



LCD-Monitor

Chassis

LS19HAA

Model

940N

19"

SERVICE Manual

LCD Monitor



Fashion Feature

- Lustrous/Colorful Appearance (Design)
- Integrated UI applied
- Built-in Scaler Sync Separator

- Connectivity : Analog (15p Dsub),
Dual (24p DVI-D)
- Power Consumption : 19"(38W)
- DPMS : under 1 W (230Vac)



-This Service Manual is a property of Samsung Electronics Co., Ltd.
Any unauthorized use of Manual can be punished under applicable International and/or domestic law.

Samsung Electronics Co.,Ltd.
416, Maetan-3Dong, Yeongtong-Gu, Suwon City,
Gyeonggi-Do, Korea, 443-742
Printed in Korea
P/N : BN82-00133M-00
URL : <http://itself.sec.samsung.co.kr/>

1 Precautions

Follow these safety, servicing and ESD precautions to prevent damage and to protect against potential hazards such as electrical shock.

1-1 Safety Precautions

1-1-1 Warnings

1. For continued safety, do not attempt to modify the circuit board.
2. Disconnect the AC power and DC power jack before servicing.

1-1-2 Servicing the LCD Monitor

1. When servicing the LCD Monitor, Disconnect the AC line cord from the AC outlet.
2. It is essential that service technicians have an accurate voltage meter available at all times. Check the calibration of this meter periodically.

1-1-3 Fire and Shock Hazard

Before returning the monitor to the user, perform the following safety checks:

1. Inspect each lead dress to make certain that the leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the monitor.
2. Inspect all protective devices such as nonmetallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacitor networks, mechanical insulators, etc.
3. Leakage Current Hot Check (Figure 1-1):

WARNING : Do not use an isolation transformer during this test.

Use a leakage current tester or a metering system that complies with American National Standards Institute (*ANSI C101.1, Leakage Current for Appliances*), and Underwriters Laboratories (*UL Publication UL1410, 59.7*).

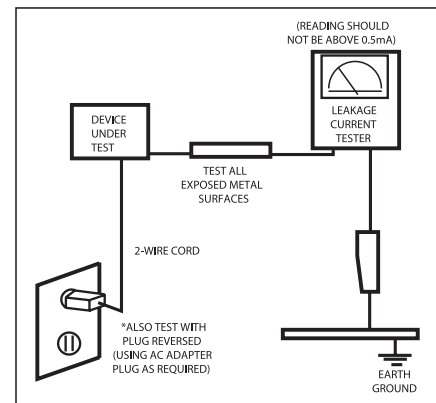


Figure 1-1. Leakage Current Test Circuit

4. With the unit completely reassembled, plug the AC line cord directly into a 120V AC outlet. With the unit's AC switch first in the ON position and then OFF, measure the current between a known earth ground (metal water pipe, conduit, etc.) and all exposed metal parts, including: metal cabinets, screwheads and control shafts. The current measured should not exceed 0.5 milliamp. Reverse the power-plug prongs in the AC outlet and repeat the test.

1-1-4 Product Safety Notices

Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection. The protection they give may not be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by \triangle on schematics and parts lists. A substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire and/or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate.

1 Precautions

1-2 Servicing Precautions

WARNING: An electrolytic capacitor installed with the wrong polarity might explode.

Caution: Before servicing units covered by this service manual, read and follow the Safety Precautions section of this manual.

Note: If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions, always follow the safety precautions.

1-2-1 General Servicing Precautions

1. Always unplug the unit's AC power cord from the AC power source and disconnect the DC Power Jack before attempting to:
(a) remove or reinstall any component or assembly, (b) disconnect PCB plugs or connectors, (c) connect a test component in parallel with an electrolytic capacitor.
2. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring is sometimes clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.
3. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the area around the serviced part has not been damaged.
4. Check the insulation between the blades of the AC plug and accessible conductive parts (examples: metal panels, input terminals and earphone jacks).
5. Insulation Checking Procedure: Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500 V) to the blades of the AC plug.
The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 megohm.
6. Always connect a test instrument's ground lead to the instrument chassis ground before connecting the positive lead; always remove the instrument's ground lead last.

1-3 Static Electricity Precautions

Some semiconductor (solid state) devices can be easily damaged by static electricity. Such components are commonly called Electrostatically Sensitive Devices (ESD). Examples of typical ESD are integrated circuits and some field-effect transistors. The following techniques will reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. To avoid a shock hazard, be sure to remove the wrist strap before applying power to the monitor.
2. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of an electrostatic charge.
3. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ESDs.
4. Use only a grounded-tip soldering iron to solder or desolder ESDs.
5. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ESDs.
6. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.
7. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.
Caution:
Be sure no power is applied to the chassis or circuit and observe all other safety precautions.
8. Minimize body motions when handling unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting your foot from a carpeted floor can generate enough static electricity to damage an ESD.

1-4 Installation Precautions

1. For safety reasons, more than two people are required for carrying the product.
2. Keep the power cord away from any heat emitting devices, as a melted covering may cause fire or electric shock.
3. Do not place the product in areas with poor ventilation such as a bookshelf or closet. The increased internal temperature may cause fire.
4. Bend the external antenna cable when connecting it to the product. This is a measure to protect it from being exposed to moisture. Otherwise, it may cause a fire or electric shock.
5. Make sure to turn the power off and unplug the power cord from the outlet before repositioning the product. Also check the antenna cable or the external connectors if they are fully unplugged. Damage to the cord may cause fire or electric shock.
6. Keep the antenna far away from any high-voltage cables and install it firmly. Contact with the high-voltage cable or the antenna falling over may cause fire or electric shock.
7. When installing the product, leave enough space (10cm) between the product and the wall for ventilation purposes.
A rise in temperature within the product may cause fire.

2 Product Specifications

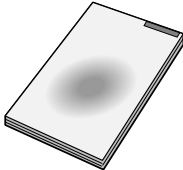
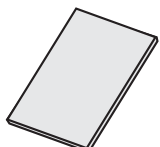
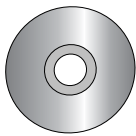


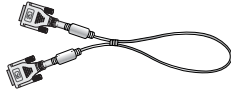
2-1 Fashion Feature

- Develop Cost Effective Model
- LCD Monitor Standardization/Develop Concept-leading Product
- Develop New Design & Advanced Stand
- Apply integrated GUI for the user's convenience

2-2 LS19HAB/LS19HAT Specifications

Item	Description	
	LS19HAB	LS19HAT
LCD Panel	TFT-LCD panel, RGB vertical stripe, normally black transmissive, 19-Inch viewable, 0.264 (H) x 0.264 (V) mm pixel pitch	
Scanning Frequency	Horizontal : 30 kHz ~ 81 kHz (Automatic) Vertical : 56 Hz ~ 75 Hz	
Display Colors	16.7 Million colors	
Maximum Resolution	Horizontal : 1280 Pixels Vertical : 1024 Pixels	
Input Video Signal	Analog, 0.7 Vp-p ± 1% positive at 75Ω , internally terminated	
Input Sync Signal	Type : Seperate H/V sync, Composite H/V, Sync-on-Green (option), automatic synchronization without external switch of sync type Level : TTL level	
Maximum Pixel Clock rate	135 MHz	
Active Display Horizontal/Vertical	338 ± 3 mm / 270 ± 3 mm	
AC power voltage & Frequency	AC 90 ~ 264 Volts, 60/50 Hz ± 3 Hz	
Power Consumption	40W (Max)	
Dimensions	Simple-Stand	HAS-Stand
Set (W x D x H)	407.6 x 65.4 x 335.0 mm(Without Stand) 407.6 x 217.0 x 421.5 (With Stand)	403.6 x 65.4 x 331.9 mm(Without Stand) 403.2 x 200.0 x 406.4 mm(With Stand)
	4.6 kg	4.9 kg
Environmental Considerations	Operating Temperature : 50°F ~ 104°F (10°C ~ 40°C) Operating Humidity : 10 % ~ 80 % Storage Temperature : -13°F ~ 113°F (-25°C ~ 45°C) Storage Humidity : 5 % ~ 95 %	
- Designs and specifications are subject to change without prior notice.		

2-3 Option Specification

Item	Item Name	CODE.NO	Remark
	Quick Setup Guide	BH68-00376L	
	Warranty Card (Not available in all locations)	BH68-70438A	
	User's Guide, Monitor Driver, Natural Color software, MagicTune software MagicRotation software	BN59-00390Q	
	D-Sub(15 Pin) Cable	BN39-00244B	
	Power Cord	3903-000042	
	DVI Cable	BN39-00341A	Sold separately

3 Alignments and Adjustments

This section of the service manual explains how to use the RS232 JIG.
This function is needed for AD board change and program memory (IC110) change.


3-1 Required Equipment

The following equipment is necessary for adjusting the monitor:

- Computer with Windows 95, Windows 98, or Windows NT.
- MTI-2031 DDC MANAGER JIG

3-2 Automatic Color Adjustment

To input video, use 16 gray or any pattern using black and white.

1. Select english for OSD language.
2. Press the “ (Enter/Source)” key for 5 seconds.

3-3 DDC EDID Data Input

1. Input DDC EDID data when replacing AD PCB.
2. Receive/Download the proper DDC file for the model from HQ quality control department.
Install the below jig (Figure 1) and enter the data.

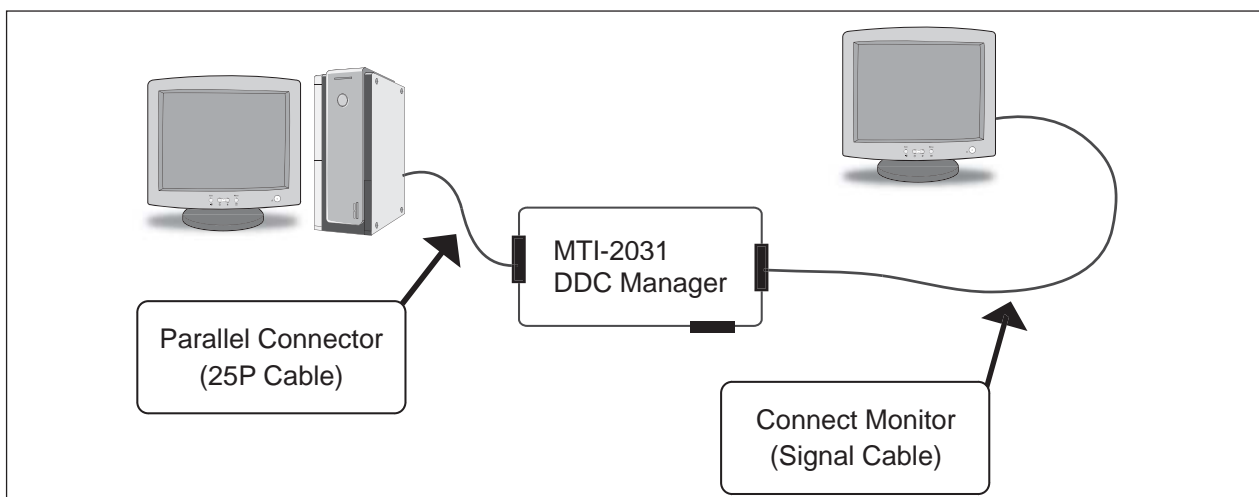



Figure 1.

3-4 OSD Adjustment When Replacing Panel

1. Adjust brightness and contrast to 0. Then, press the  (Enter/Source) key for 5 second.
Service function OSD will appear on screen.
2. Press the + key to place the cursor on the panel. Press the menu key for 5 seconds.


3-5 OSD Adjustment When Replacing Lamp Only

1. Adjust brightness and contrast to 0. Then, press the exit key for 5 seconds.
Service function OSD will appear on the screen.
2. Press the + key. Select upper lamp and press the menu key for 5 seconds.
Then, select lower lamp and press the menu key for 5 seconds.

-Note : Please be sure to read the following instructions for details on service function.

3-6 Service Function Spec.

3-6-1 How to Display Service Function OSD

1. The value for brightness and contrast should be changed to zero.
 2. Within 5 seconds, press the  (Enter/Source) key.
 3. Service function OSD will be displayed.
- If you want to disable the service function OSD, you will have to power off.

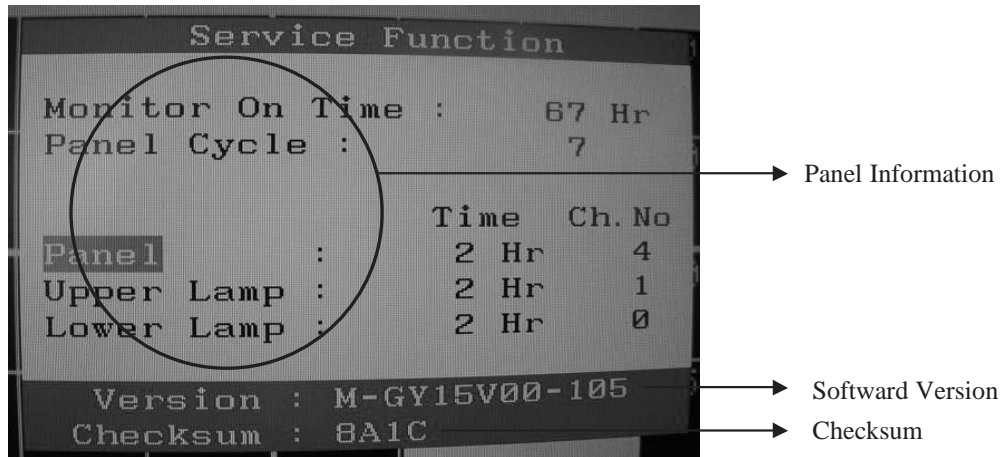


Figure 2. The example of service function OSD

The service function OSD is based on a grid of 29 columns x 12 rows.

The service function OSD consists of panel information, software version and MICOM checksum.

3-6-2 How to Control Service Function OSD

1. With the panel selected on OSD, whenever you press the right key, the base color will change to blue from "Panel" to "Upper Lamp", "Lower Lamp".

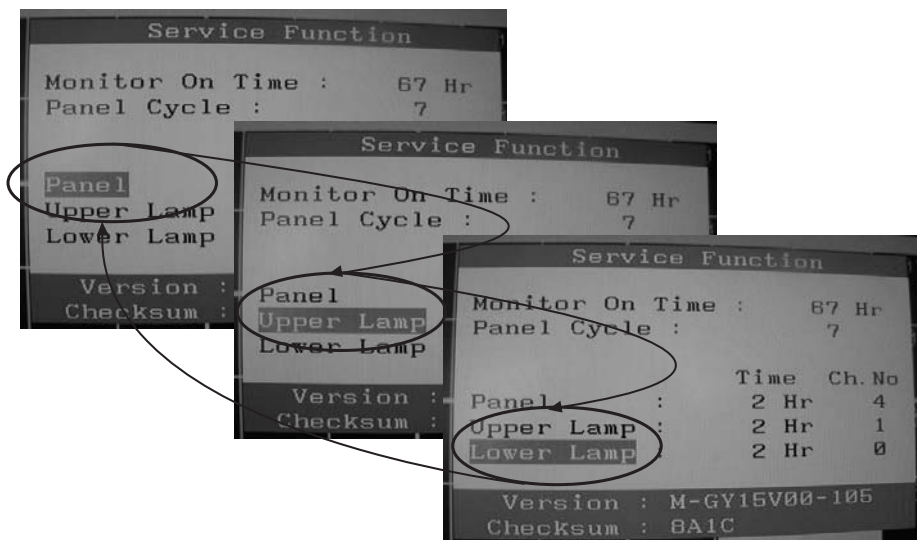


Figure 3.

3-6-3 How to Control Service Function OSD

•After change the panel or lamp, you must reset service function OSD.

•The case of panel change

After changing the panel, press the menu key within 5 seconds,.

Then, panel Ch. No increases one step and the panel time information is reset to zero.

Simultaneously, other information is reset to zero (Upper/Lower lamp, Panel cycle).

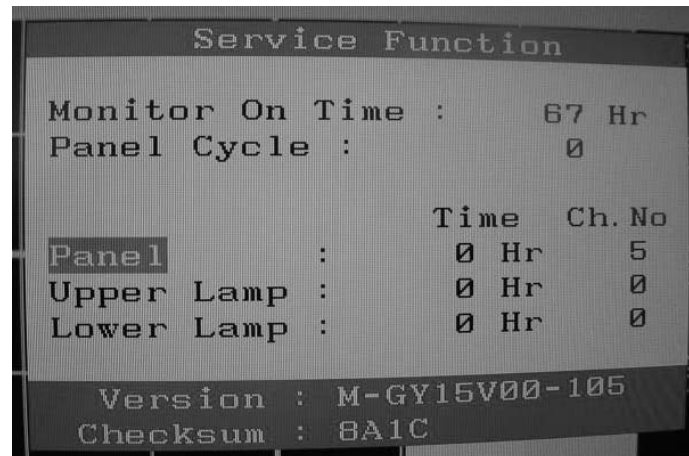


Figure 4.

3-6-4 How to Control Service Function OSD

•In the case of Upper Lamp or Lower Lamp change

After changing the Upper Lamp or Lower Lamp,

1. Select the Upper Lamp or Lower Lamp
2. Press the Menu key within an 5 seconds.

Then, Ch. No and time will be reset to zero (selected item only).

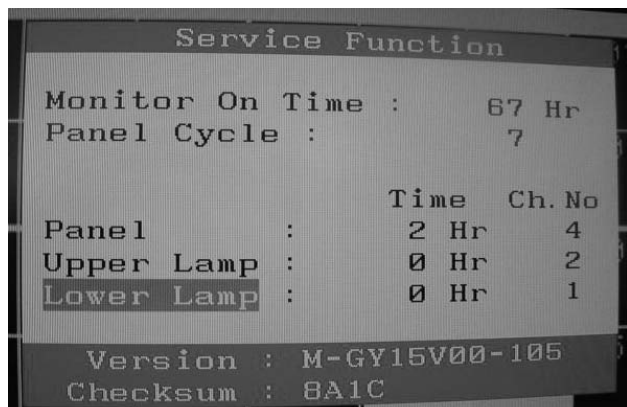
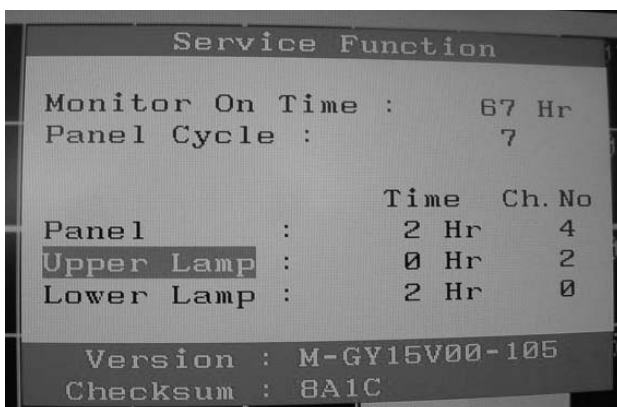
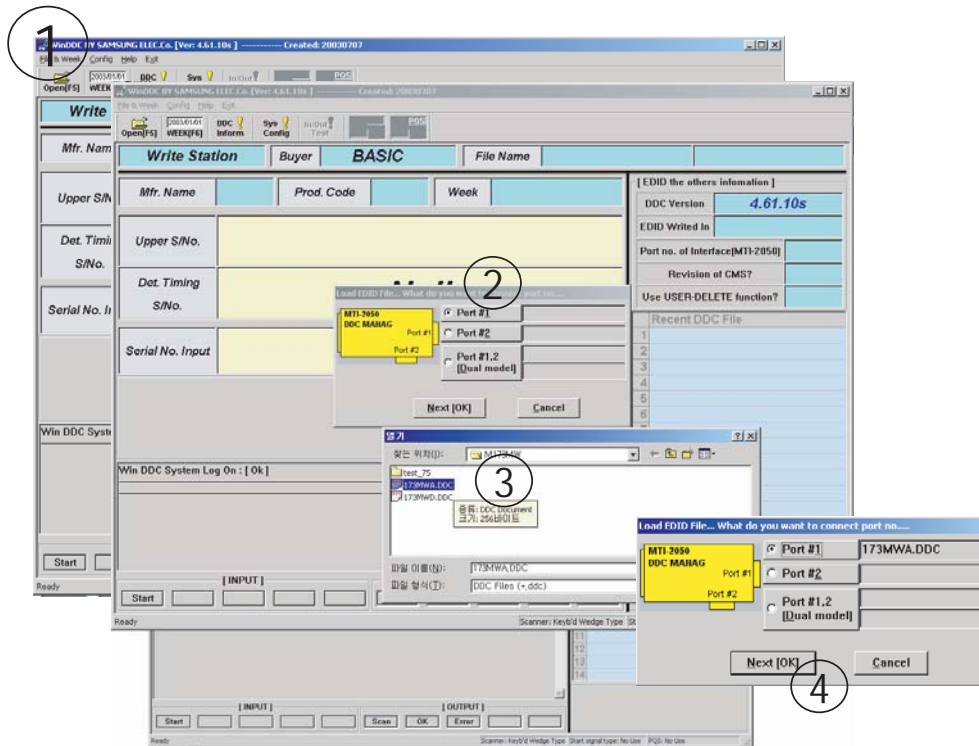


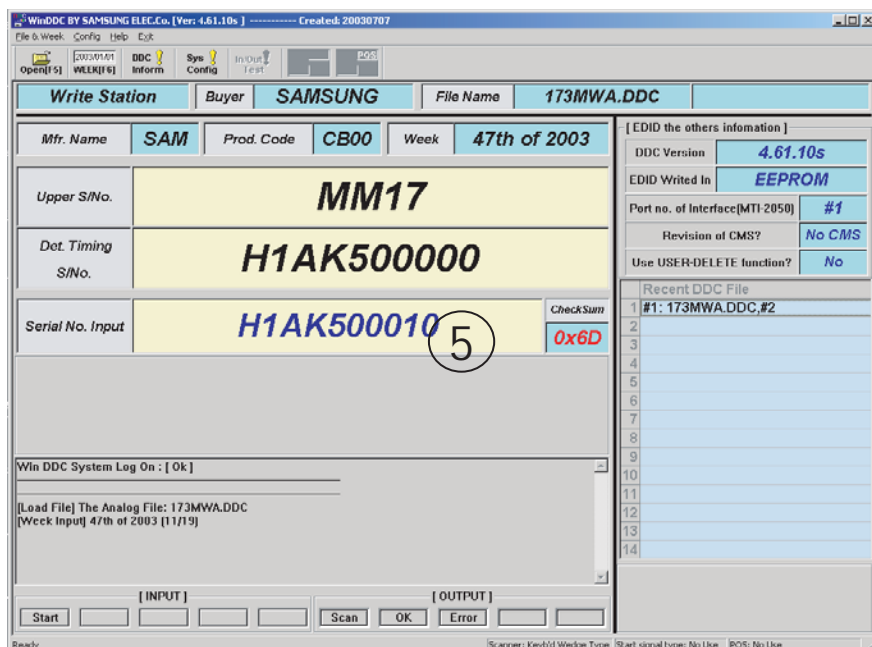
Figure 5, 6.

3 Alignments and Adjustments

3-7 How to execute DDC




1. Open file.
2. Select Port #1.
3. Select DDC file.
4. Click, "Next" Button

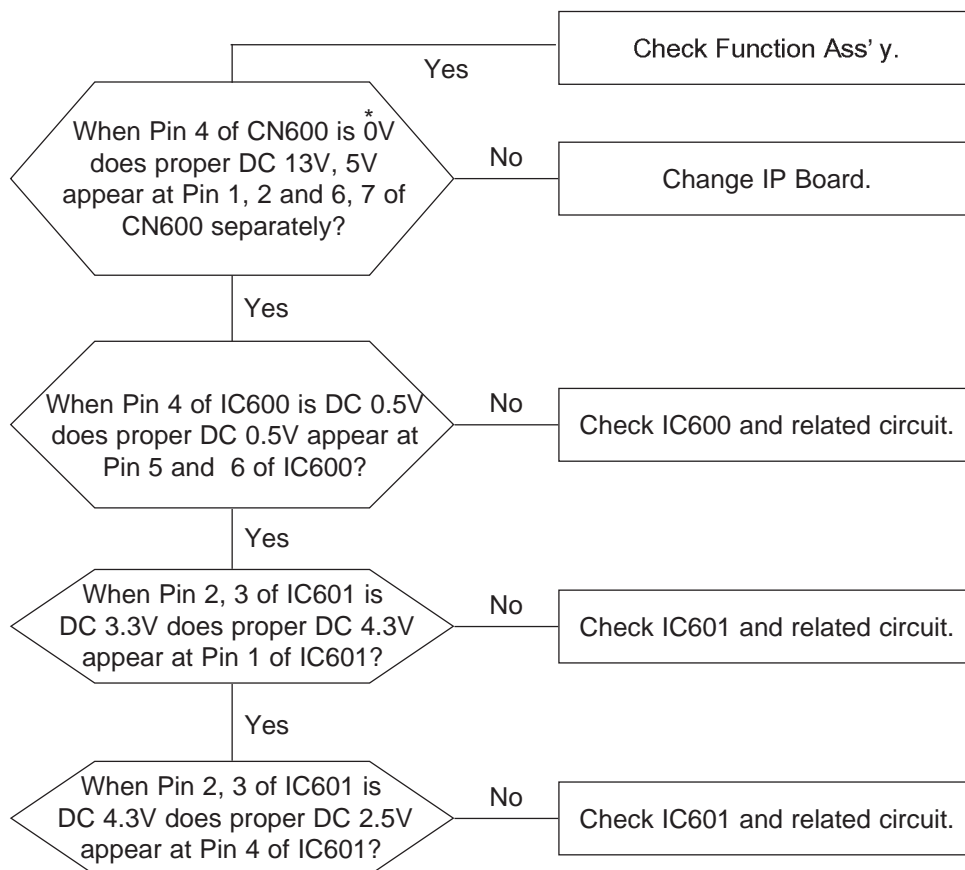


5. Type in the monitor serial number and press Enter.
- *Repeat this step 2 to 5 times in digital inputs after the analog input.

