

TASCAM

TEAC Professional Division

D00830000A



IF-FW/DM

FireWire Interface Card

OWNER'S MANUAL

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Introduction

Thank you for purchasing the TASCAM IF-FW/DM FireWire audio card for TASCAM mixers. It is designed to provide audio and MIDI interfacing between your TASCAM mixer and your computer based DAW, essentially turning your TASCAM mixer into a FireWire audio/MIDI interface.

Please take some time to look through this owners manual and familiarize yourself with the IF-FW/DM's features, setup and operation. We suggest you pay particular attention to the setup notes for your computer platform of choice (Mac or PC). You may also need to refer to your software's documentation for a clear understanding of how to setup an audio/MIDI interface from within your software. Your experience with the IF-FW/DM will be greatly enhanced by a good working knowledge of your audio software.

Be sure to check the TASCAM web site at www.tascam.com and ensure you have the latest software updates for your IF-FW/DM.

Features

The IF-FW/DM provides the following interfacing between your TASCAM mixer and a host computer via FireWire:

- 24 channels of Input to the mixer from the computer at 44.1k and 48k sample rates
- 24 channels of Output from the mixer to the computer at 44.1k and 48k sample rates
- 1 MIDI port In and Out from the computer

System Requirements

Macintosh

- OS: MacOS X 10.3.5 or higher
- Computer: Apple Macintosh series with on-board Firewire
- Minimum: G4/800MHz
- Recommended: Dual G4/1GHz
- Memory(RAM): 256MB or more

Windows

- OS: Microsoft® Windows® XP Home Edition or XP Professional with Service Pack 1
- Computer: Windows® XP Compatible PC equipped with an IEEE 1394/FireWire Port
- Minimum: Pentium®, Celeron®, or Pentium® compatible processor 1.5GHz or higher
- Recommended: Pentium® IV/2GHz or higher
- Memory(RAM): 256MB or more

DM-24 Requirements

The DM-24 must be running V3.00 software to use the IF-FW/DM. Please refer to **www.tascam.com** or your local service center to obtain this DM-24 update. Do not proceed to install the IF-FW/DM until your DM-24 has been updated.

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Macintosh, MacOS, MacOS X and FireWire™ are trademarks of Apple Computer.

All other trademarks are the property of their respective holders.

Installation

Installing the IF-FW/DM

- The IF-FW/DM must be installed in the DM-24's Slot 1. It will not function in Slot 2.
 - The following installation must be done with the DM-24's power OFF and disconnected.
1. Remove the five screws holding the blank plate or card currently installed in Slot 1, and then remove the plate or card.
 2. Insert the IF-FW/DM into Slot 1, making sure that the card edges slide into the white plastic guide inside Slot 1. Push it all the way in until it clicks and the card back plate is flush with the DM-24's back panel. Excessive force is not required - if it doesn't click in easily, remove it and start again with attention to the guides.
 3. Replace the five screws to hold the card in place.

Making Connections

- The maximum FireWire cable length is 3 meters.
1. Connect one end of the provided FireWire cable to the IF-FW/DM and the other end to an available FireWire port on your computer.
 2. Connect the MIDI Input of the IF-FW/DM to the MIDI Output of the DM-24 if you plan to use the DM-24 as a control surface for your DAW.
 3. Connect the MIDI Output of the IF-FW/DM to the MIDI Input of the DM-24 if you plan to drive the DM-24's automation from MTC provided by the DAW or if you require time code display from the DAW in the DM-24's read-out.
 - a. If you will not be using MIDI communication between the DM-24 and the DAW for

surface control or time code, the IF-FW/DM's MIDI port may be used as an additional MIDI port by the DAW's sequencer. It can be used to connect a MIDI controller, sound module or sampler.

NOTE: The IF-FW/DM must be connected by itself on a FireWire bus. More than one FireWire connector on a computer does not mean each connector has its own bus. More often, all connectors go to the same bus on the computer. If you require additional FireWire devices, it is necessary to add a FireWire card, thus adding a separate bus, for those devices.

Configuring the Computer

Macintosh

The IF-FW/DM uses the FireWire audio/MIDI services provided by OSX so it is not necessary to install drivers. You must have OSX 10.3.5 installed on your Mac to use the IF-FW/DM. Previous operating systems do not include the correct built-in services.

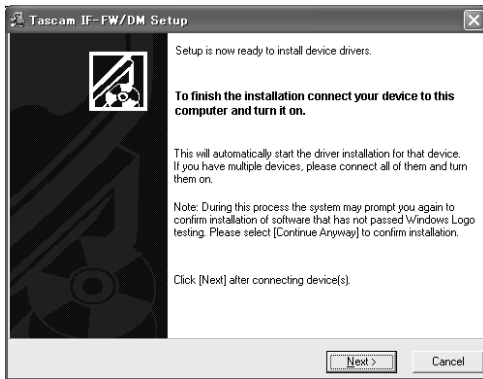
1. Make the connections as described above.
 2. Power up the Mac
 3. Power up the DM-24
 4. Open Audio/MIDI set and verify that the IF-FW/DM device is present
 5. Configure your DAW to use the IF-FW/DM Core Audio device according to the instructions for your app.
- If your Mac does not recognize the card, reboot the Mac.

Installation

Windows

It is necessary to install driver software in order for Windows to recognize the IF-FW/DM. An installer is provided for this purpose, the drivers cannot be installed manually from Windows Device Manager. On the CD-ROM that came with your IF-FW/DM is a PC Drivers installer. Launch it from the CD or copy it to your hard drive and launch it from there.

- The IF-FW/DM should be disconnected from the PC for driver installation.
1. Launch the driver installer and carefully follow the on-screen instructions in the Installation Wizard.
 2. When presented with the Windows Logo warning, click Continue Anyway.
 3. Follow the steps on the final screen of the Installation Wizard through the Windows "New Hardware Wizard".



4. Power up the DM-24 and wait until "Your new hardware is installed and ready to use" appears in the lower right of the Windows desktop.

5. When presented with the Windows Logo warning, click Continue Anyway.
6. When "Your new hardware is installed and ready to use" appears again in the lower right of the Windows desktop, click the "Next" button on the Setup dialog.
7. Configure your DAW to use the IF-FW/DM WDM or ASIO device according to the instructions for your app.

NOTE: Because WDM mode takes longer to be recognized than ASIO mode, WDM mode is defaulted to Off. It will have to be manually turned on if you are using a WDM app. There is a check box in the PC control panel to enable WDM mode.

- If the computer does not recognize the card, increase the Stream Buffer Depth in the control panel or use the Reset Cards command under the control panel Tools menu.

Setup

IF-FW/DM Interface Setup

Below are brief instructions for setting up common DAW software apps to use the IF-FW/DM interface. If your app isn't covered here, but does support ASIO (PC), WDM (PC) or Core Audio (Mac), or if you need more detailed instructions to configure your app, please refer to the documentation for your app to set up an audio/MIDI interface.

Cubase / Nuendo

1. Select Device Setup under the Devices menu
2. Select VST Multitrack
3. Select ASIO IFFWDM under the ASIO Driver pulldown
4. Click Apply then click OK

SONAR

1. Select Audio under the Options menu
2. Click the Drivers tab and enable the desired Inputs and Outputs
3. Click the General tab and select IF-FW/DM devices for the Playback and Record Timing Masters
4. Click on Wave Profiler (run this any time you change anything in this window)
5. Click on Yes to profile the interface. The sample rate corresponding to the sample rate set on the mixer will show "OK". Other sample rates will show "not available". Close this window
6. Click OK

Logic

1. Under the Logic menu, select Preferences > Audio Hardware & Drivers
2. Ensure that Core Audio is checked and click the triangle on the left to expand the window
3. Select the IF-FW/DM in the Driver pulldown
4. Click OK

Digital Performer

For the IF-FW/DM to work with Digital Performer, version 4.5 or higher of DP must be used.

In DP 4.5, there is a setting that reduces the MAS thread priority in the System. The medium or low setting should be used with the IF-FW/DM. Effectively under this setting, the IF-FW/DM can achieve an equal track & plug-in count under DP as other FW audio interfaces that can run at high MAS thread priority. However, on slower CPU's, MAS could be more prone to processor spikes on larger DP projects.

1. Under the Setup menu, select Configure Audio System > Configure Hardware Driver
2. Highlight the IF-FW/DM to make it the selected Core Audio device for DP.
3. Configure the Buffer Size and Host Buffer Multiplier according to your Mac's capabilities. Generally, less powerful Macs will require higher settings.
4. Click OK

Setup

System Clocking

Master Clock

When configured with an IF-FW/DM, the DM-24 must be the master clock relative to the computer DAW. The DM-24 itself may be clocked to an external source other than the DAW.

Clock Settings

If it becomes necessary to switch between 44.1k and 48k sample rates on the DM-24, the following steps are required for correct operation:

1. Shut down your PC or Mac.
2. Disconnect the FireWire cable.
3. Change the sample rate on the DM-24.
4. Reconnect the FireWire cable.
5. Boot the PC or Mac.

NOTE: 30 seconds must elapse between disconnection and reconnection of the FireWire cable.

96k & 88.2k Operation

At the time of this writing, the IF-FW/DM does not support high sample rate mode.

IF-FW/DM & DM-24 Routing

The IF-FW/DM appears to the DM-24 just like any other optional I/O card except that it has 24 channels of I/O instead of 8.

Mixer Outputs

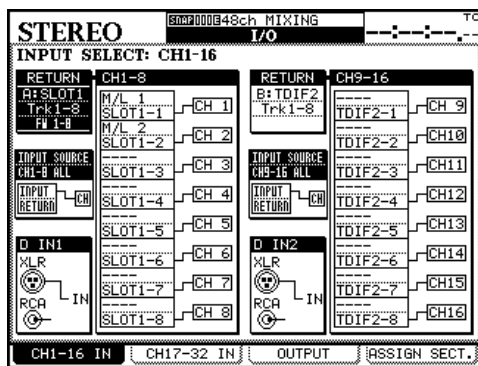
By default, the DM-24 duplicates busses 1 - 8 on IF-FW/DM mixer outputs 1 - 8, 9 - 16, and 17 - 24.

Also available are the Direct Outputs from channels 1 - 16 on the DM-24. By default, those appear on IF-FW/DM mixer outputs 1 - 16.

These routing settings can be changed in the Output tab of the DM-24's I/O screen.

Mixer Inputs

The IF-FW/DM's mixer inputs must be configured in banks of 8 in the CH1-16 IN and CH17-32 IN tabs of the DM-24's I/O screen.



For 24 channel operation:

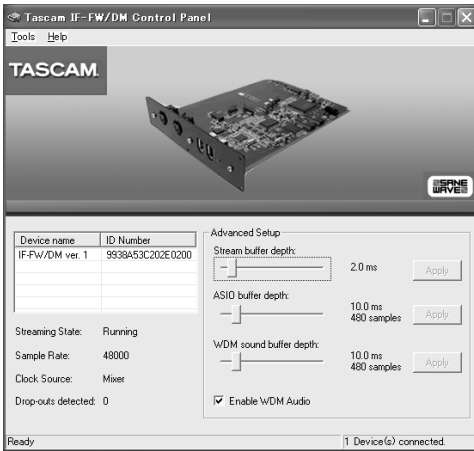
- Set RETURN CH1-8 to A:SLOT1, Trk1-8, FW 1-8
- Set RETURN CH9-16 to B:SLOT1, Trk9-16, FW 9-16
- Set RETURN CH17-24 to A:SLOT1, Trk17-24, FW 17-24

Set the INPUT SOURCE to RETURN

Setup

IF-FW/DM Control Panel (Windows)

The IF-FW/DM Control Panel is found here: Start Menu > All Programs > TASCAM > IFFWDM Control Panel.



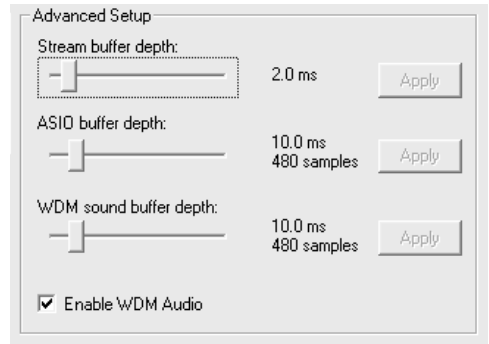
There are three sliders available in the control panel. Generally, lower audio buffer settings offer lower latency but require a more powerful computer. It may be necessary to experiment with these settings to find the lowest setting your computer is capable of running. The most common symptom of settings that are too low for a particular computer is clicks & pops in the audio.

Enable WDM Audio (Default OFF)

Check this box to enable WDM mode in order to use the IF-FW/DM with a WDM app. Checking this box will increase the time required for the IF-FW/DM to establish communication with the PC.

NOTE: There is status indication in the control panel of a good connection between the IF-FW/DM and the PC. If connection is lost, disconnect the FireWire cable for 30 seconds then reconnect it, increase the Stream Buffer Depth or use the Reset Cards command under the Tools

menu of the Windows control panel.



The three sliders are:

Stream buffer depth

Use this slider to control the size of the incoming 1394 audio stream. The larger the buffer size, the more latency in the audio. Too small of a buffer size can introduce clicks and pops in the audio.

ASIO buffer depth

Use this slider to reduce/increase latency when using a Steinberg ASIO app or when using SONAR in ASIO mode.

WDM sound buffer depth

Use this slider to reduce/increase latency when using a WDM app such as SONAR.

After adjusting the sliders, press Apply to set the changes.

