

TECHNICAL TRAINING

LCD-03-2 2003 LCD TV Power Supply and Shutdown

Course: 2003 LCD TV Servicing

Model Year: 2003

Chassis: LCD03

Models: 26HL83, 32HL83

Purpose:

Provide an overview of the 2003 LCD TV power supply and shutdown circuits and identify the electrical adjustments necessary to properly match power supply and LCD panel.

Objectives: Upon completion of this training module, the technician will:

1. Be able to troubleshoot the power supply to PC board level with 80% accuracy.
2. Understand how to properly remove and replace the power supply PC boards with 100% accuracy.
3. Perform the electrical adjustments needed to match the power supply to the LCD panel with 100% accuracy.
4. Be able to troubleshoot shutdown conditions to PC board level with 80% accuracy.

Product Specific Service Manuals:

This training is designed as an aid to the technician in servicing Toshiba products. It is not a replacement for the appropriate service manual(s). Toshiba service manuals contain product and model specific information and must be consulted prior to servicing any product.

Product Safety Precautions:

Product Safety Precautions are described in the Toshiba service manual(s) for products and models covered in this training. All safety precautions and checks must be complied with before returning any product to the customer. Servicers who defeat safety features or fail to perform safety checks may be liable for any resulting damages and may expose themselves and others to possible injury.

TOSHIBA AMERICA CONSUMER PRODUCTS, L.L.C.

National Service Division – 1420B Toshiba Drive – Lebanon, TN 37087
www.tacpservice.toshiba.com/tacp E-Mail: Technical_Training@tacp.com

26HL83 Toshiba LCD Television – Monitor Power Supply and Shutdowns

Power Supply

The Power supply used in the 26HL83 LCD (Liquid Crystal Display) television is contained on two PCB assemblies. They are the Main Switching Power and Low B (DD Power module) power boards. Figure 1 points these and all other boards out, along with their physical locations in the LCD unit.

