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1. Alignment procedure (for function adjustment)

The list of necessary alignment for a LCD monitor

Items	Description	Remark
1	Geometry adjustment & checking	For Preset timing modes
2	ADC calibration (White balance adjustment)	UVGA7 (1024x768/75Hz)
3	Color temperature measurement	C1/Bluish, C2/Reddish & C3/Normal
4	Writing EDID data into monitor	Analog/DVI-D

A. Preparation

1. Setup input timing to any preset modes or patterns.
2. Enter factory mode (press “Exit” & “Enter” & “Power” buttons at the same time to turn on monitor).
3. Press “iKey” into “Burn In Mode” tag and select “On” to enable burn-in mode.
4. Power off the monitor, remove the input source and then power on again.
5. Setup unit and keep it warm up for at least 30 minutes.

B. Geometry adjustment & checking (for preset timing modes)

1. Enter factory mode (press “Exit” & “Enter” & “Power” buttons at the same time to turn on monitor).
2. Select timing mode from figure-1 and input full screen display pattern to monitor.
3. Select “Auto Adjust” to run “AUTO” function for geometry adjustment.
4. Check if the position, phase and clock of the image are correct to make sure controlled functions and performance are O.K..
5. Select “Recall All ” to erase user settings.
6. Turn off the monitor power.
7. Turn on the monitor power again to check if monitor’s image settings are O.K. and with following settings.

CONTRAST = 50

BRIGHTNESS = 90

COLOR = Normal (default setting)

OSD time = 20

Figure-1: Preset Timing modes list

Input Timing				Actual Output			
Resolution	Horizontal Frequency (KHz)	Vertical Frequency (Hz)	Dot Clock Frequency (MHz)	Actual display Resolution	OK	N.A	Remark
720x400	31.47(N)	70.08(P)	28.32	1280x1024	√		DOS
800x600	46.87(P)	75.00(P)	49.5	1280x1024	√		VESA
1024x768	48.36(N)	60.00(N)	65.00	1280x1024	√		VESA
1024x768	60.02(P)	75.00(P)	78.75	1280x1024	√		VESA
1152x870	68.68(N)	75.06(N)	100.00	1280x1024	√		Mac
1152x900	71.81(N)	76.14(N)	108.00	1280x1024	√		VESA
1280x1024	80.00(P)	75.00(P)	135.00	1280x1024	√		VESA
1280x1024	81.18(N)	76.16(N)	135.09	1280x1024	√		SUN

C. ADC calibration (White Balance)

~~Analog only, it is not required for DVI-D input source

Alignment Procedure

1. Setup input timing UVGA7 (1024x768/75Hz), pattern 42 (5-Mosaic pattern with white color block) with Analog signals from Chroma video pattern generator. (it depends on Scaler IC supplier's recommendation)
2. Enter factory mode (press "Exit" & "Enter" & "Power" buttons at the same time to turn on monitor).
3. Press "iKey" into "Burn In Mode" tag and select "On" to enable burn-in mode.
4. Change color temperature from "Normal" (default) to "User Preset".
5. Press hot-key "CONTRAST" to run "White Balance" function. (This procedure will get optimal gain/offset (clamp) values)
6. Checking if the picture is O.K., or reject this monitor and check its circuit board or wire/cable connection.

D. Color temperature measurement

1. Setup input timing ICL-605 (1280x1024/75Hz), pattern 41 (full white color pattern) with Analog signals from Chroma video pattern generator.
2. Make sure ADC calibration (White Balance) had already been done.
3. Measure color temperature C1/Bluish, C2/Reddish & C3/Normal to meet following spec. requirement by Minolta CA-110 (or equivalent equipment).

Color temperature (C1/9300K/Bluish set on OSD)	X+-	0.283+(-) 0.03
	Y+-	0.297+(-) 0.03
Color temperature (C2/5800K/Reddish set on OSD)	X+-	0.326+(-) 0.03
	Y+-	0.342+(-) 0.03
Color temperature (C3/6500K/sRGB set on OSD)	X+-	0.313+(-) 0.03
	Y+-	0.329+(-) 0.03

4. Turns off the monitor power.

E. Writing EDID data into monitor

1. Setup a PC with DDC card.
2. Connect PC to monitor with a D-sub signal cable.
3. Please refer to the C212 for the correct EDID file.
4. Runs the writing program to write the **analog EDID data** into EEPROM for analog input (ie. 15-pin D-sub).
5. Repeat step 4 and write the **digital EDID data** into EEPROM for DVI-D input (ie. 24-pin DVI-D).
6. Read both EEPROM data and confirm it to match with the C212 definition.

