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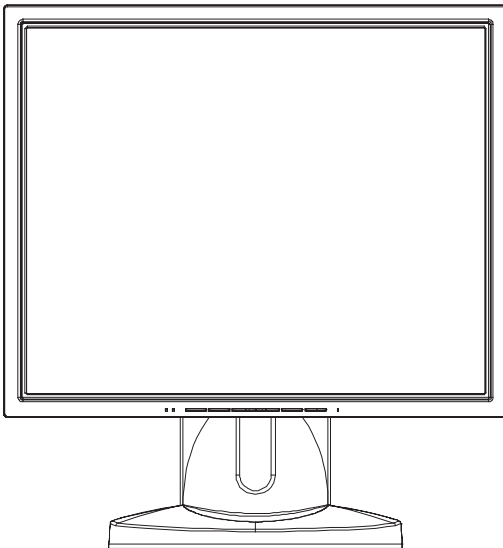
**SAMSUNG**

# TFT-LCD MONITOR

**GH19P\***

# ***SERVICE*** Manual

## TFT-LCD MONITOR



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# 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.
3. When the chassis is operating, semiconductor heatsinks are potential shock hazards.

### 1-1-2 Servicing the LCD Monitor

1. When servicing the LCD Monitor, remove the static charge by connecting a 10k ohm resistor in series with an insulated wire (such as a test probe) between the chassis and the anode lead. (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).

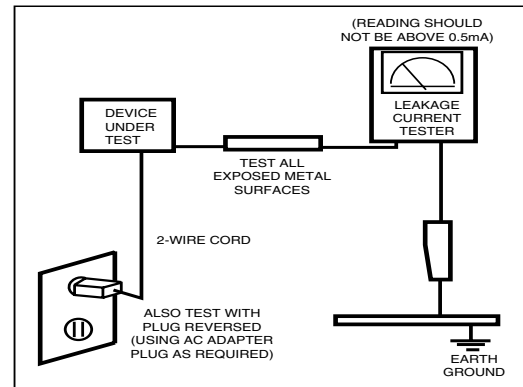


Figure 1-1. Leakage Current Test Circuit

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 ⚠ 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.

## 2 Product Specifications

### 2-1 Specifications

Item	Description
LCD Panel	TFT-LCD panel, RGB vertical stripe, normally black transmissive, 0.264 pixel pitch
Scanning Frequency	Horizontal : 30 kHz ~ 81 kHz (Automatic) Vertical : 56 Hz ~ 85 Hz
Display Colors	16,7 Million colors
Maximum Resolution	Horizontal : 1280 Pixels @ 81 kHz Vertical : 1024 Pixels @ 76 Hz
Input Video Signal	Analog : 0.7 Vp-p $\pm$ 5% positive at 75 $\Omega$ , internally terminated Digital : TMDS-Digital
Input Sync Signal	Type : Seperate H/V sync. SOG(Sync-On-Green), Composite, Automatic Synchronization without external switch Level : TTL level (V high $\geq$ 2.0 V, V low $\leq$ 0.8 V)
Maximum Pixel Clock rate	135 MHz
Active Display Horizontal/Vertical	376.32 $\pm$ 3 mm 301.056 $\pm$ 3 mm
AC power voltage & Frequency	AC 90 ~ 264 Volts, 60/50 Hz $\pm$ 3 Hz
Power Consumption	40 W (max), 36W (normal)
Dimensions Unit (W x D x H) Carton (W x D x H)	416.3 x 450.5 x 208 mm (16.4 x 17.7 x 8.2 inches) 516.0 x 536.0 x 288.0 mm (20.3 x 21.1 x 11.3 inches)
Weight (Net/Gross)	5.9 kg (13 lbs) / 8.4 kg (18.5 lbs)
Environmental Considerations	Operating Temperature : 50°F ~ 104°F (10°C ~ 40°C) Humidity : 10 % ~ 80 % Storage Temperature : -4°F ~ 113°F (-20°C ~ 45°C) Humidity : 5 % ~ 95 %
<ul style="list-style-type: none"> <li>GH19P* comply with TC099 recommendations for reduced electromagnetic fields.</li> <li>Designs and specifications are subject to change without prior notice.</li> </ul>	

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## 3 Disassembly and Reassembly

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This section of the service manual describes the disassembly and reassembly procedures for the GH19P\* monitors.

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

### 3-1 Disassembly

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**Cautions:**

1. Disconnect the monitor from the power source before disassembly.
2. Follow these directions carefully; never use metal instruments to pry apart the cabinet.

#### 3-1-1 Removing the Stand

1. Remove 4 screws in the hinge area.
2. Disconnect DVI Cable and Signal Cable and Power cord.
3. Pry it off the back of the monitor.

#### 3-1-2 Main Body Disassembly

1. Face the monitor down on a soft-cushionea flat surface.
2. Put the jig into the opening hole of the bottom.
3. Open the rear cover partly by pushing the jig into left and right hole.
4. Put the jig into the opening hole of the top-center and take the rear cover apart by pushing it upward.
5. Remove 2 screws on the Inverter PCB.
6. Remove the Main PCB Assembly.
7. Remove 3 screws on the Function PCB from locking area of Function knob and remove Function PCB.

## 4-1 Troubleshooting

**Notes:** 1. Before troubleshooting, setup the PC's display as below.

- Resolution: 1280 x 1024
- H-frequency: 63 kHz
- V-frequency: 75 Hz

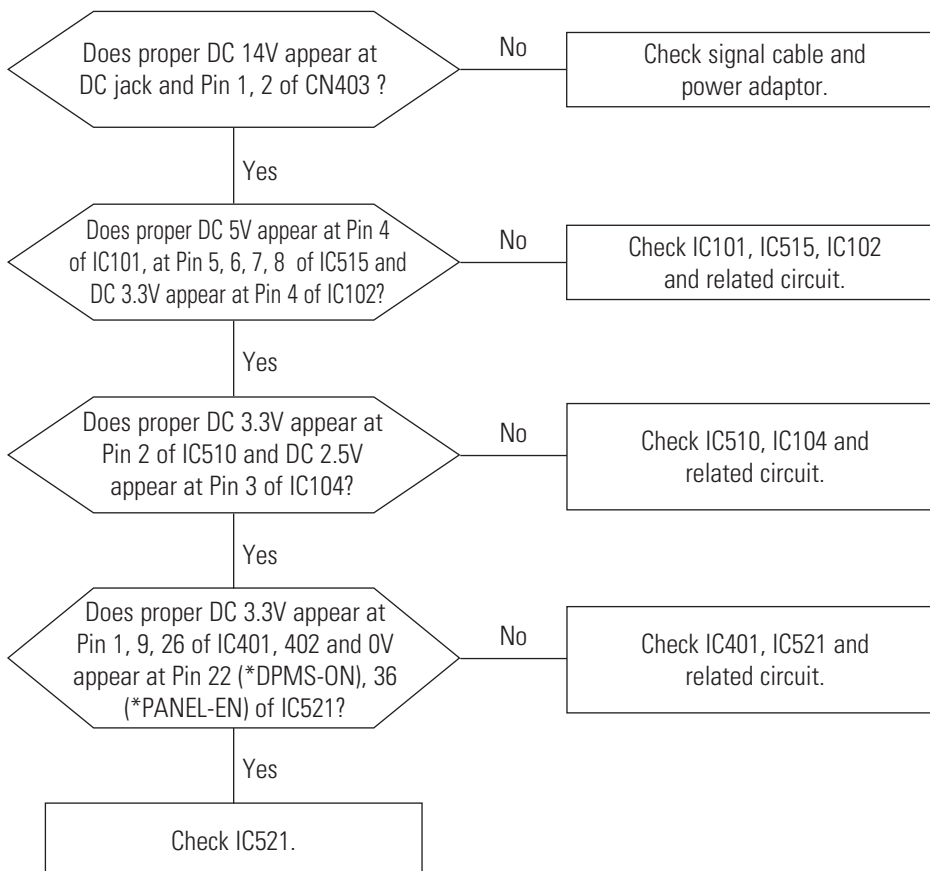
2. If no picture appears, make sure the power cord is correctly connected.

3. Check the following circuits.

- No raster appears: Stand PCB, Main PCB
- 14V develop but no screen: Main PCB
- 14V does not develop: Main PCB

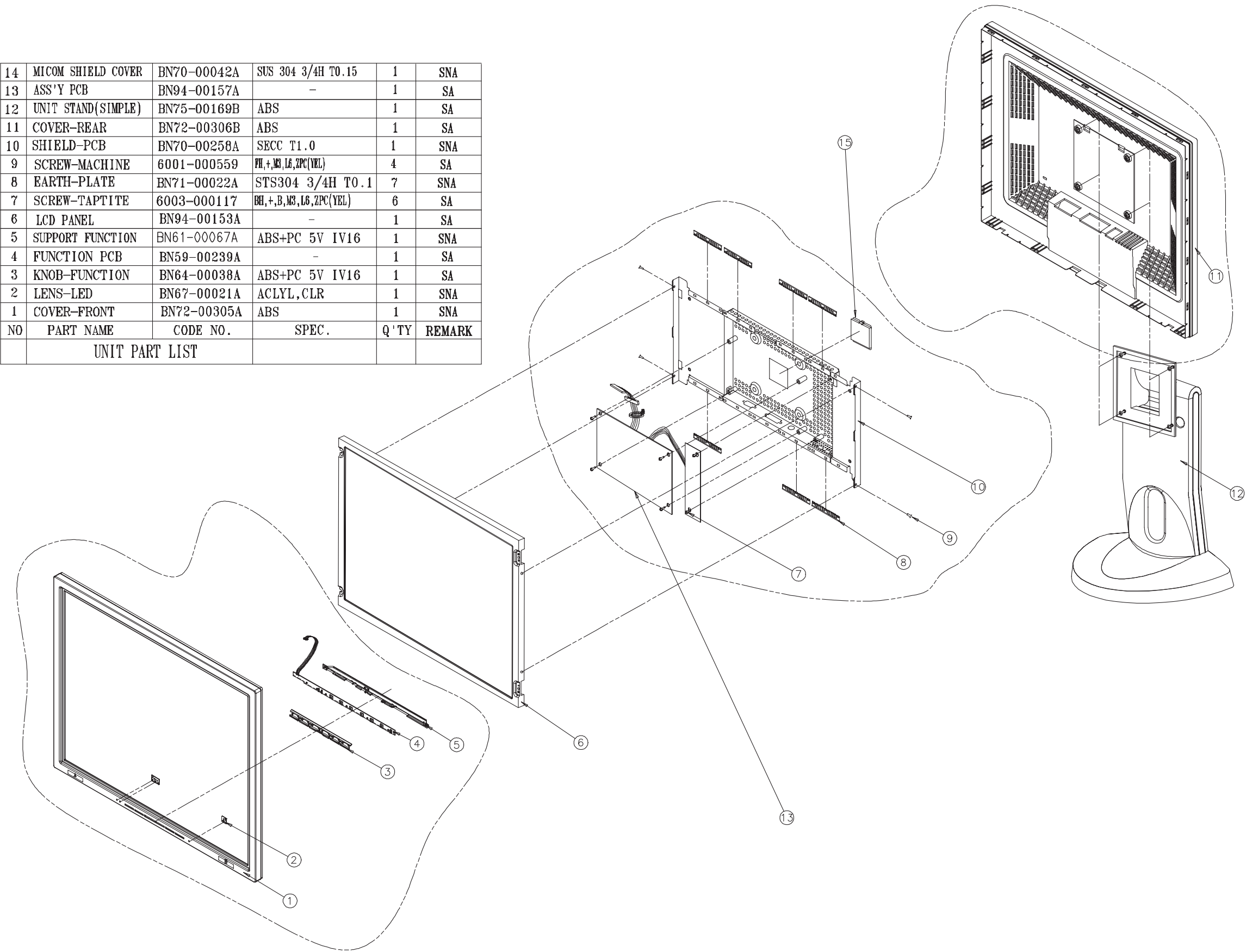
4. If you push and hold the Minus(–) button for more than 5 seconds, the monitor automatically turns back to the factory preset.