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IF-FW/DM

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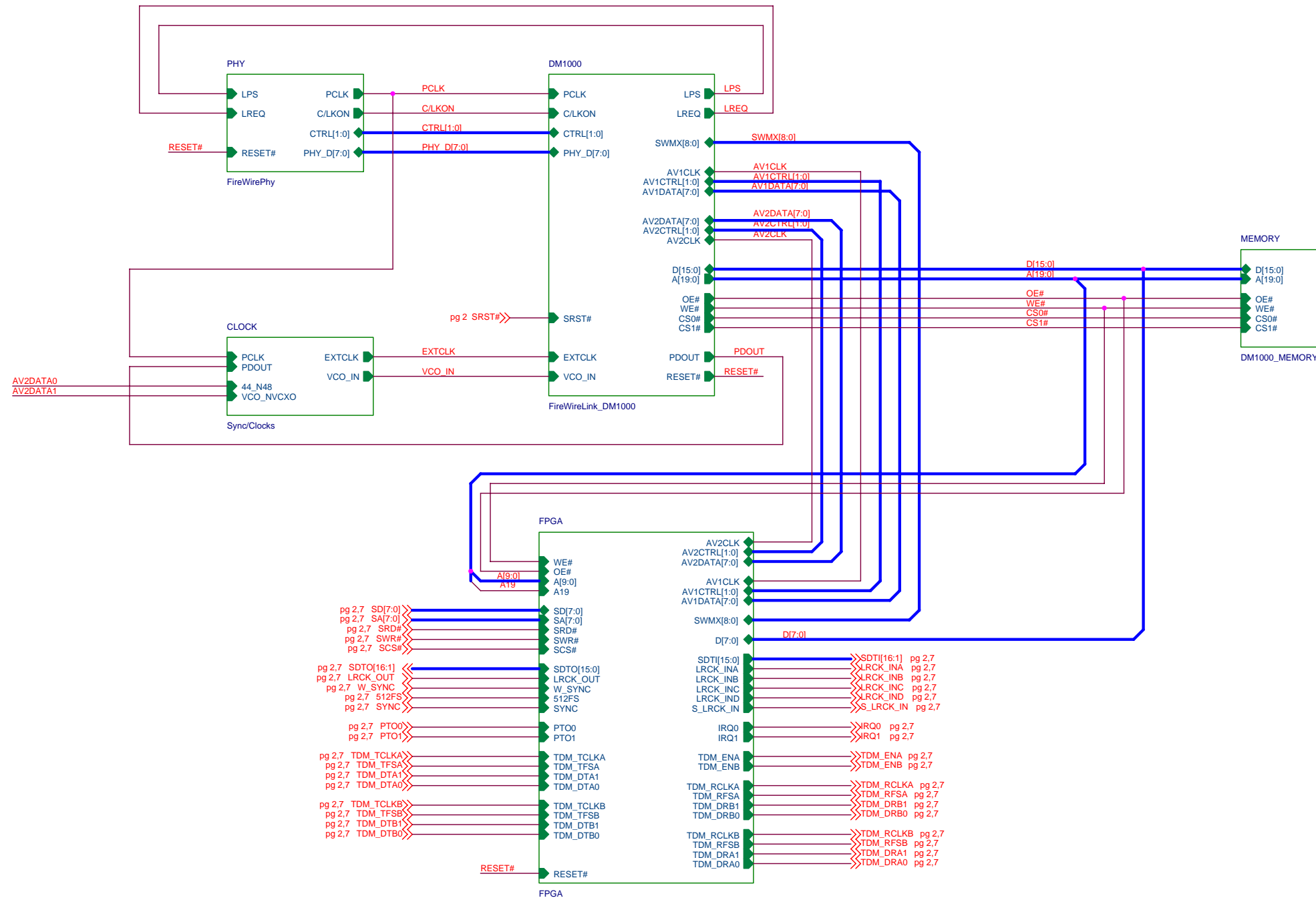
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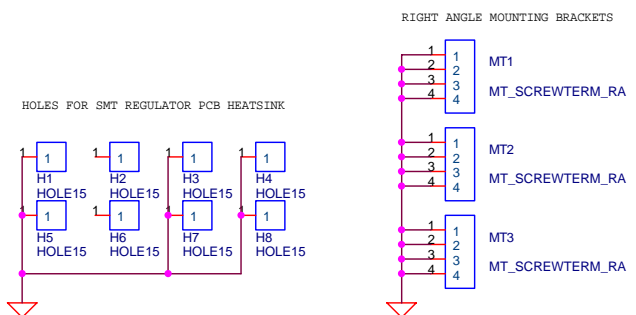
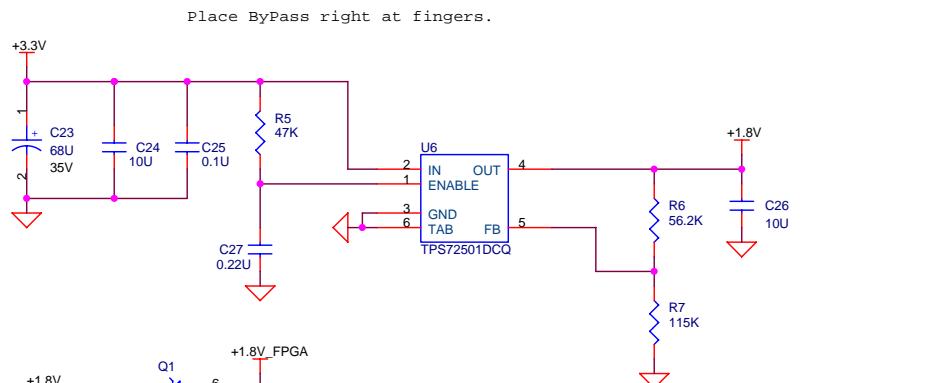
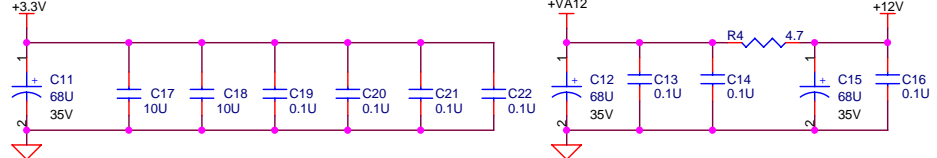
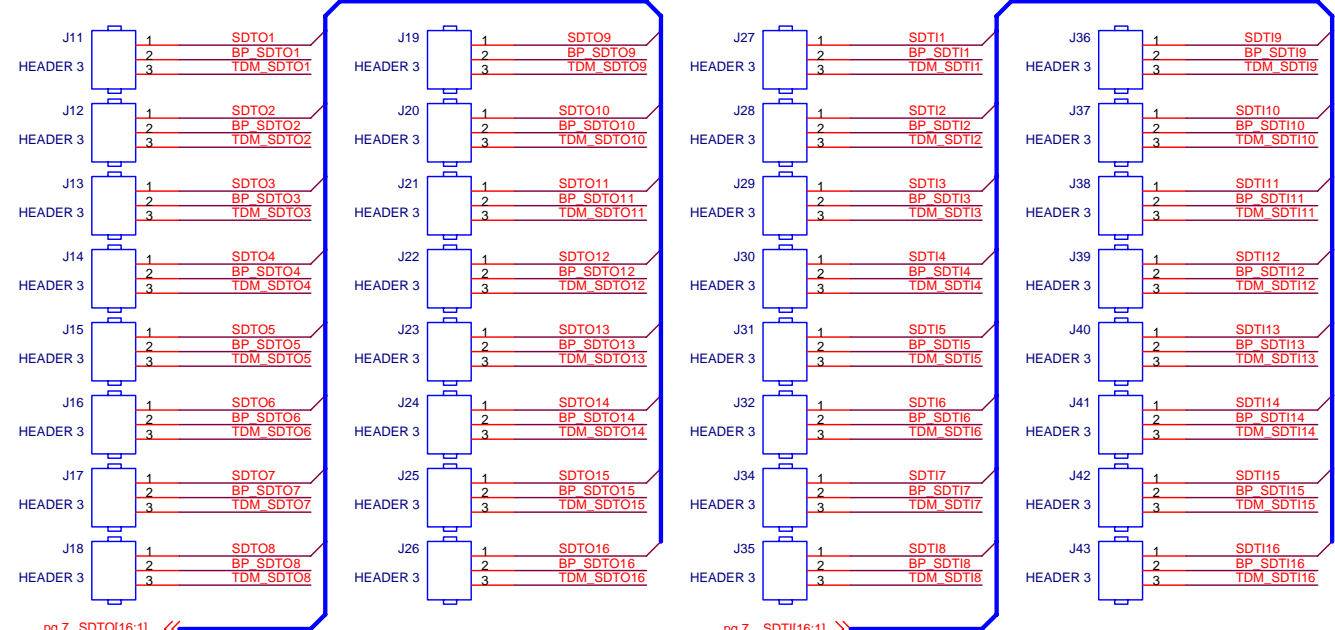
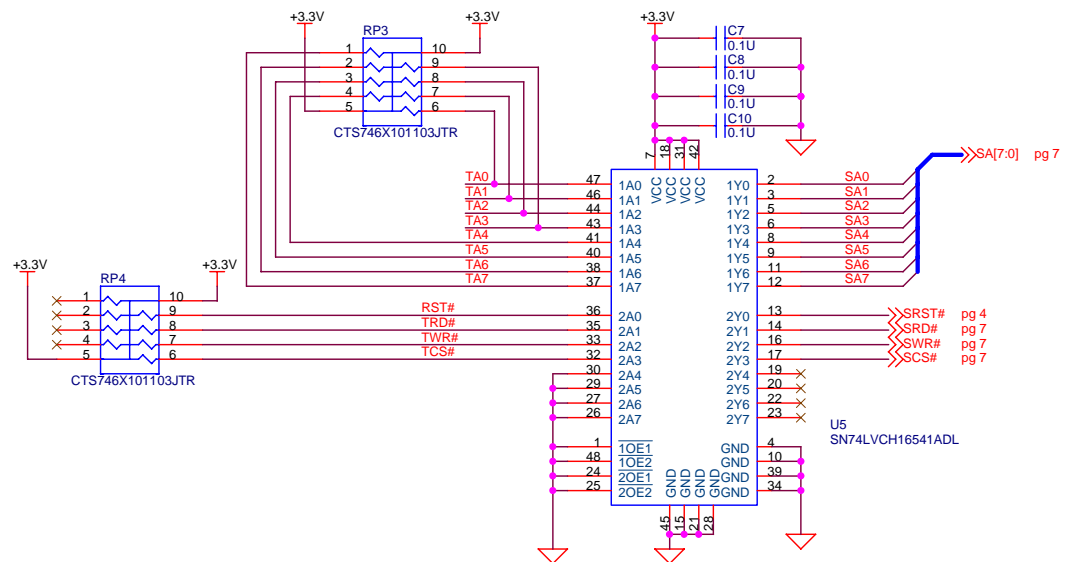
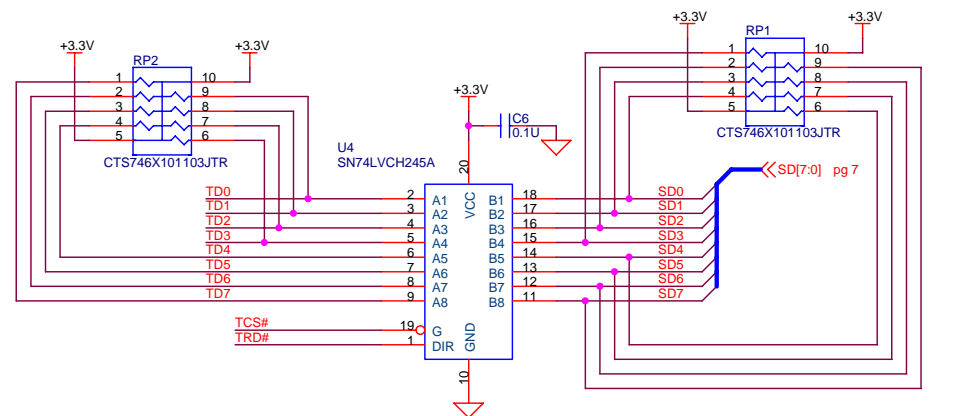
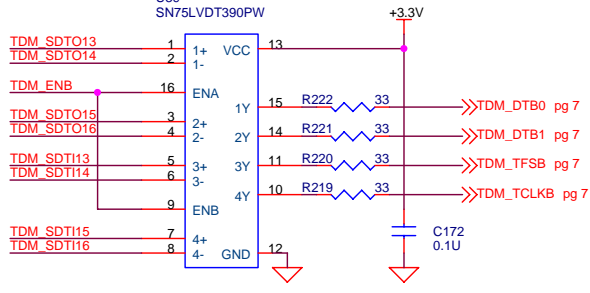
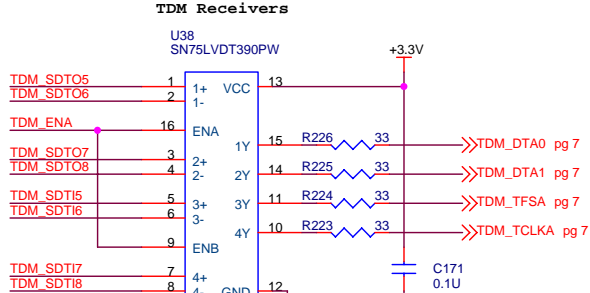
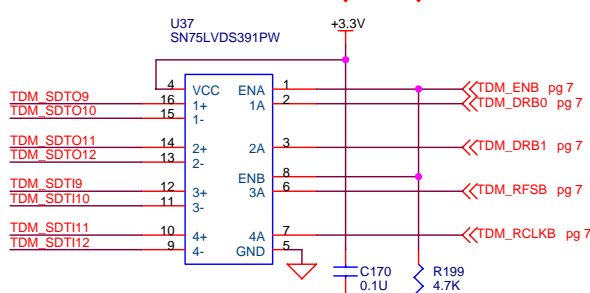
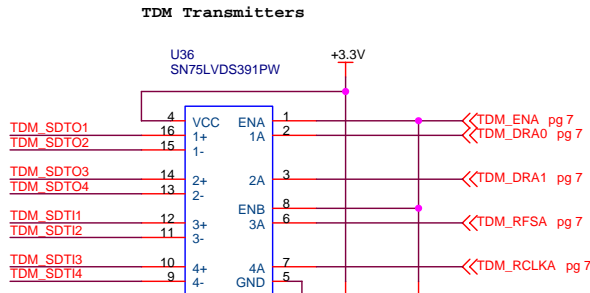
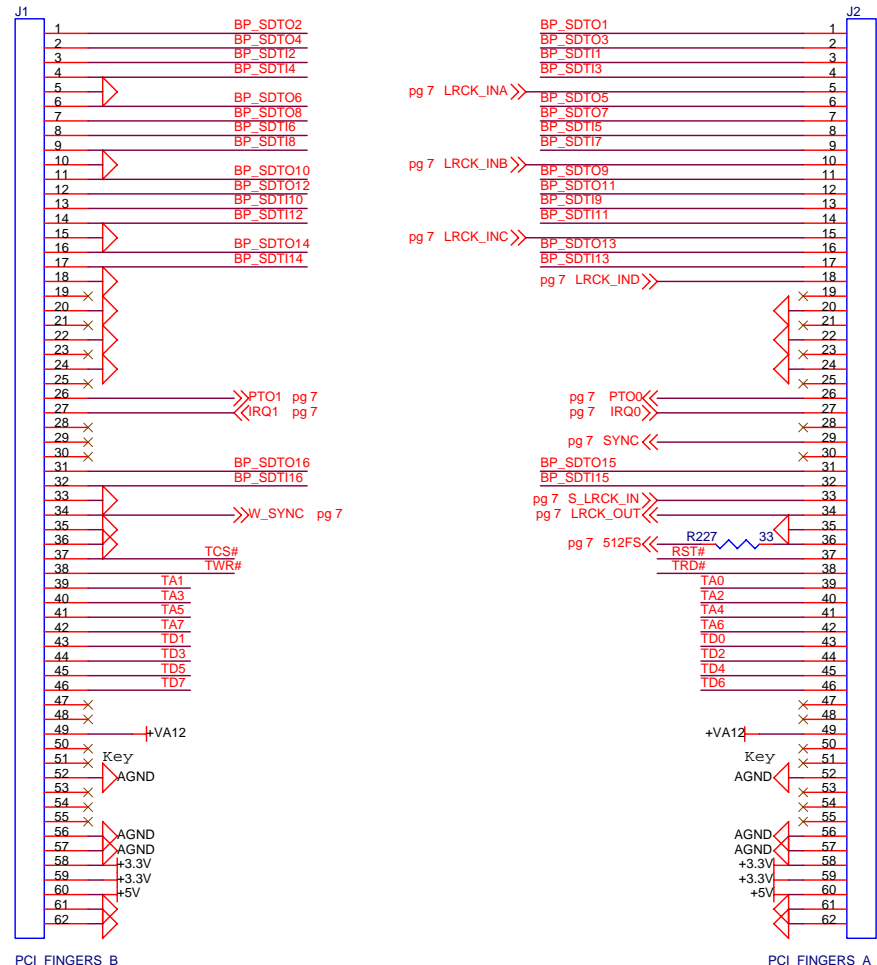
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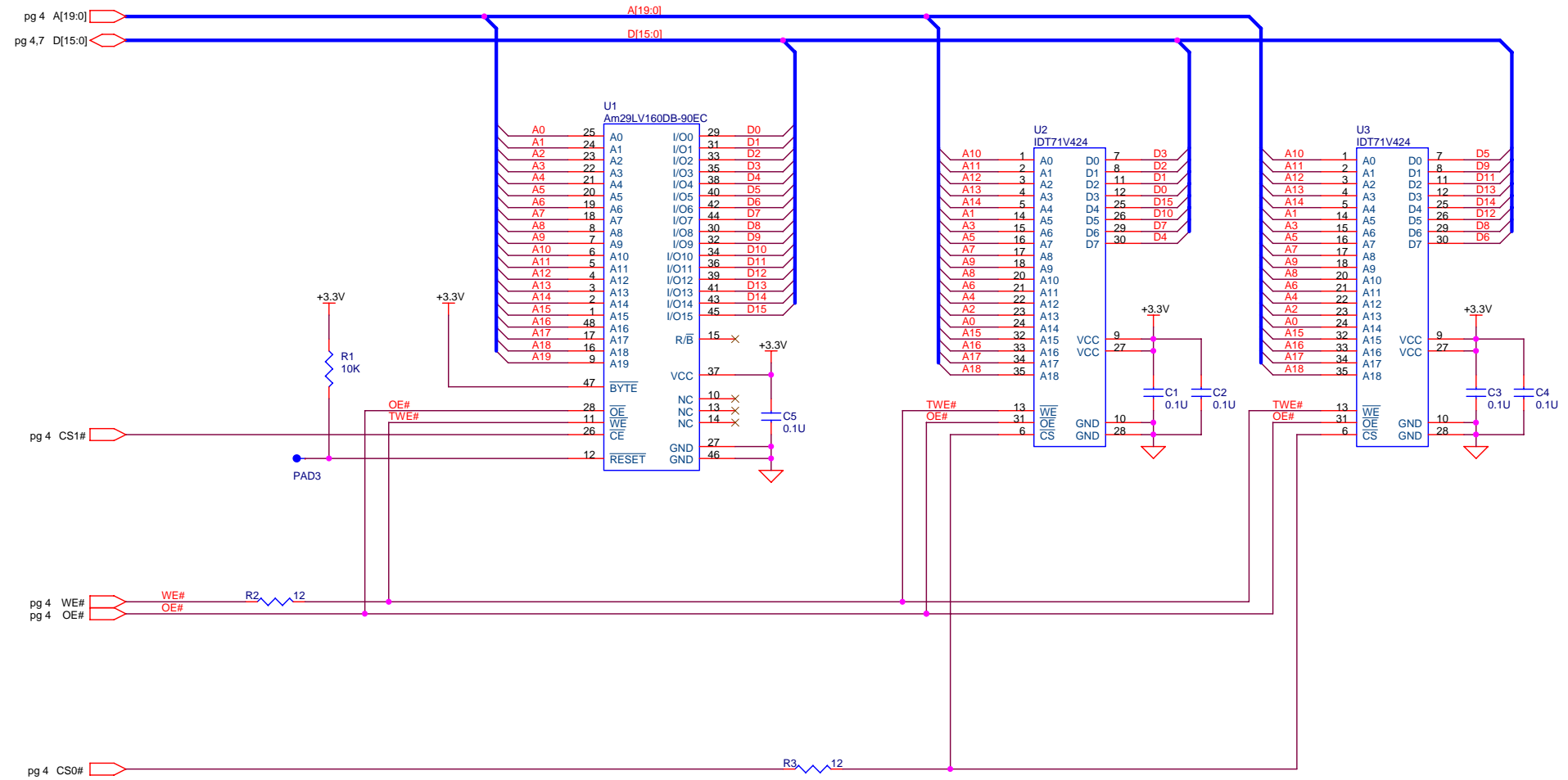
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Teac Backplane



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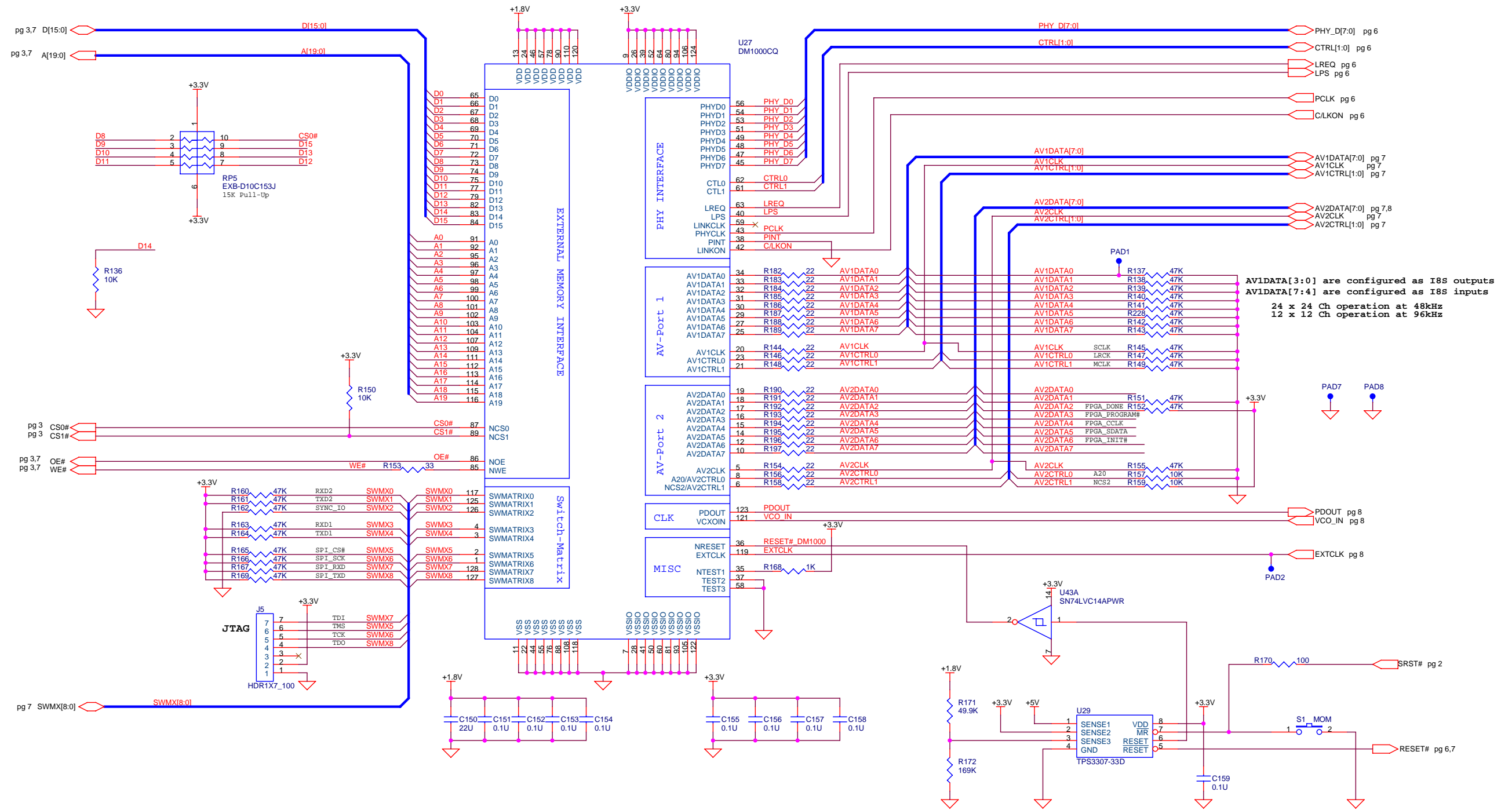
DM1000 Memory



