

Panasonic

2010 Plasma TV Technical Guide

2010-Plasma FHD TV – S2 Series (13th Generation)

Applies to models:

TC-P42S2



Panasonic National Training
Panasonic Service and Technology Company

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Features

Series Line up

SERIES	MODELS					
	42"	46"	50"	54"	58"	65"
VT SERIES (FHD Premium 3D)			TC-P50VT25 TC-P50VT20	TC-P54VT25	TC-P58VT25	TC-P65VT25
G SERIES (FHD Core)	TC-P42G25	TC-P46G25	TC-P50G25 TC-P50G20	TC-P54G25 TC-P54G20		
S SERIES (FHD Leader)	TC-P42S2	TC-P46S2	TC-P50S2	TC-P54S2	TC-P58S2	TC-P65S2
PS,U SERIES (FHD Entry)	TC-P42U2		TC-50PS24 TC-P50U2		TC-58PS24	TC-65PS24
X SERIES (HD Leader)	TC-P42X2		TC-P50X2			
PX,C SERIES (HD Entry)	TC-42PX24 TC-P42C2	TC-P46C2	TC-50PX24 TC-P50C2			

New Features

	VT25	VT20	G25	G20	S2	PS24	U2	X2	PX24	C2
						Clubs			Clubs	
High Picture Quality	<p>FHD 3D NEW</p> <p>Dual Scan</p> <p>Short Stroke NEW</p> <p>Phosphor</p> <p>THX Certified</p> <p>Moving Picture 1080 Lines</p> <p>1080p</p> <p>720p</p> <p>600Hz Sub-field Drive</p> <p>NEW Infinite Black Plus (Native CR > 2 Mil:1)</p>									
Smart Networking	<p>Viera Cast IPTV</p> <p>Wi-Fi Ready (USB)x2</p> <p>VIERA Image Viewer (Movie & Photo)</p>									
Stylish Design	<p>Metallic NEW</p> <p>Buck Cut NEW</p> <p>Glossy NEW</p> <p>& Pattern Texture</p>									
Environmentally Friendly	<p>NEW Energy Saving (Louver Filter)</p> <p>Mercury & Lead Free + 100,000 hrs + Eco Mode</p>									

Specifications (1 of 3)

		VT SERIES	G SERIES	S SERIES	PS SERIES	U SERIES	X SERIES	PX SERIES	C SERIES
Main Specification	Resolution	1920X1080	1920X1080	1920X1080	1920X1080	1920X1080	1024X768	1024X768	1024X768
	Contrast (Native)	Infinite:1	Infinite:1	Infinite:1	Infinite:1	Infinite:1	Infinite:1	Infinite:1	Infinite:1
	Gradation	6144	6144	6144	6144	6144	6144	6144	6144
	Filter	Louver (Direct filter)	Louver (Direct filter)	AR	AR	-	AR	AR	-
	Remote	w/ Viera Cast	w/ Viera Cast	-	-	-	-	-	-
	THX	Y	Y	N	N	N	N	N	N
Picture	Deep Color	Y	Y	Y	Y	Y	Y	Y	Y
	X.V. Color	Y	Y	Y	Y	Y	Y	Y	Y
	Game Mode	Y	Y	Y	N	Y	Y	N	N
	Motion Reality	1080 lines	1080 lines	1080 lines	900 lines	720 lines	720 lines	720 lines	720 lines

Specifications (2 of 3)

		VT SERIES	G SERIES	S SERIES	PS SERIES	U SERIES	X SERIES	PX SERIES	C SERIES
Sound	Surround	Y	Y	Y	Y	Y	Y	Y	Y
	Sound Control	Y	Y	Y	Y	Y	Y	Y	Y
	BBE	Y	N	N	N	N	N	N	N
	Balance Control	Y	Y	Y	Y	Y	Y	Y	Y
	Lip Sync Improvement	Y	Y	Y	Y	Y	Y	Y	Y
Terminal Input	AV1 Type (Position)	RCA/S (Rear)							
	AV2 Type (Position)	RCA (Side)							
	Component1 Type (Position)	RCA (Rear)							
	Component2 Type (Position)	RCA (Rear)							
	HDMI1 Position	Rear							
	HDMI2 Position	Rear							
	HDMI3 Position	Rear	Side	Side	Side	Side	-	-	-
	HDMI4 Position	Side	-	-	-	-	-	-	-
	PC Input	1	1	-	1	-		1	-
Terminal Output	Digital Audio Out	Y	Y	Y	Y	Y	Y	Y	Y
Network	Ethernet	1	1	-	-	-	-	-	-

Specifications (3 of 3)

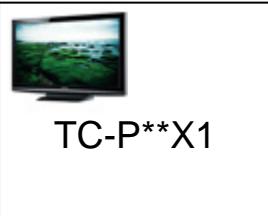
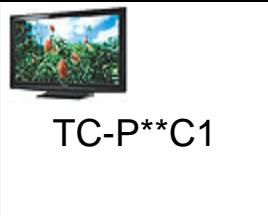
		VT SERIES	G SERIES	S SERIES	PS SERIES	U SERIES	X SERIES	PX SERIES	C SERIES
Card I/F	SD Card Slot	Y	Y	Y	Y	Y	Y	Y	Y
	SD Card LED Color	Blue	-	-	-	-	-	-	-
	SD Function	Movie & Photo	Movie & Photo	Photo	Photo	Photo	Photo	Photo	Photo
Other I/F	USB (Wi-Fi Ready)	2	2	-	-	-	-	-	-
	RS-232C	1	-	-	-	-	-	-	-
Function	DLNA	-	-	-	-	-	-	-	-
	IPTV	Viera Cast	Viera Cast	-	-	-	-	-	-

Models Comparison

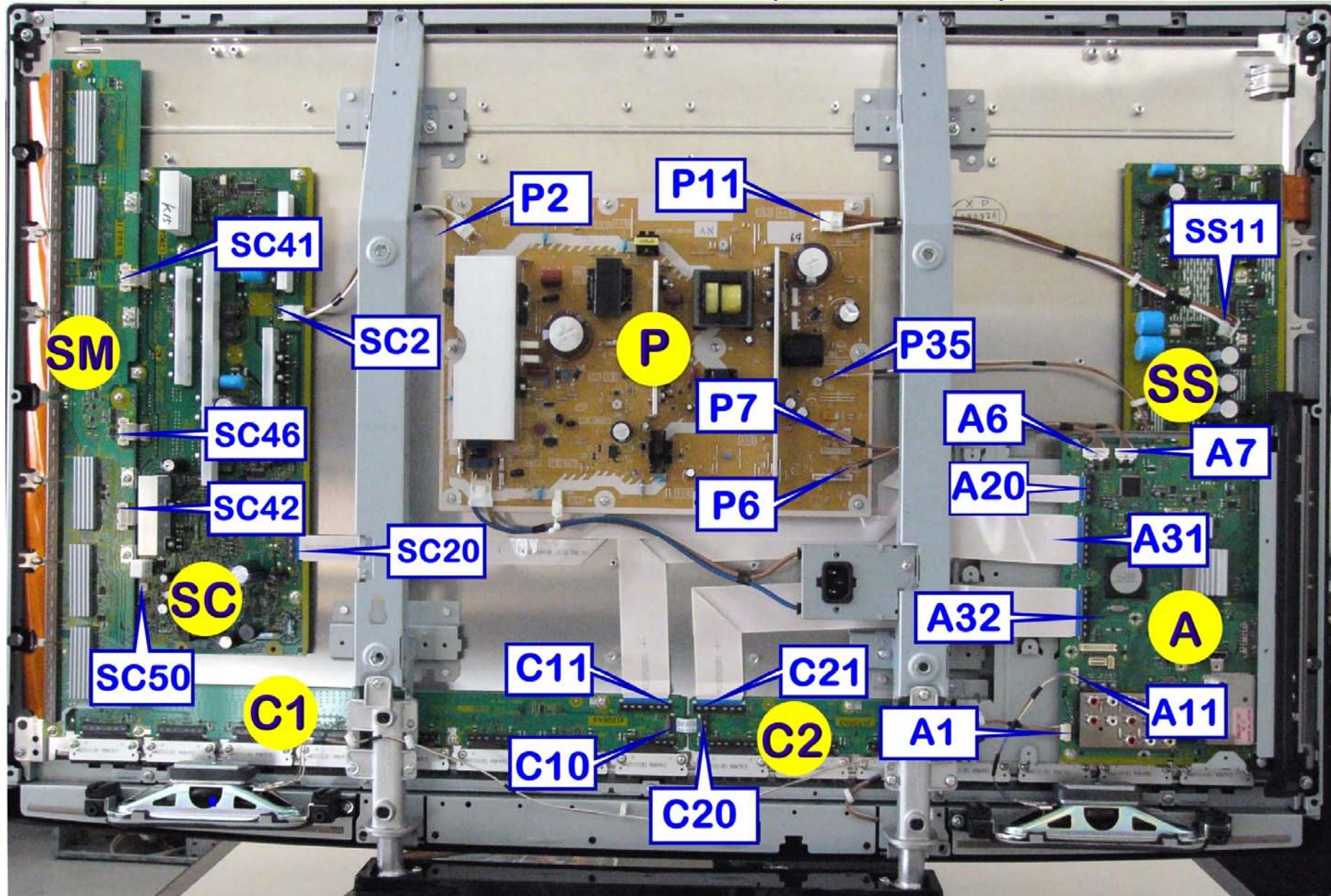
2009/2010 Models Comparison (1 of 2)

2009 model		2010model	New features	Remarks
	→	TC-P**VT25/20	3D Panel Native contrast Screen coating USB Power Consumption	Added(120kHz frame sequential) NeoPDPeco Panel Infinite:1 Louver (Direct filter, No front glass) Added (Wi-Fi Ready) -40%
	→	TC-P**G25/20	Panel Native contrast Screen coating Power Consumption	NeoPDPeco Panel Infinite:1 Louver (Direct filter, No front glass) -40%
	→	TC-P**S2	Panel Native contrast X.V. Color Power Consumption	NeoPDPeco Panel Infinite:1 Added -40%
	→	TC-**PS24	Panel Native contrast Gradation X.V. Color Power Consumption	NeoPDPeco Panel Infinite:1 6,144 Added -40%

2009/2010 Models Comparison (2 of 2)

2009 model		2010model	New features	Remarks
 TC-P**U1	→	TC-P**U2	Panel Native contrast Gradation X.V. Color Game mode Power Consumption	NeoPDPeco Panel Infinite:1 6,144 Added Added -40%
 TC-P**X1	→	TC-P**X2	Panel Resolution Native contrast Gradation X.V. Color HDMI input Power Consumption	NeoPDPeco Panel 1024X768 (*1) Infinite:1 6,144 Added 2 (*2) -40%
 TC-P**X14	→	TC-P**PX24	Panel Resolution Native contrast Gradation X.V. Color Power Consumption	NeoPDPeco Panel 1024X768 (*1) Infinite:1 6,144 Added -40%
 TC-P**C1	→	TC-P**C2	Panel Resolution Native contrast Gradation Power Consumption	NeoPDPeco Panel 1024X768 (*1) Infinite:1 6,144 -40%

Connectors Location (TC-P42S2)



Boards Description

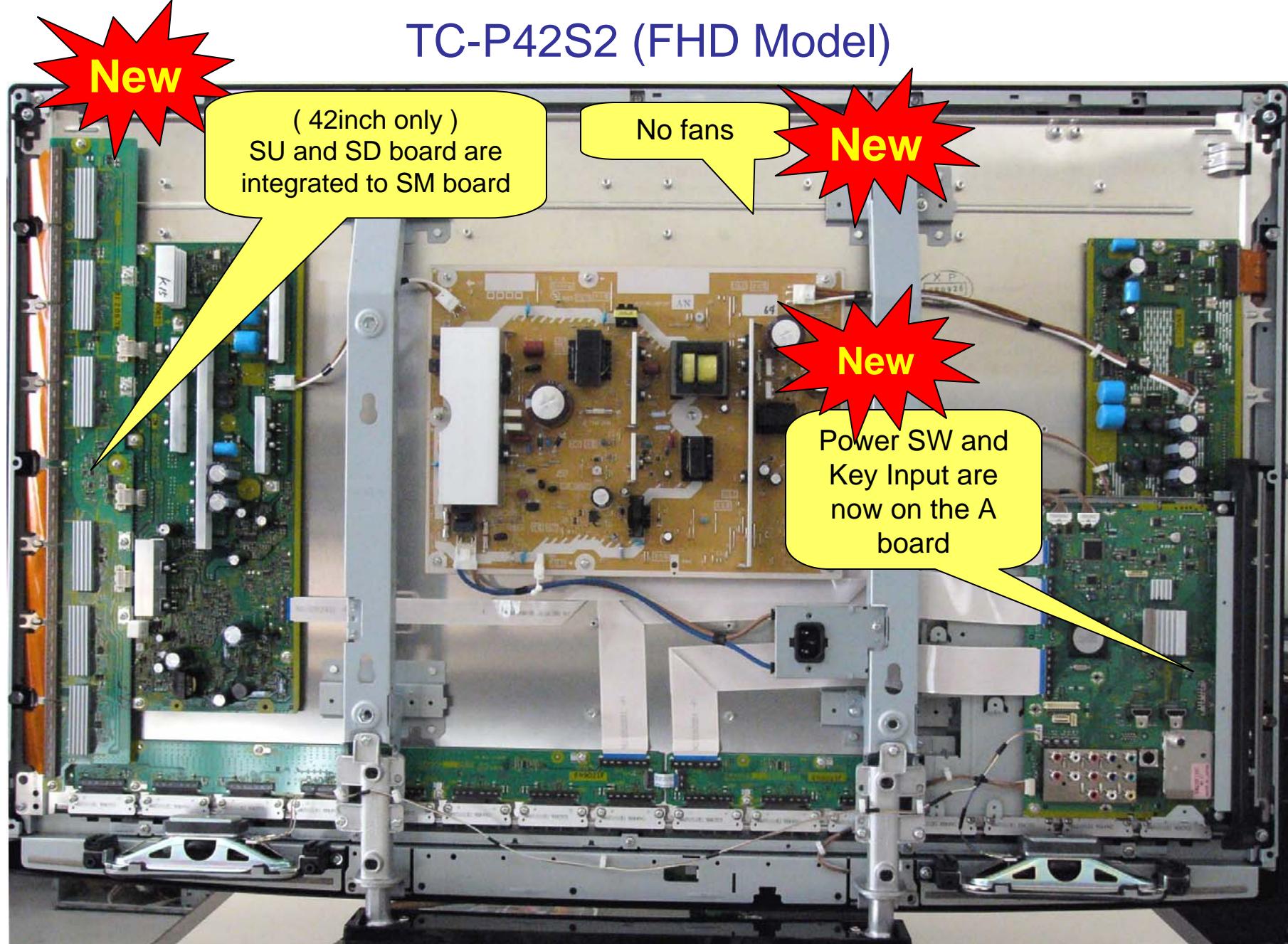
Board	Description	Board	Description
A	Speaker out, Sound Processor, AV Terminal, AV Switch, DC-DC Converter, Digital Signal Processor, Microcomputer, HDMI Interface, SD card slot, Format-Converter, Plasma AI, Sub-Field Processor, (Newly Added Key Switch)	P	Power Supply
C1	Data Drive (Right)	SC	Scan Drive
C2	Data Drive (Left)	SU	Scan Out (Upper)
K	Remote Receiver, Power LED	SD	Scan Out (Lower)

42" SM

Boards comparison between 2009 S1 series and 2010 S2 series

	2009 S1 series	⇒	2010 S2 series
Board	SU + SD	⇒	SM (only 42inch)
	GK + S	⇒	Delete (on A board)

TC-P42S2 (FHD Model)



Technical Changes

The resolution of the 50" HD models has been reduced from 1,366x768 to 1024x768 (Same as the 42" HD models).

TC-P42S2

The Power Switch is located on the A board (G20 and S2 models). The U2, X2, and C2 models still have the power switch on the S board.

The SU and SD boards are now just one board (SM). The TC-P42X2 model combines the SU, SD, and SC boards into just one board (SN).

Instead of 30V, SUB5V is used as the Tuner +B. The tuner has a built-in DC-DC Converter.

P5V is produced in the A board. (Not in the P board.)

The Main CPU and the Front end processor circuit are built into one IC. (Nile-TCON IC8001).
IC8001 uses STB3.3V and STB1.2V as VCC.

Vset is no longer used on the SC board.

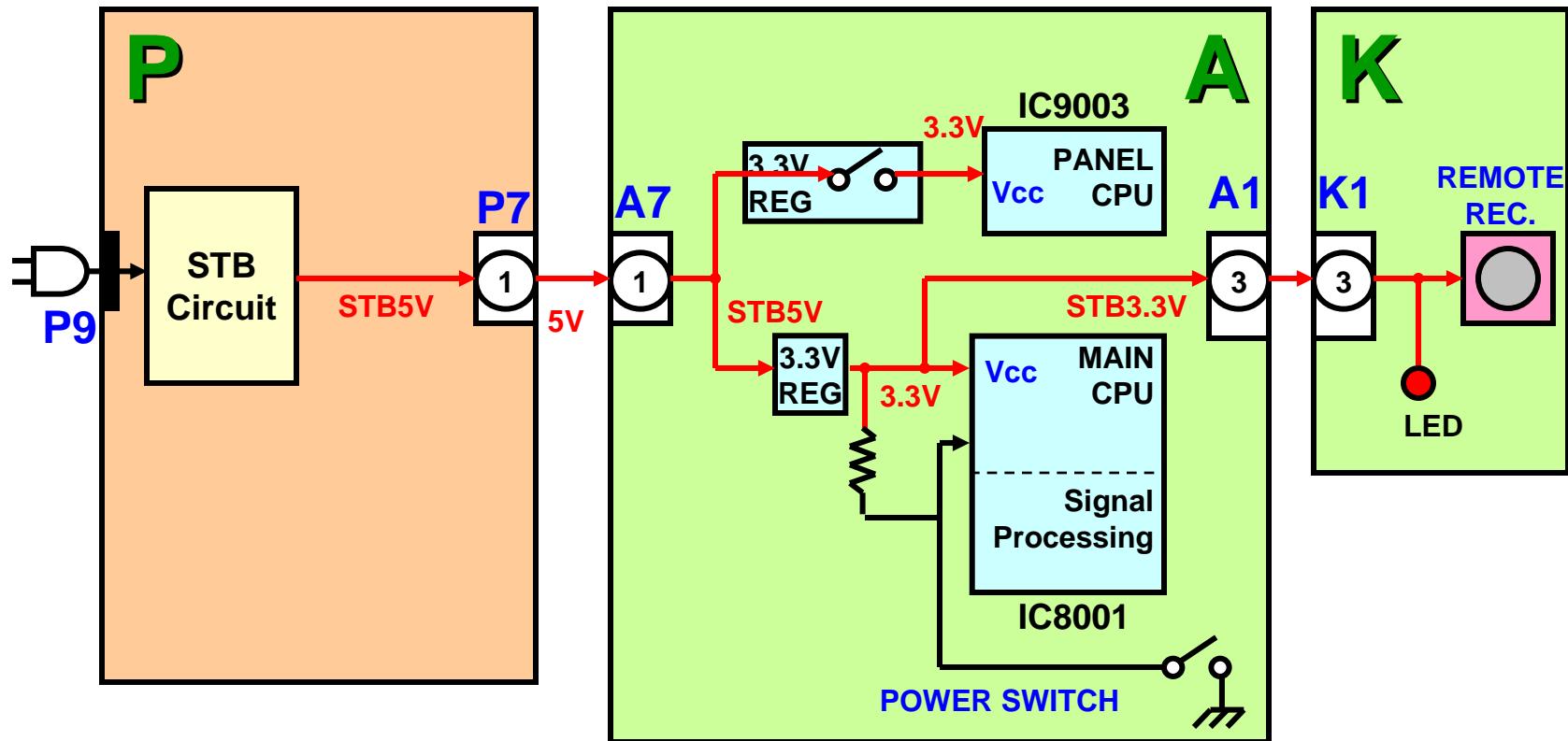
P25/A25 connector is deleted

G20/25, VT20 Series

No front glass is used on these models.

Start-up Operation Standby/Power On

Standby Operation



Standby Circuit Explanation

When the TV is plugged in:

AC is applied to the standby circuit in the power supply to produce STB5V.

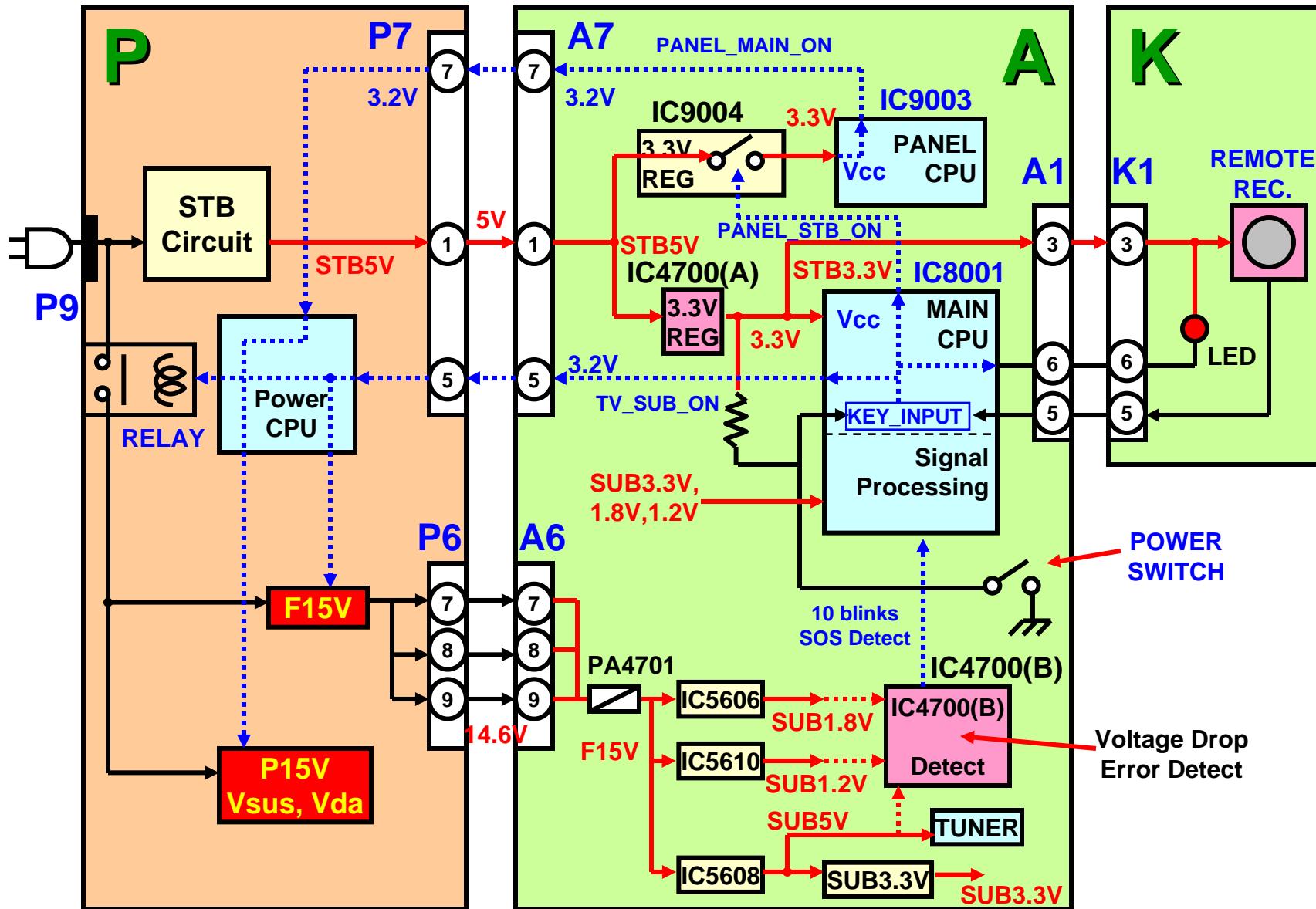
The STB5V is provided to the A board via connectors P7 (Pin 1).

The STB5V from pin1 of connector P7 is applied to a 3.3V regulator to power the Main CPU (IC8001) on the A board. This energizes and prepare the microprocessor (CPU) for program execution.

The 3.3V from the voltage regulator besides being applied to the CPU, is also applied to the remote control receiver and the power LED on the K board through connector A1/K1 (pin 3).

If the STB5V is missing, the TV is dead (No power)

Power On Operation



Power On Circuit Explanation

The power command from the power switch on the A board or the remote control receiver on the K board is provided to the Main CPU on the A board (IC8001). The CPU on the A board outputs the “TV_SUB_ON” Command (3.2V) and the PANEL_STB_ON” command (3.2V).

The “TV_SUB_ON” command is provided to pin 5 of connector P7 of the power supply to develop the F+15V. At this time, the relays on the power supply are triggered and a “click” sound can be heard.

The F+15V from the P board is applied to several voltage regulator (IC5608- IC5610, and IC5606) on the A board. The voltage output from these ICs are SUB5V, SUB1.8V, and SUB1.2V respectively. They are used by various circuits on the A board.

To avoid catastrophic failures, they are monitored by an SOS Detect circuit (IC4700) for over-voltage and over-current conditions. Any abnormalities of the SUB5V, SUB1.8V, or SUB1.2V triggers the SOS circuit. The TV shuts down and the power LED blinks 10 times.

The “PANEL_STB_ON” is used to turn on the 3.3V regulator (IC9004) on the A board. The output voltage is applied to the “Panel CPU” on the A board. The Panel CPU on the A board outputs the “PANEL_MAIN_ON” Command (3.2V) to pin 7 of connector P7 on the P board. The “PANEL MAIN ON” command turns on the power supply circuit that outputs the Vsus, Vda, and 15V.

CPU Commands Explanation

TV SUB ON (F-STBY-ON), PANEL-STB-ON, PANEL MAIN ON, and DISPEN.

The “TV Sub On”

The CPU on the A board outputs the “TV_SUB_ON” Command (3.2V) when the power is turned on. This command is used to turn on the circuit in the power supply that generates the F+15V.

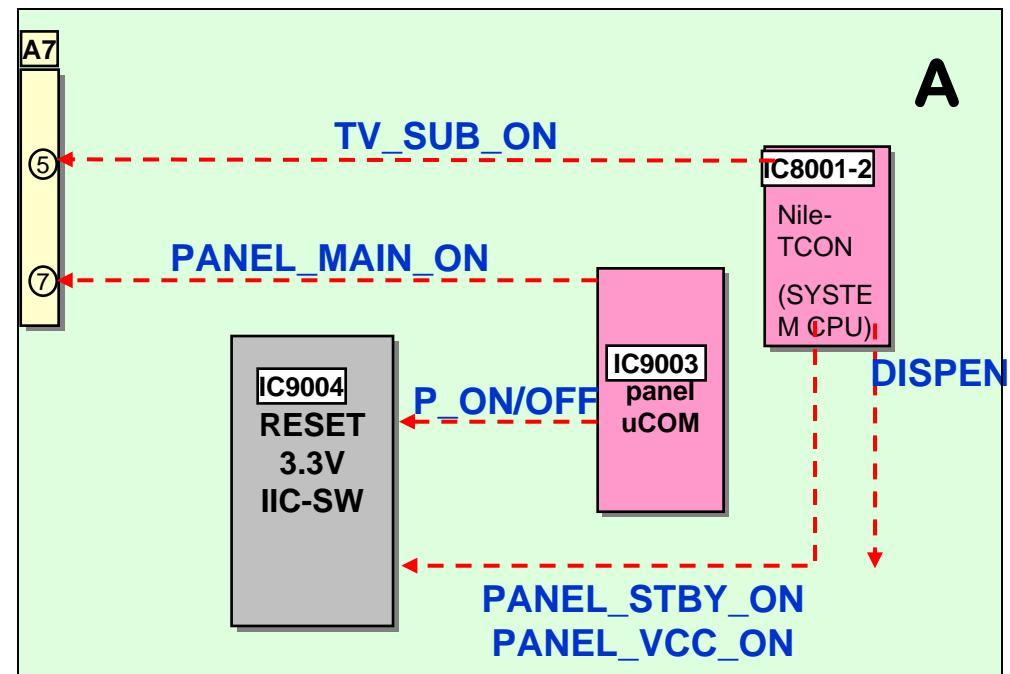
The F+15V is provided to the A to generate the Sub-voltages used by the signal process circuit.

When the output of the Sub-voltages is confirmed by the system MPU, it outputs the “Panel STB On” command.