(Note: The DVI-D input may not operation correctly if the digital EDID data do not exist.)

F. Command definition

PC Host will send 0x7C IIC slave address and then following 4 bytes command

I2C Send Command	Byte1	Byte2	Byte3	Byte4	OK	N.A.	Remark
Write Contrast to MCU RAM	CA	55	Data	cksum	✓		Write data to MCU RAM and update the related register to refresh the screen immediately. Don't store data to EEPROM.
Write Brightness to MCU RAM	CA	56	Data	cksum	✓		
Write Red Gain to MCU RAM	CA	57	Data	cksum	✓		
Write Green Gain to MCU RAM	CA	58	Data	cksum	✓		
Write Blue Gain to MCU RAM	CA	59	Data	cksum	✓		
Read Contrast from MCU RAM	C3	55	XX	cksum	✓		
Read Brightness from MCU RAM	C3	56	XX	cksum	✓		
Read Red Gain from MCU RAM by color index	C3	57	XX	cksum	✓		Base on current color index to read back the right gain value.
Read Green Gain from MCU RAM by color index	C3	58	XX	cksum	✓		
Read Blue Gain from MCU RAM by color index	C3	59	XX	cksum	✓		

Write C1 (Bluish) R-Gain Data to EEPROM	AA	3C	Data	cksum	✓		
Write C1 (Bluish) G-Gain Data to EEPROM	AA	3D	Data	cksum	✓		
Write C1 (Bluish) B-Gain Data to EEPROM	AA	3E	Data	cksum	✓		
Write C2 (sRGB) R-Gain Data to EEPROM	AA	4C	Data	cksum	✓		
Write C2 (sRGB) G-Gain Data to EEPROM	AA	4D	Data	cksum	✓		
Write C2 (sRGB) B-Gain Data to EEPROM	AA	4E	Data	cksum	✓		
Write C3 (Reddish) R-Gain Data to EEPROM	AA	5C	Data	cksum	✓		
Write C3 (Reddish) G-Gain Data to EEPROM	AA	5D	Data	cksum	✓		
Write C3 (Reddish) B-Gain Data to EEPROM	AA	5E	Data	cksum	✓		
Write User R-Gain Data to EEPROM	AA	6C	Data	cksum	✓		
Write User G-Gain Data to EEPROM	AA	6D	Data	cksum	✓		
Write User B-Gain Data to EEPROM	AA	6E	Data	cksum	✓		
Write Cx R-Gain Data to EEPROM	AA	7C	Data	cksum		✓	Reserved for some model have extra color temperature
Write Cx G-Gain Data to EEPROM	AA	7D	Data	cksum		✓	
Write Cx B-Gain Data to EEPROM	AA	7E	Data	cksum		✓	
Write Contrast to EEPROM	AA	92	Data	cksum	✓		
Write Brightness to EEPROM	AA	93	Data	cksum	✓		
							1=C1/9300/Bluish, 2=C2/6500/Normal, 3=C3/5800/Reddish, 4=User, 5=Cx
Write C/T index to EEPROM	AA	94	0~4	cksum	✓		
Write OSD-Hpos to EEPROM	AA	95	Data	cksum	✓		
Write OSD-Vpos to EEPROM	AA	96	Data	cksum	✓		
							0=DE, 1=EN, 2=ES, 3=FR, 4=IT, 5=JA, 6=繁中, 7=簡中 (Also Update MCU RAM)
Write Language to EEPROM	AA	97	0~7	cksum	✓		
Write EEPROM OSD Timer	AA	98	Data	cksum	✓		
Write EEPROM Volume	AA	99	Data	cksum	✓		
Write EEPROM Gamma index	AA	9A	Data	cksum		✓	For model with Gamma curve selection function
Write OSD Transparency to EEPROM	AA	9E	Data	cksum		✓	
Write OSD Rotation to EEPROM	AA	9F	Data	cksum		✓	
Read C1 (Bluish) R-Gain data from EEPROM	A3	3C	XX	cksum	✓		
Read C1 (Bluish) G-Gain data from EEPROM	A3	3D	XX	cksum	✓		
Read C1 (Bluish) B-Gain data from EEPROM	A3	3E	XX	cksum	✓		
Read C2 (sRGB) R-Gain data from EEPROM	A3	4C	XX	cksum	✓		
Read C2 (sRGB) G-Gain data from EEPROM	A3	4D	XX	cksum	✓		
Read C2 (sRGB) B-Gain data from EEPROM	A3	4E	XX	cksum	✓		
Read C3 (Reddish) R-Gain data from EEPROM	A3	5C	XX	cksum	✓		
Read C3 (Reddish) G-Gain data from EEPROM	A3	5D	XX	cksum	✓		
Read C3 (Reddish) B-Gain data from EEPROM	A3	5E	XX	cksum	✓		
Read User R-Gain data from EEPROM	A3	6C	XX	cksum	✓		
Read User G-Gain data from EEPROM	A3	6D	XX	cksum	✓		
Read User B-Gain data from EEPROM	A3	6E	XX	cksum	✓		
Read Cx R-Gain data from EEPROM	A3	7C	XX	cksum		✓	Reserved for some model have

