

2012 Plasma TV Troubleshooting Guide

2012-Plasma FHD TV – ST Series (15th Generation)

Applies to models:

TC-P50ST50
TC-P50UT50



National Training Department
Panasonic Consumer Marketing
Company Of North America

Important Information

- **To avoid the unnecessary replacement of multiple PC boards, please read this before beginning to repair this unit.**
- **Do not use any service documentation other than the one designed for this particular model.**
- **Techniques used on previous models may not necessarily apply to the model you are working on.**
- **For accurate diagnosis during troubleshooting, do not skip or alter the order of steps on the guide.**

SOS Precautions

When an abnormality occurs in the unit, the “SOS Detect” circuit is triggered and the TV shuts down. The power LED on the front panel will flash a pattern indicating the circuit that has failed.

Cautions:

If the power LED continues to blink even after the TV is unplugged, press and hold the power switch on the TV for a few seconds until the LED turns off.

Some steps require removal of connectors and sometimes PC boards removal. Do not allow the TV to run for more than 30 seconds while connectors or boards are disconnected.

NOTE: When taking voltage reading, place your meter's probe on the test point or pin indicated before connecting the TV to the AC line. The voltage you intent to measure may only appear for a brief moment.

Warning: The Vsus line has large capacitors that hold the charge for some time even after the TV has been turned off and unplugged. When disconnecting P2/SC2 or P11/SS1, bleed the remaining charge of the Vsus before reconnecting the cable. Use a 500 ohms/ 5W (At least) resistor to discharge the Vsus line before reconnecting P2/SC2 or P11/SS11.

Power LED Error Code Definition (1 of 2)

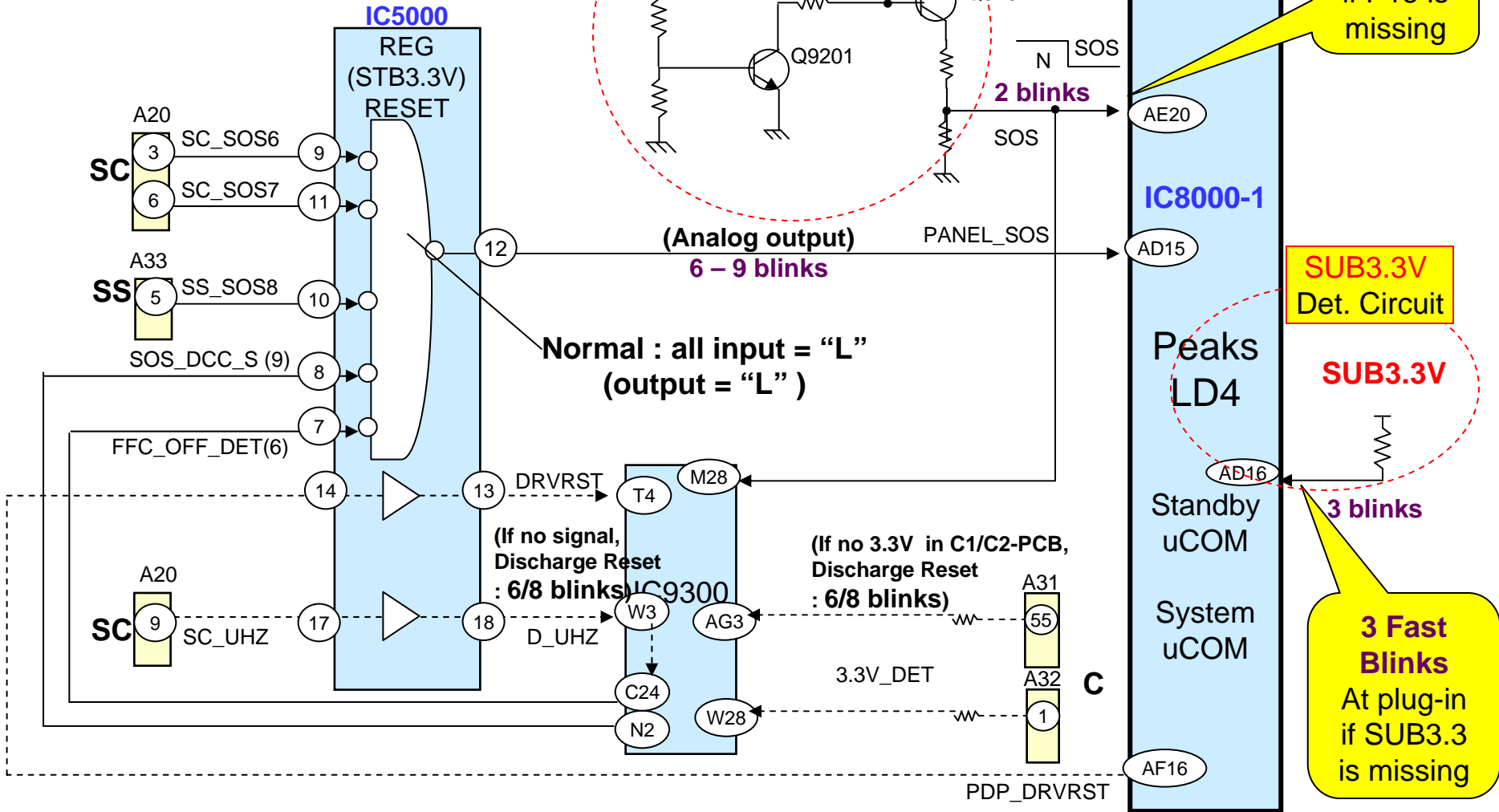
POWER LED ERROR CODE	CIRCUIT MONITORED	CONDITIONS TRIGGERING THE SHUTDOWN	LIST OF BOARDS POSSIBLY CASUSING THE FAILURE			
			#1 Suspect	#2	# 3 Occasionally	#4 Not Often
1 BLINK	Panel Information SOS	Communication problem	A			
2 BLINKS	P15V form the P board	Missing P15V P15V is not been generated by the P board. Wrong diagnostic by the A board	P	A		
3 BLINKS	Incomplete or interrupted Boot Program execution of PEAKS IC (IC8000).	Shorted P15V Missing F15V Wrong diagnostic by the A board	A	P		
4 BLINKS	Power Supply output voltages	Vsus Over Voltage Condition. P15V Shorted while in operation. Wrong diagnostic by the A board	P	A		
6 BLINKS	SC Energy Recovery Circuit	An increase or reduction of the Energy Recovery Circuit output (MID). Shorted SUB5V. Wrong diagnostic by the A board.	SC	A		C
7 BLINKS	Scan Drive Circuit and Connection between the SC board and the SC board.	Missing or shorted Vsus. Abnormality of the scan circuit output, the 15V_F, the scn_pro, and Vscn circuit. Loose or open Connection between the SC board and the SC board (SC41, SC42, SC46). Open or loose connection between connectors SC2/P2 Wrong diagnostic by the A board Defective panel	SU/SD	SC	SS	A/Panel
8 BLINKS	Sustain Drive Circuit and Connection between the SS board and the Panel.	Abnormality of the sustain drive circuit. Open or loose connection between the SS/SS2 Boards. and FPCs from the panel (SS52 – SS54 – SS55 – SS57). Open or loose connection between connectors C10/C20 or C26/C36. Wrong diagnostic by the A board	SS	A	C3	Panel

Power LED Error Code Definition (2 of 2)

POWER LED ERROR CODE	CIRCUIT MONITORED	CONDITIONS TRIGGERING THE SHUTDOWN	LIST OF BOARDS POSSIBLY CASUSING THE FAILURE			
			#1 Suspect	#2	# 3 Occasionally	#4 Not Often
9 BLINKS	Discharge Control Circuit DDC (IC9300)	Failure of IC9300 Wrong diagnostic by the A board	A			
10 BLINKS	SUB3.3V_Sense (OVP)	Over Voltage Condition of SUB5V or SUB3.3V Wrong diagnostic by the A board.	A			
12 BLINKS	Audio Amp. Circuit	Defective Speaker/Subwoofer Pinched Speaker Wire Wrong diagnostic by the A board	A	Speakers/ Subwoofer		
13 BLINKS	IC8000 Internal Communication	Defective A board	A			

Protection Circuit Block Diagram 1 of 2 (TC-P50ST50)

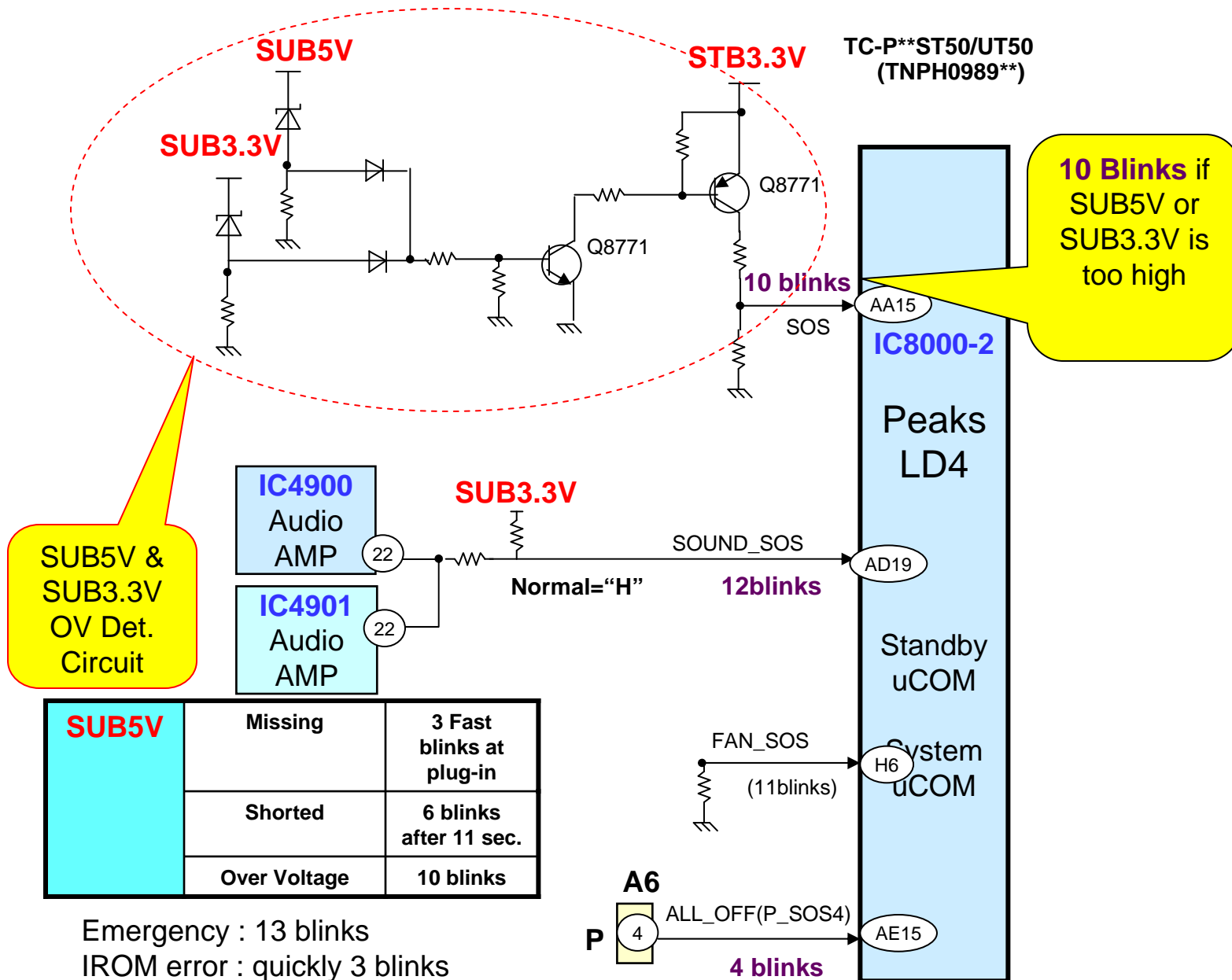
P15V	Missing	→ 2 Blinks
	Shorted	→ 3 Blinks
SUB3.3V	Missing	3 Blinks At plug-in
	Shorted	



Blink Code/Voltage Condition (TC-P50ST50 - TC-P50UT50)

Voltage	Condition	No. of Blinks	
		TC-P50UT50	TC-P50ST50
P15V	Missing	2 Blinks	2 Blinks
	Shorted	No power. The LED turns on briefly and then it goes off immediately	3 Fast Blinks
SUB3.3V	Missing	3 Fast Blinks at Plug-in	3 Fast Blinks at Plug-in
	Shorted	3 Fast Blinks at Plug-in	3 Fast Blinks at Plug-in
	Over Voltage	Dead. Power LED never turns on	10 Blinks
SUB5V	Missing	3 Fast Blinks at Plug-in	3 Fast Blinks at Plug-in
	Shorted	6 Blinks After 11sec.	6 Blinks After 11sec.
	Over Voltage	Dead. Power LED never turns on	10 Blinks

Protection Circuit Block Diagram 2 of 2 (TC-P50ST50)



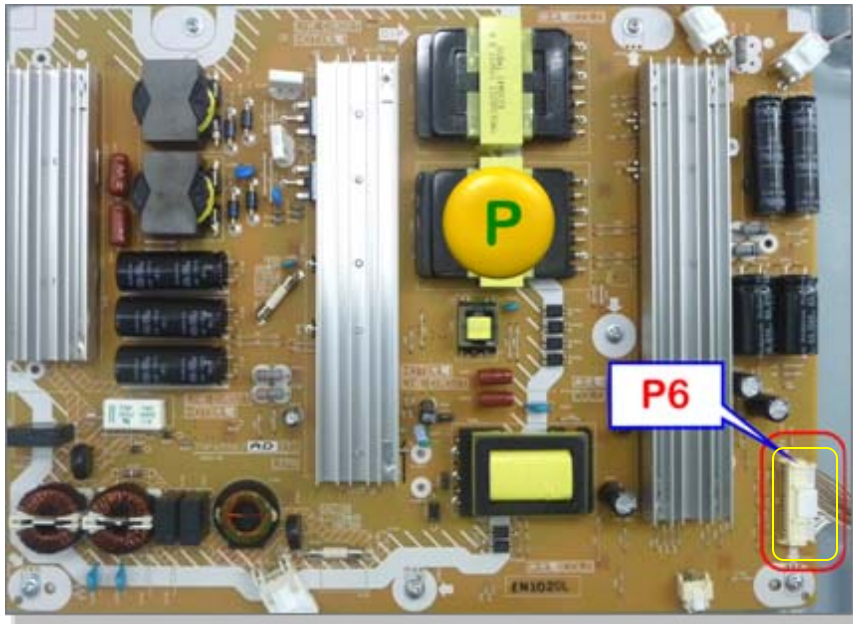
Troubleshooting 1 -9 -10 - 13 Blinks Failure