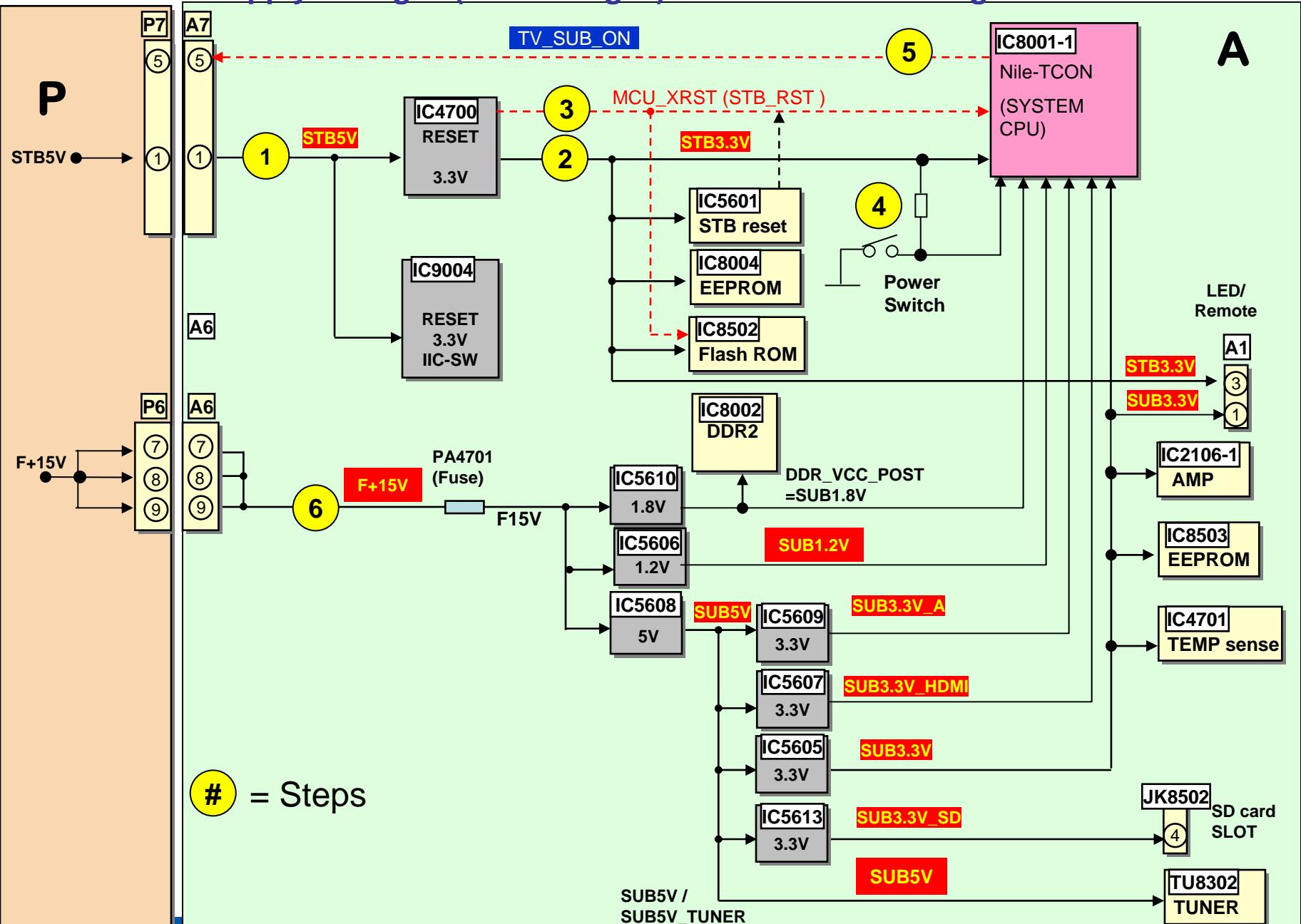
The “**Panel STB On**” (3.2V) command is used to energize the panel MPU IC. When the panel MPU is energized, it outputs the “Panel Main On” command.

The “**Panel Main On**” (3.2V) command is applied to the power supply to turn on the circuits that generate the Vsus, Vda, P15V.

The “**Disp**” (Display Enable) command is applied to the Discharge Control/Sub-field Conversion IC (IC9300) to begin panel drive operation and video display.



Supply Voltages (Sub Voltages) For Video Processing Circuit



Panasonic ideas for life

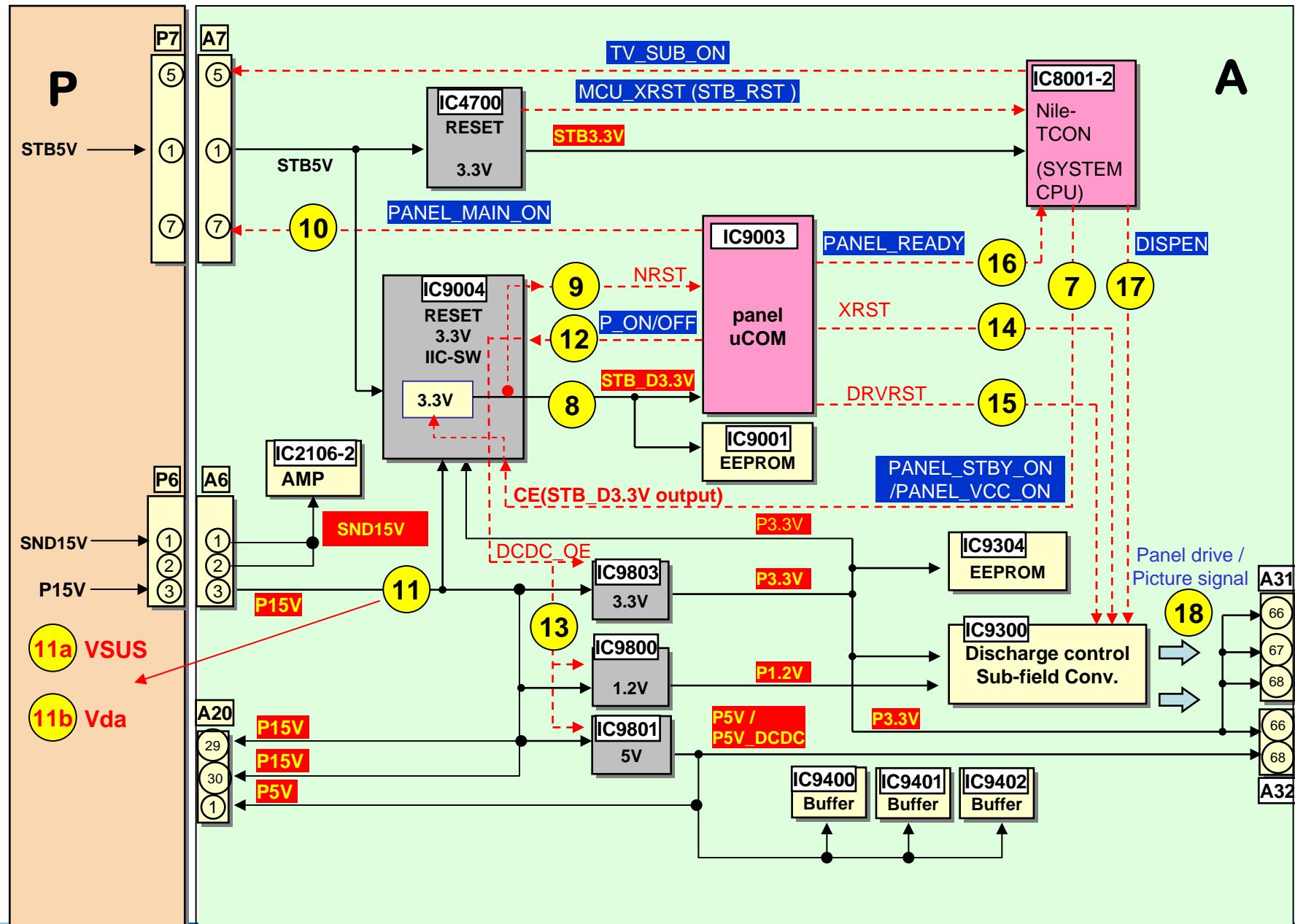
Sub-Voltages Distribution Explanation

AC is applied to the standby circuit in the power supply to produce STB5V when the TV is plugged in. The STB5V is provided to the A board via connectors P7 (Pin 1).

1	The STB5V from pin1 of connector P7 is applied to a 3.3V regulator to power the Main CPU (IC8001) on the A board. This energizes and prepare the microprocessor (CPU) for program execution.
2	The 3.3V from the voltage regulator besides being applied to the CPU, is also applied to the remote control receiver and the power LED on the K board through connector A1/K1 (pin 3).
3	The reset pulse from IC4700 is applied to the Main CPU (IC8001) for program execution.
4	The power command from the power switch on the A board or the remote control receiver on the K board (Not shown on the schematic) is provided to the Main CPU on the A board (IC8001).
5	The CPU on the A board outputs the “TV_SUB_ON” Command (3.2V) The “TV_SUB_ON” command is provided to pin 5 of connector P7 of the power supply to develop the F+15V. At this time, the relays on the power supply are triggered and a “click” sound can be heard.
6	The F+15V from the P board is applied to several voltage regulator (IC5608- IC5610, and IC5606) on the A board. The voltage output from these ICs are SUB5V, SUB1.8V, and SUB1.2V respectively. These voltages are used by the signal processing circuit in the A board.

The circuit responsible for processing the signal is now ready. All the necessary voltages are present.

Supply Voltage (P15V) For 1st Stage of Panel Drive Circuit



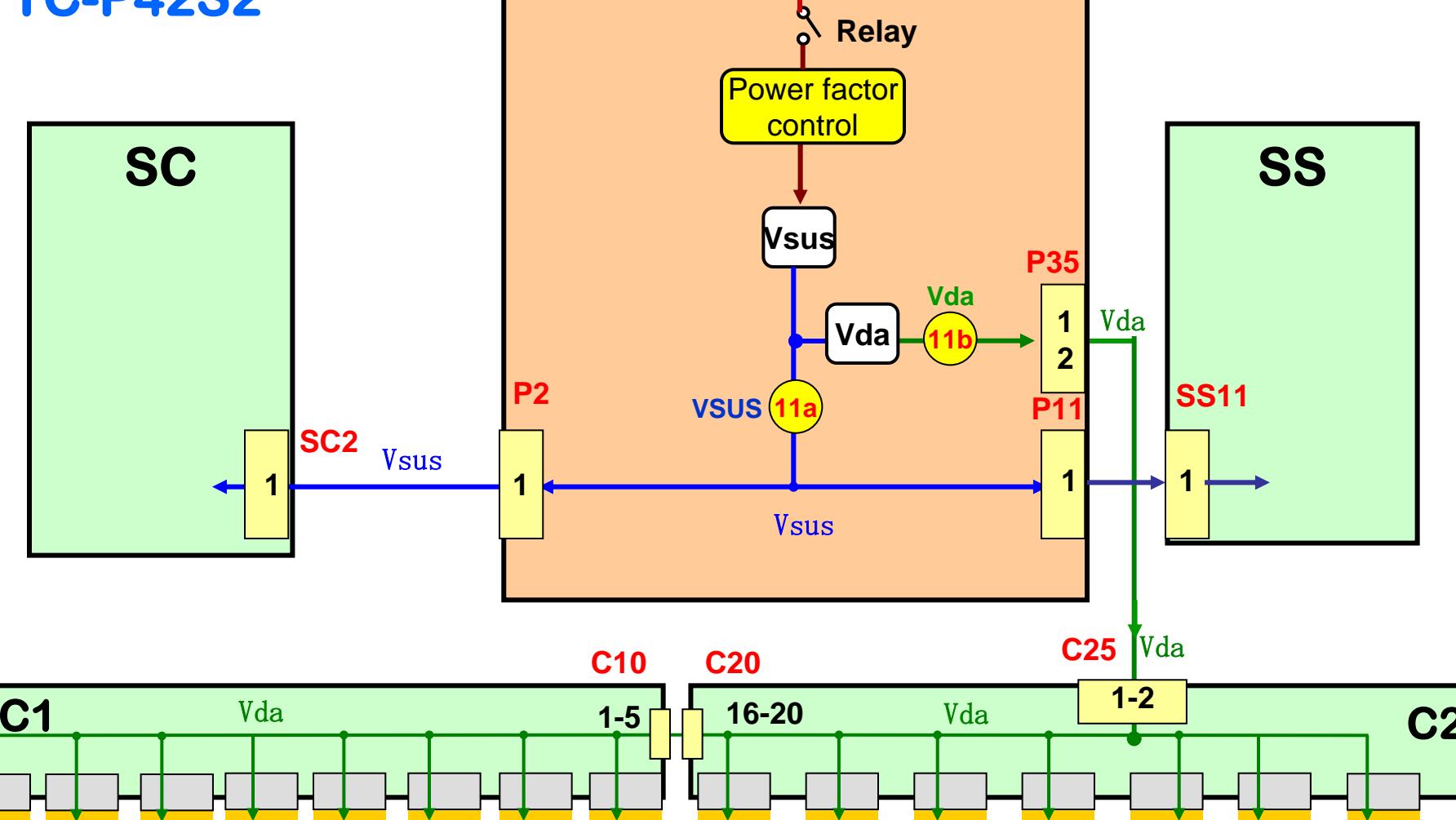
Panel Drive Circuit Supply Voltages

7	When the output of the Sub-voltages is confirmed by the system MPU, The System CPU outputs the “ Panel STB On/Panel VCC On ” command to IC9004.
8	When Panel STB On command is applied to IC9004, STB3.3V is developed.
9	Reset (NRST) is also generated by IC9004
10	When STB3.3V and Reset are applied to the Panel CPU (IC9003), the PANEL MAIN ON command is output to the power supply.
11	P15V is output from the power supply when it receives the PANEL MAIN ON command. 11a Vsus and 11b Vda are also output at this point.
12	Right after the PANEL MAIN ON command is output from IC9003, the P_ON/OFF command is also output to IC9004.
13	IC9004 outputs the ENABLE command to the voltage regulators IC9800, 9801, 9803 to output 3.3V, 1.2V, and 5V respectively.
14	IC9003 also outputs XRST
15	IC9003 outputs DRVRST (Drive Reset) to reset the drive section of IC9300 and begin panel drive operation.
16	PANEL READY from the Panel CPU is output to the System CPU to signal the beginning of panel drive operation.
17	IC8001 outputs the DISPEN (Display Enable) command to IC9300 to begin panel drive and picture drive operation.
18	IC9300 outputs the pulses and data necessary to drive the panel and generate video.

Supply voltages (Vsus and Vda) for 2nd Stage of Panel Drive Circuit

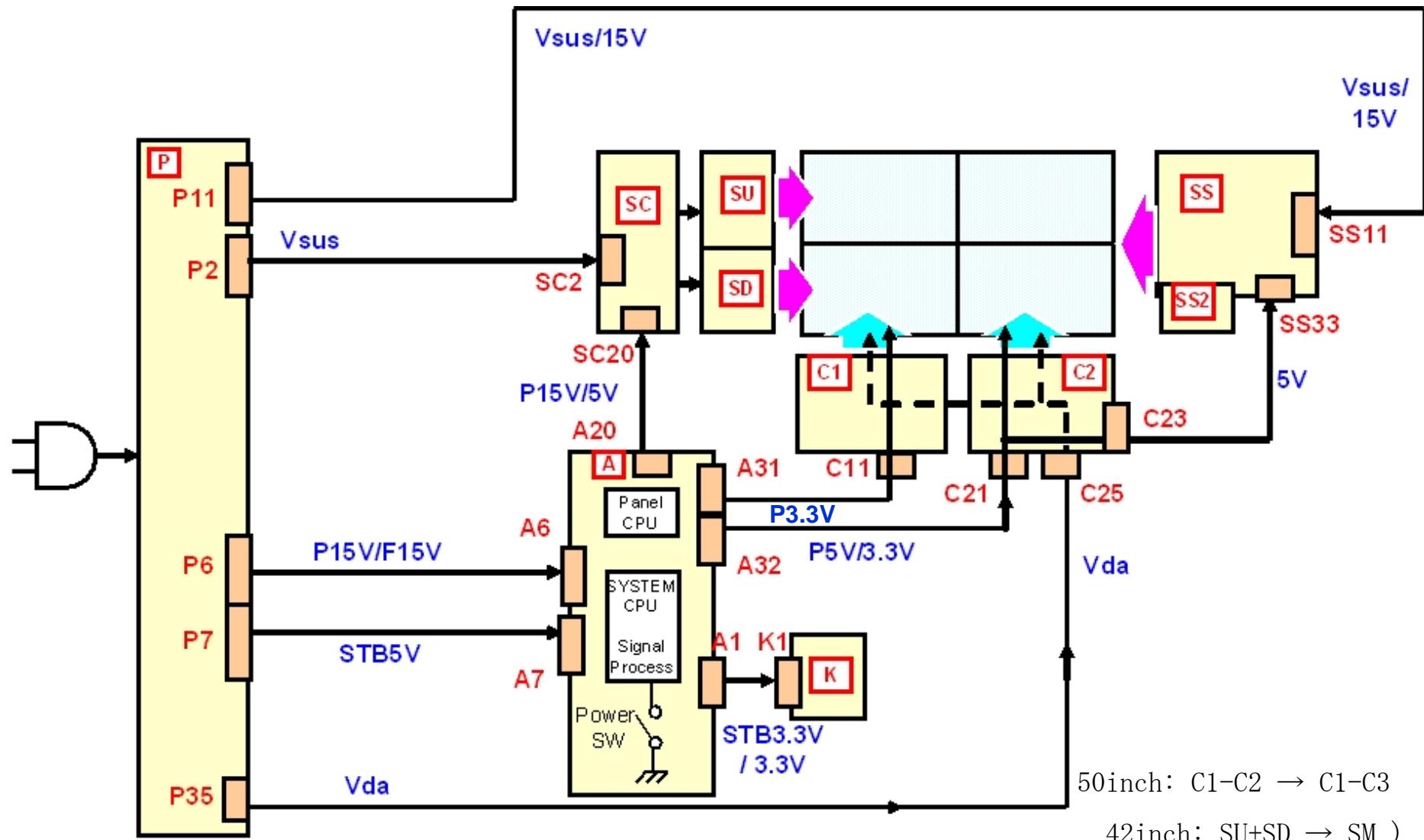
When the Vsus, Vda, and P15V and all its derivates voltages are present, the panel drive circuit starts to operate.

TC-P42S2



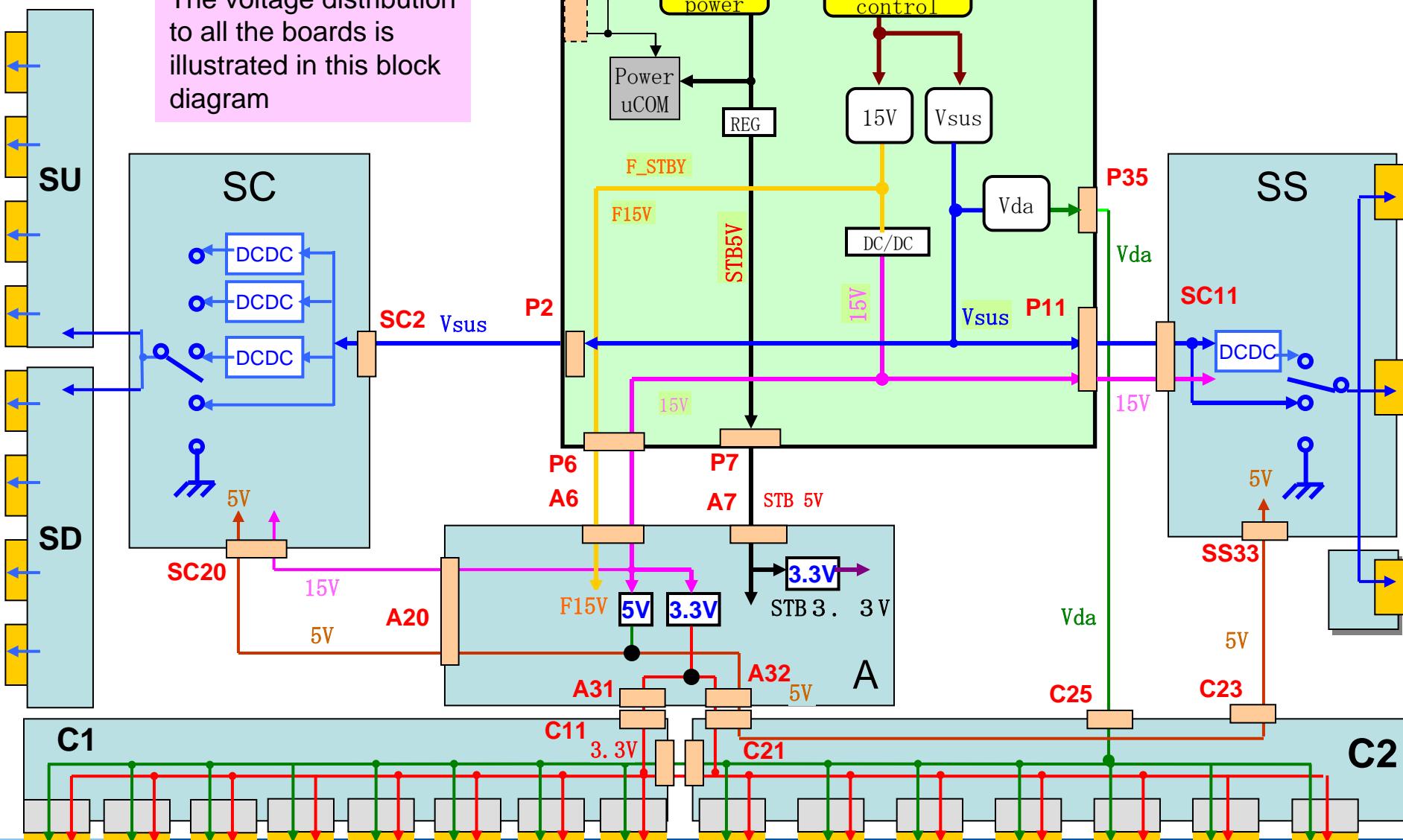
Overview of Voltage Distribution

The voltage distribution to all the boards is illustrated in this block diagram



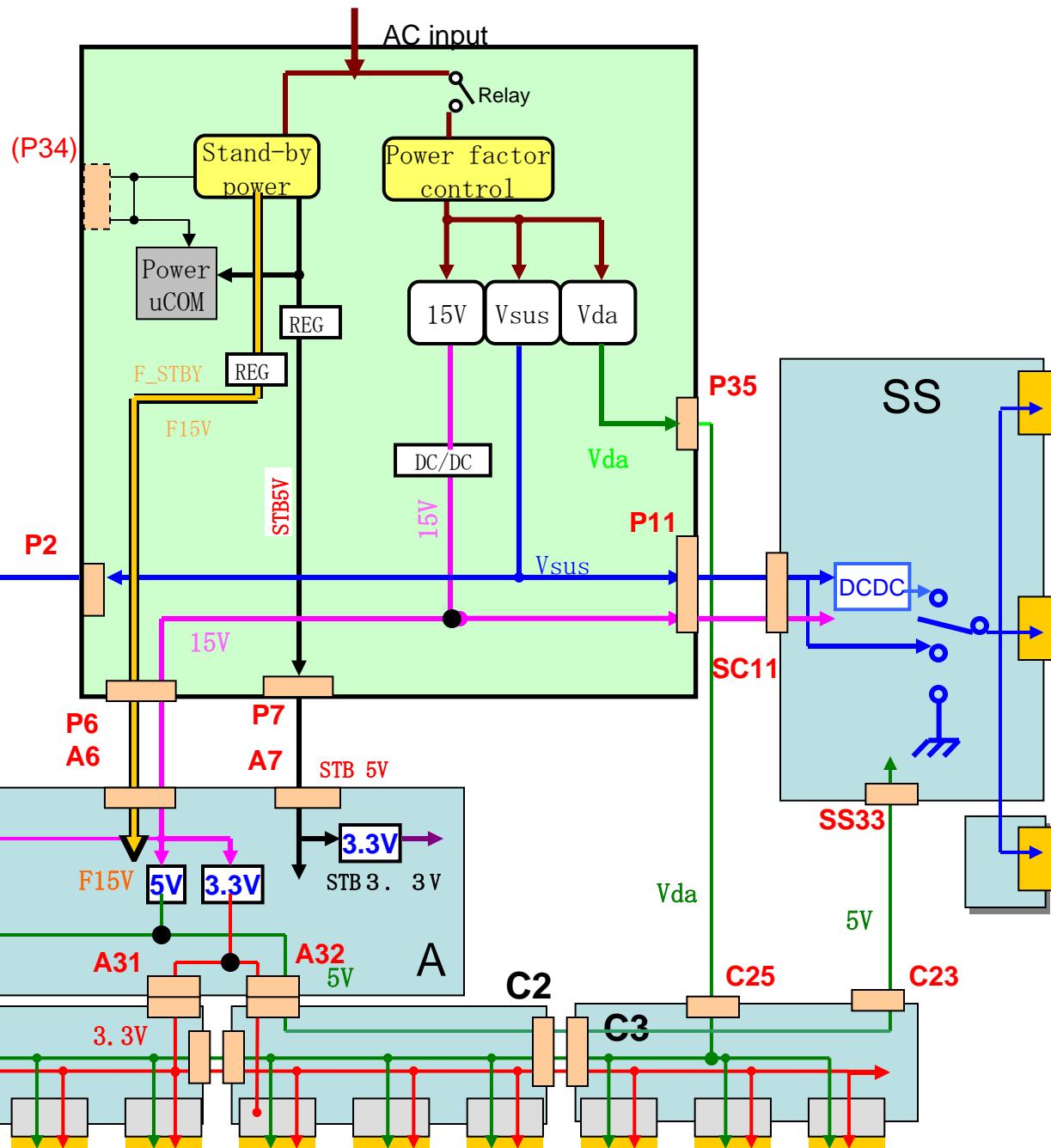
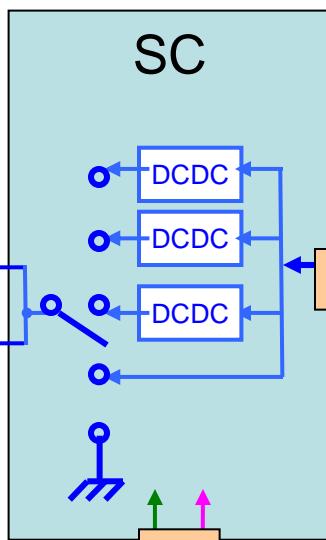
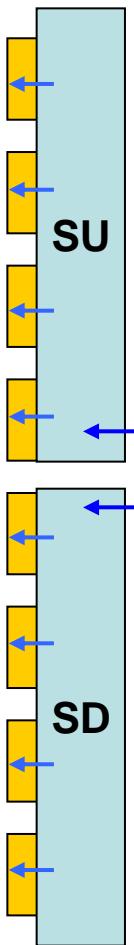
TC-P42S2

The voltage distribution to all the boards is illustrated in this block diagram



TC-P50/46S2

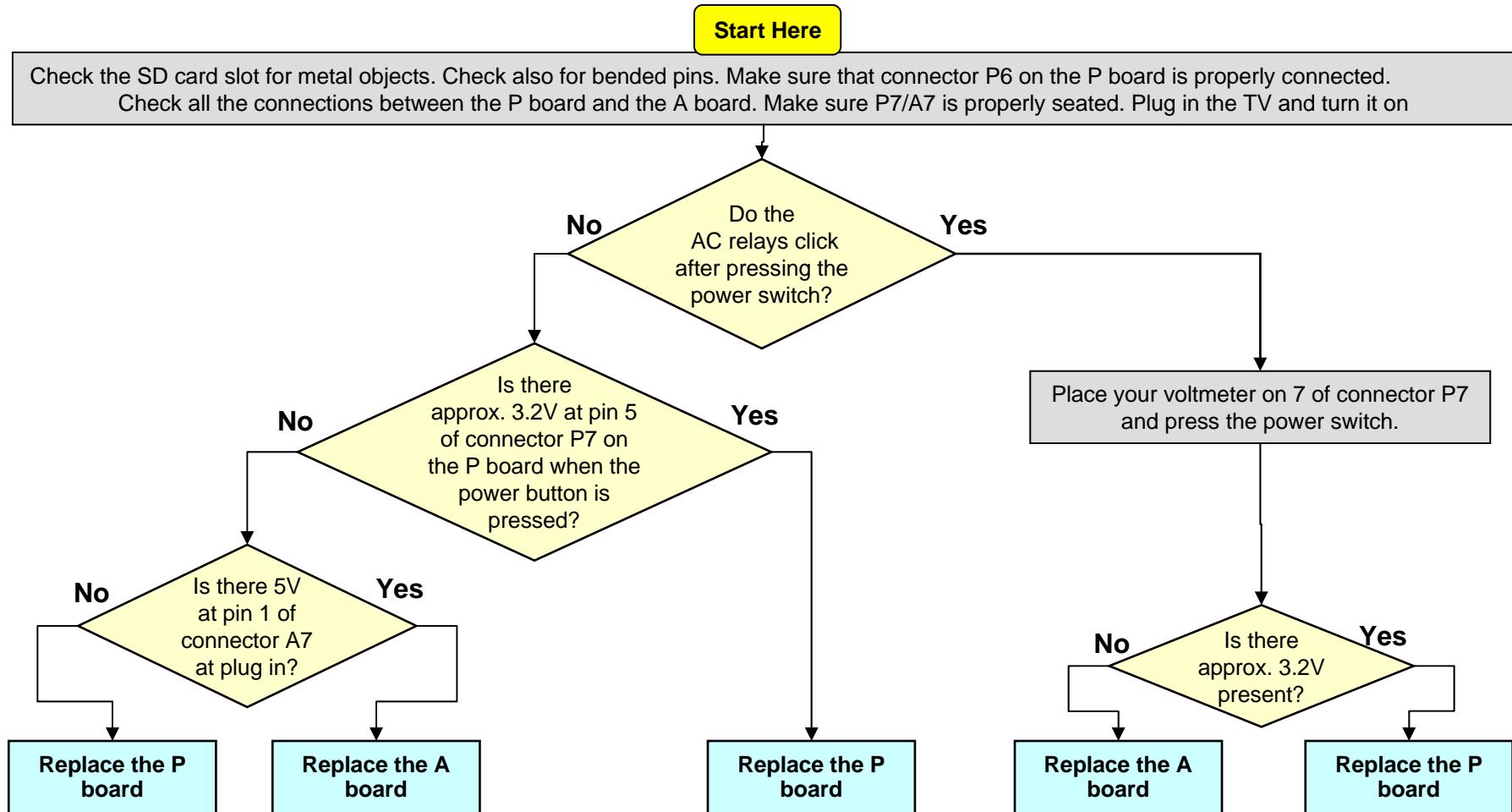
The voltage distribution to all the boards is illustrated in this block diagram



Troubleshooting “No Power” Symptom

Cautions: Disconnect the AC Power prior to making any disconnection or connection.

When taking voltage reading, place the voltmeter probe at the test point, component, or connector's pin indicated before connecting the TV to the AC line. This will ensure voltage reading accuracy before the TV shuts down. (Since the TV is shutting down, expect the voltage to only come up a couple of seconds.)