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Alignment Procedure

Read Cx G-Gain data from EEPROM	A3	7D	XX	cksum	✓	✓	extra color temperature
Read Cx B-Gain data from EEPROM	A3	7E	XX	cksum	✓	✓	
Read Contrast from EEPROM	A3	92	XX	cksum	✓		
Read Brightness from EEPROM	A3	93	XX	cksum	✓		
Read C/T index from EEPROM	A3	94	XX	cksum	✓		1=C1/9300/Bluish, 2=C2/6500/Normal 3=C3/5800/Reddish, 4=User, 5=Cx
Read OSD-Hpos EEPROM	A3	95	XX	cksum	✓		
Read OSD-Vpos from EEPROM	A3	96	XX	cksum	✓		
Read Language from EEPROM	A3	97	XX	cksum	✓		0=DE, 1=EN, 2=ES, 3=FR, 4=IT, 5=JA, 6=繁中, 7=簡中
Read OSD Timer from EEPROM	A3	98	XX	cksum	✓		
Read Volume from EEPROM	A3	99	XX	cksum	✓		
Read Gamma index from EEPROM	A3	9A	XX	cksum		✓	For model with Gamma curve selection function
Read OSD Transparency from EEPROM	A3	9E	XX	cksum		✓	
Read OSD Rotation from EEPROM	A3	9F	XX	cksum		✓	
Change Color Temp. to C1/9300K/Bluish	CC	01	XX	cksum	✓		Change C/T immediately. And store C/T index to EEPROM.
Change Color Temp. to C2/6500K/sRGB	CC	02	XX	cksum	✓		
Change Color Temp. to C3/5800K/Reddish	CC	03	XX	cksum	✓		
Change Color Temp. to User	CC	04	XX	cksum	✓		
Change Color Temp. to Cx	CC	05	XX	cksum		✓	Reserved
Change Input Source to D-Sub	CD	01	XX	cksum		✓	
Change Input Source to DVI	CD	02	XX	cksum		✓	
On burn in mode	CE	01	XX	cksum	✓		Store data to EEPROM
Off burn in mode	CE	XX*	XX	cksum	✓		XX* = Non "1" value Store data to EEPROM
Monitor is forced power saving	CF	01	XX	cksum		✓	
Monitor wake up from power saving	CF	XX*	XX	cksum		✓	XX* = Non "1" value
User mode to factory mode	1A	5A	XX	cksum	✓		
Auto Color (Offset1, Offset2, Gain)	1B	5A	XX	cksum		✓	
Copy EDID Serial number to EEPROM	1C	5A	XX	cksum		✓	For specified "Industry Customer" model.
Factory mode to User mode	1E	5A	XX	cksum	✓		
Clear user mode and factory recall	1F	5A	XX	cksum	✓		Store data to EEPROM
Write EDID data to MCU DDC RAM	55	NA	NA	NA	✓		For MTV312 MCU type
Copy DDC RAM data to EEPROM	BB	NA	NA	NA	✓		For MTV312 MCU type
Drive WP pin to low to enable write DDC IC	55	NA	NA	NA		✓	For stand alone DDC IC
Drive WP pin to high to disenable write function	BB	NA	NA	NA		✓	For stand alone DDC IC
EEPROM Bank R/W (For Debug using only, not for Production Line Write EEPROM directly)							
Read EEPROM Bank 0	B0	Address	XX	cksum	✓		
Read EEPROM Bank 1	B1	Address	XX	cksum	✓		
Read EEPROM Bank 2	B2	Address	XX	cksum		✓	(For 24C08 type)
Read EEPROM Bank 3	B3	Address	XX	cksum		✓	(For 24C08 type)
Write EEPROM Bank 0	B8	Address	Data	cksum	✓		
Write EEPROM Bank 1	B9	Address	Data	cksum	✓		