### 4-1 No Power



5 Exploded View and Parts List

14	MICOM SHIELD COVER	BN70-00042A	SUS 304 3/4H T0.15	1	SNA
13	ASS'Y PCB	BN94-00157A	-	1	SA
12	UNIT STAND(SIMPLE)	BN75-00169B	ABS	1	SA
11	COVER-REAR	BN72-00306B	ABS	1	SA
10	SHIELD-PCB	BN70-00258A	SECC T1.0	1	SNA
9	SCREW-MACHINE	6001-000559	PH,+,M3,L6,ZPC(YEL)	4	SA
8	EARTH-PLATE	BN71-00022A	STS304 3/4H T0.1	7	SNA
7	SCREW-TAPTITE	6003-000117	BH,+,B,M3,L6,ZPC(YEL)	6	SA
6	LCD PANEL	BN94-00153A	-	1	SA
5	SUPPORT FUNCTION	BN61-00067A	ABS+PC 5V IV16	1	SNA
4	FUNCTION PCB	BN59-00239A	-	1	SA
3	KNOB-FUNCTION	BN64-00038A	ABS+PC 5V IV16	1	SA
2	LENS-LED	BN67-00021A	ACLYL,CLR	1	SNA
1	COVER-FRONT	BN72-00305A	ABS	1	SNA
NO	PART NAME	CODE NO.	SPEC.	Q'TY	REMARK
UNIT PART LIST					

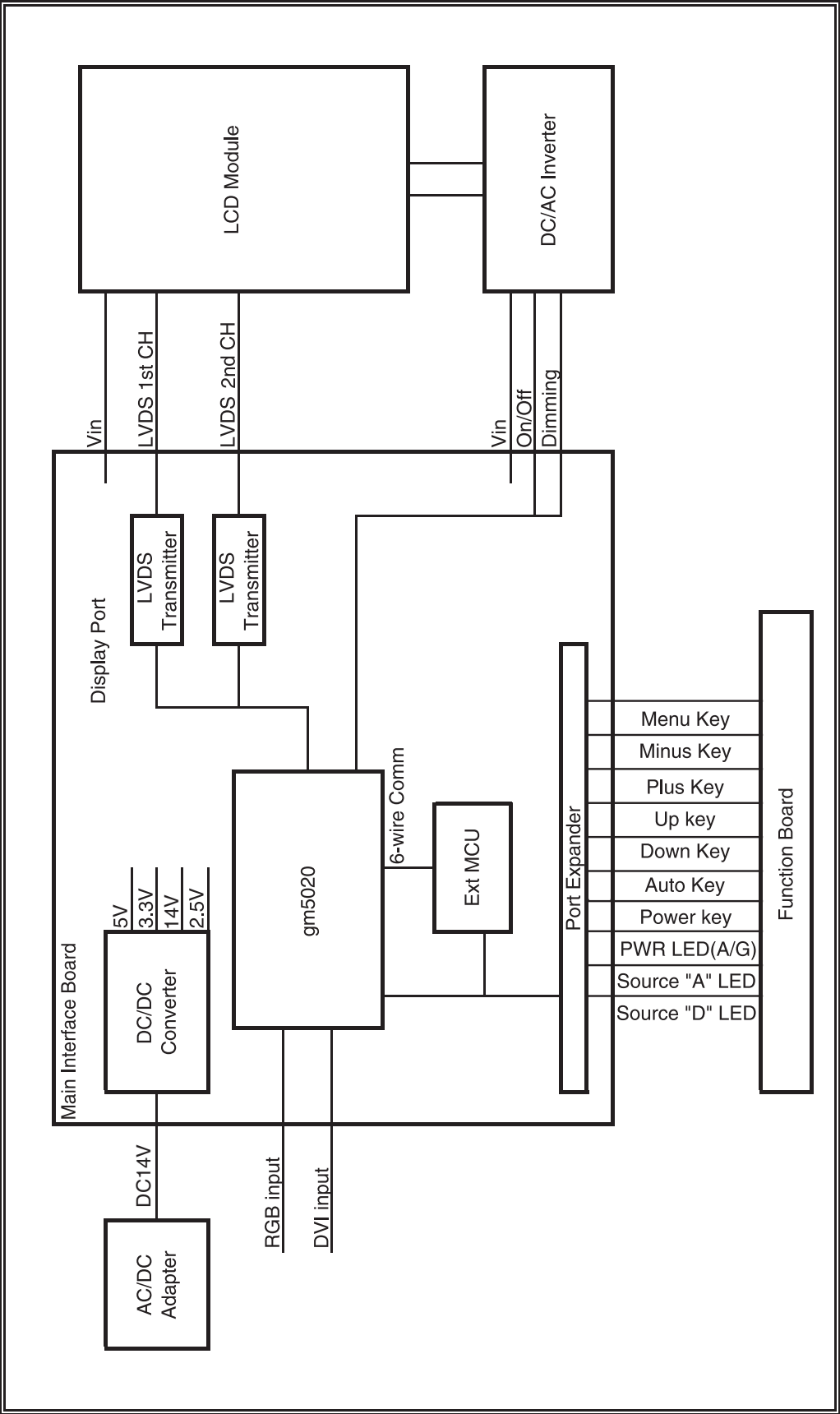


## 6 Electrical Parts List

### 6-1 Main PCB Parts

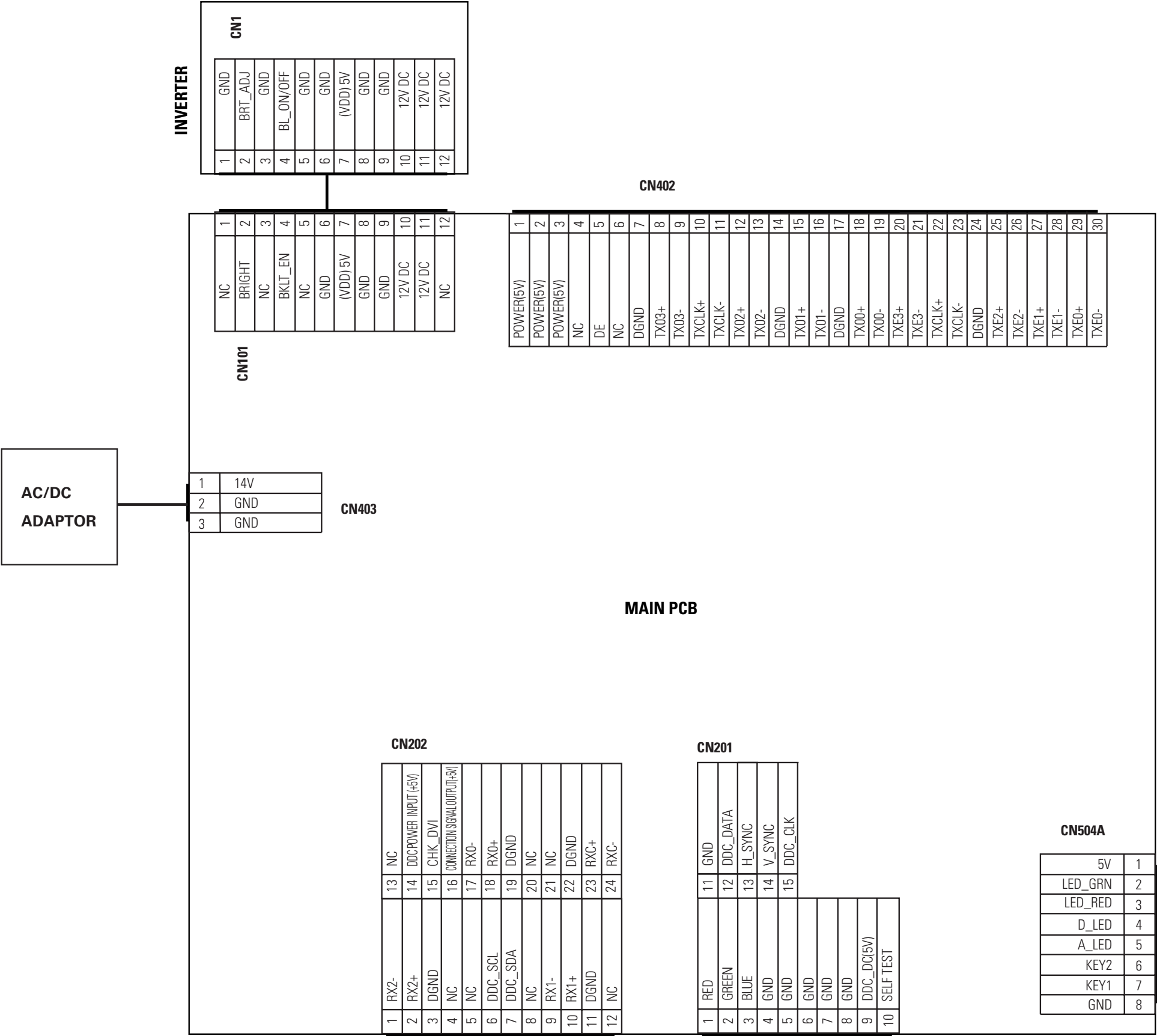
Loc. No.	Code No.	Description	Specification	Remarks
-	BN94-00279A	ASSY PCB MAIN	GH19PS,-,-,-,-	SNA
C373	2409-001043	C-ORGANIC	47UF,20%,6.3V,WT,TP,6.3X6.8,2.5	
C621	2409-001044	C-ORGANIC	100UF,+20%,16V,WT,TP,8X10.5,5	
C622	2409-001043	C-ORGANIC	47UF,20%,6.3V,WT,TP,6.3X6.8,2.5	
C651	2409-001044	C-ORGANIC	100UF,+20%,16V,WT,TP,8X10.5,5	
CIS	0201-001223	ADHESIVE-TS	HT-130S,RED,700+/- 50,-	SNA
CIS	6011-001445	BOLT-SOCKET	4-40 UNC,L7,NI PLT,BRASS,HEX SOCKET	SNA
CIS	BN39-00002A	CBF-HARNESS	-,60,BLU/WHT,-,26,-	SNA
CIS	BN39-00232A	LEAD CONNECTOR ASSY	WP19PQ,U11571#30,U1/CSA,30P,-,;#30,12507HS-30,FI-X30H,BK,-,;150MM,1571#30,-	
CIS	BN70-00269A	PLATE	GH19PS,PBC,-,TO.15,-,-,-,-,-	
CIS	BN75-00236A	UNIT-SHIELD PCB	GH19PS,-,SECC,T1.0,-,-,-,-	SNA
CN201	3701-001219	CONNECTOR-DSUB	15P,3R,FEMALE,ANGLE,AUF	
CN202	3701-001173	CONNECTOR-DSUB	24P,3R,FEMALE,ANGLE,AUF	
CN403	3722-000117	JACK-DC POWER	3P,3.5mm,AG,BLK,NO	SNA
SH/PCB+M/PCB	6003-000264	SCREW-TAPTITE	PWH,+B,M3,L6,ZPC(YEL),SWRCH18	
-	BN97-00054J	ASSY MICOM	GH15PSS,-,-,-,-,-,-,-,-	SNA
IC521	0903-001266	IC-MICROCONTROLLER	NT68F63,8BIT,PLCC,44P,653MIL,12MHZ,ST,CMOS,PLASTIC,5V,-,;QTO+70C,256B,4KB,-,;MC	
CIS	BN46-00009E	MICOM-S/W	GH15PSS,-,-,-,-,-,-,-,-	SNA
-	BN97-00075A	ASSY SMD-MAIN	GH19PS	SNA
C101	2203-000189	C-CERAMIC,CHIP	100nF,+80-20%,25V,Y5V,TP,1608,	
C102	2203-000189	C-CERAMIC,CHIP	100nF,+80-20%,25V,Y5V,TP,1608,	
C103	2402-001044	C-AL,SMD	100uF,20%,25V,-,TP,8.3x8.3x6.3	
C104	2203-000257	C-CERAMIC,CHIP	10nF,10%,50V,X7R,TP,1608	
C105	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C107	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C110	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C112	2402-001042	C-AL,SMD	100uF,20%,16V,GP,TP,6.6x6.6x5.4mm	
C135	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C137	2203-000257	C-CERAMIC,CHIP	10nF,10%,50V,X7R,TP,1608	
C138	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C139	2402-001044	C-AL,SMD	100uF,20%,25V,-,TP,8.3x8.3x6.3	
C204	2203-000626	C-CERAMIC,CHIP	0.022nF,5%,50V,NP0,TP,1608	
C214	2203-000236	C-CERAMIC,CHIP	0.1nF,5%,50V,NP0,TP,1608	
C215	2203-000236	C-CERAMIC,CHIP	0.1nF,5%,50V,NP0,TP,1608	
C252	2203-000236	C-CERAMIC,CHIP	0.1nF,5%,50V,NP0,TP,1608	
C301	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C302	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C303	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C304	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C305	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C306	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C307	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C308	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C309	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C310	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C311	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C312	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C313	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C314	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C315	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C316	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C317	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C318	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	