4 Troubleshooting

- Notes:
- Before troubleshooting, setup the PC's display as below.
 - Resolution: 1280 x 1024
 - H-frequency: 64 kHz
 - V-frequency: 60 Hz
 - If no picture appears, make sure the power cord is correctly connected.
 - Check the following circuits.
 - No raster appears: Function PBA, Main PBA, I/P PBA
 - 5V develop but no screen: Main PBA
 - 5V does not develop: I/P PBA
 - If you push and hold the " (Enter/Source)" button for more than 5 seconds, the monitor automatically returns to the factory preset.

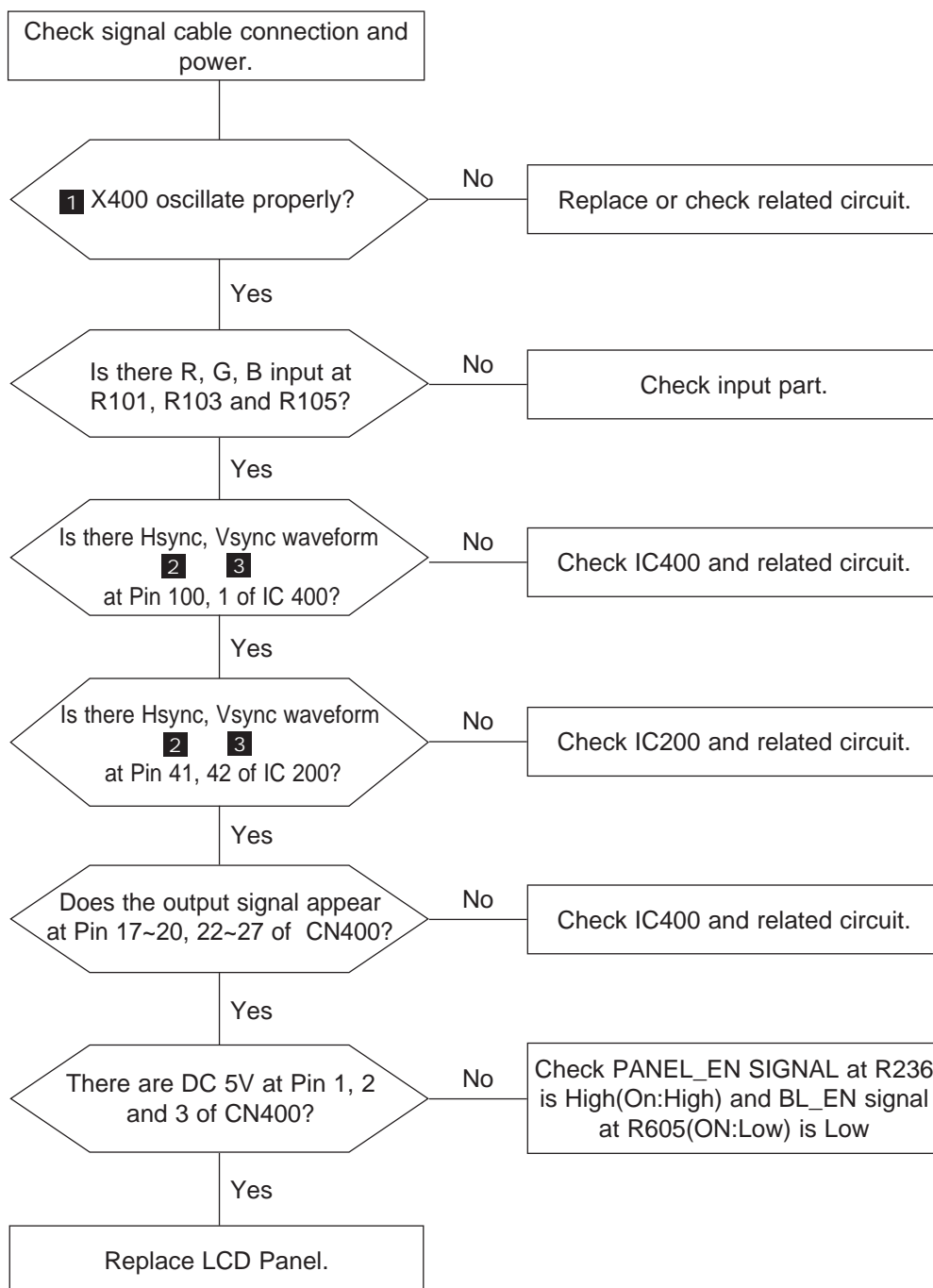
4-1 No Power (LS19HAA/LS19HAT)



* 0V means power on state.

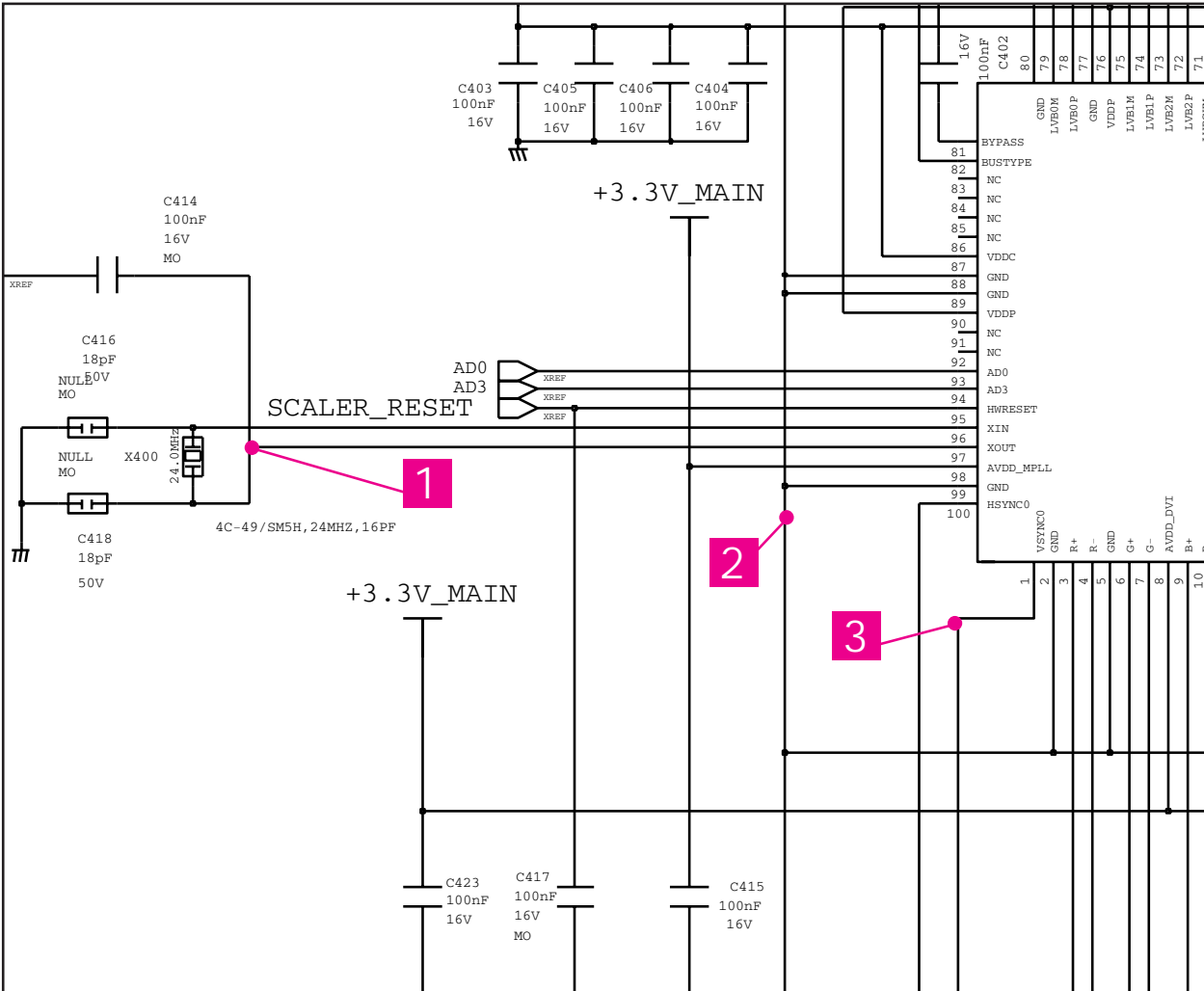
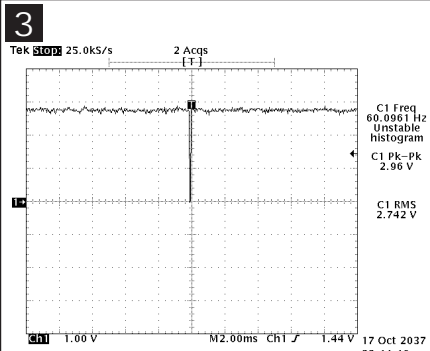
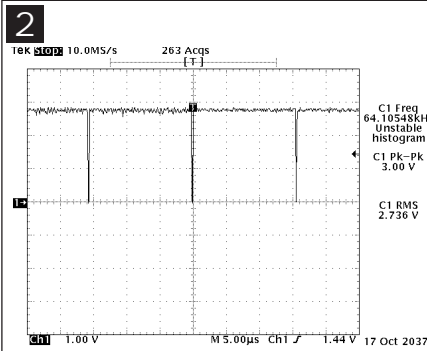
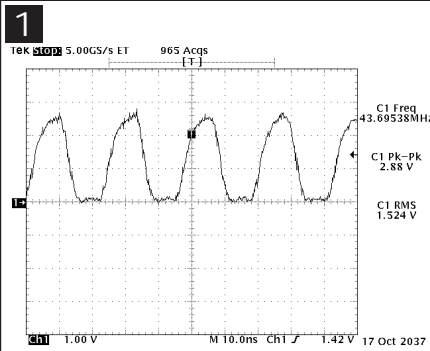
When the monitor work well except DPMS and power switch off,
0V should be applied to number 4 of CN600.

4-2 No Video (ANALOG)

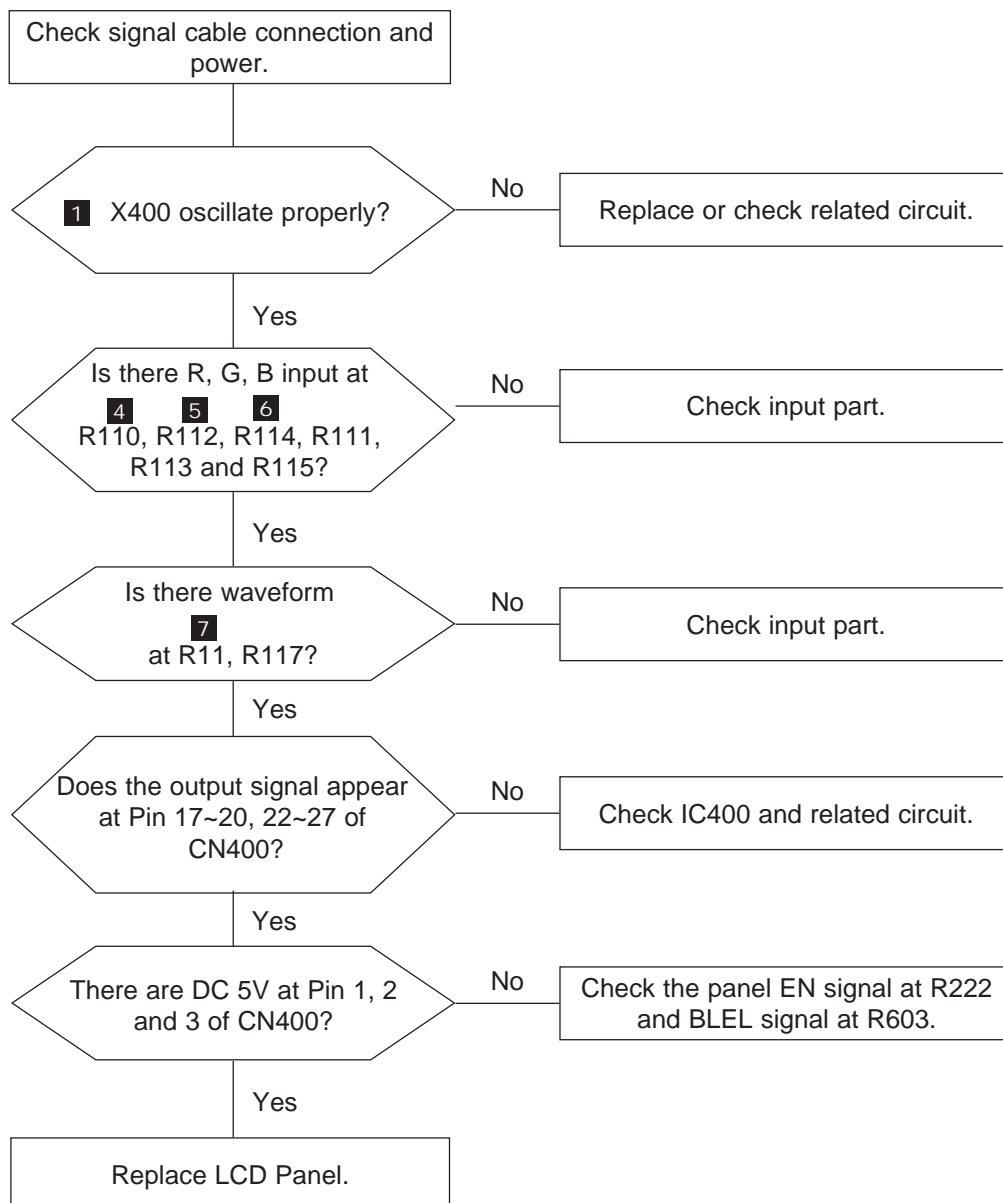


4 Troubleshooting

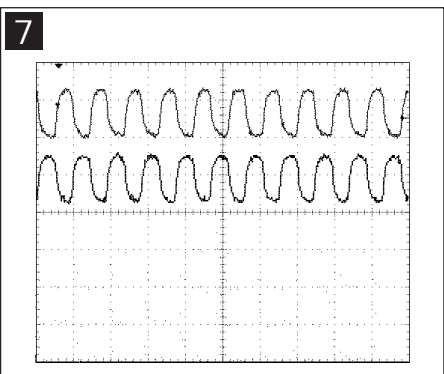
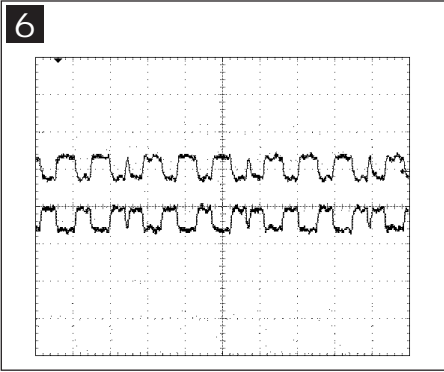
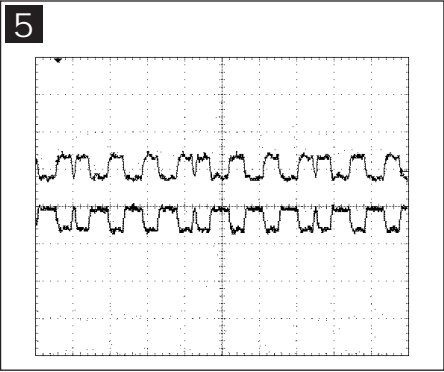
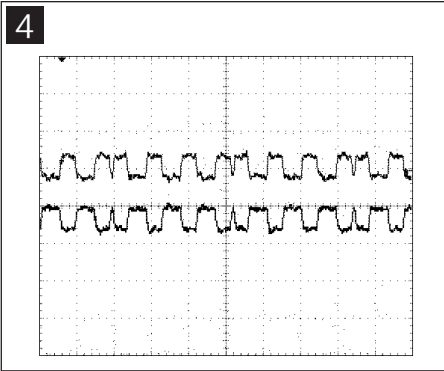
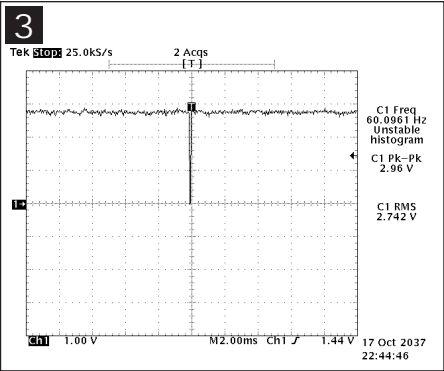
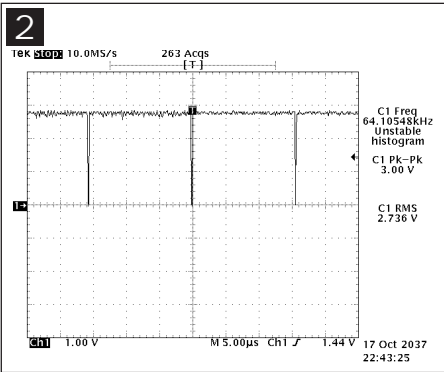
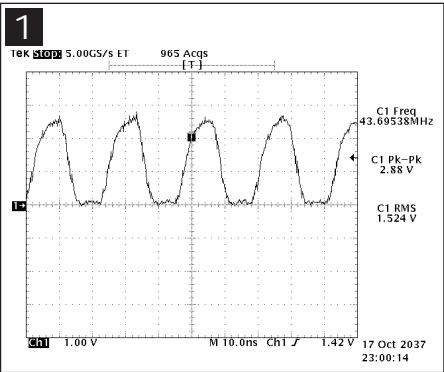
WAVEFORMS

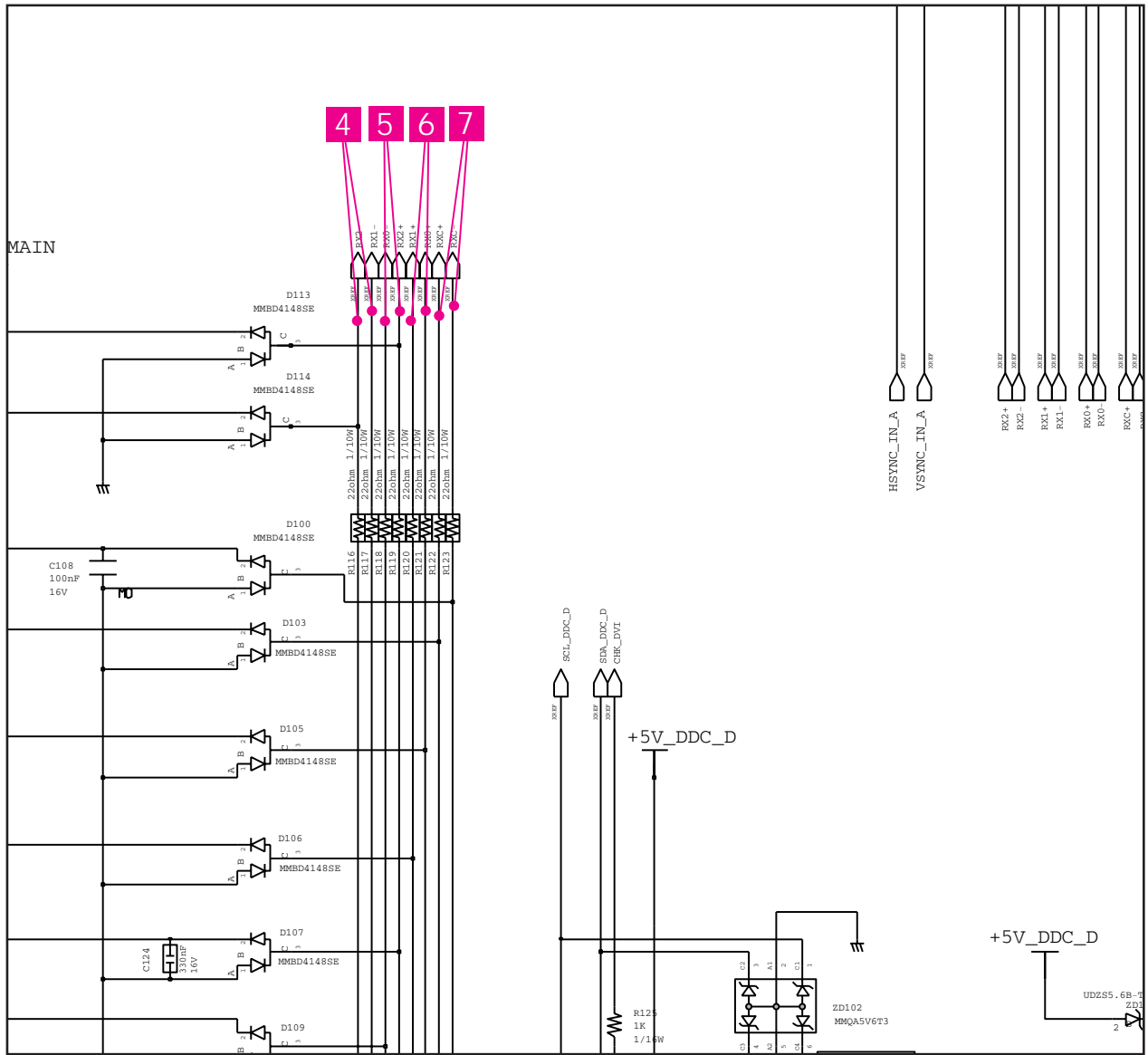


4-3 No Video (DIGITAL)