Write EEPROM Bank 2	BA	Address	Data	cksum	✓	(For 24C08 type)
Write EEPROM Bank 3	BB	Address	Data	cksum	✓	(For 24C08 type)

Note A: Byte4 (cksum) = Byte1 + Byte2 + Byte3

Note B: Data = The value write to MCU or EEPROM

Note C: XX = don't care, any value (<=0xFF).

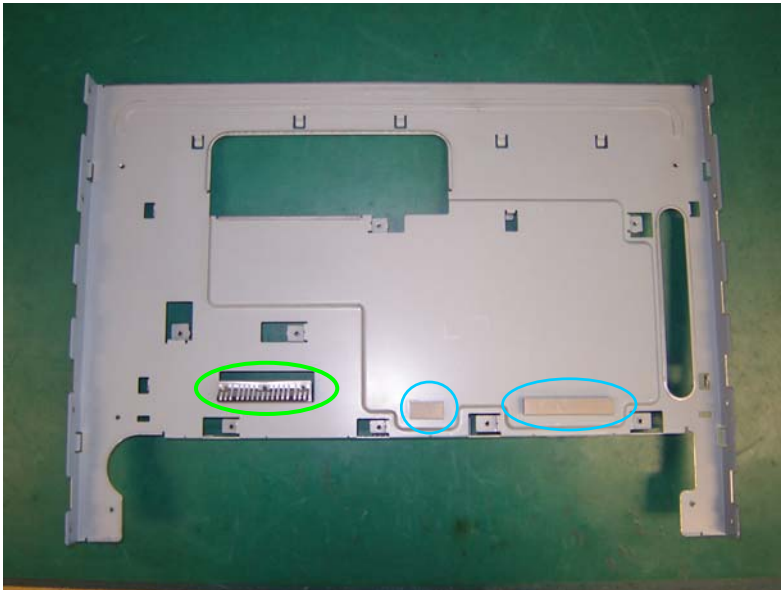
When PC Host sends 0x7D command to MCU, MCU must return as following (2 bytes)

Return Code	R-Byte1	R-Byte2
Checksum error code	FC	AA
Normal return code	the above Byte3 (/data)	FC
If normal return code is exact FCh	FC	CF