Blink Code	List of boards likely to cause this symptom			
	No.1	No.2	No.3	No.4
1	A Board			
9 Blinks	A Board			
10 Blinks	A Board			
13 Blinks	A Board			

When 1, 9, 10, or 13 blinks occur, replace the A board

Troubleshooting 2 Blinks Failure (TC-P50ST50)

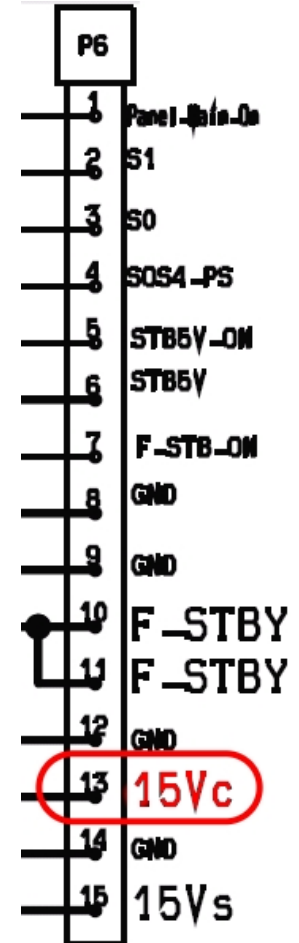
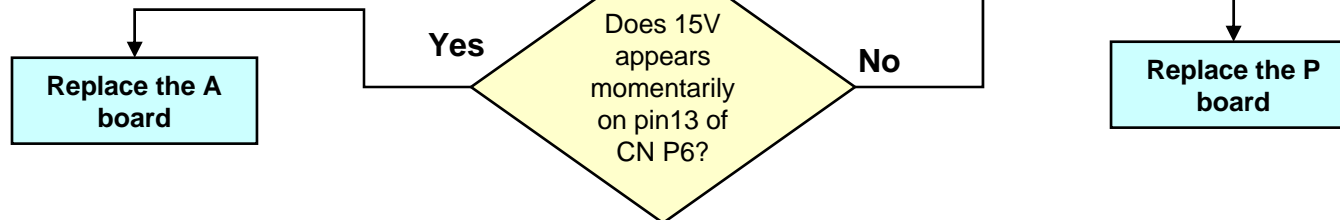
Find information for **TC-P50UT50** on the next slide)



Blink Code	List of boards likely to cause this symptom.			
	No.1	No.2	No.3	No.4
2 Blinks	P	A		

Start Here

Place the positive lead of a voltmeter at pin 13 of connector P6 while the black lead is connected to ground (Chassis ground). Plug in the TV and turn it on



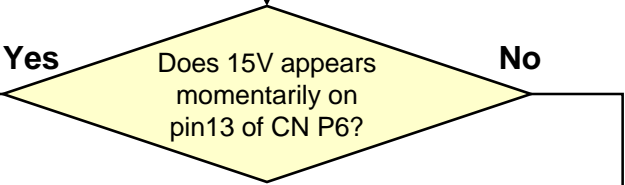
Troubleshooting 2 Blinks Failure (TC-P50UT50)

Find information for **TC-P50ST50** on the previous slide)

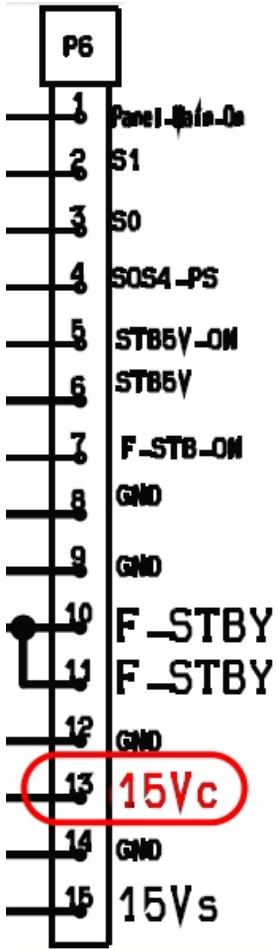
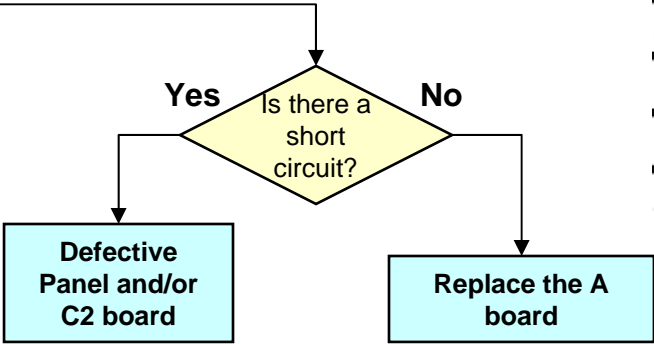
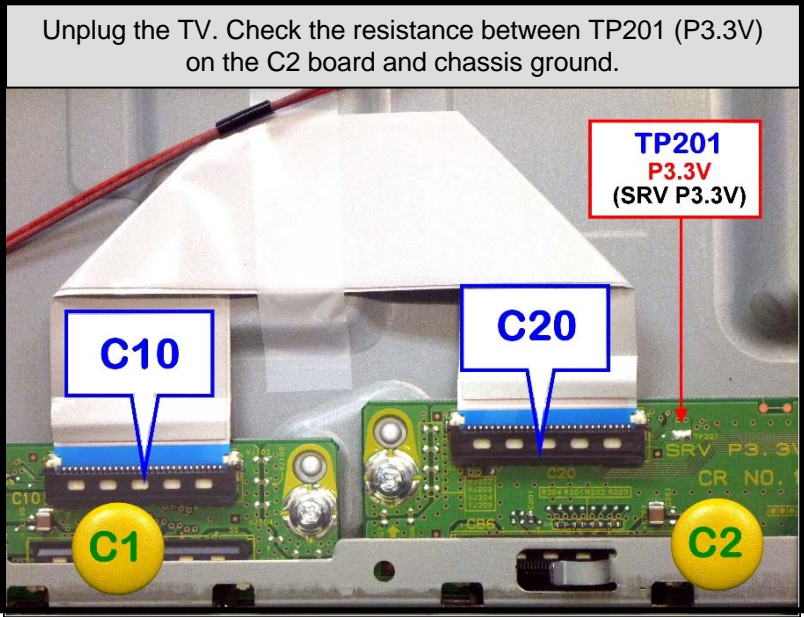
Blink Code	List of boards likely to cause this symptom.			
	No.1	No.2	No.3	No.4
2 Blinks	P	A	Panel/C2	

Start Here

Place the positive lead of a voltmeter at pin 13 of connector P6 while the black lead is connected to ground (Chassis ground). Plug in the TV and turn it on

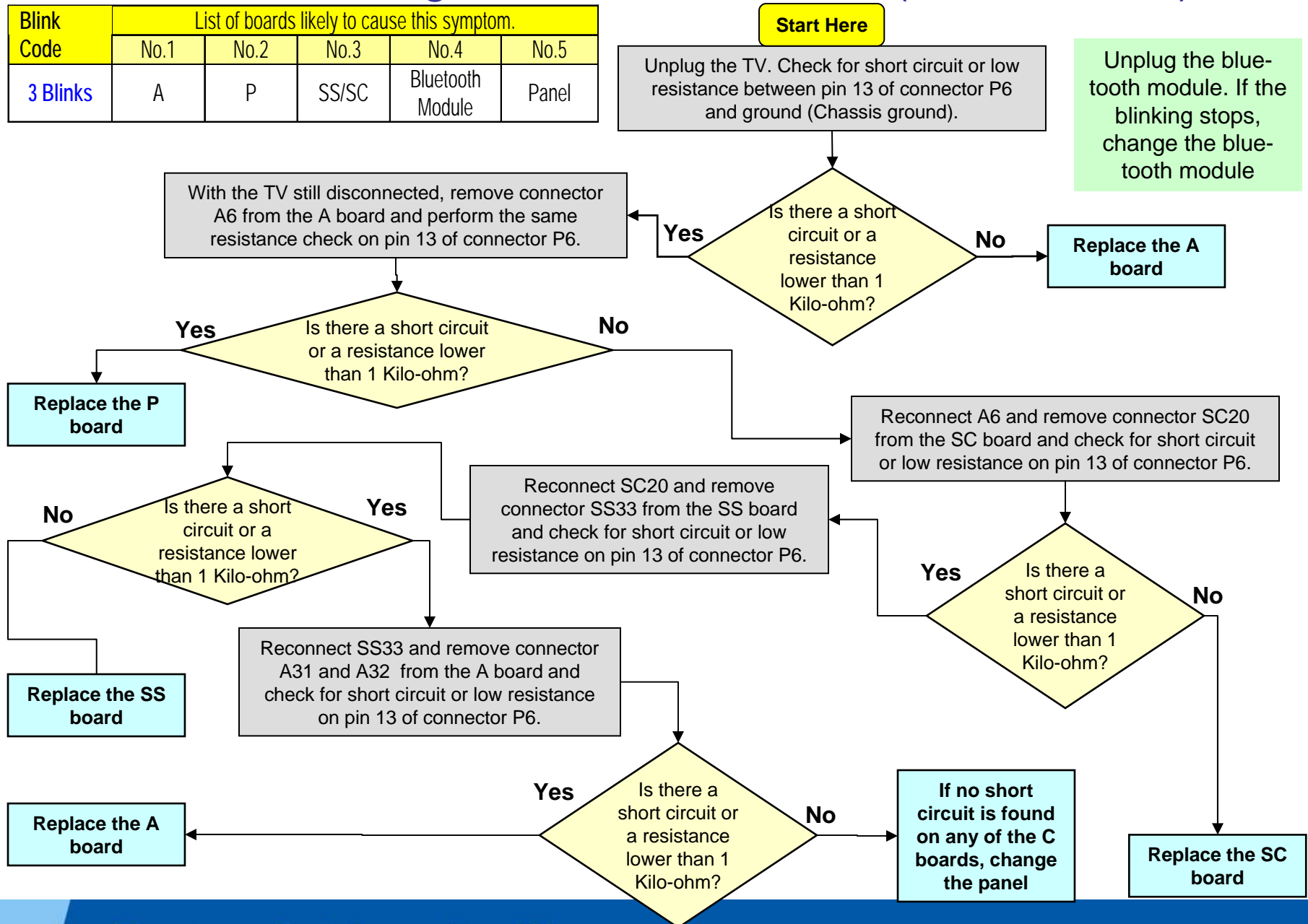


Replace the P board



Troubleshooting 3 Fast Blinks Failure (TC-P50ST50)

Blink Code	List of boards likely to cause this symptom.				
	No.1	No.2	No.3	No.4	No.5
3 Blinks	A	P	SS/SC	Bluetooth Module	Panel



Troubleshooting 3 Fast Blinks Failure At Plug-in (TC-P50UT50)

Blink Code	List of boards likely to cause this symptom.				
	No.1	No.2	No.3	No.4	No.5
3 Blinks	A	P	K	Bluetooth Module	C3/Panel

Start Here

Unplug the TV. Connect the negative (Black lead) of your DC volt- meter on chassis ground. Place the positive lead of on pin 10 of connector P6 on the power supply. While observing the display on your meter, plug-in the TV.

Unplug the blue-tooth module. If the blinking stops, change the blue-tooth module

Yes

Does 15V appear briefly?

No

Replace the P board

Unplug the TV and remove connector K1 from the A board. Plug in the TV and press the power switch on the TV.

Yes

Replace the K board

No

Does the TV turn on and stays on?

Unplug the TV and reconnect K1. Disconnect connectors A31 and A32 from the A board. Plug-in the TV.

Is the power LED blinking 3 or 8 times?

8 Times

3 times

Replace the A board

Defective Panel or/and the C3 board.

To time it takes to isolate the C3 board from the panel is approx. 30 minutes.