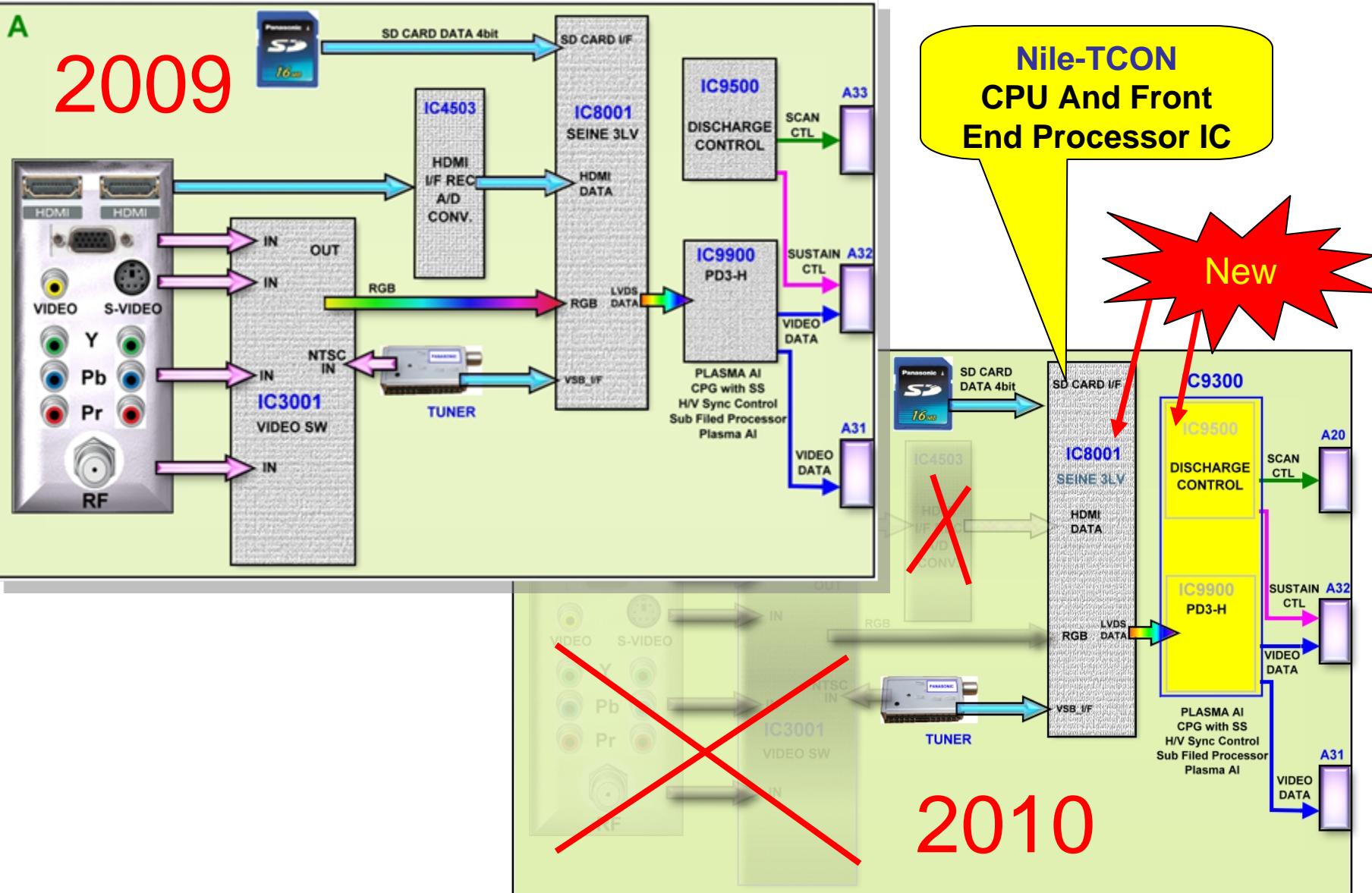


Signal Processing

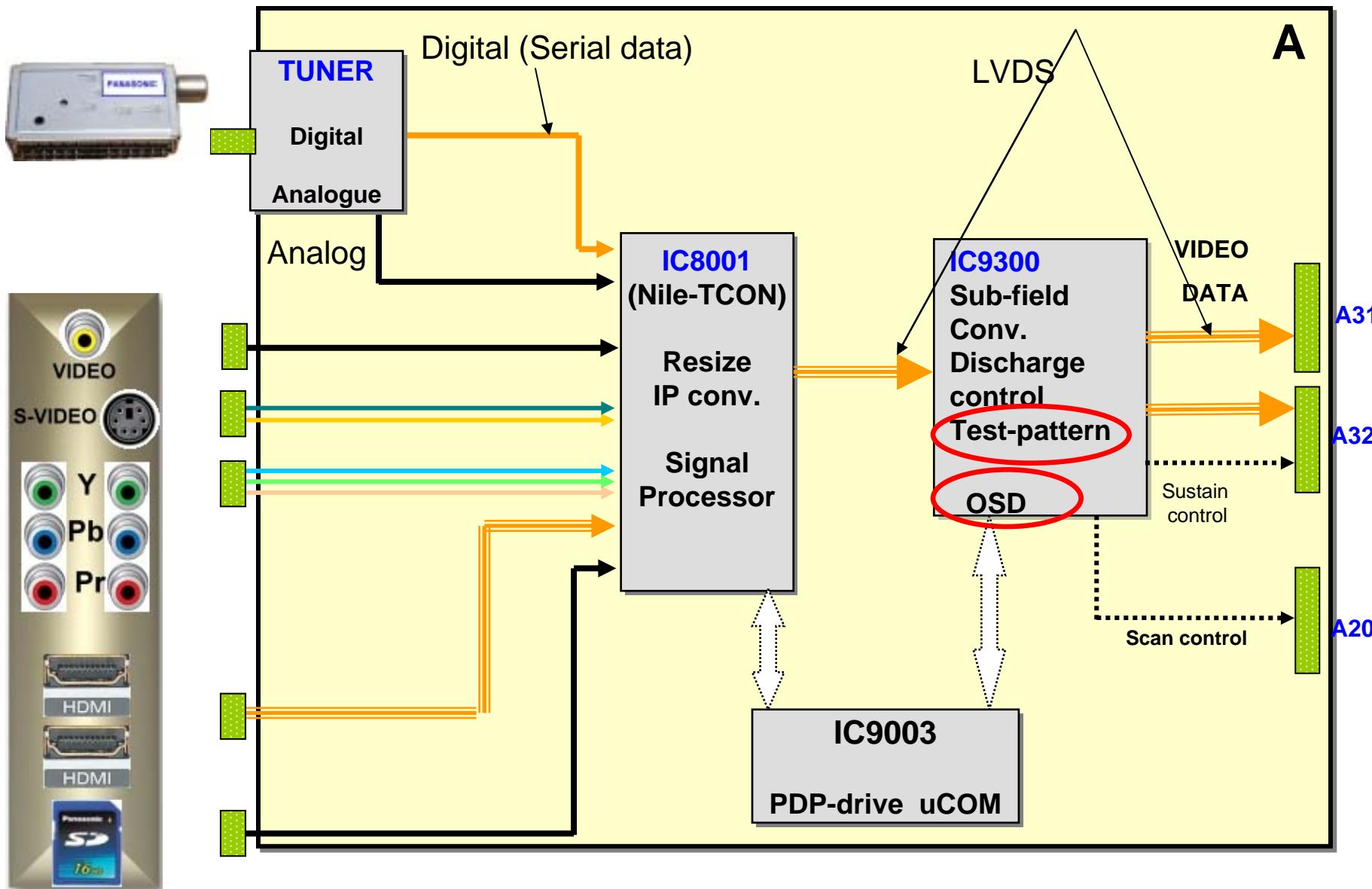
Comparison Between the Signal Process Circuit used in the 2009 Models and the Signal Process Circuit used in the 2010 models

A

2009



Signal Process Circuit



Signal Process Circuit Explanation

The main function of the A board is to select and process one of the incoming video signals. Video inputs 1 and 2, Component Video Inputs 1 and 2, HDMI inputs 1,2 and 3, and the composite video output of the tuner are all connected to IC8001 for selection. The video input signal can be in any of the three formats: Video, Y/C, or Y, Pb, Pr.

A comb filter inside IC8001 converts the composite video signal of the main picture to Y and C (luminance and chrominance) signals. S-Video, which is already Y/C separated, simply passes through the comb filter. The signal is then converted to RGB. At the completion of this process, the format of the composite or S-Video signal is now the same as a digital 1080i component signal. If the incoming video is in the 480p, 720P, 1080i, and 1080p format, the Y, Pb, and Pr signals undergo A/D (analog to digital) conversion only.

Digital television reception of the tuner is output in the form of an IF (Intermediate Frequency) signal .

The transport stream from the tuner enters the VSB I/F (Interface) section of IC8001 where the video signal is extracted and converted to YUV data. The output is provided to the Video Input I/F for selection. The JPEG data of the SD card enters the JPEG I/F section of IC8001 for conversion into YUV data and output to the Video Input I/F circuit. The video input interface outputs the selected picture data to the video process circuit.

This Video Process section of the IC performs all picture control operations such as brightness, contrast, color, tint, etc. On Screen Display data such as channel numbers, Digital TV closed caption, and picture adjustments are mixed with the video data. LVDS (Low Voltage Differential Signaling) is output to IC9300 (Plasma AI, H/V Sync Control, and Sub-field Processor). The Plasma AI (Adaptive brightness Intensifier) circuit analyzes the video program level for the distribution of dark and bright components. This circuit is also used to speed up the scanning process and control the number of sustain periods. This increases the brightness and improves the contrast ratio.

The data drive signals are output to the C1 and C2 boards. The C1 board drives the right portion of the panel and the C2 board drives the left portion

IC9300 also provides the scan, sustain and data drive signals.

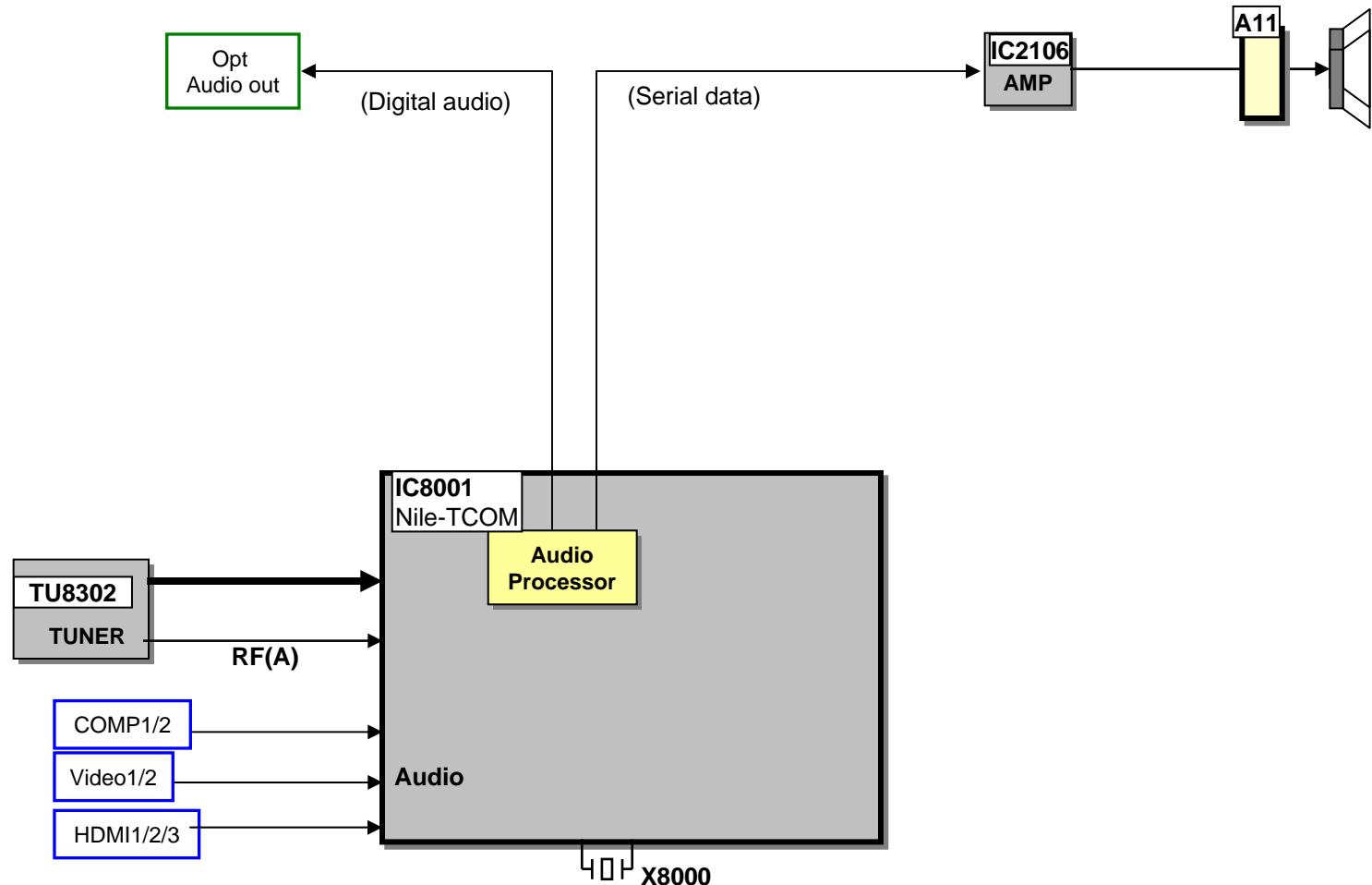
The scan pulses are output to the SC board. The sustain pulses are output to the SS board.

The main MCU handles all video applications. It serves as the controller that monitors all operations of the TV section of the unit.

Audio Signal Processing Circuit (TC-P42S2/U2/X2/C2)

All the audio signal processing is done by the Main CPU/Signal Processor IC (IC8001). The digital audio signal from IC8001 is output to the optical audio output jack as PCM/Dolby Digital.

Serial data is output to the audio amplifier IC (IC2106). The output of IC2106 is connected to the speakers.



SOS Detect (Shutdown)

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:

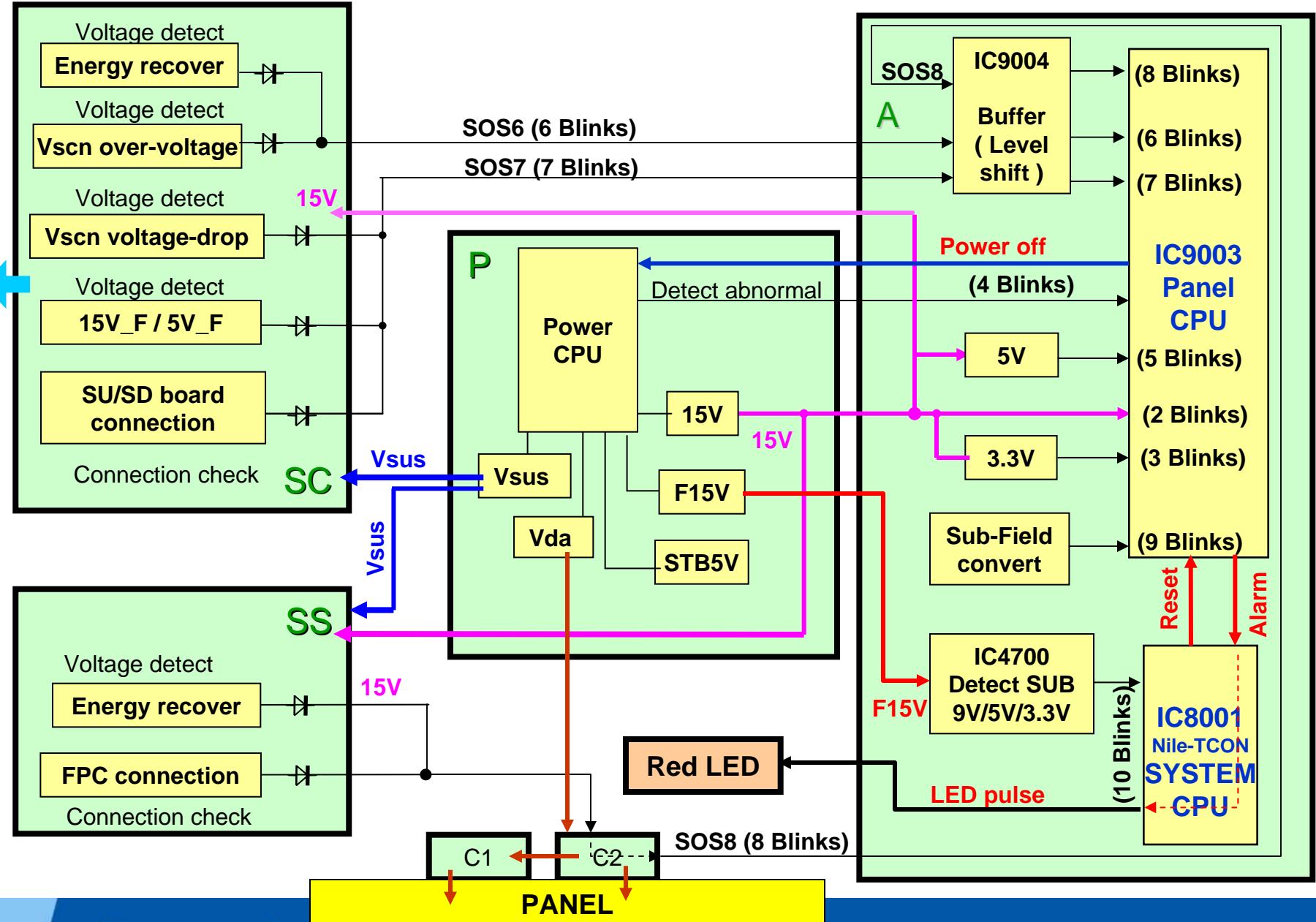
If the power LED continues to blink even after the TV is unplugged, press and hold the power switch on the TV for a few seconds until the LED turns off.

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.

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.

Protection circuit block diagram (TC-P42S2)



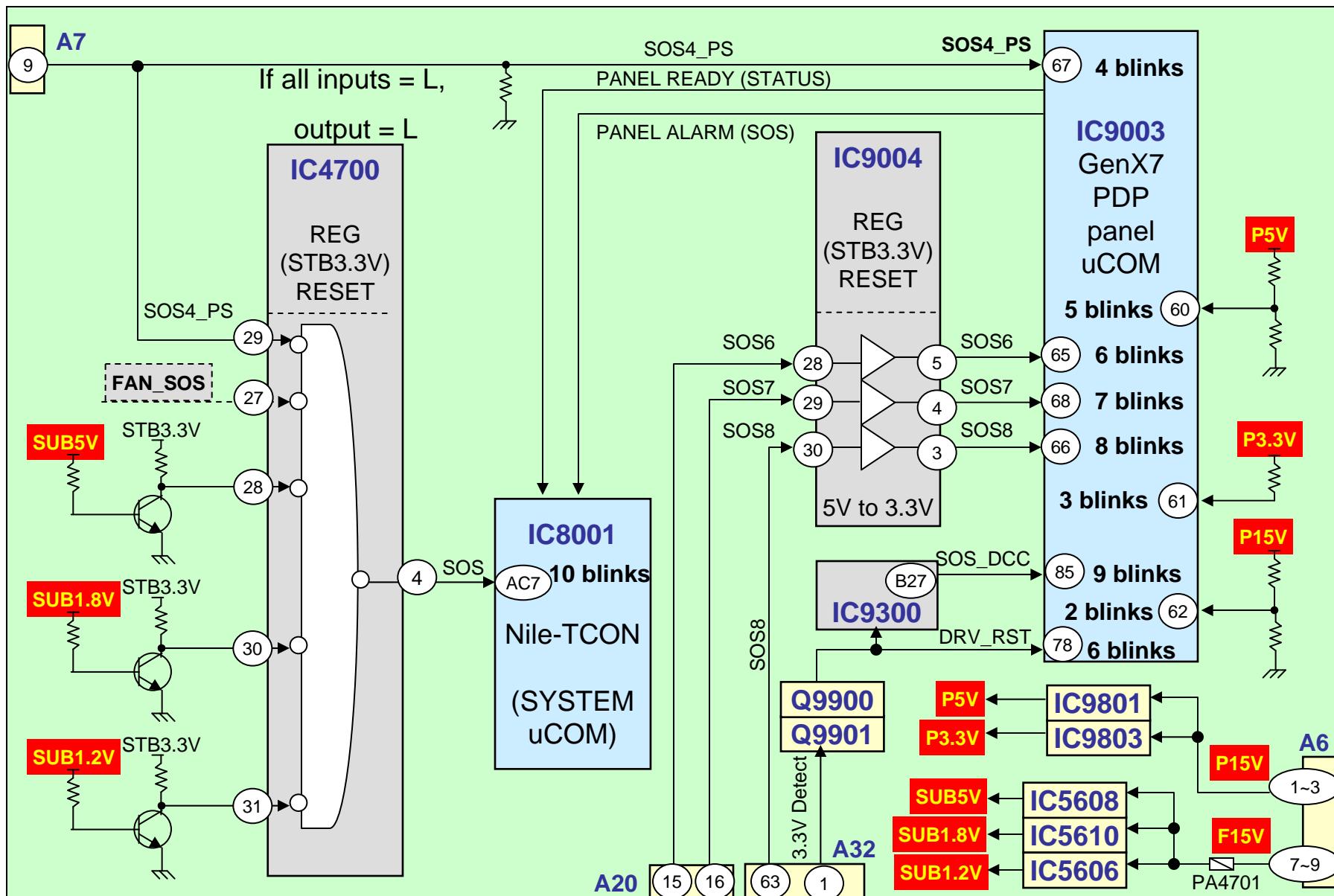
Power LED Error Code Definition (1 of 2)

POWER LED ERROR CODE	CIRCUIT MONITORED	CONDITIONS TRIGGERING THE SHUTDOWN	LIST OF BOARDS POSSIBLY CASUSING THE FAILURE			
			MOST COMMON	2 ND	OCCASIONALLY	RARELY
1 BLINK	Panel Information SOS Panel Alarm SOS	Communication problem between the System CPU (IC8001) and the Panel CPU (IC9003)	A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2 BLINKS	P15V from the P board	Missing P15V <ul style="list-style-type: none"> P15V is not been generated by the P board. P15V is been affected by one of the boards it is connected to (A short circuit of the P15V). Wrong diagnostic by the A board	SC	P	SS	A
3 BLINKS	P3.3V from the A board	Missing P3.3V Reasons: <ul style="list-style-type: none"> The A board is not generating the 3.3V The 3.3V is been affected by one of the C boards or the Panel (A short circuit of the P3.3V). Wrong diagnostic by the A board	C1 or C2	A	Panel	<input checked="" type="checkbox"/>
4 BLINKS	Power Supply output voltages	Regulation issues with any of the voltages output from the power supply. Wrong diagnostic by the A board	P	A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
5 BLINKS	P5V from the A board	Missing P5V Reasons: <ul style="list-style-type: none"> The A board is not generating the 5V The 5V is been affected by the SC, SS, A, or C2 board (A short circuit of the P5V). Wrong diagnostic by the A board	SC,SS	C2	A	<input checked="" type="checkbox"/>
6 BLINKS	SC Energy Recovery Circuit	An increase or reduction of the Energy Recovery Circuit output (MID). Open connection between connector A20 on the A board and SC20 on the SC board. Open connection between any of the ribbon cables on the C boards and the A board. Open connection between the ribbon cable/cables interconnecting the C boards. Wrong diagnostic by the A board.	SC	A	<input checked="" type="checkbox"/>	C

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			
			MOST COMMON	2 ND	OCASSIONALLY	RAREALLY
7 BLINKS	Scan Drive Circuit and Connection between the SC board and the SM board.	<p>Missing Vsus.</p> <p>Abnormality of the scan circuit output, the 15V_F, the scn_pro, and Vscn circuit.</p> <p>Loose or open Connection between the SC board and the SM board (SC41, SC42, SC46).</p> <p>Open or loose connection between connectors SC2/P2</p> <p>Wrong diagnostic by the A board</p> <p>Defective panel</p>	SC	SM	Panel	A
8 BLINKS	Sustain Drive Circuit and Connection between the SS board and the Panel.	<p>Abnormality of the sustain drive circuit.</p> <p>Open or loose connection between the SS bd and FPCs from the panel (SS61, SS64, SS21, SS24, and SS58).</p> <p>Open or loose connection between connectors C10/C20</p> <p>Wrong diagnostic by the A board</p> <p>Defective panel</p>	SS	Panel	A	C2
9 BLINKS	Discharge Control Circuit (IC9300)	Failure of IC9300	A	☒	☒	☒
10 BLINKS		<p><u>Abnormalities of the F+15V.</u></p> <ul style="list-style-type: none"> Reasons: The P board is not generating the F+15V SUB Voltages are affected by the K board or by metal object present in the SD card slot.. <p><u>Shorted Vsus (By the SS board or SC board).</u></p> <p><u>Shorted Vda (By the panel, C1, or C2 board)</u></p> <p><u>Wrong diagnostic by the A board.</u></p>	SS	SC	A - P	K

SOS Detect Circuit (TC-P42S2)



SOS Detect Circuit (1 of 3)

Protection circuits are incorporated in the unit to prevent the failure of a single circuit or component from creating catastrophic damage.

A shutdown condition occurs when there is an over voltage, a short or a drop in any of the voltage lines. If the TV has fans, the shutdown circuit is triggered when they draw more current than normal.

Note: The model TC-P42S2

The Nile-TCON CPU/Front End Processor (IC8001) and the GenX7 Panel CPU IC9003 of the A board detect when a shutdown condition has been triggered.

When an abnormality has occurred, the unit's protection circuit operates and the TV is reset to the standby mode. At this time, the defective block can be identified by the number of blinks of the POWER LED on the front of the unit.

The Panel MPU IC9003 of the A board (Located on the D board on previous generations) detects conditions that make the power LED blinks 1, 2, 3, 4, 5, 6, 7, 8, or 9 times.

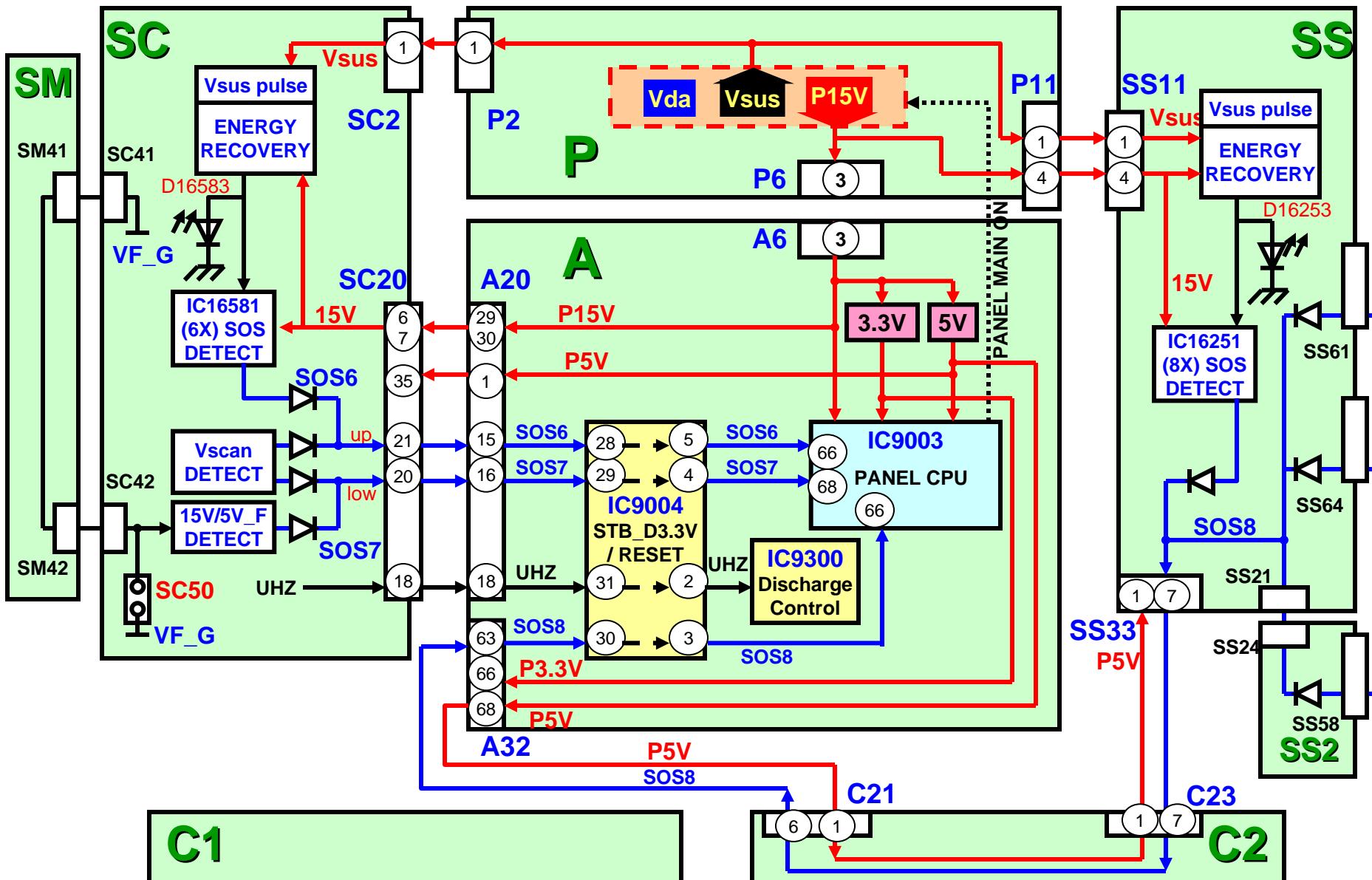
The Main MPU IC8001 of the A board detects conditions that make the power LED blinks 10 times. The number of times that the POWER LED blinks indicates the areas where a problem is suspected.

1 Blink SOS: Communication error between System CPU IC8001 and Panel CPU (IC9003).

2 Blinks SOS: Pin 62 of the CPU IC9003 monitors the 15V line. During normal operation pin 62 is kept high. If the 15V line is missing or shorted, a low is provided to pin 62. As a result, the unit shuts down and the power LED blinks 2 times.

3 Blinks SOS: The 3.3V from IC9803 on the A board is monitored by IC9003. If the 3.3V is not present at pin 61, the CPU (IC9003) shuts down the unit. The power LED blinks 3 times.

Panel Drive SOS Detect Block Diagram (TC-P42S2/U2)



SOS Detect Circuit (2 of 3)

4 Blinks SOS: When a voltage regulation issue of any of the lines from the power supply occurs, pin 9 of connector P7 goes high. This high is provided to pin 67 of IC9003 of the A board triggering the “POWER SOS” circuit. When this happens, the TV shuts down and the power LED blinks 4 times. Primarily the P board causes 4 blinks, followed by the A board.