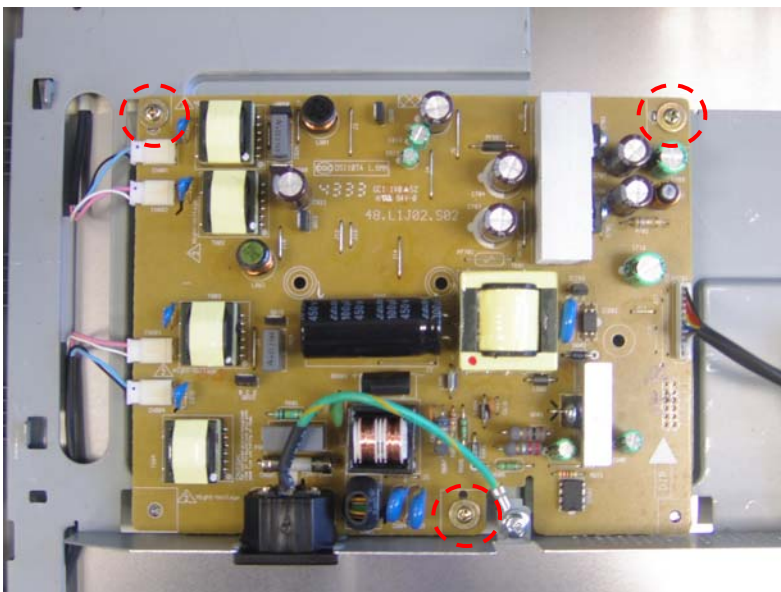
2. EEPROM mapping

User Area	Private Area																	
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F		
0	EDID DATA																	
10																		
20																		
30																		
40																		
50																		
60																		
70																		
80	MonitorFlag	PowerOnValue	BurnInEriValue	Brightness	Contrast	ColorTemp	Language	ManagementFlag	OsdHStart	OsdVStart	OsdTime	OsdTransparency	TotalMin				80	
90	BackLightMin				InputType	UserModelIndex	Sharpness	checksum									90	
A0	AdcRedGain	AdcGreenGain	AdcBlueGain	AdcRedOffset	AdcGreenOffset	AdcBlueOffset	FAdcRedGain	FAdcGreenGain	FAdcBlueGain	FAdcRedOffset	FAdcGreenOffset	FAdcBlueOffset	RedColor	GreenColor	BlueColor	RedColor300K	A0	
B0	GreenColor300K	BlueColor300K	RedColor500K	GreenColor500K	BlueColor500K	RedColor500K	GreenColor500K	BlueColor500K	UserRedGain	UserGreenGain	UserBlueGain						B0	
C0	SrcHFreq		SrcVFreq		SrcPolarity	ModeIndex	Hstart	Vstart			Htotal		Phase	AutoTimes	Default Hstart		C0	
D0	Default VStart		Default Htotal		Mode 1												D0	
E0	Mode 1								Mode 2								E0	
F0	Mode 2								Mode 3								F0	
100	Mode 3								Mode 4									
110	Mode 4								Mode 5									
120	Mode 5								Mode 6									
130	Mode 6								Mode 7									
140	Mode 7								Mode 8									
150	Mode 8								Mode 9									
160	Mode 9								Mode 10									
170	Mode 10								Mode 11									
180	Mode 11								Mode 12									
190	Mode 12								Mode 13									
1A0	Mode 13								Mode 14									
1B0	Mode 14								Mode 15									
1C0	Mode 15																	
1D0																		
1E0																		
1F0																		