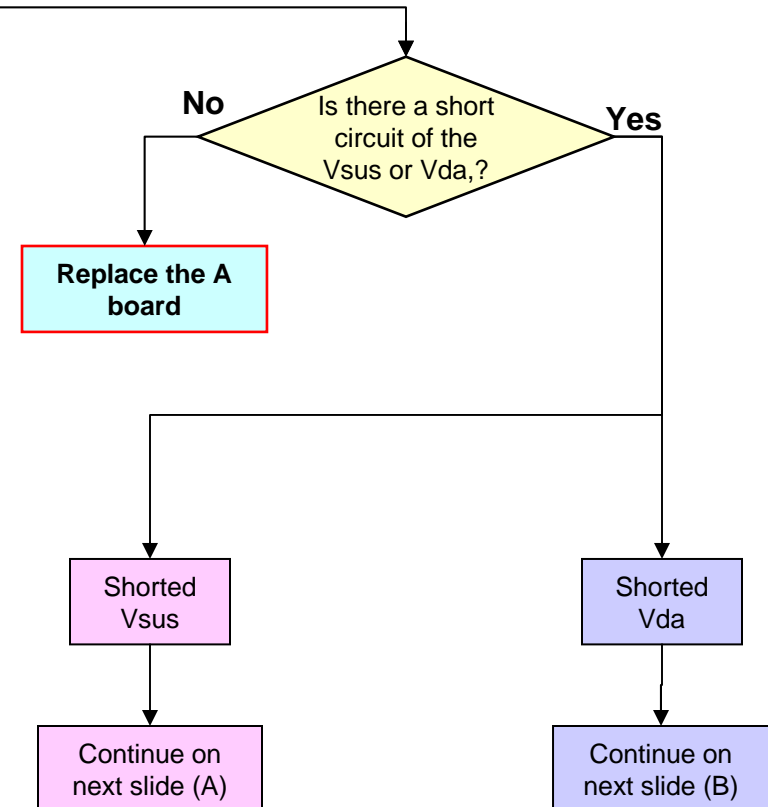
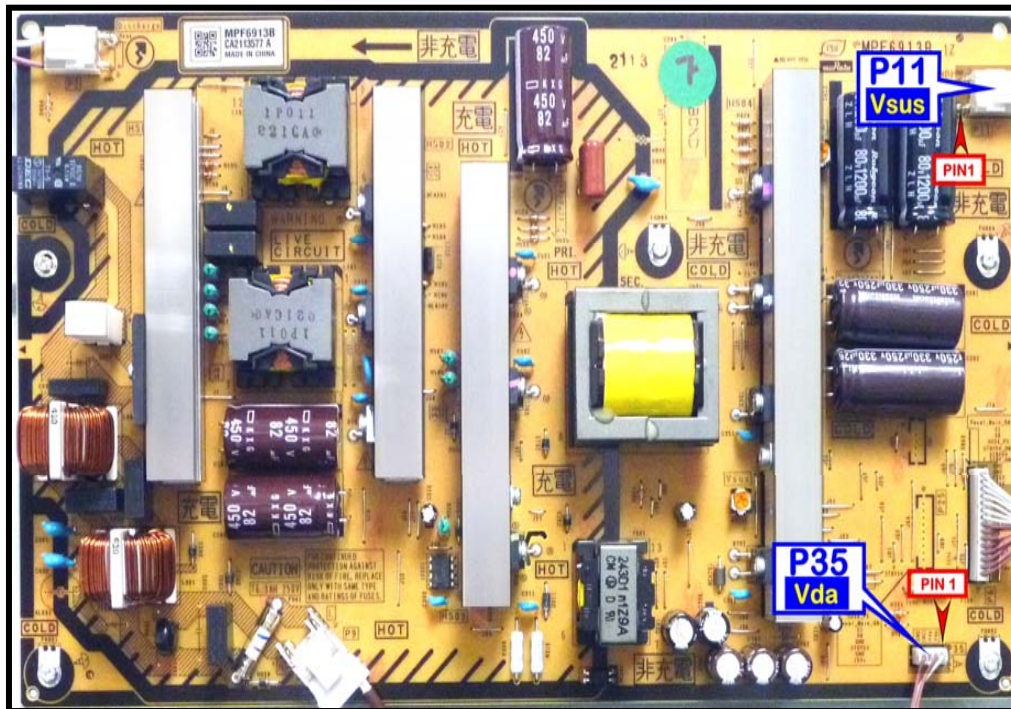
To isolate the C3 board, reconnect A31 and A32 and remove the metal bracket over the C boards. Disconnect connectors CB12~CB15 from the C3 board and plug-in the TV. If the power LED stops blinking at plug-in, then the Panel is defective. If the LED blinks 3 times, then the C3 board is defective.

Troubleshooting 3 Fast Blinks Failure At Power-On (TC-P50UT50) (1 of 2)

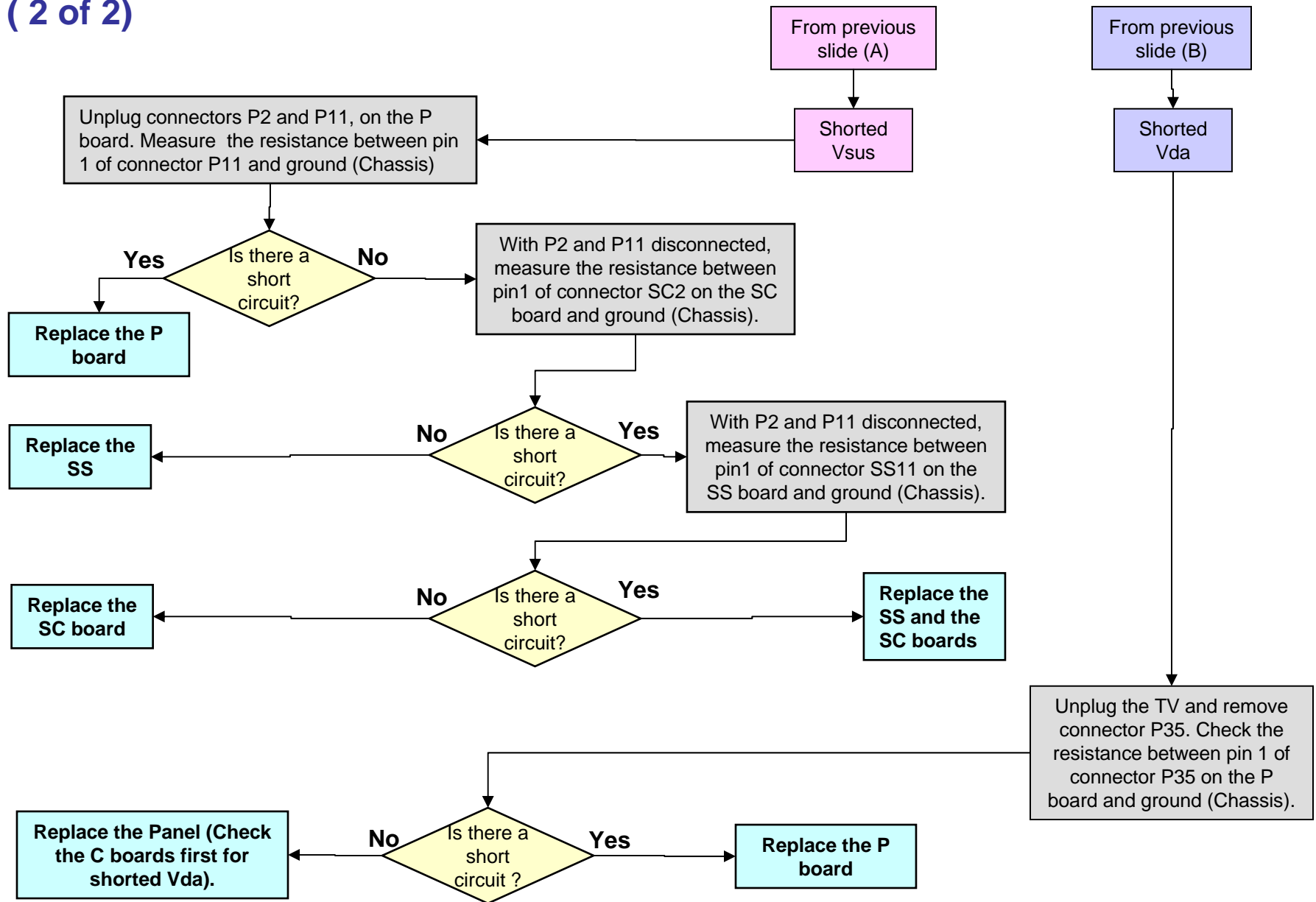
Start Here

1. Unplug the TV.
2. Remove any residual charge from the Vsus and Vda lines. Use a 5W 500ohms resistor.
3. Measure the resistance between chassis ground and pin 1 of connector P11 on the P board. Also measure the resistance between chassis ground and pin 1 of connector P35 on the P board. (See the picture below for connectors' location.) **Note:** A dead short or a reading lower than 1K indicates a shorted or partially shorted line.

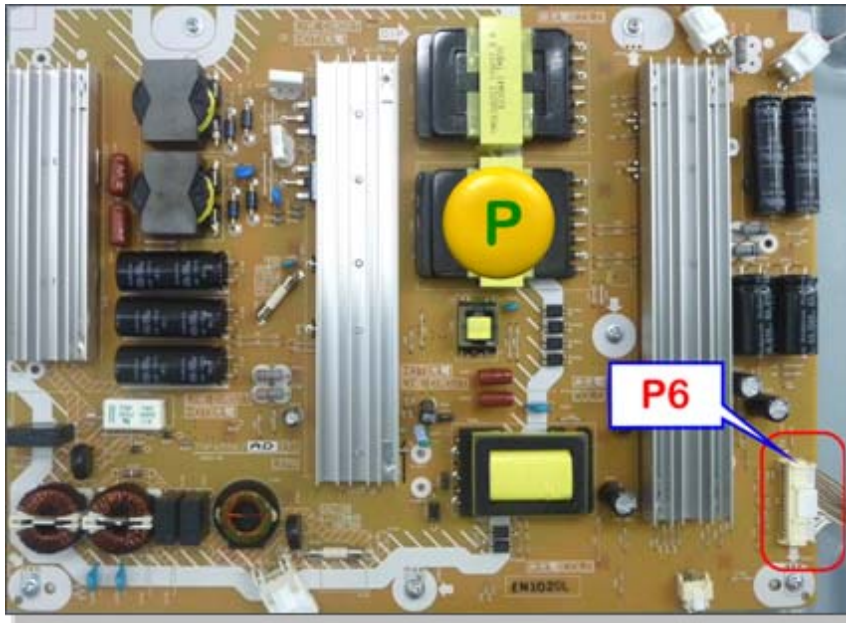
POWER SUPPLY



(2 of 2)



Troubleshooting 4 Blinks Failure



Blink Code	List of boards likely to cause this symptom.			
	No.1	No.2	No.3	No.4
4 Blinks	P	A		

Start Here

Place the positive lead of a voltmeter at pin 4 of connector P6 while the black lead is connected to ground (Chassis ground). Plug in the TV and turn it on

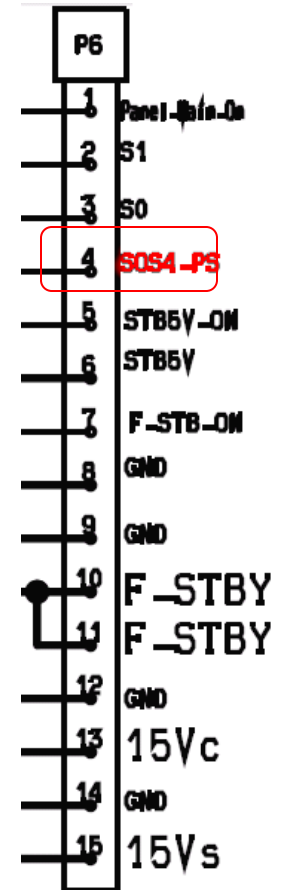
No

Is there 2V to 3V
(Approx.) momentarily
on pin 4 of CN P6?

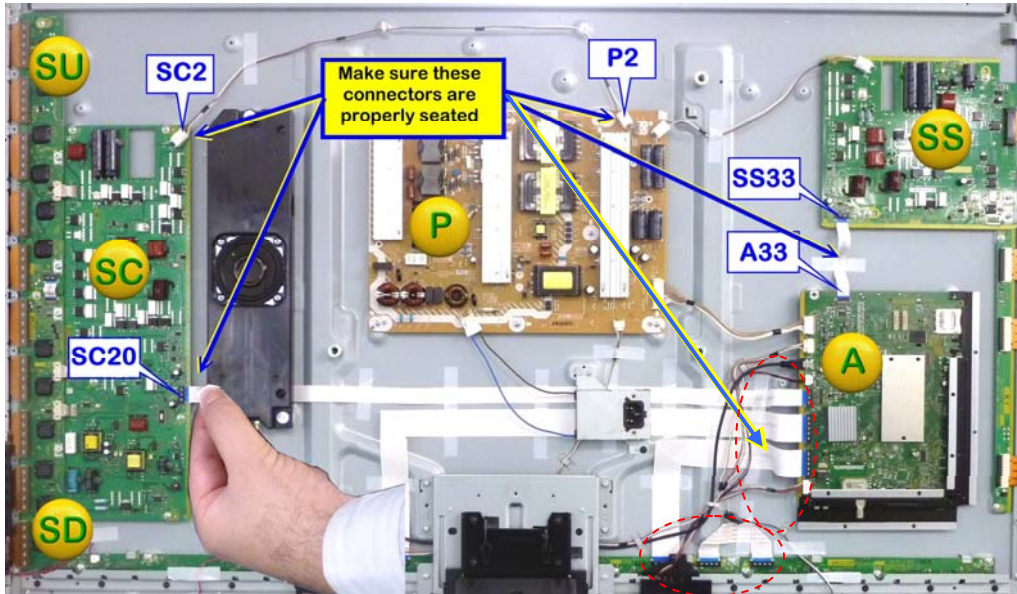
Yes

Replace the A
board

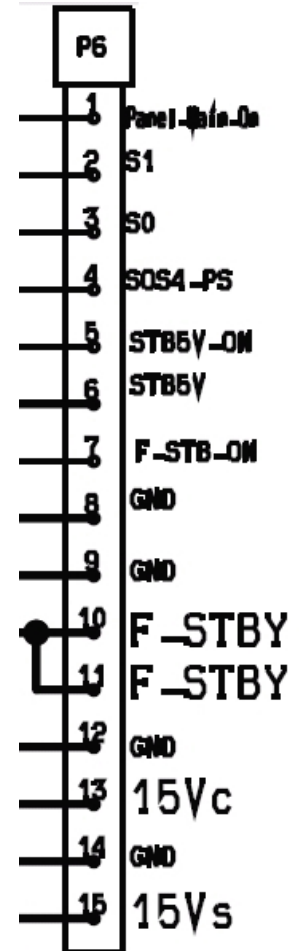
Replace the P
board



Troubleshooting 6 Blinks Failure

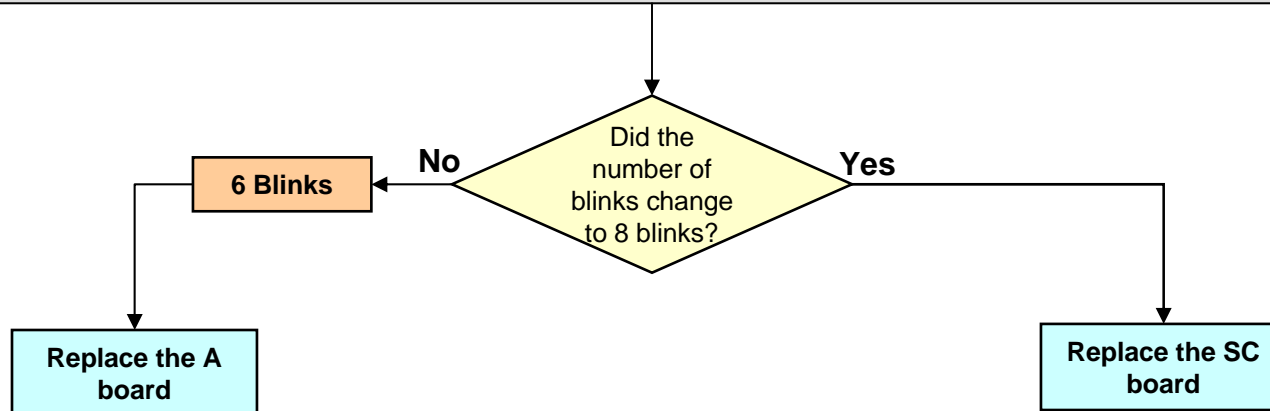


Blink Code	List of boards likely to cause this symptom.			
	No.1	No.2	No.3	No.4
6 Blinks	SC	A		