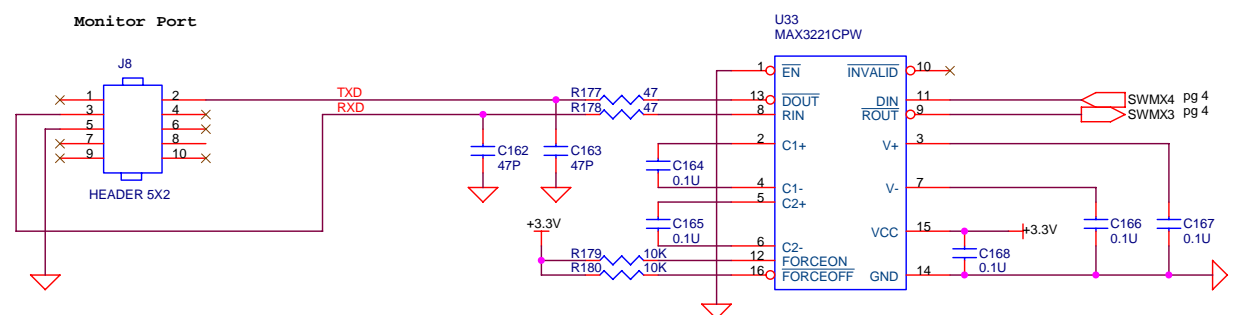
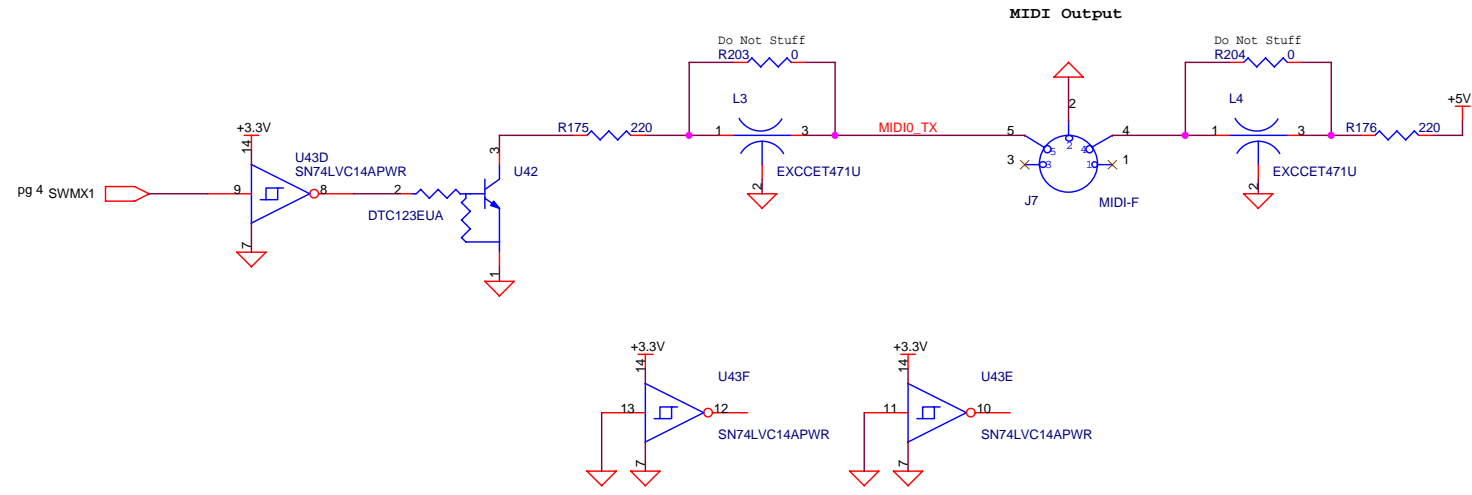
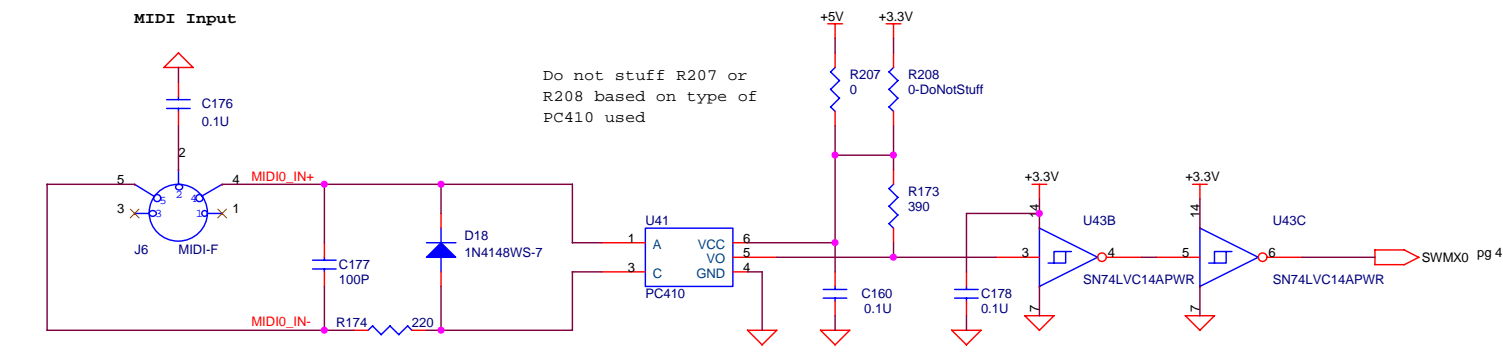
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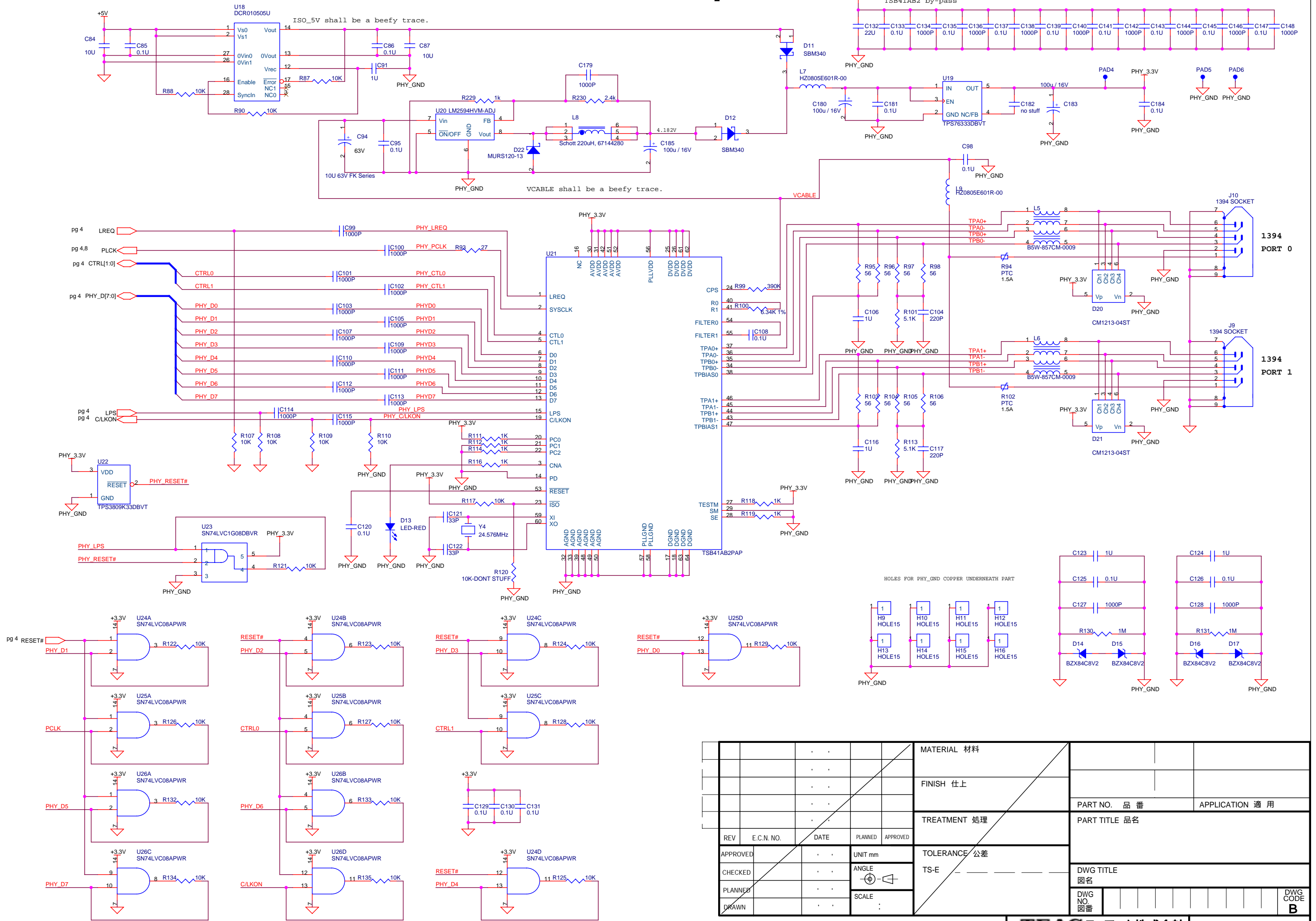


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IEEE 1394a Phy

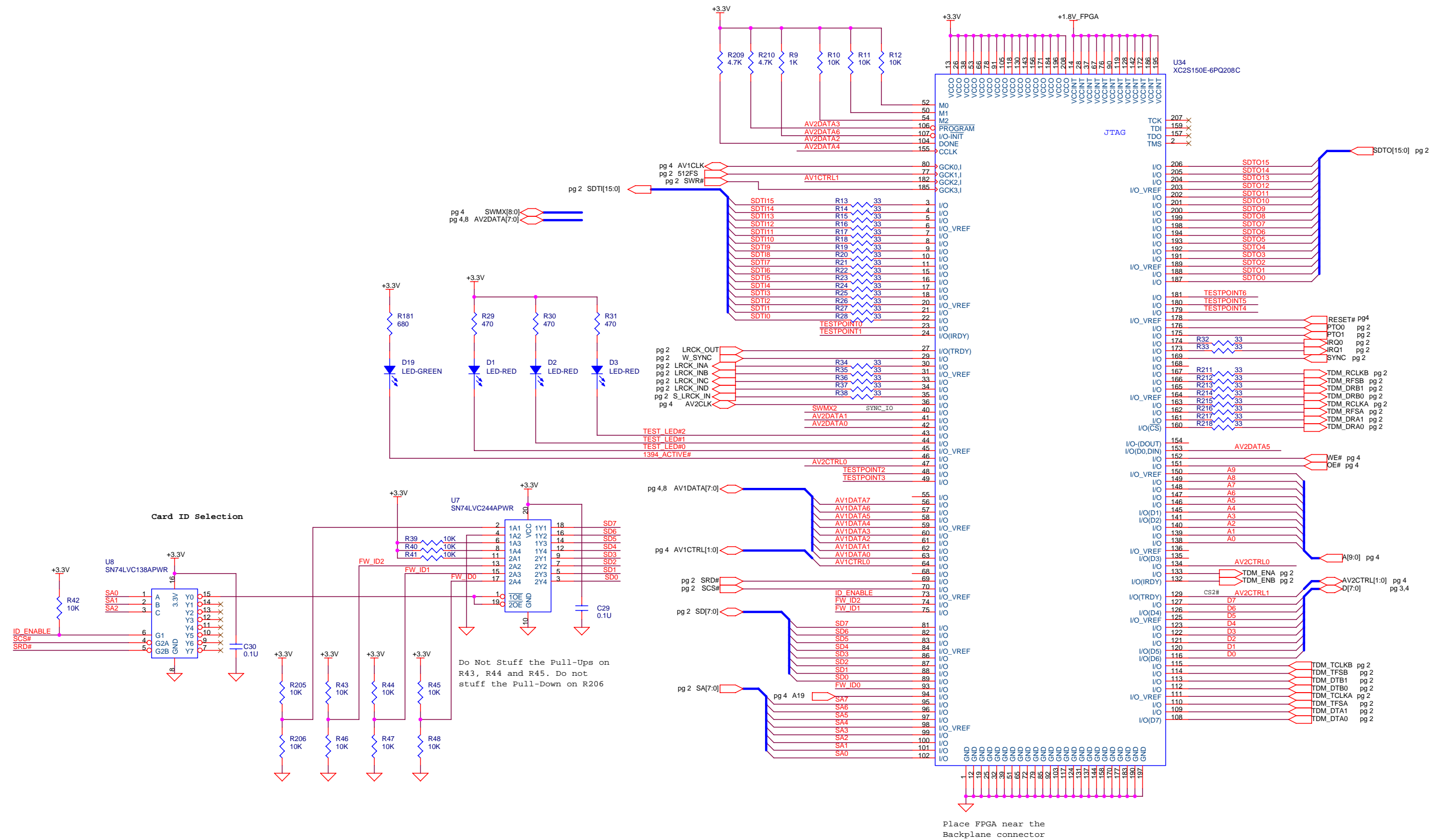


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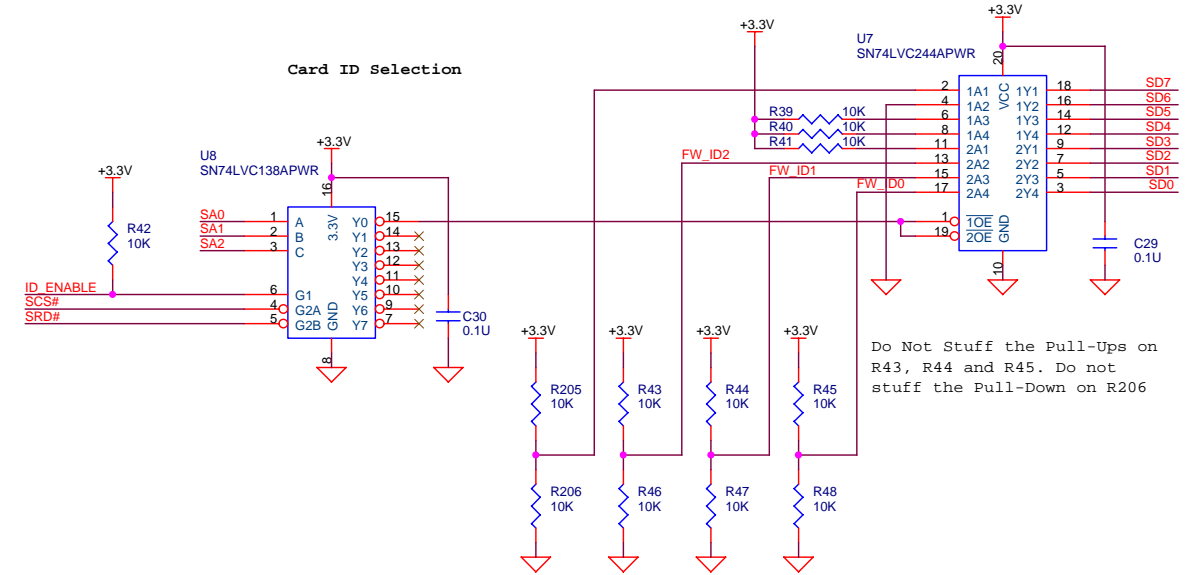
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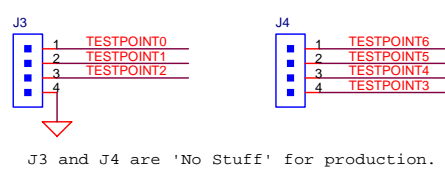
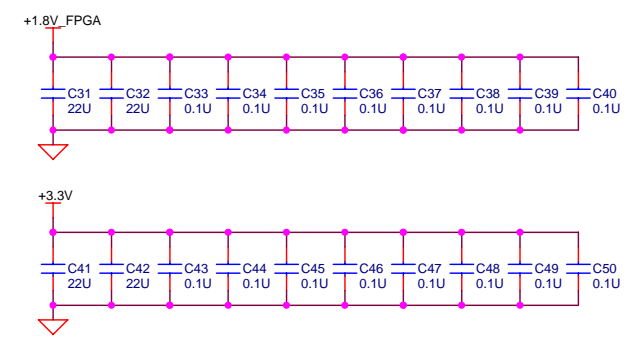
FPGA



Card ID Selection

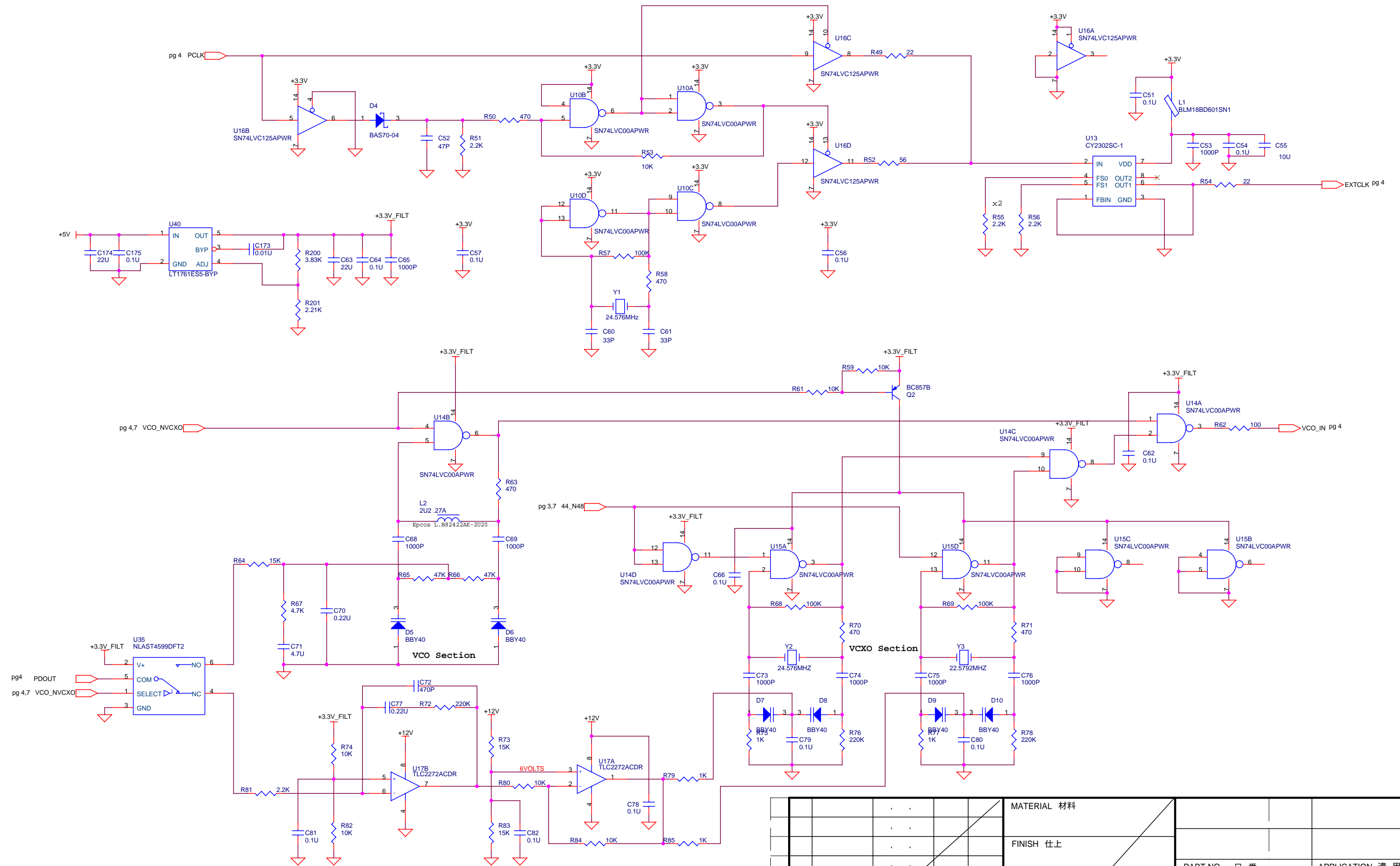


Place FPGA near the Backplane connector



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Sync/Clocks



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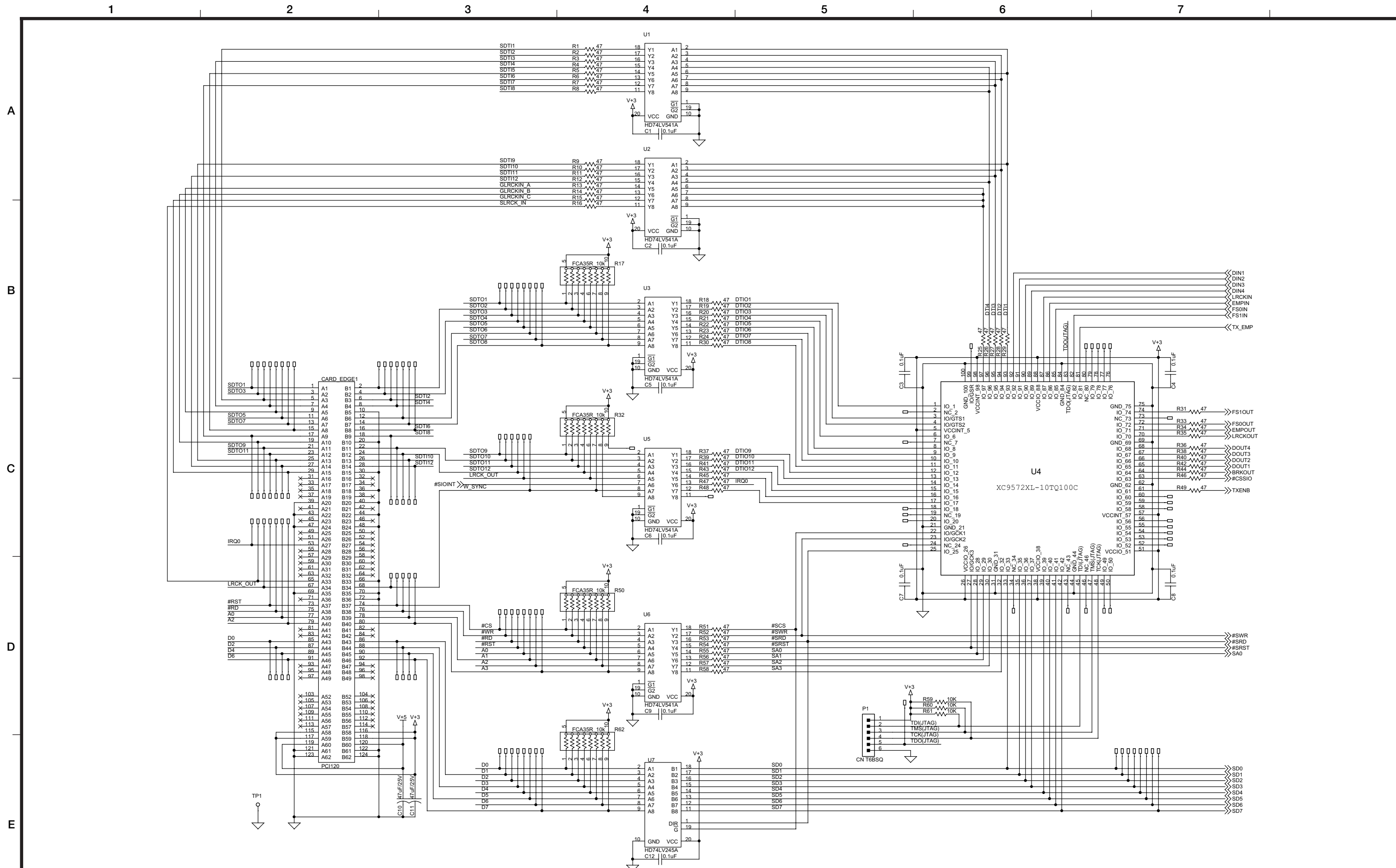
SCHEMATIC DIAGRAMS