LAYOUT OF MAJOR BOARDS

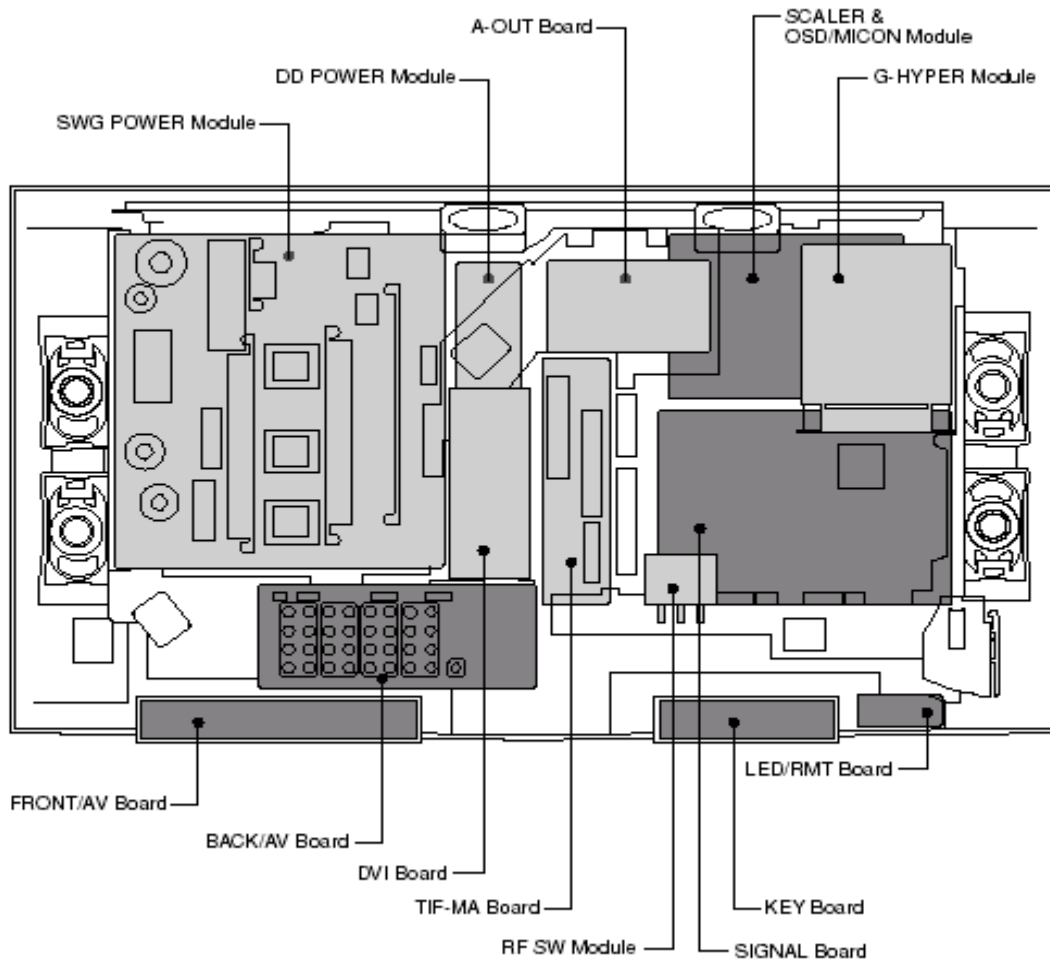


Figure 1

These two supply boards are serviceable to board level only. For that reason, our service approach will address the supply voltage routing, operational levels and DC resistances to cold ground exhibited by the various sources. Using that information, troubleshooting to board level should be successful with an acceptable degree of accuracy.

Main Power Supply

Figure 2 shows the connectors associated with the Main Switching power supply PCB. After this overview, we will then look at each connector in terms of the associated voltage sources and DC resistances each supply line should be expected to exhibit when referenced to cold ground.