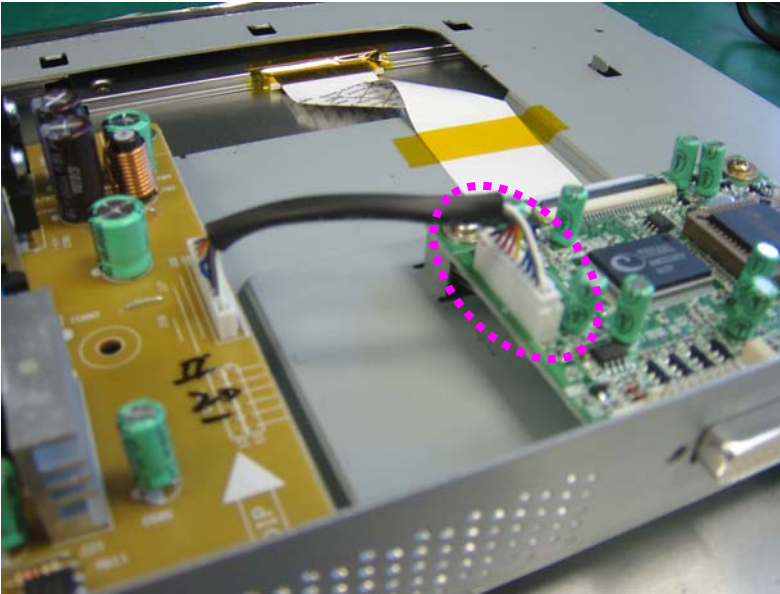
3. Wire Dressing
- Assembly note



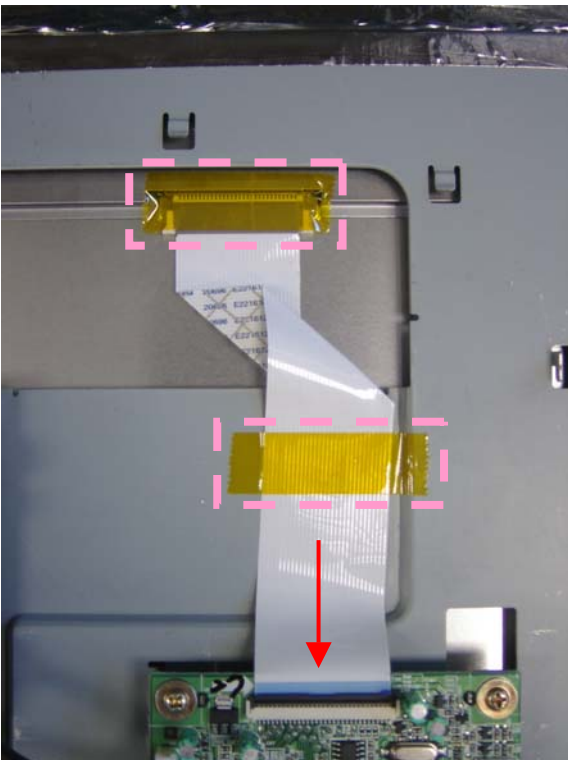
A. Make sure the spring and gaskets are attached on main bracket.



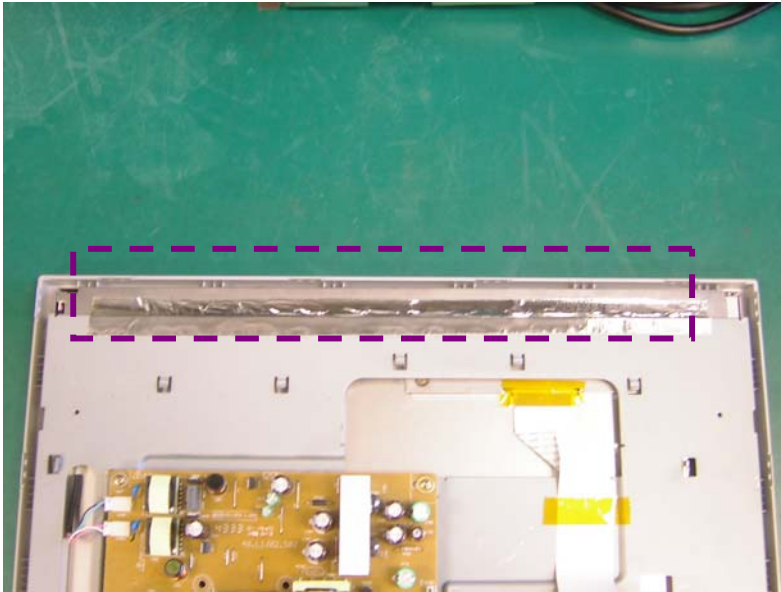
B. Screw up **only 3 points** on Power BD.



C. Connect Power BD with I/F BD by wire.



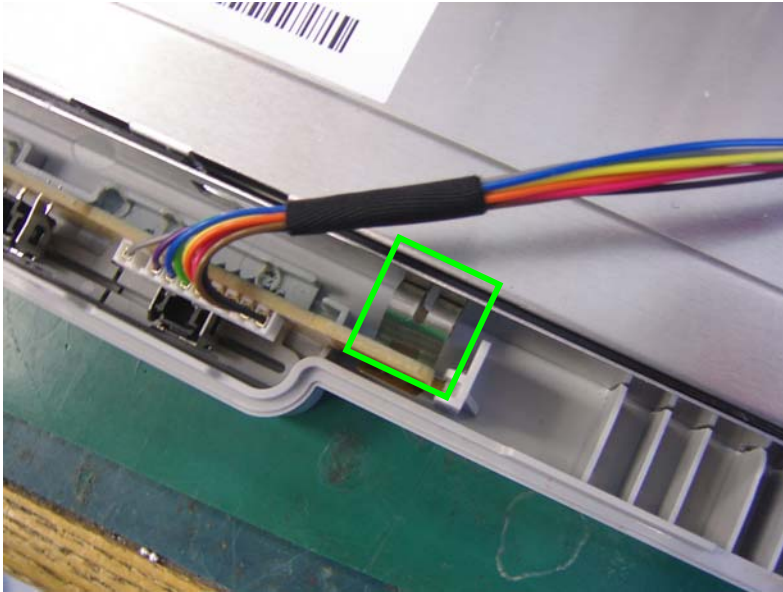
D. Stick yellow tapes on LVDS FFC.