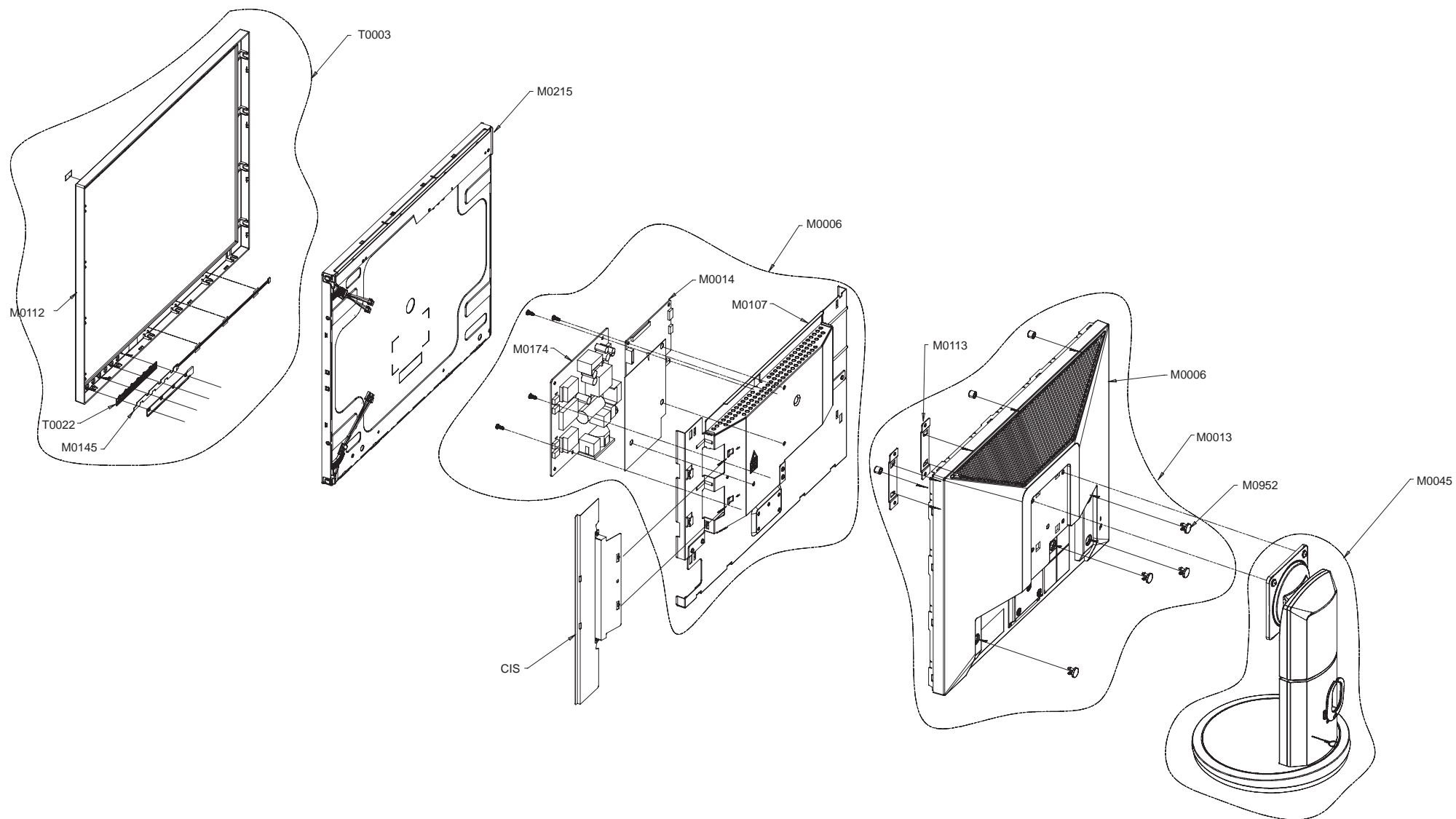


WAVEFORMS





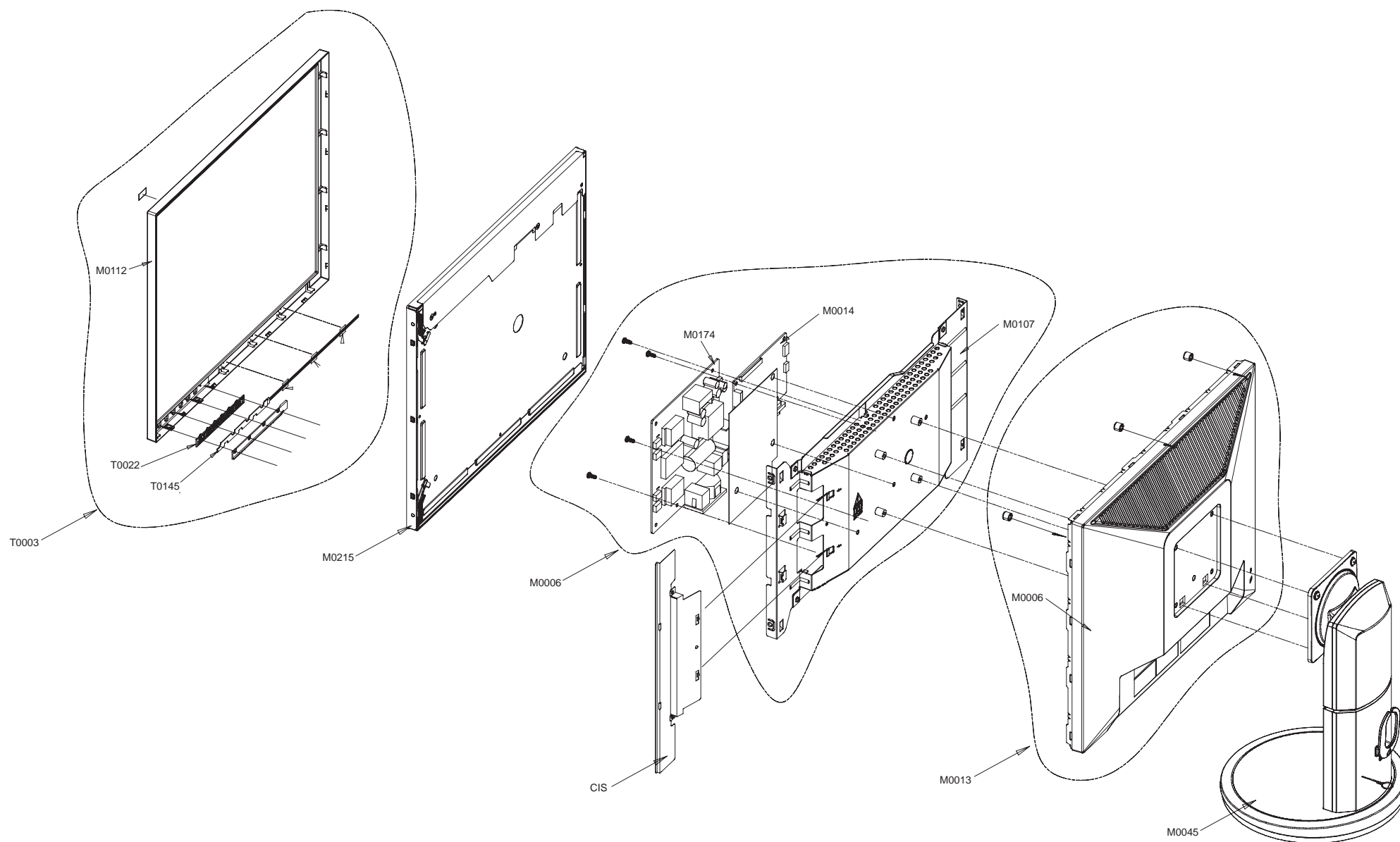
5-1 LS19HAB



5 Exploded View & Parts List

Location	Code.No	Item & Specification	Q'ty	SA/SNA	Remark
T0003	BN96-02385B	ASSY COVER P-FRONT;HA19BS,TCO03,ABS HB,G	1		
M0112	BN63-01978B	COVER-FRONT;HA19BS,ABS,T2.5,407.6,335,HB	1	S.N.A	
T0022	BN64-00377B	KNOB CONTROL;HA17TS,PC CLEAR,T2.1,9,112,	1	S.N.A	
M0145	BN96-02474C	ASSY BOARD P-FUNCTION;HAYDN,YWP-VD-05-05	1		
M0215	BN07-00203A	LCD-PANEL;M190EN04,GY,6BIT FRC,396*324*1	1		
M0006	BN96-01951C	ASSY SHIELD P-COVER;BI19BS,SECC,T0.8,DUA	1	S.N.A	
M0107	BN63-01780C	SHIELD-COVER;BI19BS,SECC,T1.0,CHANGE COR	1	S.N.A	
M0014	BN94-00735B	ASSY PCB MAIN-ATZ;LS19HAB*,W/W,AU	1		
M0174	BN44-00124C	IP BOARD;IP-35135B (H),BI17VS,3.0 ~4.0mA	1		
CIS	BN63-01781A	SHIELD-LAMP;BI19BS,SPTE,T0.3	1	S.N.A	
M0013	BN96-02386D	ASSY COVER P-REAR;HA19BS,HISP HB,BK24,HA	1		
M0113	BN61-01581A	BRACKET-VESA;BI17/19BS,SECC,T1.0	2	S.N.A	
M0006	BN63-01979B	COVER-REAR;HA19BS,HIPS,T2.5,407.6,335,HB	1	S.N.A	
M0952	BN63-02075A	COVER-DUCT;HA17BS,HIPS,T1.5,13.5,13.5,HB	4	S.N.A	
M0045	BN96-02242B	ASSY STAND P-SET;HA19TS,HIPS HB,GR70,SIL	1		

5-2 LS19HAT



Location	Code.No	Item & Specification	Q'ty	SA/SNA	Remark
T0003	BN96-02239B	ASSY COVER P-FRONT;HA19TS,ABS HB,GR70,SI	1		
M0112	BN63-01967B	COVER-FRONT;HA19TS,ABS,T1.5,403.2,331.9,	1	S.N.A	
T0022	BN64-00377B	KNOB CONTROL;HA17TS,PC CLEAR,T2.1,9,112,	1	S.N.A	
M0145	BN96-02474C	ASSY BOARD P-FUNCTION;HAYDN,YWP-VD-05-05	1		
M0215	BN07-00223A	LCD-PANEL;LTM190E4-L21,Haydn,8BIT,396*32	1		
M0006	BN96-02241B	ASSY SHIELD P-COVER;HA19TS,SECC T0.8,MEC	1	S.N.A	
M0107	BN63-01974B	SHIELD-COVER;HA19TS,SECC,T0.8,398,222,M/	1	S.N.A	
M0014	BN94-00735E	ASSY PCB MAIN-SPZ;LS19HATT*,W/W,M/SWICH(1		
M0174	BN44-00123B	IP BOARD;SSIP-1719-HD-A,HAYDN17,3.0 ~5.0	1		
CIS	BN63-01781A	SHIELD-LAMP;BI19BS,SPTT,T0.3	1	S.N.A	
M0013	BN96-02240A	ASSY COVER P-REAR;HA19TS,HIPS HB,BK24,DU	1		
M0006	BN63-01968A	COVER-REAR;HA19TS,HIPS,T2.0,403.2,331.9,	1	S.N.A	
M0045	BN96-02242B	ASSY STAND P-SET;HA19TS,HIPS HB,GR70,SIL	1		

6-1 LS19HATBBV/XAA

Level	Loc. No.	Code No.	Description & Specification	EA	SA/SNA
0		LS19HATBBV/XAA	940T,SGT4/S19B0-LHA,19,LCD-MO,UNITED STA	0	
0.1	M0002	BN90-00756E	ASSY COVER REAR;LS19HATTSQ/EDC	1	S.N.A
..2	M0013	BN96-02240A	ASSY COVER P-REAR;HA19TS,HIPS HB,BK24,DU	1	
...3	M0006	BN63-01968A	COVER-REAR;HA19TS,HIPS,T2.0,403.2,331.9,	1	S.N.A
...3		BN73-00096A	RUBBER-PANEL;BI19BS,RUBBER,T1.0,50-60,NT	3	S.N.A
0.1	M0001	BN90-00776P	ASSY COVER FRONT;LS19HATBBV/XAA	1	S.N.A
..2	T0003	BN96-02239A	ASSY COVER P-FRONT;HA19TS,ABS HB,BK24,D/	1	
...3	M0112	BN63-01967A	COVER-FRONT;HA19TS,ABS,T1.5,403.2,331.9,	1	S.N.A
...3	T0022	BN64-00377A	KNOB CONTROL;HA17TS,PC CLEAR+SMOG,T2.1,9	1	S.N.A
...3	M0145	BN96-02474C	ASSY BOARD P-FUNCTION;HAYDN,YWP-VD-05-05	1	
....4	C/F	0601-001896	LED;SMD,BLUE,1.6x0.8x0.4mm,470,1.6x0.8x0	1	
....4	C/F	2007-000081	R-CHIP;2.7Kohm,5%,1/10W,TP,1608	2	
....4	C/F	2007-000123	R-CHIP;1.5Kohm,5%,1/10W,TP,1608	2	
....4	CN906	3711-005935	CONNECTOR-HEADER;BOX,4P,1R,1mm,SMD-A,AU,	1	
....4	C/F	BN34-00001A	SWITCH-DOME SHEET;HYADN_FUNCTION F/K,DOM	1	
....4	M2893	BN39-00688A	LEAD CONNECTOR;HAYDN,UL1571#30,4P,450mm,	1	
....4	T0077	BN41-00633A	PCB MAIN;HAYDN,FR4,2L,MP1.0,0.6T,105*8,1	1	S.N.A
....4	C/F	BN61-01846A	GUIDE-CONTROL;HA17T,ABS HB,T1.1,9,112,IV	1	S.N.A
0.1	M0216	BN90-00782D	ASSY STAND;LS19HATBBV/XAA	1	S.N.A
..2	M0045	BN96-02652A	ASSY STAND P-SET;HA19TS,HIPS HB,BK24,New	1	
0.1	T0852	BN91-00841U	ASSY LCD-SPZ;LS19HAT*	1	S.N.A
..2	M0215	BN07-00223A	LCD-PANEL;LTM190E4-L21,Haydn,8BIT,396*32	1	
0.1	M0112	BN91-00866S	ASSY SHIELD;LS19HAT*	1	S.N.A
..2	CIS	BN63-01781A	SHIELD-LAMP;BI19BS,SPTE,T0.3	1	S.N.A
..2	CIS	0203-001774	TAPE-CONDUCTIVE;DK-100-60-70,AL-TAPE,T0.	1	S.N.A
0.1	M0019	BN92-00962Q	ASSY LABEL;MJ19BS*,ADC	1	S.N.A
0.1	M0003	BN92-01540Z	ASSY BOX;LS19HATBBV/XAA	1	S.N.A
..2	T0129	BH75-10529C	UNIT-HANDLE/PACKING;S/M170MP,PE-LD,PE-HD	1	
...3	M0103	BN72-60001A	LEVER-TOP;LSD210TL,PE-LD,WHITE,TFT_LCD	1	S.N.A
...3	M0102	BN72-60002C	LEVER-BOTTOM;S/M170MP,PE-HD,BLUE	1	S.N.A
..2	BOX	BN69-01107A	BOX-01,SET;S/M940T(HA19TS),SW4,A,YEL,A1,	1.02	S.N.A
0.1	M0113	BN92-01543E	ASSY P/MATERIAL;LS19HATBBV/XAA	1	S.N.A
..2	T0376	6902-000061	BAG AIR;LDPE,T0.2,L1000,W500,TRP,,,	0.01	S.N.A
..2	T0524	6902-000111	BAG PE;HDPE,T0.015,L800,W650,TRP,28,4,PE	1	S.N.A
..2	T0376	6902-000379	BAG AIR;LDPE,T0.2,W1000,L1800,TRP,-,-	0.002	S.N.A
..2	P/M	6902-000604	BAG WRAPPING;LDPE,T0.02,W500,L10000,TRP,	1.51	S.N.A
..2	M0081	6902-000609	BAG ROLL;LDPE,T0.05,W2400,L1000,TRP,-,-	0.1	S.N.A
0.1	M0045	BN92-01555W	ASSY ACCESSORY;LS17HATBBV/XAA	1	S.N.A
..2	M0114	BN39-00244B	CBF SIGNAL;MO15PS,15P/15P,20276-N,1830MM	1	
..2	M0125	BN39-00246F	CBF SIGNAL-DVI(D);1703FP,24P/24P,20276-D	1	
..2	M0045	BN96-02329Q	ASSY ACCESSORY;LS17HAAKB/XAA,U.S	1	
...3	T0268	3903-000085	CBF-POWER CORD;DT,US,BP3/YES,I(IEC C13/C	1	
...3	T0524	6902-000110	BAG PE;LDPE,T0.05,W250,L400,TRP,28,2	1	S.N.A
...3	MP1.0	AA68-40065B	CARD-01,REGISTRATION;;SEA,A5,ENG,A/P220,	1	S.N.A
...3	ACCESSORY	BH68-00261F	CARD WARRANTY-03;SyncMaster14-1,ADC,MOJO	1	S.N.A
...3	ACCESSORY	BH68-00344C	CARD WARRANTY-01;SECA W/TY & CRM CARD,SE	1	S.N.A
...3	ACCESSORY	BN68-00832C	MANUAL-REGISTRATION CARD;SECA all,SAMSUN	1	S.N.A
...3	ACCESSORY	BN68-00832D	MANUAL-REGISTRATION CARD;SECA all,SAMSUN	1	S.N.A
...3	M0215	BN96-02495G	ASSY MANUAL P-IB+QSG;LS19HAA/940N,SyncMa	1	S.N.A
....4	M0808	BH68-00376L	MANUAL-04;LCDQUICK SETUP GUIDE,SYNCASTE	1	S.N.A
....4	IB	BN59-00486G	S/W DRIVER-01,IB;LS19HAA/940N,W/W,SyncMa	1	S.N.A

6 Electrical Parts List

Level	Loc. No.	Code No.	Description & Specification	EA	SA/SNA
0.1	M0017	BN91-00889Q	ASSY CHASSIS-SPZ;LS19HAT*,W/W,M/SWICH(O)	1	
.2	M0006	BN96-02241B	ASSY SHIELD P-COVER;HA19TS,SECC T0.8,MEC	1	S.N.A
...3		BN63-01774A	SHIELD-INSULATOR;BI17/19BS,PET,T0.35	1	S.N.A
...3	M0107	BN63-01974B	SHIELD-COVER;HA19TS,SECC,T0.8,398,222,M/	1	S.N.A
.2	M0014	BN94-00735E	ASSY PCB MAIN-SPZ;LS19HATT*,W/W,M/SWICH(1	
...3	T0245	0202-001366	SOLDER-WIRE FLUX;-RS60S,D1.2,63Sn/37Pb,	0.01	S.N.A
...3	CN102	3701-001173	CONNECTOR-DVI;24P,3R,FEMALE,ANGLE,AUF	1	
...3	CN101	3701-001219	CONNECTOR-DSUB;15P,3R,FEMALE,ANGLE,AUF	1	
...3	CN400	3711-005884	HEADER-BOARD TO BOARD;BOX,30P,2R,2mm,ANG	1	
...3	T0174	BN97-00630H	ASSY SMD;LS19HATT*	1	S.N.A
...4	CIS5	0202-001375	SOLDER-CREAM;RMA-20-21L,S63,-,Sn63/Pb36.	1.01	S.N.A
...4	D100	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200MA,SO	1	
...4	D101	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200MA,SO	1	
...4	D102	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200MA,SO	1	
...4	D103	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200MA,SO	1	
...4	D104	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200MA,SO	1	
...4	D105	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200MA,SO	1	
...4	D106	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200MA,SO	1	
...4	D107	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200MA,SO	1	
...4	D109	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200MA,SO	1	
...4	D111	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200MA,SO	1	
...4	D112	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200MA,SO	1	
...4	D113	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200MA,SO	1	
...4	D114	0401-001056	DIODE-SWITCHING;MMBD4148SE,100V,200MA,SO	1	
...4	ZD100	0403-001411	DIODE-ZENER;-5.49-5.73V,200MW,SOD-323,T	1	
...4	ZD101	0403-001411	DIODE-ZENER;-5.49-5.73V,200MW,SOD-323,T	1	
...4	ZD103	0403-001411	DIODE-ZENER;-5.49-5.73V,200MW,SOD-323,T	1	
...4	ZD104	0403-001411	DIODE-ZENER;-5.49-5.73V,200MW,SOD-323,T	1	
...4	ZD105	0403-001411	DIODE-ZENER;-5.49-5.73V,200MW,SOD-323,T	1	
...4	ZD107	0403-001411	DIODE-ZENER;-5.49-5.73V,200MW,SOD-323,T	1	
...4	ZD108	0403-001411	DIODE-ZENER;-5.49-5.73V,200MW,SOD-323,T	1	
...4	ZD109	0403-001411	DIODE-ZENER;-5.49-5.73V,200MW,SOD-323,T	1	
...4	ZD110	0403-001411	DIODE-ZENER;-5.49-5.73V,200MW,SOD-323,T	1	
...4	ZD201	0403-001411	DIODE-ZENER;-5.49-5.73V,200MW,SOD-323,T	1	
...4	ZD102	0406-001061	DIODE-TVS;MMQA5V6T3,5.32/5.6/5.88V,24W,S	1	
...4	ZD106	0406-001061	DIODE-TVS;MMQA5V6T3,5.32/5.6/5.88V,24W,S	1	
...4	ZD200	0406-001061	DIODE-TVS;MMQA5V6T3,5.32/5.6/5.88V,24W,S	1	
...4	Q100	0501-002080	TR-SMALL SIGNAL;2SC2412K,NPN,200mW,SC-59	1	
...4	Q603	0501-002080	TR-SMALL SIGNAL;2SC2412K,NPN,200mW,SC-59	1	
...4	Q604	0501-002080	TR-SMALL SIGNAL;2SC2412K,NPN,200mW,SC-59	1	
...4	Q409	0505-001957	FET-SILICON;NTR2101P,P,-8V,-3.7A,0.052oh	1	
...4	IC109	1003-001814	IC-LCD CONTROLLER;SE56AWL,PQFP,100P,23.4	1	
...4	IC112	1103-000129	IC-EEPROM;24C02,256x8,SOP,8P,5x4mm,4.5/5	1	
...4	IC112	1103-001023	IC-EEPROM;24C08,1Kx8,SOP,8P,5x4mm,2.5/5.	1	
...4	T0087	1203-003695	IC-POSIFIXED REG.;NCP1117ST33T3G,SOT-22	1	
...4	T0087	1203-003696	IC-POSIFIXED REG.;NCP1117DT18T5G,DPAK,3	1	
...4	R100	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	
...4	R101	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	
...4	R102	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	
...4	R103	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	
...4	R104	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	
...4	R105	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	
...4	R233	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	
...4	R270	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	
...4	R116	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	
...4	R117	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	
...4	R118	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	
...4	R119	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	
...4	R120	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	

6 Electrical Parts List

Level	Loc. No.	Code No.	Description & Specification	EA	SA/SNA
....4	R121	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	
....4	R122	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	
....4	R123	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	
....4	R107	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	
....4	R108	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	
....4	R109	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	
....4	R110	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	
....4	R111	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	
....4	R112	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	
....4	R133	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	
....4	R134	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	
....4	R215	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	
....4	R216	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	
....4	R230	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	
....4	R232	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	
....4	R234	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	
....4	R235	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	
....4	R236	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	
....4	R237	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	
....4	R238	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	
....4	R240	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	
....4	R241	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	
....4	R242	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	
....4	R243	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	
....4	R244	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	
....4	R245	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	
....4	R246	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	
....4	R247	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	
....4	R248	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	
....4	R249	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	
....4	R253	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	
....4	R254	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	
....4	R255	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	
....4	R218	2007-000077	R-CHIP;470ohm,5%,1/10W,TP,1608	1	
....4	R124	2007-000078	R-CHIP;1Kohm,5%,1/10W,TP,1608	1	
....4	R125	2007-000078	R-CHIP;1Kohm,5%,1/10W,TP,1608	1	
....4	R201	2007-000078	R-CHIP;1Kohm,5%,1/10W,TP,1608	1	
....4	R260	2007-000082	R-CHIP;3.3Kohm,5%,1/10W,TP,1608	1	
....4	R261	2007-000082	R-CHIP;3.3Kohm,5%,1/10W,TP,1608	1	
....4	R217	2007-000083	R-CHIP;3Kohm,5%,1/10W,TP,1608	1	
....4	R251	2007-000083	R-CHIP;3Kohm,5%,1/10W,TP,1608	1	
....4	R130	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	
....4	R136	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	
....4	R203	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	
....4	R204	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	
....4	R205	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	
....4	R206	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	
....4	R207	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	
....4	R208	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	
....4	R210	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	
....4	R211	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	
....4	R212	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	
....4	R220	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	
....4	R221	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	
....4	R222	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	
....4	R223	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	
....4	R226	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	
....4	R227	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	
....4	R228	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	
....4	R605	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	

6 Electrical Parts List

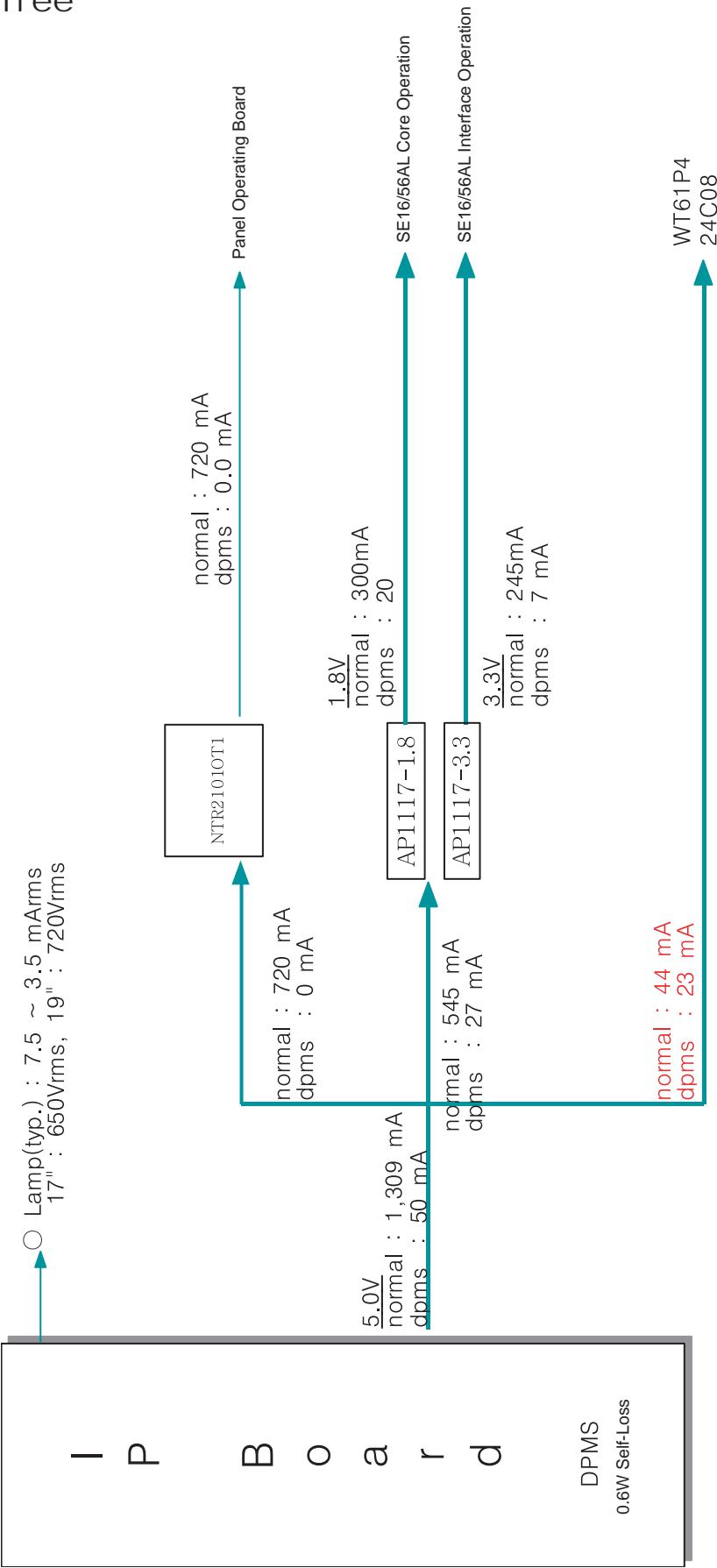
Level	Loc. No.	Code No.	Description & Specification	EA	SA/SNA
....4	R131	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	
....4	R135	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	
....4	R214	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	
....4	R252	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	
....4	R400	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	
....4	R401	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	
....4	R603	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	
....4	R604	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	
....4	R606	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	
....4	R607	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	
....4	R610	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	
....4	R128	2007-000092	R-CHIP;15Kohm,5%,1/10W,TP,1608	1	
....4	R129	2007-000092	R-CHIP;15Kohm,5%,1/10W,TP,1608	1	
....4	R602	2007-000102	R-CHIP;100Kohm,5%,1/10W,TP,1608	1	
....4	R106	2007-000821	R-CHIP;390ohm,1%,1/10W,TP,1608	1	
....4	R403	2007-000821	R-CHIP;390ohm,1%,1/10W,TP,1608	1	
....4	R132	2007-001002	R-CHIP;510ohm,5%,1/10W,TP,1608	1	
....4	R113	2007-001164	R-CHIP;75ohm,1%,1/10W,TP,1608	1	
....4	R114	2007-001164	R-CHIP;75ohm,1%,1/10W,TP,1608	1	
....4	R115	2007-001164	R-CHIP;75ohm,1%,1/10W,TP,1608	1	
....4	R126	2007-001164	R-CHIP;75ohm,1%,1/10W,TP,1608	1	
....4	R127	2007-001164	R-CHIP;75ohm,1%,1/10W,TP,1608	1	
....4	R608	2007-002899	R-CHIP;10ohm,1%,1/10W,TP,1608	1	
....4	R609	2007-002899	R-CHIP;10ohm,1%,1/10W,TP,1608	1	
....4	C416	2203-000041	C-CER,CHIP;0.01nF,0.25pF,50V,C0G,1608	1	
....4	C418	2203-000041	C-CER,CHIP;0.01nF,0.25pF,50V,C0G,1608	1	
....4	C210	2203-000189	C-CER,CHIP;100nF,+80-20%,25V,Y5V,1608	1	
....4	C109	2203-000236	C-CER,CHIP;0.1nF,5%,50V,C0G,1608	1	
....4	C106	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,1608	1	
....4	C208	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,1608	1	
....4	C209	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,1608	1	
....4	C120	2203-000903	C-CER,CHIP;0.0047nF,0.25pF,50V,C0G,1608	1	
....4	C121	2203-000903	C-CER,CHIP;0.0047nF,0.25pF,50V,C0G,1608	1	
....4	C122	2203-000903	C-CER,CHIP;0.0047nF,0.25pF,50V,C0G,1608	1	
....4	C111	2203-000998	C-CER,CHIP;0.047nF,5%,50V,C0G,1608	1	
....4	C124	2203-001630	C-CER,CHIP;330nF,+80-20%,16V,Y5V,1608	1	
....4	C127	2203-001630	C-CER,CHIP;330nF,+80-20%,16V,Y5V,1608	1	
....4	C100	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C101	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C102	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C103	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C104	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C105	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C107	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C108	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C113	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C207	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C400	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C402	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C403	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C404	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C405	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C406	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C407	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C408	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C409	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C410	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C411	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C412	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C413	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	