5 Blinks SOS: Pin 60 of the CPU IC9003 monitors the 5V line. During normal operation, pin 60 is kept high. If the 5V line is missing or shorted, a low is provided to pin 60. As a result, the unit shuts down and the power LED blinks 5 times.

6 Blinks SOS: Pin 65 of the CPU IC9003 monitors the status of the SC board. During normal operation, a low is applied to pin 65. If the SC board becomes defective, a high is provided to pin 65. As a result, the unit shuts down and the power LED blinks 6 times.

The **TC-P42X2/C2** series have an energy recovery circuit in the SN boards. This circuit monitors the scan board output and the sustain board output. Any abnormality on this circuit will trigger the 6 blinks code. If SC20 is disconnected or is not seated properly, the TV shuts down with 6 blinks.

7 Blinks SOS: Pin 68 of the CPU IC9003 monitors the status of the SC, SU, SD board. During normal operation, a low is applied to pin 68. If the SC, SU, or SD board becomes defective, a high is provided to pin 68. As a result, the unit shuts down and the power LED blinks 7 times.

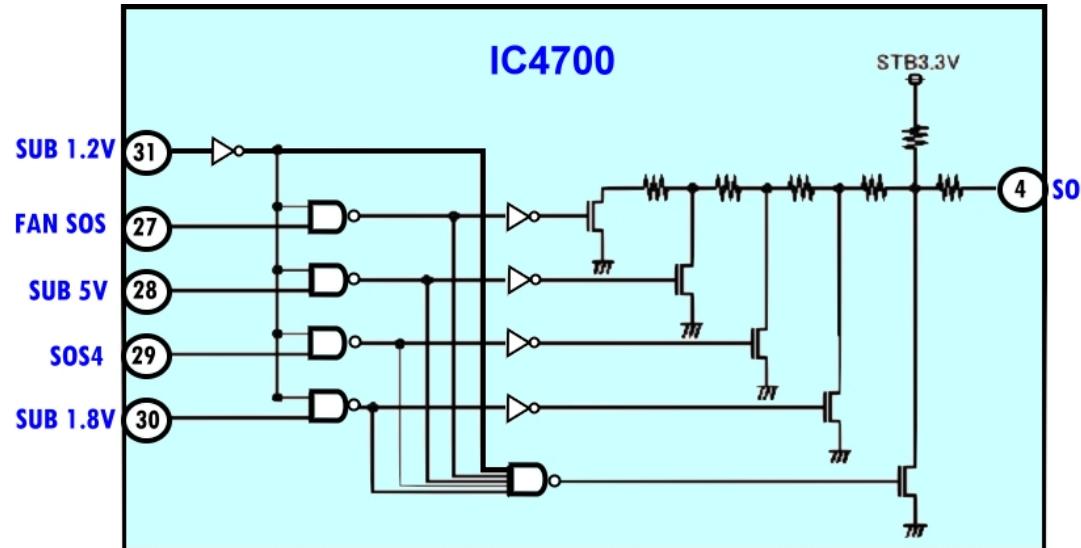
8 Blinks SOS: Pin 66 of the MPU IC9003 monitors the status of the SS board. During normal operation, a low from connector SS33 on the SS board is connected via the C2 board to pin 63 of connector A32 on the A board. Pin 63 of A32 is connected to pin 66 of the panel CPU IC9003. If the SS board becomes defective, a high is provided to pin 66. As a result, the unit shuts down and the power LED blinks 8 times.

8 Blinks condition is also caused when the connections between the panel's flex-cables and the sustain board are broken or the connector are not properly seated.

SOS Detect Circuit (3 of 3)

10 Blinks SOS: IC5606 generates the SUB1.2V, IC5610 generates the SUB1.8V, and IC5608 generates the SUB5V. The output from these ICs are monitored by the Analog-ASIC (An Application-Specific Integrated Circuit (ASIC) IC4700. Any abnormality on these voltages (Including the F_STB15V), triggers the shutdown circuit. The MPU shuts down the unit. The power LED blinks 10 times.

A short circuit of the Vsus or the Vda can also cause a 10 blinks shutdown.



INPUT					OUTPUT
SUB 1.2V	FAN SOS	SUB 5V	SOS4	SUB 1.8V	SOS
Pin 31	Pin27	Pin 28	Pin 29	Pin 30	Pin 4
L	L	L	L	L	0.3V
L	H	L	L	L	2.55V
L	X	H	L	L	1.95V
L	X	X	H	L	1.35V
L	X	X	X	H	0.75V
H	X	X	X	X	3.0V

Normal

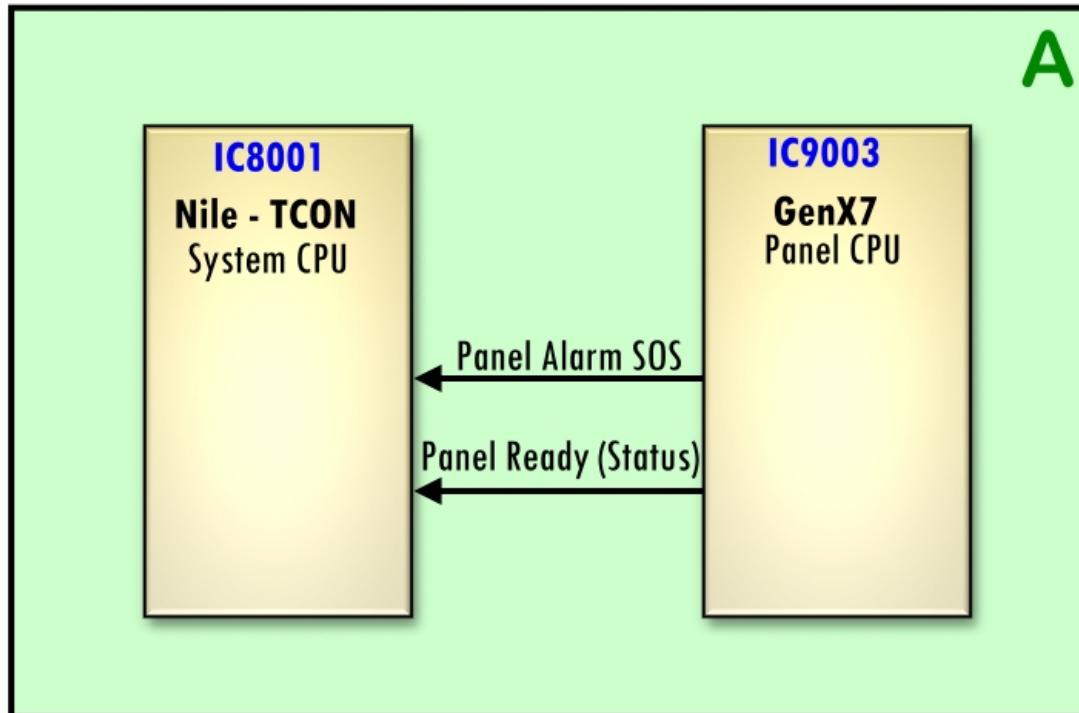
SOS 10X

1 Blink Error Code (Communication Error Between IC8001 and IC9003)

This condition can cause the TV to shutdown and the power LED to blink 1 time

1. No communication between IC8001 and IC9003

Since both ICs are located on the A board, only the A board should be replaced



Note: In 2009 models, STB5V for IC8001 and IC9003 is provided by 2 different connectors. For this reason if there were connection problems between the P board and the A board, the TV would've went into shutdown with one blink. This is not the case with the 2010 models. Only the A board can possibly cause 1 blink shutdown.

Troubleshooting 1 Blink Failure

**If the TV shuts down and the power
LED blinks 1 time, replace the A**

2 Blinks Error Code (P15V Abnormality)

These 2 conditions can cause the TV to shutdown and the power LED to blink 2 times

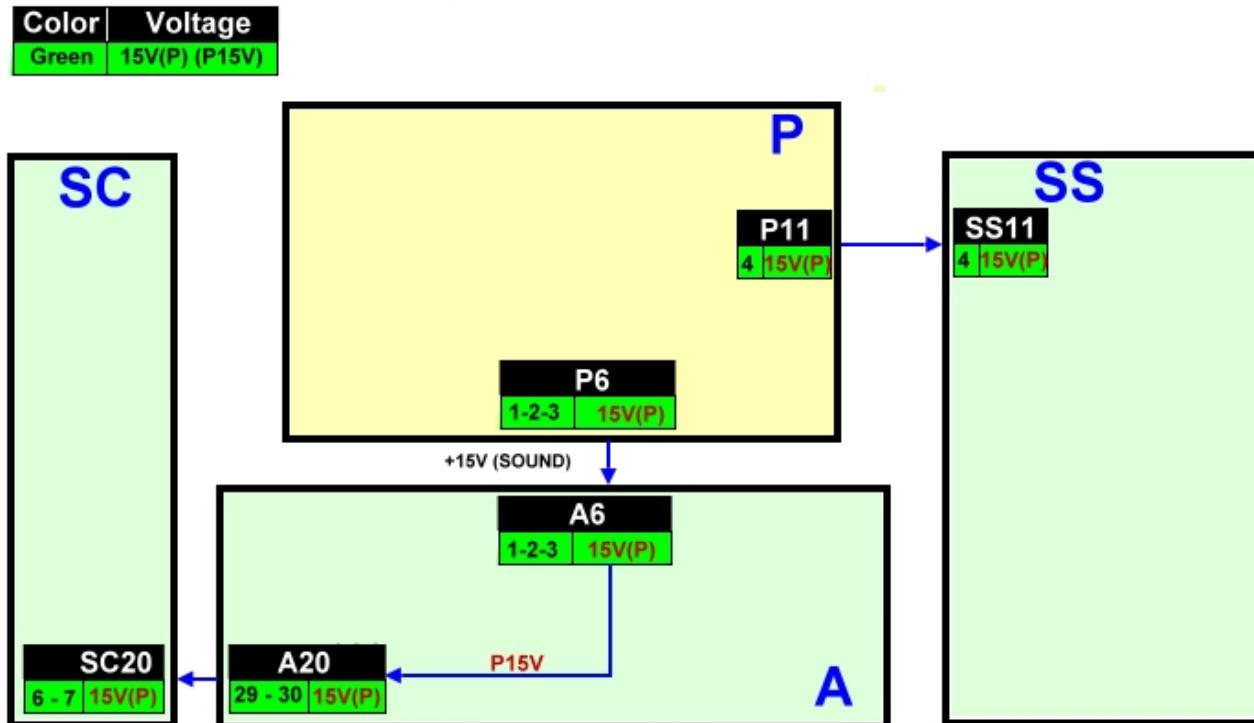
1. Missing P15V

Reasons:

- P15V is not been generated by the P board.
- P15V is been affected by one of the boards it is connected to (A short circuit of the P15V).

2. Wrong diagnostic by the A board

TC-P42S2 P15V Distribution



Troubleshooting 2 Blinks Failure

A 2 blinks condition is caused by the SC, SS, A, or P board. (SC>SS>A>P)

Troubleshooting

Unplug the TV and do a resistance test between the P15V and ground to determine if the P15V is shorted or not.

15V not shorted (Only the A and P board are suspected of causing the problem)

If the 15V is not shorted, the possibilities of the SC and SS boards being defective are eliminated.

To determine between the P board and the A board, connect the TV, turn the power on, and check to see if the P15V is present.

If P15V is present, the A board is likely to be defective. If P15V is missing, the P board is defective.

Shorted 15V

If a short is found, with the TV disconnected, start removing the connectors providing P15V one at a time until the source of the short is detected.

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.

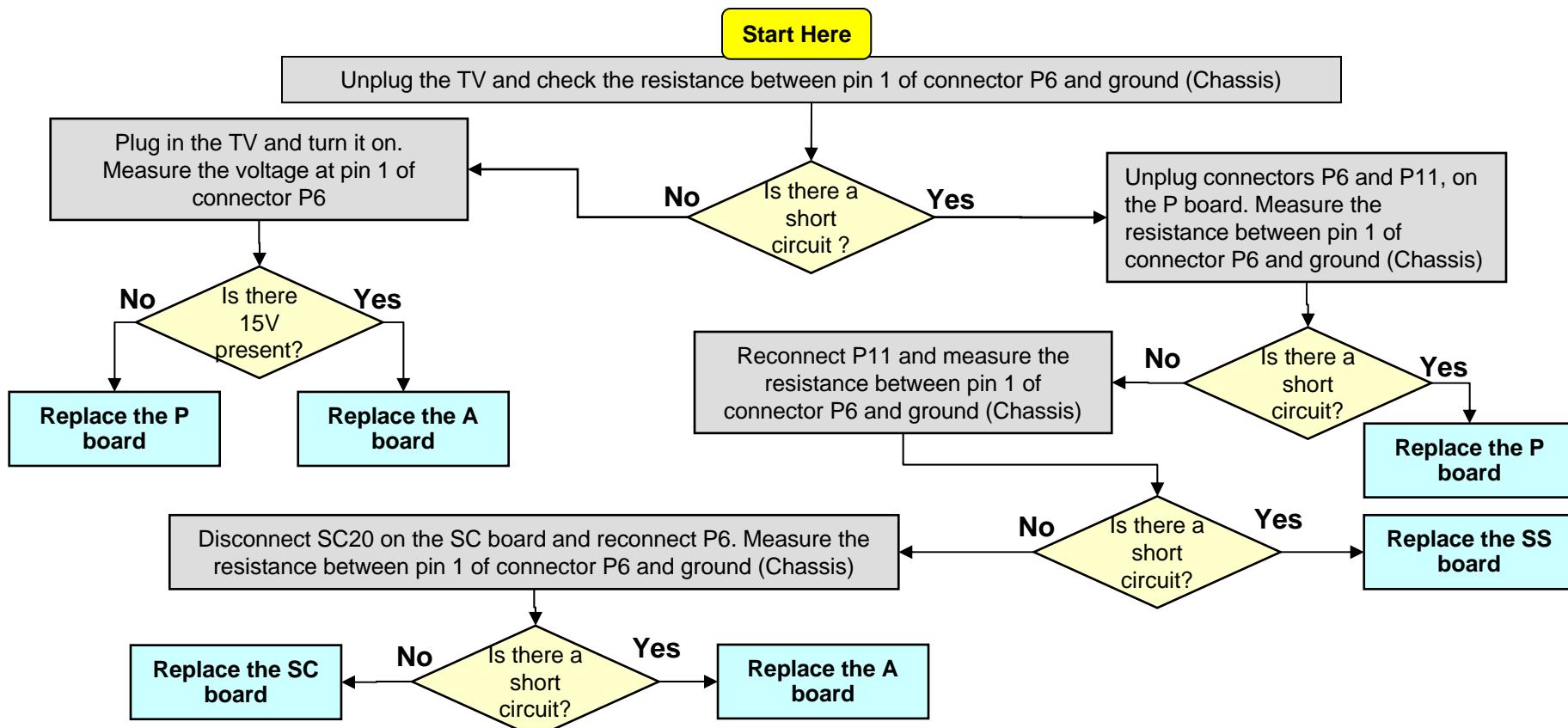
Use a 500 ohms/ 5W (At least) resistor to discharge the Vsus line before reconnecting P2/SC2 or P11/SS11.

Troubleshooting 2 Blinks Failure (2)

Cautions: Disconnect the AC Power prior to making any disconnection or connection.

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.

When taking voltage reading, place the voltmeter probe at the test point, component, or connector's pin indicated before connecting the TV to the AC line. This will ensure voltage reading accuracy before the TV shuts down. (Since the TV is shutting down, expect the voltage to only come up a couple of seconds.)



3 Blinks Error Code (P3.3V Abnormality)

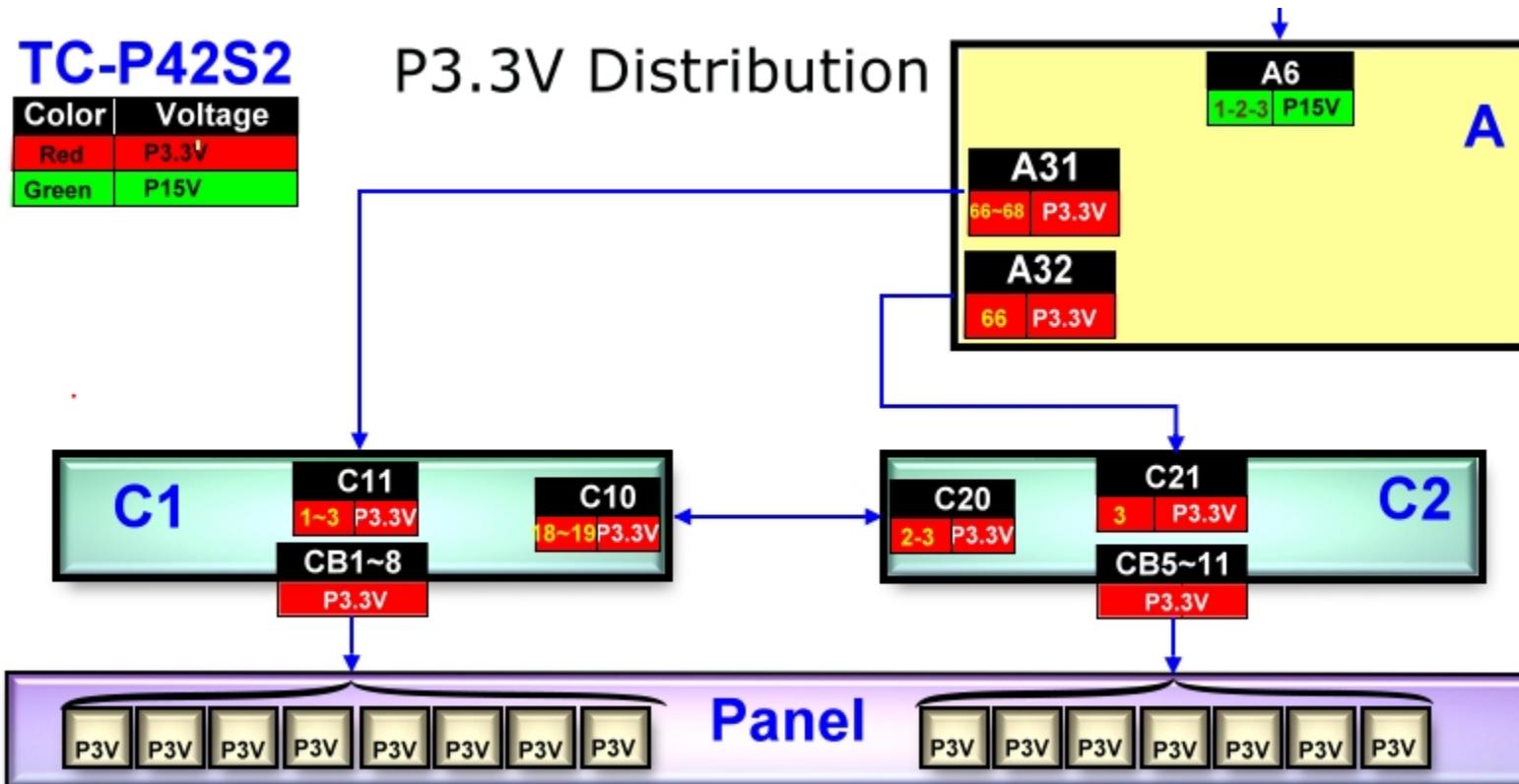
These 2 conditions can cause the TV to shutdown and the power LED to blink 3 times

1. Missing P3.3V

Reasons:

- The A board is not generating the 3.3V
- The 3.3V is been affected by one of the C boards or the Panel (A short circuit of the P3.3V).

2. Wrong diagnostic by the A board



Troubleshooting 3 Blinks Failure

A 3 blinks condition is caused by the A, board, C board, or the panel (A>C>Panel)

Note: In previous generations of Panasonic Plasma TVs (With the exception of the 2009 model, TC-P54Z1), a 3 blinks error code was normally caused by the A or DG board.

In 2010 models, the P3.3V generated in the A board is used by the A board, the C boards, and the panel drive ICs of the FPC from the panel into the C boards.

Troubleshooting

Unplug the TV and do a resistance test between the P3.3V and ground to determine if the P3.3V is shorted or not.

3.3V not shorted (Only the A is suspected of causing the problem)

If the 3.3V is not shorted, the possibilities of the C boards or the panel being defective are eliminated.

If P15V is present, the A board is likely to be defective.

Shorted 3.3V

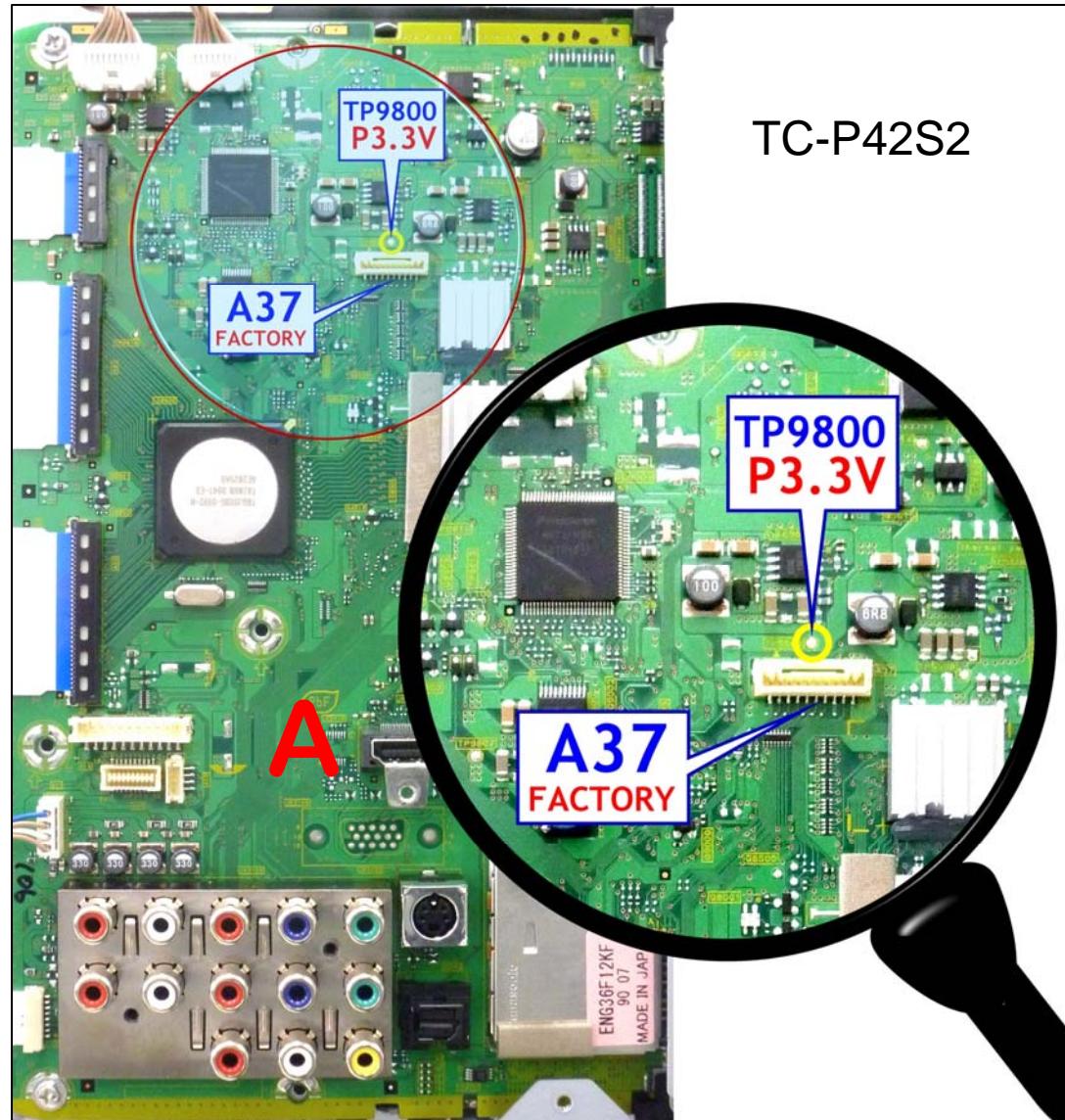
If a short is found, with the TV disconnected, start removing the connectors providing P3.3V one at a time until the source of the short is detected.

Troubleshooting 3 Blinks Failure (P3.3V Location)

The connectors used for the distribution of P3.3V in the A and C boards use ribbon cables. Measuring the voltage at these locations might be a little challenging and difficult. To easily measure the P3.3V, locate the test point TP9800.

TP9800 is located just above the factory connector A37 shown in the image to the right..

P3.3V-TP9800 Location

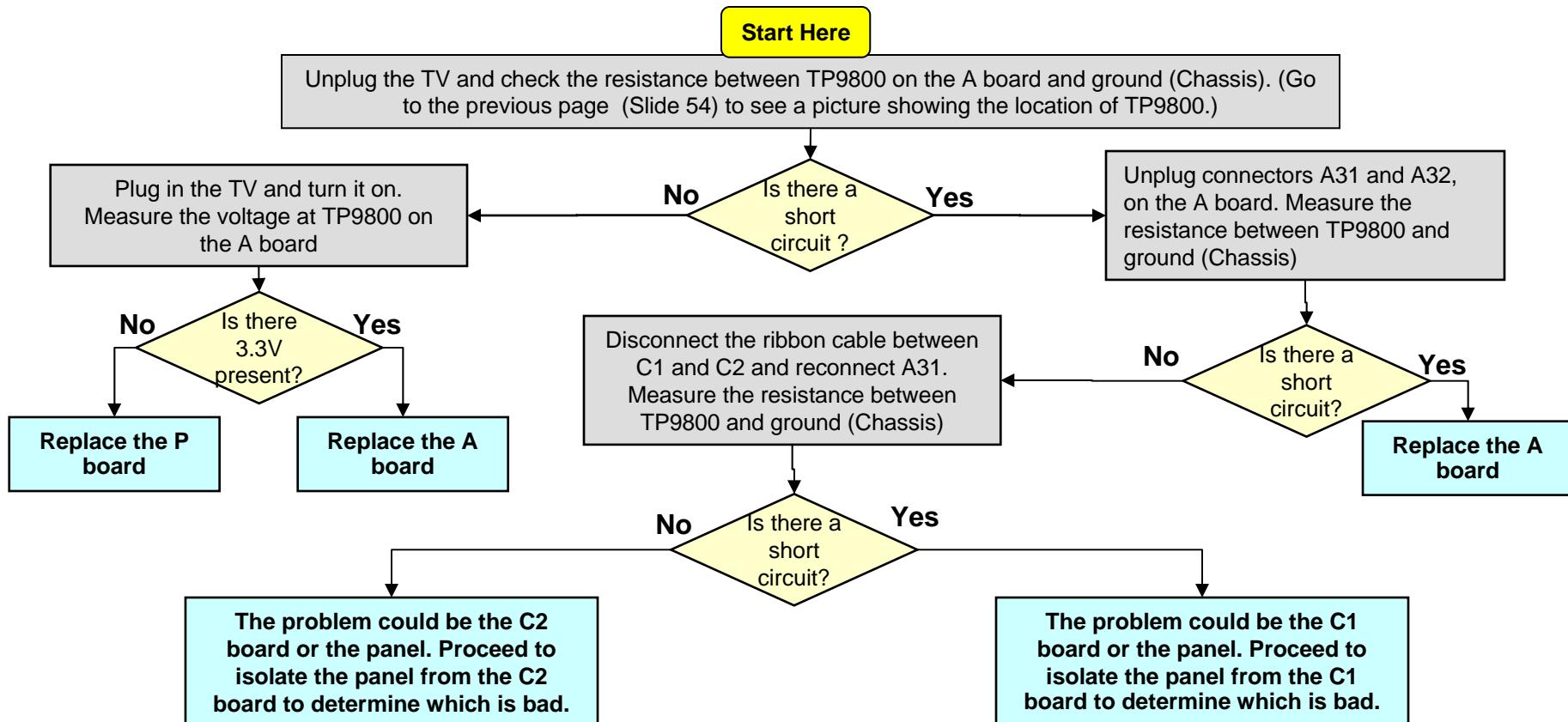


Troubleshooting 3 Blinks Failure

Cautions: Disconnect the AC Power prior to making any disconnection or connection.

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.

When taking voltage reading, place the voltmeter probe at the test point, component, or connector's pin indicated before connecting the TV to the AC line. This will ensure voltage reading accuracy before the TV shuts down. (Since the TV is shutting down, expect the voltage to only come up a couple of seconds.)