7 Block Diagram



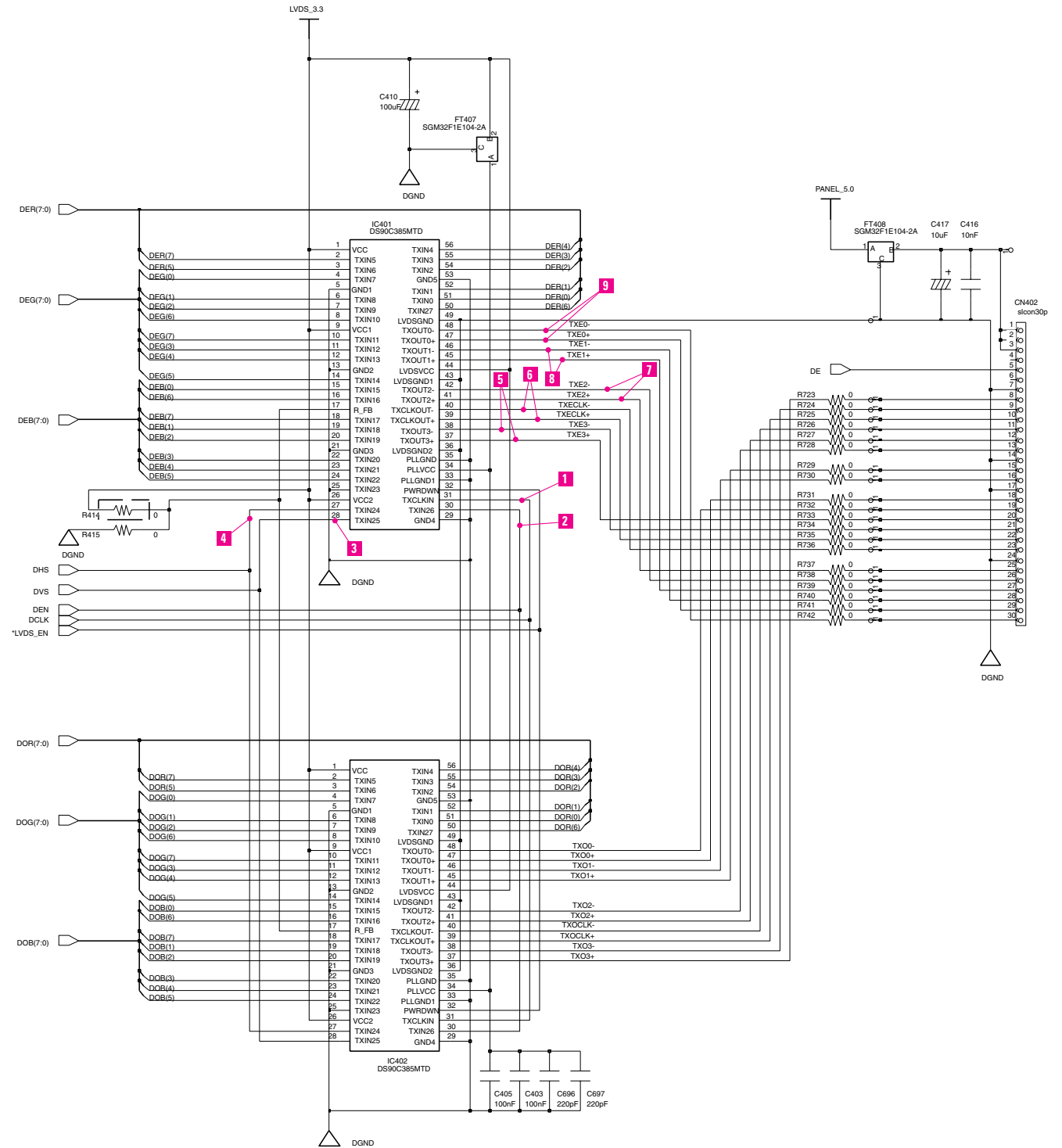
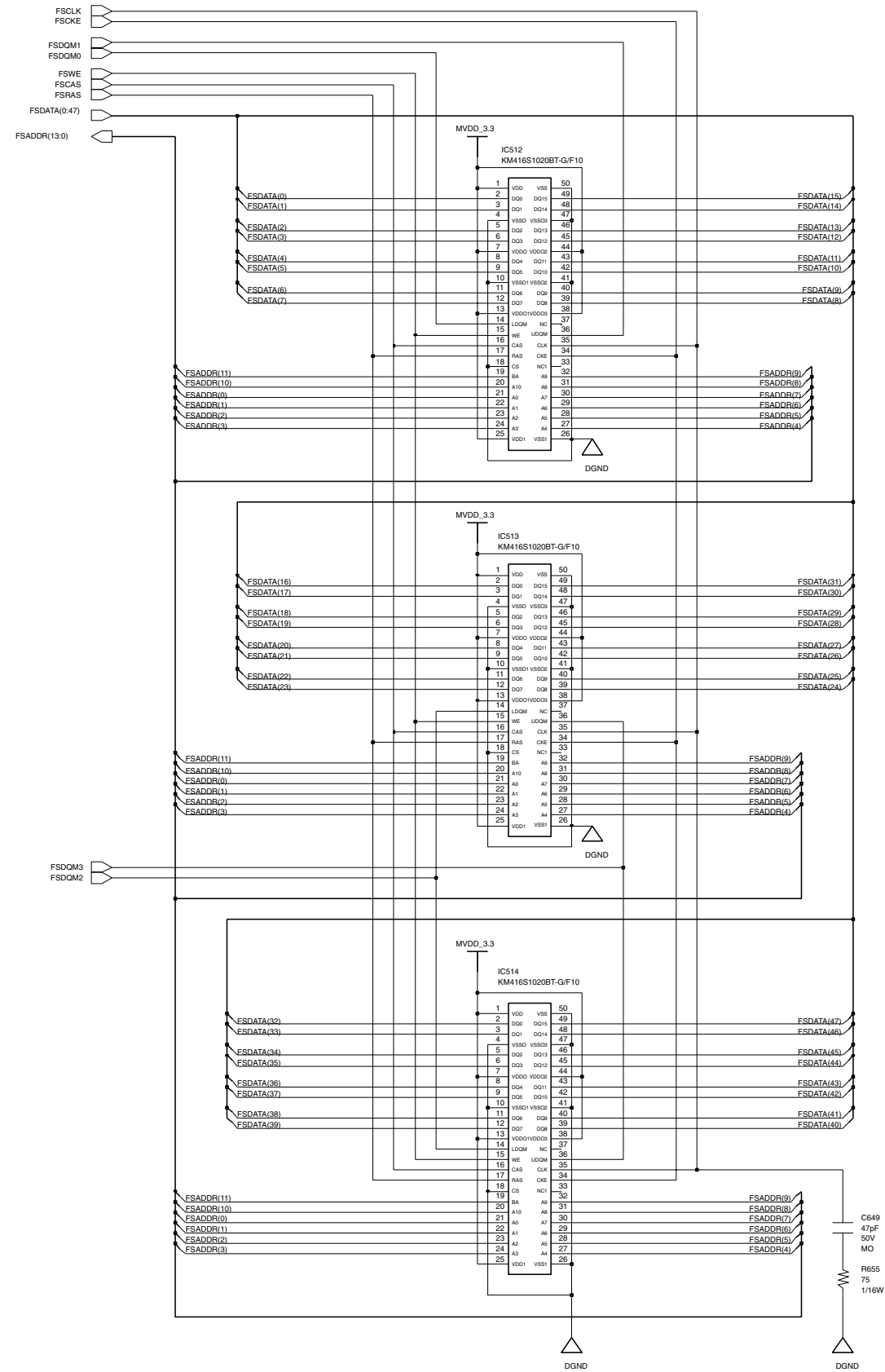


8 Wiring Diagram



# 9 Schematic Diagrams

## 9-1 Narrow 19" Part Schematic Diagram



## 10 Panel Description

Maker	VENDOR P/N	PANEL_CODE	PANEL_ABB	STICKER_CODE	Remarks
SEC	LT140X1-002	BN07-00004A	SA	BN68-00187A	
SEC	LT150XS-L01	BN07-00009A	SB	BN68-00187B	
SEC	LT150XS-L01-B	BN07-00022A	SC	BN68-00187C	
SEC	LTM150XS-L02	BN07-00005A	SD	BN68-00187D	
SEC	LT181E2-132	BN07-00001A	SE	BN68-00187E	
SEC	LT150XS-T01	BN07-00010A	SF	BN68-00187F	
SEC	LTM181E3-132	BN07-00019A	SG	BN68-00187G	
SEC	LT170E2-131	BN07-10001D	SH	BN68-00187H	
SEC	LT181E2-131	BN07-10001E	SJ	BN68-00187J	
SEC	LTM170E4-L01	BN07-00018A	SK	BN68-00187K	
SEC	LTM240W1-L01	BN07-00015A	SL	BN68-00187L	
SEC	LTM213U3-L01	BN07-00016A	SM	BN68-00187M	
SEC	LTM150XH-L01	BN07-00026A	SN	BN68-00187W	
SEC	LTM150XH-L03	BN07-00027A	SP	BN68-00187X	
SEC	LTM150XS-L01	BN07-00032A	SQ	BN68-00195B	DELL(ZPD)
SEC	LTM181E4-L01	BN07-00034A	SR	BN68-00195C	PVA
SEC	LTM170EH-L01	BN07-00036A	SS	BN68-00195D	TN
SEC	LTM170E5-L01	BN07-00037A	SU	BN68-00195E	PVA
SEC	LTM150XH-L11	BN07-00041A	SV	BN68-00195G	
SEC	LTM213U4-L01	BN07-00039A	SW	BN68-00195L	PVA
SEC	LTM150XH-L01(ZPD)	BN07-00045A	SX	BN68-00195M	ZPD
SEC	LTM150XH-L04	BN07-00046A	SY	BN68-00195N	PANEL
SEC	LTM170W1-L01	BN07-00047A	SZ	BN68-00195P	TV PANEL
SEC	LTM150XH-L06	BN07-00053A	EA	BN68-00195V	TV PANEL/450cd _ Sony& EOS panel
SEC	LTM153W1-L01	BN07-00054A	EB	BN68-00195W	NIKE MODEL
SEC	LTM170EH-L05	BN07-00055A	EC	BN68-00195X	"17" EH-L05 panel EOS proj.
SEC	LTM170E5-L03	BN07-00056A	ED	BN68-00195Y	Dell 1702FP pro. E4 EH Compatible
SEC	LTM190E1-L01	BN07-00057A	EE	BN68-00195Z	DELL 1900 FP
TOSHIBA	LTM15C419(A)	BN07-00002A	TA	BN68-00187N	
TOSHIBA	LTM15C423(B)	BN07-00006A	TB	BN68-00187P	
TOSHIBA	LTM18C161	BN07-00008A	TC	BN68-00187U	
TOSHIBA	LTM15C443	BN07-00031A	TD	BN68-00195A	
TOSHIBA	LTM15C445	BN07-00043A	TE	BN68-00195H	
HANNSTAR	HSD150MX41A(A)	BN07-00020A	NA	BN68-00187Q	TTL
HANNSTAR	HSD150MX12	BN07-00030A	NB	BN68-00187Y	LVDS
TORISAN	TM150XG-22L03(A)	BN07-00021A	RA	BN68-00187R	
TORISAN	TM150XG-26L06	BN07-00042A	RB	BN68-00195J	
TORISAN	TM181SX-76N01	BN07-00048A	RC	BN68-00195Q	
TORISAN	TM150XG-22L06	BN07-00059A	RD		"15" XGA TN MODE(ZPD)
SHARP	LQ181E1DG11(A)	BN07-10001C	PA	BN68-00187S	
HITACHI	TX38D12VC0CAA(A)	BN07-00003A	HA	BN68-00187T	
HITACHI	TX43DVCOCAB	BN07-00060A	HB		"17" SXGA PVA MODE
IBM	ITSX94S	BN07-00017A	IA	BN68-00187V	
UNIPAC	UM170E0	BN07-00028A	UA	BN68-00187Z	
HYUNDAI	HT15X13	BN07-00035A	DA	BN68-00195F	
HYUNDAI	HT17E11-200	BN07-00049A	DB	BN68-00195R	TN MODE
ACER	L170E3	BN07-00044A	AA	BN68-00195K	TN(ADT)
CHIMEI	M170E3-L01	BN07-00050A	CA	BN68-00195S	TN PANEL
CHIMEI	M150X3-L01	BN07-00051A	CB	BN68-00195T	COMPATIBLE
CHIMEI	M170E4-L01	BN07-00052A	CC	BN68-00195U	MVA PANEL