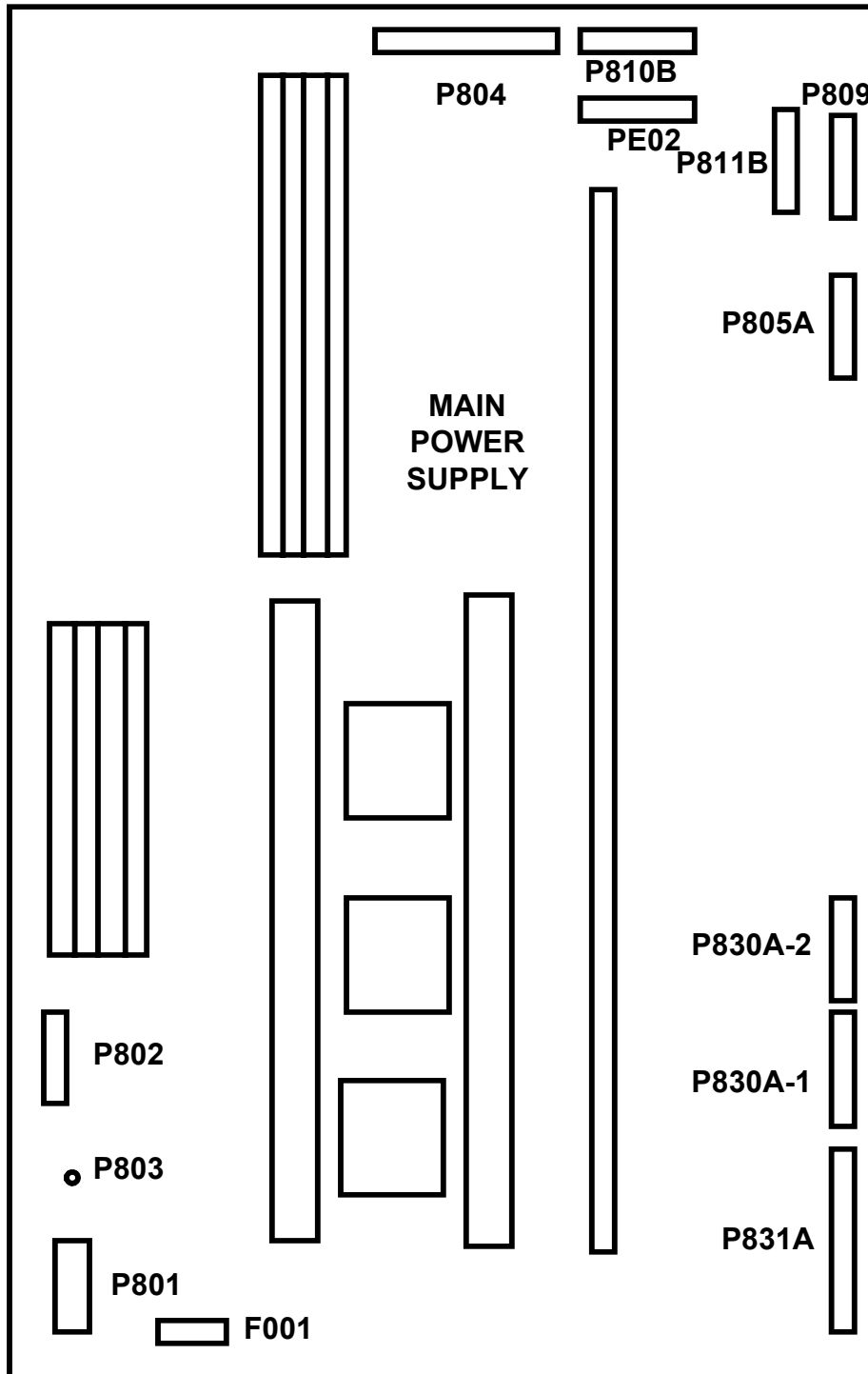


Figure 2

Let's begin with plugs P801, P802, and P803. (Figure 3)

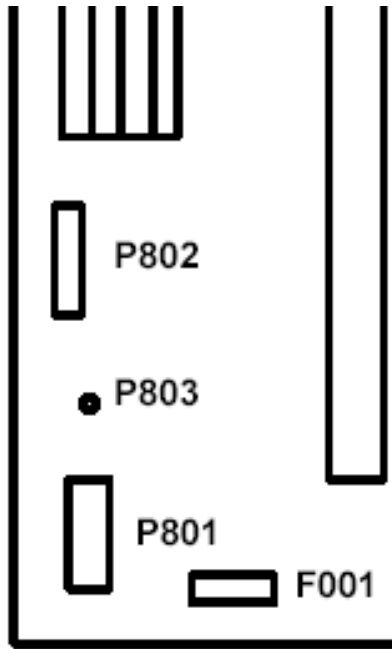


Figure 3

P801 is the AC input to the power supply and is fused by F001. P803 is a tuner ground on the power PCB. It is occupied by a green slide on connector routed to the tuner area. P802 is a jumper between points located in the AC input.

Readme: P802 is used in non-US models requiring the product to have a mechanical AC switch.

Figure 4 shows plugs PE02, P804, and P810B.

Readme: In this model, PE02 is on the power supply board but it is not used. This plug is available for the ATSC ready models using a Digital Board.

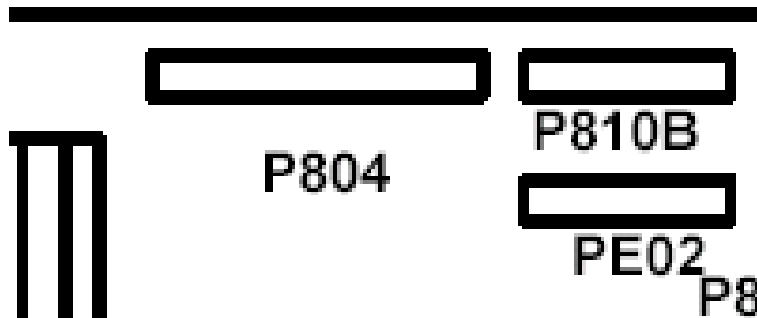


Figure 4

P804 is the supply for the LCD. Table 1 illustrates voltage and resistances that should be measured to cold ground at P804.

Pin	Voltage and Resistance to cold ground	
1.	3.2 volts	90k ohms
2.	5 volts	11k ohms
3.	3.3 volts	55k ohms
4.	3.2 volts	46k ohms
5.	0 volts	0 ohms
6.	0 volts	0 ohms
7.	9 volts	> 500 ohms
8.	9 volts	> 500 ohms
9.	0 volts	0 ohms
10.	0 volts	0 ohms
11.	5 volts	> 500 ohms
12.	5 volts	> 500 ohms

Table 1

Readme: Remember that resistance readings will vary depending on the instrument used to measure them but a reading significantly below what is listed in this text indicates a problem and should be investigated.

As shown in Figure 5, P820B contains a total of 12 pins, with the 9 and 5V2 sources occupying 8 of these pins (including source grounds). Resistance measurements to cold ground should measure in excess of 400 ohms for both sources.