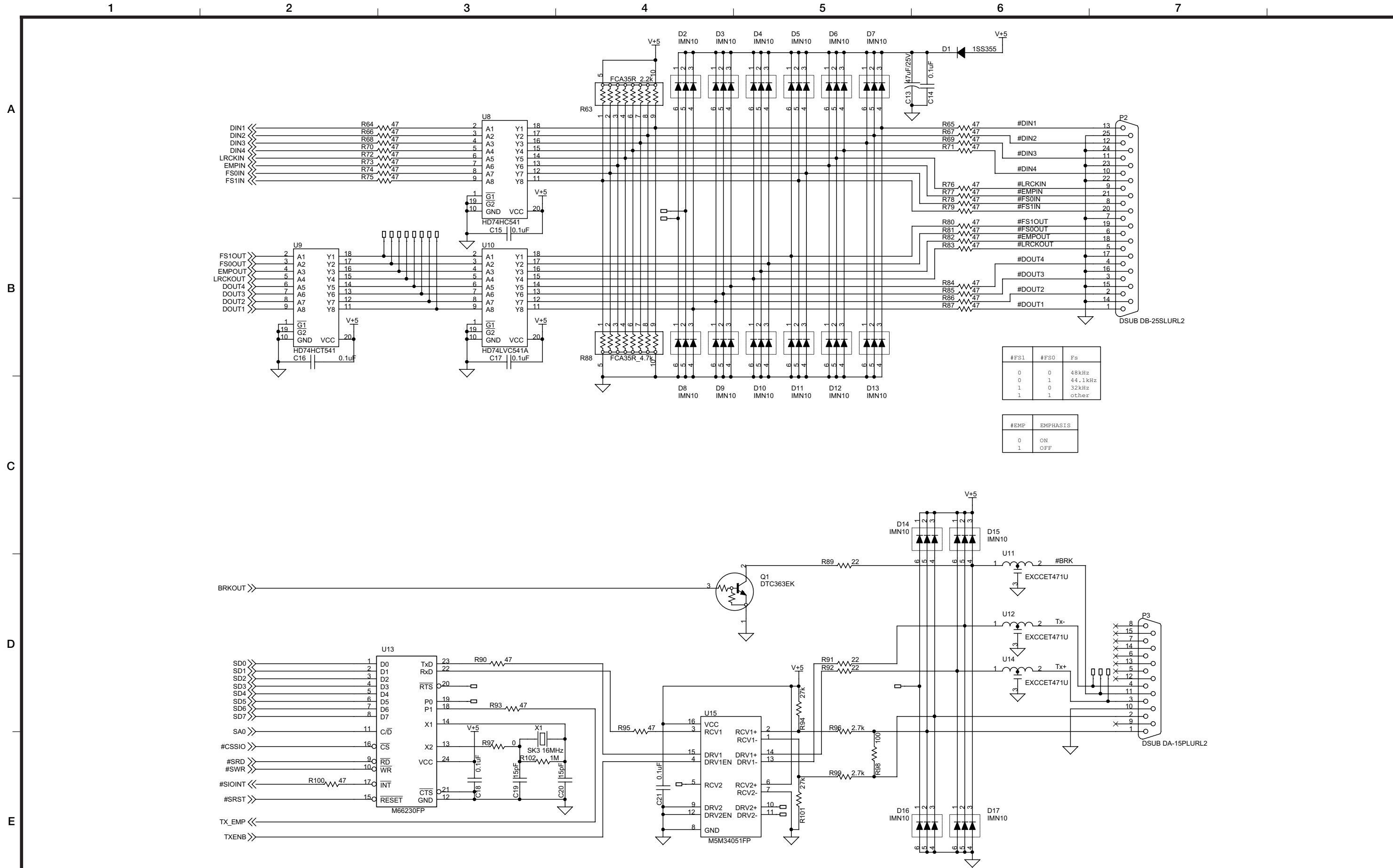
回路図

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Optional Accessories

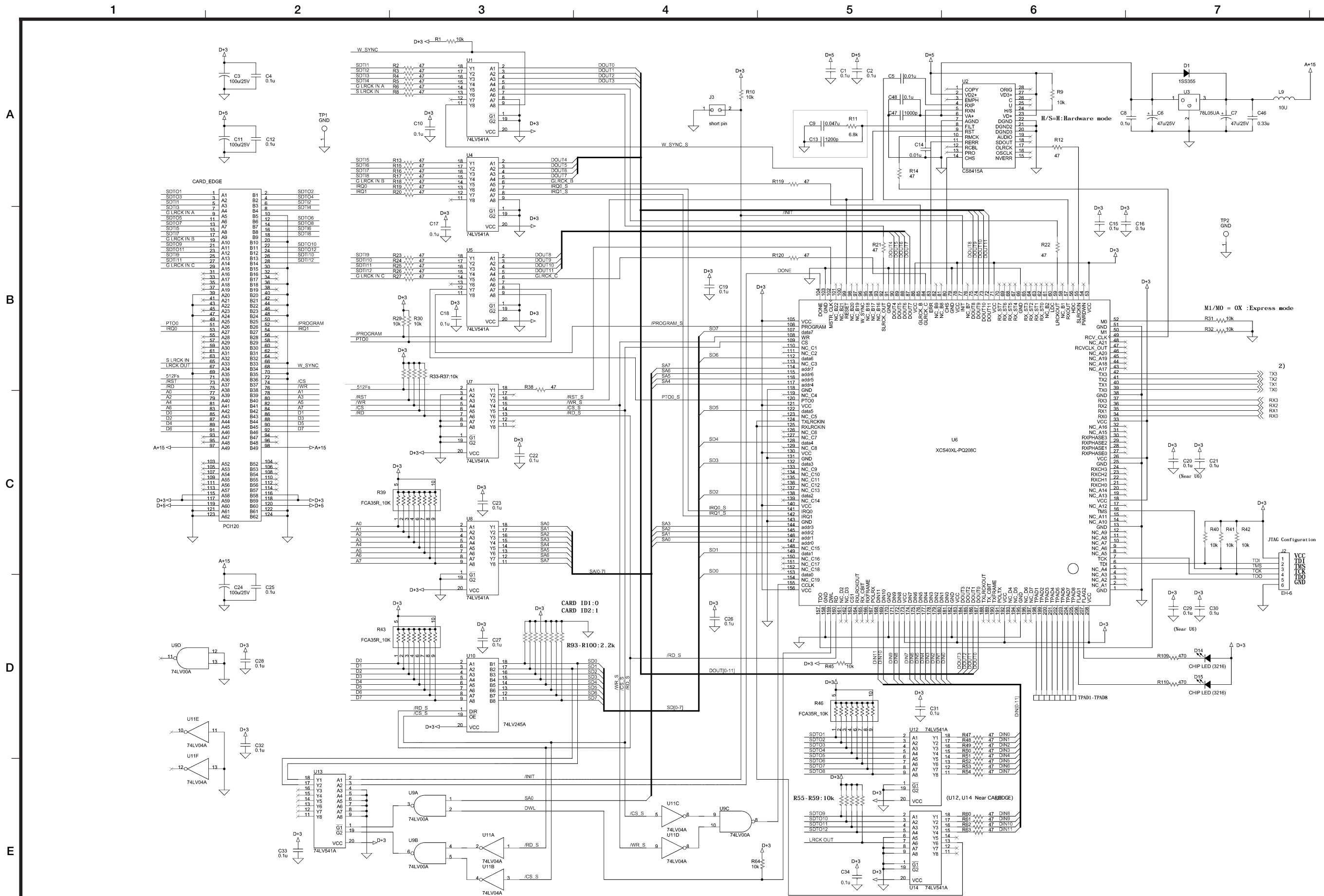
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IF-AE/DM PCB (IF-AE/DM)	Pages 3, 4
IF-AD/DM PCB (IF-AD/DM)	Pages 5, 6
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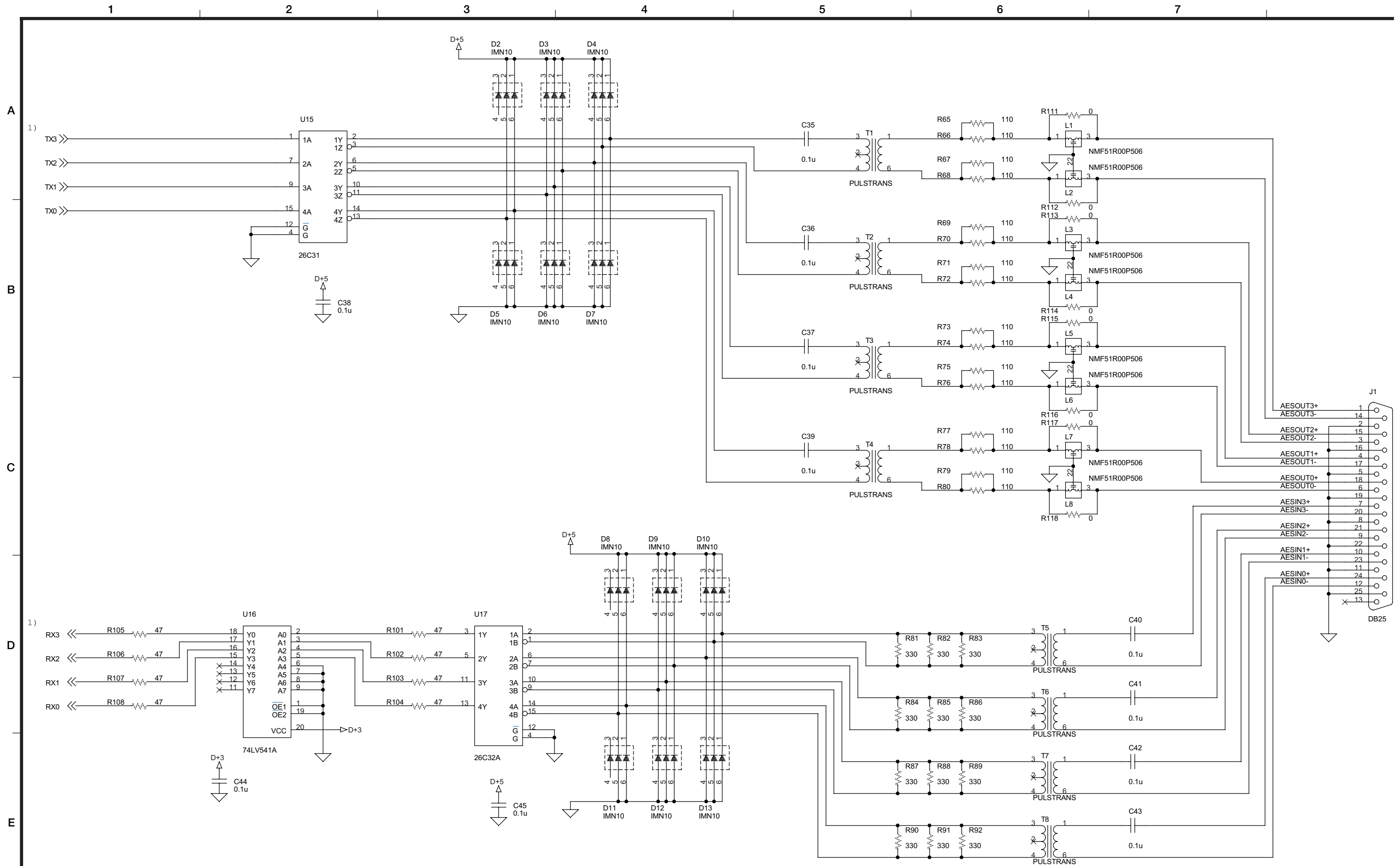


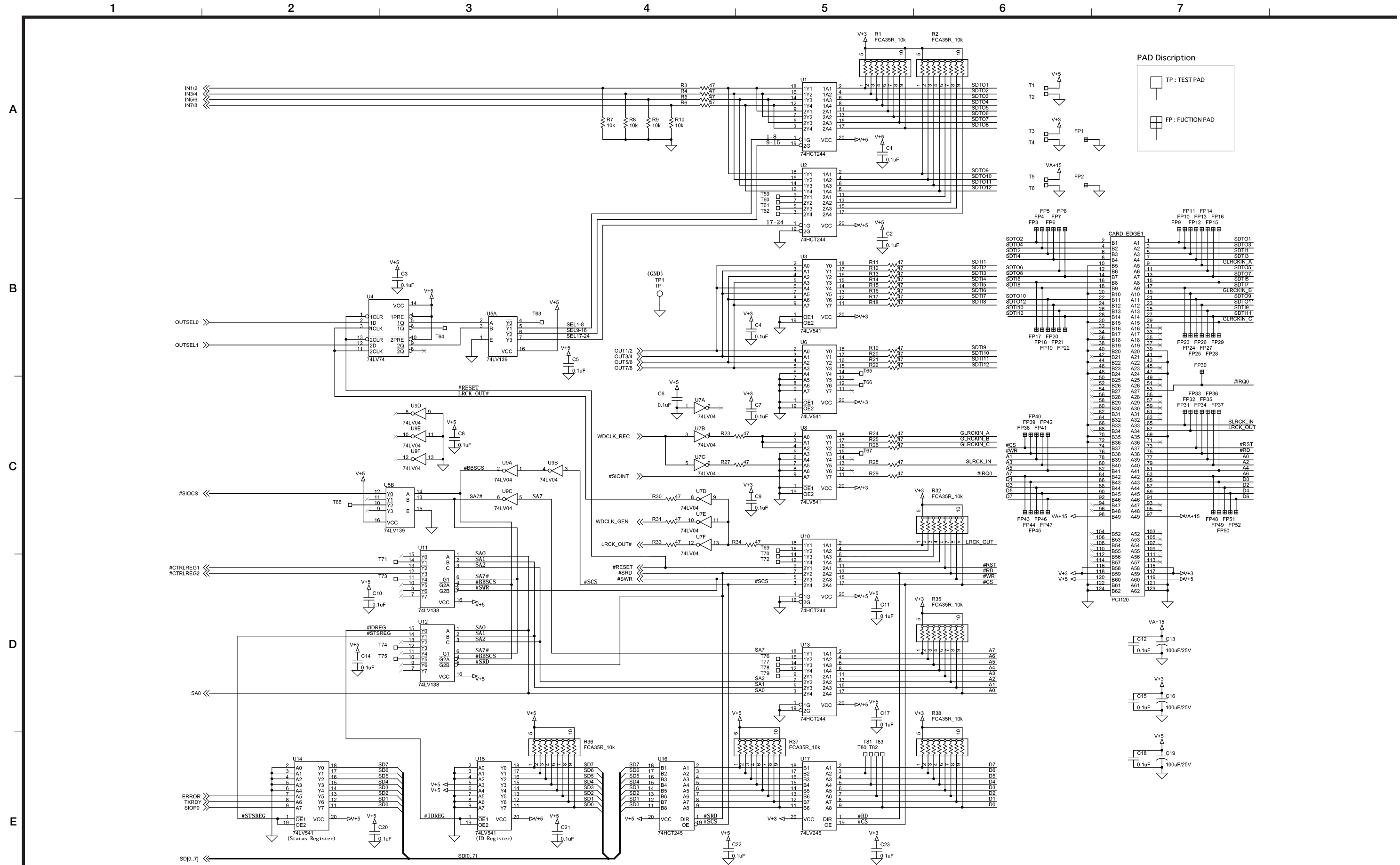


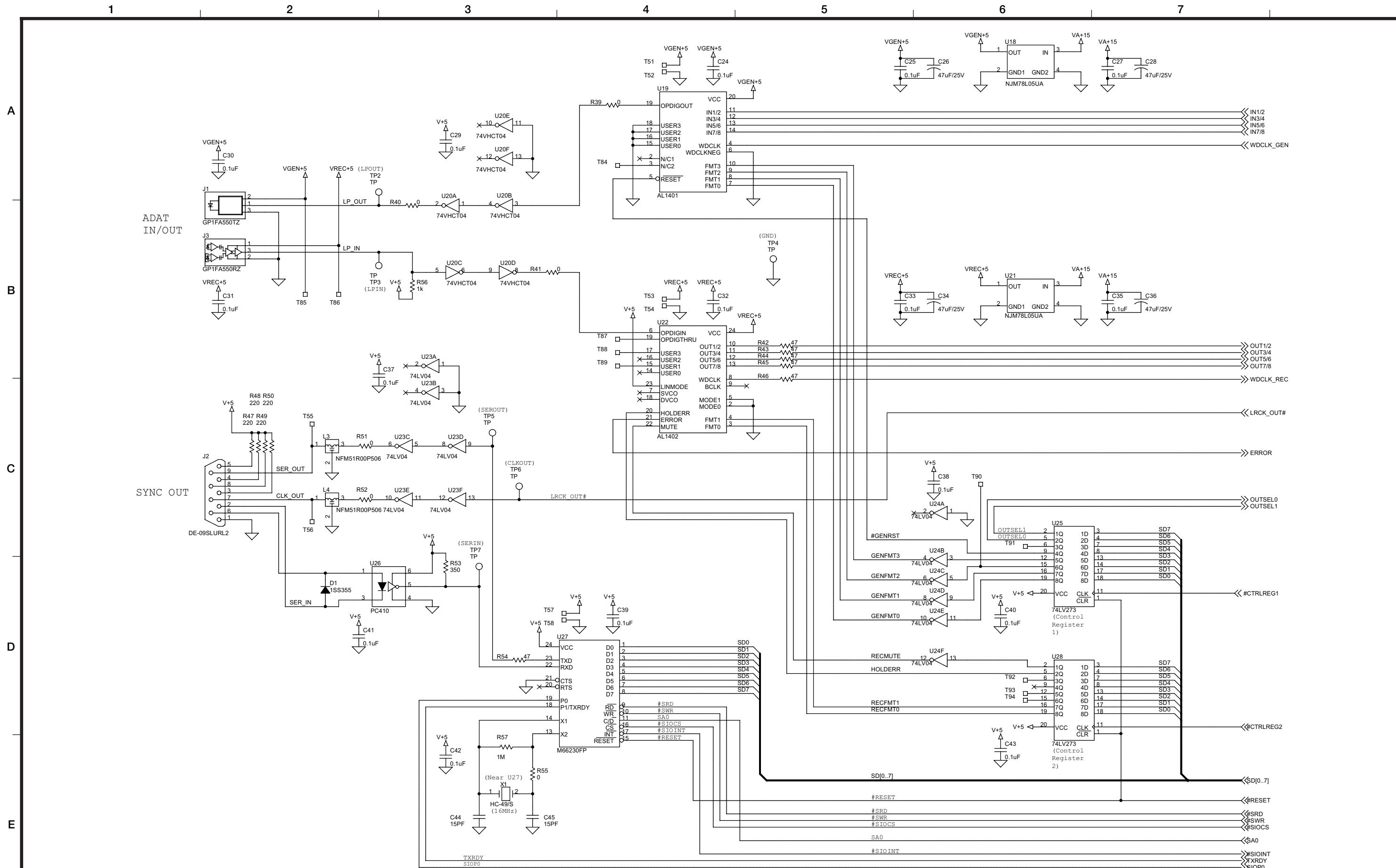
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0	1	44.1kHz
1	0	32kHz
1	1	other