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GH19P\* Service Manual

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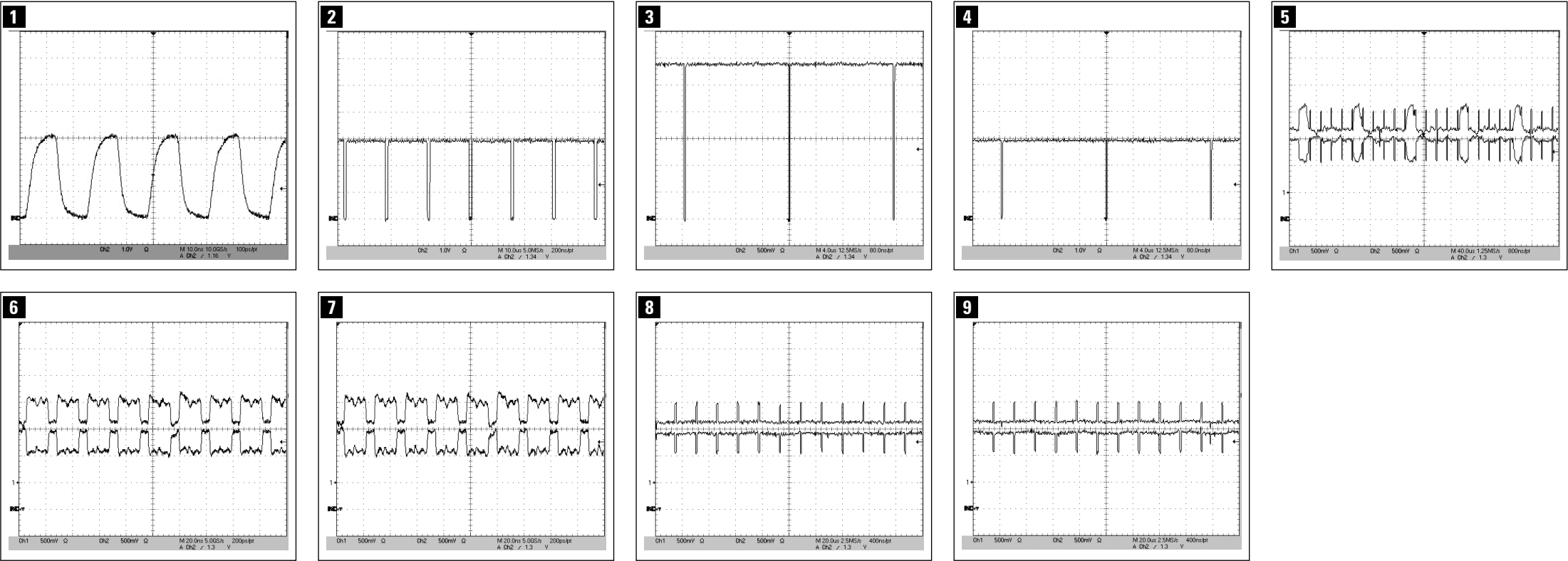
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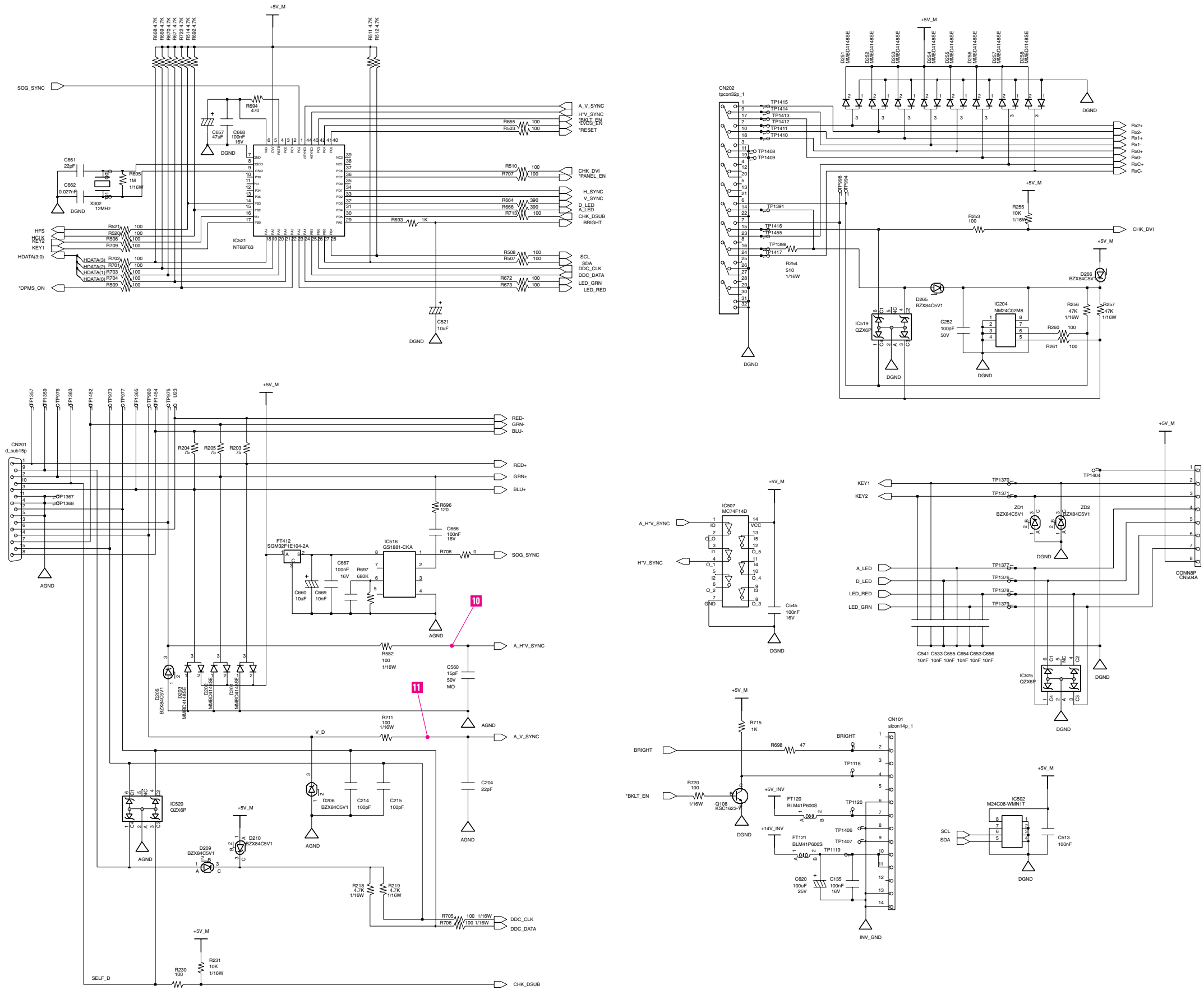
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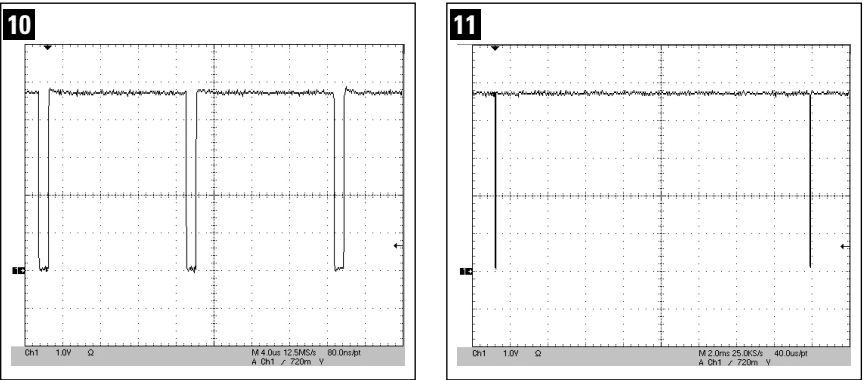
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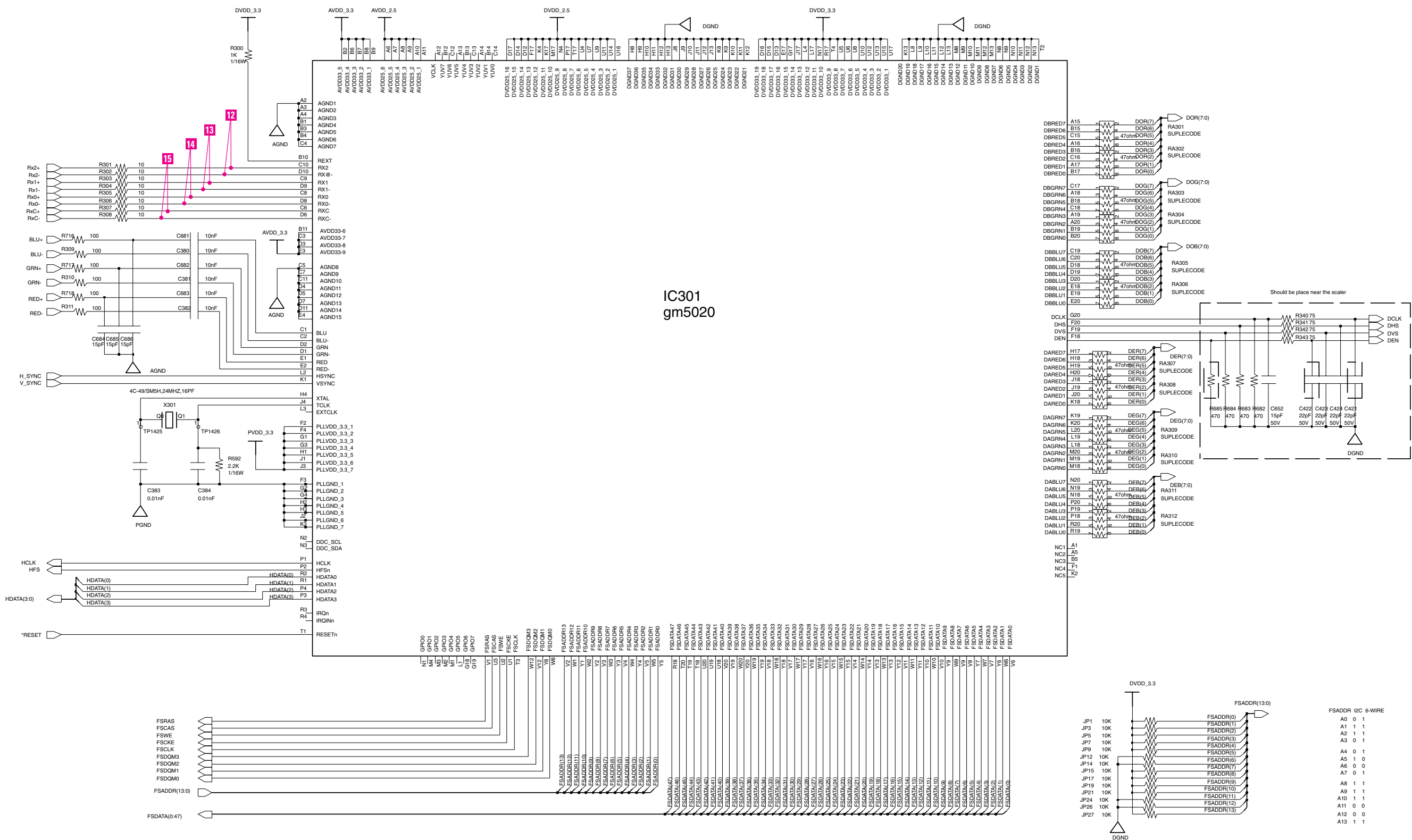


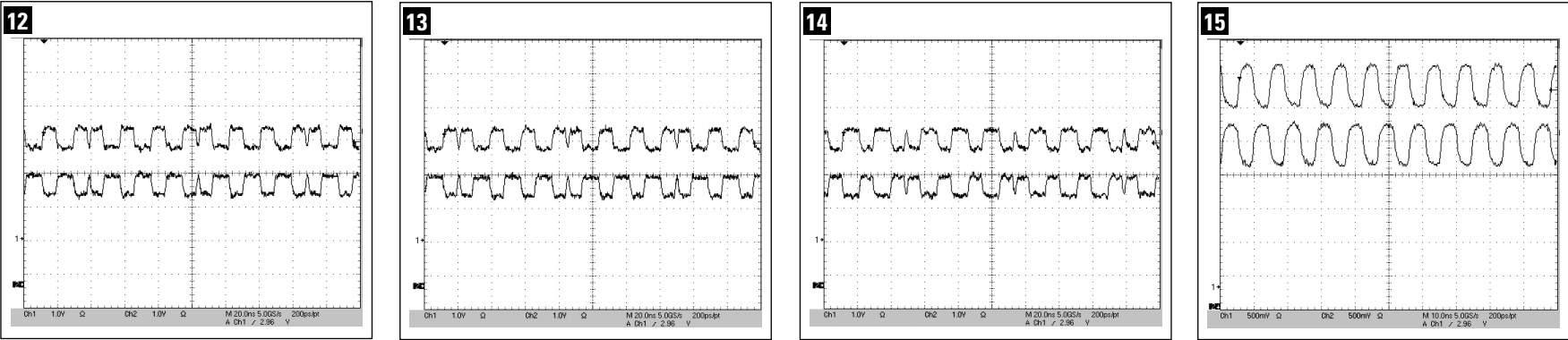
9-2 Narrow 19" Part Schematic Diagram



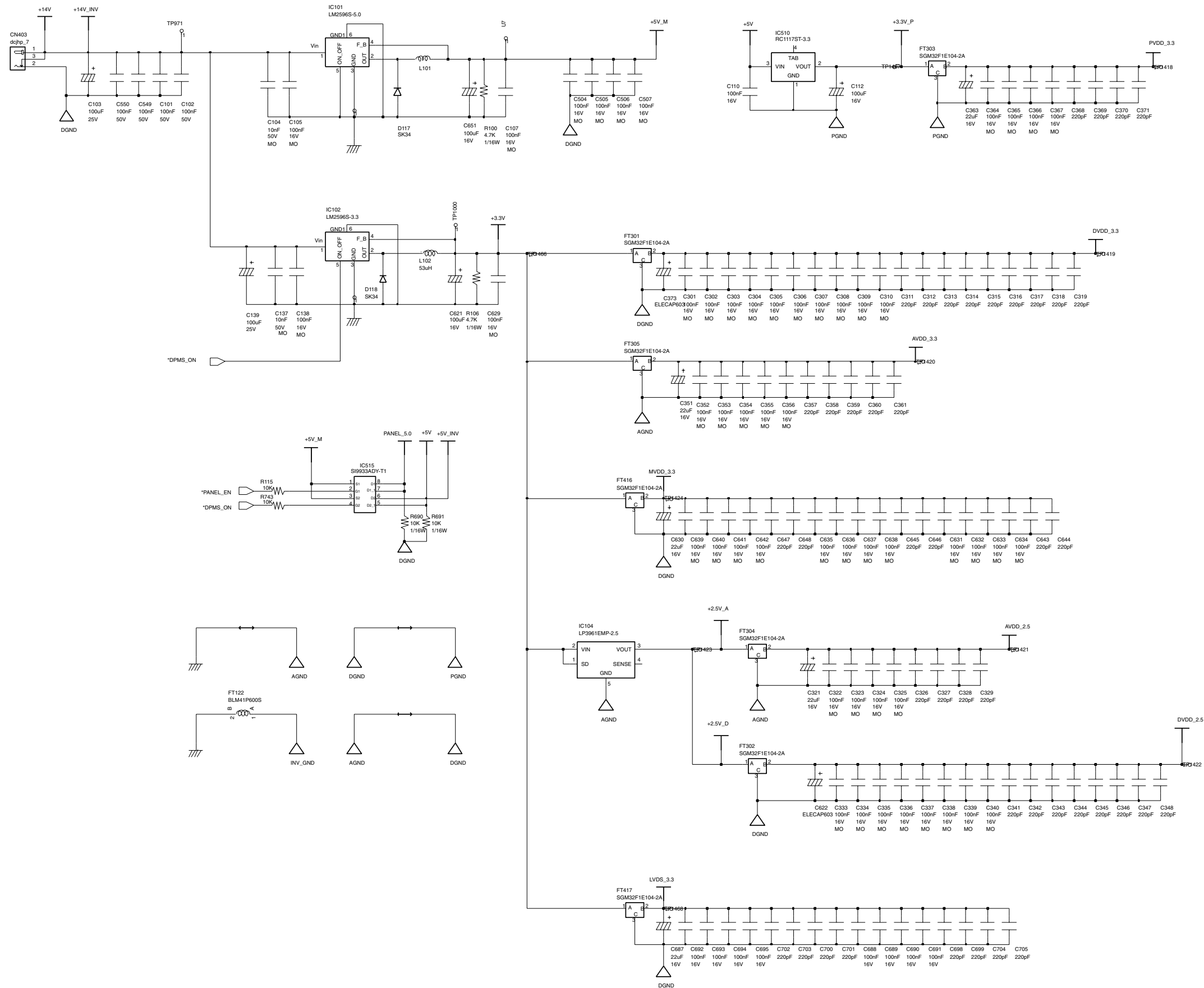








9-4 Narrow 19" Part Schematic Diagram



**Memo**

Memo

**Memo**

Loc. No.	Code No.	Description	Specification	Remarks
C319	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C321	2402-000135	C-AL,SMD	22uF,20%,16V,GP,TP,5.3x5.3x5.4	
C322	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C323	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C324	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C325	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C326	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C327	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C328	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C329	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C333	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C334	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C335	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C336	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C337	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C338	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C339	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C340	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C341	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C342	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C343	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C344	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C345	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C346	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C347	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C348	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C351	2402-000135	C-AL,SMD	22uF,20%,16V,GP,TP,5.3x5.3x5.4	
C352	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C353	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C354	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C355	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C356	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C357	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C358	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C359	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C360	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C361	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C363	2402-000135	C-AL,SMD	22uF,20%,16V,GP,TP,5.3x5.3x5.4	
C364	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C365	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C366	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C367	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C368	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C369	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C370	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C371	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C380	2203-000257	C-CERAMIC,CHIP	10nF,10%,50V,X7R,TP,1608	
C381	2203-000257	C-CERAMIC,CHIP	10nF,10%,50V,X7R,TP,1608	
C382	2203-000257	C-CERAMIC,CHIP	10nF,10%,50V,X7R,TP,1608	
C383	2203-000280	C-CERAMIC,CHIP	0.01nF,0.5pF,50V,NP0,TP,1608	
C384	2203-000280	C-CERAMIC,CHIP	0.01nF,0.5pF,50V,NP0,TP,1608	
C403	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C405	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C410	2402-001042	C-AL,SMD	100uF,20%,16V,GP,TP,6.6x6.6x5.4mm	
C416	2203-000257	C-CERAMIC,CHIP	10nF,10%,50V,X7R,TP,1608	