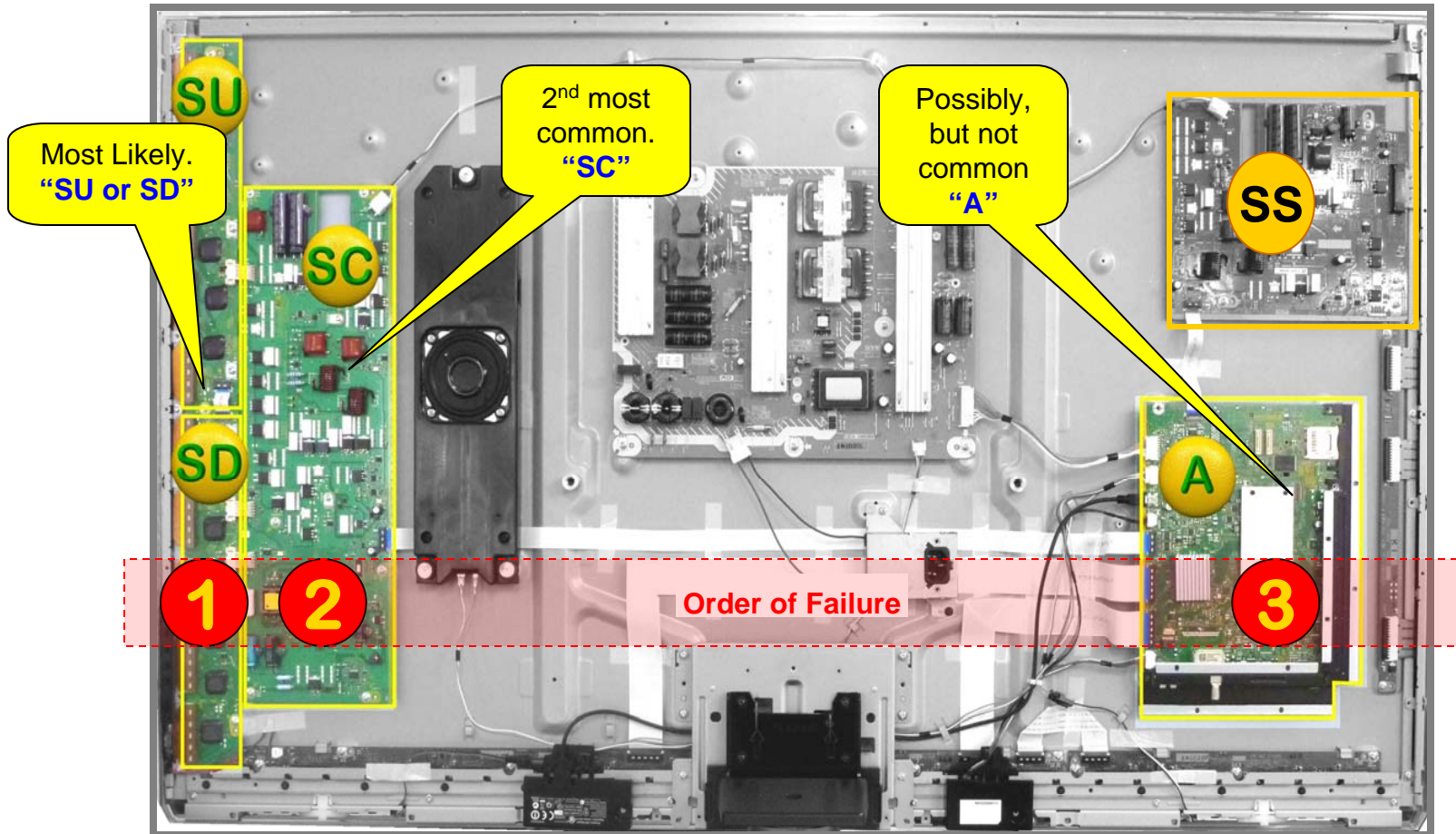
Start Here

Verify that all the cables on the SC board are properly seated. Also check the ribbon cables and connectors on the A and C boards. Unplug the TV and disconnect connector SC20 on the SC board. Plug in the TV and turn it on



Troubleshooting 7 Blinks (SOS 7)

A 7 blinks shutdown can be caused by a failure of any or a combination of the following boards:
SU/SD, SC, A, or the Panel. Is also possible for the SS board to cause 7 blinks shutdown on this model.



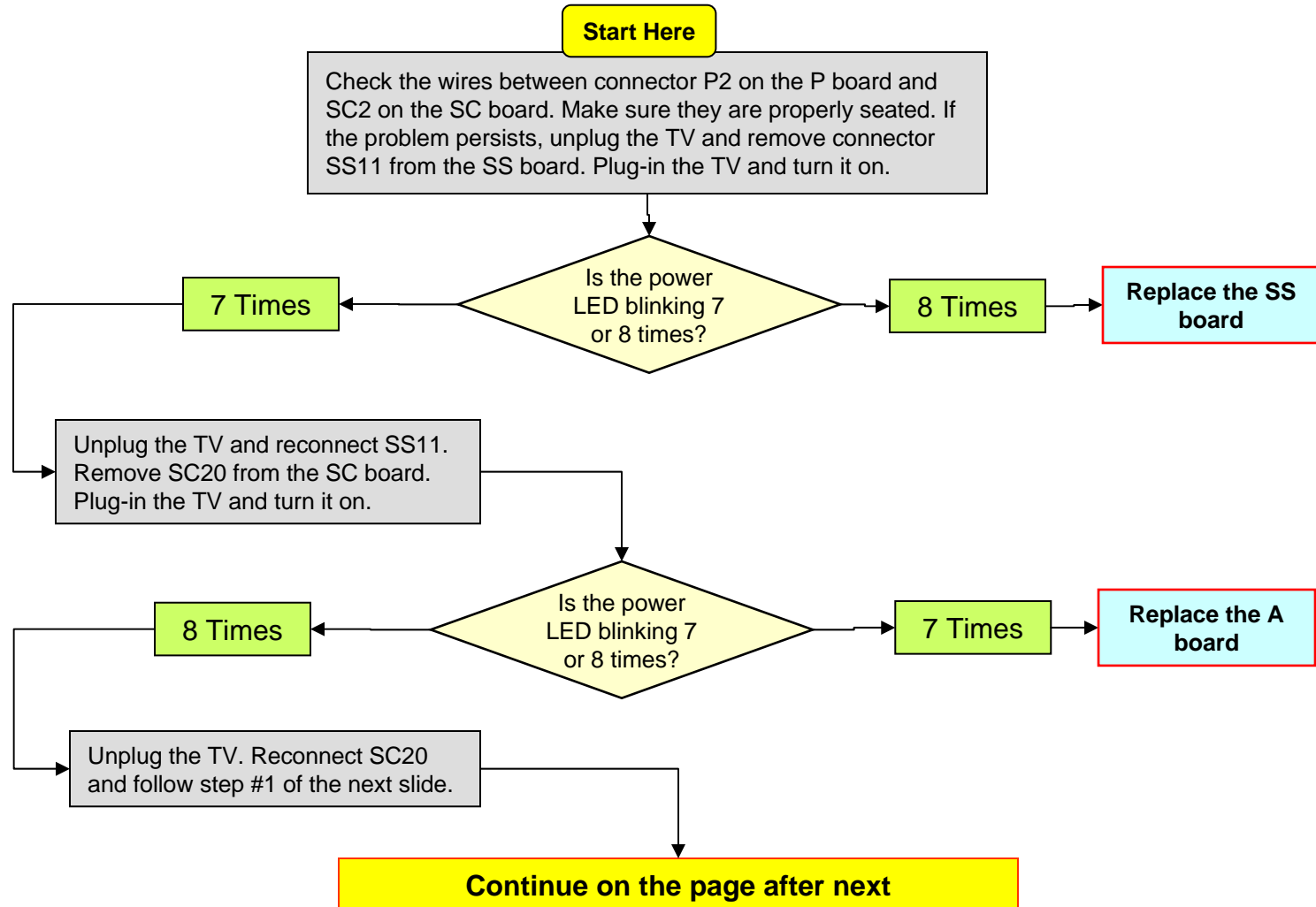
Note: This page indicates the order in which these boards are likely to fail. This information alone is not enough to diagnose which board is defective. To determine the cause of a 7 blinks failure, follow the troubleshooting procedure on the following pages.



Troubleshooting 7 Blinks Failure (TC-P50ST50)

Blink Code	List of boards likely to cause this symptom.					
	No.1	No.2	No.3	No.4	No. 5	No. 6
7 Blinks	SU	SC	SS	A	Panel	
	SD					

Find information for **TC-P50UT50** on slides 23~26



Troubleshooting 7 Blinks Failure (F5V/TPSC Resistance Check)

Disconnect the AC prior to making any disconnection or connection. Wait at least 2 minutes before the removal of any connector.

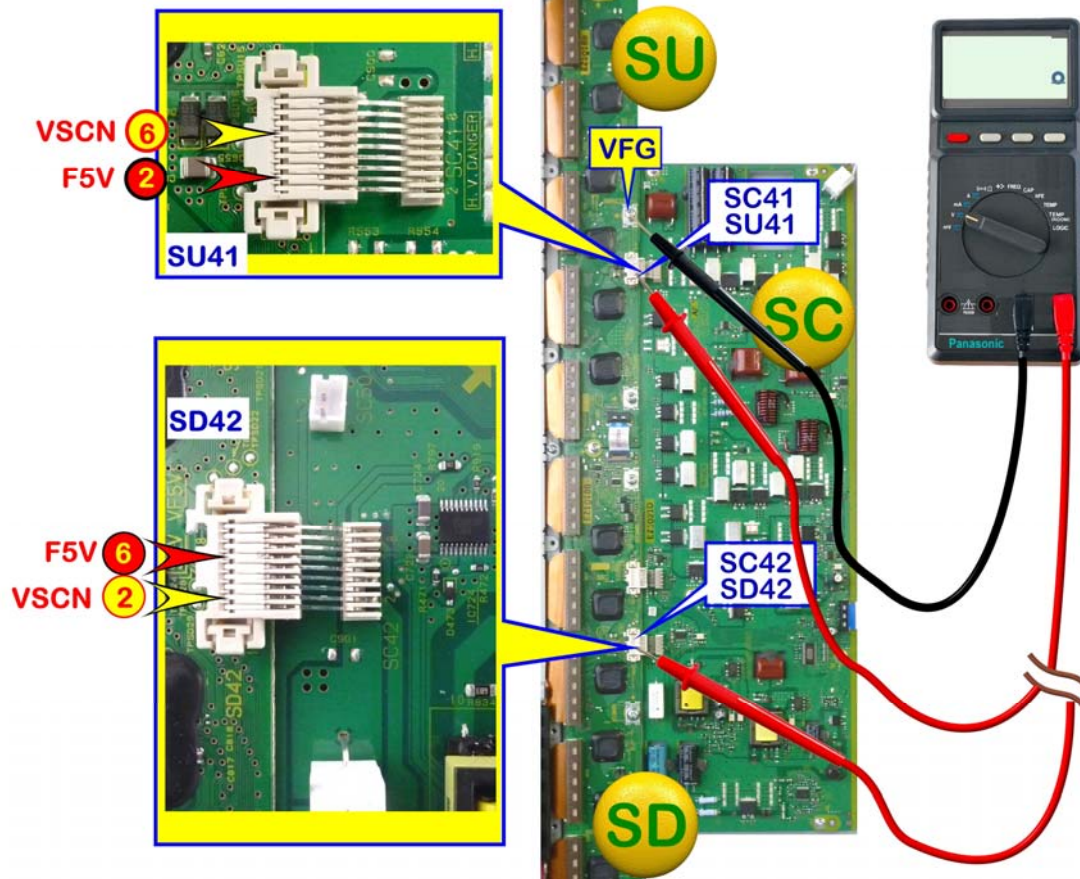
1

Step

Using any of the VFG screws (Floating ground screws) as ground, measure the resistance of pin 2 and pin 6 of either SU41/SC41 or SD42/SC42.

If a short circuit is found, proceed with step 2.

If no short circuit is found, isolate the SU and SD boards as illustrated on the next slide.