4 Blinks Error Code (Abnormality of Power Supply Output)

These conditions can cause the TV to shutdown and the power LED to blink 4 times

1. Regulation issues with any of the voltages from the power supply.

- If PFC goes over 470V ($\pm 50V$) or below 165V ($\pm 20V$)
- If Vsus goes over 240V ($\pm 10V$)
- If Vda goes above 67V ($\pm 4V$) or below 28V ($\pm 4V$)
- If there's an over current condition at the P15V line

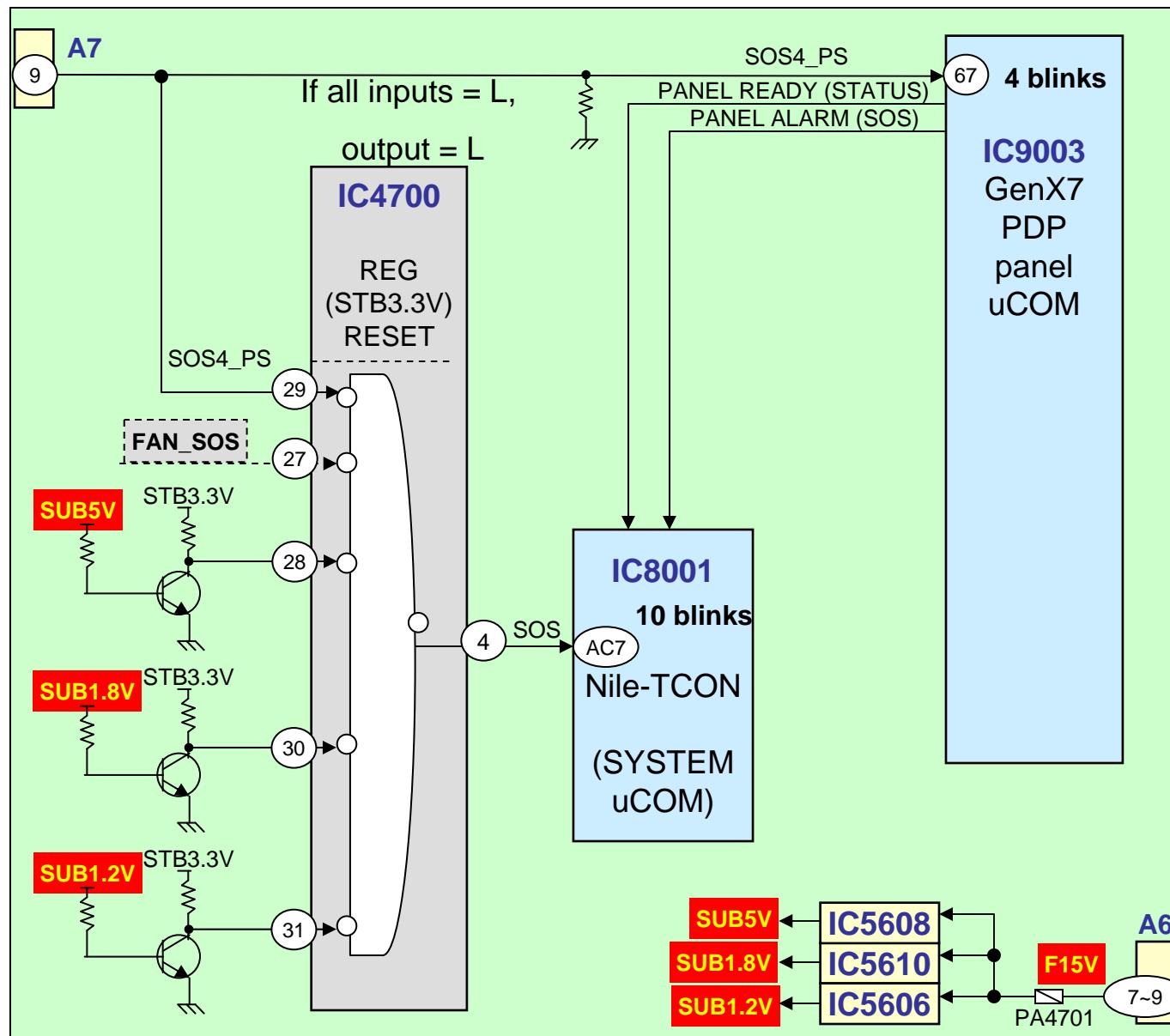
2. Wrong diagnostic by the A board

The power supply outputs STB5V, F+15V, Vsus, Vda, and P15V. These voltages are necessary to drive the different circuits in the TV.

In order to provide protection to the TV, these voltages are monitored. If any abnormality is detected, the power supply outputs a shutdown voltage (SOS4_PS) to the System CPU to disable the Unit.

A 4 blinks condition is normally caused by the P board or the A board.

4 Blinks Error Code (Abnormality of Power Supply Output)

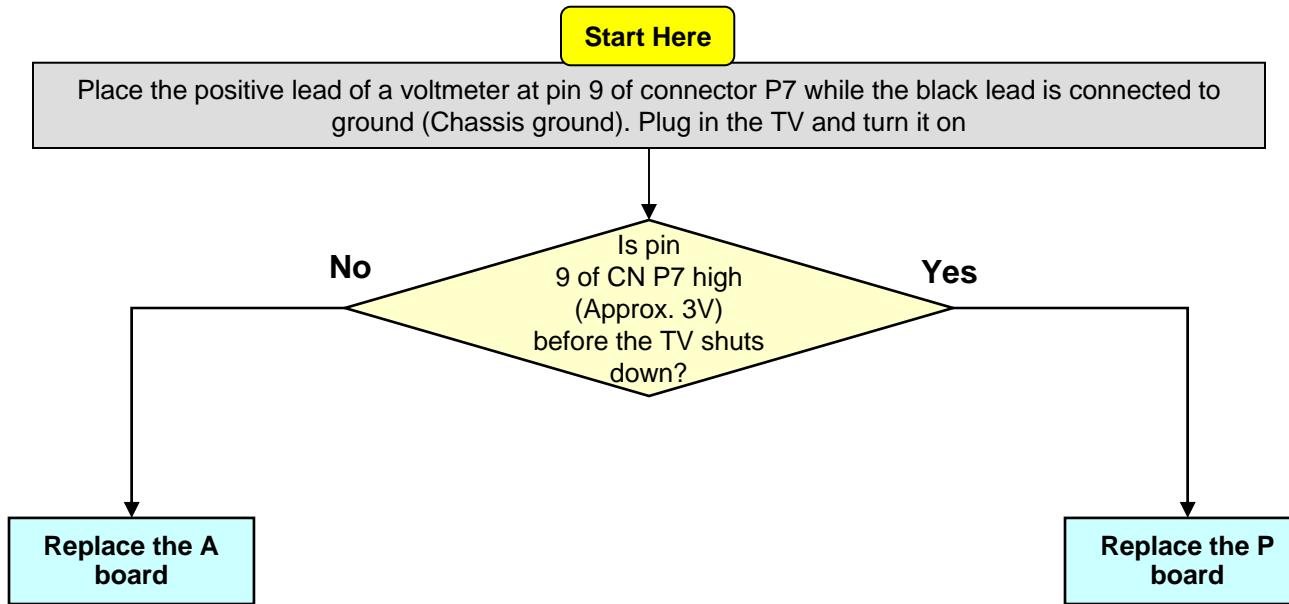


Troubleshooting 4 Blinks Failure

Cautions: Disconnect the AC Power prior to making any disconnection or connection.

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.

When taking voltage reading, place the voltmeter probe at the test point, component, or connector's pin indicated before connecting the TV to the AC line. This will ensure voltage reading accuracy before the TV shuts down. (Since the TV is shutting down, expect the voltage to only come up a couple of seconds.)



5 Blinks Error Code (P5V Abnormality)

These 4 conditions can cause the TV to shut down and the power LED to blink 5 times

1. Missing P5V

Reasons:

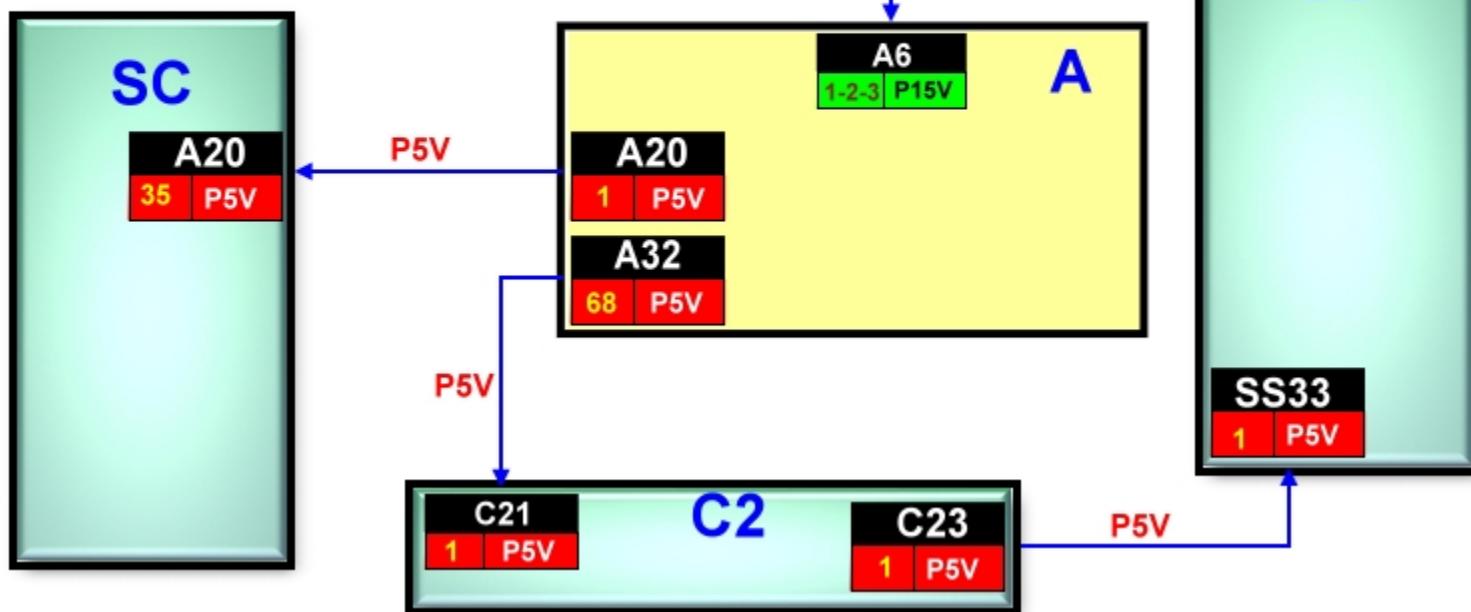
- The A board is not generating the 5V
- The 5V is been affected by the SC, SS, A, or C2 board (A short circuit of the P5V).

2. Wrong diagnostic by the A board

TC-P42S2

Color	Voltage
Red	P5V
Green	P15V

P5V Distribution



Troubleshooting 5 Blinks Failure

A 5 blinks condition is caused by the A, C, SC, or SS board. (A>C>SC>SS)

Note: In previous generations of Panasonic plasma TVs, P5V is used by the panel. In the 2010 models P5V is not used by the panel.

Troubleshooting

Unplug the TV and do a resistance test between the P5V and ground to determine if the P5V is shorted or not.

P5V not shorted (Only the A and P board are suspected of causing the problem)

If the P5V is not shorted, the possibilities of the SC, C2, and SS boards of being defective are eliminated.

To determine between the P board and the A board, connect the TV, turn the power on, and check to see if the P5V is present.

If P5V is present, the A board is likely to be defective. If P5V is missing, the P board is defective.

Shorted P5V

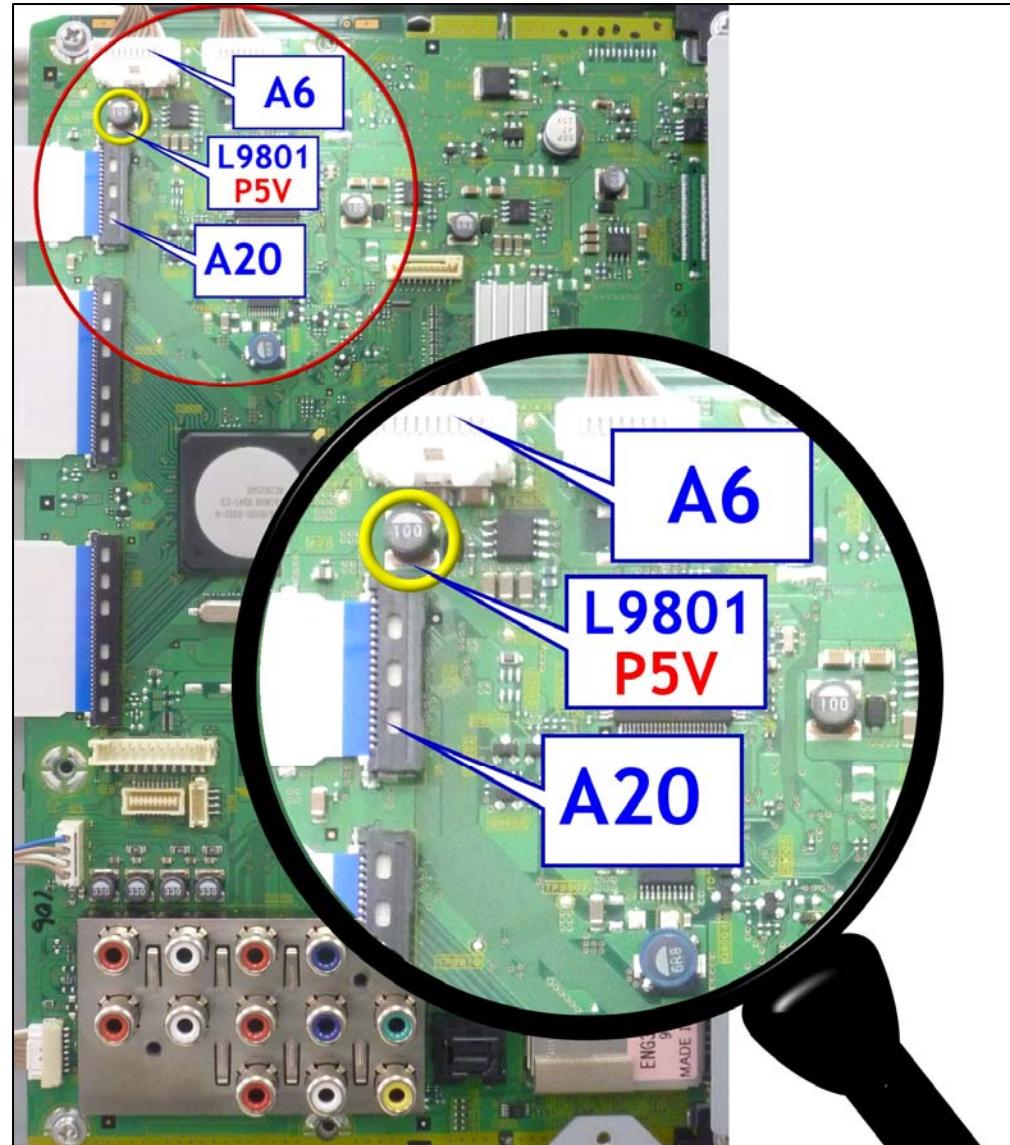
If a short is found, with the TV disconnected, start removing the connectors providing P5V one at a time until the source of the short is detected.

Troubleshooting 5 Blinks Failure (TP-C42S2)

To easily measure the P5V, locate the coil L9801.

L9801 is located just above the connector A20 shown in the image to the right..

P5V-L9801 Location

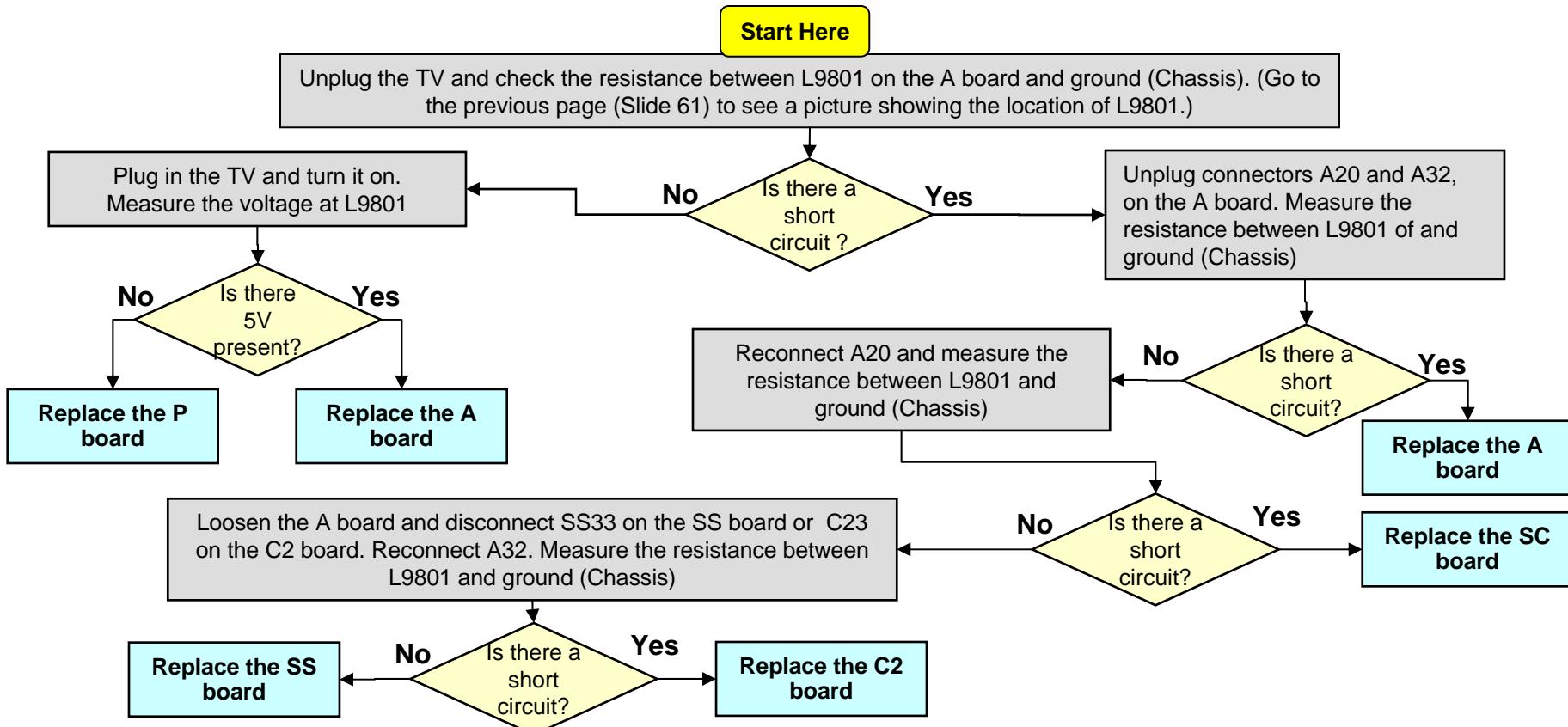


Troubleshooting 5 Blinks Failure

Cautions: Disconnect the AC Power prior to making any disconnection or connection.

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.

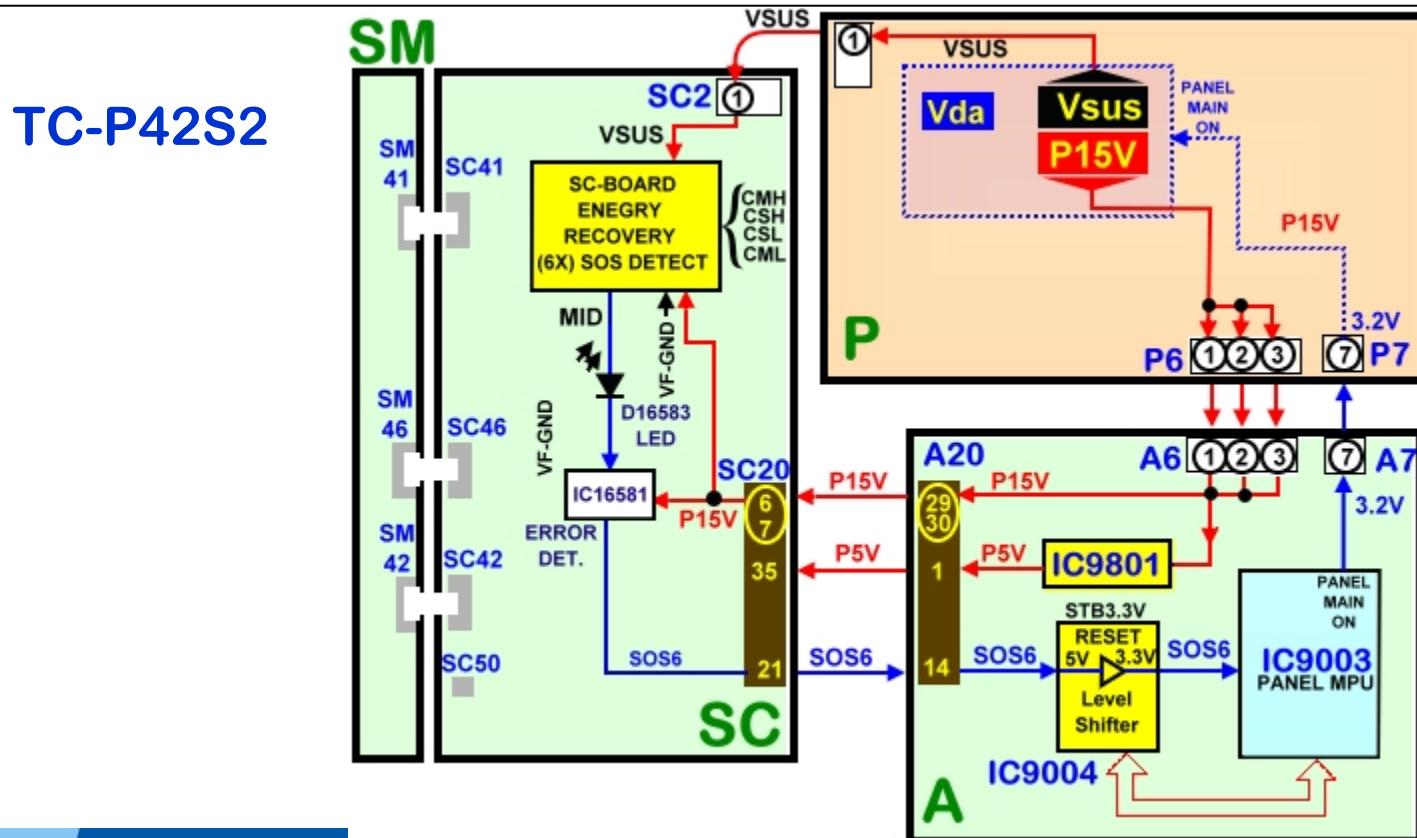
When taking voltage reading, place the voltmeter probe at the test point, component, or connector's pin indicated before connecting the TV to the AC line. This will ensure voltage reading accuracy before the TV shuts down. (Since the TV is shutting down, expect the voltage to only come up a couple of seconds.)



6 Blinks Error Code (SC Energy Recovery Circuit Abnormality)

These 5 conditions can cause the TV to shutdown and the power LED to blink 6 times

1. An increase or reduction of the Energy Recovery Circuit output (MID).
2. Open connection between connector A20 on the A board and SC20 on the SC board.
3. Open connection between any of the ribbon cables on the C boards and the A board.
4. Open connection between the ribbon cable/cables interconnecting the C boards.
5. Wrong diagnostic by the A board



6 Blinks Error Code Circuit Explanation

6 Blinks SOS

Energy Recovery/Vscan

The energy recovery circuit and Vscan are monitored in the SC board. Failure of any these 2 circuits triggers the SOS6 line causing the unit to shut down and the power LED to blink 6 times.

Under normal operation, the output voltage (MID) of the “Energy Recovery” circuit ranges between 68V and 138V. If the voltage drops below 67V or increases above 139V, the error detect circuit (IC16581) is triggered. This causes a high to be output to pin 21 of connector SC20.

Pin 21 of SC20 also goes high, if the Vscan generating circuit fails.

The voltage from SC20 is connected to pin 65 the Panel CPU (IC9003) in the A board via the DC level shifter section of the multi-functions IC (IC9400).

When pin 65 of the panel CPU (IC9003) goes high, the TV shuts down and the power LED blinks 6 times.

TC-P42S2

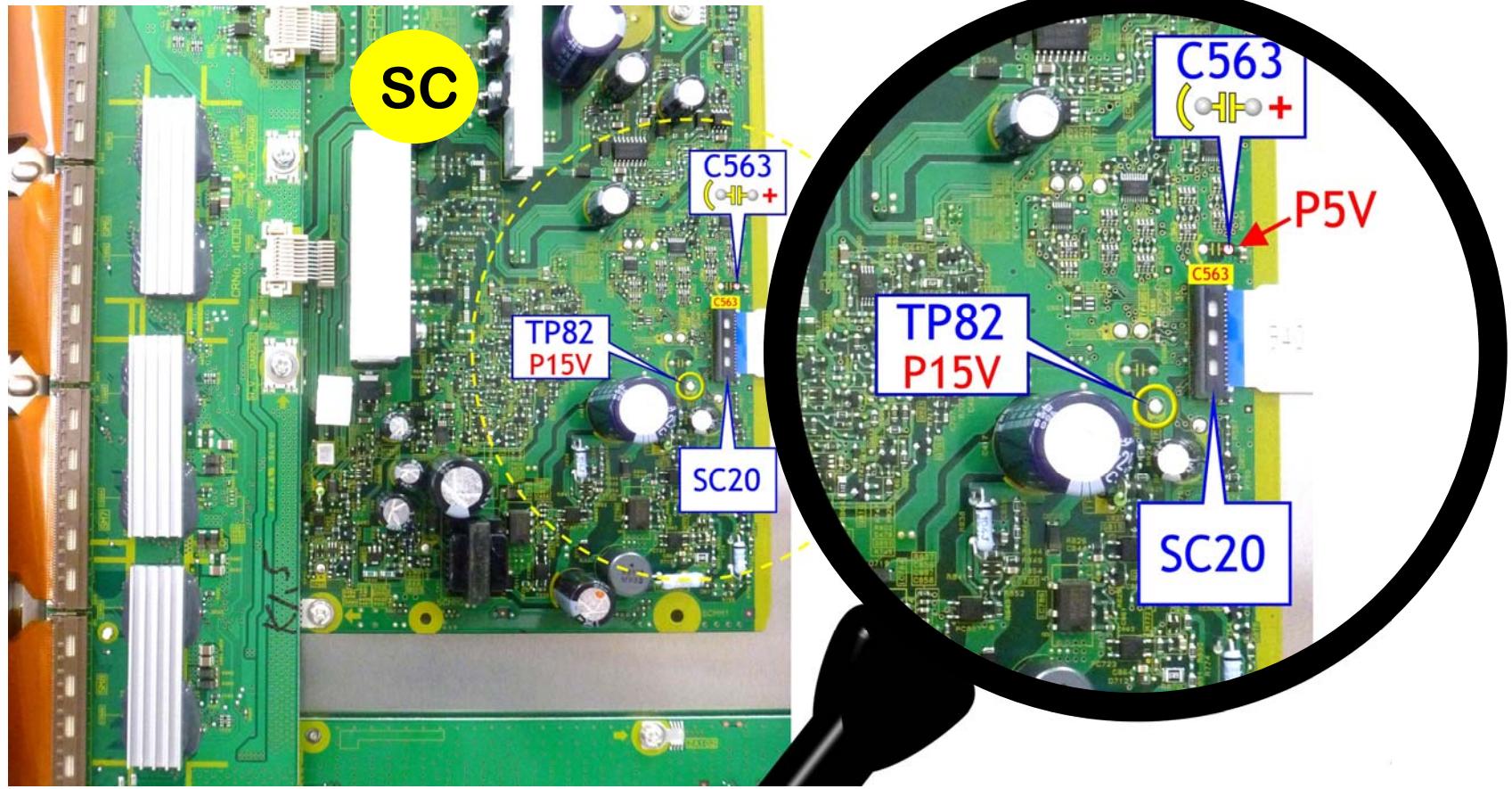
This condition is normally caused by the SC, A, or P board. (SC>A>P).

6 blinks can also be caused by open connection between the C boards and open connection between any of the C board and the A board.

Note: This circuit is different than the circuit used in 2010 HD models (TC-P**X2/C2)

P15V and P5V Test Points (SC Board)

TC-P42S2

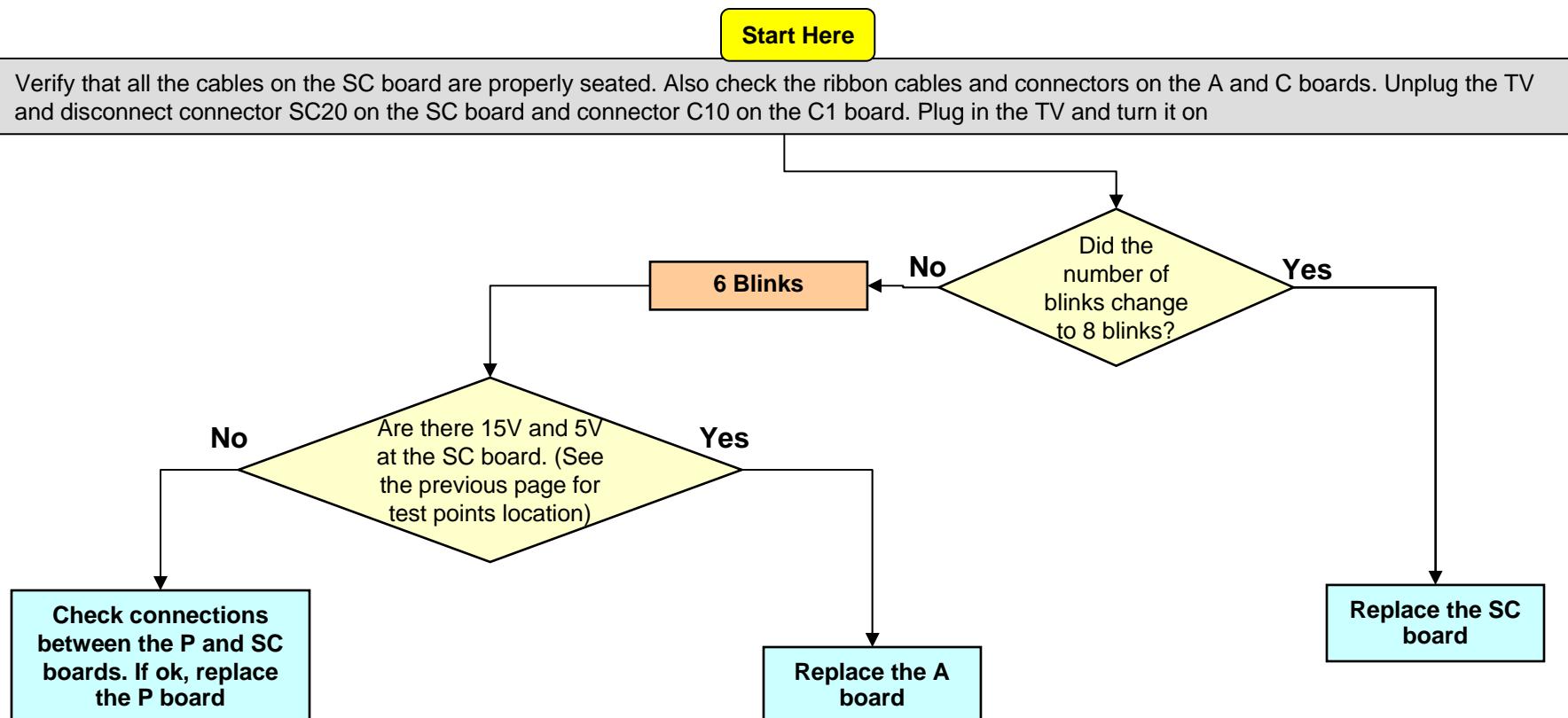


Troubleshooting 6 Blinks Failure

Cautions: Disconnect the AC Power prior to making any disconnection or connection.

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.