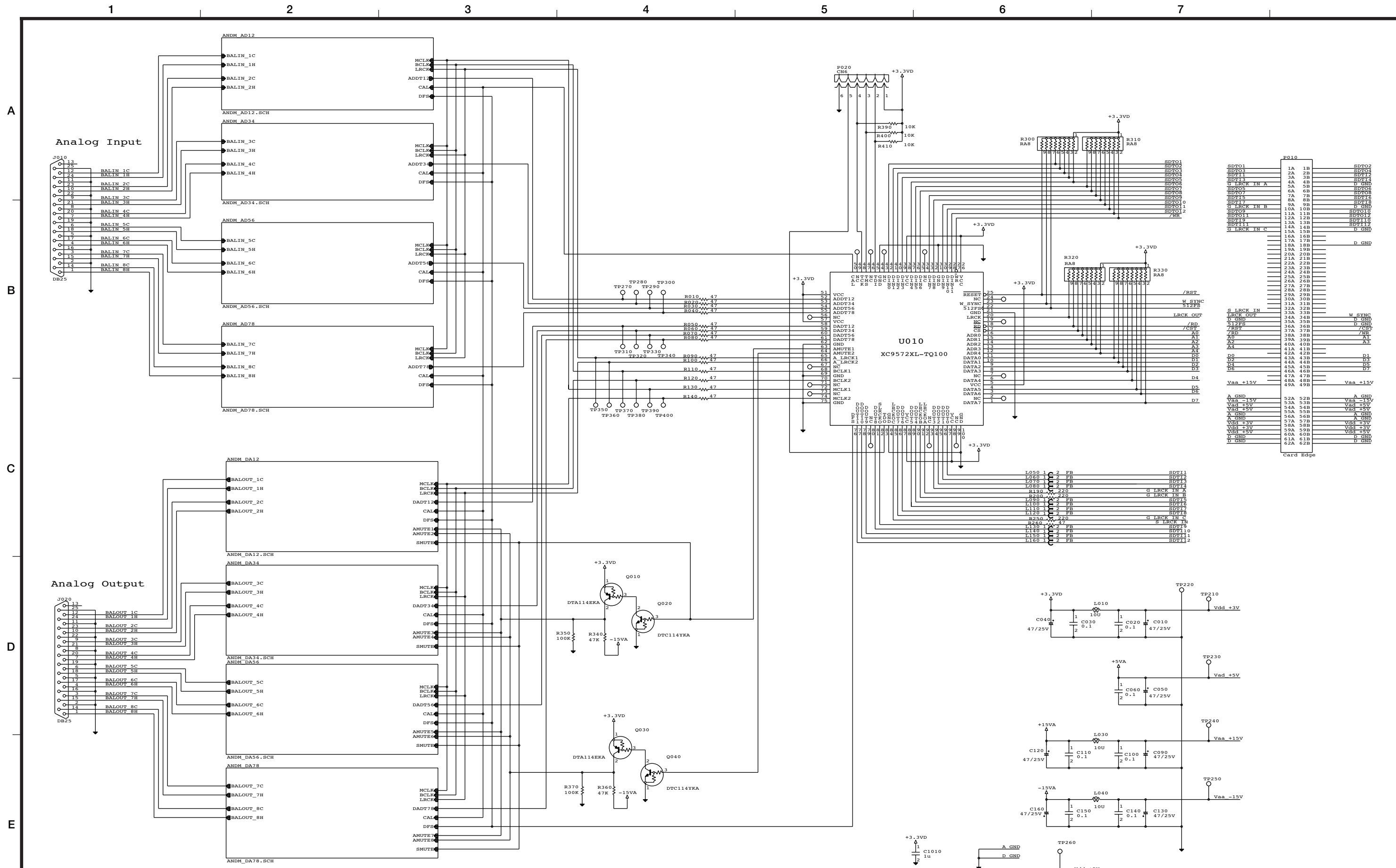
#EMP	EMPHASIS
0	ON
1	OFF











ANDM_AD12

Input Level		
	SW011	SW021
15dB	OFF	OFF
20dB	ON	OFF
24dB	ON	ON

Input Level		
	SW012	SW022
15dB	OFF	OFF
20dB	ON	OFF
24dB	ON	ON

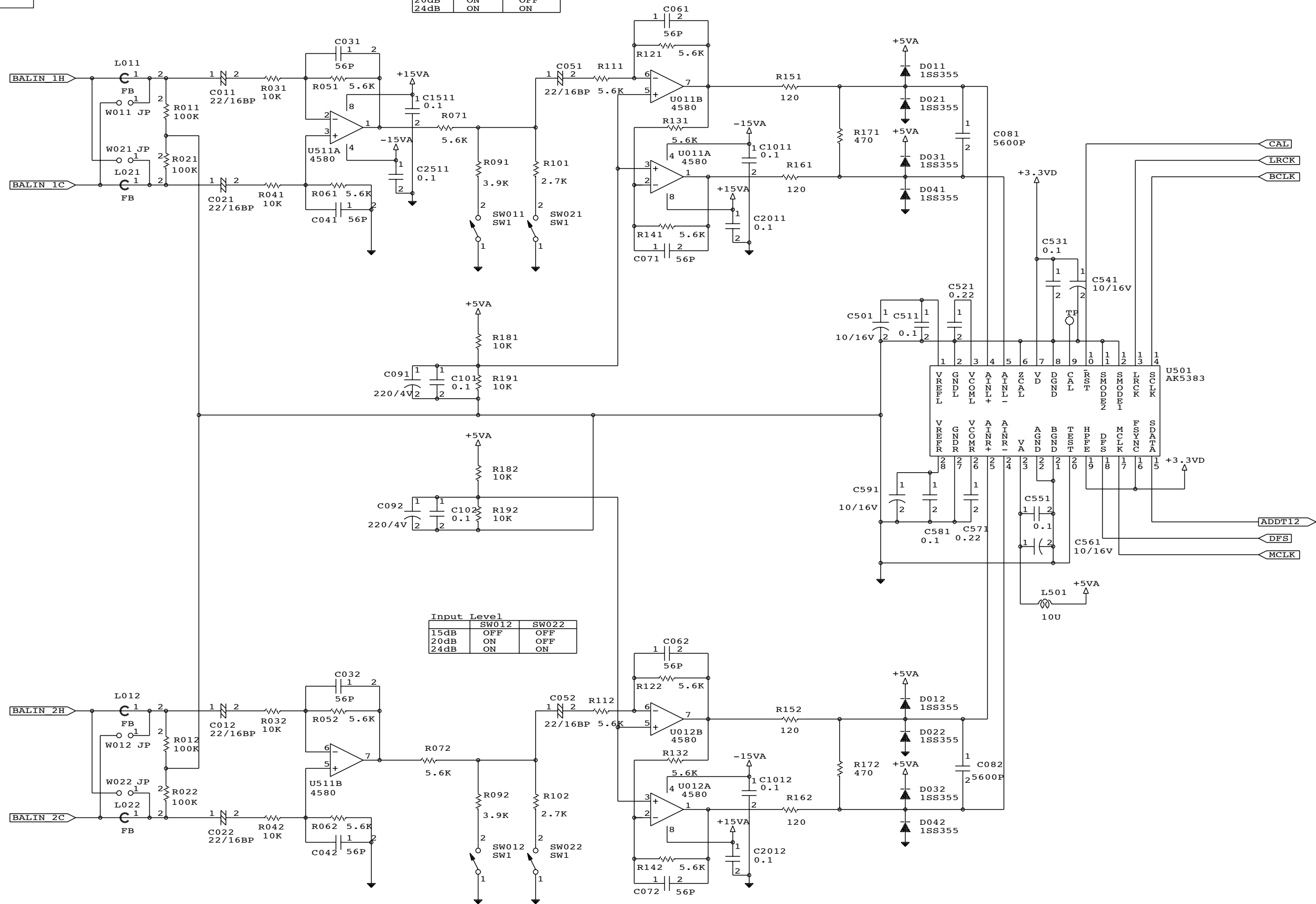
A

B

C

D

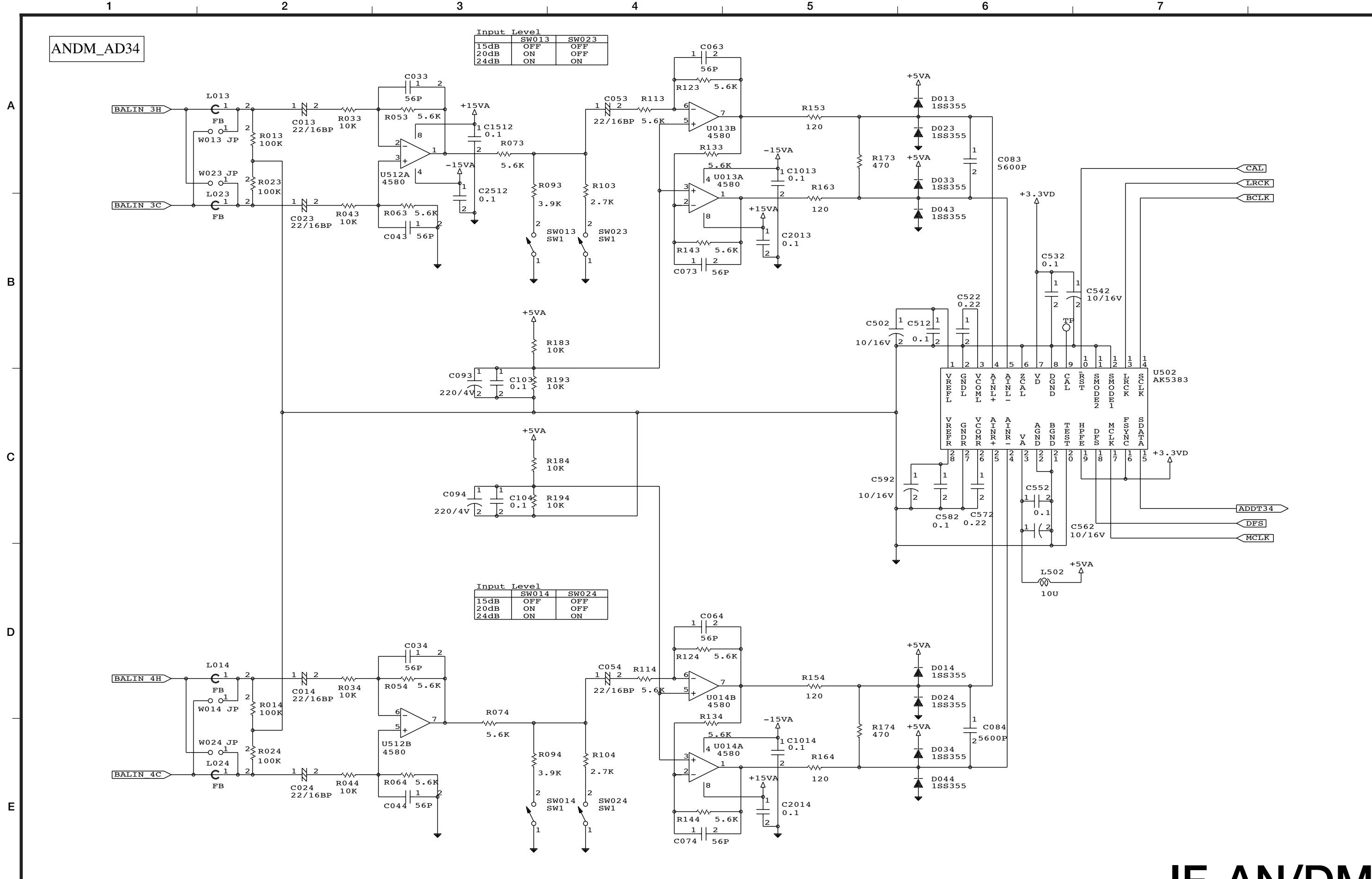
E



ANDM_AD34

Input Level		
	SW013	SW023
15dB	OFF	OFF
20dB	ON	OFF
24dB	ON	ON

Input Level		
	SW014	SW024
15dB	OFF	OFF
20dB	ON	OFF
24dB	ON	ON



Analog Card IF-AN/DM

1

2

3

4

5

6

7

ANDM_AD56

Input Level		
	SW015	SW025
15dB	OFF	OFF
20dB	ON	OFF
24dB	ON	ON

Input Level		
	SW016	SW026
15dB	OFF	OFF
20dB	ON	OFF
24dB	ON	ON

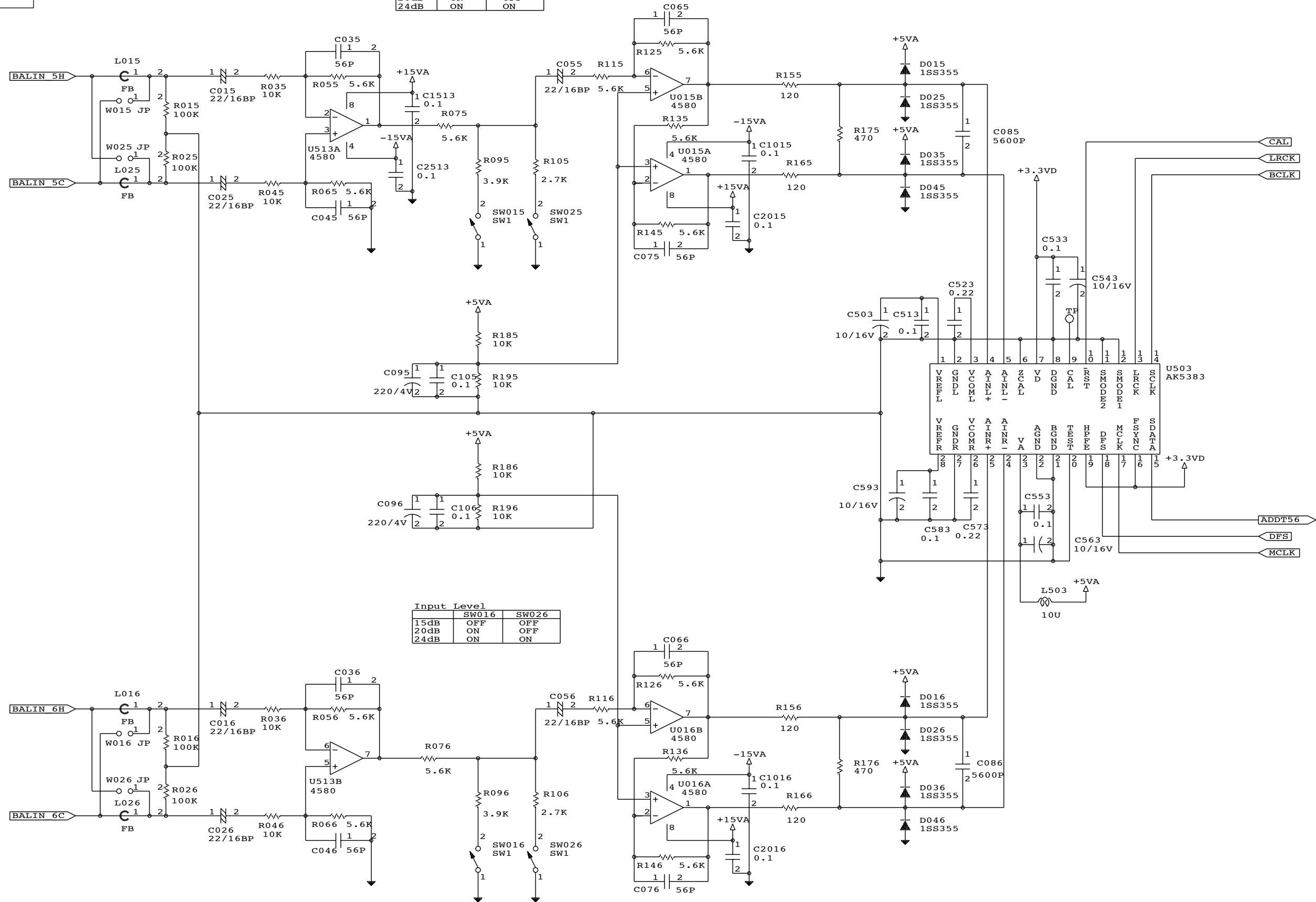
A

B

C

D

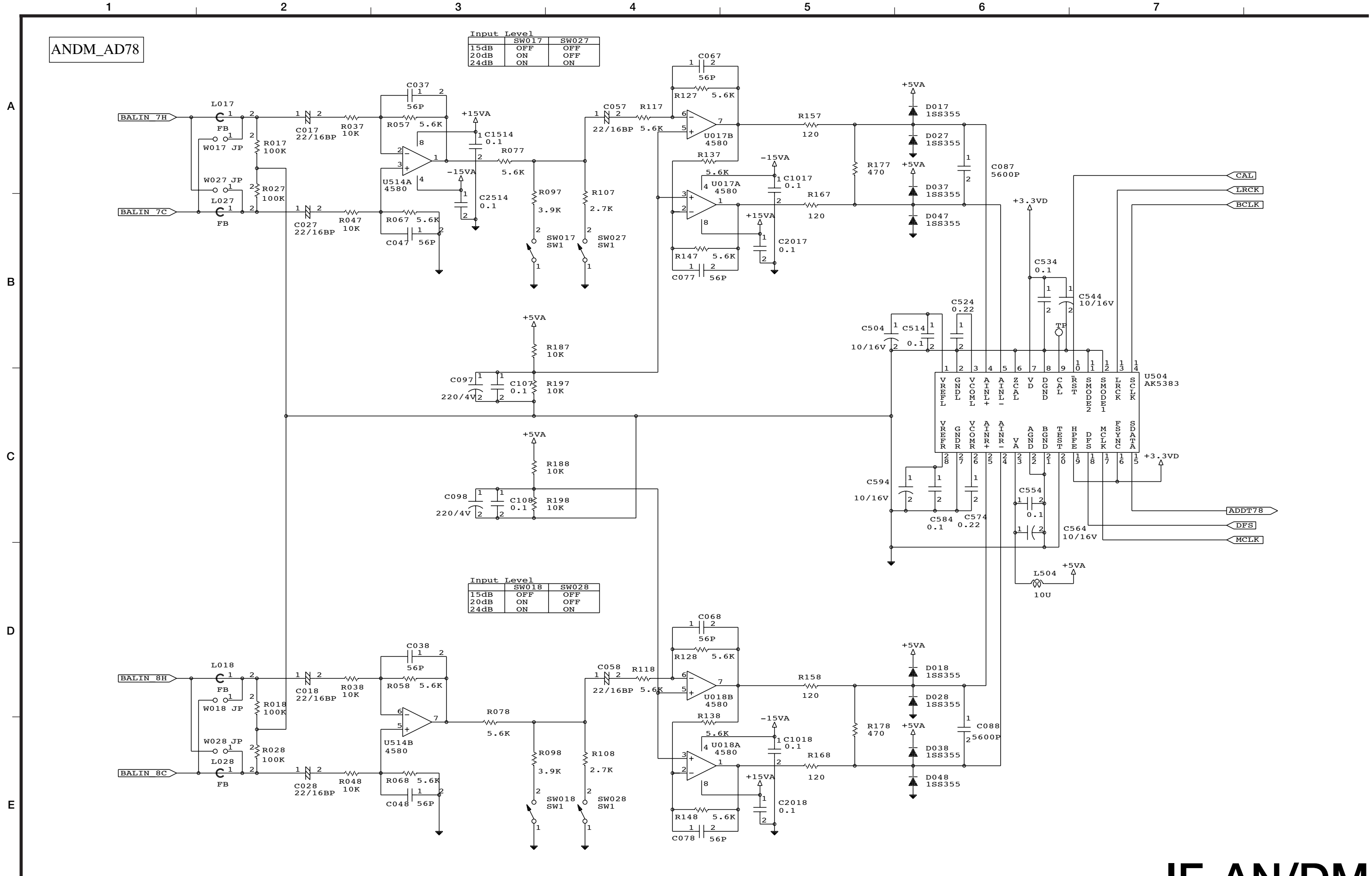
E



ANDM_AD78

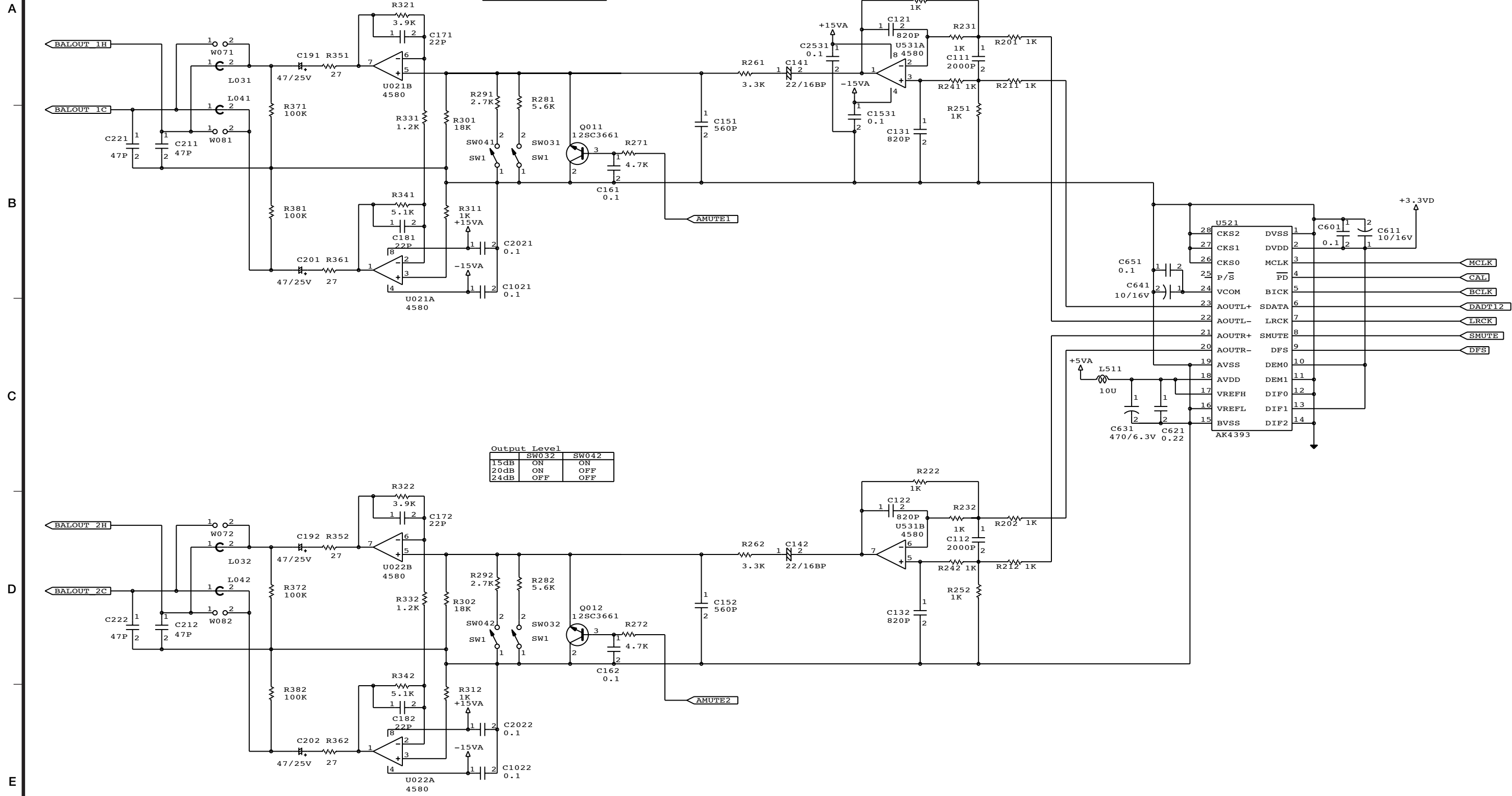
Input Level		
	SW017	SW027
15dB	OFF	OFF
20dB	ON	OFF
24dB	ON	ON