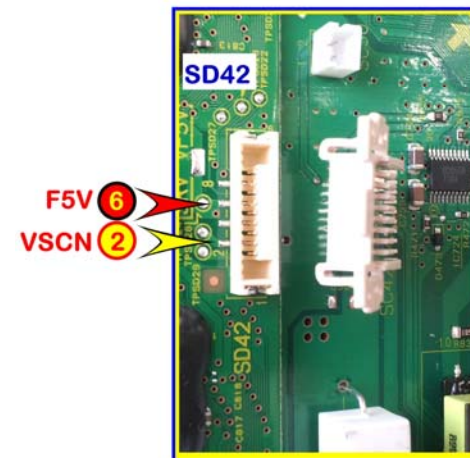
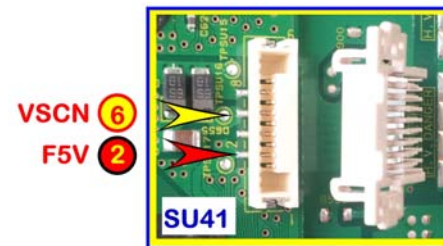


2

Step

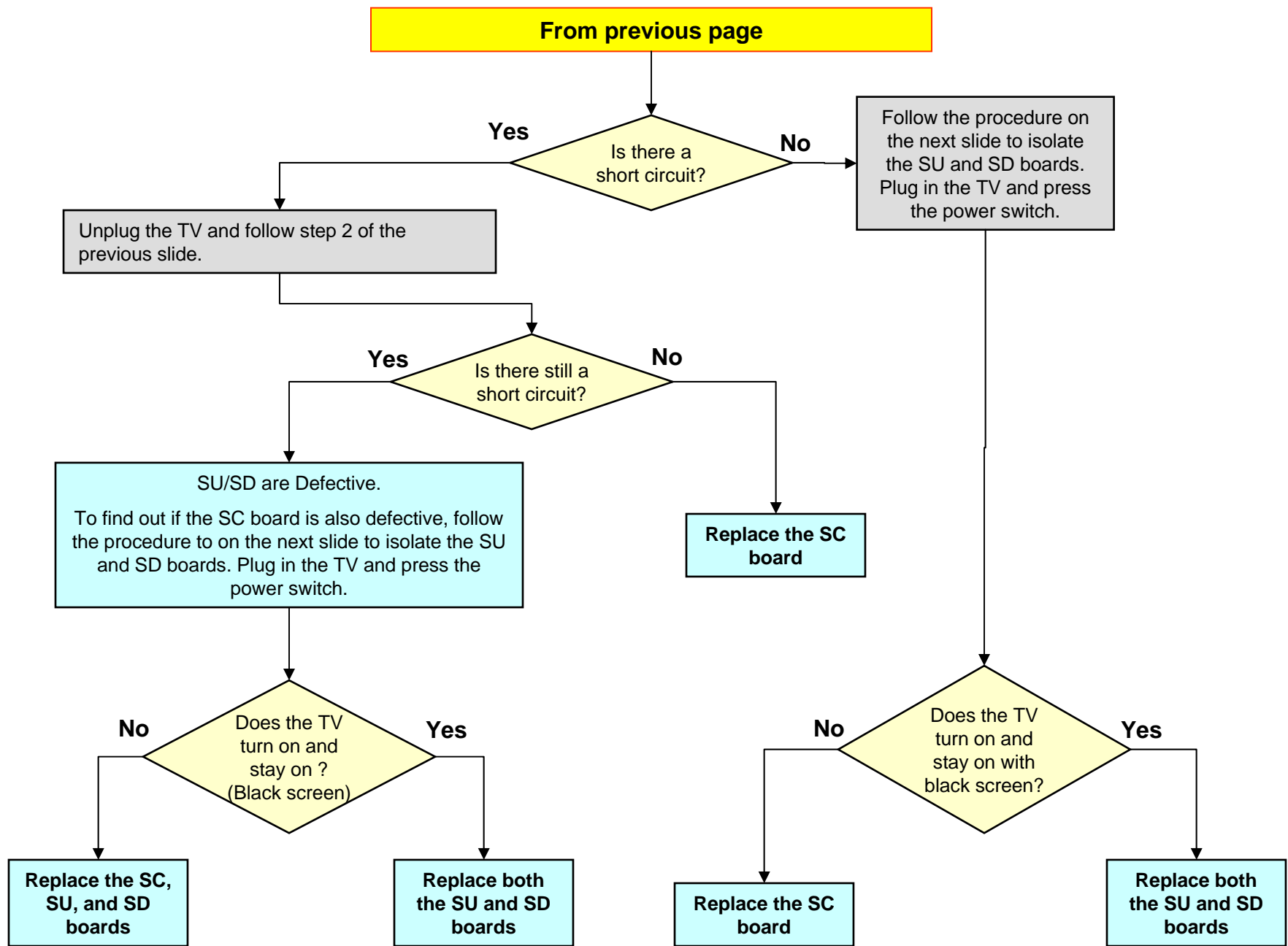
Unplug SU41 and SD42. Using any of the VFG Screws (Floating ground screws) as ground, measure the resistance of pin 2 and pin 6 of both SU41 and SD42.

A short circuit indicates the failure of the board where it was found.



Note: Change the SU and SD boards together even if only one is found to be defective.

Continue on the next page



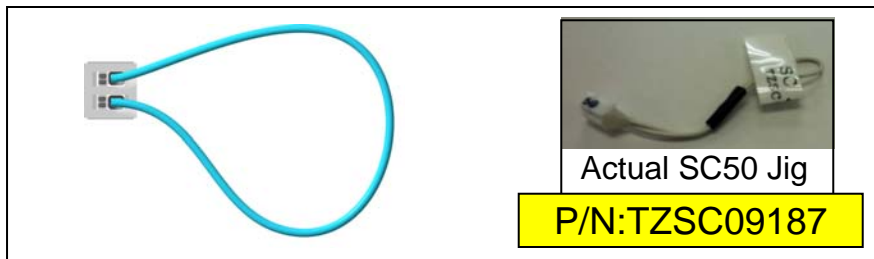
Troubleshooting 7 Blinks Failure (SU/SD Boards Isolation Procedure)

Warning:

When performing this procedure, isolate the SU and SD boards together at the same time. Do not attempt to isolate the SU or the SD boards individually. This could cause further damages to the TV.

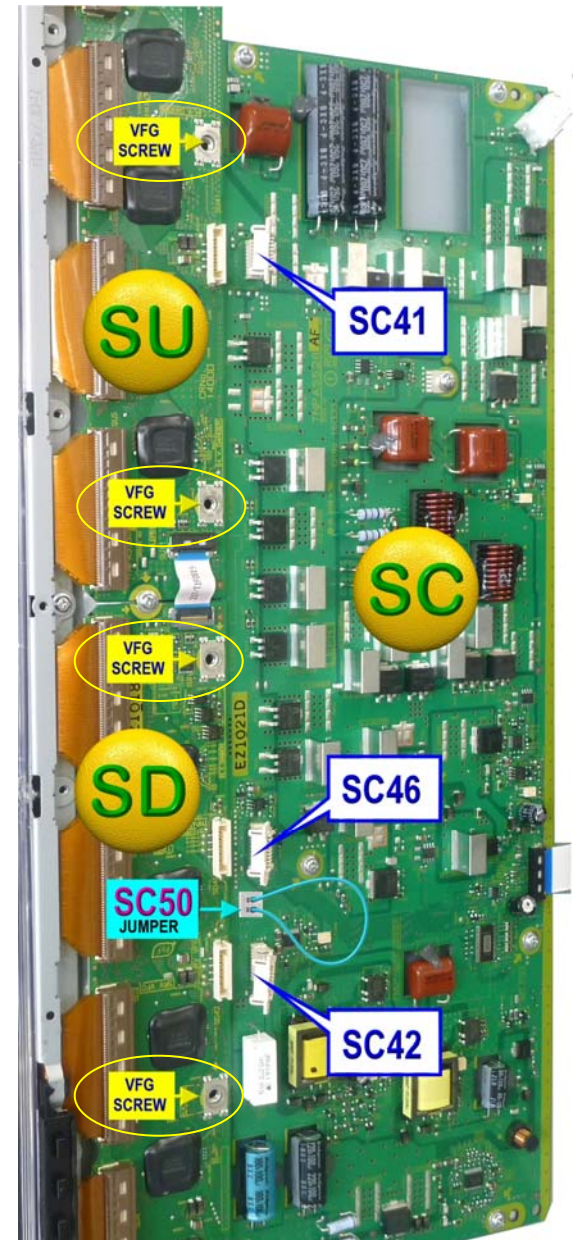
Procedure:

1. Remove the 4 VFG screws from the SU and SD boards. (See picture on the left side.)
2. Remove SC41, SC42, and SC46 from the SC board.
3. Install the SC50 Jig or just jump pins 1 and 2 of connector SC50 on the SC board.



4. Plug-in the TV and turn it on.

Note: Remove the jig or the jumper after completing the isolation procedure.

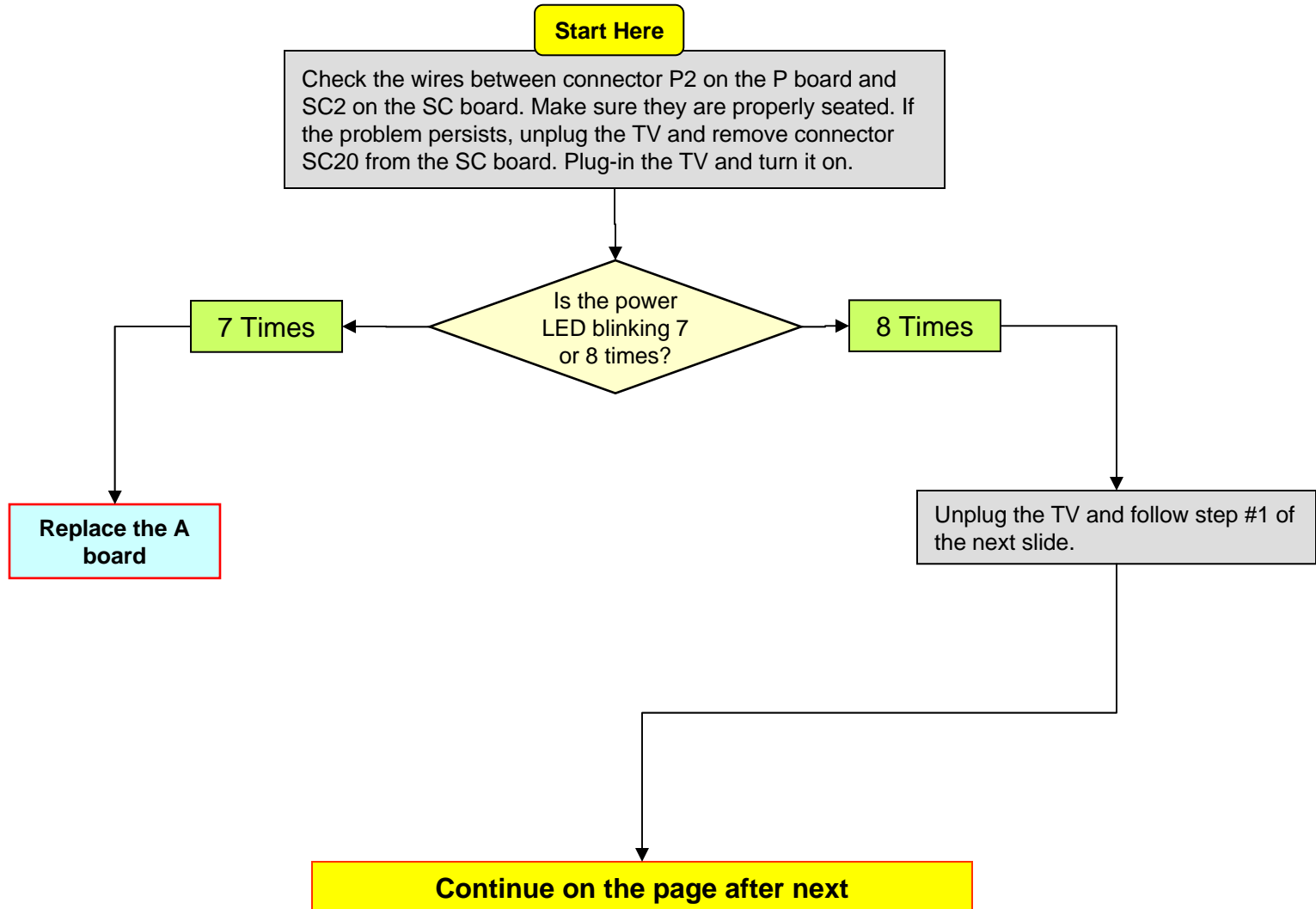




Troubleshooting 7 Blinks Failure (TC-P50UT50)

Blink Code	List of boards likely to cause this symptom.					
	No.1	No.2	No.3	No.4	No. 5	No. 6
7 Blinks	SU	SC	A	Panel		
	SD					

Find information for **TC-P50ST50** on slides 19~22



Troubleshooting 7 Blinks Failure (F5V/TPSC Resistance Check)

Disconnect the AC prior to making any disconnection or connection. Wait at least 2 minutes before the removal of any connector.

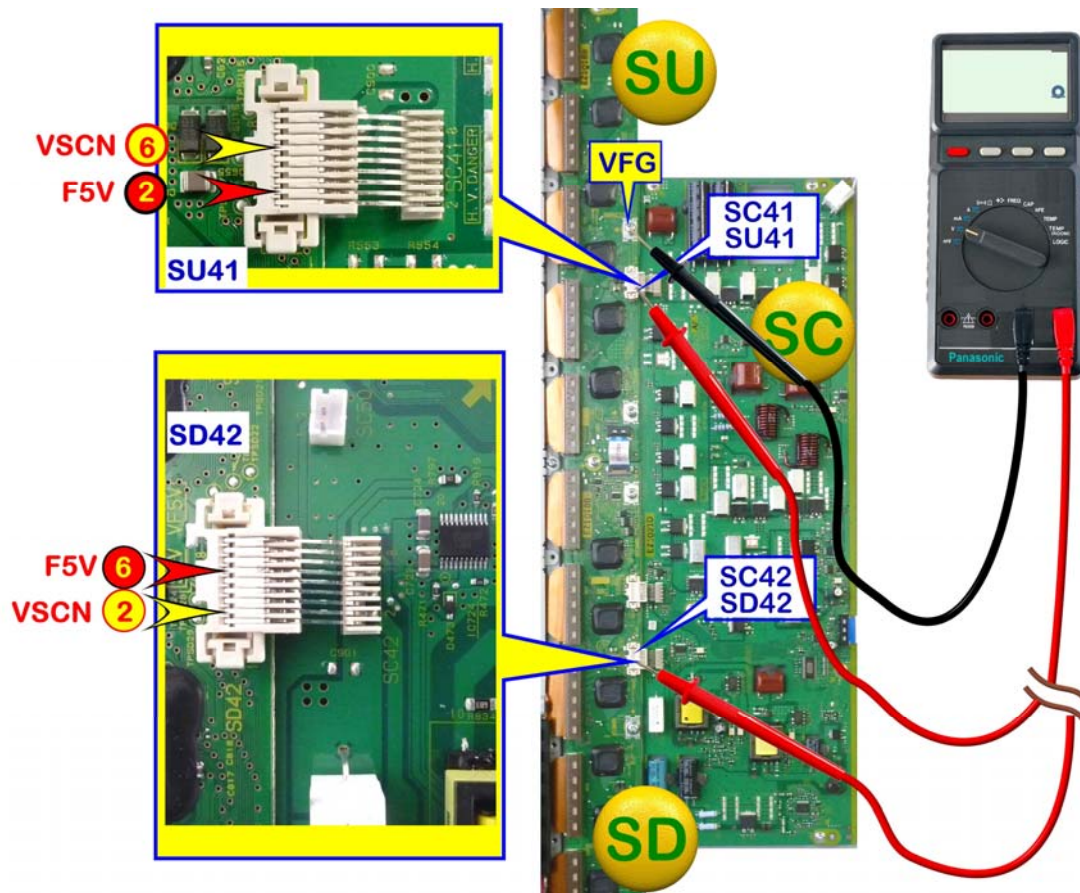
1

Step

Using any of the VFG screws (Floating ground screws) as ground, measure the resistance of pin 2 and pin 6 of either SU41/SC41 or SD42/SC42.