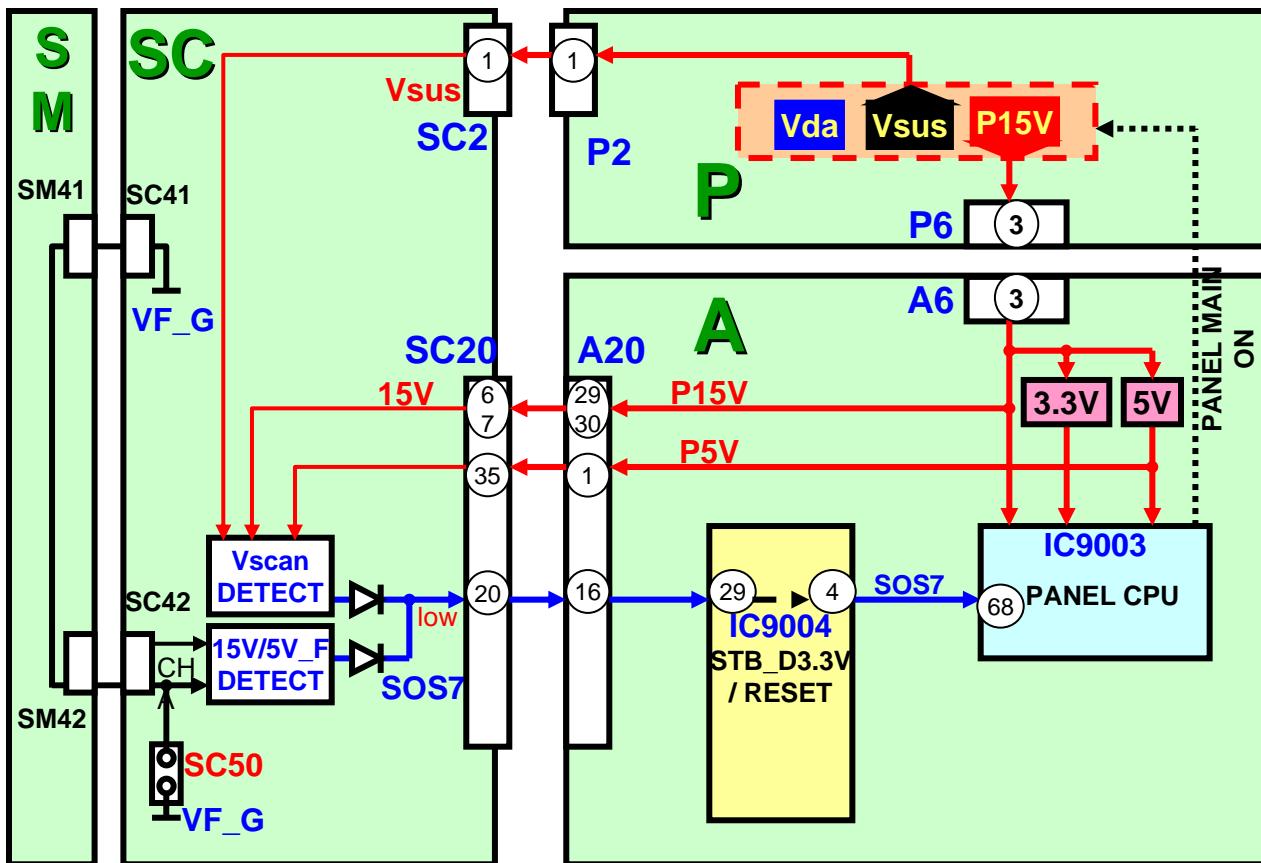
When taking voltage reading, place the voltmeter probe at the test point, component, or connector's pin indicated before connecting the TV to the AC line. This will ensure voltage reading accuracy before the TV shuts down. (Since the TV is shutting down, expect the voltage to only come up a couple of seconds.)



7 Blinks Error Detect Circuit

These 4 conditions can cause the TV to shut down and the power LED to blink 7 times

1. Missing Vsus.
2. Abnormality of the scan circuit output, the 15V_F, the scn_pro, and Vscan circuit.
3. Defective Panel.
4. Loose or open Connection between the SC board and the SM board.
5. Wrong diagnostic by the A board



The SOS7 circuit monitors the panel, the scan circuit output, the 15V_F, the scan_pro, Vscan, and the physical connection between the SC board and the SM board (CHA).

If any abnormality occurs on any of these lines or Vsus is missing, the TV shuts down and the power LED blinks 7 times. If any of the connectors between the SC and the SM board is open, the TV also shuts down and the power LED blinks 7 times.

Troubleshooting 7 Blinks Failure

Cautions: Disconnect the AC Power prior to making any disconnection or connection.

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.

When taking voltage reading, place the voltmeter probe at the test point, component, or connector's pin indicated before connecting the TV to the AC line. This will ensure voltage reading accuracy before the TV shuts down. (Since the TV is shutting down, expect the voltage to only come up a couple of seconds.)

Preparation:

Disconnect AC Power prior to making any disconnection or connection.

Wait at least 2 minutes before the removal of any connector.

Note: 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.

Remove the front cabinet and expose the panel to a bright light for a thorough visual inspection.

Check for cracks and blown pixels or any other abnormalities.

Check for burnt spots on the SM board.

If the panel is defective, it is possible that the SM board and/or the SC board are also defective.

Replace the panel, the SM, and SC boards if the resistance test indicates they are defective.

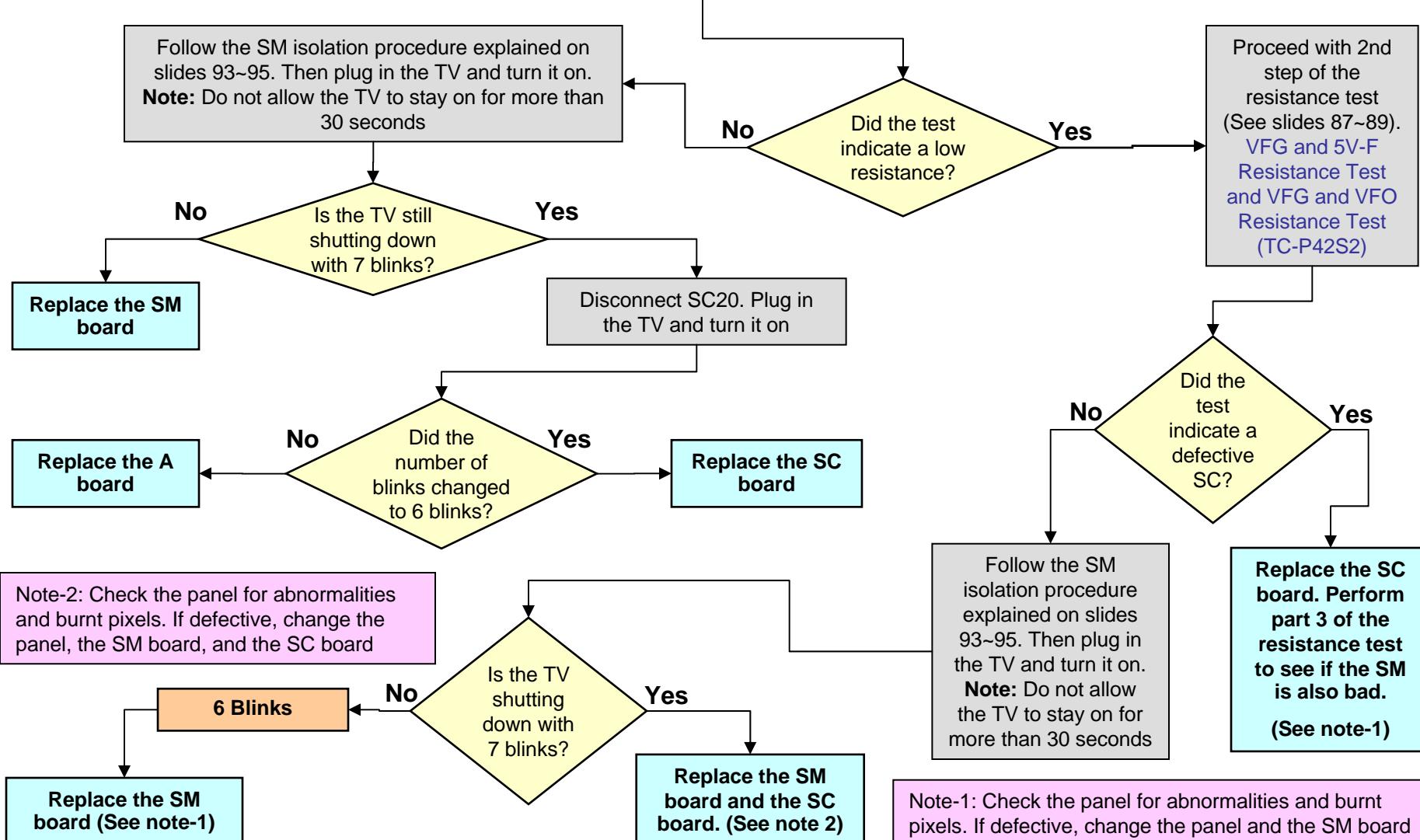
Warning: The Vsus line has large capacitors that hold the charge for some time even after the TV has been turned off and unplugged. When disconnecting P2/SC2 or P11/SS1, bleed the remaining charge of the Vsus before reconnecting the cable.

Use a 500 ohms/ 5W (At least) resistor to discharge the Vsus line before reconnecting P2/SC2 or P11/SS11.

Troubleshooting 7 Blinks Failure

Start Here

Check all the connectors on the SC and SM boards. Make sure they are properly seated. If the TV still shuts down with 7 blinks, unplug it and perform the 1st step of the resistance test (See slides 85 and 86). [“VFG and VFO \(TPSC1\) Resistance Test \(TC-P42S2\)”](#)



8 Blinks Error Code

These 4 conditions can cause the TV to shut down and the power LED to blink 8 times

1. Abnormality of the Sustain drive circuit.
2. Open or loose connection between the SS board and FPCs from the panel.
3. When SC20, SC2, and SC10 are all disconnected.
4. Wrong diagnostic by the A board

The SOS Detect circuit in the Sustain board monitors:

- Physical connection between the panel and the SS board.
- The output of the sustain drive circuit.

Under normal condition, Q16280 is on. When Q16280 is on, a low is provided to the anode of D16280 (D280).

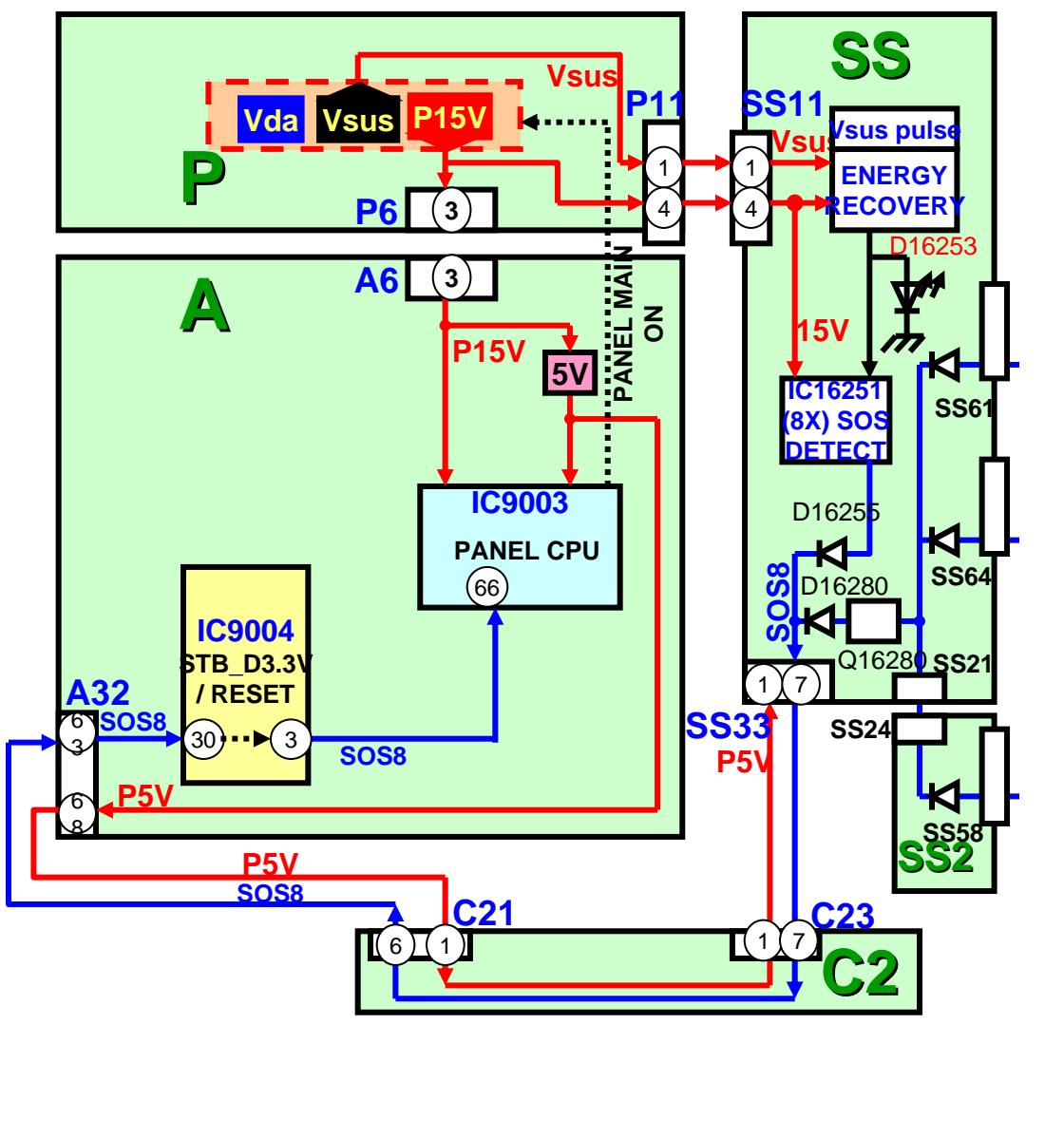
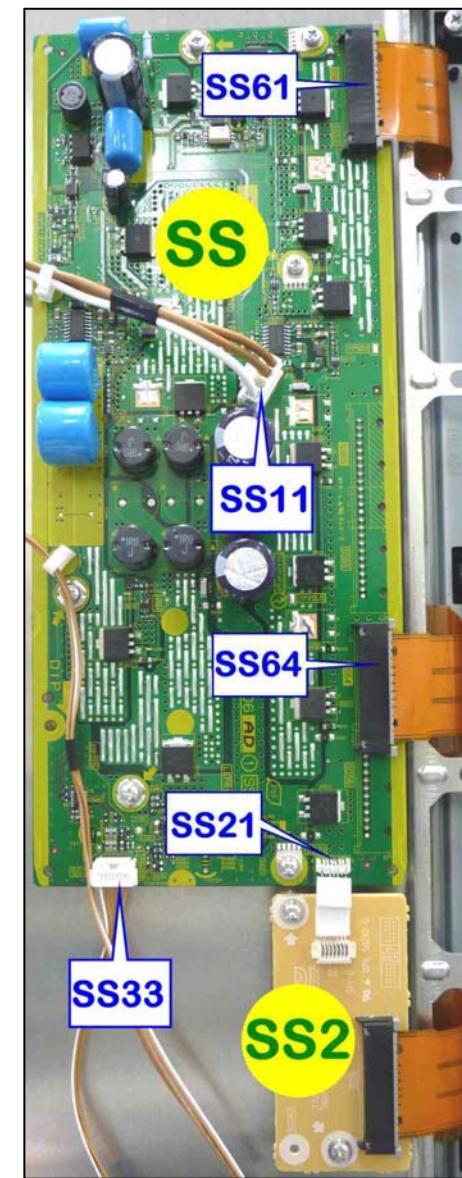
If one of the FPC cables is open, Q16280 turns off and a high is provided to the anode of D16280 (D280). This high is provided to pin 66 of the CPU in the A board. When this happens, the TV shuts down and the power LED blinks 8 times.

If any abnormality occurs in the sustain drive circuit, a high is provided to the anode of D16255. This high is provided to pin 66 of the CPU in the A board. When this happens, the TV shuts down and the power LED blinks 8 times.

To determine if the 8 blinks is caused by the A board, SS board, or the Panel:

- Isolate the SS board and check if the TV stays on when it's turned on.
- If the TV does not stay on after disconnecting the SS board, the A board is defective.
- If the TV stays on, then the SS or the Panel is defective.
- If the anode of D16280 (D280) is high (2.7V) at the time the unit shuts down, the Panel might be defective. (Check for loose connection between the flex-cables and the SS board).
- If the anode is low, the SS board is defective.

8 Blinks Error Detect Circuit

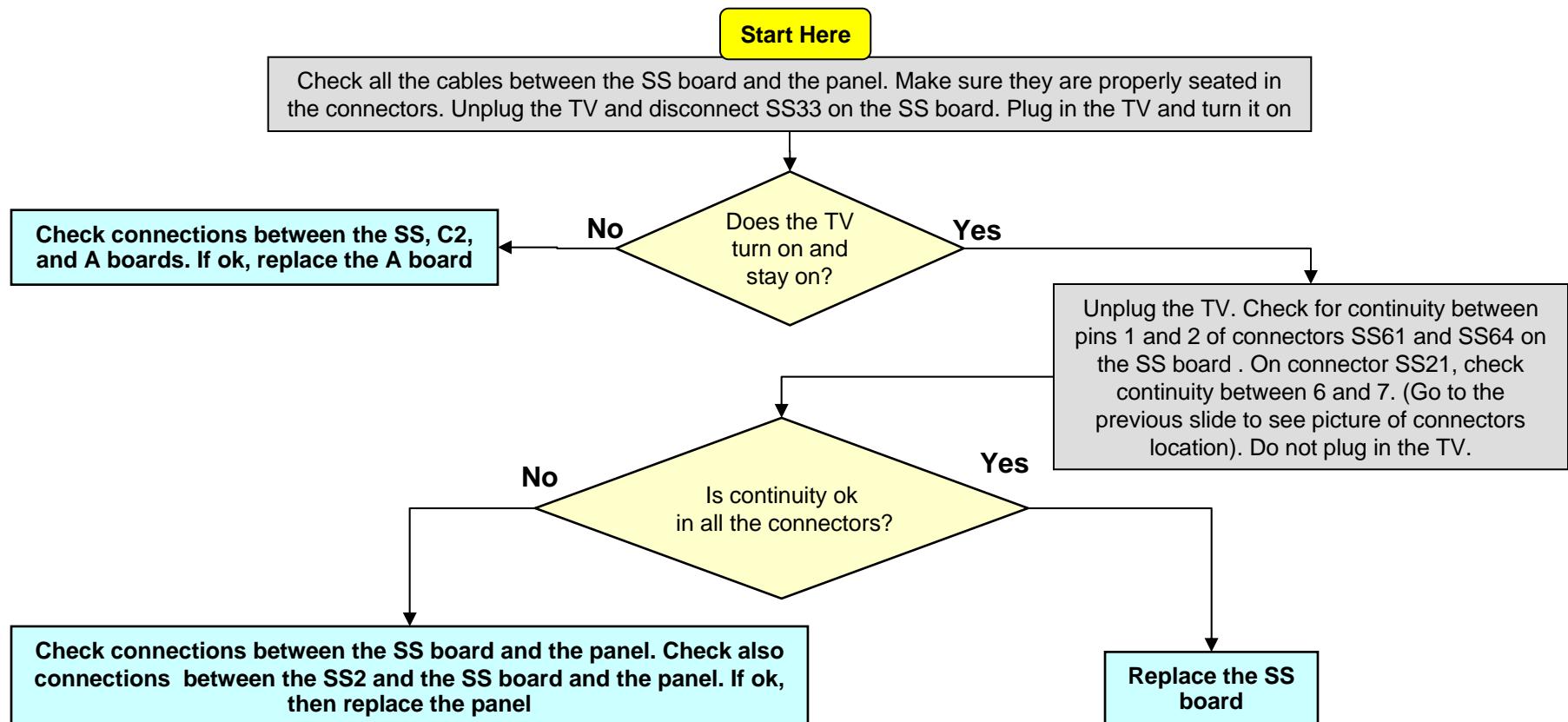


Troubleshooting 8 Blinks Failure

Cautions: Disconnect the AC Power prior to making any disconnection or connection.

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.

When taking voltage reading, place the voltmeter probe at the test point, component, or connector's pin indicated before connecting the TV to the AC line. This will ensure voltage reading accuracy before the TV shuts down. (Since the TV is shutting down, expect the voltage to only come up a couple of seconds.)

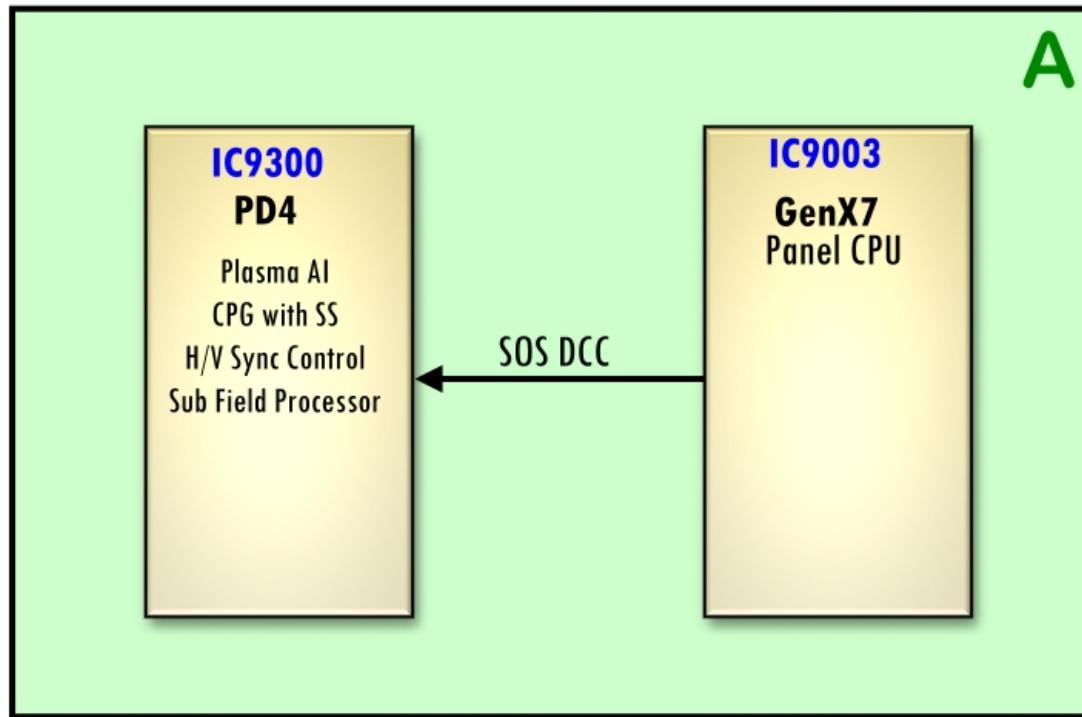


9 Blinks Error Code

This condition can cause the TV to shutdown and the power LED to blink 9 time

1. No communication between IC9300 and IC9003

Since both ICs are located on the A board, only the A board should be replaced



10 Blinks Error Code

These 4 conditions can cause the TV to shut down and the power LED to blink 10 times

1. Abnormalities of the F+15V.

Reasons:

- The A board is not generating the F+15V
- SUB Voltages are affected by the K board or by metal object present in the SD card slot..

2. Shorted Vsus.

3. Shorted Vda.

4. If connector P6 on the P board is not connected or properly seated.

5. Wrong diagnostic by the A board.

IMPORTANT: Unlike previous generations, there's no 10 blinks error code at plug-in for this model. When the A board is replaced, the TV turns on in aging mode by itself at plug in.

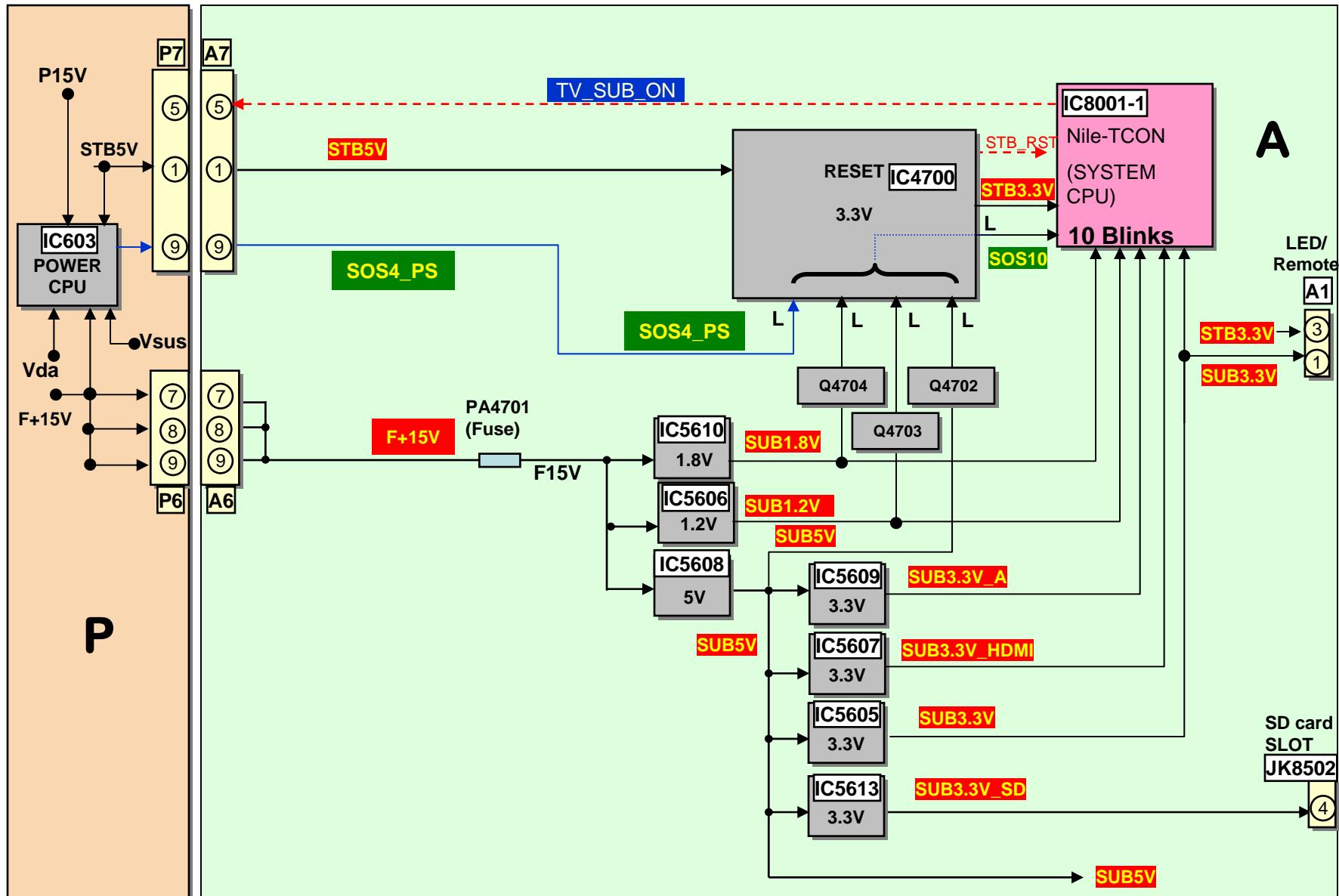
To troubleshoot a PDP TV that is shutting down and the power LED blinks 10 times:

- Find out if there is a shorted Vsus. (Measure resistance between Vsus and chassis ground.)
- Find out if there is a shorted Vda. (Measure resistance between Vda and chassis ground.)
- Find out if 15V is output at pin 7,8,or 9 of connector P6 of the P board. If no voltage is output, the P board may be defective.
- If the F_STB_15V voltage is OK, it's likely that the A board is defective.

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.

10 Blinks Error Detect Circuit

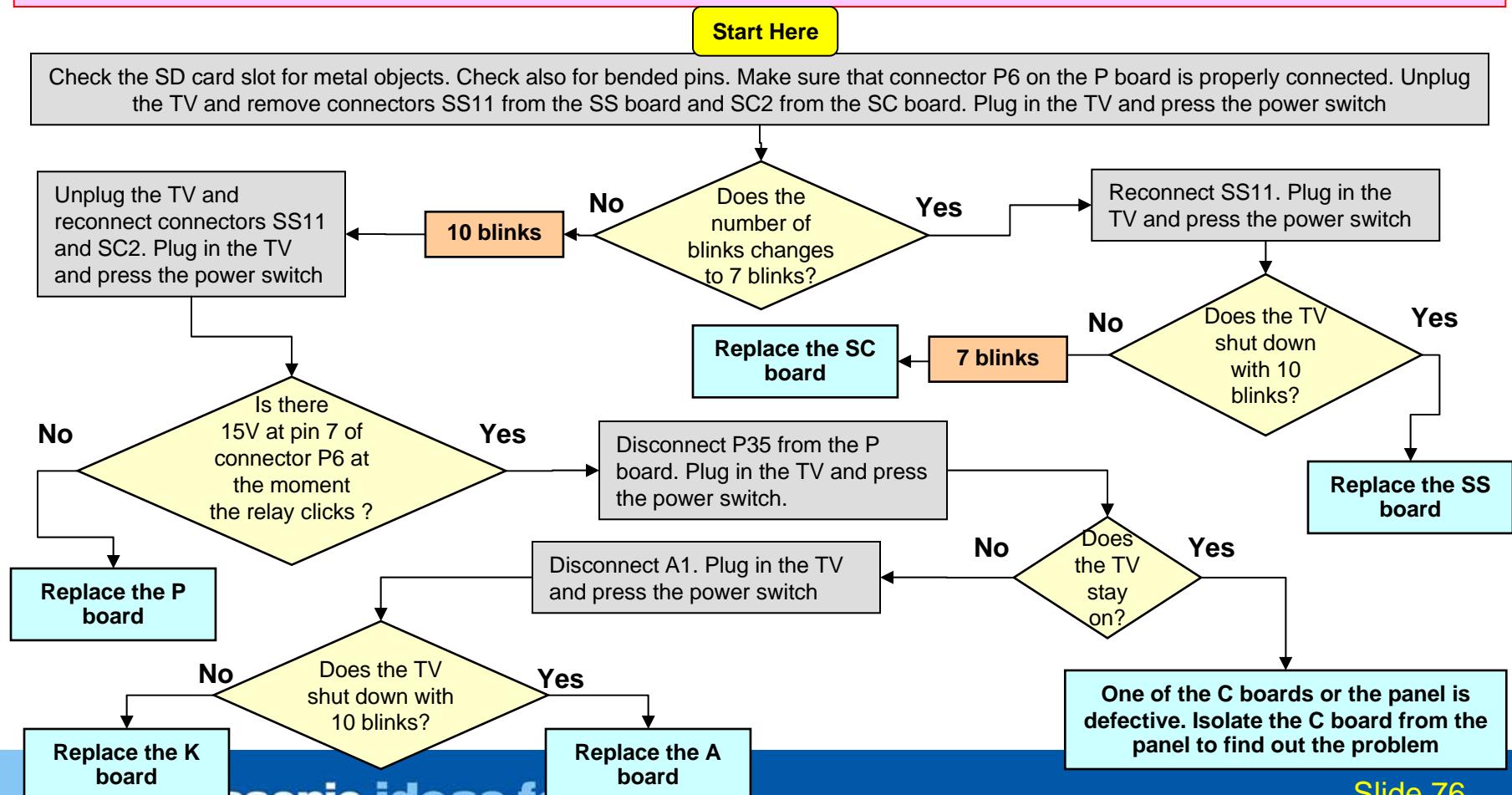


Troubleshooting 10 Blinks Failure

Cautions: Disconnect the AC Power prior to making any disconnection or connection.

