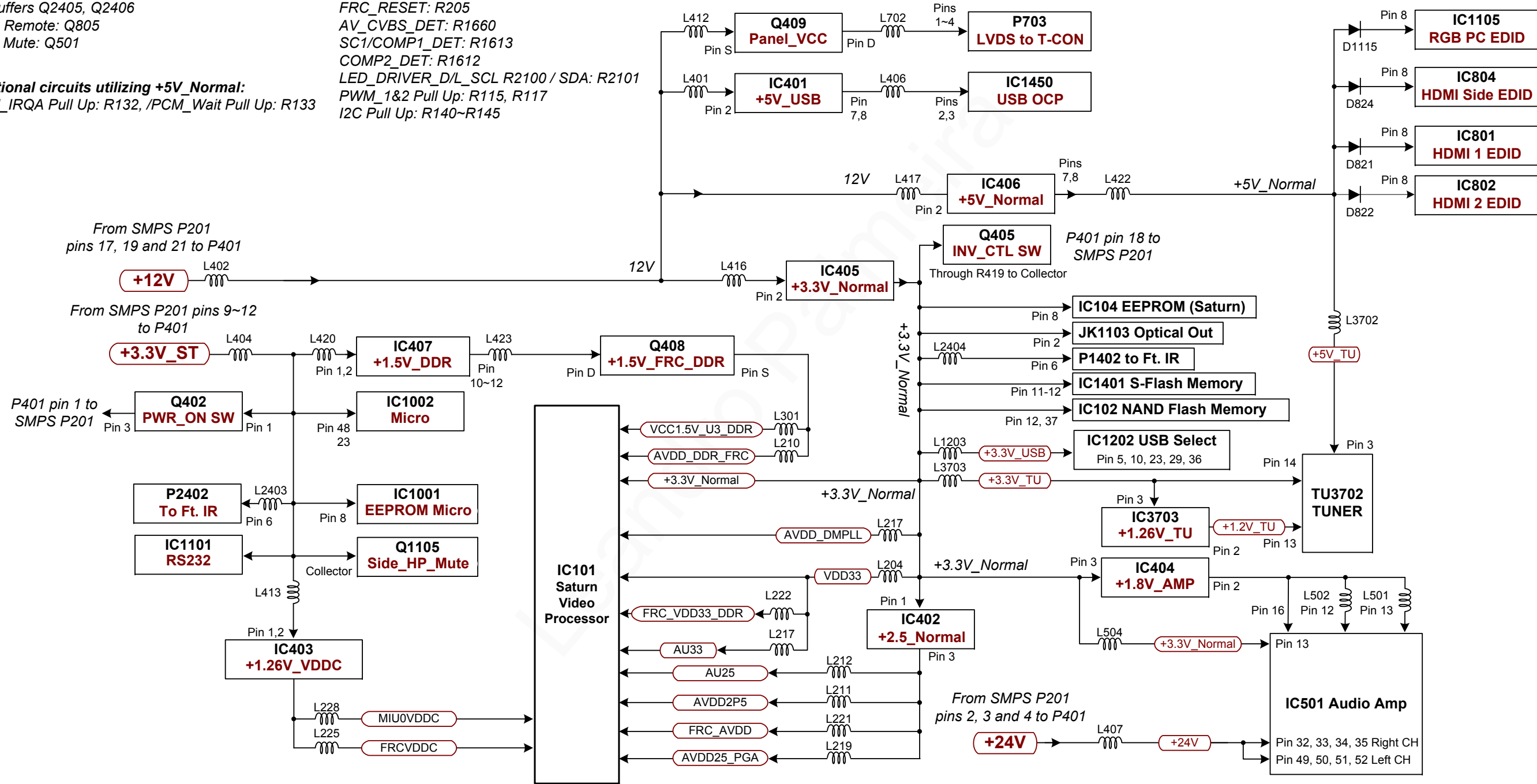
Additional circuits utilizing +3.5V_ST:
 Reset for Microprocessor: C1010 and R1046
 Key 1 and Key 2 pull up: R2401, R2405
 S/T_SCL R4043, S/T_SDA R4035
 Microm Model Option 0~3 pull up:
 R1071, R1009, R1075, R1079
 IR Buffers Q2405, Q2406
 CEC Remote: Q805
 Amp Mute: Q501

Additional circuits utilizing +5V_Normal:
 /PCM_IRQA Pull Up: R132, /PCM_Wait Pull Up: R133

Additional circuits utilizing +3.3V_Normal:
 CEC Remote: Q806
 DSUB_Det: R1146
 HP_DET: R1155
 Write Protect (WP): IC1401 pin 3 R1403
 IC_AGC_MAIN Pull Up: L227 R4019
 FRC_RESET: R205
 AV_CVBS_DET: R1660
 SC1/COMP1_DET: R1613
 COMP2_DET: R1612
 LED_DRIVER_D/L_SCL R2100 / SDA: R2101
 PWM_1&2 Pull Up: R115, R117
 I2C Pull Up: R140~R145

Additional circuits utilizing +12V:
 IC408 Power_Det: R448
 Panel Power Drivers: R431 to Q406, R439, R440 to Q407

Additional circuits utilizing +24V:
 IC409 Power_Det: R482



37LK450 Conclusion Page



*This concludes the
37LK450 training session.*

(1) Updates 09/28/2011

1. Corrected page 65, 66 and 67 by rotating IC3703. It was sideways and should have been up/down.
2. Added Tuner Information, Pages 70 and 71.
3. Updated the Interconnect drawing to reflect IC3703 orientation, page 84.
4. Added Main Board Voltage Distribution to the Interconnect Diagram Page 88~91.

[To First Page](#)