Loc. No.	Code No.	Description	Specification	Remarks
C417	2402-000108	C-AL,SMD	10uF,20%,16V,WT,TP,4.3x4.3x5.4	
C421	2203-000044	C-CERAMIC,CHIP	22pF,5%,50V,NP0,TP,1608,-	
C423	2203-000626	C-CERAMIC,CHIP	0.022nF,5%,50V,NP0,TP,1608	
C424	2203-000626	C-CERAMIC,CHIP	0.022nF,5%,50V,NP0,TP,1608	
C504	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C505	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C506	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C507	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C513	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C521	2402-000176	C-AL,SMD	10uF,20%,16V,GP,TP,4.3x4.3x5.4	
C533	2203-000257	C-CERAMIC,CHIP	10nF,10%,50V,X7R,TP,1608	
C541	2203-000257	C-CERAMIC,CHIP	10nF,10%,50V,X7R,TP,1608	
C545	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C549	2203-000189	C-CERAMIC,CHIP	100nF,+80-20%,25V,Y5V,TP,1608,	
C550	2203-000189	C-CERAMIC,CHIP	100nF,+80-20%,25V,Y5V,TP,1608,	
C560	2203-000384	C-CERAMIC,CHIP	0.015nF,5%,50V,NP0,TP,1608	
C620	2402-001044	C-AL,SMD	100uF,20%,25V,-,TP,8.3x8.3x6.3	
C629	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C630	2402-000135	C-AL,SMD	22uF,20%,16V,GP,TP,5.3x5.3x5.4	
C631	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C632	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C633	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C634	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C635	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C636	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C637	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C638	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C639	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C640	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C641	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C642	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C643	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C644	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C645	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C646	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C647	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C648	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C649	2203-000998	C-CERAMIC,CHIP	0.047nF,5%,50V,NP0,TP,1608	
C652	2203-000384	C-CERAMIC,CHIP	0.015nF,5%,50V,NP0,TP,1608	
C653	2203-000257	C-CERAMIC,CHIP	10nF,10%,50V,X7R,TP,1608	
C654	2203-000257	C-CERAMIC,CHIP	10nF,10%,50V,X7R,TP,1608	
C655	2203-000257	C-CERAMIC,CHIP	10nF,10%,50V,X7R,TP,1608	
C656	2203-000257	C-CERAMIC,CHIP	10nF,10%,50V,X7R,TP,1608	
C657	2402-000179	C-AL,SMD	47uF,20%,16V,GP,TP,6.6x6.6x5.4	
C660	2402-000176	C-AL,SMD	10uF,20%,16V,GP,TP,4.3x4.3x5.4	
C662	2203-000681	C-CERAMIC,CHIP	0.027nF,5%,50V,NP0,TP,1608	
C666	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C667	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C668	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C669	2203-000257	C-CERAMIC,CHIP	10nF,10%,50V,X7R,TP,1608	
C681	2203-000257	C-CERAMIC,CHIP	10nF,10%,50V,X7R,TP,1608	
C682	2203-000257	C-CERAMIC,CHIP	10nF,10%,50V,X7R,TP,1608	
C683	2203-000257	C-CERAMIC,CHIP	10nF,10%,50V,X7R,TP,1608	
C687	2402-000135	C-AL,SMD	22uF,20%,16V,GP,TP,5.3x5.3x5.4	
C688	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	



Loc. No.	Code No.	Description	Specification	Remarks
C689	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	SNA SNA
C690	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C691	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C692	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C693	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C694	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C695	2203-005005	C-CERAMIC,CHIP	100nF,10%,16V,X7R,TP,1608	
C696	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C697	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C698	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C699	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C700	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C701	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C702	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C703	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C704	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
C705	2203-001607	C-CERAMIC,CHIP	0.22nF,5%,50V,NP0,TP,1608	
CN101	3711-000556	CONNECTOR-HEADER	BOX,12P,1R,1.25mm,SMD-A,SN	
CN402	3711-004070	CONNECTOR-HEADER	BOX,30P,1R,1.25mm,SMD-A,SN	
CN504A	3708-000461	CONNECTOR-FPC/FFC/PIC	8P,1mm,SMD,AUF	
D117	0402-001098	DIODE-RECTIFIER	SK34,40V,3A,SMC,TP	
D118	0402-001098	DIODE-RECTIFIER	SK34,40V,3A,SMC,TP	
D201	0401-001056	DIODE-SWITCHING	MMBD4148SE,75V,200MA,SOT-23,TP	
D202	0401-001056	DIODE-SWITCHING	MMBD4148SE,75V,200MA,SOT-23,TP	
D203	0401-001056	DIODE-SWITCHING	MMBD4148SE,75V,200MA,SOT-23,TP	
D205	0403-000579	DIODE-ZENER	BZX84C5V1.5,1V,5%,200mW,SOT-23	
D206	0403-000579	DIODE-ZENER	BZX84C5V1.5,1V,5%,200mW,SOT-23	
D209	0403-000579	DIODE-ZENER	BZX84C5V1.5,1V,5%,200mW,SOT-23	
D210	0403-000579	DIODE-ZENER	BZX84C5V1.5,1V,5%,200mW,SOT-23	
D251	0401-001056	DIODE-SWITCHING	MMBD4148SE,75V,200MA,SOT-23,TP	
D252	0401-001056	DIODE-SWITCHING	MMBD4148SE,75V,200MA,SOT-23,TP	
D253	0401-001056	DIODE-SWITCHING	MMBD4148SE,75V,200MA,SOT-23,TP	
D254	0401-001056	DIODE-SWITCHING	MMBD4148SE,75V,200MA,SOT-23,TP	
D255	0401-001056	DIODE-SWITCHING	MMBD4148SE,75V,200MA,SOT-23,TP	
D256	0401-001056	DIODE-SWITCHING	MMBD4148SE,75V,200MA,SOT-23,TP	
D257	0401-001056	DIODE-SWITCHING	MMBD4148SE,75V,200MA,SOT-23,TP	
D258	0401-001056	DIODE-SWITCHING	MMBD4148SE,75V,200MA,SOT-23,TP	
D265	0403-000579	DIODE-ZENER	BZX84C5V1.5,1V,5%,200mW,SOT-23	
D266	0403-000579	DIODE-ZENER	BZX84C5V1.5,1V,5%,200mW,SOT-23	
FT121	3301-001145	CORE-FERRITE BEAD	AB,4.5x1.6x1.6mm,-,-	SNA SNA
FT122	3301-001145	CORE-FERRITE BEAD	AB,4.5x1.6x1.6mm,-,-	
FT301	2901-001114	FILTER-EMI SMD	25VDC,2.0ADC,-,100nF,3.2x1.6x1	
FT302	2901-001114	FILTER-EMI SMD	25VDC,2.0ADC,-,100nF,3.2x1.6x1	
FT303	2901-001114	FILTER-EMI SMD	25VDC,2.0ADC,-,100nF,3.2x1.6x1	
FT304	2901-001114	FILTER-EMI SMD	25VDC,2.0ADC,-,100nF,3.2x1.6x1	
FT305	2901-001114	FILTER-EMI SMD	25VDC,2.0ADC,-,100nF,3.2x1.6x1	
FT407	2901-001114	FILTER-EMI SMD	25VDC,2.0ADC,-,100nF,3.2x1.6x1	
FT408	2901-001114	FILTER-EMI SMD	25VDC,2.0ADC,-,100nF,3.2x1.6x1	
FT412	2901-001114	FILTER-EMI SMD	25VDC,2.0ADC,-,100nF,3.2x1.6x1	
FT416	2901-001114	FILTER-EMI SMD	25VDC,2.0ADC,-,100nF,3.2x1.6x1	
FT417	2901-001114	FILTER-EMI SMD	25VDC,2.0ADC,-,100nF,3.2x1.6x1	
IC101	1203-001448	IC-POSI.FIXED REG.	2596,TO-263,5P,-,PLASTIC,4.750	
IC102	1203-001447	IC-POSI.FIXED REG.	2596,TO-263,5P,-,PLASTIC,3.135	
IC104	1203-001890	IC-VOLTAGE REGULATOR	3961,SOT223-5,5P,-,PLASTIC,2.5V,-,-40to+125C,800mA,-,TR	
IC204	1103-000129	IC-EEPROM	24C02,256x8BIT,SOP,8P,150MIL,1	

Loc. No.	Code No.	Description	Specification	Remarks
IC301	0904-001585	IC-GRAPHIC CONT.	GM5020 01H,-,BGA,292P,1063MIL,160MHZ,TR,CMOS,PLASTIC,2.5V,19.1W,0TO+70C,-,-,10	
IC401	1205-001740	IC-TRANSMITTER	DS90C385,TSSOP,56P,240MIL,PLASTIC,4V,1.63W,-10 TO +70C,ST,FPD LINK-85MHZ(LVDS)	
IC402	1205-001740	IC-TRANSMITTER	DS90C385,TSSOP,56P,240MIL,PLASTIC,4V,1.63W,-10 TO +70C,ST,FPD LINK-85MHZ(LVDS)	
IC502	1103-001023	IC-EEPROM	524C80D81,1028x8Bit,SOP,8P,150MIL,10mS,5V,10%,PLASTIC,0to+70C,110uA,CMOS,TP	
IC507	0803-000117	IC-TTL	74F14,INVERTER,SOP,14P,150MIL,	
IC510	1203-000490	IC-SWITCH VOL. REG.	1117,SOT-223,3P,-,PLASTIC,3.235/3.365V,-,0to+125C,800mA,1.224/1.264V,TP	
IC512	1105-001165	IC-DRAM	416S1020,512Kx16BITx2,TSOP,50P	
IC513	1105-001165	IC-DRAM	416S1020,512Kx16BITx2,TSOP,50P	
IC514	1105-001165	IC-DRAM	416S1020,512Kx16BITx2,TSOP,50P	
IC516	1204-001551	IC-VIDEO SYSTEM	GS1881,SOIC,8P,150MIL,PLASTIC,13.2V,-,0TO+70C,TP,VIDEO SYNC SEPARATOR	
IC519	0403-001435	DIODE-ZENER	QZX363C5V6,5.32-5.88,200MW,SOT-363,TP	
IC520	0403-001435	DIODE-ZENER	QZX363C5V6,5.32-5.88,200MW,SOT-363,TP	
IC521 SOCK	3704-000001	SOCKET-IC	44P,PLCC,SN,-	
IC525	0403-001435	DIODE-ZENER	QZX363C5V6,5.32-5.88,200MW,SOT-363,TP	
JP1	2007-000090	R-CHIP	10KOHM,5%,1/16W,DA,TP,1608	
JP12	2007-000090	R-CHIP	10KOHM,5%,1/16W,DA,TP,1608	
JP14	2007-000090	R-CHIP	10KOHM,5%,1/16W,DA,TP,1608	
JP15	2007-000090	R-CHIP	10KOHM,5%,1/16W,DA,TP,1608	
JP17	2007-000090	R-CHIP	10KOHM,5%,1/16W,DA,TP,1608	
JP19	2007-000090	R-CHIP	10KOHM,5%,1/16W,DA,TP,1608	
JP21	2007-000090	R-CHIP	10KOHM,5%,1/16W,DA,TP,1608	
JP24	2007-000090	R-CHIP	10KOHM,5%,1/16W,DA,TP,1608	
JP26	2007-000090	R-CHIP	10KOHM,5%,1/16W,DA,TP,1608	
JP27	2007-000090	R-CHIP	10KOHM,5%,1/16W,DA,TP,1608	
JP3	2007-000090	R-CHIP	10KOHM,5%,1/16W,DA,TP,1608	
JP5	2007-000090	R-CHIP	10KOHM,5%,1/16W,DA,TP,1608	
JP7	2007-000090	R-CHIP	10KOHM,5%,1/16W,DA,TP,1608	
JP9	2007-000090	R-CHIP	10KOHM,5%,1/16W,DA,TP,1608	
L101	BN27-00008A	COIL-SMD	SMD12*12*8.5,GH15/17PS,22.0UH,±20%,0.0450HM MAX,3.0A,DR10X7/SMD12X6.7,16.5TS	
L102	BN27-20001A	COIL-CHOKE	-.53.0UH,20%,DR10*5,-,-,-,0.18ohm,-,-,-,TRAY	
MP1.0	BN41-00150A	PCB MAIN	GH19PS,FR4,-,-,1.6T,166*109*1.6T,GH19PS,6L,-,-	
Q108	0501-000342	TR-SMALL SIGNAL	KSC1623-Y,NPN,200mW,SOT-23,TP,135-270	
R100	2007-000084	R-CHIP	4.7Kohm,5%,1/16W,DA,TP,1608	
R106	2007-000084	R-CHIP	4.7Kohm,5%,1/16W,DA,TP,1608	
R115	2007-000090	R-CHIP	10KOHM,5%,1/16W,DA,TP,1608	
R203	2007-001164	R-CHIP	75ohm,1%,1/16W,DA,TP,1608	
R204	2007-001164	R-CHIP	75ohm,1%,1/16W,DA,TP,1608	
R205	2007-001164	R-CHIP	75ohm,1%,1/16W,DA,TP,1608	
R211	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R218	2007-000092	R-CHIP	15Kohm,5%,1/16W,DA,TP,1608	
R219	2007-000092	R-CHIP	15Kohm,5%,1/16W,DA,TP,1608	
R230	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R231	2007-000090	R-CHIP	10KOHM,5%,1/16W,DA,TP,1608	
R253	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R254	2007-001002	R-CHIP	510ohm,5%,1/16W,DA,TP,1608	
R255	2007-000090	R-CHIP	10KOHM,5%,1/16W,DA,TP,1608	
R256	2007-000097	R-CHIP	47Kohm,5%,1/16W,DA,TP,1608	
R257	2007-000097	R-CHIP	47Kohm,5%,1/16W,DA,TP,1608	
R260	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R261	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R300	2007-000078	R-CHIP	1Kohm,5%,1/16W,DA,TP,1608	
R301	2007-000309	R-CHIP	10ohm,5%,1/16W,DA,TP,1608	
R302	2007-000309	R-CHIP	10ohm,5%,1/16W,DA,TP,1608	
R303	2007-000309	R-CHIP	10ohm,5%,1/16W,DA,TP,1608	
R304	2007-000309	R-CHIP	10ohm,5%,1/16W,DA,TP,1608	