Input Level		
	SW018	SW028
15dB	OFF	OFF
20dB	ON	OFF
24dB	ON	ON



ANDM_DA12

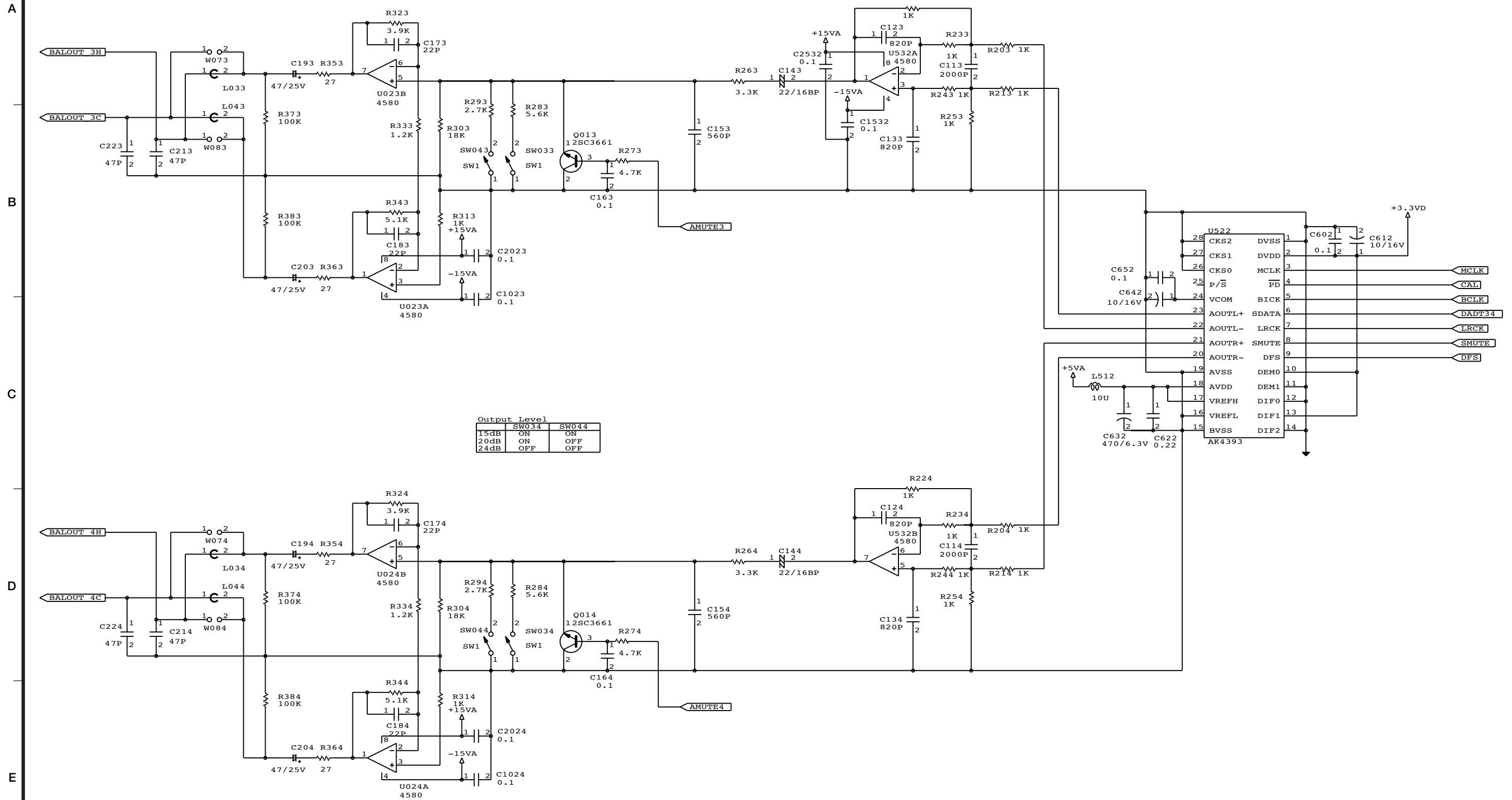
Output Level		
	SW031	SW041
15dB	ON	ON
20dB	ON	OFF
24dB	OFF	OFF



Output Level		
	SW032	SW042
15dB	ON	ON
20dB	ON	OFF
24dB	OFF	OFF

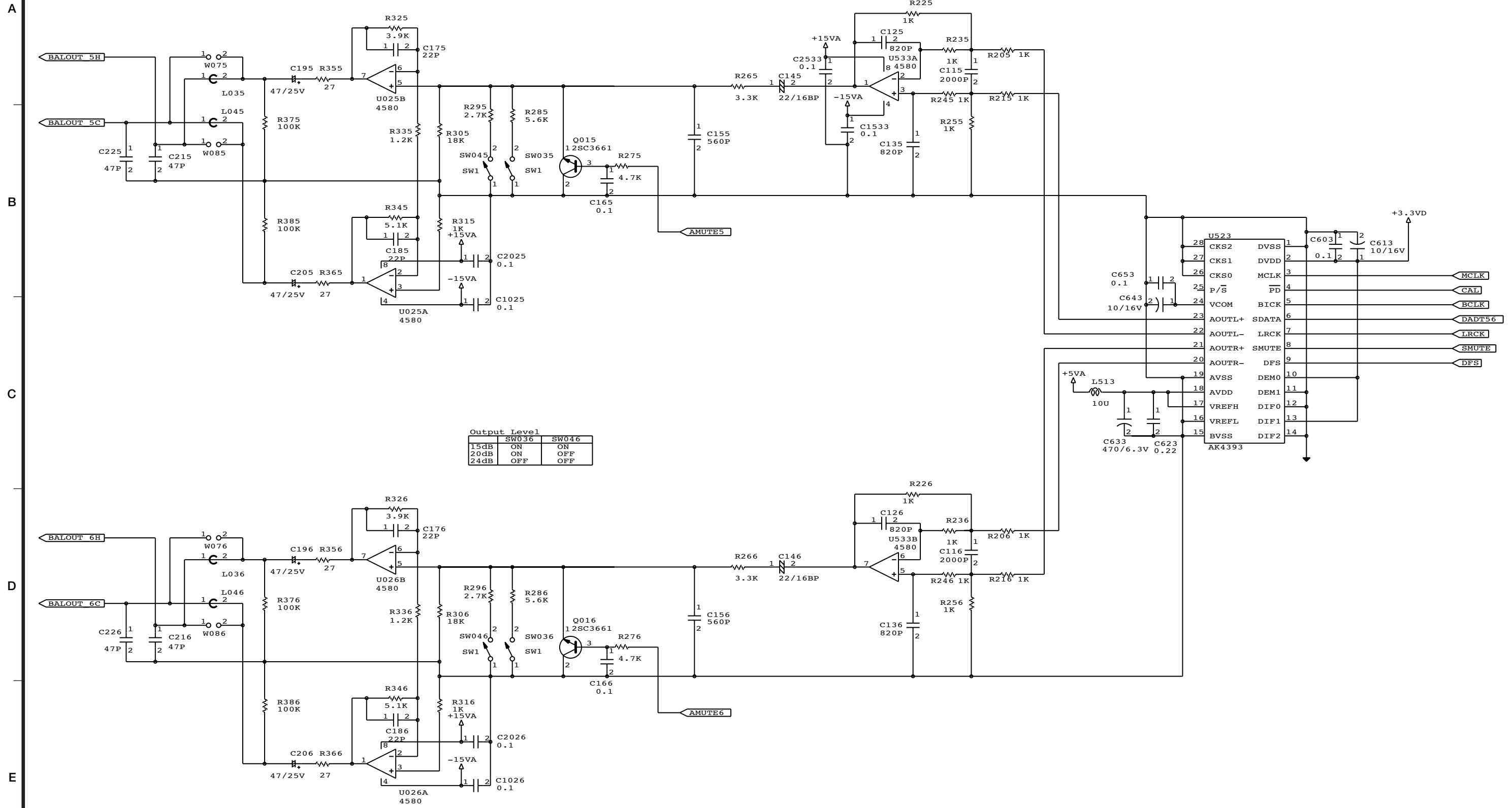
ANDM_DA34

Output Level		
	SW033	SW043
15dB	ON	ON
20dB	ON	OFF
24dB	OFF	OFF



ANDM_DA56

Output Level		
	SW035	SW045
15dB	ON	ON
20dB	ON	OFF
24dB	OFF	OFF

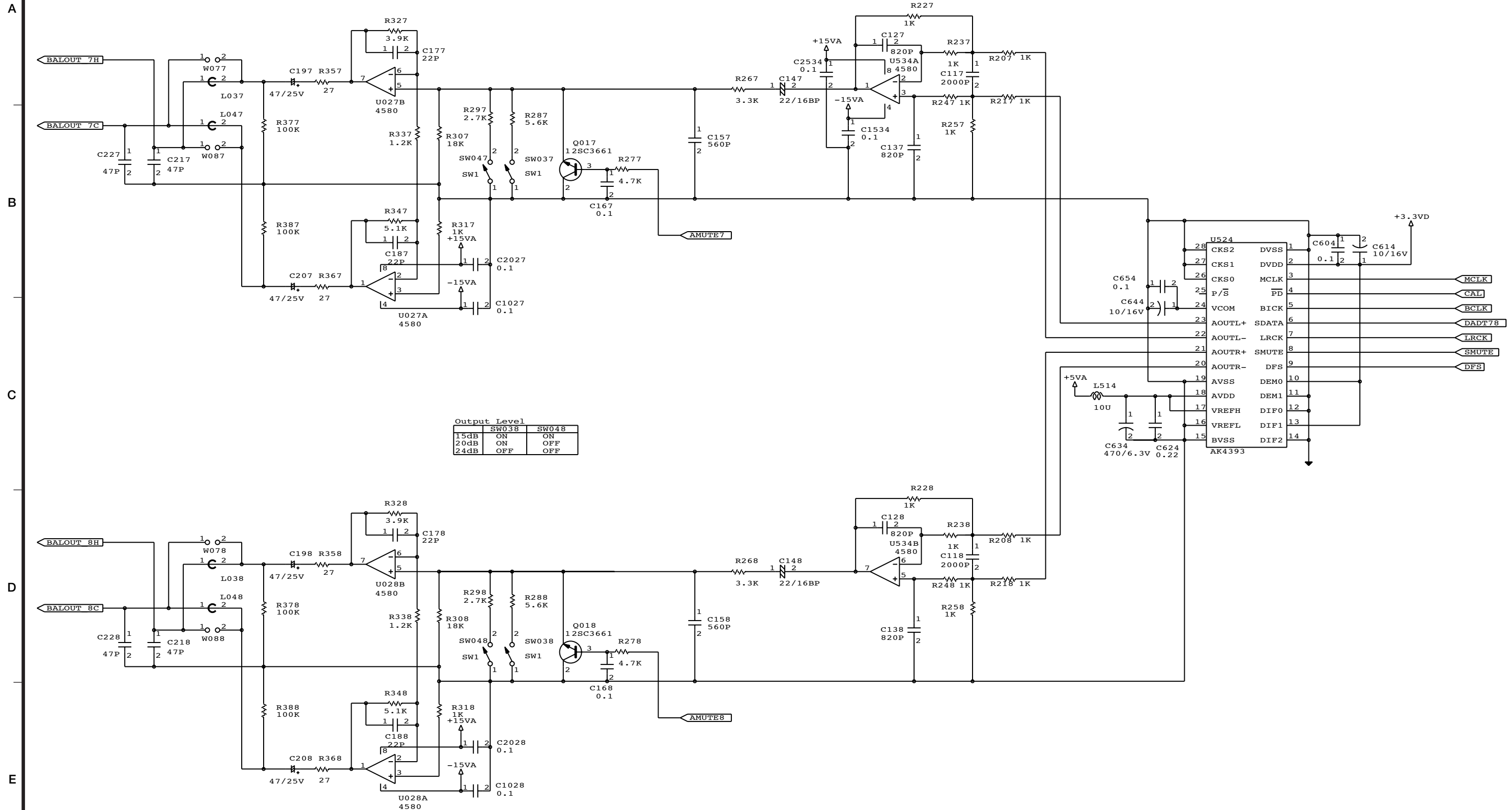


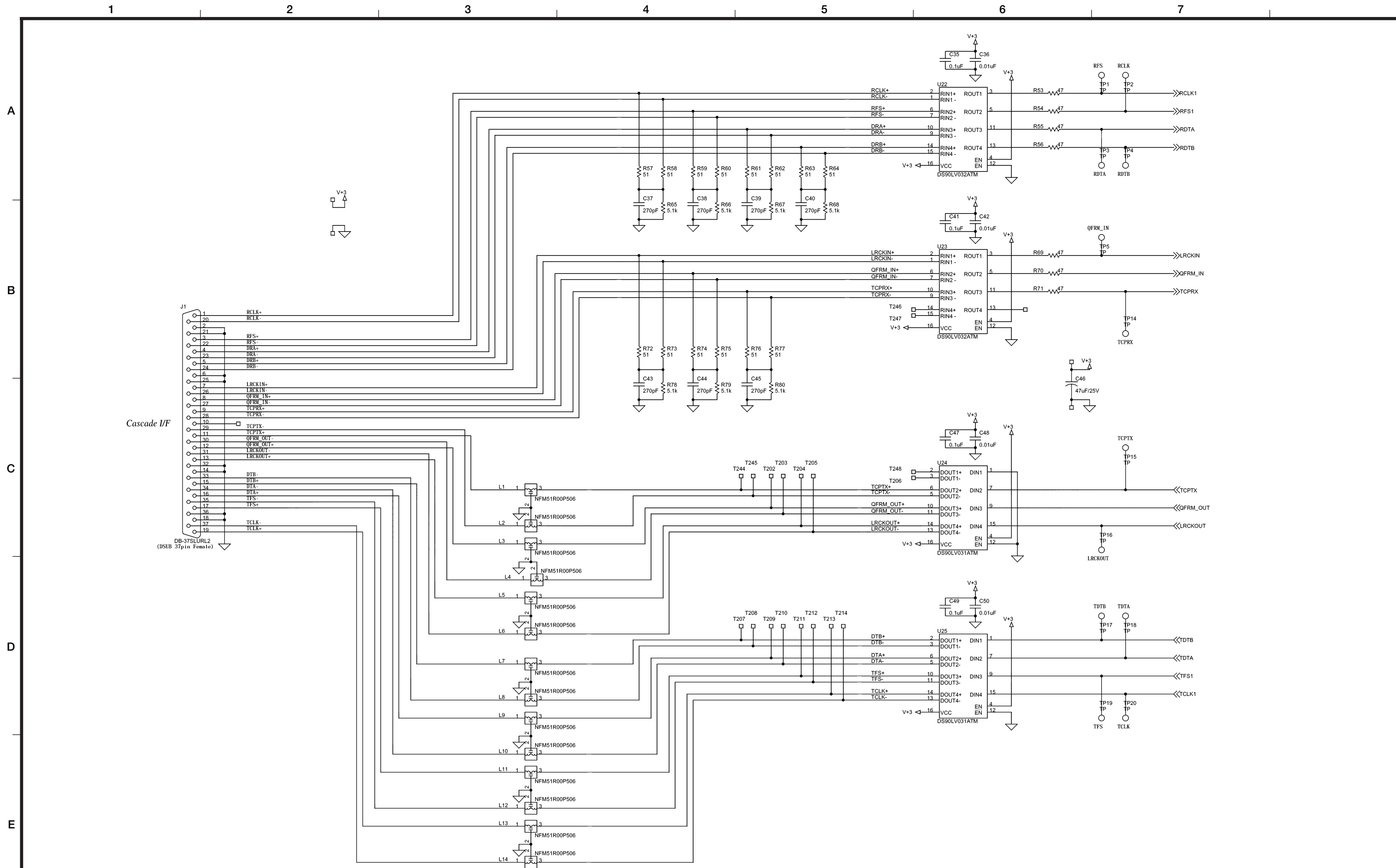
Output Level		
	SW036	SW046
15dB	ON	ON
20dB	ON	OFF
24dB	OFF	OFF