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.

When taking voltage reading, place the voltmeter probe at the test point, component, or connector's pin indicated before connecting the TV to the AC line. This will ensure voltage reading accuracy before the TV shuts down. (Since the TV is shutting down, expect the voltage to only come up a couple of seconds.)



Service Notes

Service Mode

While pressing the “VOLUME -” button of the main unit, press the “INFO” button of the remote control three times within 2 seconds.

Service Mode Screen

SERVICE	DTVSOC SOFT	1.090	RB Cnt	000
ADJUST	DTVSOC EEP	1.01.0167		
WB-ADJ	LSI DATA	1.31.00		
OPTION	STBY SOFT	1.00.01		
VSUS	STBY EEP	01.00.0187		
AGING	PDP SOFT	02.00		
SRV-TOOL	PDPEEP	33.43		
	PDP DCC	73.03		
	PDP PDROM	33.41		
	EPOP	200		

Key command

- [1] button...Main items Selection in forward direction
- [2] button...Main items Selection in reverse direction
- [3] button...Sub items Selection in forward direction
- [4] button...Sub items Selection in reverse direction
- [VOL] button...Value of sub items change in forward direction (+), in reverse direction (-)

How to exit:

Switch off the power with the “POWER” button on the main unit or the “POWER” button on the remote control.

Self Check/Reset

1. Checks the communication IIC bus lines
2. Provides a SOS History

To Access the Self-Check Mode, turn the TV on and while pressing “VOLUME (-)” button on the main unit, press the “OK” button on the remote control for more than 3 seconds.

TV volume down & OK on remote only does a basic IC self check. It does NOT clear any unit settings.

It does not clear channel programmed settings, picture settings, channel labels, LOCK mode settings, or password.

Using this method, it shows the unit firmware version (Peaks 1.050 and GenX 1.00) and it checks IC communications ONLY.

This is more useful to identify the firmware version without having to decode the info in the setup menu About/Version screen.

To Exit the Self-Check Mode, Press and hold the Power button on the TV for 5 seconds or disconnect the AC cord from the wall outlet.

Reset Procedure

Reset forces the TV to factory shipment setting.

Note: All customer programmed parameters will be erased.

To Reset the TV, Press and hold the “VOLUME (-)”button on the TV and press the “MENU” button on the remote control for more than 3 seconds.

To Exit, Disconnect the AC cord from wall outlet.

To Exit:

Disconnect the AC cord from wall outlet.

Mirror Function



This feature allows the picture to be rotated 180° horizontally or 180° vertically.

When servicing plasma TVs with horizontal lines, this feature can help to determine if the A board is causing the problem or not. For vertical lines problems, this feature can help to determine if the problem is the A board or the panel. The rear cover does not have to be removed to do this.

If the position of the line/lines changes when performing this function, the A board is possibly defective. If the line/lines do not move:

- For horizontal lines check between the panel and the SM board.
- For vertical lines, change the panel.

To enter the Mirror Function.

From the Service Mode Menu, select “OPTION”.

Press 3 or 4 to select “MIRROR”.

Press the VOLUME up or down button to change the Mirror’s data.

Data = 00 is the default data (Mirror feature is off)

Data = 01 The picture is flipped 180° horizontally.

Data = 02 The picture is flipped 180° vertically

Mirror Function

Normal View



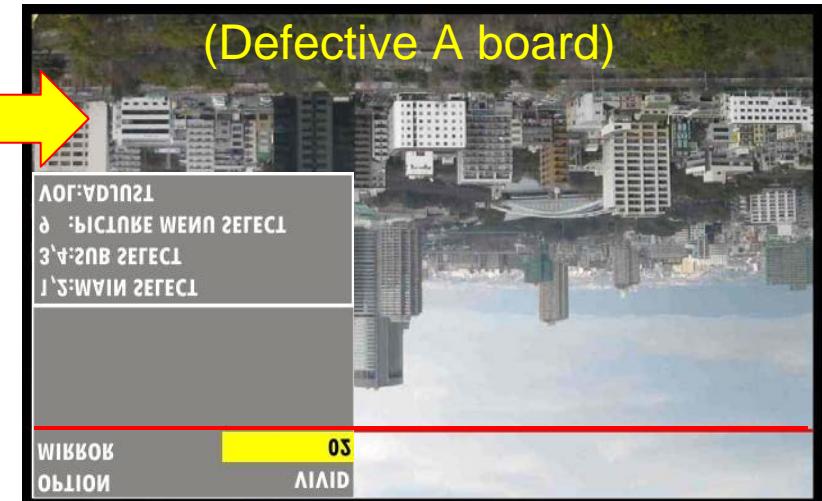
Picture flipped Horizontally
(Defective A board)



Normal View

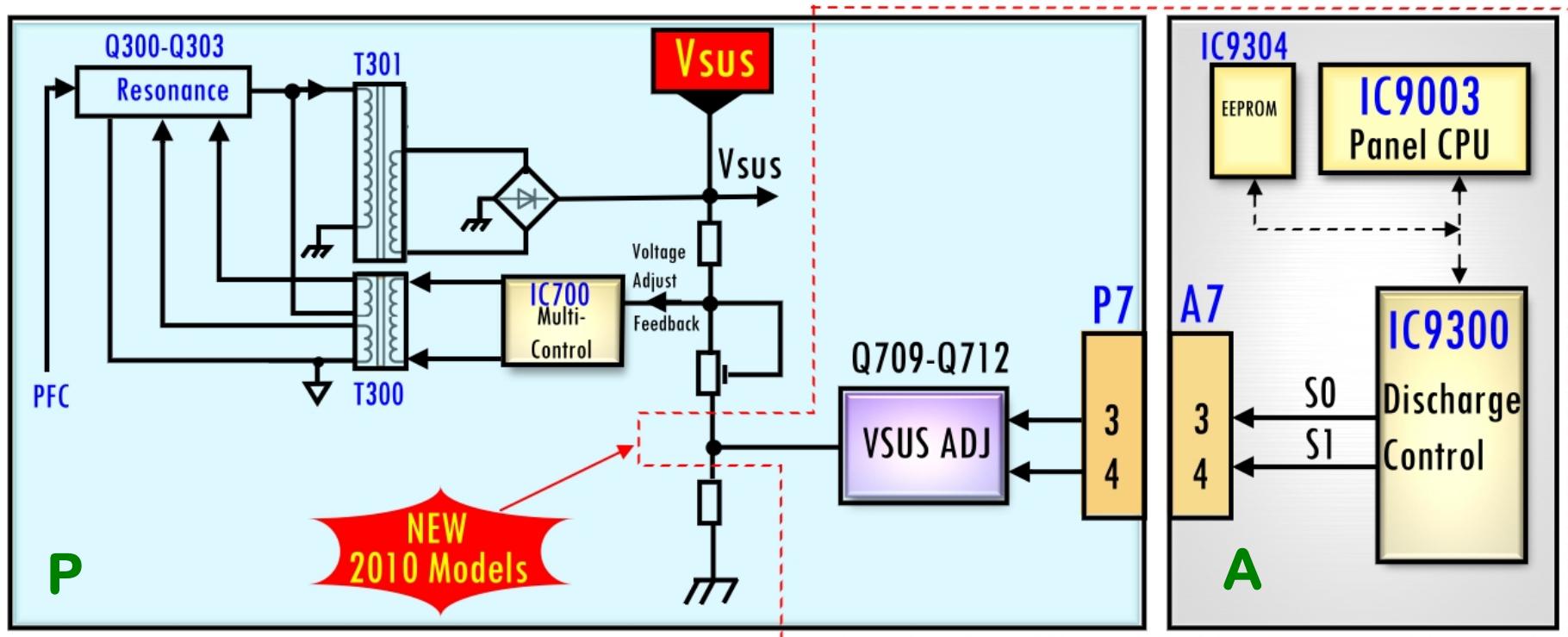


Picture flipped Vertically
(Defective A board)





VSUS Adjustment With Remote Control



The new 2010 Plasma TV models do not require Vsus adjustment using the control in the power supply. The Vsus can now be adjusted to 2 different levels (high or Low) using the remote control from within the service mode menu. Perform this adjustment when the A board or the panel is replaced and to correct conditions of uneven illumination level of pixels noticeable when a white signal is displayed.

To correct illumination unevenness, display a white screen and then change the settings between high and low. If there is no change, set the adjustment to low. If an improvement is shown when setting the adjustment to high, then keep the settings at high level.

If the picture seems normal with both high and low settings, then set the Vsus to "LOW", even if the picture looks brighter when set to "HIGH". LOW is the default setting.

VSUS Adjustment With Remote Control

To adjust Vsus:

Enter the service mode.

Press 1 or 2 on the remote control to select Vsus from the main Items menu.

The Vsus menu appears showing whether is low or high. (Default setting is "LOW")

At this point, the settings can not be changed.

To perform the adjustment, press the "OK" button on the remote control to change the menu to Vsus "TEST" mode. **Note:** the data can now be changed (Low or High). Press the Vol 1 or Vol+ button on the remote control to change to "Low or High". The data's color changes to **red** when adjusted.

Note: The data can only be changed while in the "Vsus Test" mode.

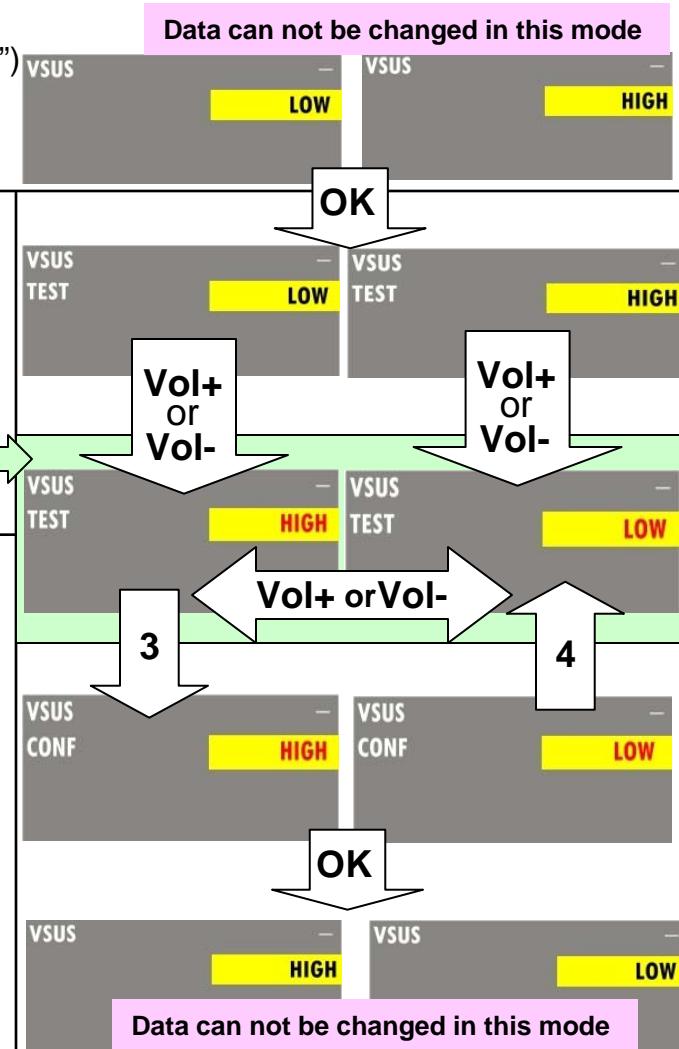
If result of adjustment is satisfactory at this point, proceed to save the data by pressing the number 3 on the remote control. This will change from the "Test" menu to the "CONF" menu. **Note:** the Data is still **red**, indicating that it has not been saved yet.

If no improvement is noticed, set the adjustment to "LOW".

To return to the Vsus "TEST" mode after entering the Vsus "CONF" mode, press the number 4 on the remote control.

After changing the settings, make sure to save the data.

To save the data, while in the "CONF" menu, press the "OK" button on the remote control. The data changes from **red** to black and the Vsus menu goes back to normal mode. The adjustment is now completed.



Troubleshooting

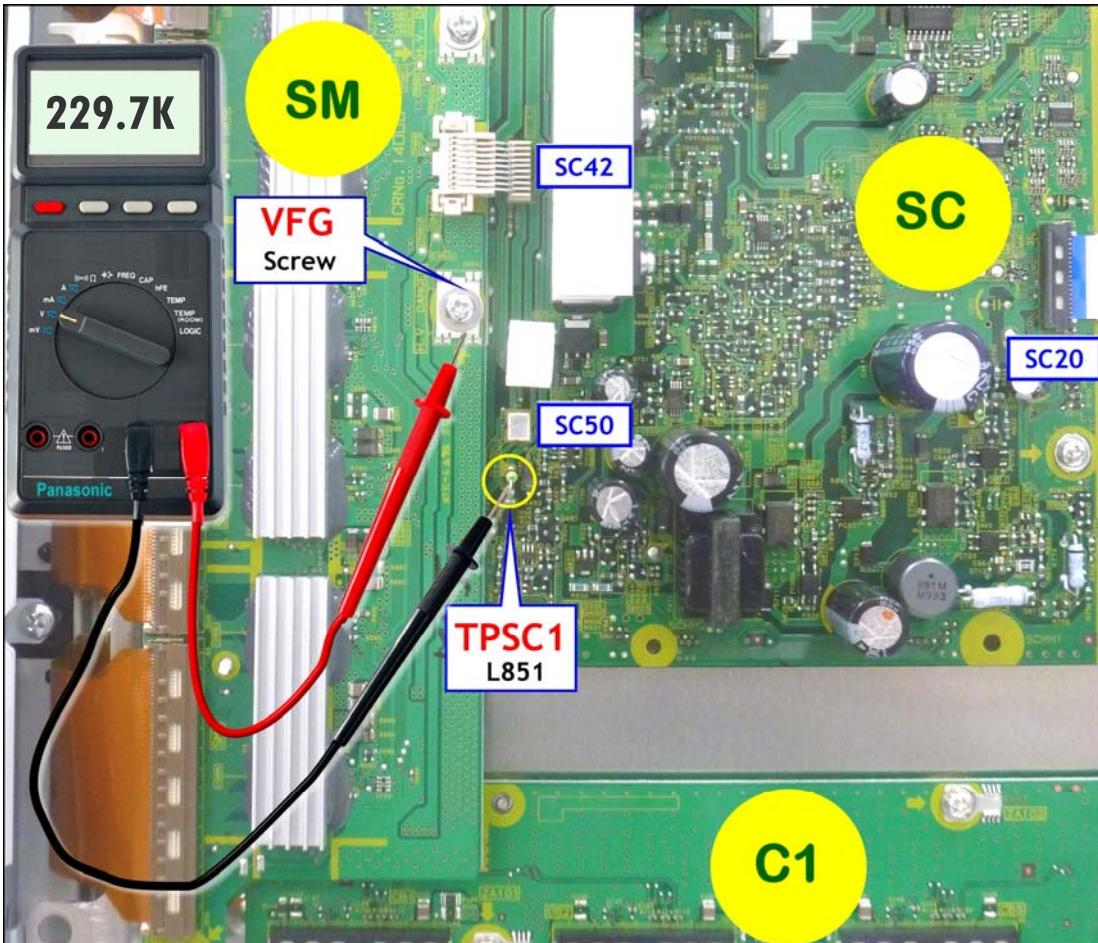
1st Step Resistance Test - VFG and VFO (TPSC1) (TC-P42S2)

Preparation:

Disconnect AC Power prior to making any disconnection or connection.

Wait at least 2 minutes before the removal of any connector.

Note: 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.



Procedure:

Using a digital meter, measure the resistance between VFG (Floating ground) and TPSC1 (Coil L851) on the SC board.

The normal resistance should be approximately **190K-Ohms** or higher. It may take a few seconds for the reading to become stable.

Note: A low resistance reading indicates a defective SM or SC board. To find out which one is defective perform a separate resistance test for the SC and SM boards.

A Normal resistance reading does not necessarily indicates that the boards are 100% functional.

Additional testing procedure are required.

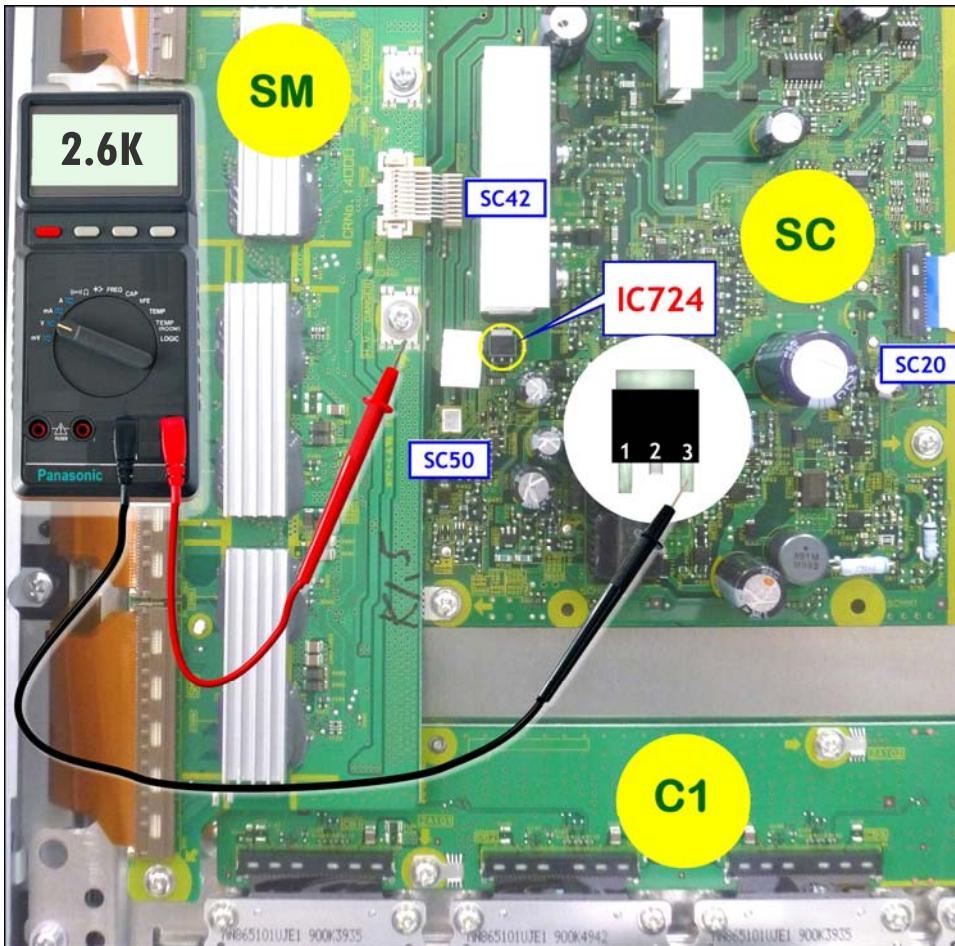
1st Step Resistance Test - 5V_F and VFG (TC-P42S2) (2 of 2)

Preparation:

Disconnect AC Power prior to making any disconnection or connection.

Wait at least 2 minutes before the removal/installation of any connector.

Note: 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.



Procedure:

Using a digital meter, measure the resistance between VFG (Floating ground) and pin 3 of IC724 (IC16724) on the SC board.

The normal resistance should be approximately 2.6 K-Ohms.

Note: A low resistance reading indicates a defective SM or SC board. To find out which one is defective perform a separate resistance test for the SC and SM boards.

A Normal resistance reading does not necessarily indicates that the boards are 100% functional.

Additional testing procedure are required.

2nd Step - SC Resistance Test (TC-P42S2) (1 of 3)

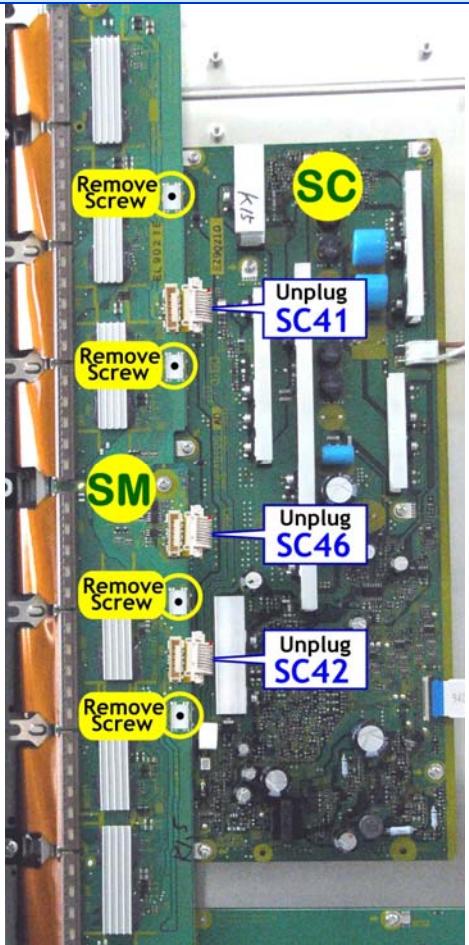
Only perform this test if abnormal readings are obtained from tests on the previous 2 pages

Preparation:

Disconnect AC Power prior to making any disconnection or connection.

Wait at least 2 minutes before the removal of any connector.

Note: 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.



Procedure:

Remove the 4 VFG screws from the SM board. (See picture to the left.)

Remove SC41, SC42, and SC46 from the SC board. (See picture to the left.)

Resistance between VFG and (VFO) TPSC1

Using a digital meter, measure the resistance between VFG (pin 1 of connector SC50) and TPSC1 (Coil L851) on the SC board. (See picture in the next page.)

It may take a few seconds for the reading to become stable.

The normal resistance should be over **30 M-Ohms** (In lower range meters the resistance may read open).

Resistance between VFG and 5V_F

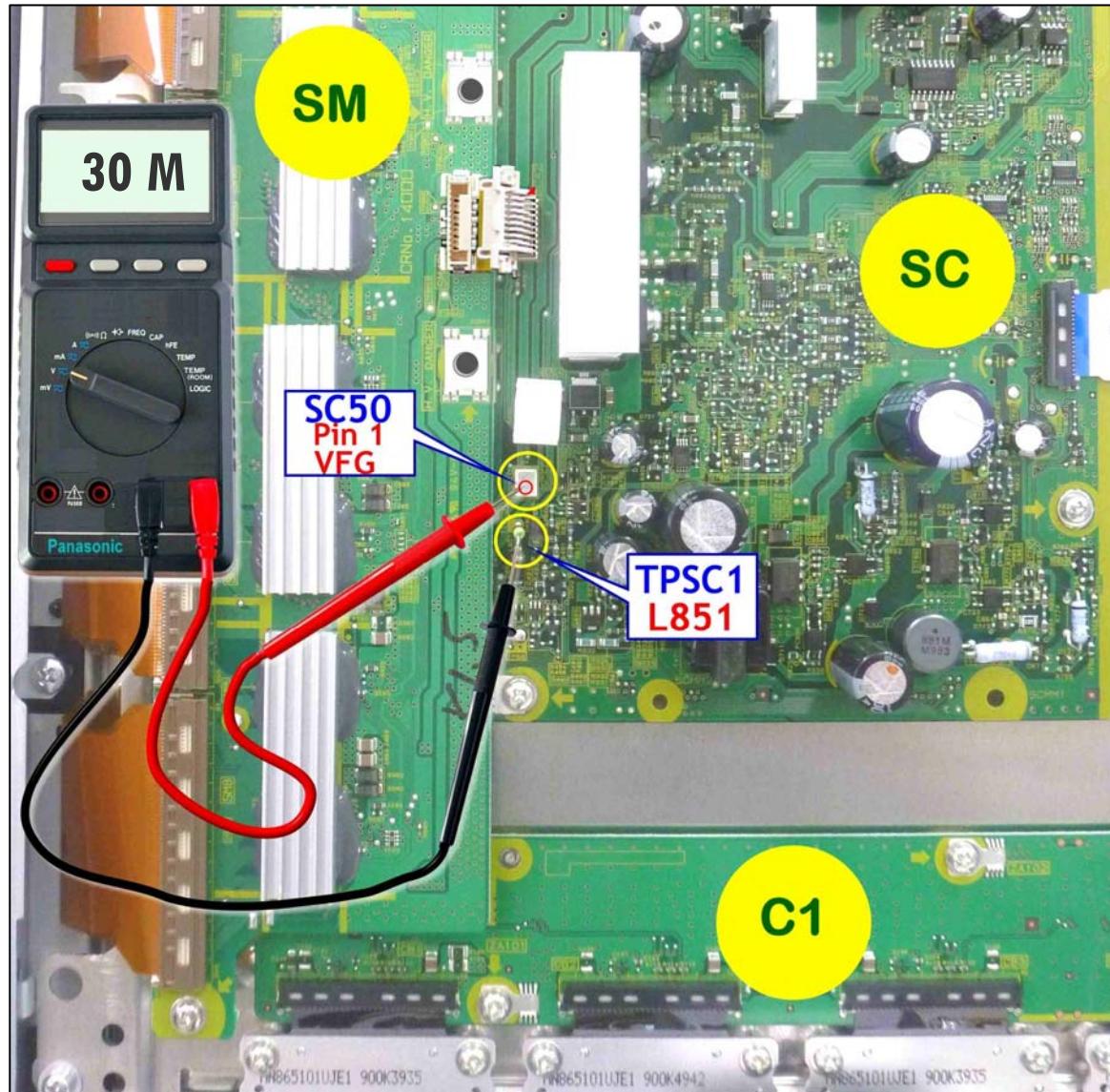
Measure the resistance between VFG (Pin 1 of connector SC50) and 5V_F (Pin 3 of IC 724) (See picture on page ???)

The normal resistance should be **2.6K**.

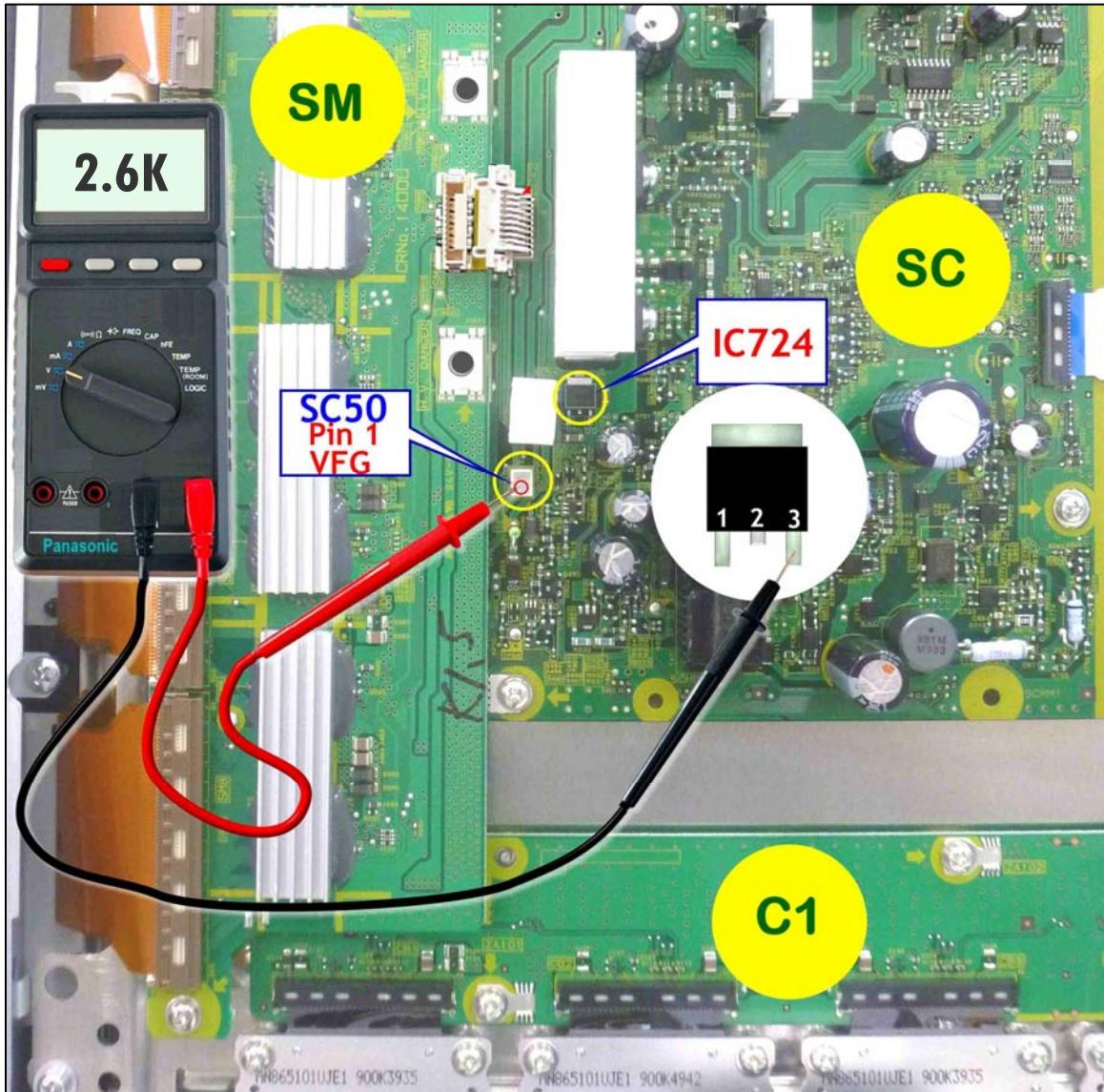
Note: A low resistance reading indicates a defective SC board. A Normal resistance reading does not necessarily indicates that the board is 100% functional.