If a short circuit is found, proceed with step 2.

If no short circuit is found, isolate the SU and SD boards

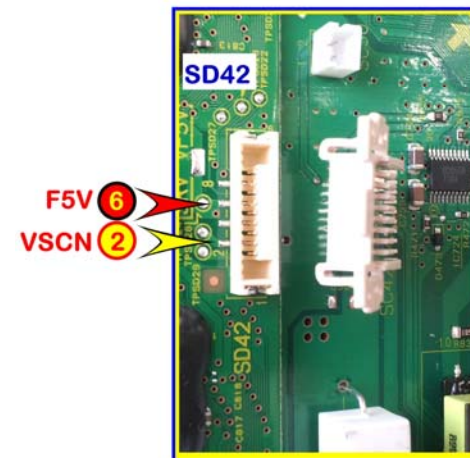
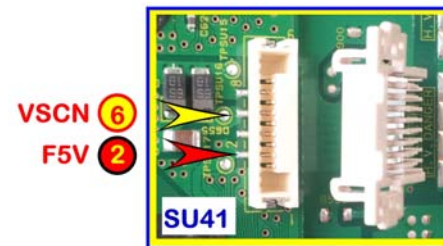


2

Step

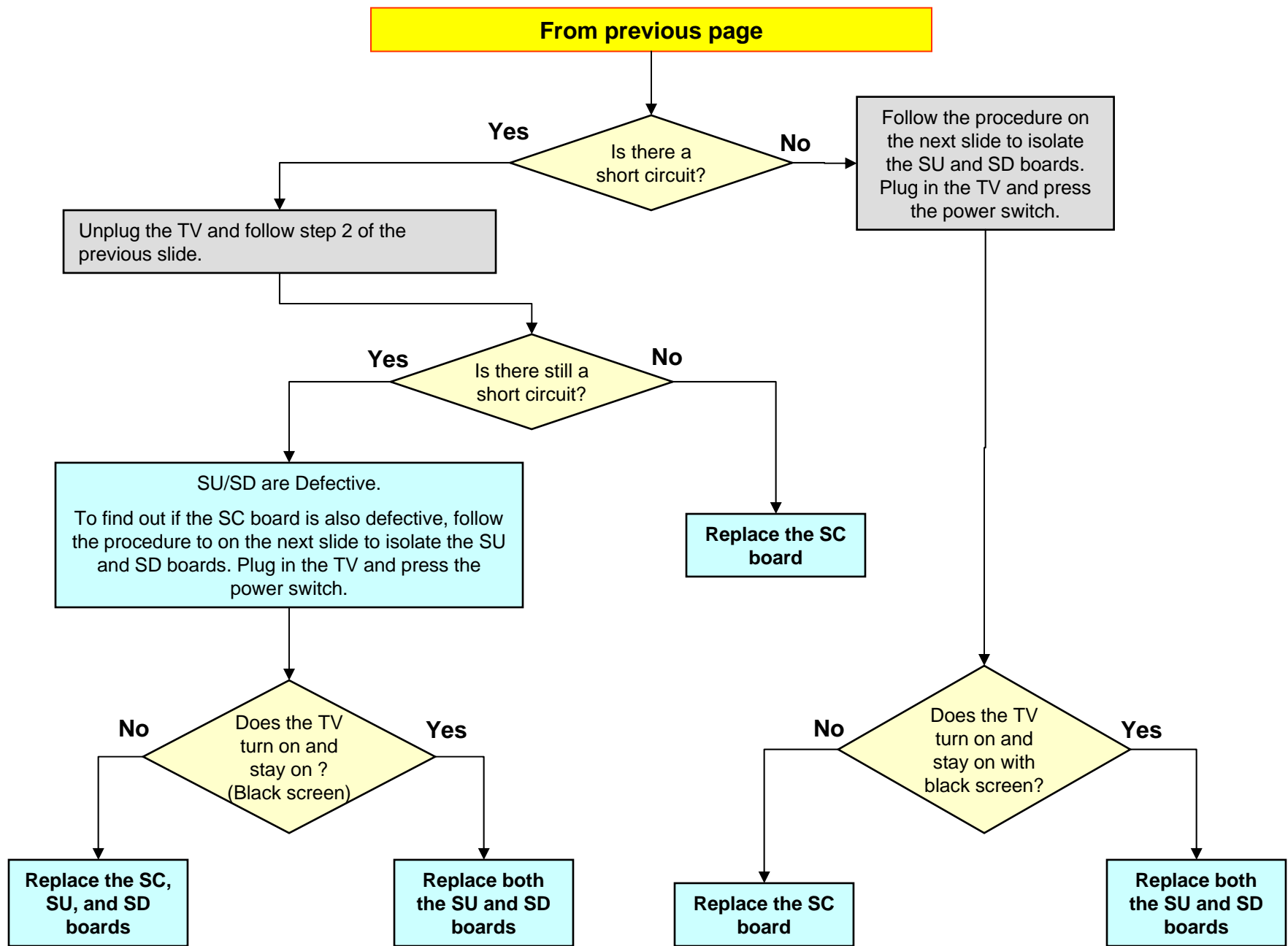
Unplug SU41 and SD42. Using any of the VFG Screws (Floating ground screws) as ground, measure the resistance of pin 2 and pin 6 of both SU41 and SD42.

A short circuit indicates the failure of the board where it was found.



Note: Change the SU and SD boards together even if only one is found to be defective.

Continue on the next page



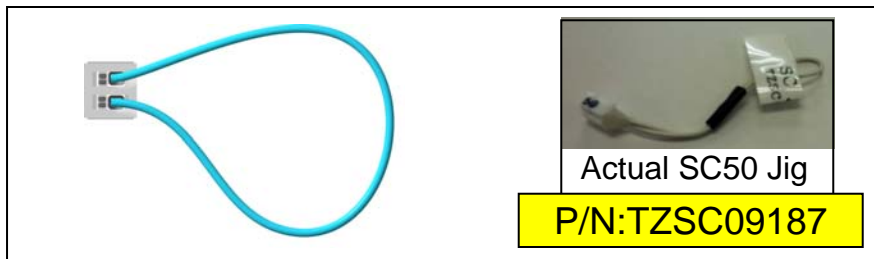
Troubleshooting 7 Blinks Failure (SU/SD Boards Isolation Procedure)

Warning:

When performing this procedure, isolate the SU and SD boards together at the same time. Do not attempt to isolate the SU or the SD boards individually. This could cause further damages to the TV.

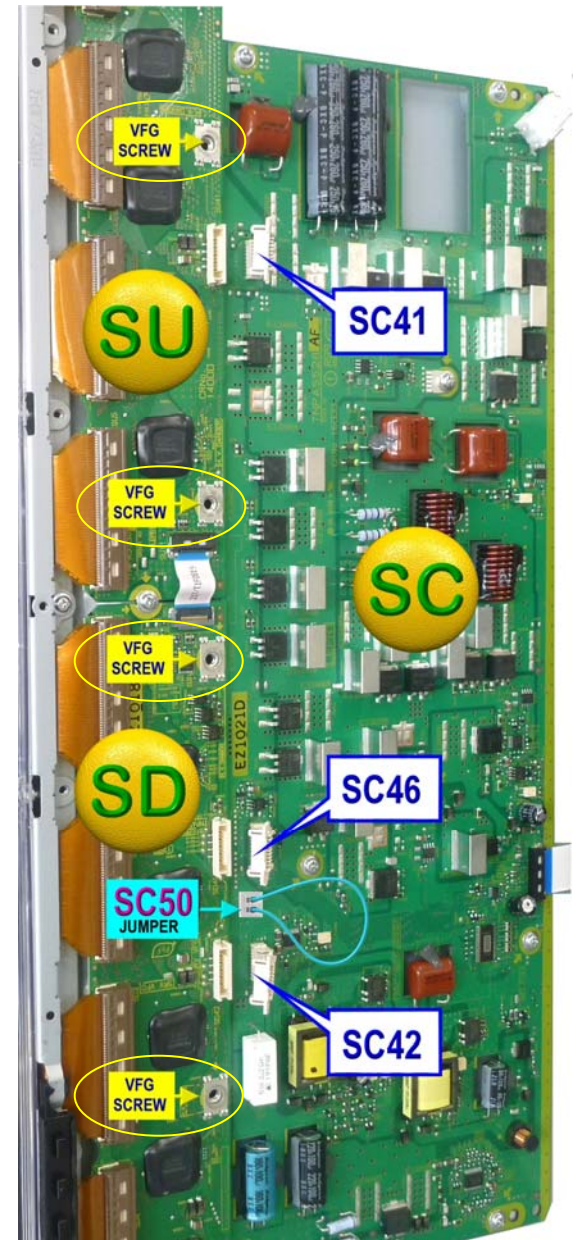
Procedure:

1. Remove the 4 VFG screws from the SU and SD boards. (See picture on the left side.)
2. Remove SC41, SC42, and SC46 from the SC board.
3. Install the SC50 Jig or just jump pins 1 and 2 of connector SC50 on the SC board.



4. Plug-in the TV and turn it on.

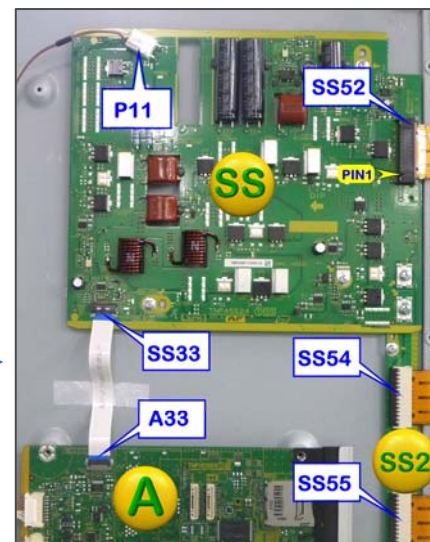
Note: Remove the jig or the jumper after completing the isolation procedure.



Troubleshooting 8 Blinks Failure (TC-P50ST50)

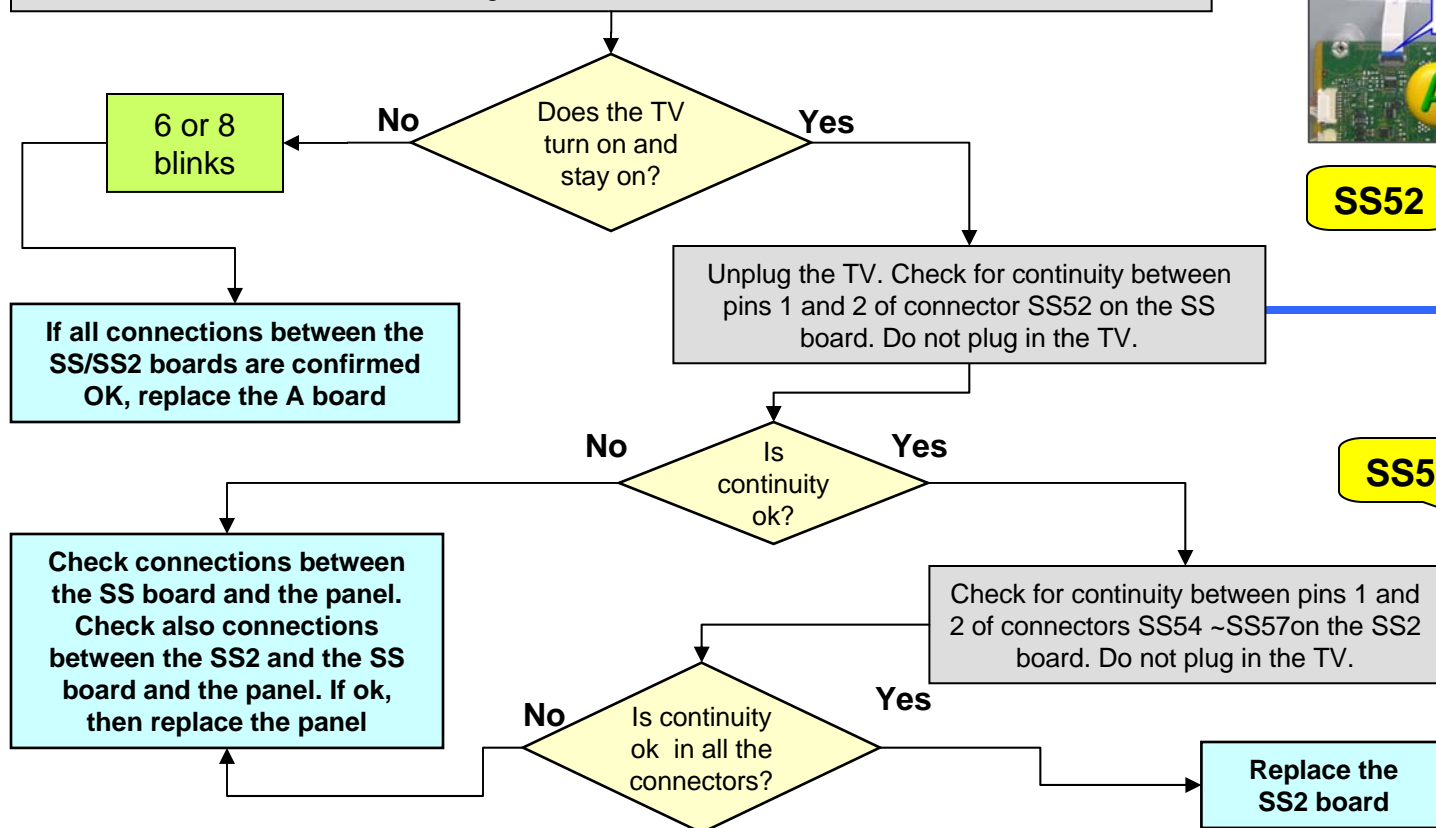
Blink Code	List of boards likely to cause this symptom.			
	No.1	No.2	No.3	No.4
8 Blinks	SS	A	SS2	Panel