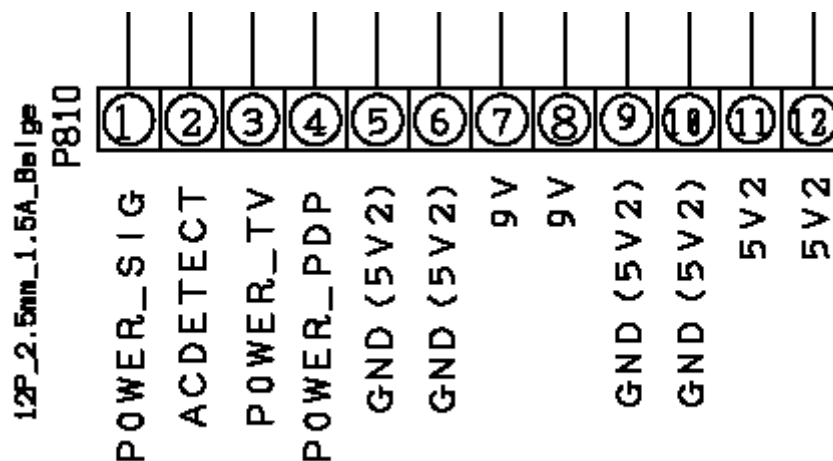


Figure 5

Figure 6 shows the location of plugs P805A, P809, and P811B.



Figure 6

P805A (Figure 7) is a 7-pin plug that supplies power to the scaler module. The 5V3 volt source can be found at pins 1, 2, and 3. DC resistance to cold ground should measure 1500 ohms. Pins 4, 5, 6, and 7 are ground.

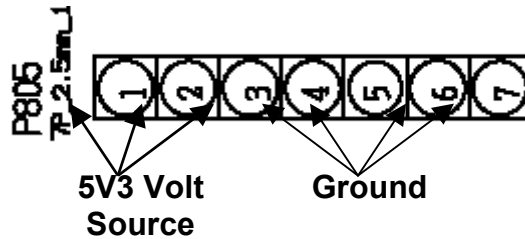


Figure 7

Figure 8 is a detailed drawing of P811B. The power supply sources found here are 5.1 volts at pin 1, 32 volts at pin 6, 12 volts at pin 7, and 3.3 volts at pins 9 and 10. Resistance to cold ground at pin 1 should measure in excess of 3K ohms, pin 6 greater than 1 Meg ohm, pin 7 greater than 20K ohms, and pin 9 greater than 5K ohms.

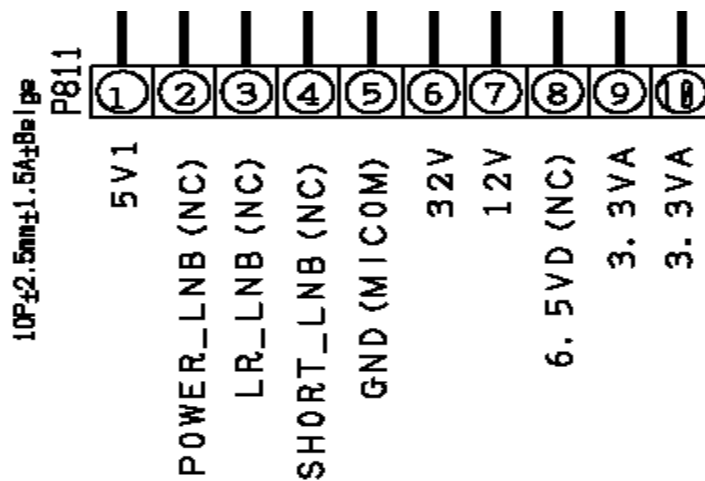


Figure 8

P809 is routed to the audio output PCB and contains only one source, 26 volts to operate the audio output system. Figure 9 is a detailed drawing of P809. DC resistance to cold ground should measure approximately 12K ohms.