Additional testing procedure are required.

2nd Step - Resistance Test VFG and TPSC1 (TC-P42S2) (2 of 3)



2nd Step - Resistance Test VFG and 5V_F (TC-P42S2) (3 of 3)



3rd Step SM Resistance Test (TC-P42S2) (1 of 3)

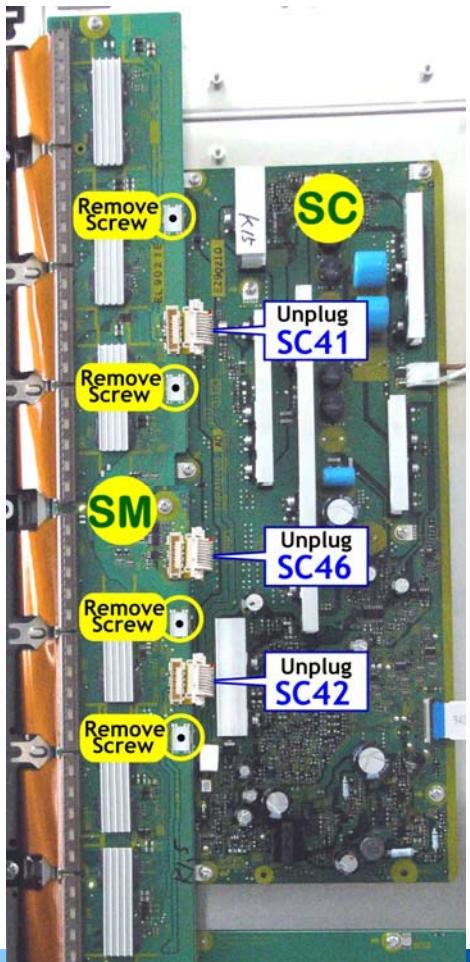
Perform this test if the result of the SC board resistance test indicates a possible defective SM board

Preparation:

Disconnect AC Power prior to making any disconnection or connection.

Wait at least 2 minutes before the removal of any connector.

Note: 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.



Procedure:

Remove the 4 VFG screws from the SM board. (See picture to the left.)

Remove SC41, SC42, and SC46 from the SC board. (See picture to the left.)

Resistance between VFG and VFO (TPSC1)

Using a digital meter, measure the resistance between VFG (Plated screw post) and VFO (pin 1 of connector SM42). (See picture in the next page.)

It may take a few seconds for the reading to become stable.

The normal resistance should be over 4 M-Ohms or higher (In lower range meters the resistance may read open).

Resistance between VFG and 5V_F

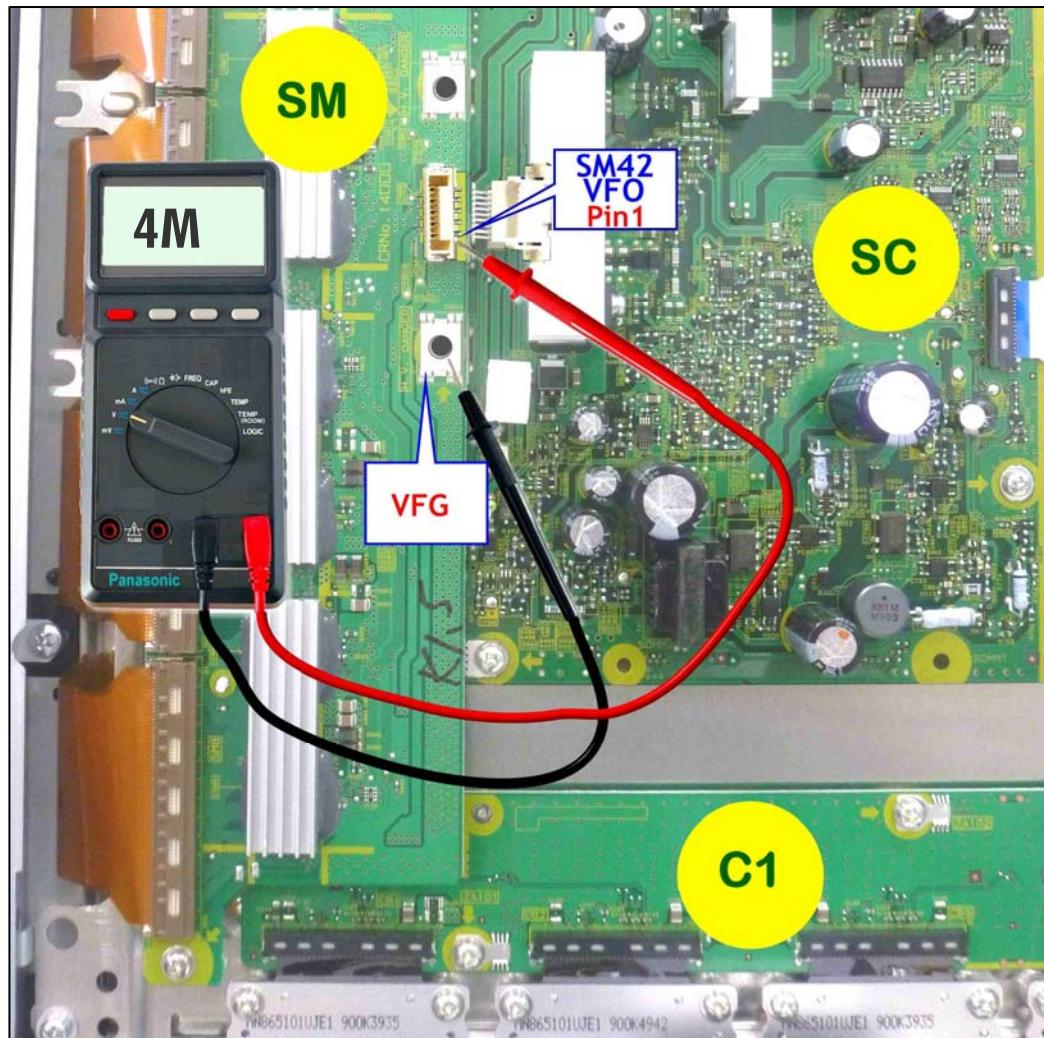
Measure the resistance between VFG (Plated screw post) and 5V_F (Pin 5 of connector SM42) (See picture on page 92)

The normal resistance should be 190K or higher.

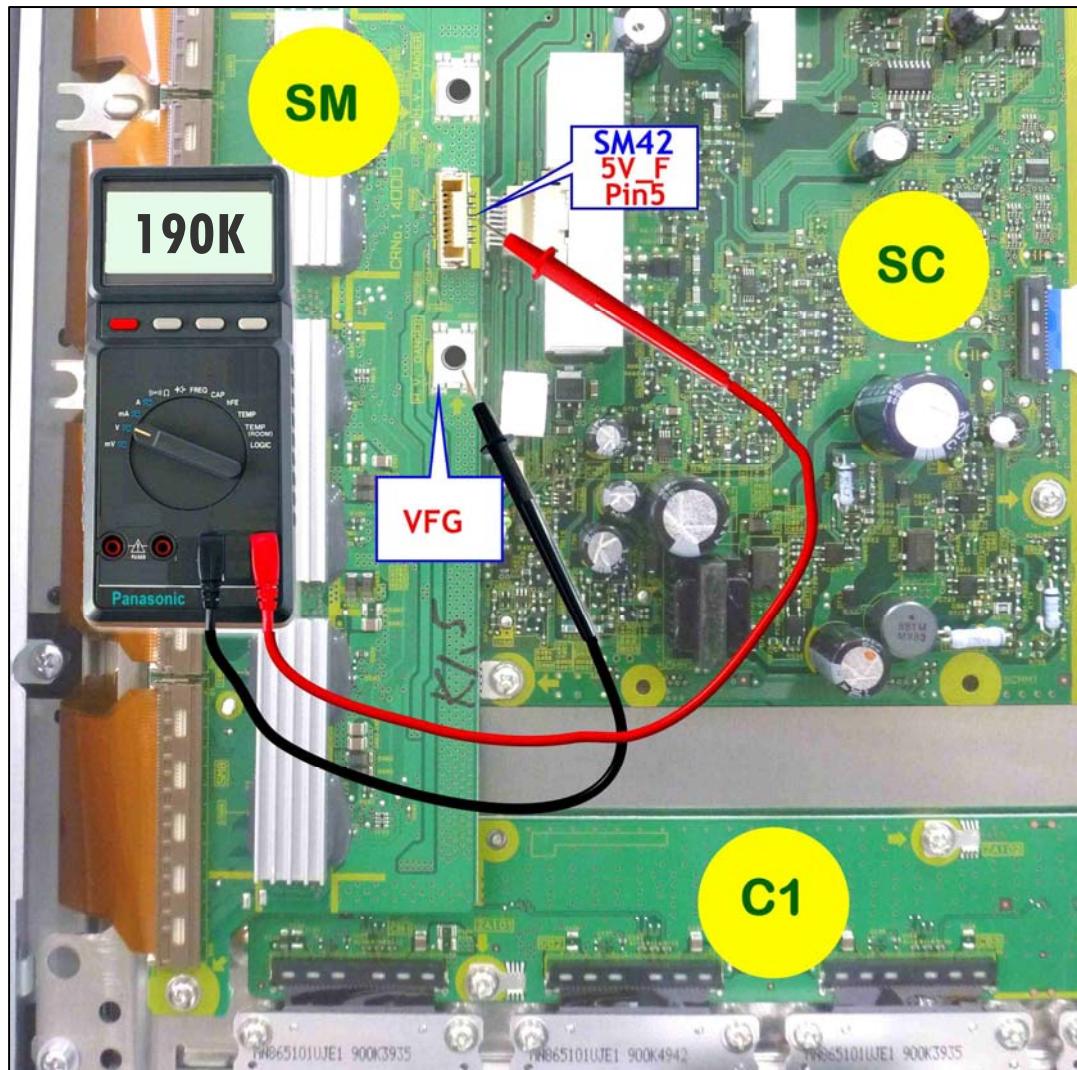
Note: A low resistance reading indicates a defective SM board. A Normal resistance reading does not necessarily indicates that the board is 100% functional.

Additional testing procedure are required.

3rd Step - Resistance Test VFG and VFO (TC-P42S2) (2 of 3)



3rd Step - Resistance Test VFG and 5V_F (TC-P42S2) (3 of 3)

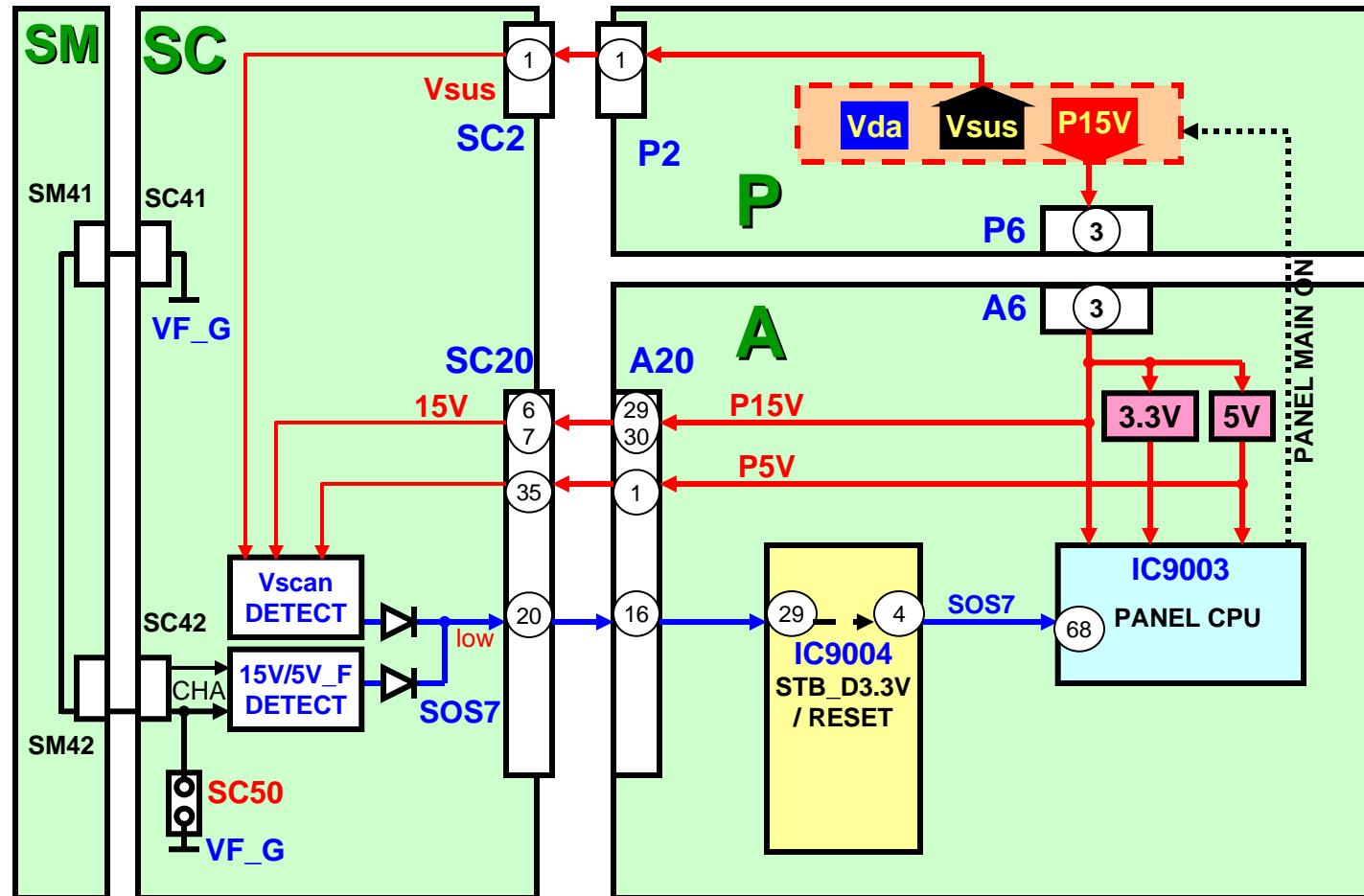


SM Board Isolation Procedure (1 of 3) (TC-P42S2)

This TV is designed to shutdown if the SM board is disconnected.

Disconnecting this board causes the unit to shutdown and the power LED to blink 7 times

Unplugging any of the connectors SC41/SM41 and SC42/SM42, opens the interlocked connection between VF_GND on the SC board. This floats point “CHA” triggering the SOS7 detect circuit. This outputs a high to the A board through pin 20 of connector SC20 triggering the shutdown circuit.



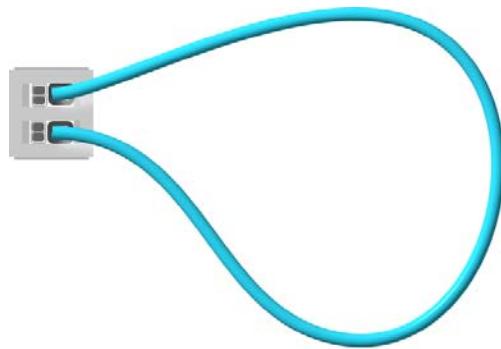
SM Board Isolation Procedure (2 of 3) (TC-P42S2)

This procedure is useful when troubleshooting 7 blinks problems.

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.

To isolate the SM board is not necessary to remove any boards:

- Remove the 4 VF_GND screws on the SM board.
- Unplug connectors SC41, SC46, and SC42 on the SC board.
- Place the SC jig cable (**TZSC09187**) between pins 1 and 2 of connector SC50 on the SC board.

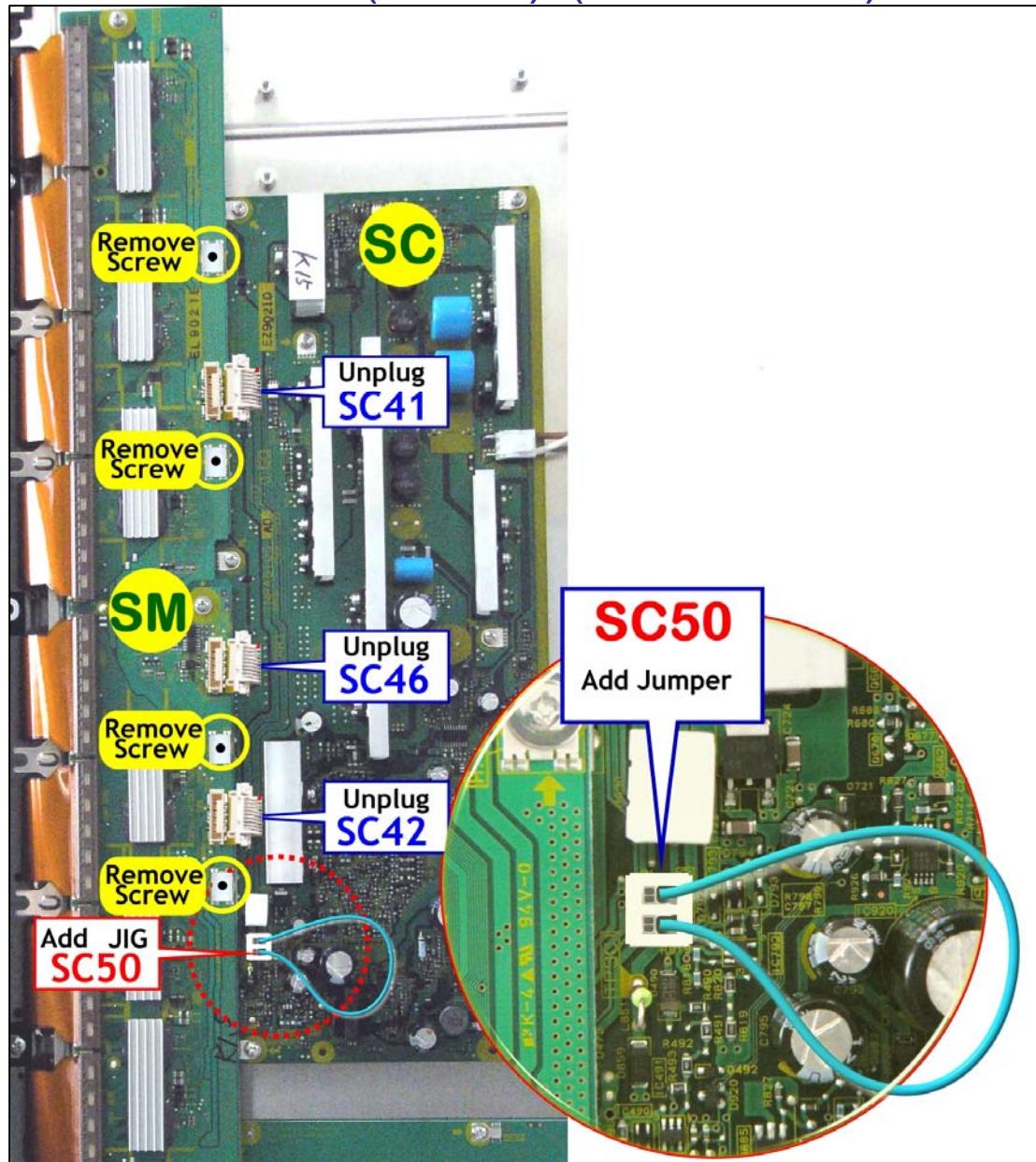
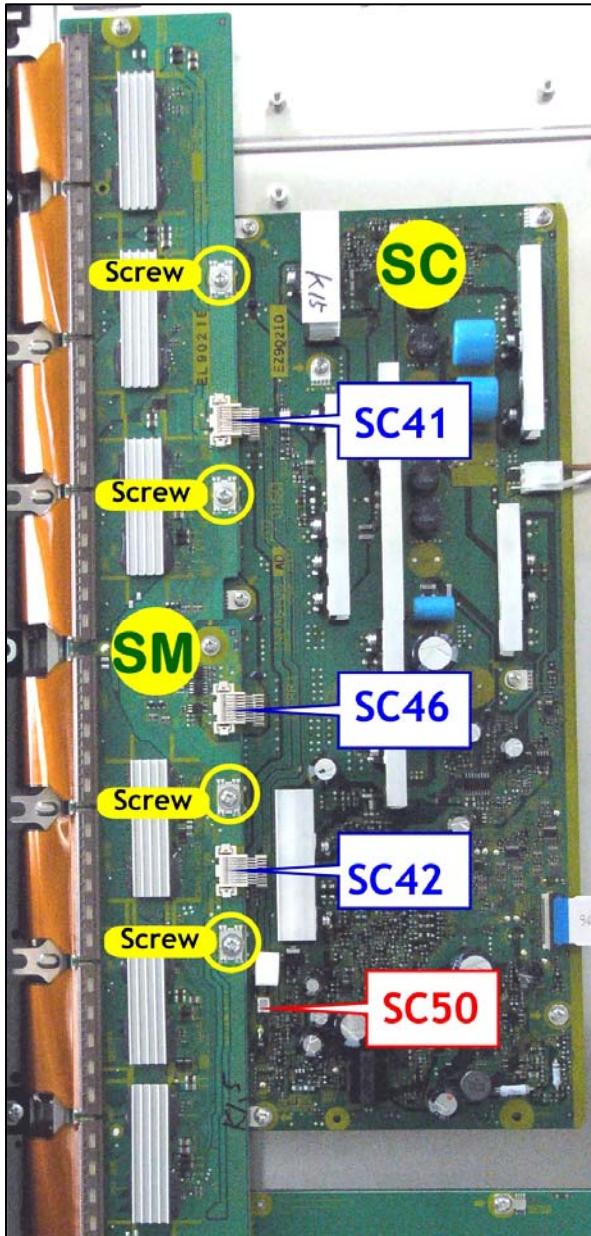


The SC test fixture (Jig) can be used when the SM board is isolated. The jig is a small connector with a jumper between pin 1 and pin 2. The part number is **TZSC09187**.

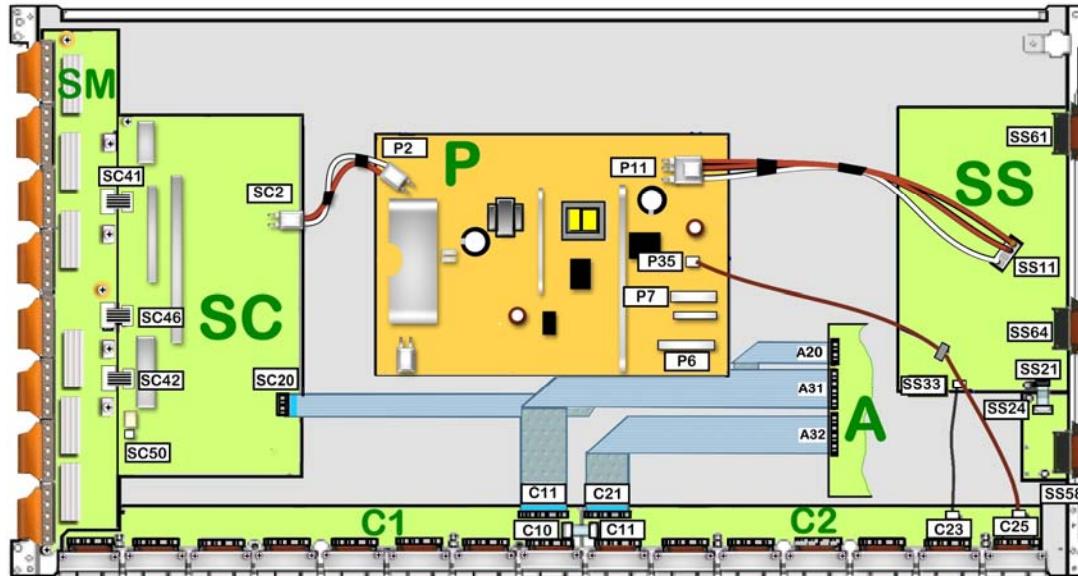
It plugs into connector SC50 on the SC board.

Note: If the SC jig is not available, install a jumper between pins 1 and 2 of connector SC50 on the SC board. (Remove the jig or the jumper after completing the isolation procedure). When this is done, the display is completely black (No picture)

SM Board Isolation Procedure (3 of 3) (TC-P42S2)



TV's Behavior After Connectors Removal



MODEL NO. TC-P42S2 (Connectors Removal on the SS + combination of connectors on the SS board and SC board)

Connector	Connector	Connector on SC Board	Connector on SC Board	Result
SS11				TV Stays On
	SS33			TV Stays On
SS11	SS33			TV Stays On
SS11		SC2		SOS 7 Blinks
	SS33	SC2		SOS 7 Blinks
SS11	SS33	SC2		SOS 7 Blinks
SS11			SC20	SOS 6 Blinks
	SS33		SC20	SOS 6 Blinks
	SS33	SC2	SC20	SOS 6 Blinks
SS11	SS33	SC2	SC20	SOS 6 Blinks

Note: If P6 is removed, the TV shuts down with 10 blinks.

If P7 is removed, the TV is dead (No power)

MODEL NO. TC-P42S2 (Connectors Removal on the SC Board)

Connector	Connector	Connector on C1 Board	Result
SC2			SOS 7 Blinks
	SC20		SOS 6 Blinks
SC2	SC20		SOS 6 Blinks
SC2		C10	SOS 6 Blinks
	SC20	C10	SOS 8 Blinks
SC2	SC20	C10	SOS 8 Blinks

MODEL NO. TC-P42S2 (Connectors Removal on the A Board)

Connector	Connector	Connector	Result
A20			SOS 6 Blinks
	A31		TV Stays On (L-side OK/R-side Black)
		A32	SOS 6 Blinks
A20	A31		SOS 6 Blinks
A20		A32	TV Stays ON with Black Screen
	A31	A32	SOS 6 Blinks
A20	A31	A32	TV Stays ON with Black Screen

Glossary

Resolution

Resolution is a combination of values that express the quality of displayed images. A display's resolution is indicated by the number of dots in the horizontal and vertical directions of the screen, such as 1024 x 768 dots. Higher values indicate clearer, sharper image reproduction. The larger the screen size, the higher the required resolution.

HD (high-definition) panel

The HD panel has a resolution of 1,366 x 768 pixels and an aspect ratio of 16:9. It is designed for displaying the beautiful images of digital, high-definition broadcasts.

Full HD (high-definition) panel

The term "full-HD panel" refers to 1,920 x 1,080-pixel panels that display progressive images of full-specification HDTV signals without the use of up sampling.

Number of pixels

The number of pixels indicates the resolution of the Image. The number of pixels of a digital image is expressed by the product of the number of pixels (dots) in the horizontal direction and the number of pixels (dots) in the vertical direction. The higher the number of pixels, the better the image quality. For plasma TVs and LCD TVs, the number of pixels is sometimes expressed by the following equation: number of pixels in horizontal direction x number of pixels in vertical direction x 3 (R, G, B).

Pixel

A pixel is a tiny dot that forms the smallest basic unit of a displayed image. Digital images are composed of pixels, with all of the text and images displayed on the screen consisting of dots. Digital images are usually rendered by square pixels arranged vertically and horizontally in an orderly manner.

Plasma panel

A key component of the plasma display. A plasma panel is a collection of millions of tiny fluorescent lights. By firing these lights on and off at a rapid rate, the plasma panel produces images.

Glossary

THX

THX is a trade name of a high-fidelity sound reproduction standard for movie theaters, screening rooms, home theaters, computer speakers, gaming consoles, and car audio systems. THX stands for **Tomlinson Holman's eXperiment**.

The THX system is not a recording technology, and it does not specify a sound recording format: all sound formats, whether digital (Dolby Digital, SDDS) or analog (Dolby Stereo, Ultra-Stereo), can be "shown in THX." THX is mainly a quality assurance system.

THX-certified theaters provide a high-quality, predictable playback environment to ensure that any film soundtrack mixed in THX will sound as near as possible to the intentions of the mixing engineer.

AVCHD

Advanced Video Codec High Definition is a high-definition and standard-definition recording format for use in digital tape-less camcorders and digital cameras. It is based on the H.264/MPEG-4 AVC video compression standard. Audio is stored in compressed form (Dolby AC-3). The container format for the audio and video is MPEG transport stream.

H.264

H.264 is a standard for video compression, and is equivalent to **MPEG-4 Part 10**, or **MPEG-4 AVC (for Advanced Video Coding)**. As of 2008, it is the latest block-oriented motion-compensation-based codec standard. The final drafting work on the first version of the standard was completed in May 2003.

The intent of the H.264/AVC project was to create a standard capable of providing good video quality at substantially lower bit rates than previous standards (e.g. half or less the bit rate of MPEG-2, H.263, or MPEG-4 Part 2), without increasing the complexity of design so much that it would be impractical or excessively expensive to implement.

YUV

YUV is used for a specific analog encoding of color information in television systems
Y' stands for the luma component (the brightness) and U and V are the chrominance (color) components.

Glossary

YUV

Is The color encoding system used for analog television worldwide (NTSC, PAL and SECAM). The YUV color space differs from RGB, which is what the camera captures and what humans view.

Composite Video and S-video

The original TV standard combined luma (Y) and both color signals (B-Y, R-Y) into one channel, which uses one cable and is known as "composite video." An option known as "S-video" or "Y/C video" keeps the luma separate from the color signals, using one cable, but with separate wires internally. S-video is a bit sharper than composite video.

Component Video

When luma and each of the color signals (B-Y and R-Y) are maintained in separate channels, it is called "component video," designated as YPbPr when in the analog domain and YCbCr when it is digital.

ASIC

An **A**pplication-**S**pecific **I**ntegrated **C**ircuit (ASIC) is an integrated circuit (IC) customized for a particular use, rather than intended for general-purpose use.

The End