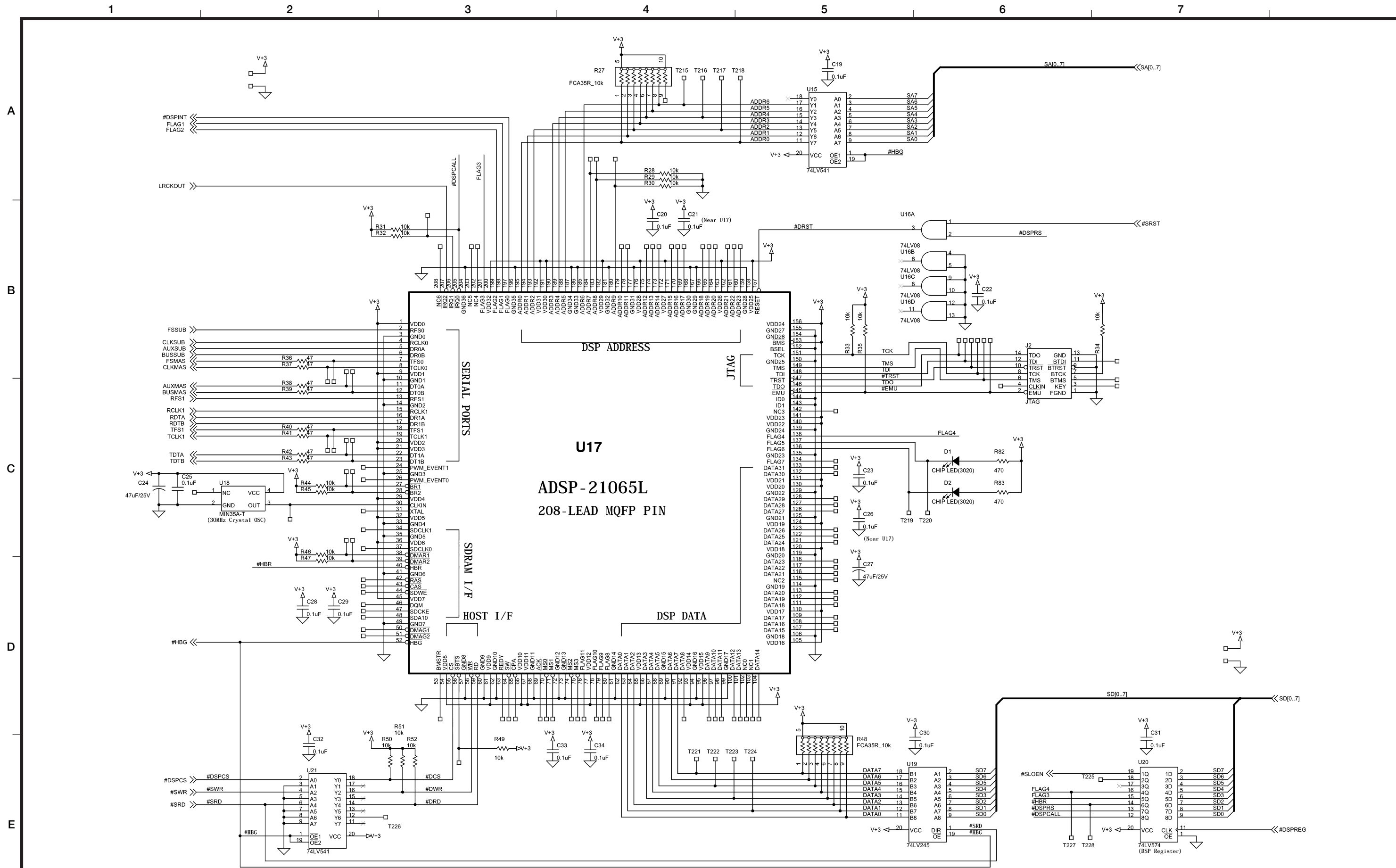
ANDM_DA78

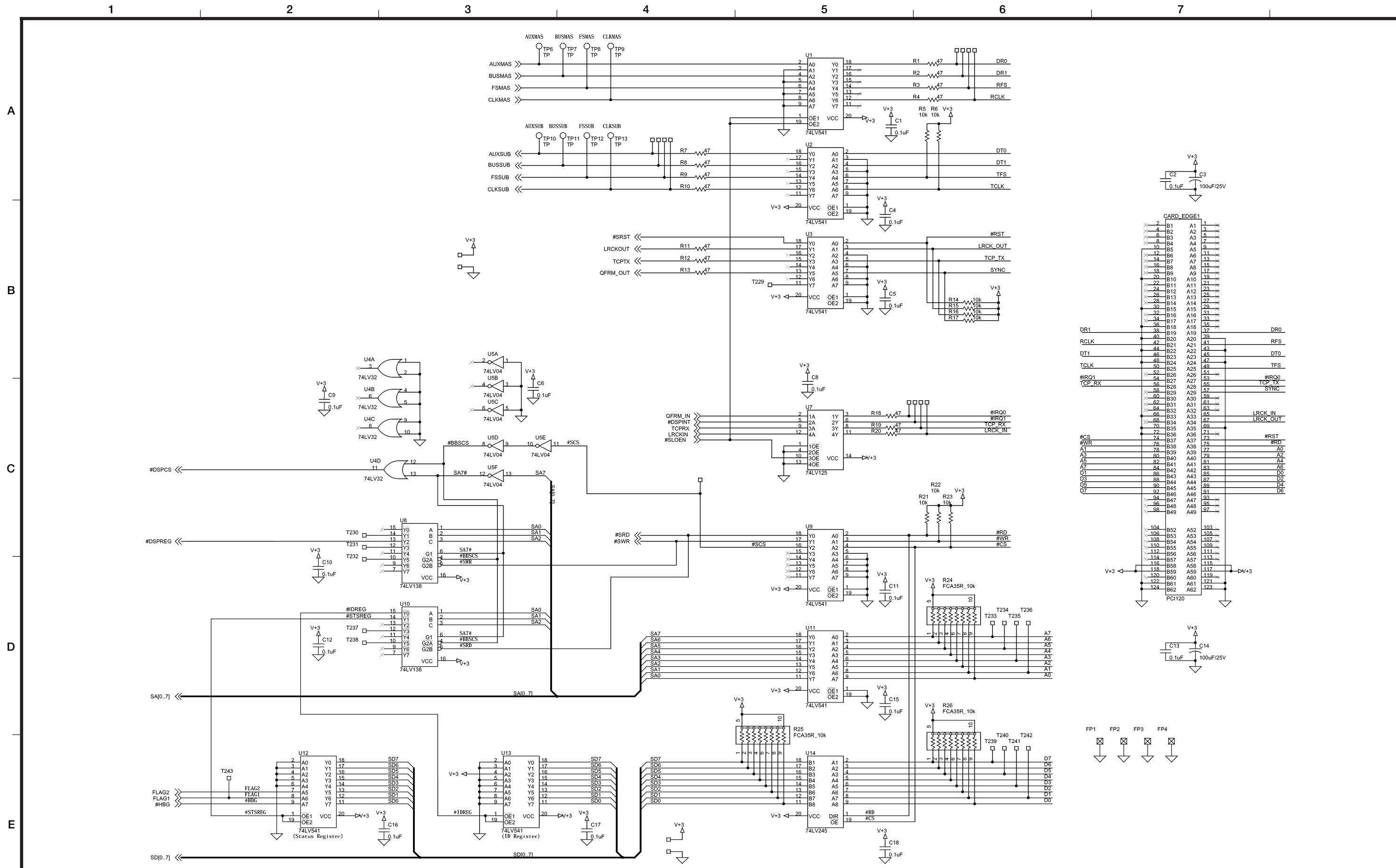
Output Level		
	SW037	SW047
15dB	ON	ON
20dB	ON	OFF
24dB	OFF	OFF

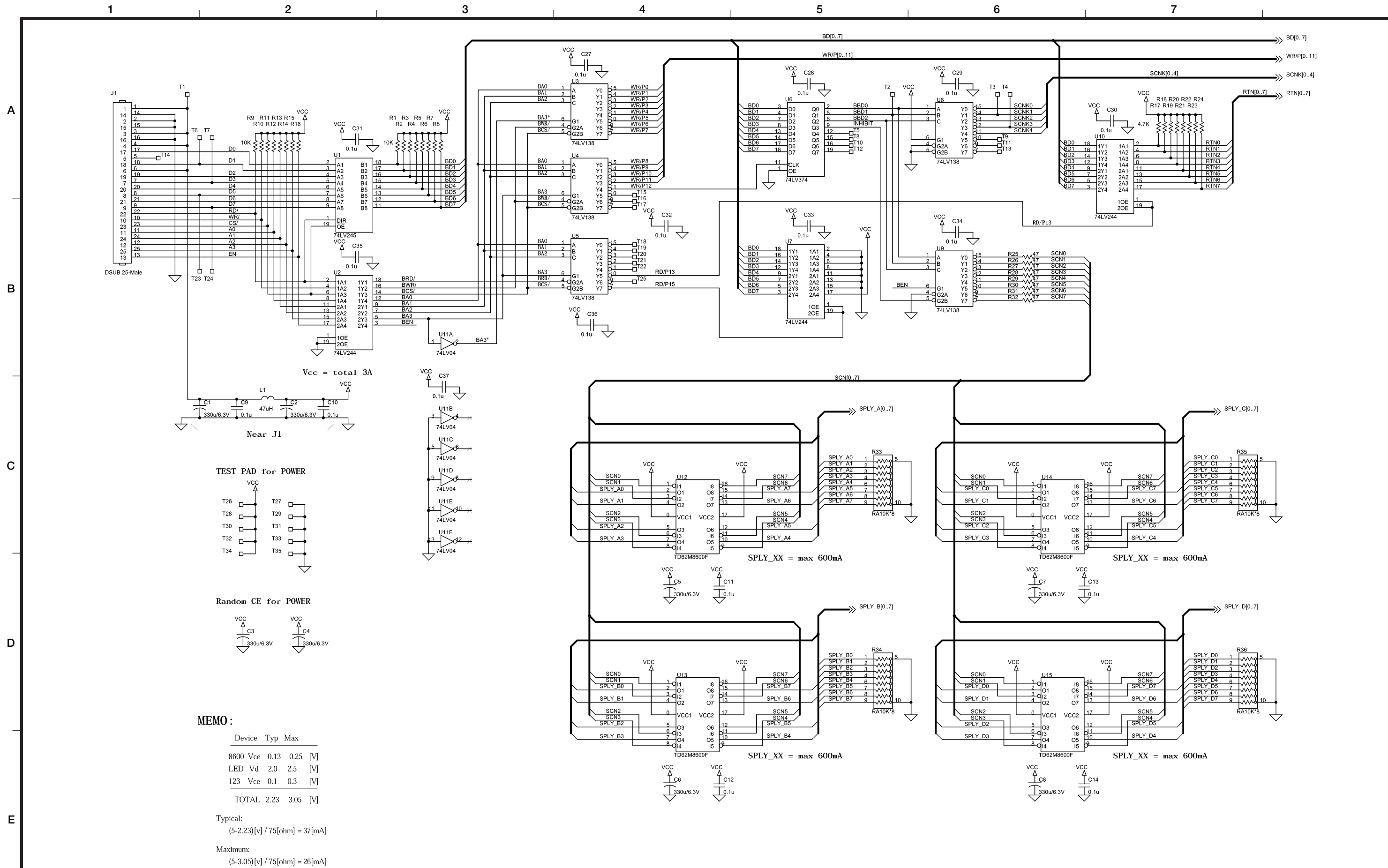
Output Level		
	SW038	SW048
15dB	ON	ON
20dB	ON	OFF
24dB	OFF	OFF









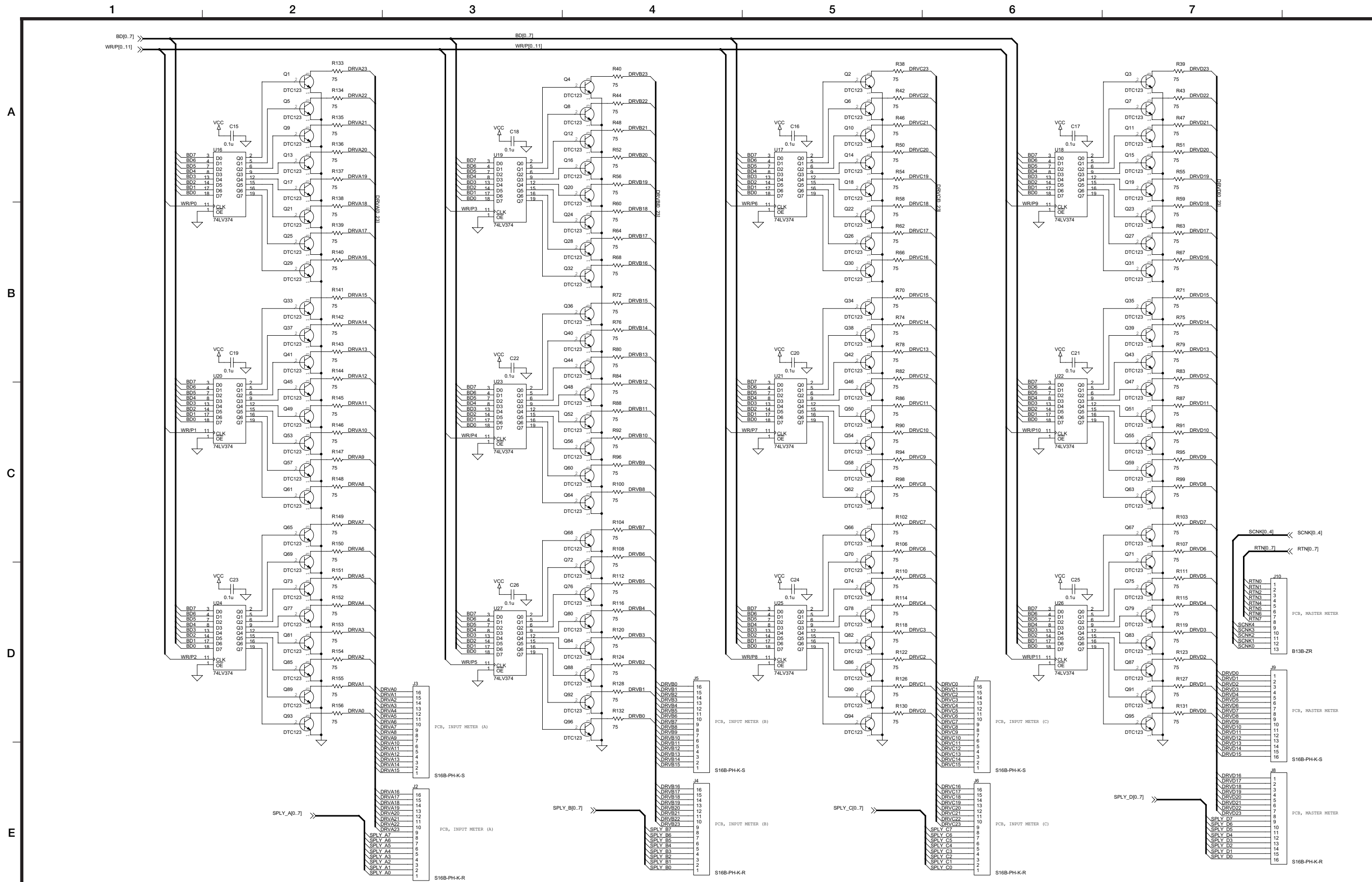


MEMO:

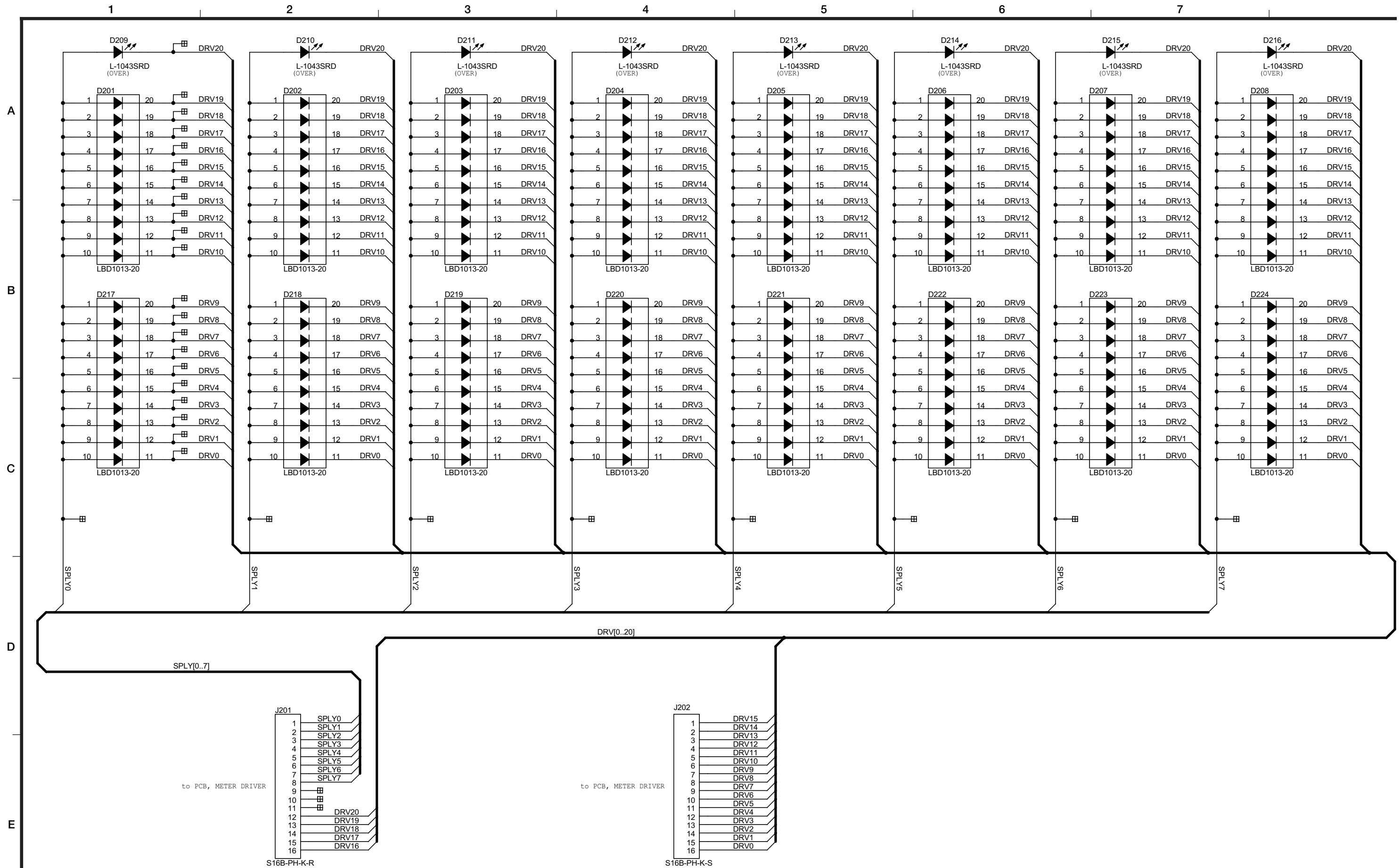
Device	Typ	Max	
8600	Vce	0.13	0.25 [V]
LED	Vd	2.0	2.5 [V]
123	Vce	0.1	0.3 [V]
TOTAL		2.23	3.05 [V]

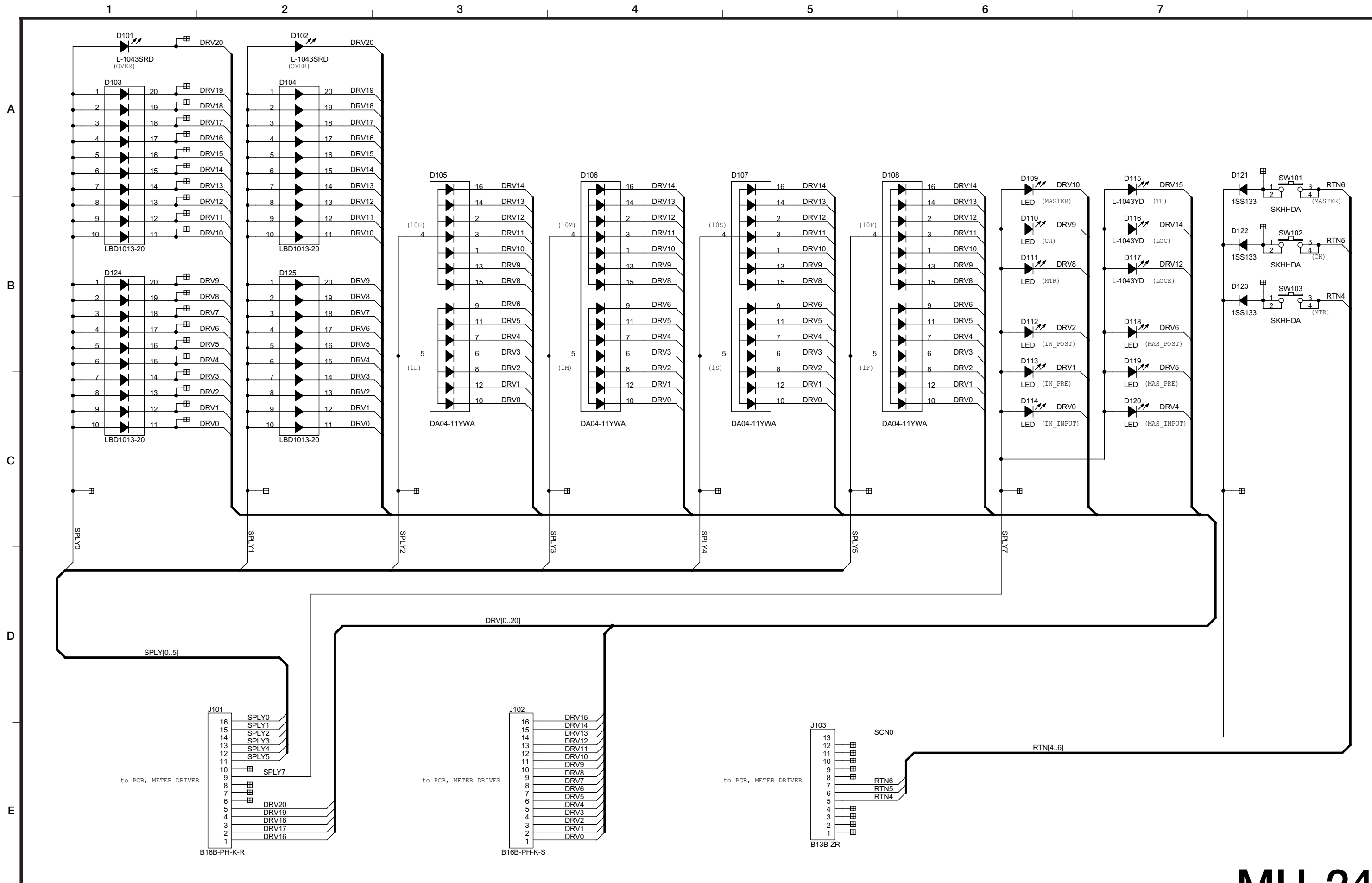
Typical:
(5-2.23)[v] / 75[ohm] = 37[mA]