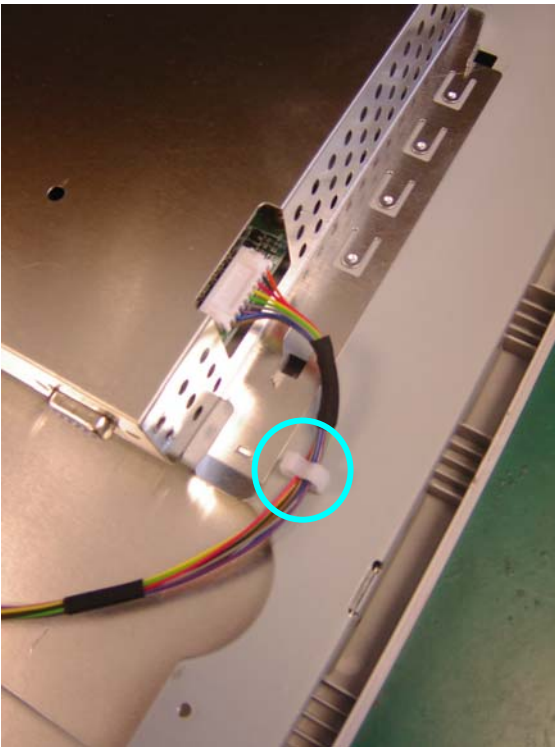
E. Stick AL foil to cover the gap between panel and main bracket.



F. Fix the main shielding by connector screws.

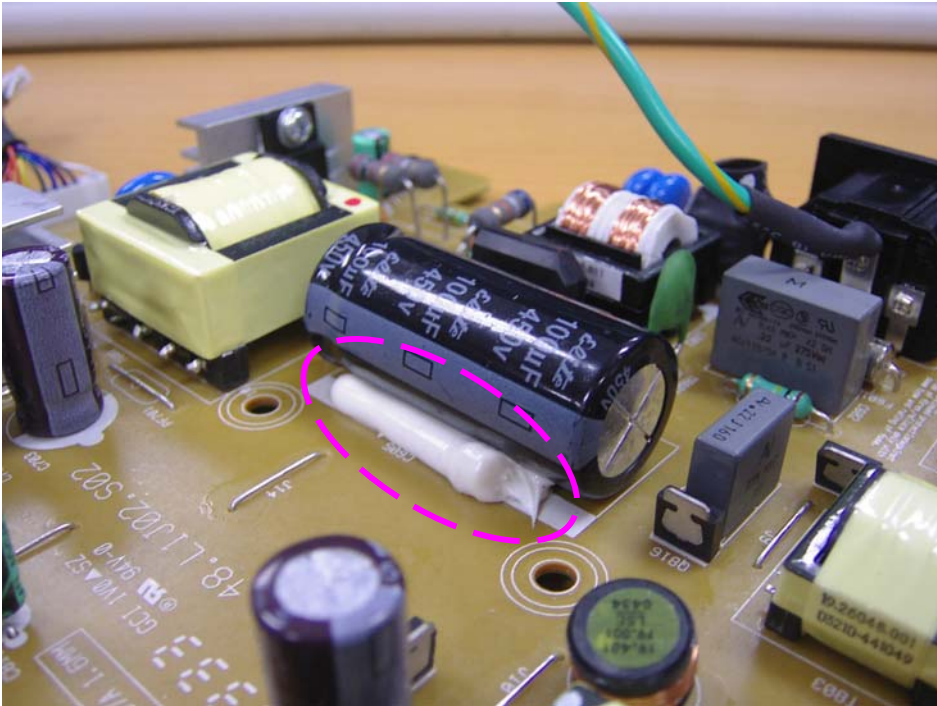


G. Add spring between Ctrl BD and panel.



H. Fix the Ctrl BD wire by clip.

4. Add Glue



C605 (Power BD)