6 Electrical Parts List

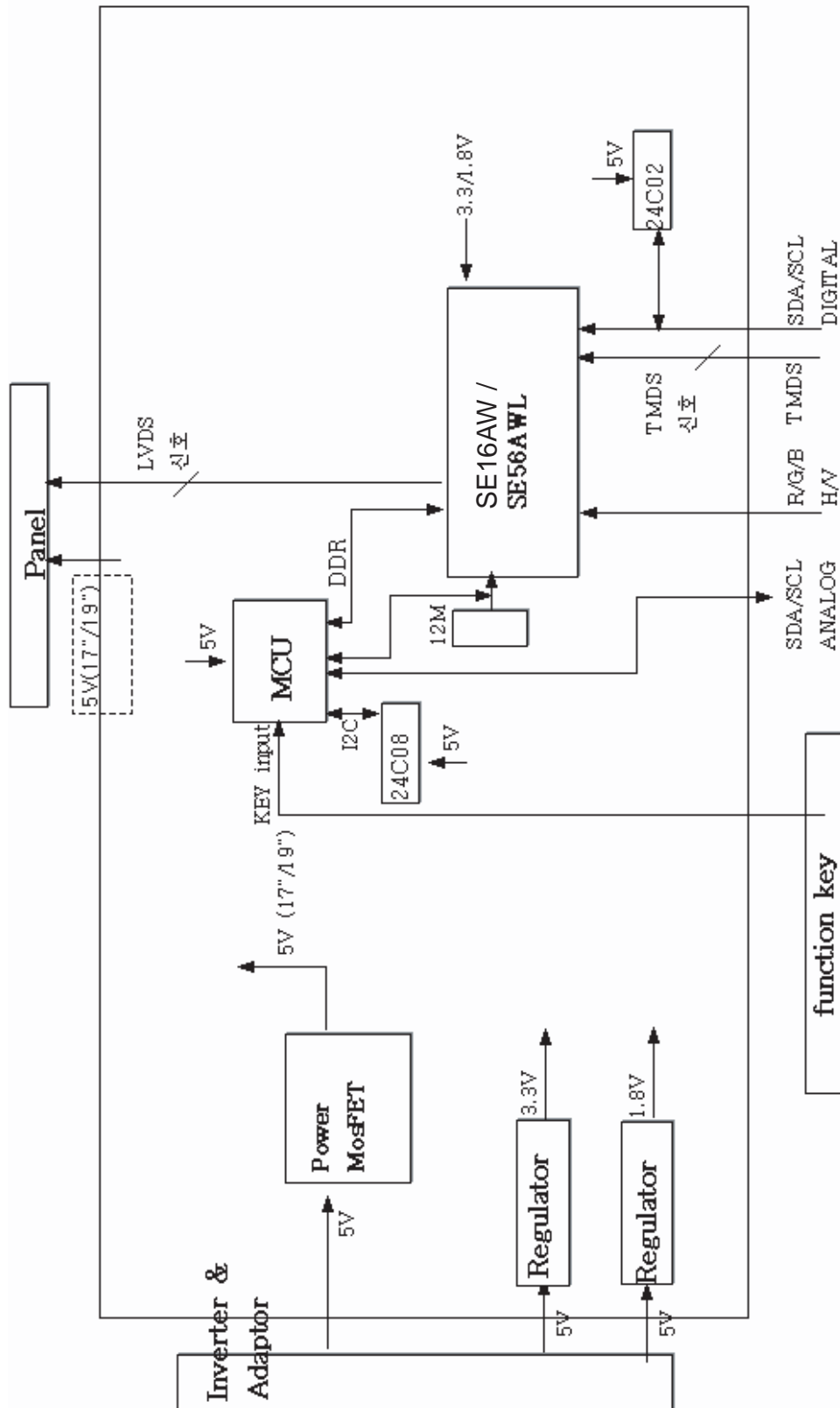
Level	Loc. No.	Code No.	Description & Specification	EA	SA/SNA
....4	C414	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C415	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C417	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C419	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C420	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C421	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C423	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C424	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C605	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C607	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C610	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C611	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C615	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C618	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C619	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C620	2203-005005	C-CER,CHIP;100nF,10%,16V,X7R,1608	1	
....4	C215	2203-005065	C-CER,CHIP;1000nF,+80-20%,10V,Y5V,1608	1	
....4	C216	2203-005065	C-CER,CHIP;1000nF,+80-20%,10V,Y5V,1608	1	
....4	C604	2203-005065	C-CER,CHIP;1000nF,+80-20%,10V,Y5V,1608	1	
....4	C614	2203-005065	C-CER,CHIP;1000nF,+80-20%,10V,Y5V,1608	1	
....4	C205	2203-005437	C-CER,CHIP;10000nF,+80-20%,10V,Y5V,3216	1	
....4	C422	2203-005437	C-CER,CHIP;10000nF,+80-20%,10V,Y5V,3216	1	
....4	C608	2402-001128	C-AL,SMD;100UF,20%,16V,WT,TP,6.3X5.7MM	1	
....4	C609	2402-001128	C-AL,SMD;100UF,20%,16V,WT,TP,6.3X5.7MM	1	
....4	T0052	2703-001334	INDUCTOR-SMD;1.5uH,10%,2012	1	
....4	T0052	2703-001334	INDUCTOR-SMD;1.5uH,10%,2012	1	
....4	X400	2801-003773	CRYSTAL-SMD;12MHZ,30PPM,28-AAN,20PF,50OH	1	
....4	T0568	3301-001145	BEAD-SMD;60OHM,4516,6000,TP,70OHM/45MHZ,	1	S.N.A
....4	T0568	3301-001145	BEAD-SMD;60OHM,4516,6000,TP,70OHM/45MHZ,	1	S.N.A
....4	T0568	3301-001145	BEAD-SMD;60OHM,4516,6000,TP,70OHM/45MHZ,	1	S.N.A
....4	CN600	3711-005503	HEADER-BOARD TO CABLE;BOX,9P,1R,2mm,SMD-	1	
....4	CN200	3711-005509	HEADER-BOARD TO CABLE;BOX,4P,1R,1.25mm,S	1	
....4	T0077	BN41-00631A	PCB MAIN;HAYDN,CEM-3,1.0,1.6,110*78*1.6,	1	S.N.A
....4	M0018	BN97-00626L	ASSY MICOM;LS19HATT*,W/W,AMLCD	1	
....5	IC520	0903-001402	IC-MICROCONTROLLER;NT68F632ALG,8Bit,PLCC	1	S.N.A
....4	C401	2402-001129	C-AL,SMD;47UF,20%,16V,WT,TP,6.3X5.2MM	1	
....4	C612	2402-001129	C-AL,SMD;47UF,20%,16V,WT,TP,6.3X5.2MM	1	
...3	M0524	BP39-00028A	CONNECT WIRE;BI17,19BS,UL1007#26,9P,80mm	1	
...3	M0131	BN63-00533A	GASKET;BESTBUY17",CONDUCTIVE FABRIC,7.5M	1	S.N.A
...3	M0131	BN63-01243A	GASKET;KD17AS,CONDUCTIVE FABRIC,3mm,13mm	1	S.N.A
..2	M0174	BN44-00123B	IP BOARD;SSIP-1719-HD-A,HAYDN17,3.0 ~5.0	1	
..2	M2893	BN39-00663A	LEAD CONNECTOR;LS17BIC,UL1571#30,30P,200	1	
..2	M0081	6003-000334	SCREW-TAPTITE;RH,+,2S,M3,L6,ZPC(YEL),SWR	1	S.N.A
..2	M0081	6003-000334	SCREW-TAPTITE;RH,+,2S,M3,L6,ZPC(YEL),SWR	2	S.N.A
..2	M0081	6003-001439	SCREW-TAPTITE;BH,+,S,M4,L8,ZPC(YEL)	1	S.N.A

7 Block Diagram

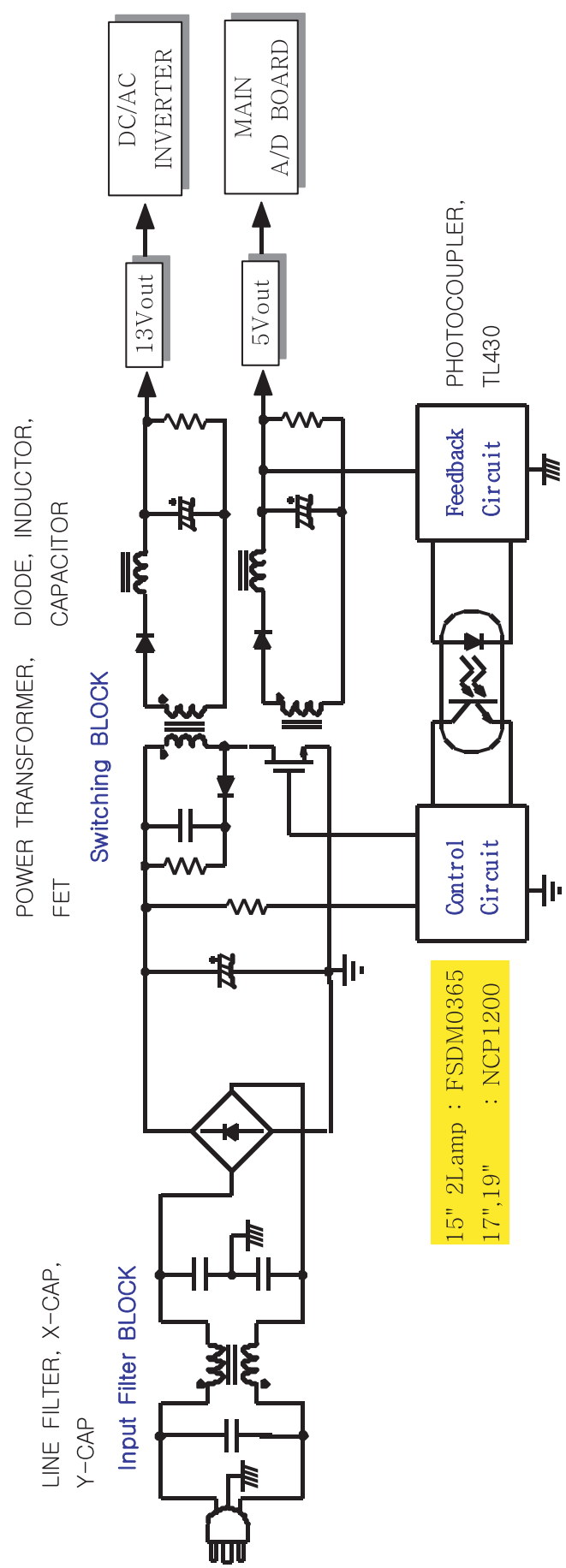
7-1 Power Tree



7-2 Main Board Part



7-3 IP Board Part (SMPS Part)



7-4 IP Board Part (Inverter Part)

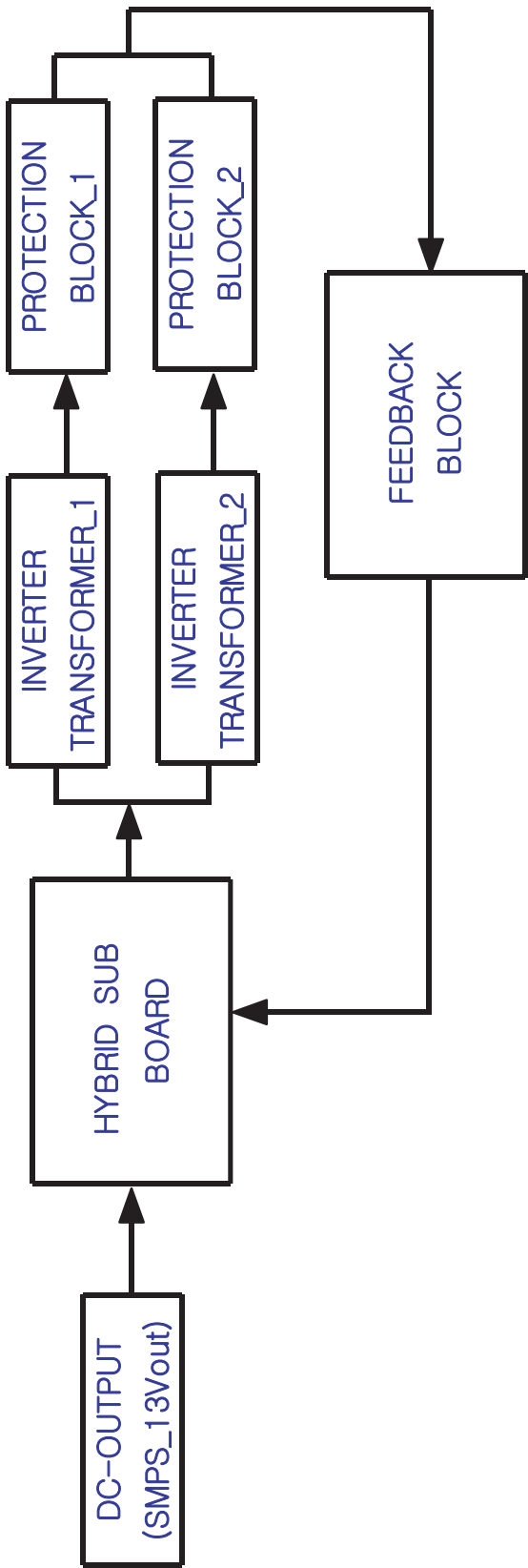


FIG 1 INVERTER BLOCK DIAGRAM

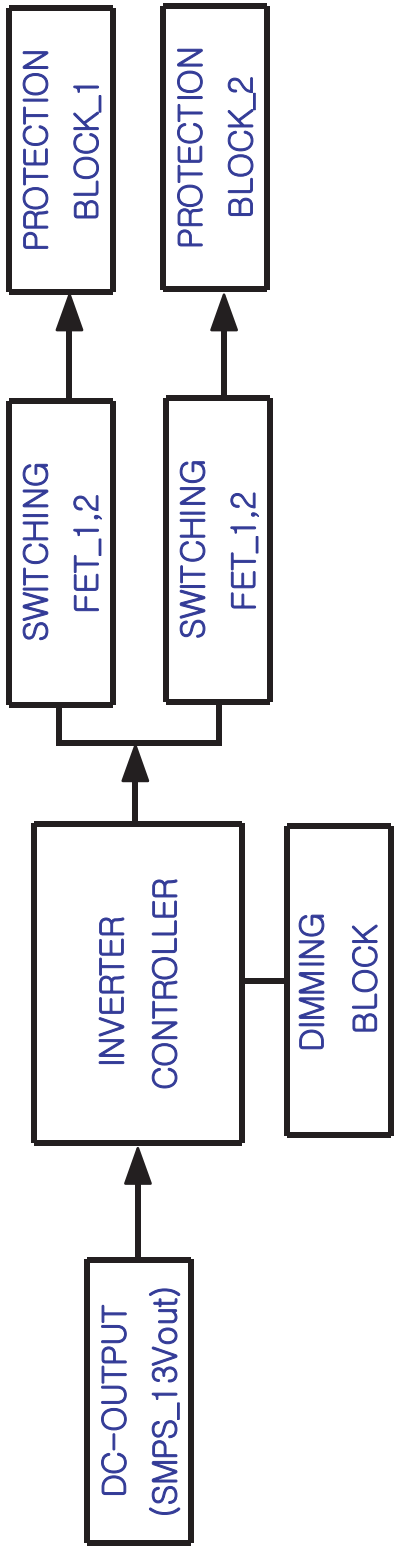
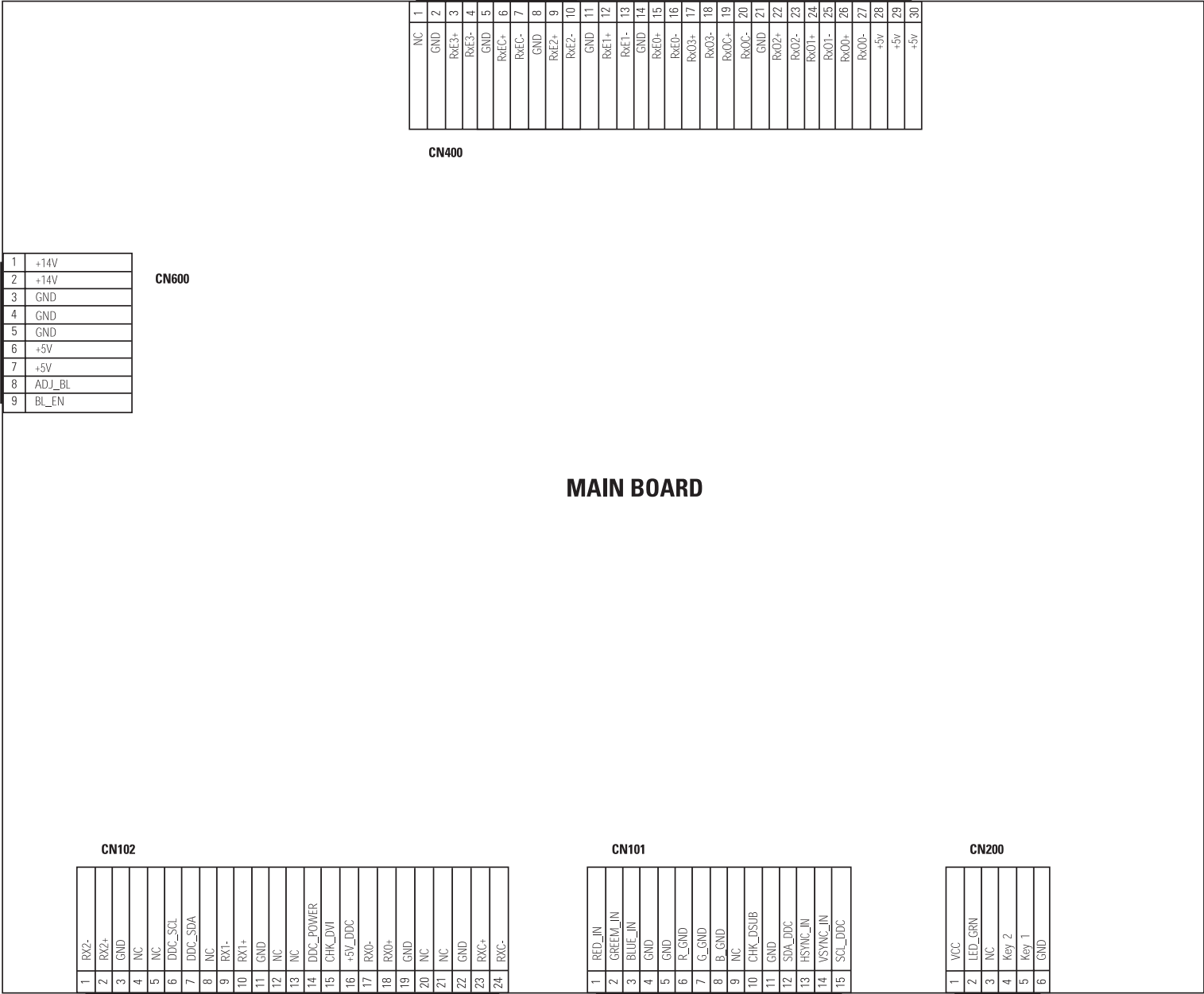


FIG 2 INVERTER SUB BOARD BLOCK DIAGRAM

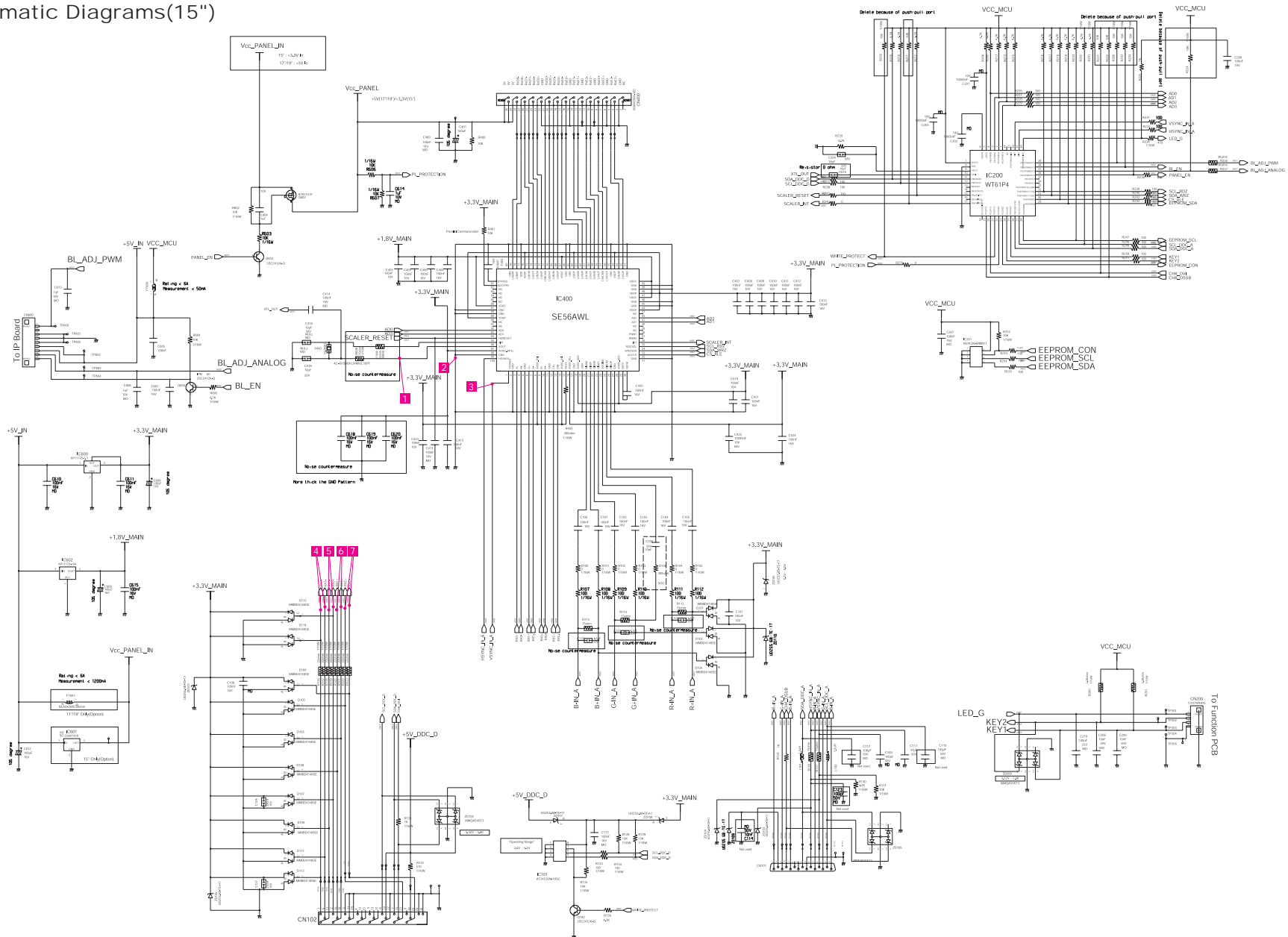
8 Wiring Diagram



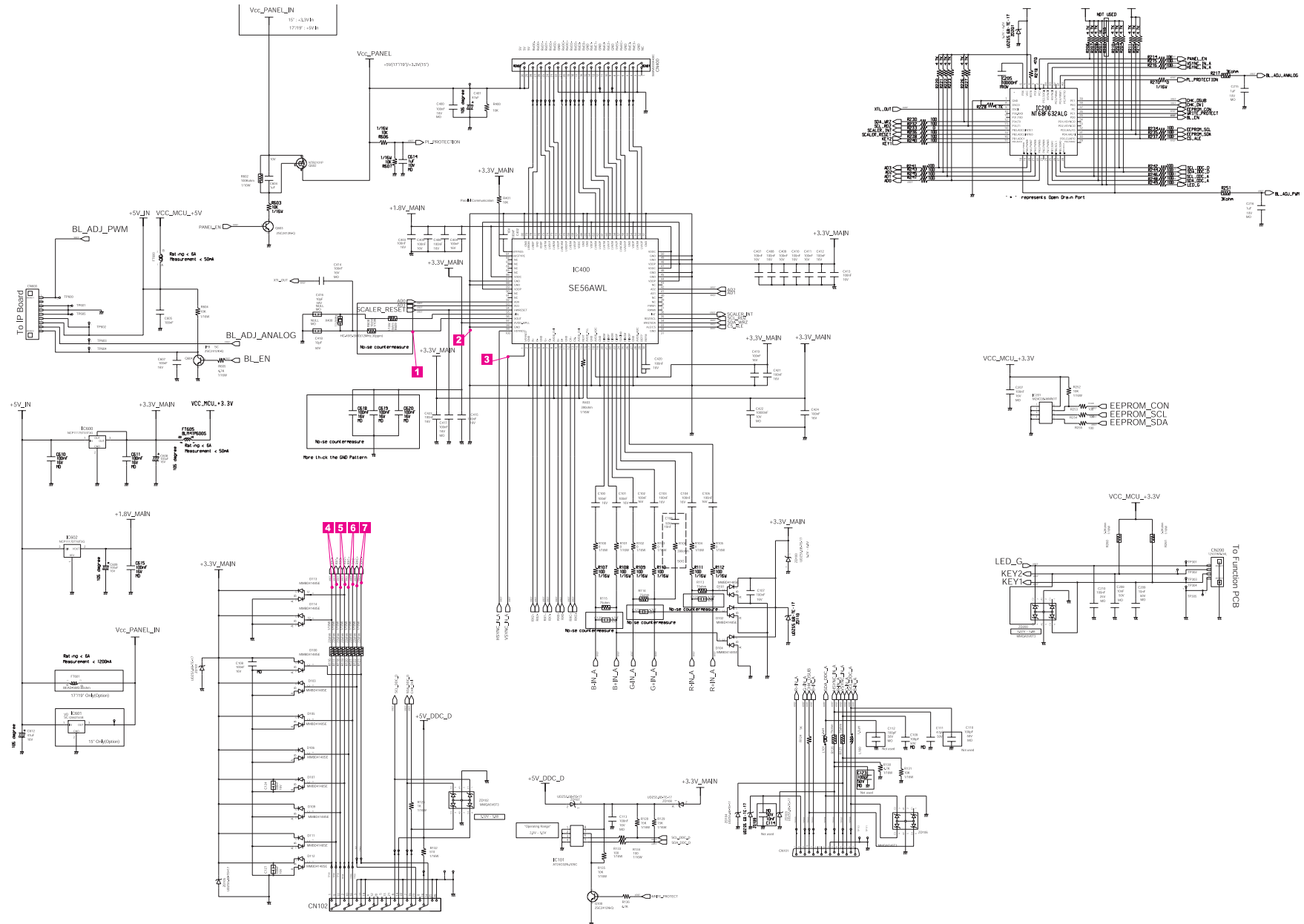
9 Schematic Diagrams

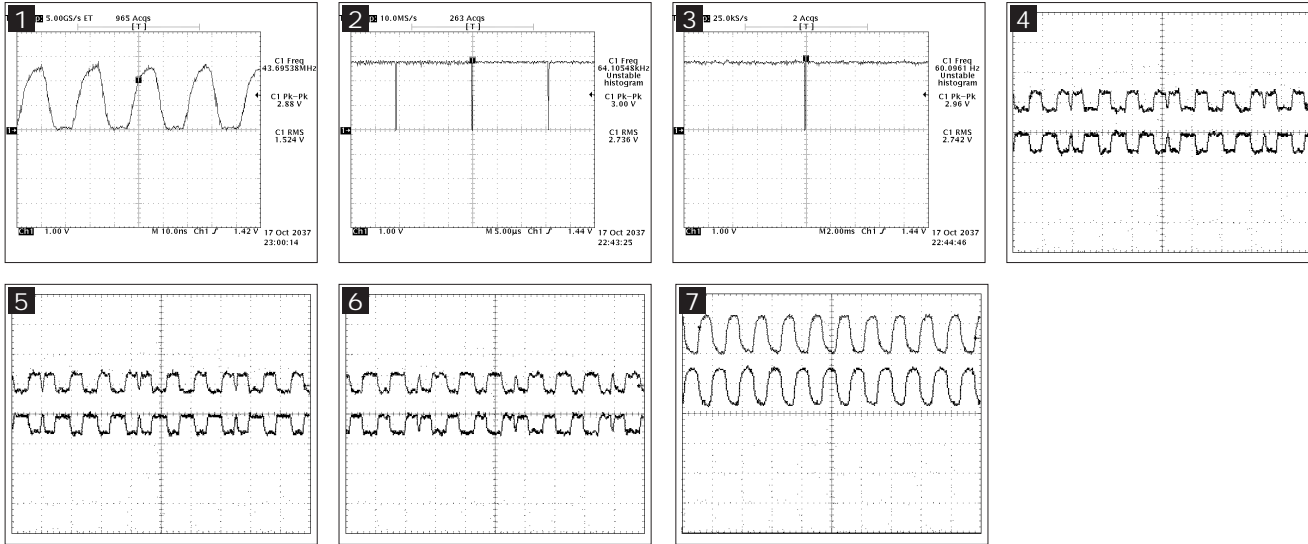
- This Document can not be used without Samsung's authorization.