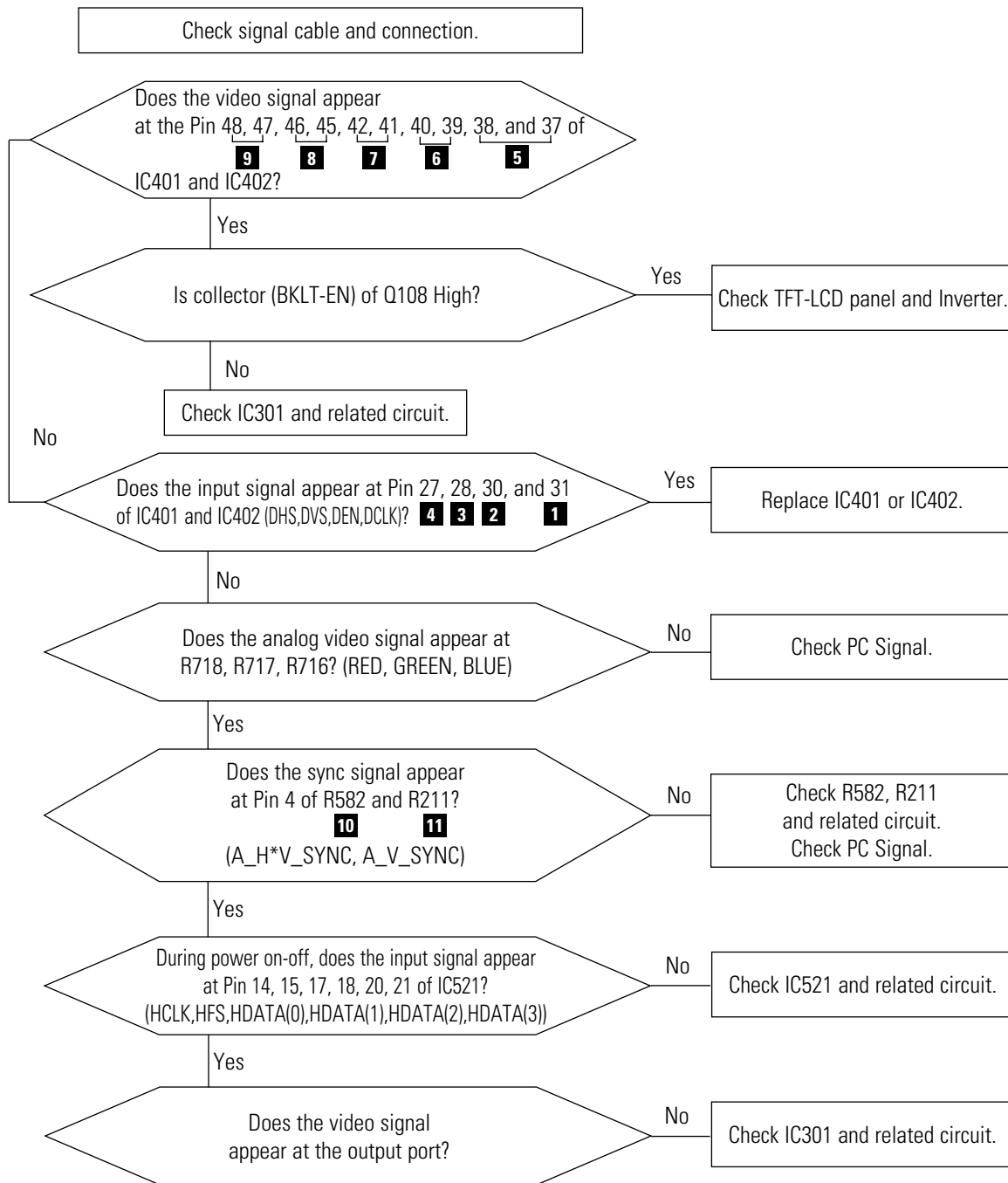
Loc. No.	Code No.	Description	Specification	Remarks
R305	2007-000309	R-CHIP	10ohm,5%,1/16W,DA,TP,1608	
R306	2007-000309	R-CHIP	10ohm,5%,1/16W,DA,TP,1608	
R307	2007-000309	R-CHIP	10ohm,5%,1/16W,DA,TP,1608	
R308	2007-000309	R-CHIP	10ohm,5%,1/16W,DA,TP,1608	
R309	2007-000287	R-CHIP	1000HM,1%,1/10W,DA,TP,1608	
R310	2007-000287	R-CHIP	1000HM,1%,1/10W,DA,TP,1608	
R311	2007-000287	R-CHIP	1000HM,1%,1/10W,DA,TP,1608	
R340	2007-001167	R-CHIP	75ohm,5%,1/16W,DA,TP,1608	
R341	2007-001167	R-CHIP	75ohm,5%,1/16W,DA,TP,1608	
R342	2007-001167	R-CHIP	75ohm,5%,1/16W,DA,TP,1608	
R343	2007-001167	R-CHIP	75ohm,5%,1/16W,DA,TP,1608	
R415	2007-000070	R-CHIP	0ohm,5%,1/16W,DA,TP,1608	
R503	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R506	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R507	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R508	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R509	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R510	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R511	2007-000084	R-CHIP	4.7Kohm,5%,1/16W,DA,TP,1608	
R512	2007-000084	R-CHIP	4.7Kohm,5%,1/16W,DA,TP,1608	
R514	2007-000084	R-CHIP	4.7Kohm,5%,1/16W,DA,TP,1608	
R520	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R521	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R582	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R592	2007-000124	R-CHIP	2.2Kohm,5%,1/16W,DA,TP,1608	
R655	2007-001167	R-CHIP	75ohm,5%,1/16W,DA,TP,1608	
R664	2007-000118	R-CHIP	390ohm,5%,1/16W,DA,TP,1608	
R665	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R666	2007-000118	R-CHIP	390ohm,5%,1/16W,DA,TP,1608	
R668	2007-000084	R-CHIP	4.7Kohm,5%,1/16W,DA,TP,1608	
R669	2007-000084	R-CHIP	4.7Kohm,5%,1/16W,DA,TP,1608	
R670	2007-000084	R-CHIP	4.7Kohm,5%,1/16W,DA,TP,1608	
R671	2007-000084	R-CHIP	4.7Kohm,5%,1/16W,DA,TP,1608	
R672	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R673	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R682	2007-000077	R-CHIP	470ohm,5%,1/16W,DA,TP,1608	
R683	2007-000077	R-CHIP	470ohm,5%,1/16W,DA,TP,1608	
R684	2007-000077	R-CHIP	470ohm,5%,1/16W,DA,TP,1608	
R690	2007-000090	R-CHIP	10KOHM,5%,1/16W,DA,TP,1608	
R691	2007-000090	R-CHIP	10KOHM,5%,1/16W,DA,TP,1608	
R692	2007-000084	R-CHIP	4.7Kohm,5%,1/16W,DA,TP,1608	
R693	2007-000078	R-CHIP	1Kohm,5%,1/16W,DA,TP,1608	
R694	2007-000077	R-CHIP	470ohm,5%,1/16W,DA,TP,1608	
R695	2007-000109	R-CHIP	1Mohm,5%,1/16W,DA,TP,1608	
R696	2007-000116	R-CHIP	120ohm,5%,1/16W,DA,TP,1608	
R697	2007-001114	R-CHIP	680Kohm,5%,1/16W,DA,TP,1608	
R698	2007-000072	R-CHIP	47ohm,5%,1/16W,DA,TP,1608	
R701	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R702	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R703	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R704	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R705	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R706	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R707	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R708	2007-000070	R-CHIP	0ohm,5%,1/16W,DA,TP,1608	

Loc. No.	Code No.	Description	Specification	Remarks
R709	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R713	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R715	2007-000078	R-CHIP	1Kohm,5%,1/16W,DA,TP,1608	
R716	2007-000287	R-CHIP	100OHM,1%,1/10W,DA,TP,1608	
R717	2007-000287	R-CHIP	100OHM,1%,1/10W,DA,TP,1608	
R718	2007-000287	R-CHIP	100OHM,1%,1/10W,DA,TP,1608	
R720	2007-000074	R-CHIP	100ohm,5%,1/16W,DA,TP,1608	
R722	2007-000084	R-CHIP	4.7Kohm,5%,1/16W,DA,TP,1608	
R723	2007-000072	R-CHIP	47ohm,5%,1/16W,DA,TP,1608	
R724	2007-000072	R-CHIP	47ohm,5%,1/16W,DA,TP,1608	
R725	2007-000072	R-CHIP	47ohm,5%,1/16W,DA,TP,1608	
R726	2007-000072	R-CHIP	47ohm,5%,1/16W,DA,TP,1608	
R727	2007-000072	R-CHIP	47ohm,5%,1/16W,DA,TP,1608	
R728	2007-000072	R-CHIP	47ohm,5%,1/16W,DA,TP,1608	
R729	2007-000072	R-CHIP	47ohm,5%,1/16W,DA,TP,1608	
R730	2007-000072	R-CHIP	47ohm,5%,1/16W,DA,TP,1608	
R731	2007-000072	R-CHIP	47ohm,5%,1/16W,DA,TP,1608	
R732	2007-000072	R-CHIP	47ohm,5%,1/16W,DA,TP,1608	
R733	2007-000072	R-CHIP	47ohm,5%,1/16W,DA,TP,1608	
R734	2007-000072	R-CHIP	47ohm,5%,1/16W,DA,TP,1608	
R735	2007-000072	R-CHIP	47ohm,5%,1/16W,DA,TP,1608	
R736	2007-000072	R-CHIP	47ohm,5%,1/16W,DA,TP,1608	
R737	2007-000072	R-CHIP	47ohm,5%,1/16W,DA,TP,1608	
R738	2007-000072	R-CHIP	47ohm,5%,1/16W,DA,TP,1608	
R739	2007-000072	R-CHIP	47ohm,5%,1/16W,DA,TP,1608	
R740	2007-000072	R-CHIP	47ohm,5%,1/16W,DA,TP,1608	
R741	2007-000072	R-CHIP	47ohm,5%,1/16W,DA,TP,1608	
R742	2007-000072	R-CHIP	47ohm,5%,1/16W,DA,TP,1608	
R743	2007-000090	R-CHIP	10KOHM,5%,1/16W,DA,TP,1608	
RA301	2011-000585	R-NETWORK	47ohm,5%,63mW,L,CHIP,8P,TP	
RA302	2011-000585	R-NETWORK	47ohm,5%,63mW,L,CHIP,8P,TP	
RA303	2011-000585	R-NETWORK	47ohm,5%,63mW,L,CHIP,8P,TP	
RA304	2011-000585	R-NETWORK	47ohm,5%,63mW,L,CHIP,8P,TP	
RA305	2011-000585	R-NETWORK	47ohm,5%,63mW,L,CHIP,8P,TP	
RA306	2011-000585	R-NETWORK	47ohm,5%,63mW,L,CHIP,8P,TP	
RA307	2011-000585	R-NETWORK	47ohm,5%,63mW,L,CHIP,8P,TP	
RA308	2011-000585	R-NETWORK	47ohm,5%,63mW,L,CHIP,8P,TP	
RA309	2011-000585	R-NETWORK	47ohm,5%,63mW,L,CHIP,8P,TP	
RA310	2011-000585	R-NETWORK	47ohm,5%,63mW,L,CHIP,8P,TP	
RA311	2011-000585	R-NETWORK	47ohm,5%,63mW,L,CHIP,8P,TP	
RA312	2011-000585	R-NETWORK	47ohm,5%,63mW,L,CHIP,8P,TP	
X301	2801-003326	CRYSTAL-SMD	24MHz,30ppm,28-ABX,16pF,50ohm,	
X302	2801-003773	CRYSTAL-SMD	12MHZ,30PPM,28-AAN,20PF,50OHM,TP	
ZD1	0403-000579	DIODE-ZENER	BZX84C5V1,5.1V,5%,200mW,SOT-23	
ZD2	0403-000579	DIODE-ZENER	BZX84C5V1,5.1V,5%,200mW,SOT-23	
-	BN91-00311D	ASSY LCD	GH19PS,-,-,-	SNA
CIS	BN07-00057A	LCD	LTM190E1-L01,GH17LS,1280*1024,404*330*20,16.7M,36,0.098*0.294,0-50,5.0,PVA,-	