Find information for **TC-P50UT50** on the next slide)

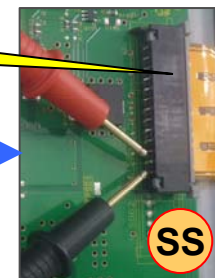


Start Here

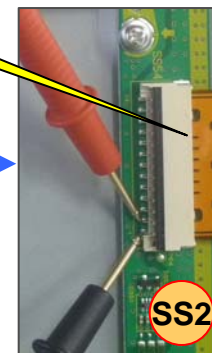
Check all the cables between the SS/SS2 boards (SS52, SS54 ~SS57) and the panel. Make sure they are properly seated in the connectors. Unplug the TV and disconnect SS33 on the SS board. Plug in the TV and turn it on



SS52



SS54



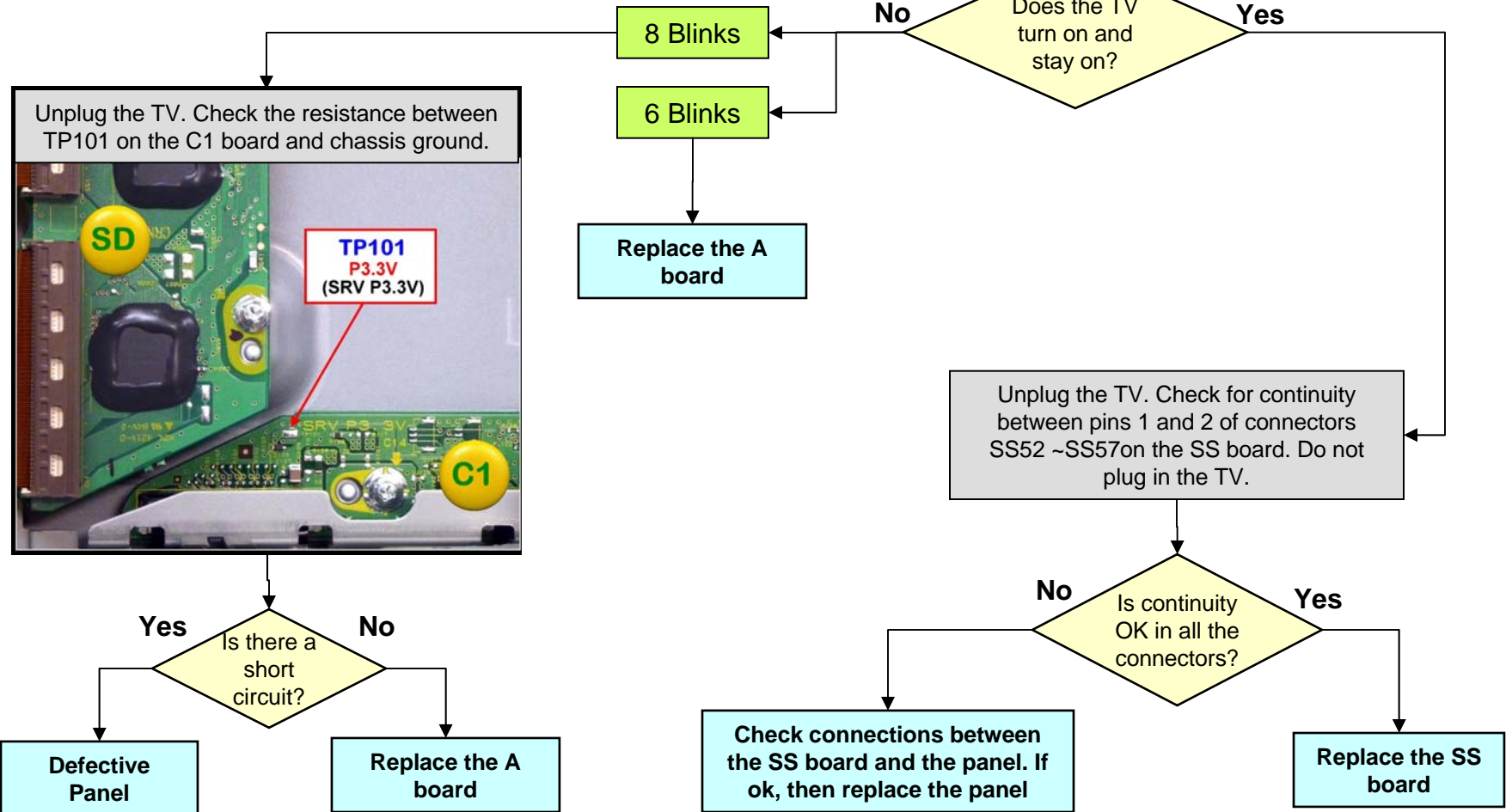
Troubleshooting 8 Blinks Failure (TC-P50UT50)

Find information for **TC-P50ST50** on the previous slide)

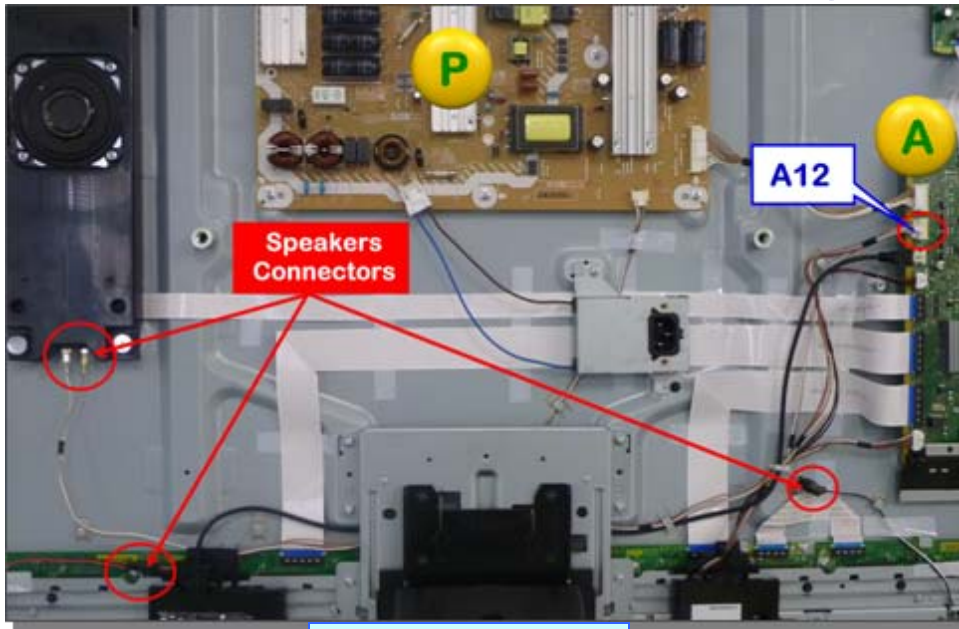
Blink Code	List of boards likely to cause this symptom.			
	No.1	No.2	No.3	No.4
8 Blinks	SS	A	Panel	

Start Here

Check all the cables between the SS board (SS52 ~SS57) and the panel. Make sure they are properly seated in the connectors. Unplug the TV and disconnect SS33 on the SS board. Plug in the TV and turn it on.



Troubleshooting 12 Blinks Failure



TC-P50ST50

Blink Code	List of boards likely to cause this symptom.			
	No.1	No.2	No.3	No.4
12 Blinks	A	Speaker/ Subwoofer		

Start Here

Unplug the TV and remove connector A12 from the A board. Plug in the TV and turn it on

No

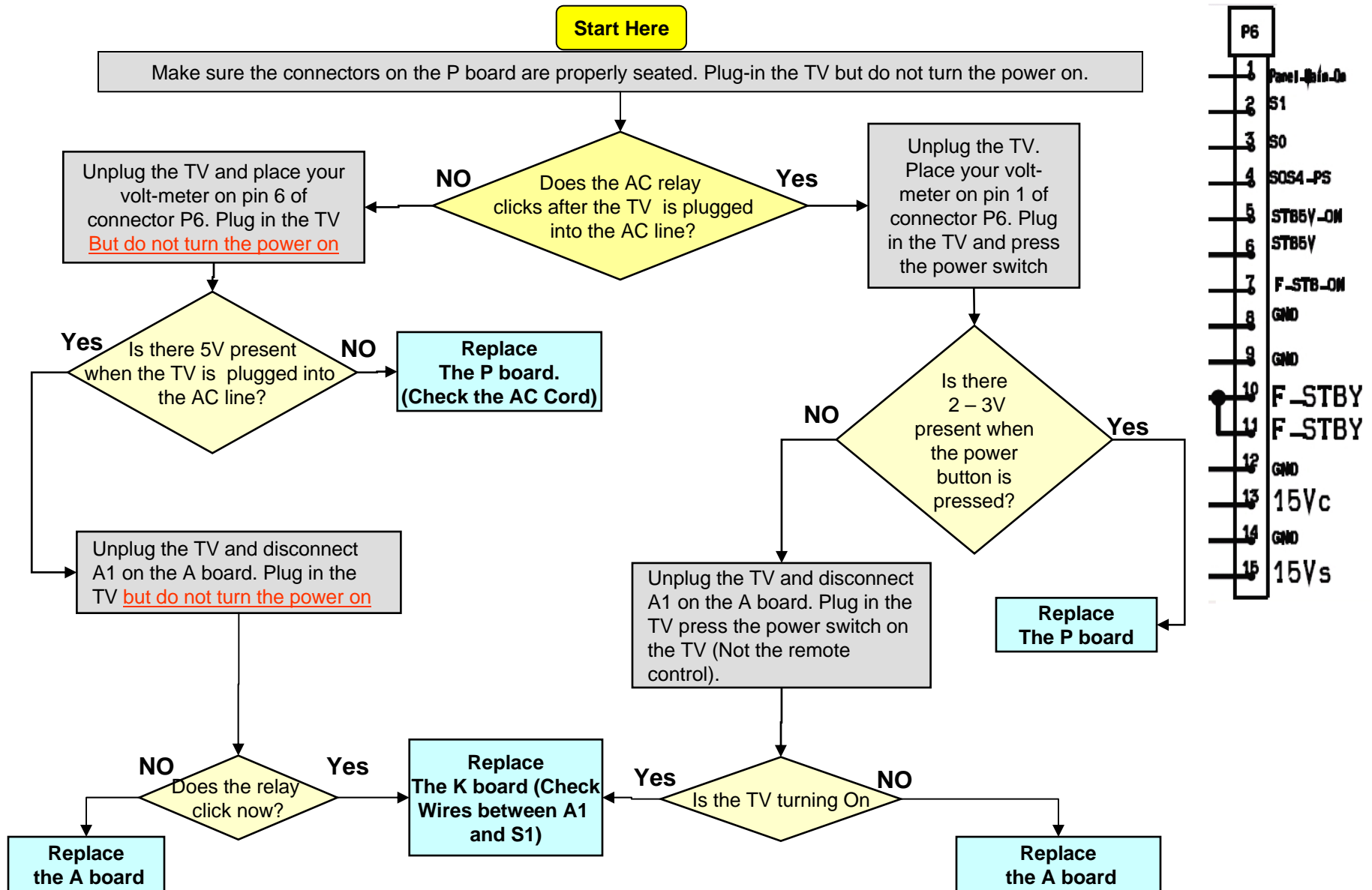
Is the TV still shutting down with 12 blinks?