9-1 Schematic Diagrams(15")



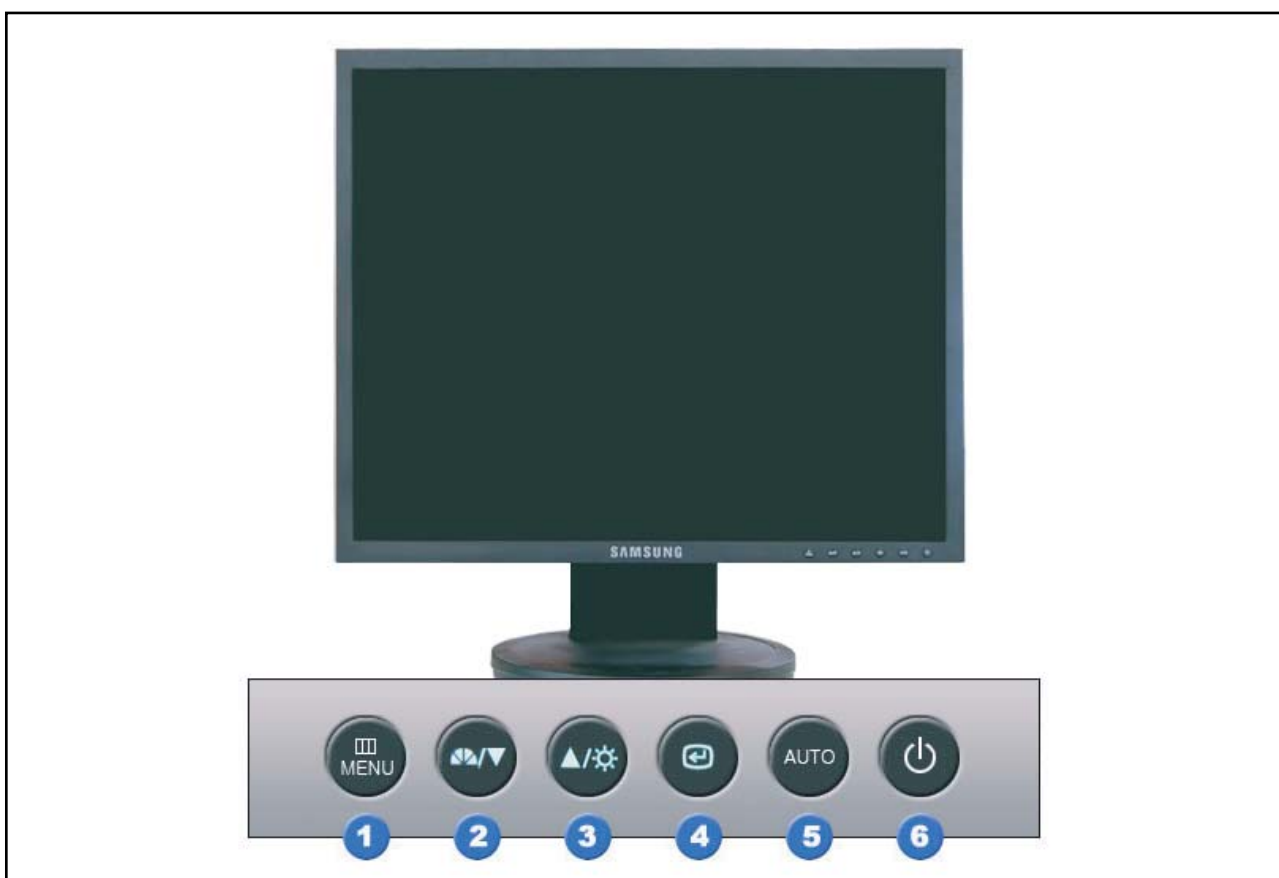
9-2 Schematic Diagrams(17", 19")





10 Operating Instructions and Installation

10-1 Front



1. Menu button

Opens the OSD menu. Also use to exit the OSD menu or return to the previous menu.

2. MagicBright button

MagicBright is a new feature providing optimum viewing environment depending on the contents of the image you are watching. Currently six different modes are available: Custom, Text, Internet, Game, Sport and Movie. Each mode has its own pre-configured brightness value. You can easily select one of six settings by simply pressing MagicBright control buttons.

1) Custom

Although the values are carefully chosen by our engineers, the pre-configured values may not be comfortable to your eyes depending on your taste. If this is the case, adjust the brightness and contrast by using the OSD menu.

2) Text : Normal brightness

For documentations or works involving heavy text.

3) Internet : Medium brightness

For working with a mixture of images such as text and graphics.

4) Game

For watching motion pictures such as a game.

5) Sport

For watching motion pictures such as a sport.

6) Movie : High brightness

For watching motion pictures such as a DVD or Video CD.

3. Brightness button

When OSD is not on the screen, push the button to adjust brightness.

2,3. Adjust buttons

Adjust items in the menu.

4. Enter button / Source button

Activates a highlighted menu item. /

Push the 'SOURCE', then selects the video signal while the OSD is off. (When the source button is pressed to change the input mode, a message appears in the center of the screen displaying the current mode -- analog or digital input signal.)

Note : If you select the digital mode, you must connect your monitor to the graphic card's port using the DVI cable.

5. Auto button

Use this button for auto adjustment.

6. Power button

Use this button for turn the monitor on and off.

7. Power indicator

This light glows green during normal operation, and blinks green once as the monitor saves your adjustments.

10-2 Rear



1. Power port

Connect the power cord for your monitor to the power port on the back of the monitor.

2. DVI port

Connect the DVI cable to the DVI port on the back of your monitor.

3. D-sub 15-pin port

Connect the signal cable to the 15-pin, D-sub connector on the back of your monitor.

4. Power on/off Switch(option)

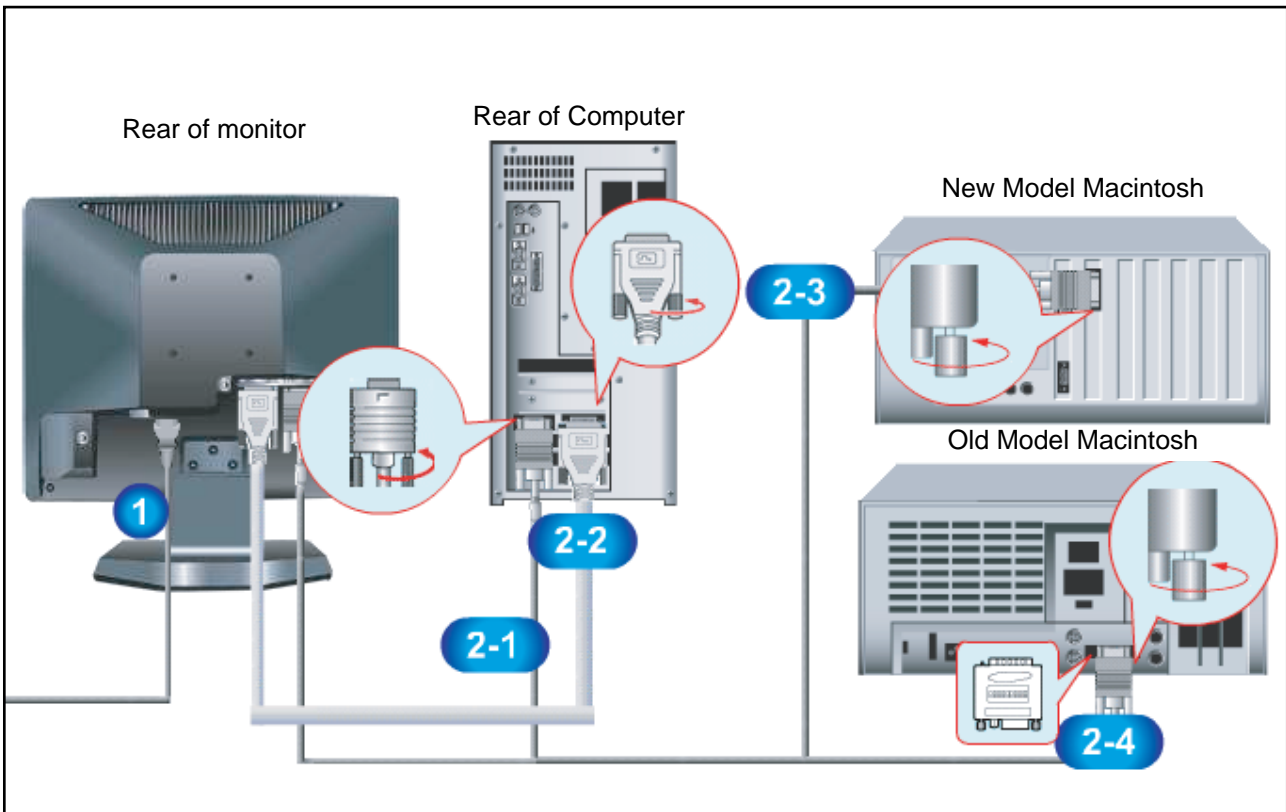
Use this button for turn the monitor on and off.

5. Kensington Lock

The Kensington lock is a device used to physically fix the system when using it in a public place. (The locking device has to be purchased separately.)

To get the information on using the Kensington Lock, contact an authorized dealer.

10-3 Connecting the monitor



1. Connect the power cord for your monitor to the power port on the back of the monitor. Plug the power cord for the monitor into a nearby outlet.

2-1. Using the D-sub (Analog) connector on the video card.
Connect the signal cable to the 15-pin, D-sub connector on the back of your monitor.



2-2. Using the DVI (Digital) connector on the video card.
Connect the DVI cable to the DVI port on the back of your monitor.

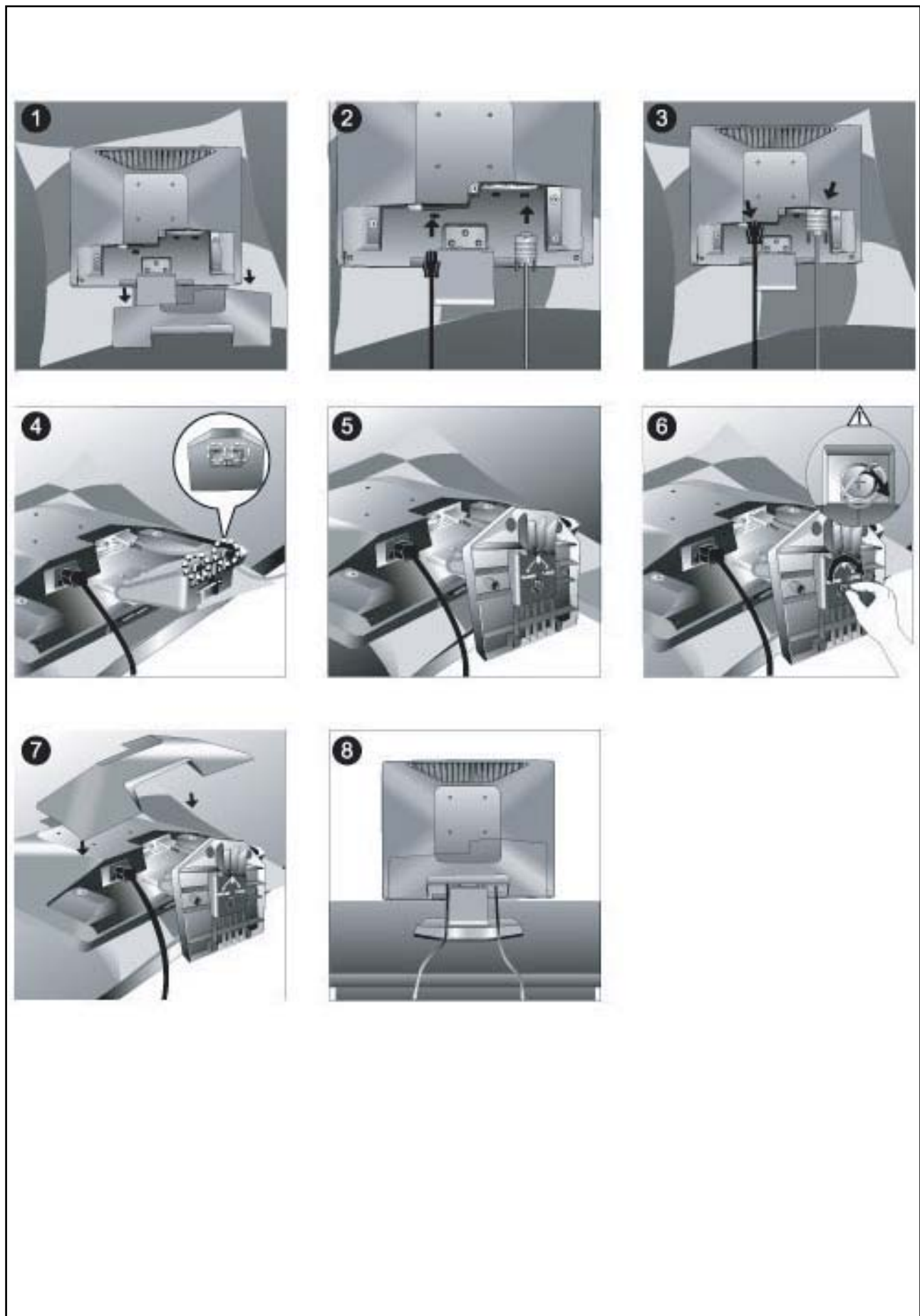


2-3. Connected to a Macintosh.
Connect the monitor to the Macintosh computer using the D-SUB connection cable.

2-4. In the case of an old model Macintosh, you need to connect the monitor using a special Mac adapter.

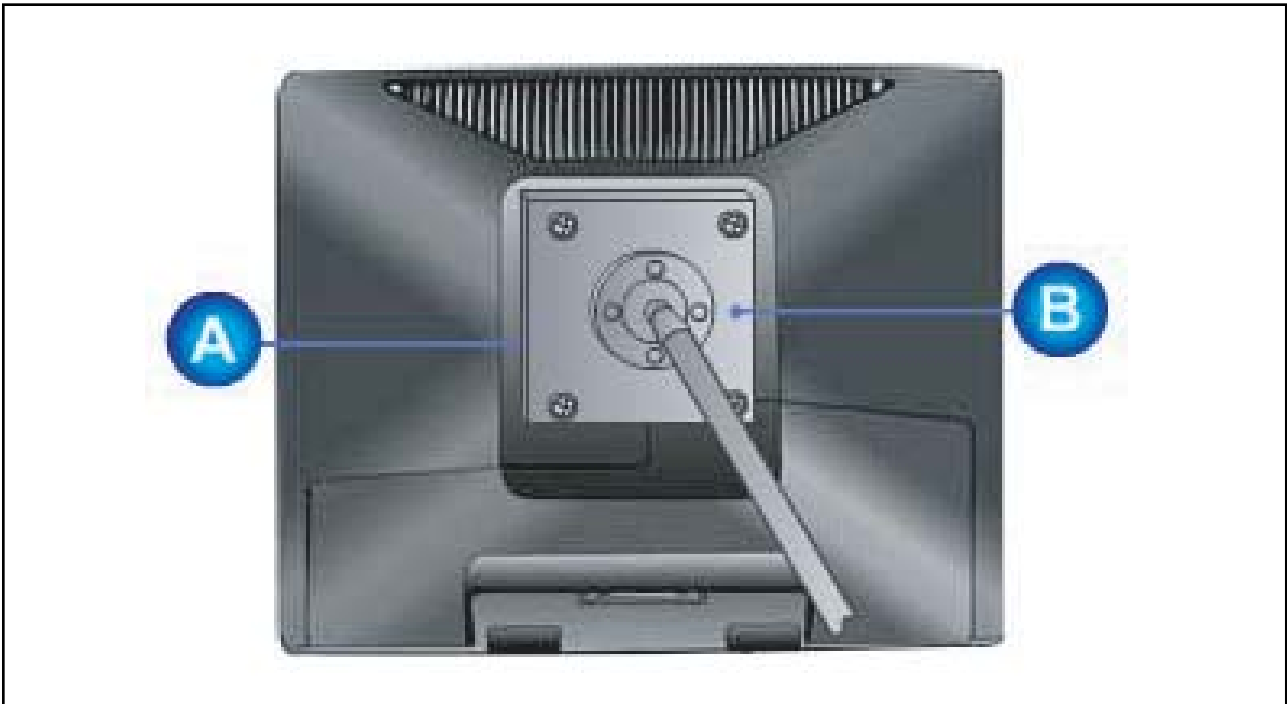
3. Turn on your computer and monitor. If your monitor displays an image, installation is complete.

10-4 Monitor Assembly



10-5 Attaching a Base

- This monitor accepts a 75mm x 75mm VESA-compliant mounting interface pad.



A. Monitor

B. Mounting interface pad

1. Turn off your monitor and unplug its power cord.
2. Lay the LCD monitor face-down on a flat surface with a cushion beneath it to protect the screen.
3. Remove four screws and then remove the stand from the LCD monitor.
4. Align the mounting interface Pad with the holes in the rear cover mounting pad and secure it with four screws that came with the arm-type base, wall mount hanger or other base.

11 Disassembly and Reassembly

This section of the service manual describes the disassembly and reassembly procedures for the TFT-LCD monitors.

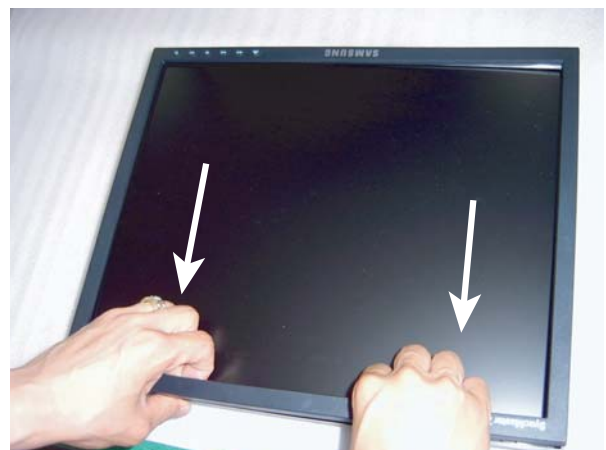
⚠ WARNING: This monitor contains electrostatically sensitive devices. Use caution when handling these components.

11-1 Disassembly (Simple - Stand)

⚠ Cautions: 1. Disconnect the monitor from the power source before disassembly.



1. Place monitor face down on cushioned table. Remove 3 screws from the stand.

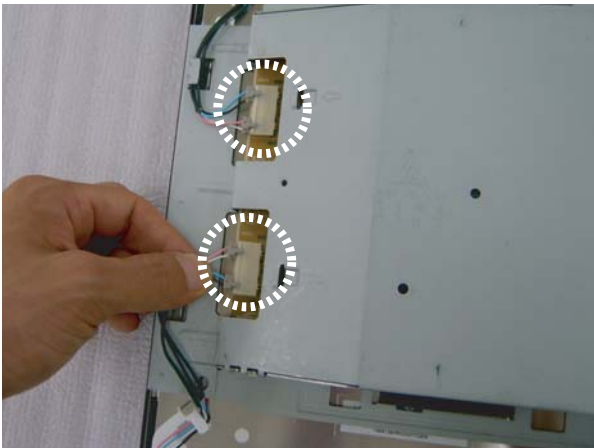


2. Remove stand and front cover.

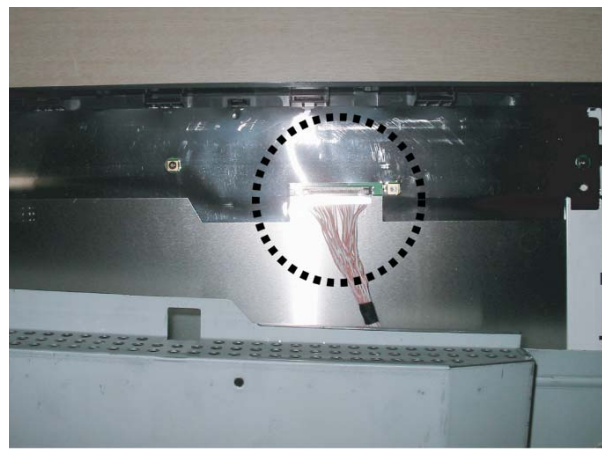
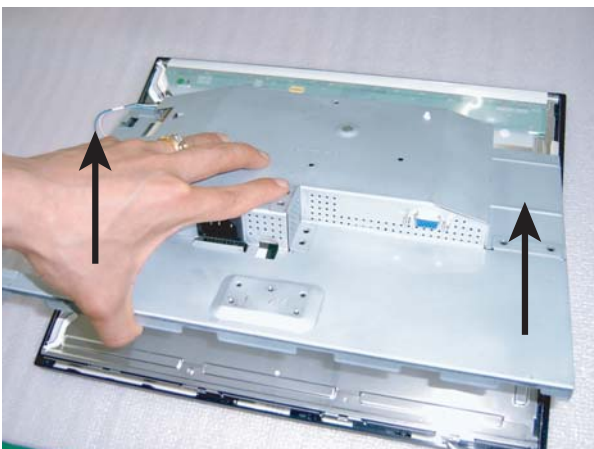
11 Disassembly and Reassembly



3. Lift up the back cover and Use the jig to remove the shield lamp.



4. Disconnect cables.



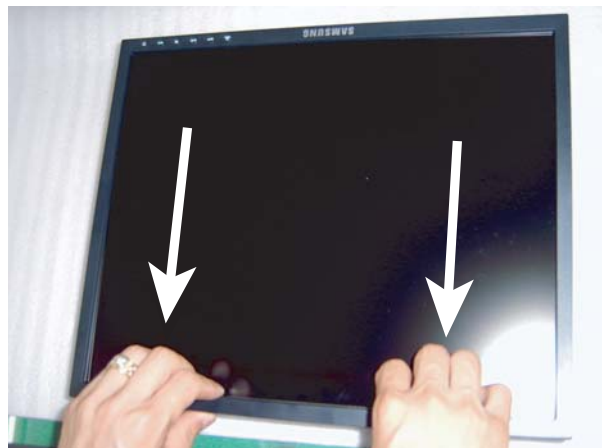
5. Lift up the shield and disconnect LVDS cable.