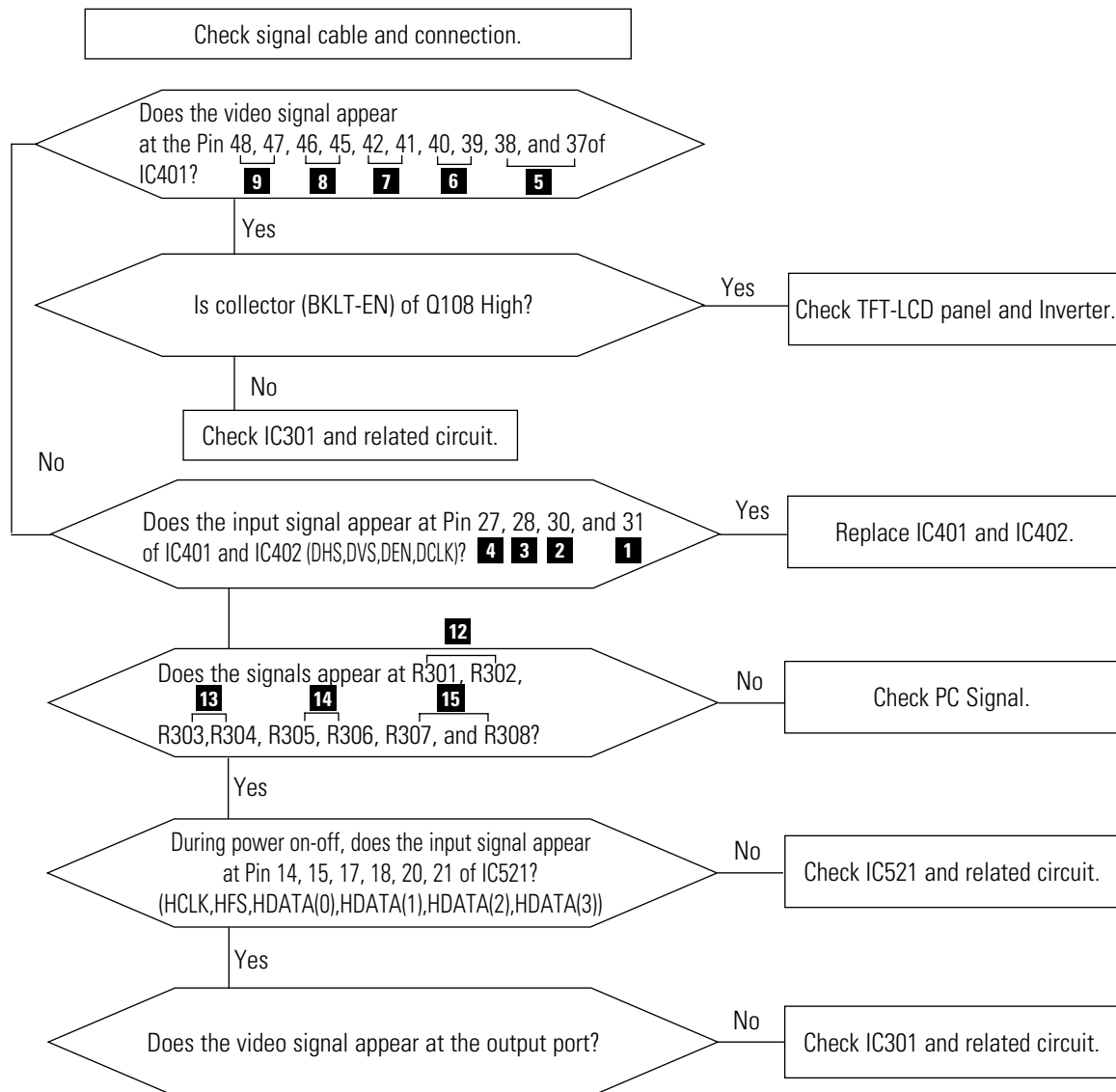
Memo

Memo

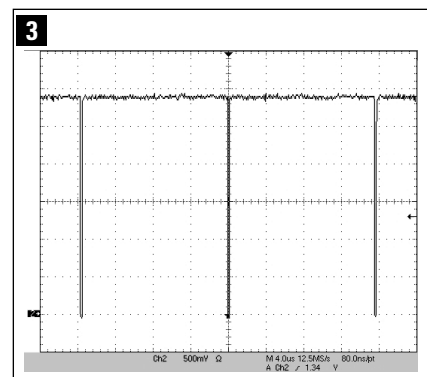
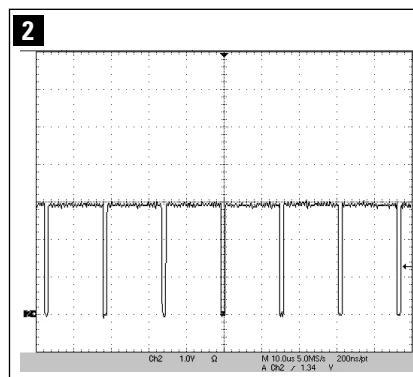
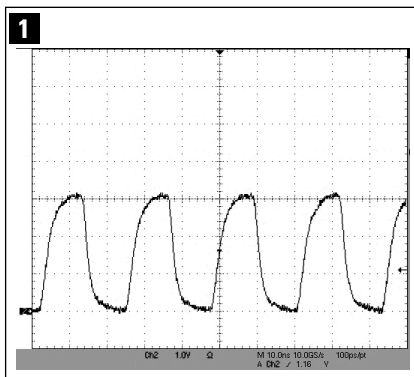
## 4-2 No Video [Analog]



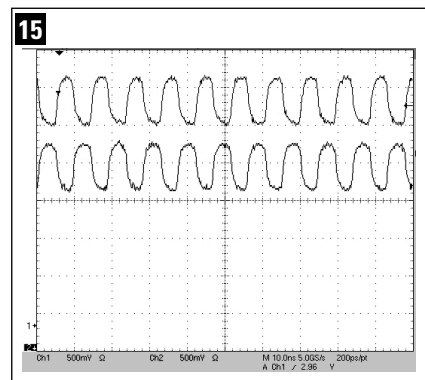
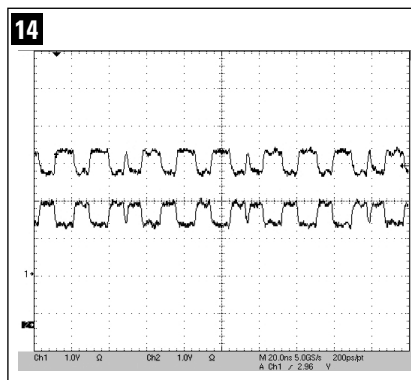
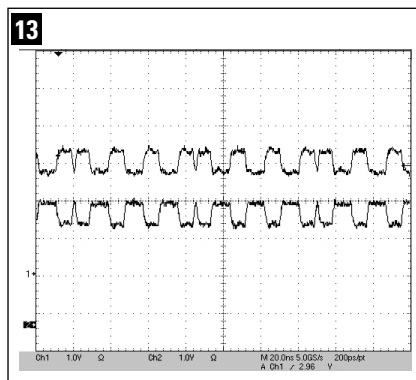
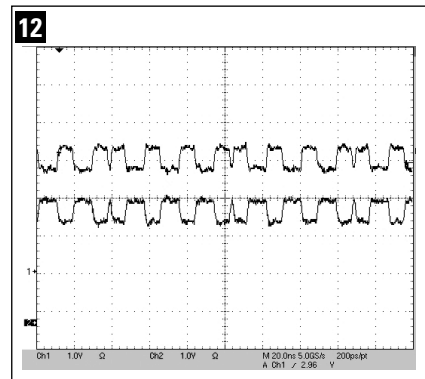
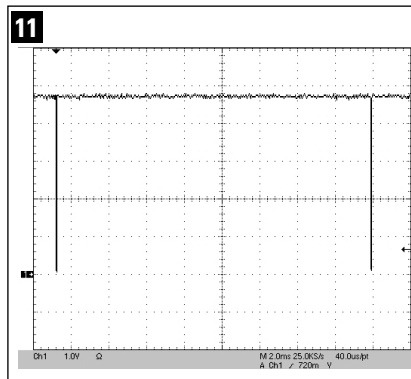
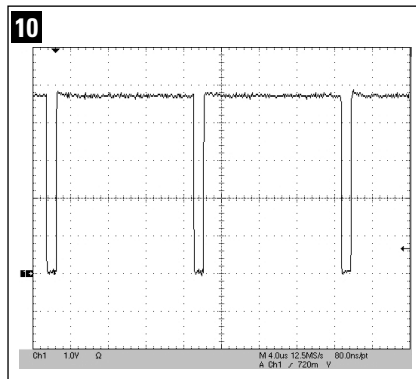
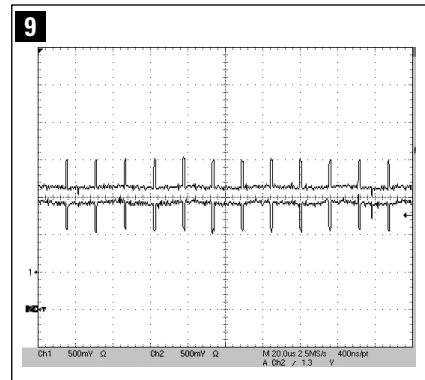
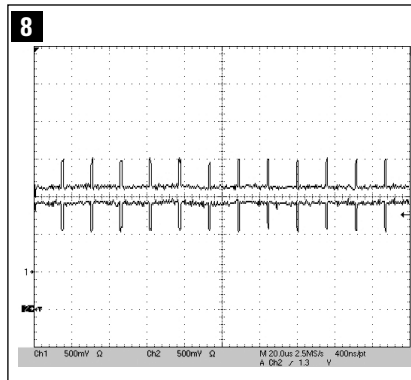
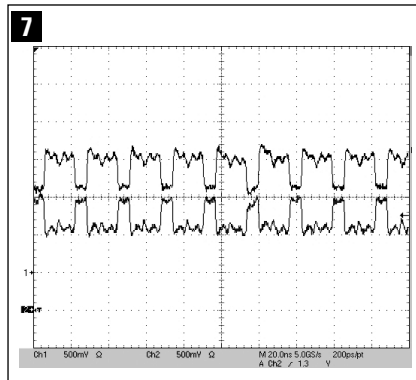
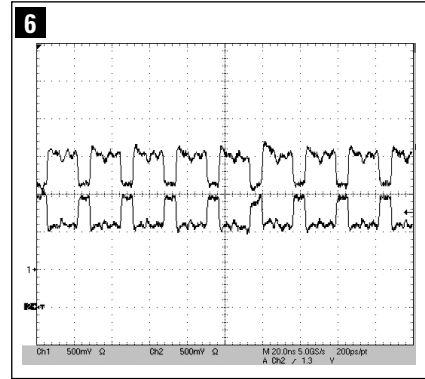
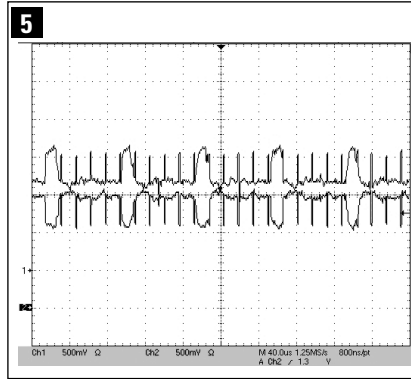
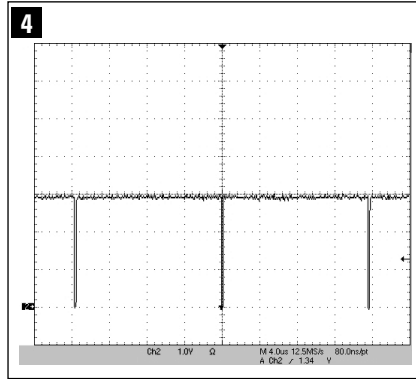
### 4-3 No Video [Digital]



### WAVEFORMS



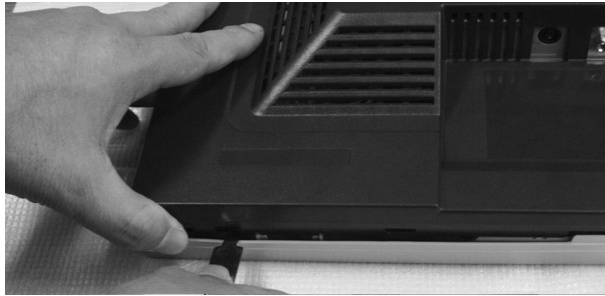




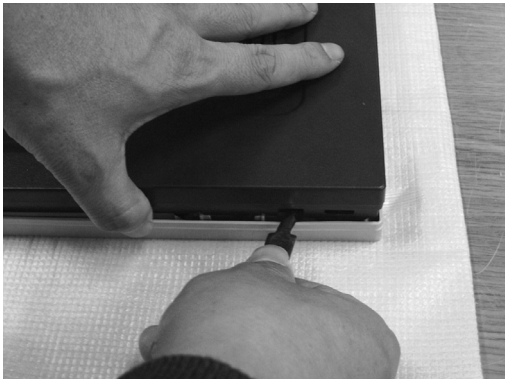
## 3-2 Disassembly

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Reassembly procedures are in the reverse order of Disassembly procedures.



1. Put the jig into the left opening hole and lift up the panel until the snap of the Cover Rear opens.



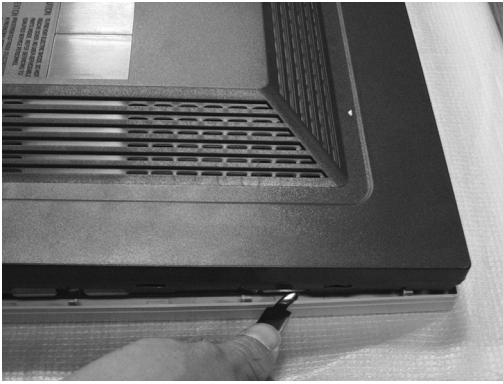
2. Put the jig into the right opening hole and lift up the panel until the snap of the Cover Rear opens.