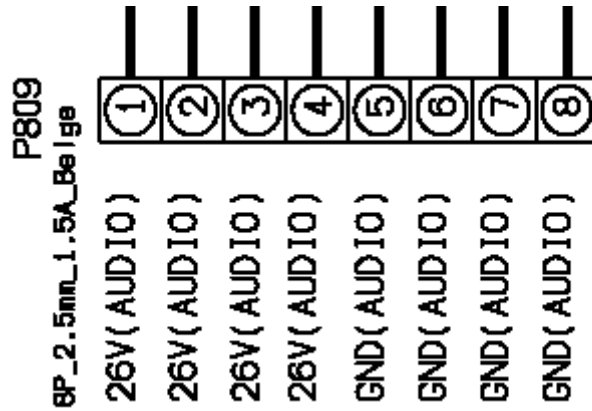


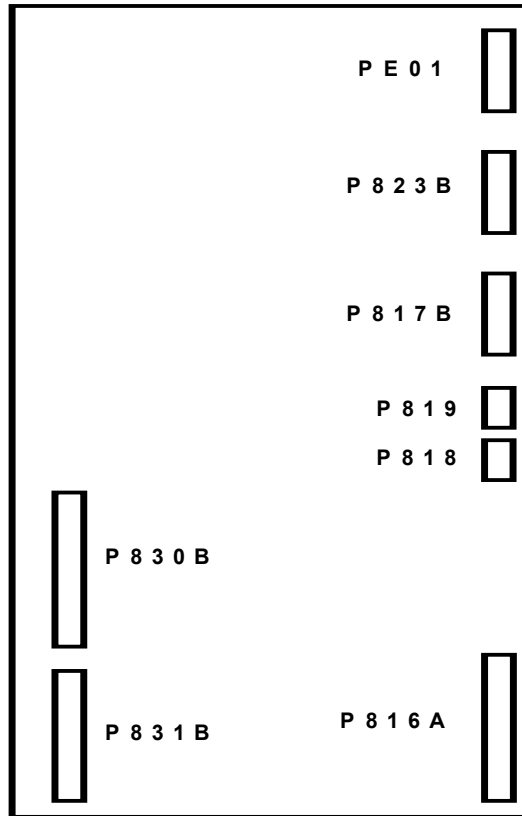
Figure 9

P831A, P830A-1, and P830A-2 shown in Figure 10 are all interconnects to the Low B, DD Power Module.



Figure 10

Figure 11 shows the plug locations on the Low B PCB.



LOW B
DD POWER MODULE

Figure 11

Now let's look at the individual plugs located on the Low B PCB. Other than the inputs at plugs P830B and P831B (Figure 12) from the main power supply, there are six outputs located on this board.

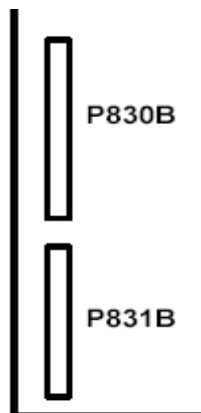


Figure 12

Figure 13 shows the first of these outputs, P816A.



Figure 13

This plug connects the Low B sources to the scaler module. These sources consist of two 3.3 volt, one 9 volt source, and a 5 volt source. Both 3.3-volt sources should measure in excess of 700 ohms to cold ground. The 5-volt source (pin 11) should measure about 3400 ohms and the 9-volt source (pin 13) will measure about 15K ohms to cold ground.

Figure 14 is a detailed drawing of P816 showing the pin locations of these three voltage sources.

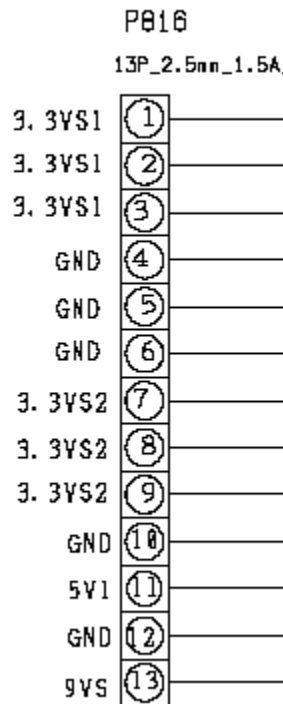


Figure 14

The next two plugs are P818 and P819 shown in Figure 15. These plugs are used to monitor rotation and operate the fans in this unit. The 9-volt sources at pin 1 of these plugs will measure in excess of 10K ohms to cold ground.