6. Lift up the LCD panel.

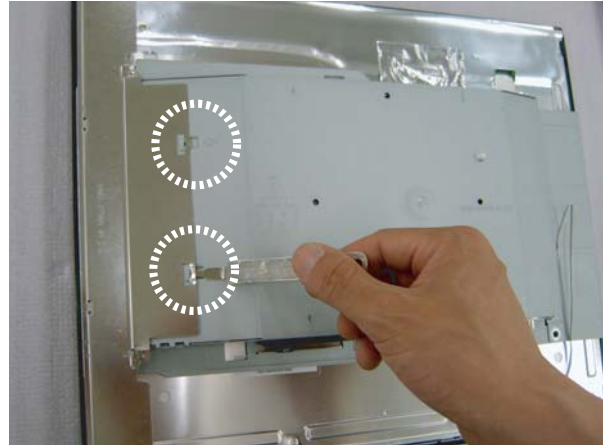


11-2 Disassembly (HAS-Stand)

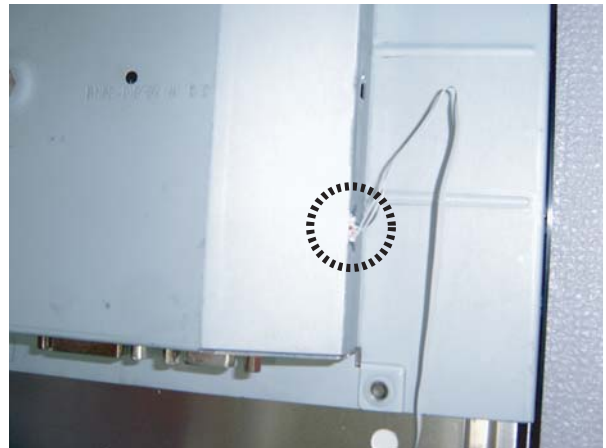
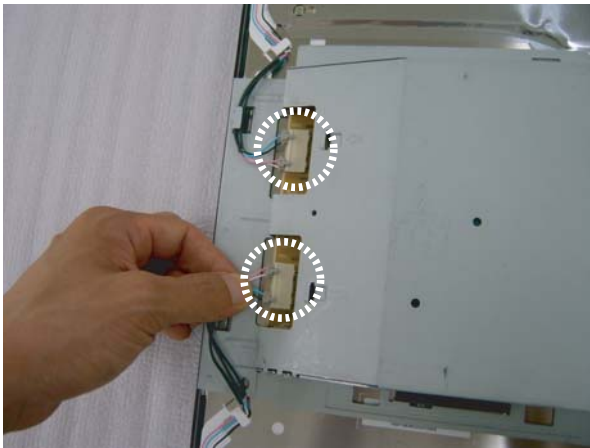


1. Place monitor face down on cushioned table. Remove 2 screws from the stand and remove front cover.

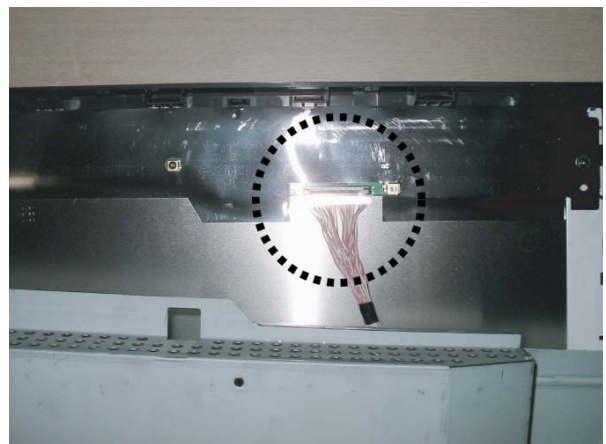
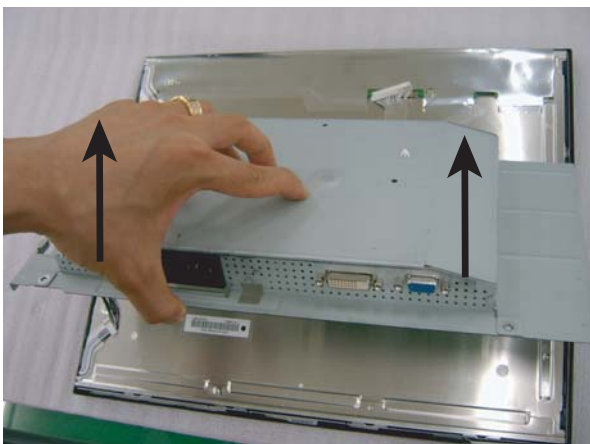
11 Disassembly and Reassembly



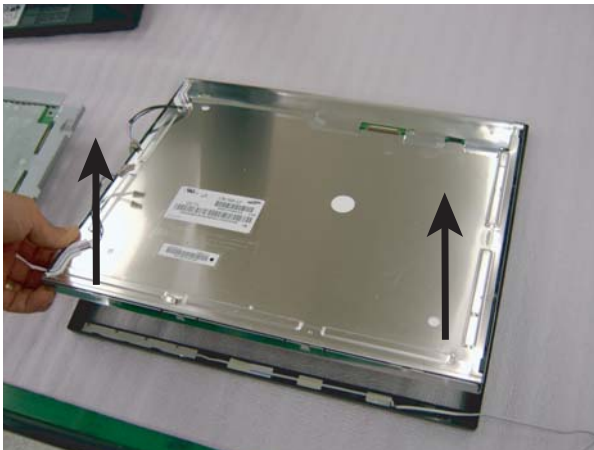
2. Lift up the back cover and Use the jig to remove the shield lamp.



3. Disconnect cables.



4. Lift up the shield and disconnect LVDS cable.



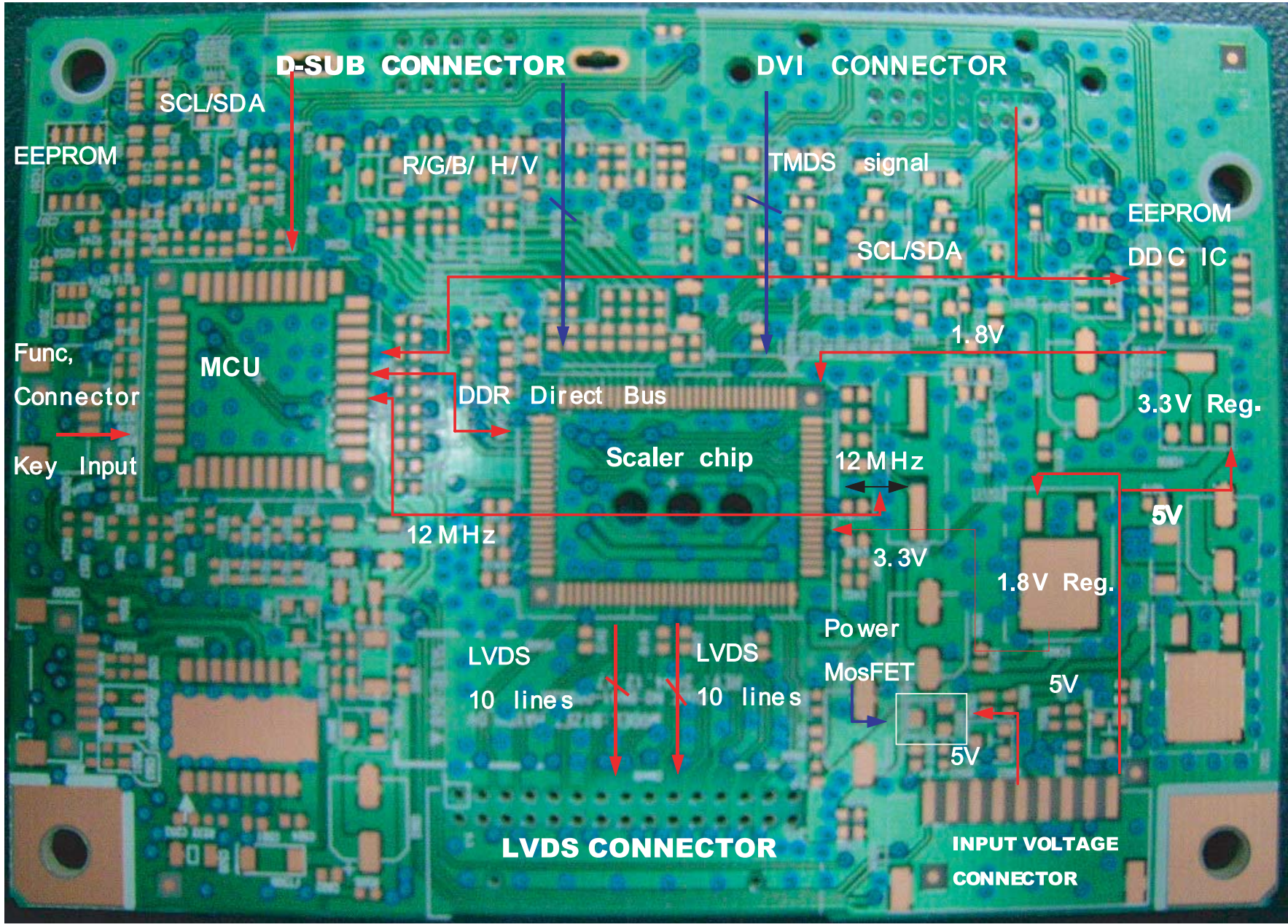
5. Lift up the LCD panel.



11-3 Reassembly

Reassembly procedures are in the reverse order of disassembly procedures.

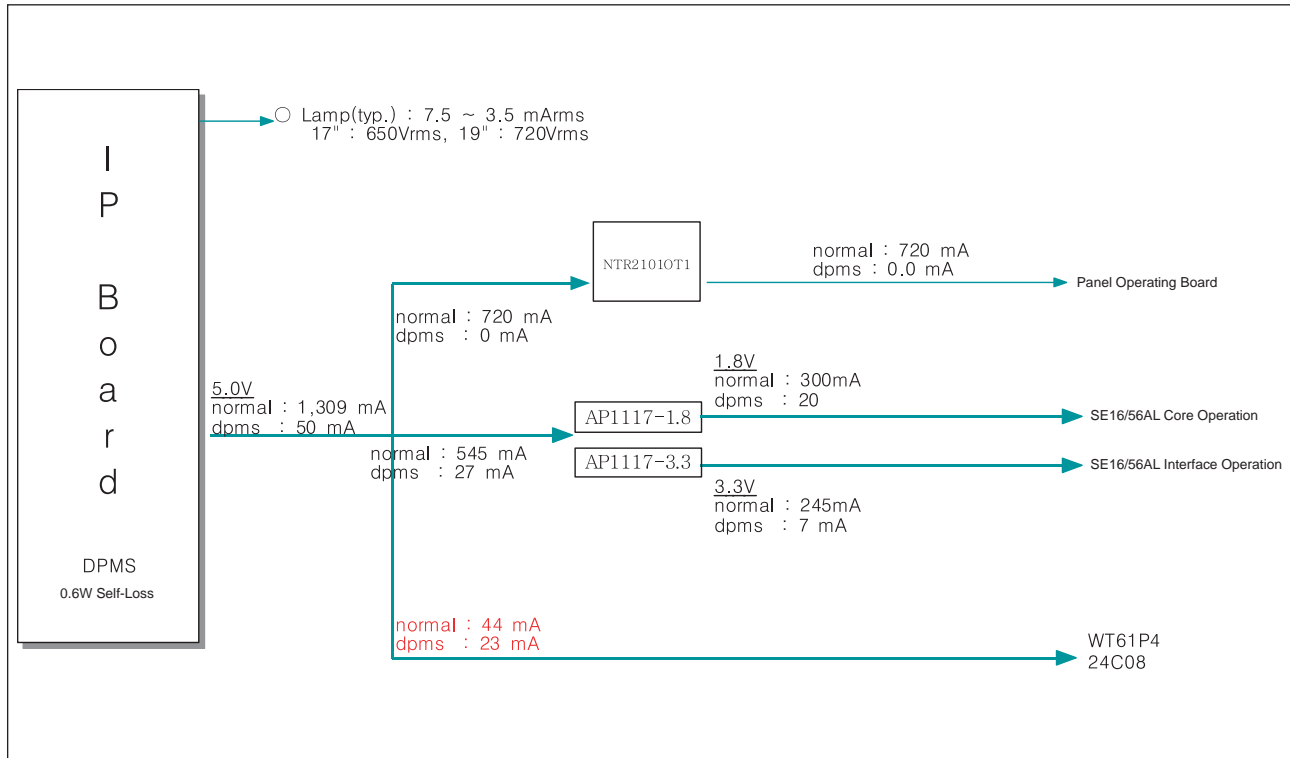
12 PCB Diagram



13 Circuit Descriptions

13-1 Overall Block Structure

13-1-1 Power Tree



1. When the AD board is in DPMS state:

- 1.1 The IP has been designed so that it operates with a power consumption of less than 0.6W of.
- 1.2 The Scaler consumes power up to 27mA
- 1.3 The power to the panel is switched off
- 1.4 The MCU consumes power up to 23mA.

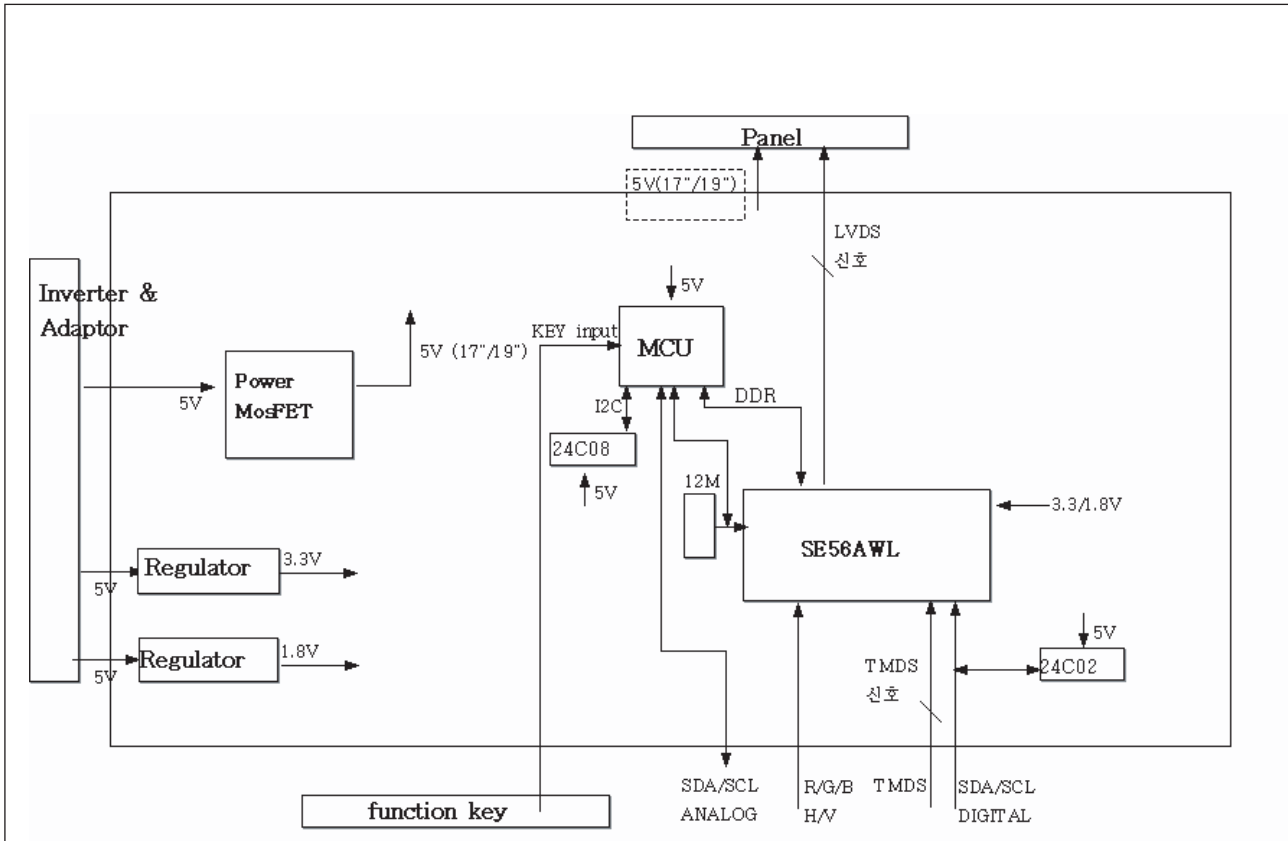
--> The total current consumption to the DPMS is less than 60mA

and the total power consumption is $0.6W + 5V \times 60mA = 0.9W$ so that the total power consumption is less than 1W.

2. When the AD board is operating normally:

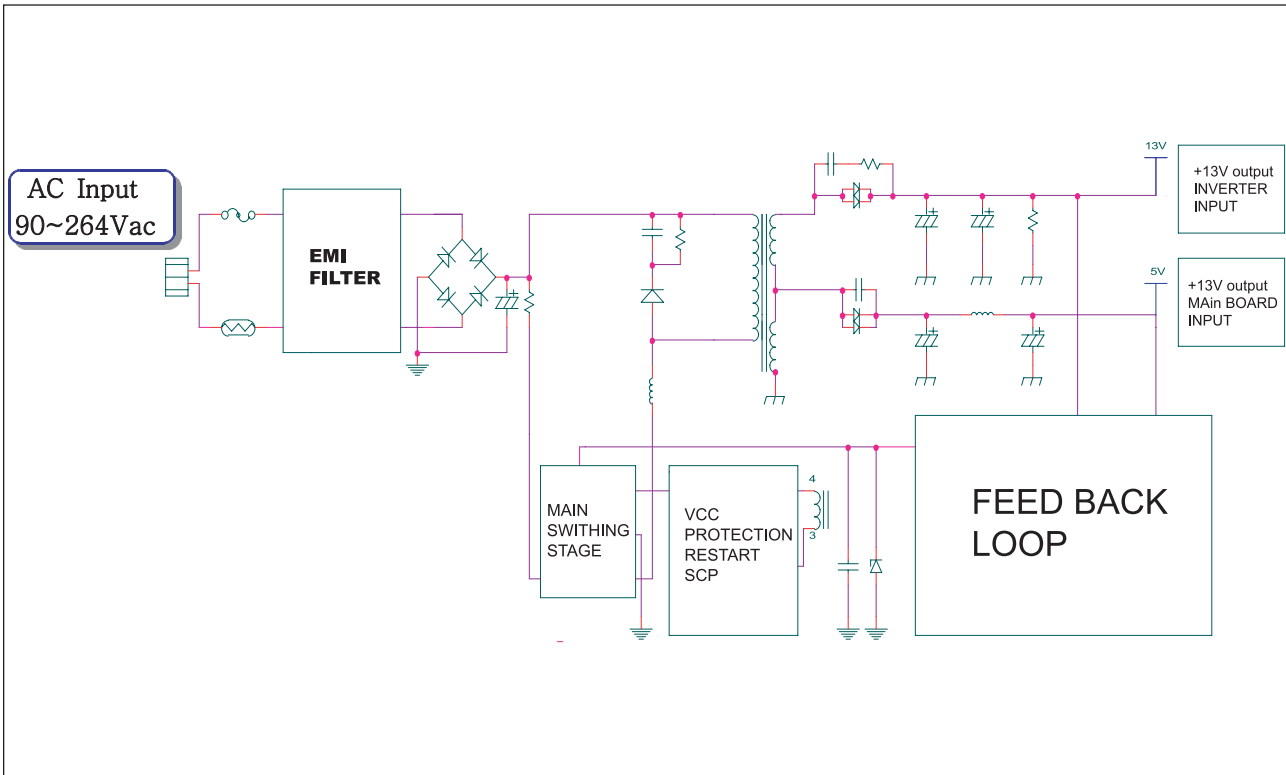
- 2.1 The maximum power consumption of the panel lamps is described below (It may vary depending on the panel manufacturer)
 - 17" : $4 \times (7.5mA \times 650mVrms) = 4 \times 4.9 = 19.6W$
 - 19" : $4 \times (7.5mA \times 720mVrms) = 4 \times 5.4 = 21.6W$
- 2.2 The power consumption of the Panel Control board is as follows: $5V \times 720mA = 3.6W$
- 2.3 The power consumption of the Scaler is as follows: $3.3V \times 245mA + 1.8V \times 300mA = 1.35W$
- 2.4 The power consumption of the MCU is as follows: $5V \times 44mA = 0.22W$

13-1-2 Main Board Parts

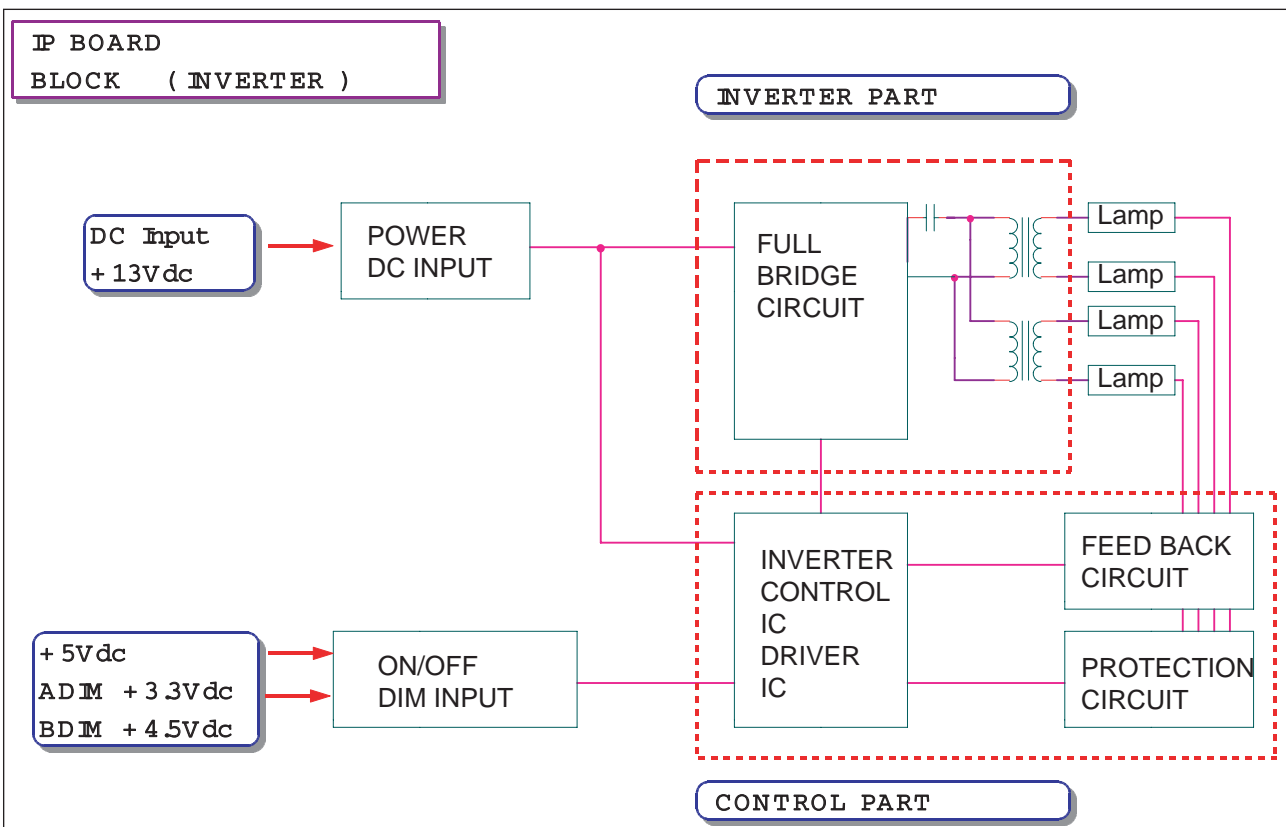


1. Inverter: A conversion device that converts DC rated voltage/current to high ones necessary for the panel lamp.
2. DC/DC(Regulator): General term for DC to DC converting devices.
The IP board receives 5V and outputs 1.8 or 3.3V that is supplied to the scaler (SE56AWL).
3. Power MosFET: The IP board receives 5V and outputs a lower voltage in DPMS mode and supplies the whole 5V for the panel operating board in normal conditions. In that case, the switching of Power MosFET is controlled by Micom.
4. Scaler: Receives the digital TMDs and analog R,G,B signals and convert them to proper resolutions using up- or down- scaling that are transferred to the panel in the LDVS formats.
5. Crystal(Oscillator): Use one 24MHz oscillator externally to supply power to both MCU and Scaler at the same time.
6. MCU & EEPROM: I2C is a two-way serial bus of two lines that supports communications across the integrated circuits as well as between MCU, Scaler and EEPROM.
In particular, MCU and Scaler (SE56AWL) use the DDR direct bus for mutual communications, which is an effective, speedy system because it allows 4 additional address/data lines compared to the old serial systems.
7. Function Key: A certain keystroke generates a certain electrical potential, which is transferred into ADC input port of the MCU and then converted to a digital value by the A/D converter of the chip. The digital value (data) is a clue to which key is entered. In practical, the voltage levels are set as below.

13-1-3 IP BOARD BLOCK(POWER) Parts



13-1-4 IP BOARD BLOCK(INVERTER) Parts



13-1-5 IP BOARD (inverter) PROTECTION Parts

BIZET INVERTER CONTROLER FAN7310 have 2-way of the PROTECTION MODE.

1. OVP[Over Voltage Protection] : If the Voltage of the series capacitors C10 & C15 is over the 2.0V, the Inverter latched-off.[See the Picture1]

2. OLP[Over Load Protection] : If the inverter output harness is opened(No-output current), the base of the Q1 turns on and charge the C9 over 2V and then, the Inverter latched-off[See the Picture2]

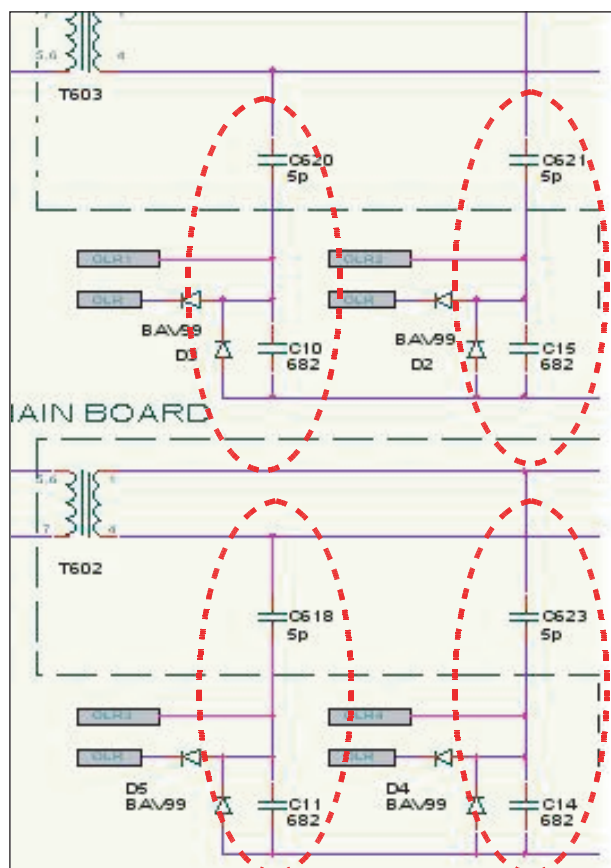


Figure 1.