Yes

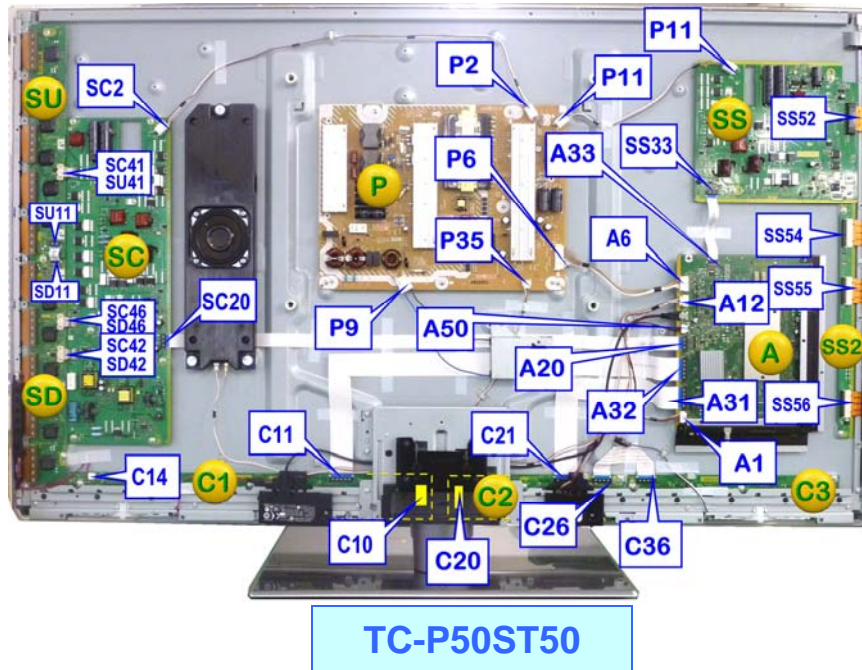
Disconnect the speakers one at a time to determine which one is bad

Replace the A board

Troubleshooting No Power/Dead Unit (Power LED is Off)



2012 Plasma TV's Behavior After Connectors Removal



TV Behavior When Connectors are Removed on the SC and SS boards					
Connector on The SC Board		Connector on The SS Board		TC-P50ST50	TC-P50UT50
SC2				7 Blinks	7 Blinks
	SC20			8 Blinks	8 Blinks
		SS11		8 Blinks	8 Blinks
			SS33	The TV stays on with black screen.	The TV stays on with black screen.
SC2	SC20			8 Blinks	8 Blinks
SC2		SS11		3 Fast Blinks	7 Blinks
SC2			SS33	3 Fast Blinks	7 Blinks
	SC20	SS11		8 Blinks	8 Blinks
	SC20		SS33	6 Blinks After 11 Sec. of Being on.	6 Blinks After 11 Sec. of Being on.
		SS11	SS33	The TV Stays on With Black Screen	The TV Stays on With Black Screen
SC2	SC20	SS11		3 Fast Blinks	8 Blinks
SC2	SC20		SS33	6 Blinks After 11 Sec. of Being on.	6 Blinks After 11 Sec. of Being on.
SC2	SC20	SS11	SS33	3 Fast Blinks	6 Blinks After 11 Sec. of Being on.
	SC20	SS11	SS33	6 Blinks After 11 Sec. of Being on.	6 Blinks After 11 Sec. of Being on.
SC2		SS11	SS33	3 Fast Blinks	7 Blinks

Any Combination of A20 – A31 and A32




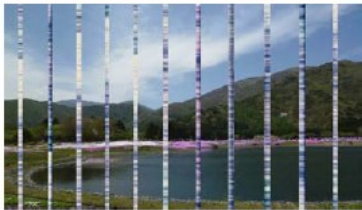



8 Blinks

Behavior Comparison Between 2010 and 2011 Models When the TV Fail with Shorted Vsus, Vda, or P15V

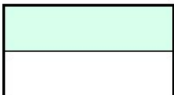

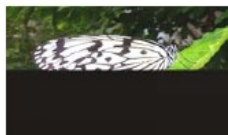



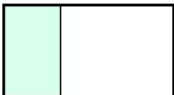





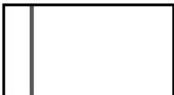





Behavior Comparison Between 2011 and 2012 Models When The TV Fails With Shorted Vsus, Vda, or P15V						
Year →		2011		2012		
Series →		X – S – ST	GT - VT30	TC-P50UT50	TC-P50ST50	--
Shorted	Vsus	Locked Solid Red LED	7 Blinks	3 Fast Blinks	7 Blinks	
	Vda				No SOS. The TV stays on with black screen.	
	P15	Locked Solid Red LED (14 Blinks, If TV is Turned On After the 2 nd Relay Click)	The TV does not turn on. The TV does not shut down. It tries to turn on (the LED briefly turns on), then it goes off.	The TV does not turn on. The TV does not shut down. It tries to turn on (the LED briefly turns on), then it goes off.	3 Fast Blinks	

Video/Lines Troubleshooting

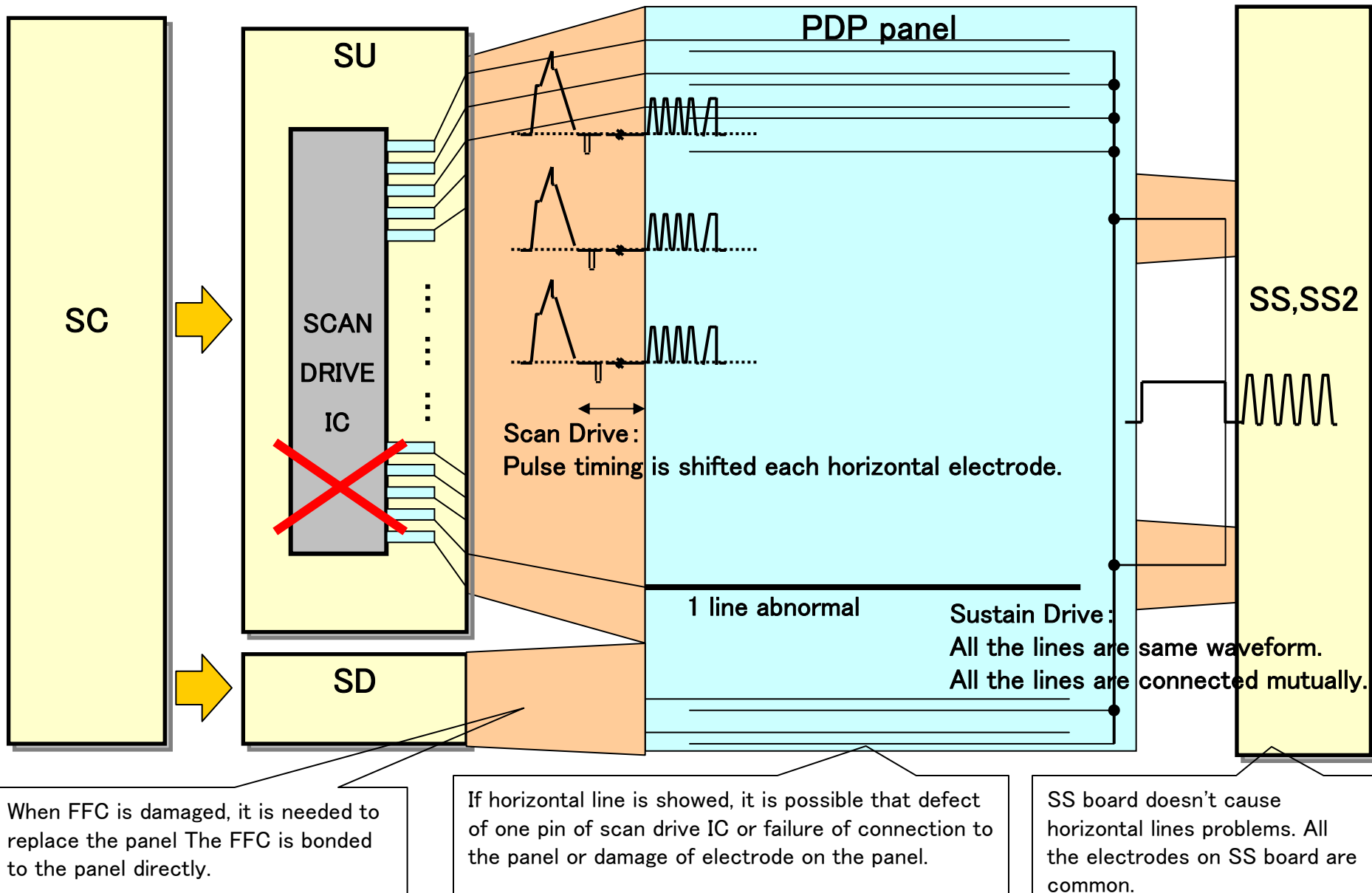
Troubleshooting Picture Distortions

Symptom	Actual symptom	Defective board
Irregular Color	 	<div>A board</div>
All vertical line	 	<div>A board</div>
Abnormal electric discharge	  	<div>SC / SS board in case of 42inch SN / SS board</div>

Troubleshooting Picture Distortions

Symptom	Actual symptom	Defective board
Trouble at Upper or Lower half 	 	Over 46inch : SU / SD 42inch : SN
Horizontal line (Upper or Lower side) 	 	Over 46inch : SU / SD 42inch : SN or panel
Trouble at Left or Center or Right part (46,42inch : Left or Right half) 	Over 50inch  46/42 inch 	Over 50inch : C1-C3 46/42inch : C1,C2
Vertical line (Width is same as FPC) 	 	C or A or PDP panel
Vertical line (Width is narrower than FPC) 	 	PDP panel
Regular bar 	 	A

Troubleshooting Horizontal Line Problem



Test Patterns

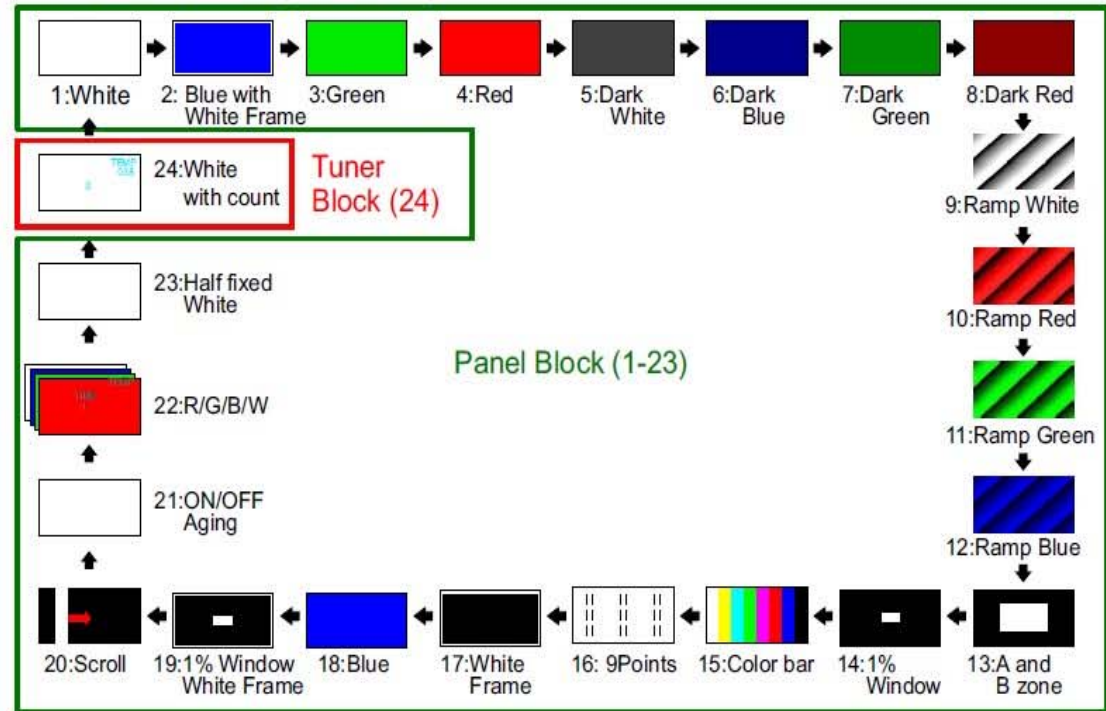
<Symptom>

Picture Noise, Full Vertical Line, Abnormal color

<How to enter the Test Pattern>

1. Press the "**VOLUME -**" on the TV set and push "**INFO**" button of remote controller 3 times at the same time.
2. After this procedure, you can enter "Service Mode" and select "**AGING**", then "Test pattern" will appear.
3. Push "3" button of Remote Controller to select the test pattern mode to forward.
4. Push "4" button of Remote Controller to select the test pattern mode to reverse.

<Test Pattern (Normal)>



<Diagnosis>

How to diagnose by using test pattern

Abnormal picture
(Picture Noise, Full Vertical Line, Abnormal color)

Test pattern (1-23)	Defective Block (Board)
Abnormal	Panel Block (A Board or Panel)
Normal	Tuner Block (A Board)

No picture

Test pattern	Defective Block (Board)
No picture	Panel Block (A Board or Panel)
O.K	Tuner Block (A Board)

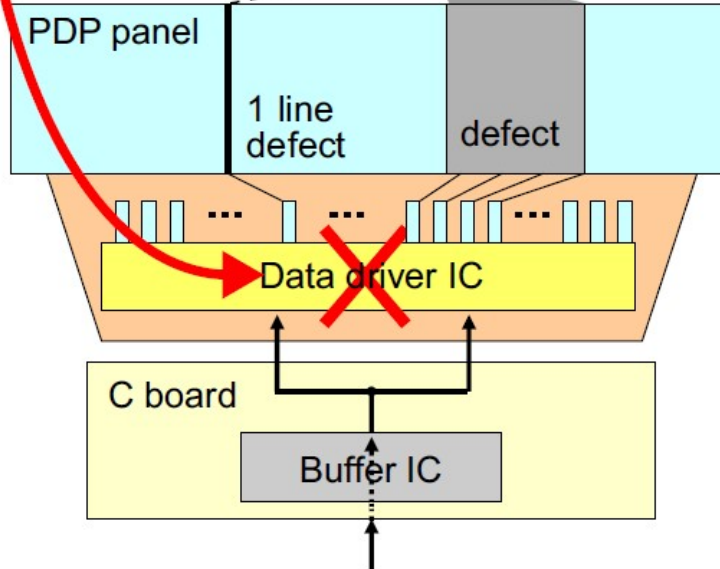
Defective Panel Drive IC

PDP panel defective (Data driver IC defective)

Width is narrower than FPC

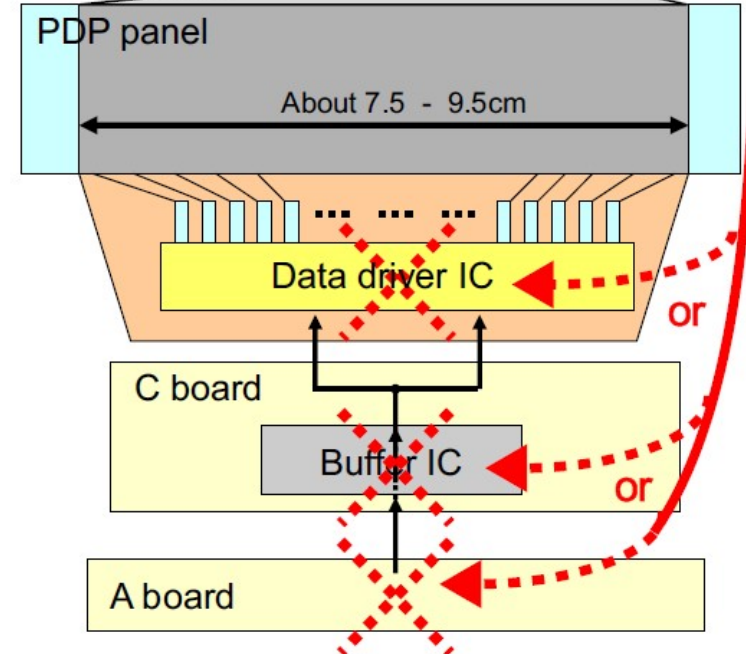


Data driver IC defect= PDP panel defect



Data driver IC or C or A board defective

Width is same as FPC



The End