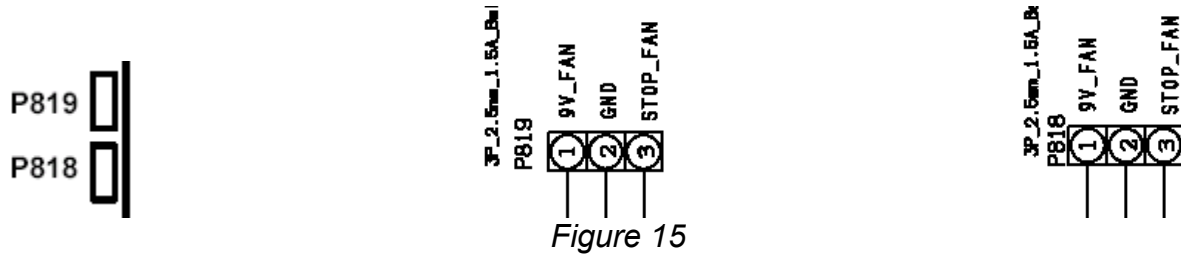


Figure 15

The last three plugs located on the Low B power module are P817B, P823B, and PE01. (Figure 16)



Figure 16

P817 includes the fan power source and a 5-volt source. (Figure 17) The 5-volt source should measure in excess of 3K ohms to cold ground and the fan power source should measure in excess of 87K ohms.

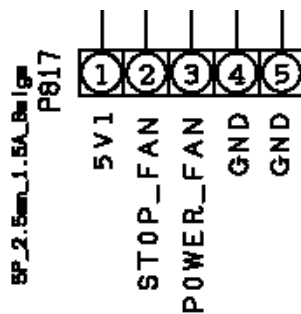


Figure 17

P823B (Figure 19) supplies 9, 5, and 3.3-volt sources used by the HDMI module assembly.

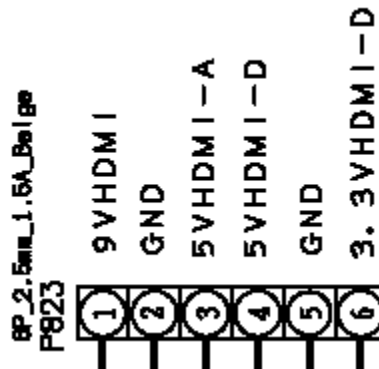


Figure 19

The 9-volt source at pin 1 and the 5-volt source at pin 3 of P823 should both measure about 450 ohms to cold ground. The 3.3-volt source will measure in excess of 7000 ohms.

PE01 is present on the Low B PCB but it is not used on this model. This plug is only used if the unit is ATSC or HD ready.

Shutdown

Shutdown on the LCD monitor/television receiver will, in most cases, be related to a thermal cause, one of the supply lines, or power supply panels themselves. It will be indicated by a blinking power LED.

- When the blinking LED symptom is observed, check the fans for rotation first. If there is no or only partial rotation of either fan, check the voltage sources for them, then change the fan if necessary. If the fan voltage sources are incorrect, suspect a problem with the Low B power supply panel.
- If nothing related to the fans or thermal shutdown is detected, since the unit is serviced to modular level, use the voltage and resistance values located in the provided charts to detect other possible modular problems.

TECHNICAL TRAINING

QUIZ LCD-03-2

2003 LCD TV Power Supply and Shutdown

Print the quiz form. Printing neatly, complete all fields to insure you receive proper credit. Select the most correct answer to each question by filling in the corresponding check box. Fax the completed quiz form to:

Toshiba Technical Training 615-444-7520

Technician's Name: _____

Date: _____

Company Name: _____

Account No: _____

Company Address: _____

How did you attend this training Module?

Live Online Online Archive On-Site CD ROM Textbook only

1. There are _____ power supply boards in the 26HL83.
 One Four None Two
2. These boards are serviceable to component level.
 True False
3. Display power is supplied by PE02 on the main power supply PCB.
 True False
4. All resistance measurements in Table 1 are referenced to _____ ground.
 Hot Cold
5. Resistance measurements in this text are accurate to within 10 ohms.
 True False
6. Fan failure will not cause an error indication.
 True False
7. The AC switch for this unit is located on the back next to the AC cord.
 True False
8. This unit is ATSC compatible and will decode off-air HD broadcasts.
 True False
9. PE01 is located on the main power module.
 True False
10. P802 is the AC input.
 True False

TOSHIBA AMERICA CONSUMER PRODUCTS, L.L.C.

National Service Division – 1420B Toshiba Drive – Lebanon, TN 37087
www.tacpservice.toshiba.com/tacp E-Mail: Technical_Training@tacp.com