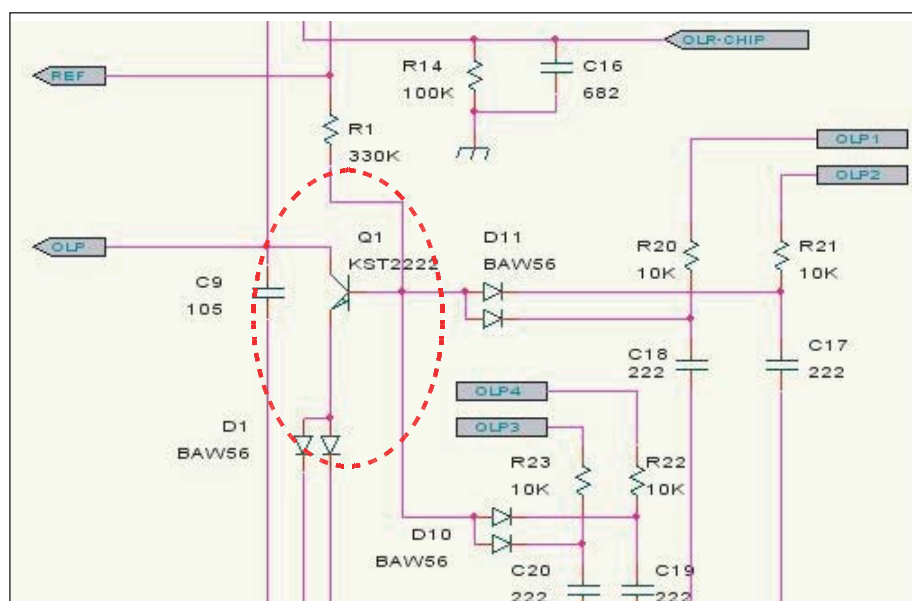
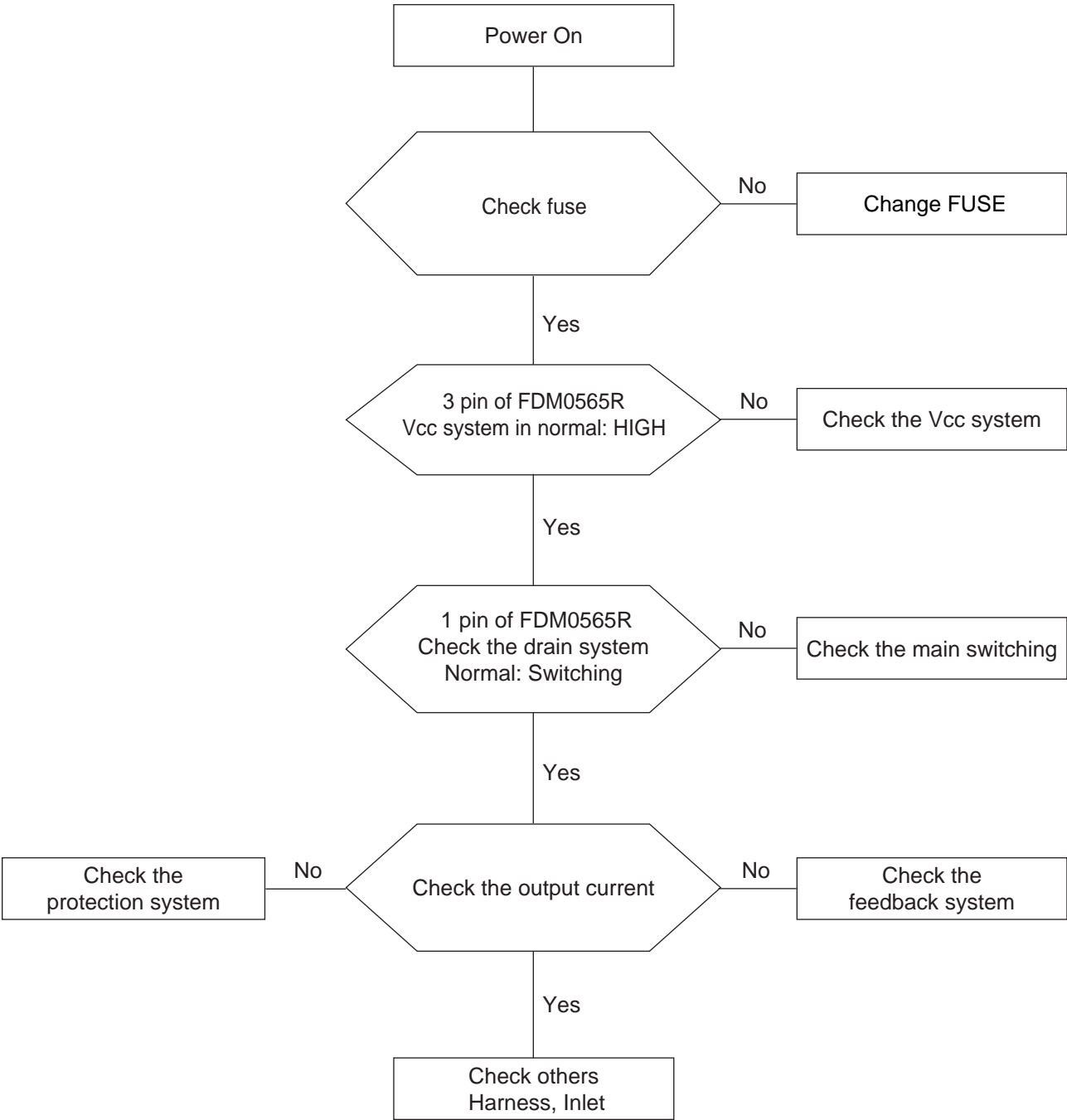


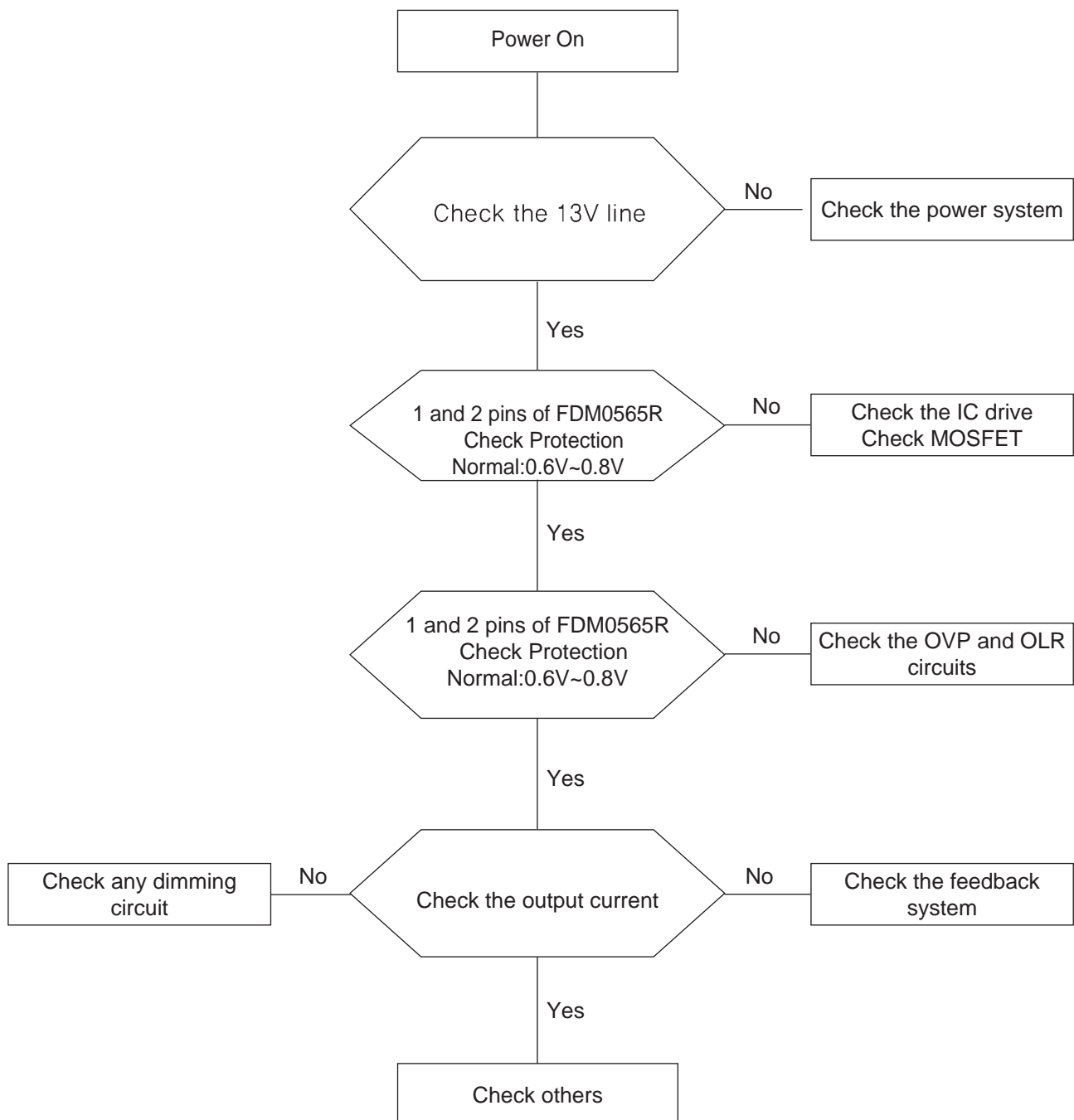
Figure 2.

13-2 Trouble Shooting

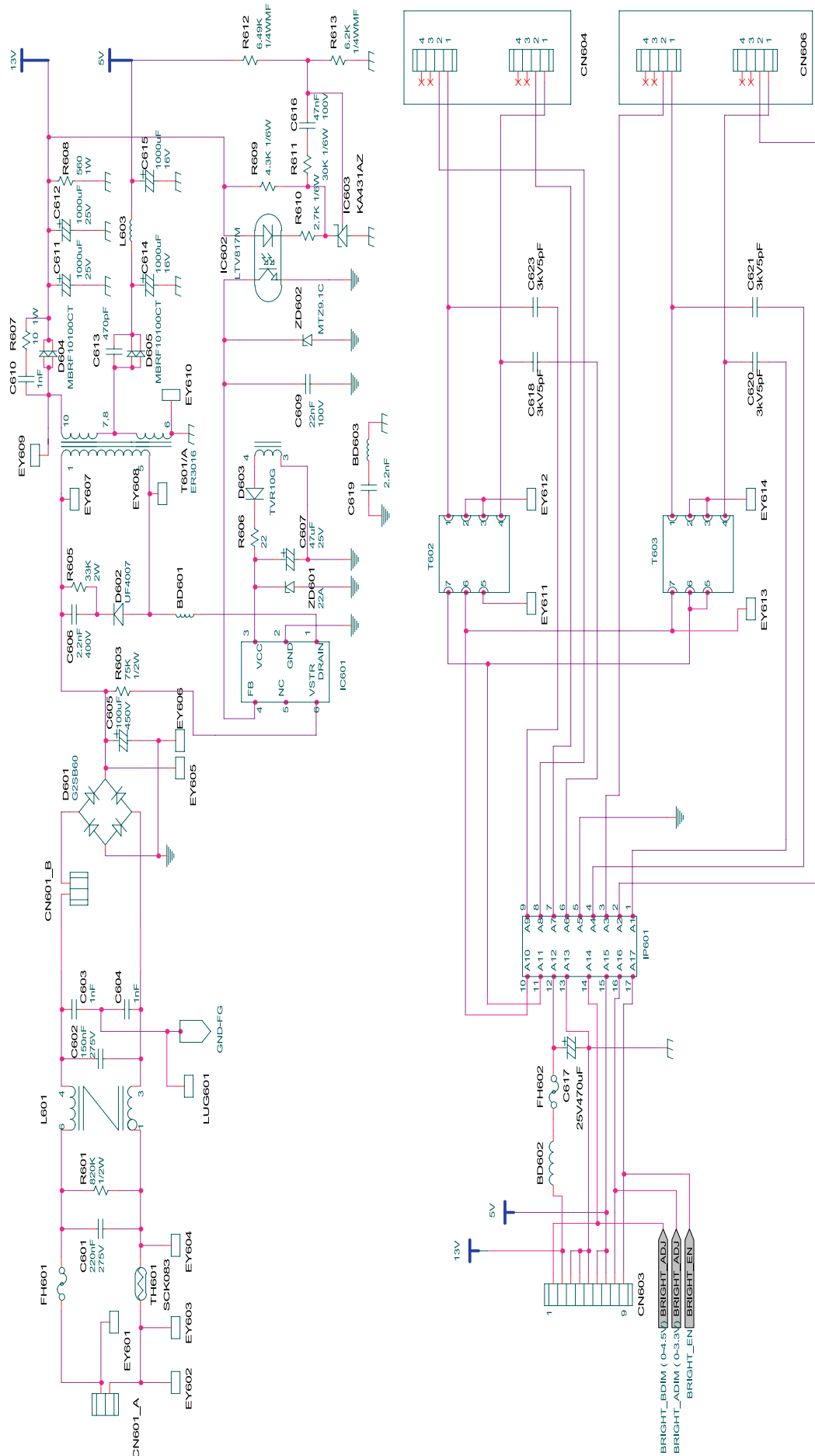
13-2-1 IP BOARD(Power)



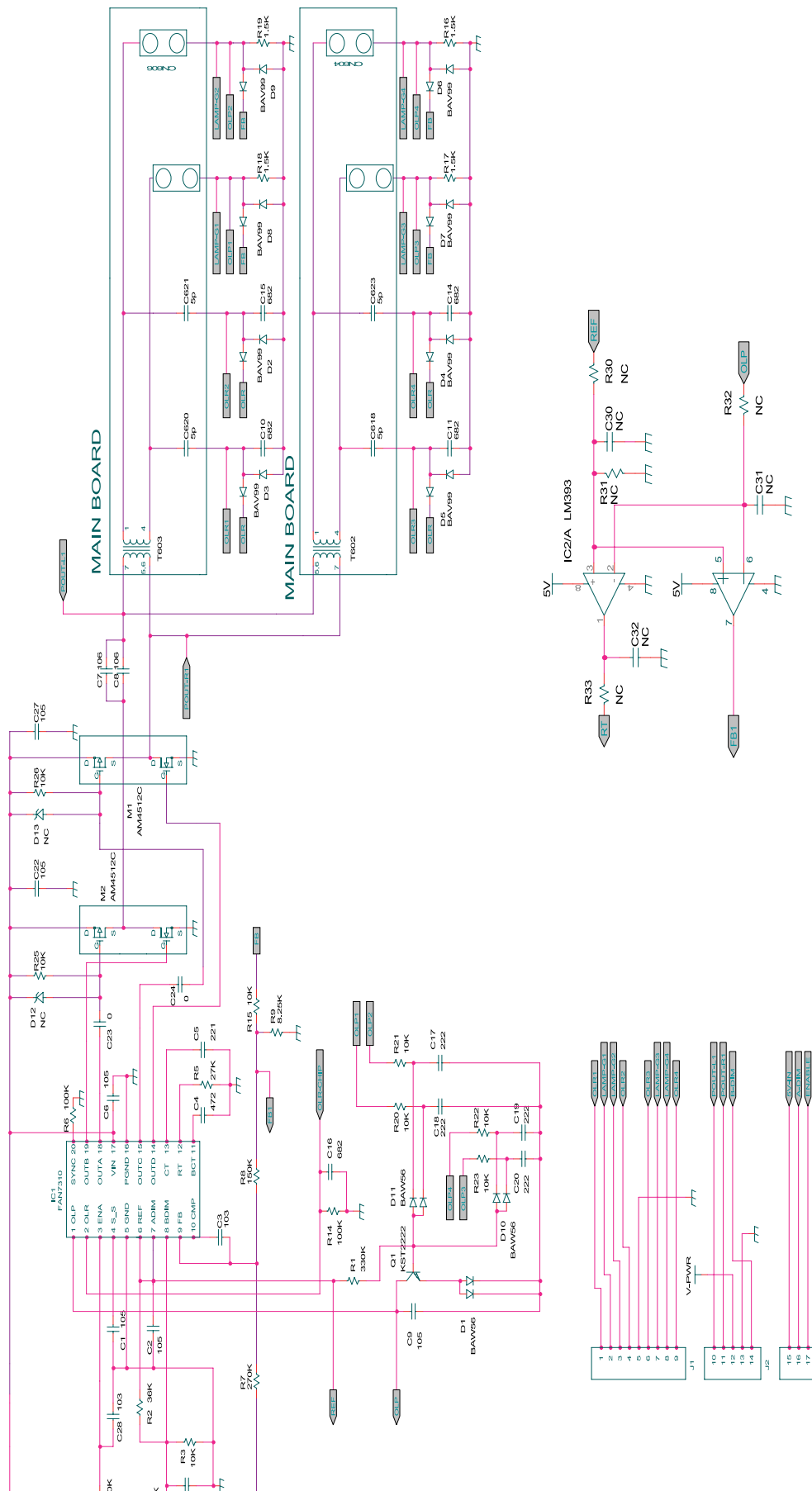
13-2-1 IP BOARD(Inverter)



13-3 IP BOARD(Power) Schematic Diagrams



13-4 IP BOARD(Inverter) Schematic Diagrams



14 Reference Information

14-1 Technical Terms

-TFT-LCD

(Thin film Transistor Liquid Crystal Display)

ADC(Analog to Digital Converter)

This is a circuit that converts from analog signal to digital signals.

-PLL(Phase Locked Loop)

During progressing ADC, Device makes clock synchronizing HSYNC with Video clock

-Inverter

Device that supply Power to LCD panel lamp. this device generate about 1,500~2,000V.

AC Adapter

Device that converts AC(90V~240V) to DC(+12V or 14V)

SMPS(Switching Mode Power Supply)

Switching Mode Power supply. This design technology is used to step up/down the input power by switching on/off

-FRC(Frame Rate Controller)

Technology that change image frame quantity displayed on screen for one second.

Actually TFT-LCD panel require 60 pcs of frame for one second.

so, this technology is needed to convert input image to 60 pcs regardless input frame quantity.

-Image Scaler

Technology that convert various input resolution to other resolution.(ex. 640* 480 to 1024*768)

-Auto Configuration(Auto adjustment)

This is an algorithm to adjust monitor to optimum condition by pushing one key.

-OSD(On Screen Display)

On screen display. customer can control the screen easily with this.

-Image Lock

This means "Fineness adjustment " in LCD Monitor, the features are "Fine" and "Coarse"

-FINE

"Fine" adjustment is used to adjust visibility by control phase difference.

-COARSE

This is a adjustment by tuning with Video clock and PLL clock.

-DVI (Digital Visual Interface)

This provides a high speed digital connection for visual data types that is display technology independent. this interface is primarily focused at providing a connection between a computer and its display device.

-L.V.D.S.(Low Voltage Differential Signaling)

a kind of transmission method for Digital. It can be used from Main PBA to Panel.

-DVI (Digital Visual Interface)

This provides a high speed digital connection for visual data types that is display technology independent. this interface is primarily focused at providing a connection between a computer and its display device.

-T.M.D.S

(Transition minimized Differential Signaling)

a kind of transmission method for Digital.

It can be used from Video card to Main PBA.

-DDC(Display data channel)

It is a communication method between Host Computer and related equipment.

It can make it Plug and Play between PC and Monitor.

-EDID

Extended Display Identification Data PC can recognize the monitor information as Product data,

Product name, Display mode, Serial number and Signal source, etc through DDC Line communicating with PC and Monitor.

-Dot Pitch

The image on a monitor is composed of red, green and blue dots. The closer the dots, the higher the resolution. The distance between two dots of the same color is called the 'Dot Pitch'. Unit: mm

-Vertical Frequency

The screen must be redrawn several times per second in order to create and display an image for the user. The frequency of this repetition per second is called Vertical Frequency or Refresh Rate. Unit: Hz
Example: If the same light repeats itself 60 times per second, this is regarded as 60 Hz.

-Horizontal Frequency

The time to scan one line connecting the right edge to the left edge of the screen horizontally is called Horizontal Cycle. The inverse number of the Horizontal Cycle is called Horizontal Frequency. Unit: kHz

-Interlace and Non-Interlace Methods

Showing the horizontal lines of the screen from the top to the bottom in order is called the Non-Interlace method while showing odd lines and then even lines in turn is called the Interlace method. The Non-Interlace method is used for the majority of monitors to ensure a clear image. The Interlace method is the same as that used in TVs.

-Plug & Play

This is a function that provides the best quality screen for the user by allowing the computer and the monitor to exchange information automatically. This monitor follows the international standard VESA DDC for the Plug & Play function.

-Resolution

The number of horizontal and vertical dots used to compose the screen image is called 'resolution'. This number shows the accuracy of the display. High resolution is good for performing multiple tasks as more image information can be shown on the screen.

Example: If the resolution is 1280 x 1024, this means the screen is composed of 1280 horizontal dots (horizontal resolution) and 1024 vertical lines (vertical resolution).

14-2 Pin Assignments

Pin No.	Sync Type	15-Pin D-Sub Signal Cable Connector		
		Separate	Composite	Sync-on-green
1		Red	Red	Red
2		Green	Green	Green + H/V Sync.
3		Blue	Blue	Blue
4		GND	GND	GND
5		DDC Return (GND)	DDC Return (GND)	DDC Return (GND)
6		GND-R	GND-R	GND-R
7		GND-G	GND-G	GND-G
8		GND-B	GND-B	GND-B
9		DDC Power Input (+5V)	DDC Power Input (+5V)	DDC Power Input (+5V)
10		Self Raster	Self Raster	Self Raster
11		GND	GND	GND
12		Bi-Dr Data (SDA)	Bi-Dr Data (SDA)	Bi-Dr Data (SDA)
13		H-Sync.	H/V-Sync.	Not Used
14		V-Sync.	Not Used	Not Used
15		DDC Clock (SCL)	DDC Clock (SCL)	DDC Clock (SCL)

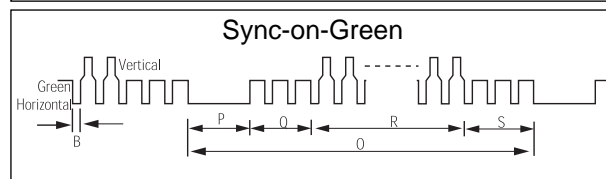
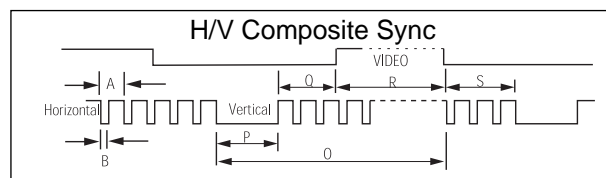
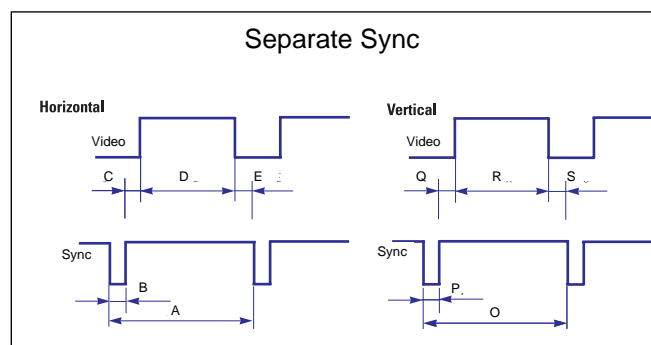
Pin No.	Sync Type	24P DVI-D		
1		Rx2-	13	No Connection
2		Rx2+	14	+5V_M
3		GND	15	Self Raster
4		No Connection	16	+5V_M
5		No Connection	17	Rx0-
6		DDC Clock (SCL)	18	Rx0+
7		DDC Data (SDA)	19	NC
8		NC	20	No Connection
9		Rx1-	21	No Connection
10		Rx1+	22	NC
11		NC	23	RxC+
12		No Connection	24	RxC-

14-3 Timing Chart

This section of the service manual describes the timing that the computer industry recognizes as standard for computer-generated video signals.

Table 2-1 Timing Chart

Mode Timing	IBM		VESA						
	VGA2/ 70 Hz 720 x 400	VGA3/ 60 Hz 640 x 480	640/75 Hz 640x480	800/60 Hz 800x600	800/75 Hz 800x600	1024/60 Hz 1024x768	1024/75 Hz 1024x768	1280/60 Hz 1280x1024	1280/75 Hz 1280x1024
fH (kHz)	31.469	31.469	37.500	37.879	46.875	48.363	60.023	63.981	79.975
A μ sec	31.777	31.778	26.667	26.400	21.333	20.677	16.660	11.852	12.504
B μ sec	3.813	3.813	2.032	3.200	1.616	2.092	1.219	1.037	1.067
C μ sec	1.589	1.589	3.810	2.200	3.232	2.462	2.235	2.296	1.837
D μ sec	26.058	26.058	20.317	20.000	16.162	15.754	13.003	9.259	9.481
E μ sec	0.318	0.318	0.508	0.000	0.323	0.369	0.203	0.000	0.119
fV (Hz)	70.087	59.940	75.000	60.317	75.000	60.004	75.029	60.020	75.025
O msec	14.268	16.683	13.333	16.579	13.333	16.666	13.328	16.005	13.329
P msec	0.064	0.064	0.080	0.106	0.064	0.124	0.050	0.047	0.038
Q msec	0.858	0.794	0.427	0.607	0.448	0.600	0.466	0.594	0.475
R msec	13.155	15.761	12.800	15.840	12.800	15.880	12.795	15.630	12.804
S msec	0.191	0.064	0.027	0.0261	0.021	0.062	0.017	0.016	0.013
Clock Freq. (MHz)	28.322	26.175	31.500	40.000	49.500	75.000	78.750	108.000	135.000
Polarity H.Sync	Negative	Negative	Negative	Positive	Positive	Negative	Positive	Positive	Positive
V.Sync	Positive	Negative	Negative	Positive	Positive	Negative	Positive	Positive	Positive
Remark	Separate	Separate	Separate	Separate	Separate	Separate	Separate	Separate	Separate



A : Line time total

B : Horizontal sync width

C : Back porch

D : Active time

E : Front porch

O : Frame time total

P : Vertical sync width

Q : Back porch

R : Active time

S : Front porch

14-4 Preset Timing Modes

-If the signal transferred from the computer is the same as the following Preset Timing Modes, the screen will be adjusted automatically. However, if the signal differs, the screen may go blank while the power LED is on. Refer to the video card manual and adjust the screen as follows.