3. Put the jig into the gap (between the right side of the panel the and Front Cover) and tilt up Front Cover until the snap opens.



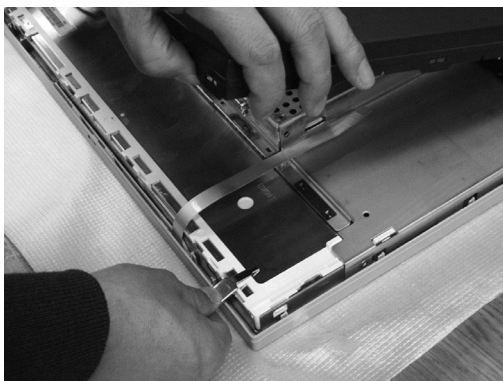
4. Put the jig into the gap (between the right side of the panel the and Front Cover) and tilt up Front Cover until the snap opens.



5. Put the jig into the gap (between the right side of the panel the and Front Cover) and tilt up Front Cover until the snap opens.



6. After pushing the right bottom of the panel with jig.



7. Pull up the Rear Cover until it opens fully.

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## 2-2 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		GND (DDC Return)	GND (DDC Return)	GND (DDC Return)
6		GND-Red	GND-Red	GND-Red
7		GND-Green	GND-Green	GND-Green
8		GND-Blue	GND-Blue	GND-Blue
9		No Connection	No Connection	Not Used
10		GND-Sync./Self Test	GND-Sync./Self Test	GND-Sync./Self Test
11		GND	GND	GND
12		DDC Data	DDC Data	DDC Data
13		H-Sync.	H/V-Sync.	Not Used
14		V-Sync.	Not Used	Not Used
15		DDC Clock	DDC Clock	DDC Clock

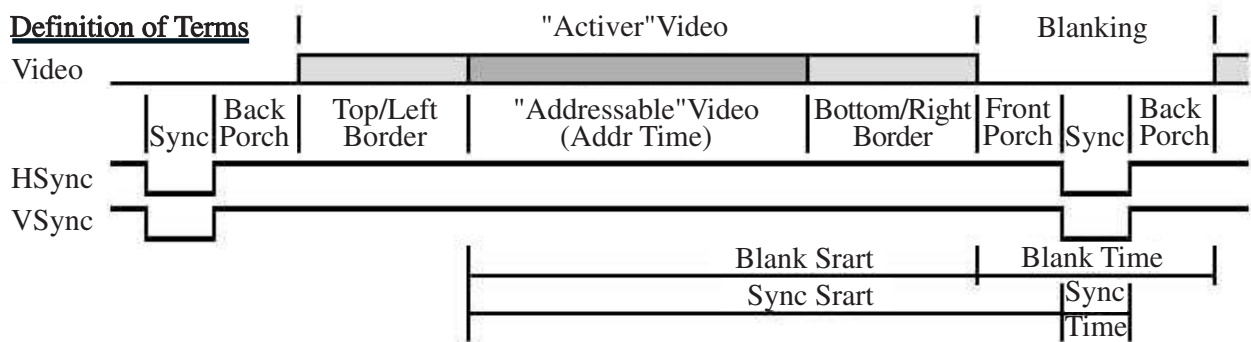
Pin No.	Sync Type	24-Pin DVI-D(TMDS)		
1		T.M.D.S Data2-	13	No Connection
2		T.M.D.S Data2+	14	+5V Power
3		T.M.D.S Data2 Shield	15	Ground (for +5V)
4		No Connection	16	Hot Plug Detect
5		No Connection	17	T.M.D.S Data0-
6		DDC Clock	18	T.M.D.S Data0+
7		DDC Data	19	T.M.D.S Data0 Shield
8		No Connection	20	No Connection
9		T.M.D.S Data1-	21	No Connection
10		T.M.D.S Data1+	22	T.M.D.S Clock Shield
11		T.M.D.S Data1 Shield	23	T.M.D.S Clock+
12		No Connection	24	T.M.D.S Clock-

## 2-3 Timing Chart

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

### 2-3-1 LCD Panel Mode : 1 mode

Timing No.	21
Originator	HP
Mode Name	1280/60Hz
Resolution (HxV)	1280x1024
<b>HORIZONTAL</b>	
Frequency	63.981kHz
Total time	11.852μs
Active time	9.259μs
Blank time	3.778μs
Border (L / R)	0.000μs
Data time	9.259μs
Front porch	0.444μs
Sync. width	1.037μs
Back porch	2.296μs
Sync. polarity	Positive
<b>VERTICAL</b>	
Frequency	60.020Hz
Total time	16.005ms
Active time	15.630ms
Blank time	0.375ms
Border (T / B)	0.000ms
Data time	15.630ms
Front porch	0.016ms
Sync. width	0.047ms
Back porch	0.594ms
Sync. polarity	Positive
Dot Clock	108.00MHz
Sync. Type	Separate
Scan Type	N/I



**2-3-2 Supported Modes (1)**

Timing No. Originator Mode Name Resolution (HxV)	1 IBM VGA1 640x350	2 IBM VGA2 720x400	3 IBM VGA3 640x480	11 VESA 640/72Hz 640x480	17 VESA 640/75Hz 640x480
HORIZONTAL Frequency Total time Active time Blank time Border (L / R) Data time Front porch Sync. width Back porch Sync. polarity	31.469kHz 31.778μs 26.058μs 5.720μs 0.318μs 25.422μs 0.318μs 3.813μs 1.589μs Positive	31.469kHz 31.777μs 26.058μs 5.720μs 0.318μs 25.422μs 0.318μs 3.813μs 1.589μs Negative	31.469kHz 31.778μs 26.058μs 5.720μs 0.318μs 25.422μs 0.318μs 3.813μs 1.589μs Negative	37.861kHz 26.413μs 20.825μs 5.588μs 0.254μs 20.317μs 0.508μs 1.270μs 3.810μs Negative	37.500kHz 26.667μs 20.317μs 6.350μs 0.000μs 20.317μs 0.508μs 2.032μs 3.810μs Negative
VERTICAL Frequency Total time Active time Blank time Border (T / B) Data time Front porch Sync. width Back porch Sync. polarity	70.086Hz 14.268ms 11.504ms 2.764ms 0.191ms 11.122ms 0.985ms 0.064ms 1.716ms Negative	70.087Hz 14.268ms 13.155ms 1.113ms 0.222ms 12.711ms 0.191ms 0.064ms 0.858ms Positive	59.940Hz 16.683ms 15.761ms 0.922ms 0.254ms 15.253ms 0.064ms 0.064ms 0.794ms Negative	72.809Hz 13.735ms 13.100ms 0.635ms 0.211ms 12.678ms 0.026ms 0.079ms 0.528ms Negative	75.000Hz 13.333ms 12.800ms 0.533ms 0.000ms 12.800ms 0.027ms 0.080ms 0.427ms Negative
Dot Clock	25.175MHz	28.322MHz	25.175MHz	31.500MHz	31.500MHz
Sync. Type	Separate	Separate	Separate	Separate	Separate
Scan Type*	N/I	N/I	N/I	N/I	N/I

**2-3-2 Supported Modes (2)**

Timing No. Originator Mode Name Resolution (HxV)	42 VESA 640/85Hz 640x480	32 MAC 640/67Hz 640x480	33 MAC 832/75Hz 832x624	12 VESA 800/56Hz 800x600	13 VESA 800/60Hz 800x600
HORIZONTAL Frequency Total time Active time Blank time Border (L / R) Data time Front porch Sync. width Back porch Sync. polarity	43.269kHz 23.111μs 17.778μs 5.333μs 0.000μs 17.778μs 1.556μs 1.556μs 2.222μs Negative	35.000kHz 28.571μs 21.164μs 7.407μs 0.000μs 21.164μs 2.116μs 2.116μs 3.175μs Negative	49.726kHz 20.110μs 14.524μs 5.586μs 0.000μs 14.524μs 0.559μs 1.117μs 3.910μs Negative	35.156kHz 28.444μs 22.222μs 6.222μs 0.000μs 22.222μs 0.667μs 2.000μs 3.556μs Positive or Negative	37.879kHz 26.400μs 20.000μs 6.400μs 0.000μs 20.000μs 1.000μs 3.200μs 2.200μs Positive
VERTICAL Frequency Total time Active time Blank time Border (T / B) Data time Front porch Sync. width Back porch Sync. polarity	85.008Hz 11.764ms 11.093ms 0.671ms 0.000ms 11.093ms 0.023ms 0.069ms 0.578ms Negative	66.667Hz 15.000ms 13.714ms 1.286ms 0.000ms 13.714ms 0.086ms 0.086ms 1.114ms Negative	74.551Hz 13.414ms 12.549ms 0.865ms 0.000ms 12.549ms 0.020ms 0.060ms 0.784ms Negative	56.250Hz 17.778ms 17.067ms 0.711ms 0.000ms 17.067ms 0.028ms 0.057ms 0.626ms Positive or Negative	60.317Hz 16.579ms 15.840ms 0.739ms 0.000ms 15.840ms 0.026ms 0.106ms 0.607ms Positive
Dot Clock	36.000MHz	30.240MHz	57.284MHz	36.000MHz	40.000MHz
Sync. Type	Separate	Separate Composite Sync.-on-G	Separate Composite Sync.-on-G	Separate	Separate
Scan Type	N/I	N/I	N/I	N/I	N/I



**2-3-2 Supported Modes (3)**

Timing No. Originator Mode Name Resolution (HxV)	14 VESA 800/72Hz 800x600	18 VESA 800/75Hz 800x600	43 VESA 800/85Hz 800x600	15 VESA 1024/60Hz 1024x768	16 VESA 1024/70Hz 1024x768
HORIZONTAL					
Frequency	48.077kHz	46.875kHz	53.674kHz	48.363kHz	56.476kHz
Total time	20.800	21.333μs	18.631μs	20.677μs	17.707μs
Active time	16.000	16.162μs	14.222μs	15.754μs	13.653μs
Blank time	4.800	5.171μs	4.409μs	4.923μs	4.054μs
Border (L / R)	0.000	0.000μs	0.000μs	0.000μs	0.000μs
Data time	16.000	16.162μs	14.222μs	15.754μs	13.653μs
Front porch	1.120	0.323μs	0.569μs	0.369μs	0.320μs
Sync. width	2.400	1.616μs	1.138μs	2.092μs	1.813μs
Back porch	1.280	3.232μs	2.702μs	2.462μs	1.920μs
Sync. polarity	Positive	Positive	Positive	Negative	Negative
VERTICAL					
Frequency	72.188Hz	75.000Hz	85.061Hz	60.004Hz	70.069Hz
Total time	13.853ms	13.333ms	11.756ms	16.666ms	14.272ms
Active time	12.480ms	12.800ms	11.179ms	15.880ms	13.599ms
Blank time	1.373ms	0.533ms	0.577ms	0.786ms	0.673ms
Border (T / B)	0.000ms	0.000ms	0.000ms	0.000ms	0.000ms
Data time	12.480ms	12.800ms	11.179ms	15.880ms	13.599ms
Front porch	0.770ms	0.021ms	0.019ms	0.062ms	0.053ms
Sync. width	0.125ms	0.064ms	0.056ms	0.124ms	0.106ms
Back porch	0.478ms	0.448ms	0.503ms	0.600ms	0.513ms
Sync. polarity	Positive	Positive	Positive	Negative	Negative
Dot Clock	50.000MHz	49.500MHz	56.250MHz	65.000MHz	75.000MHz
Sync. Type	Separate	Separate	Separate	Separate	Separate
Scan Type	N/I	N/I	N/I	N/I	N/I

**2-3-2 Supported Modes (4)**

Timing No.	19	44	20	
Originator	VESA	VESA	VESA	SUN
Mode Name	1024/75Hz	1024/85Hz	1280/75Hz	1280/76Hz
Resolution (HxV)	1024x768	1024x768	1280x1024	1280x1024
HORIZONTAL				
Frequency	60.023kHz	68.677kHz	79.976kHz	81.129kHz
Total time	16.660μs	14.561μs	12.504μs	1664 pixels
Active time	13.003μs	10.836μs	9.481μs	1280 pixels
Blank time	3.657μs	3.725μs	3.023μs	
Border (L / R)	0.000μs	0.000μs	0.000μs	
Data time	13.003μs	10.836μs	9.481μs	
Front porch	0.203μs	0.508μs	0.119μs	32 pixels
Sync. width	1.219μs	1.016μs	1.067μs	64 pixels
Back porch	2.235μs	2.201μs	1.837μs	288 pixels
Sync. polarity	Positive	Positive	Positive	Negative
VERTICAL				
Frequency	75.029Hz	84.997Hz	75.025Hz	76.106Hz
Total time	13.328ms	11.765ms	13.329ms	1066 pixels
Active time	12.795ms	11.183ms	12.804ms	1024 pixels
Blank time	0.533ms	0.582ms	0.525ms	
Border (T / B)	0.000ms	0.000ms	0.000ms	
Data time	12.795ms	11.183ms	12.804ms	
Front porch	0.017ms	0.015ms	0.013ms	2 pixels
Sync. width	0.050ms	0.044ms	0.038ms	8 pixels
Back porch	0.466ms	0.524ms	0.475ms	32 pixels
Sync. polarity	Positive	Positive	Positive	Negative
Dot Clock	78.750MHz	94.500MHz	135.00MHz	135.00MHz
Sync. Type	Separate	Separate	Separate	Composite
Scan Type*	N/I	N/I	N/I	N/I

Memo

## 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 Electrostatically Sensitive Devices (ESD) 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 devices 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.



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