Table 1. Preset Timing

Display Mode	Horizontal Frequency (kHz)	Vertical Frequency (Hz)	Pixel Clock (MHz)	Sync Polarity (H/V)
MAC, 640 x 480	35.000	66.667	30.240	-/-
MAC, 832 x 624	49.726	74.551	57.284	-/-
MAC, 1152 x 870	68.681	75.062	100.000	-/-
IBM, 640 x 350	31.469	70.086	25.175	+/-
IBM, 640 x 480	31.469	59.940	25.175	-/-
IBM, 720 x 400	31.469	70.087	28.322	-/+
VESA, 640 x 480	37.500	75.000	31.500	-/-
VESA, 640 x 480	37.861	72.809	31.500	-/-
VESA, 800 x 600	35.156	56.250	36.000	+, -/+, -
VESA, 800 x 600	37.879	60.317	40.000	+/+
VESA, 800 x 600	46.875	75.000	49.500	+/+
VESA, 800 x 600	48.077	72.188	50.000	+/+
VESA, 1024 x 768	48.363	60.004	65.000	-/-
VESA, 1024 x 768	56.476	70.069	75.000	-/-
VESA, 1024 x 768	60.023	75.029	78.750	+/+
VESA, 1152 x 864	67.500	75.000	108.00	+/+
VESA 1280 x 960	60.000	60.000	108.00	+/+
VESA, 1280 x 1024	63.981	60.020	108.00	+/+
VESA, 1280 x 1024	79.976	75.025	135.00	+/+

Horizontal Frequency

The time to scan one line connecting the right edge to the left edge of the screen horizontally is called Horizontal Cycle and the inverse number of the Horizontal Cycle is called Horizontal Frequency. Unit: kHz

Vertical Frequency

Like a fluorescent lamp, the screen has to repeat the same image many times per second to display an image to the user. The frequency of this repetition is called Vertical Frequency or Refresh Rate. Unit: Hz

14-5 Panel Description

Maker	VENDOR P/N	PANEL_CODE	PANEL_ABB	STICKER_CODE	Remarks
SEC	LT140X1-002	BN07-00004A	SA	BN68-00239H	-
SEC	LT150XS-L01	BN07-00009A	SB		-
SEC	LT150XS-L01-B	BN07-00022A	SC		-
SEC	LTM150XS-L02	BN07-00005A	SD		-
SEC	LT181E2-132	BN07-00001A	SE		-
SEC	LT150XS-T01	BN07-00010A	SF		-
SEC	LTM181E3-132	BN07-00019A	SG		-
SEC	LT170E2-131	BN07-10001D	SH		-
SEC	LT181E2-131	BN07-10001E	SJ		-
SEC	LTM170E4-L01	BN07-00018A	SK		-
SEC	LTM240W1-L01	BN07-00015A	SL		-
SEC	LTM213U3-L01	BN07-00016A	SM		-
SEC	LTM150XH-L01	BN07-00026A	SN		-
SEC	LTM150XH-L03	BN07-00027A	SP		-
SEC	LTM150XS-L01	BN07-00032A	SQ		DELL(ZPD)
SEC	LTM181E4-L01	BN07-00034A	SR		PVA
SEC	LTM170EH-L01	BN07-00036A	SS		TN
SEC	LTM170E5-L01	BN07-00037A	SU		PVA
SEC	LTM150XH-L11	BN07-00041A	SV		-
SEC	LTM213U4-L01	BN07-00039A	SW		PVA
SEC	LTM150XH-L01(ZPD)	BN07-00045A	SX		ZPD
SEC	LTM150XH-L04	BN07-00046A	SY		New panel with high brightness
SEC	LTM170W1-L01	BN07-00047A	SZ		Panel for TV
SEC	LTM150XH-L06	BN07-00053A	EA		Panel for TV/ High luminance for 450cd _ SONY&EOS Team Panel for TV
SEC	LTM153W1-L01	BN07-00054A	EB		Use NIKE MODEL
SEC	LTM170EH-L05	BN07-00055A	EC		Panel EOS proj. for high brightness of 17" EH-L05
SEC	LTM170E5-L03	BN07-00056A	ED		Dell 1702FP pro. E4. EH mechanical Compatible
SEC	LTM190E1-L01	BN07-00057A	EE		DELL 1900 FP
SEC	LTM181E5-L01	BN07-00061A	EF		18" narrow bezel GH18PS
SEC	LTM150XP-L01	BN07-00065A	EG		AMLCD PVA PANEL
SEC	LTM240W1-L02	BN07-00062A	EH		Panel for 15" Wide TV
SEC	LTM170EU-L01	BN07-00071A	EJ		Slim design, TN
SEC	LTM170E5-L04	BN07-00072A	EK		E5-L04 6 bits FRC... for IBM
SEC	LTA220W1-L01	BN07-00074A	EL		Panel for 22" TV
SEC	LTM170E6-L02	BN07-00075A	EM		AMLCD Narrow & slim design 17" PVA mode
SEC	LTM170W1-L01	BN07-00082A	EN		LTM170W1-L01 ZPD panel
SEC	LTM170EH-L01	BN07-00080A	EP		LTM170EH-L01 ZPD panel
SEC	LTM170E5-L01	BN07-00081A	EQ		LTM170E5-L01 ZPD panel
SEC	LTM170EH-L05	BN07-00083A	ER		LTM170EH-L05 ZPD panel
SEC	LTM170E5-L03	BN07-00084A	ES		LTM170E5-L03 ZPD panel
SEC	LTM170EU-L01	BN07-00085A	ET		LTM170EU-L01 ZPD panel
SEC	LTM170E5-L04	BN07-00086A	EU		LTM170E5-L04 ZPD panel
SEC	LTM170E6-L02	BN07-00087A	EV		LTM170E6-L02 ZPD panel
SEC	LTM150XH-L06	BN07-00091A	EW		Color coordinates change for LCD TV
SEC	LTM153W1-L01	BN07-00092A	EX		AMLCD WIDE 15",9/10
SEC	LTM170W1-L01	BN07-00100A	EY		Color Coordinates change code management
SEC	LTM170EH-L05	BN07-00097A	EZ		LTM170E5-L05 Color Coordinates Change Panel Code
SEC	LTA400W1-L01	BN07-00109A	S1		PANEL of AMLCD 40" TV
SEC	LTM153W1-L01	BN07-00110A	S2		Color coordinates change 0.280/0.290, 10000k & ZPD Panel
SEC	LTM150XH-L06	BN07-00111A	S3		Color coordinates change 0.280/0.290, 10000k & ZPD Panel

Maker	VENDOR P/N	PANEL_CODE	PANEL_ABB	STICKER_CODE	Remarks
SEC	LTM170W1-L01	BN07-00112A	S4		Color coordinates change 0.280/0.290, 10000k & ZPD Panel
SEC	LTM170EH-L05	BN07-00113A	S5		Color coordinates change 0.280/0.290, 10000k & ZPD Panel
SEC	LTM220W1-L01	BN07-00114A	S6		ZPD Panel for AMLCD 22" TV
SEC	LTM150XH-L06	BN07-00117A	S7		ZPD Panel code
SEC	LTM153W1-L01	BN07-00118A	S8		ZPD Panel code
SEC	LTM170WP-L01	BN07-00119A	S9		PVA Panel for NIKE
SEC	LTM213U4-L01	BN07-00039A	E1		21.3" NARROW
SEC	LTA260W1-L01	BN07-00121A	E2		VENUS
SEC	LTA220W1-L01	BN07-00074B	E3		"Panel B-level panel code for 22" TV Panel "
SEC	LTA320W1-L01	BN07-00108A	E4		"Panel for AMLCD 32" TV"
SEC	LTM213U4-L01	BN07-00124A	E5		NARROW BEZEL 21 " PANEL
SEC	LTM170E6-L04	BN07-00129A	E6		"HIGHLAND 17" LOW PANEL (Panel only for TCO03)"
SEC	LTM190E1-L01	BN07-00088A	E7		LTM190E1-L01 ZPD panel
SEC	M150X4-L06	BN07-00137A	E8		15" Narrow & Slim panel
SEC	LTA170V1	BN07-00139A	E9		"17" Panel for Muse 4:3 VGA TV"
SEC	LTM190E1-L02	BN07-00128A	E10		"New Panel from AMLCDI, Specification : 6bit Driver IC"
SEC	LTM170EX-L01	BN07-00143A	E11		"Development new Panel from AMLCD"
SEC	LTM170E8-L01	BN07-00144A	E12		"Development new Panel from AMLCD"
SEC	LTM170E6-L04	BN07-00129B	E13		"ZPD panel for AMLCD (Panel only for TCO03)"
SEC	LTA320W1-L02	BN07-00108B	E14		"Creat B-level Panel code for AMLCD 32" TV"
SEC	LTM190E1-L03	BN07-00151A	E15		"Development new 19" Panel form AMLCD (Panel only for TCO03)"
SEC	LTM240W1-L03	BN07-00134A	E16		"AMLCD 24" panel development"
SEC	LTM190E1-L02	BN07-00128B	E17		"New Panel from AMLCD, Specification : 6bit Driver IC(ZPD)"
SEC	LTM190E4-L01	BN07-00145A	E18		"AMLCD 24" new panel development"
SEC	LTM170E8-L01	BN07-00158A	E19		"ZPD code derivation"
SEC	LTM170EX-L01	BN07-00159A	E20		"ZPD code derivation"
SEC	LTM190E1-L03	BN07-00151B	E21		"Creat new panel code for AMLCD 19" (Panel only for TCO03)"
SEC	LTA460H1-L01	BN07-00157A	E22		"creat panel code for AMLCD 46" TV "
SEC	LTM170EU-L11	BN07-00160A	E23		"creat new panel code for AMLCD 17" (Panel only for TCO03)"
SEC	LTM240W1-L03	BN07-00134B	E24		"24" panel ZPD code derivation"
SEC	LTM190E4-L01	BN07-00145B	E25		"AMLCD 19" ZPD Panel code derivation"
SEC	LTM240W1-L03	BN07-00134B	E26		"24" panel ZPD code derivation"
SEC	LTM150XO-L01	BN07-00164A	E27		"AMLCD 15" XO-L01 new panel development"
SEC	LTM150XO-L01	BN07-00164B	E28		"AMLCD 15" XO-L01 ZPD code derivation"
SEC	LTM170EU-L11	BN07-00160B	E29		"AMLCD 17" NEW panel code derivation"
SEC	LTA320W2-L01	BN07-00172A	SPZ		AMLCD 32" NEW panel
SEC	LTM213U4-L01	BN07-00124B	SPZ		21.3" Narrow PANEL ZPD Panel derivation
SEC	LTM170EU-L11	BN07-00189A	STH		AMLCD EU-L11 Pb free panel code derivation
SEC	LTM170EU-L11	BN07-00189B	STZ		AMLCD EU-L11 Pb free panel ZPD code derivation
SEC	LTM240W1-L04	BN07-00188A	SPH		24" A-DCC new panel development
SEC	LTM240W1-L04	BN07-00188B	SPZ		24" A-DCC panel ZPD code derivation
SEC	LTM190EX-L01	BN07-00191A	STH		AMLCD 19" TN new Panel
SEC	LTM190EX-L02	BN07-00191B	STZ		AMLCD 19" TN new Panel ZPD derivation
SEC	LTA230W1-L02	BN07-00184A	SPZ		AMLCD 23" 16:9 new Panel
SEC	LTA260W2-L01	BN07-00185A	SPZ		AMLCD 26" 16:9 new Panel
SEC	LTM240M1-L01	BN07-00195A	SPH		24" panel with high brightness development
SEC	LTA400W2-L01	BN07-00186A	SPZ		AMLCD 40" 16:9 new Panel
SEC	LTM150XO-L01	BN07-00197A	STH		AMLCD 15" XO-L01 Pb free panel code
SEC	LTM150XO-L01	BN07-00197B	STZ		AMLCD 15" XO-L01 Pb free panel ZPD code
SEC	LTM170EU-L21	BN07-00202A	STZ		AMLCD EU-L21 ZPD new code derivation

14 Reference Information

Maker	VENDOR P/N	PANEL_CODE	PANEL_ABB	STICKER_CODE	Remarks
SEC	LTA460W2-L03	BN07-00187A	SPZ		BEETOVEN 46"ZPD new panel
SEC	LTM240M1-L01	BN07-00195B	SPZ		24" igh brightness panel ZPD code derivation
SEC	M170EX-L21	BN07-00206A	STZ		AMLCD LTM170EX-L21 ZPD new code derivation
SEC	LTA460H3-L01	BN07-00200A	SPZ		AMLCD 46" LED BLU panel
SEC	LTM170EU-L15	BN07-00214A	STZ		AMLCD EU-L15 TV high brightness ZPD new code derivation
SEC	LTM170E8-L21	BN07-00218A	SPZ		AMLCD LTM170E8-L21 PVA ZPD new code derivation
SEC	LTM190EX-L21	BN07-00222A	STZ		DISPLAY LCD
SEC	LTM201U1-L01	BN07-00190B	SPZ		AMLCD 20.1" Normal panel ZPD code derivation
SEC	LTM190E4-L21	BN07-00223A	SPZ		HAYDN 17" PZD code PANEL derivation
SEC	LTA570H1-L01	BN07-00196A	SPZ		AMLCD 57" new panel development
SEC	LTM150XO-L21	BN07-00229A	STZ		AMLCD 15" XO-L21 8ms panel code
SEC	LTA260W2-L11	BN07-00239A	SPZ		AMLCD 26" 16:9 7Line new Panel
SEC	LTA400WS-LH1	BN07-00245A	SPZ		AMLCD 40" 16:9 SPVA 90% new Panel
SEC	LTM213U6-L01	BN07-00231A	SPZ		AMLCD 21.3" PVA new Panel Code
SEC	LTA320WS-LH2	BN07-00244A	SPZ		AMLCD 32" 16:9 SPVA 90% new Panel
SEC	LTA400WS-LH1	BN07-00245A	SPZ		AMLCD 40" 16:9 SPVA 90% new Panel
SEC	LTM190M2-L01	BN07-00227A	STZ		AMLCD 19" TN Wide new Panel Code
SEC	LTM201UX-L01	BN07-00249A	STZ		AMLCD 20.1" TN new Panel Code
CPT	CLAA150XG09	BN07-00141A	PA		"CPT 15"" Monitor new panel development"
CPT	CLAA170EA02	BN07-00148A	PB		"17"" CPT NEW development panel"
CPT	CLAA170EA02	BN07-00148B	PC		"17"" CPT ZPD panel code derivation"
CPT	CLAA150XG09	BN07-00141B	PTZ		"CPT 15"" panel ZPD code derivation (GOYA-PJT)"
CPT	CLAA150XP01	BN07-00173A	PTH		CPT 15" PSWG code derivation
CPT	CLAA150XP01	BN07-00173B	PTZ		CPT 15" PSWG panel ZPD code
CPT	CLAA170EA07	BN07-00174A	PTH		"CPT 17"" PSWG panel code derivation
CPT	CLAA170EA07	BN07-00174B	PTZ		CPT 17"" PSWG type new Panel code""
CPT	CLAA170EA07	BN07-00174B	PTZ		CPT 17" PSWG type new Panel code
CPT	CLAA170EA07Q	BN07-00220A	PTZ		CPT 17" PSWG R/T 8msec code derivation
CPT	CLAA170EA07Q	BN07-00220B	PTH		CPT 17" PSWG R/T 8msec HPD code derivation
CPT	CLAA150XP01F	BN07-00236A	PTZ		CPT 15" PSWG panel ZPD & Lead free code derivation
TOSHIBA	LTM15C419(A)	BN07-00002A	TA		-
TOSHIBA	LTM15C423(B)	BN07-00006A	TB		-
TOSHIBA	LTM18C161	BN07-00008A	TC		-
TOSHIBA	LTM15C443	BN07-00031A	TD		-
TOSHIBA	LTM15C458	BN07-00043A	TE		-
TOSHIBA	LTM15C458S	BN07-00077A	TF		"TSB 15"" high brightness Panel"
TOSHIBA	LTM15C458	BN07-00078A	TG		Toshiba ZPD panel
TOSHIBA	LTM15C458S	BN07-00099A	TH		TSB LTM15C458S (ZPD)
HANNSTAR	HSD150MX41A(A)	BN07-00020A	NA		"TTL type"
HANNSTAR	HSD150MX12	BN07-00030A	NB		"TTL type"
HANNSTAR	HSD170ME13	BN07-00180A	NTH		Hannstar 17" TN new panel development
HANNSTAR	HSD170ME13	BN07-00180B	NTZ		Hannstar 17" TN new panel development ZPD code derivation
HANNSTAR	HSD190ME12	BN07-00210A	NTZ		Hannstar 19" TN new panel development
HANNSTAR	HSD150MX17-A	BN07-00226A	NTZ		Hannstar 15" slim panel ZPD code derivation
TORISAN	TM150XG-22L03(A)	BN07-00021A	RA		-
TORISAN	TM150XG-26L06	BN07-00042A	RB		-

Maker	VENDOR P/N	PANEL_CODE	PANEL_ABB	STICKER_CODE	Remarks
TORISAN	TM181SX-76N01	BN07-00048A	RC		-
TORISAN	TM150XG-26L06	BN07-00059A	RD		15" XGA TN MODE(ZPD)
TORISAN	TM290WX-71N31	BN07-00063A	RE		"RS24NS (TORISAN 29"" NEW PANEL)"
TORISAN	TM396WX-71N31	BN07-00064A	RF		"RS24NS (TORISAN 40"" NEW PANEL)"
TORISAN	TM150XG-26L09	BN07-00073A	RG		"Panel for 15"" TV"
TORISAN	TM150XG-26L10	BN07-00089A	RH		"L10(change except D/IC) ZPD"
TORISAN	TM150XG-26L10	BN07-00090A	RJ		L10 NORMAL
TORISAN	TM190SX-70N01	BN07-00098A	RK		Torisan 19" Panel
TORISAN	TM181SX-76N01	BN07-00106A	RL		ZPD Panel code
TORISAN	TM190SX-70N01	BN07-00107A	RM		ZPD Panel code
TORISAN	TM290WX-71N31	BN07-00115A	RN		"Color Coordinates change panel for TORISAN 29"" TV"
TORISAN	TM396WX-71N31	BN07-00116A	RP,Q		"Color Coordinates change panel for TORISAN 40"" TV"
TORISAN	TM220WX-71N31	BN07-00125A	RR		"Development TORISAN 22"" TV PANEL (ZPD)"
TORISAN	TM220WX-71N31	BN07-00127A	RS		"Development TORISAN 22"" TV PANEL (HPD)"
TORISAN	TM396WX-71N32A	BN07-00150A	RT		120V inverter Exclusive panel
TORISAN	TM190SX-70N02	BN07-00154A	RMH		Torisan 6bit panel code Derivation
TORISAN	TM190SX-70N02	BN07-00154B	RMZ		Torisan 6bit panel code Derivation
TORISAN	TM150XG-A01	BN07-00162A	RTH		Torisan 15" Narrow & Slim panel development
TORISAN	TM150XG-A01	BN07-00162B	RTZ		Torisan 15" N&S panel ZPD code Derivation
SHARP	LQ181E1DG11(A)	BN07-10001C	PA		-
SHARP	LQ150X1LW71	BN07-00067A	PB		SHARP 15" PVA PANEL
SHARP	LQ370T3LZ41	BN07-00216A	FAZ		Rome2
HITACHI	TX38D12VC0CAA(A)	BN07-00003A	HA		-
HITACHI	TX43DVCOCAB	BN07-00060A	HB		17" SXGA PVA MODE
HITACHI	TX43D15VC0CAB	BN07-00101A	HC		ZPD Panel
HITACHI	TX51D11VC0CAB	BN07-00122A	HD		20.1" NARROW
HITACHI	TX54D11VC0CAB	BN07-00123A	HE		21.3" NARROW
HITACHI	TX80D12VC0CAB	BN07-00169A	HIZ		"Development new panel for Hitachi 32"" TV (ZPD)"
HITACHI	TX54D11VC0CAB	BN07-00123B	HIZ		Hitachi 21.3"ZPD panel
IBM	ITSX94S	BN07-00017A	IA		-
UNIPAC	UM170E0	BN07-00028A	UA		Loaded by cisdba
HYUNDAI	HT15X13	BN07-00035A	DA		-
HYUNDAI	HT17E11-200	BN07-00049A	DB		TN MODE
HYUNDAI	HT17E11-300	BN07-00093A	DC		HT17E11-300 ZPD panel
HYUNDAI	HT17E11-400	BN07-00094A	DD		HT17E11-400 normal panel
HYUNDAI	HT17E11-400	BN07-00095A	DE		HT17E11-400 ZPD panel code
HYUNDAI	HT17E12	BN07-00096A	DF		HT17E12 (Narrow & slim Design)
HYUNDAI	HT17E12	BN07-00105A	DG		ZPD Panel code
HYUNDAI	HT15X15-D00	BN07-00146A	DH		"Development for Ares 15"" Hydis TV"
HYUNDAI	HT15X15-D01	BN07-00146B	DJ		"Derivation panel HPD for Ares 15"" Hydis TV "
HYUNDAI	HT17E13-100	BN07-00167A	DTH		"PINEHURST-2(IBM) PJT 17"" HYDIS PANEL Derivation"
HYUNDAI	HT17E13-100	BN07-00167B	DTZ		"PINEHURST-2(IBM) Hydis 17"" ZPD code Derivation"
HYUNDAI	HT170EX1-100	BN07-00240A	DTZ		17" EX compatible Hydis Slim panel development
ACER	L170E3	BN07-00044A	AA		TN(ADT)
ACER	M170EN05	BN07-00076A	AB		AU 17" Panel (Narrow & slim design)

14 Reference Infomation

Maker	VENDOR P/N	PANEL_CODE	PANEL_ABB	STICKER_CODE	Remarks
ACER	M170EN05	BN07-00102A	AC		ZPD Panel code
ACER	M190EN02	BN07-00170A	AMH		"AU Monitor 19"" new panel development (P19-1S)"
ACER	M190EN02	BN07-00170B	AMZ		"AU 19"" ZPD code derivation (ZPD)"
ACER	M170EN06	BN07-00171A	ATH		"AU Monitor 17"" New panel development "
ACER	T260XW01	BN07-00163A	AMZ		"AU 26"" new panel development (NF26EO)"
ACER	A201SN01	BN07-00177A	ATZ		"AU TV panel 20.1"" TN SVGA new panel development"
ACER	M170EN06	BN07-00171B	ATZ		AU Monitor 17" ZPD code derivation
ACER	T315XW01	BN07-00194A	AMZ		AU 32" new
ACER	M170EG01	BN07-00192A	ATH		AU TN PSWG type new Panel code
ACER	M170EG01	BN07-00192B	ATZ		AU TN PSWG type NEW panel code derivation
ACER	M190EN04	BN07-00203A	ATH		AU Monitor 19" ZPD new Panel code
ACER	T260XW02	BN07-00208A	AMZ		AUO 26" ZPD panel
ACER	M170EG01 V8	BN07-00221A	ATZ		AU TN PSWG type new Panel (8msec) ZPD code derivation
ACER	T260XW02	BN07-00233A	AMZ		AUO 26" Panel new (Cosmetic spec down grade)
ACER	T315XW01	BN07-00234A	AMZ		AUO 32" Grade new (Cosmetic spec down grade)
ACER	M190EN03	BN07-00224A	AMZ		AU Monitor 19" MVA new code derivation
ACER	T315XW01	BN07-00237A	AMZ		LCD TV VE project new
ACER	T315XW01	BN07-00238A	AMZ		LCD TV VE project new
ACER	M201UN02 V3	BN07-00168A	AMZ		
ACER	M190EN04 V7	BN07-00248A	ATZ		AU Monitor 19" TN Glare ZPD new code derivation
CHIMEI	M170E3-L01	BN07-00050A	CA		TN PANEL
CHIMEI	M150X3-L01	BN07-00051A	CB		COMPATIBLE
CHIMEI	M170E4-L01	BN07-00052A	CC		MVA PANEL
CHIMEI	M150X2-L01	BN07-00066A	CD		CHIME 15" PVA PANEL
CHIMEI	M150X3-L01	BN07-00079A	CE		Chimei ZPD panel
CHIMEI	M170E3-L01	BN07-00103A	CF		ZPD Panel code
CHIMEI	M170E4-L01	BN07-00104A	CG		ZPD Panel code
CHIMEI	V296W1-L01	BN07-00120A	CH		MVA
CHIMEI	M170E6-L02	BN07-00126A	CJ		HIGHLAND 17" LOW PANEL
CHIMEI	M190E2-L01	BN07-00131A	CK		GH19AS,BS CHIMEI PANEL
CHIMEI	M150X4-L06	BN07-00137A	CL		15" Narrow & Slim panel
CHIMEI	M170E6-L01	BN07-00133A	CM		"2003-03-11 vendor change"
CHIMEI	M170E6-L01	BN07-00133B	CN		ZPD derivation panel
CHIMEI	V201V1-T01	BN07-00135A	CP		CHIMEI 20.1" panel development
CHIMEI	M170E6-L02	BN07-00126B	CQ		"HIGHLAND 17"" LOW PANEL ZPD derivation panel"
CHIMEI	M170E6-L05	BN07-00152A	CR		"CMO 17"" new panel development code"
CHIMEI	M170E6-L05	BN07-00152B	CS		"CMO 17"" ZPD panel code derivation"
CHIMEI	M150X4-L06	BN07-00137B	CT		Chimei 15" Narrow & Slim panel ZPD derivation
CHIMEI	M170E5-L05	BN07-00165A	CTH		CMO 17" new panel development code (GOYA2-PJT)
CHIMEI	M170E5-L05	BN07-00165B	CTZ		CMO 17" ZPD panel(GOYA2-PJT)
CHIMEI	V230W1-L02	BN07-00209A	CMZ		CMO 23" development
CHIMEI	V320B1-L01	BN07-00207A	CMZ		CMO 32" development
CHIMEI	V270W1-L01	BN07-00136A	CMZ		CHI MEI 27" panel development
NEC	SVA150XG04TB	BN07-00225A	BTZ		SVA NEC 15" panel ZPD code