Maximum:
(5-3.05)[v] / 75[ohm] = 26[mA]



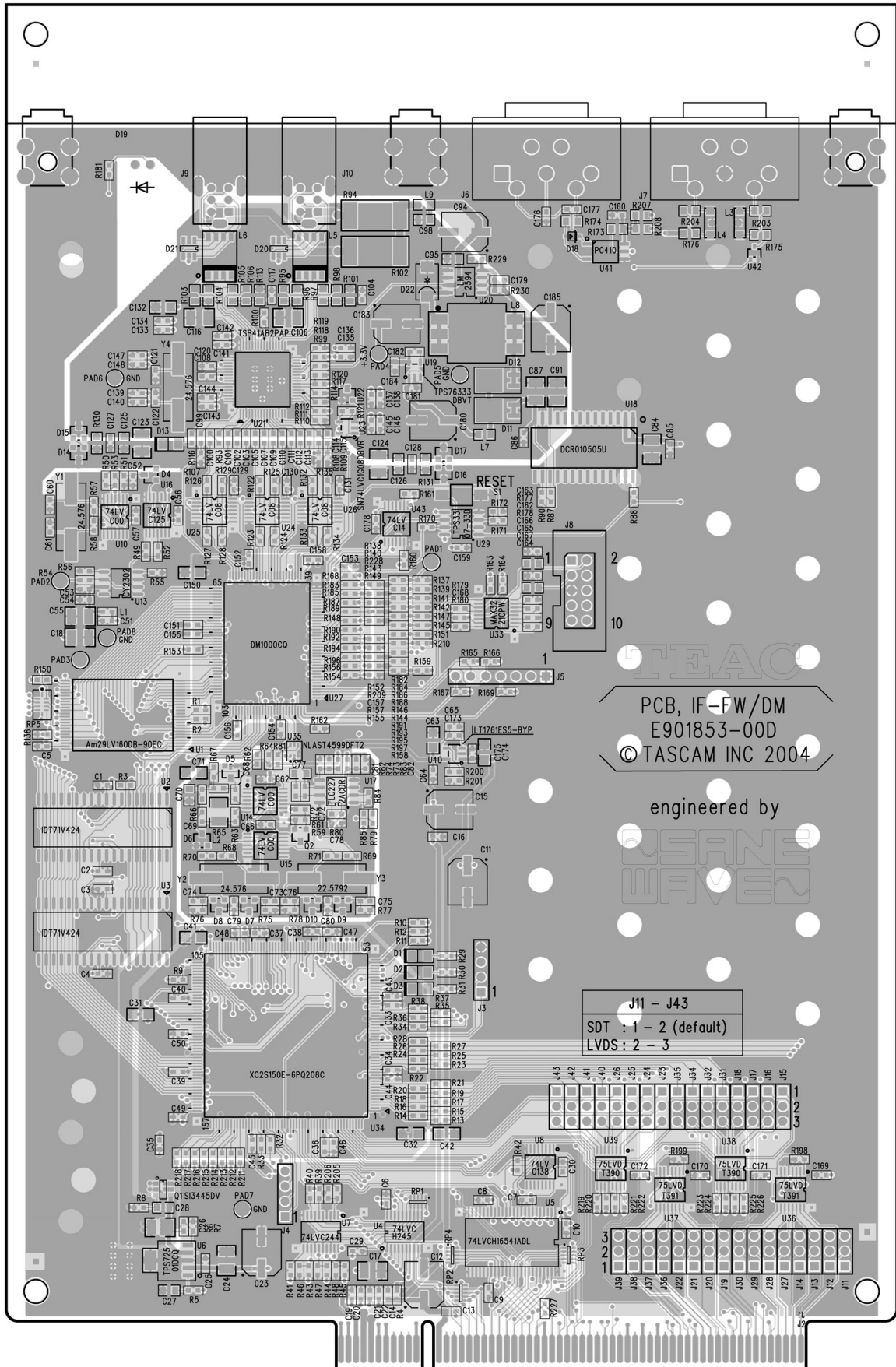
Meter Bridge MU-24





PC BOARDS AND PARTS LIST

基板図とパーツリスト



PCB, IF-FW/DM
E901853-00D
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engineered by



J11 - J43
SDT : 1 - 2 (default)
LVDS : 2 - 3

IF-FW/DM(OPTION)

REF.NO.	PARTS NO.	DESCRIPTION
	*M01781800B	PANEL,IF-FW/DM G
	*B00245000A	LEVER SLOT,3*18FZB G
	*3E9582600A	PCBA,IF-FW/DM
D1-D3	3E033974G	LED,APK3020SURCK G
D4	3S033124G	DIODE,BAS70-04-7-F-G
D5-D10	3S033134	DIODE,BBY40TA
D11,D12	3S033144G	DIODE,SBM340-13-F-G
D13	3E033974G	LED,APK3020SURCK G
D14-D17	3S033154G	DIODE,BZX84C8V2-7-F G
D18	3S035764	DIODE,1N4148WS-7
D20 D21	3S034544G	DIODE,CM1213-04SO G
D22	3S010064G	DI,MURS120T3G G
J3	3E035590G	PIN,HEADER 2211S-02T-F1 G
J6,J7	3E017850G	CONNECT,MIDI HDC-052-01-G
J8	3E034730G	HEADER,2213S-10T-G
J9,J10	3E021540G	CONNECTOR,1394UR-06-F1 G
J11-J32	3E029430G	PIN,HEADER 2.54MM 1*3P-G
J34-J43	3E029430G	PIN,HEADER 2.54MM 1*3P-G
L1	3E034064	COIL,BLM18BD601SN1 G
L2	3E034754G	COIL,1008LS-222E-FS(5%) G
L3 L4	3S006654	EMI,EXC CET 471U G
L5,L6	3E021564G	COIL,B5W-#857CM-0052 G
L7,L9	3E037244	COIL,HZ0805E601R-00
L8	3E037254	COIL,220UH 67144280
MT1-MT3	M01510100A	BRACKET,PCB-A G
Q1	3S033164G	FET,SI3445DV-T1-E3 G
Q2	3S033174	TR,BC857BT G
R94,R102	3E021530G	RESETTABLE PTC 3425L150 G
RP1-RP4	3R024804	R,ARRAY,CND1J10KTTD103J G
RP5	3R022874	RES ARRAY,EXB-D10C153J G
S1	3E034084	TACT SW,SKQMBAE010 G
U1	3S033184	IC,AM29LV160DB-90ED G
U2,U3	3S033194G	IC,IDT71V424S10Y-G G
U4	3S033204G	IC,SN74LVCH245APWR G
U5	3S033214G	IC,SN74LVCH16541ADL G
U6	3S033224G	IC,TPS72501DCQR G
U7	3S033234G	IC,SN74LVC244APWR G
U8	3S033244G	IC,SN74LVC138APWR G
U10,U14	3S007084G	IC,SN74L VC00APW G
U13	3S033274	IC,CY2302SXC-1T G
U15	3S007084G	IC,SN74L VC00APW G
U16	3S034564G	IC,TC74LCX125FT(EL,M) G
U17	3S033294G	IC,TLC2272ACDR G
U18	3S033304G	IC,DCR010505U G
U19	3S035774G	IC,TPS76333DBVT G
U20	3S035784G	IC,LM2594HVMX-ADJ NOPB G
U21	3S033334G	IC,TSB41AB2PAP G
U22	3S033344G	IC,TPS3809K33DBVT G
U23	3S033354G	IC,SN74LVC1G08DBVR G
U24-U26	3S033364G	IC,SN74LVC08APWR G
U27	3S033374G	IC,DM1000CQL G
U29	3S033394G	IC,TPS3307-33DR G

IF-FW/DM(OPTION)

REF.NO.	PARTS NO.	DESCRIPTION
U33	3S033404G	IC,MAX3221CPWR G
U34	3S033414G	IC,XC2S150E-6PQG208C G
U35	3S033424G	IC,NLAST4599DFT2G G
U36,U37	3S033434G	IC,SN75LVDS391PW G
U38,U39	3S033444G	IC,SN75LVDT390PW G
U40	3S033314G	IC,LT1761ES5-BYP#PBF G
U41	3S033074	PC410LONIP
U42	3S033454	IC,DTC123EUA T106 TP G
U43	3S034554G	IC,TC74LCX14FT(EL,M) G
Y1,Y2	9173019130	XTAL 24.576MHZ SDS
Y3	3E034714G	RESONATOR,SD3 22.5792MHZG
Y4	9173019130	XTAL 24.576MHZ SDS
	D00879200A	OWNERS MNL,(F)IF-FW/DM G
	3E032150	CABLE 1394 G
	D00793700B	CD ROM,IF-FW/DM G

TEAC**TECHNICAL INFORMATION****TASCAM IF-AE/DM, Change of U2 (CS-8415A)**No. **0216**

DATE 23rd October 2002

On the way of production, U2 (CS8415A, 96 kHz Digital Audio Interface Receiver) has been changed to new version due to that the manufacturer changed the production process. There is no change on the performance but peripheral circuitry should be changed.

New one has been mounted onto the IF-AE/DM that has "0208" label (or higher) on the carton. ("0208" means 2002 August production.)

U2 and other components have been changed simultaneously as follows:

	Original	New
U2	S0043574, CS8415-CZ	S0049194, CS8415-CZ(A1)
R11	91132810-30, 2.2 kΩ	91132750-30, 1.2 kΩ
C9	91183823-30, 0.047 μF	91183843-30, 0.1 μF
C13	91187093-30, 1200 pF	91177570-30, 4700 pF

Notice:

1. **Do not apply** changes ①+② of Tech-Info No. 0215 to the IF-AE/DM that has the new CS8415A.
2. Old and new CS8415A can be identified with a printing on the IC as shown below.



- Starts with "Z": old version
- Starts with "R": new version

TEAC TECHNICAL INFORMATION

TASCAM IF-CS/DM, Jumper Wire

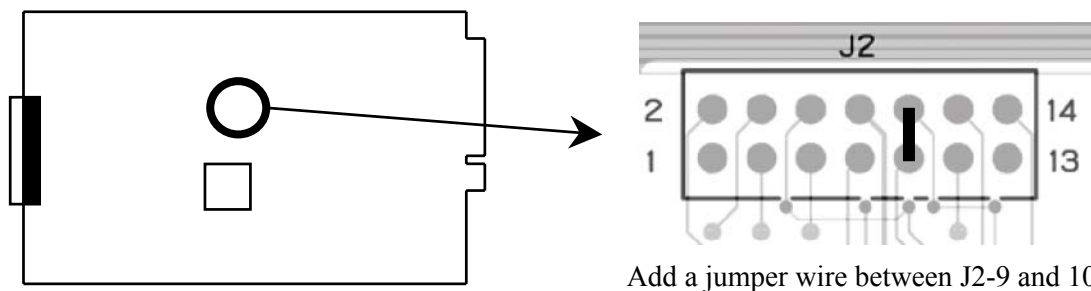
No. **0208**
DATE 21st June 2002

IF-CS/DM is an optional cascade card for the DM-24.

There may be a possibility that the DM-24 does not boot with the IF-CS/DM inserted. In that case, DM-24's LCD screen keeps "white condition."

If such is experienced, add one jumper wire as shown below.

IF-CS/DM Top View



Add a jumper wire between J2-9 and 10

- Above jumper wire will be added from the next production. However, next production has not been scheduled as of 19/June/2002.
- All Tokyo stock has been reworked and "O" is marked on the carton box.

TEAC**TECHNICAL INFORMATION****TASCAM IF-AE/DM, Unlock to low Fs (Sampling Frequency)**

No.	0215
DATE	23rd October 2002

IF-AE/DM is an optional AES/EBU card for the DM-24 and the SX-1.

When receiving the AES/EBU signal through the IF-AE/DM, following may occur.

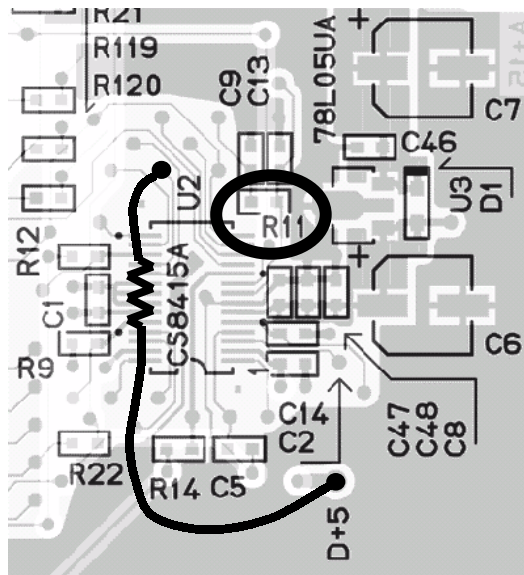
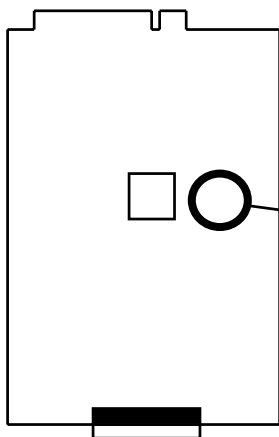
- Does not lock.
- Takes several minutes to lock.

Note:

- “Unlock” would occur with lower Fs, such as 44.1 kHz –6%. (So that the problem rarely occurs.)
- No problem with 48 kHz Fs.

When above is experienced, apply following changes:

- ① Replace R11 (6.8 k Ω) with 2.2 k Ω (**P/No. 91132810-30**).
- ② Add 47 k Ω (**P/No. 91133130-30**) between U2-18 (nearby U2 silk) and Digital 5V (D+5 pad).

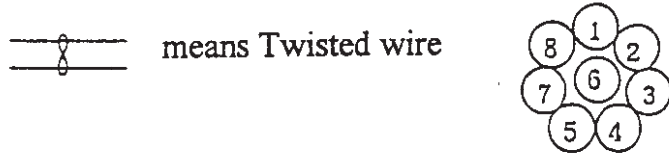
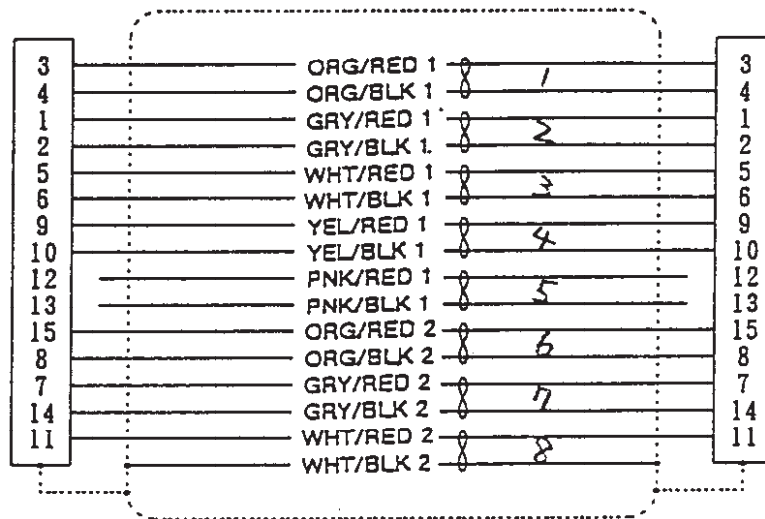
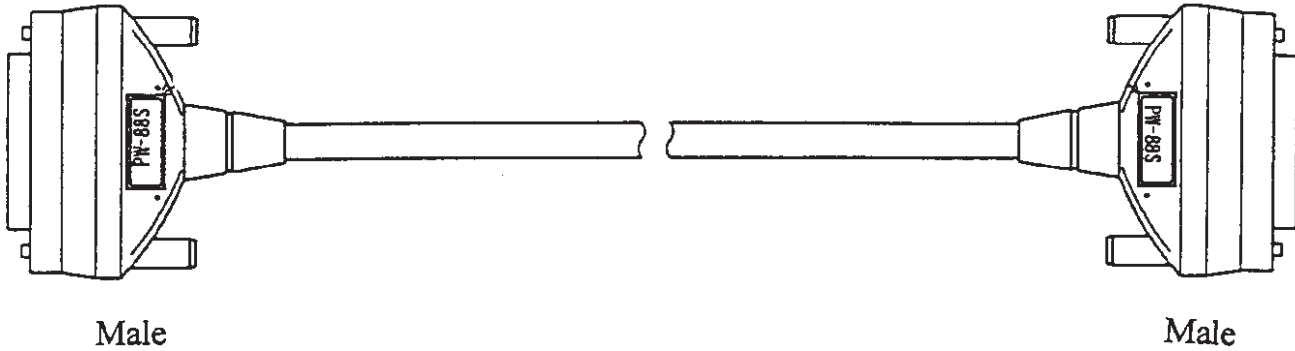
IF-AE/DM Top View**Notice:**

1. There is no production which has above changes ①+② applied.
2. On the way of production, U2 (CS8415A, 96 kHz Digital Audio Interface Receiver) has been changed to new version due to that the manufacturer changed the production process of CS-8415A. New one has been mounted to the IF-AE/DM that has “0208” label (or higher) on the carton. (“0208” means 2002 August production.) See Tech-Info No. 0216 for the details.
3. **Do not apply** above changes ①+② to the IF-AE/DM that has the new CS8415A. They do not have “unlock” problem.
4. Old and new CS8415A can be identified with a printing on the IC as shown below.



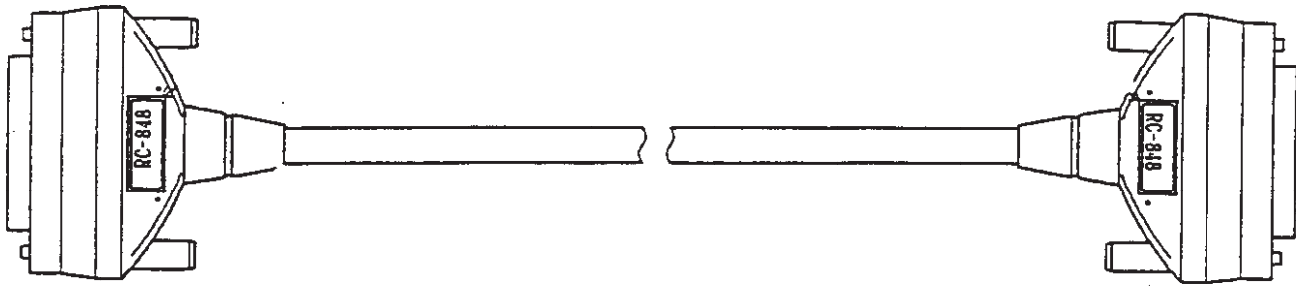
- Starts with “Z”: old version
- Starts with “R”: new version

THE CABLES FOR SYNC



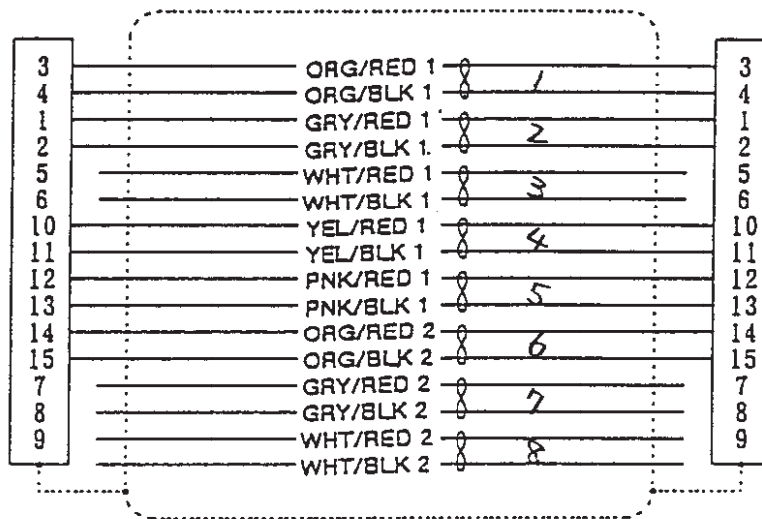
- 2 pcs. 5336 3570-00 Connector Plug, 15 pin D-Sub (Male)
- 2 pcs. 5336 3580-00 Case Assy, 15 pin D-Sub

THE CABLES FOR REMOTE

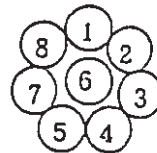


Female

Male



means Twisted wire

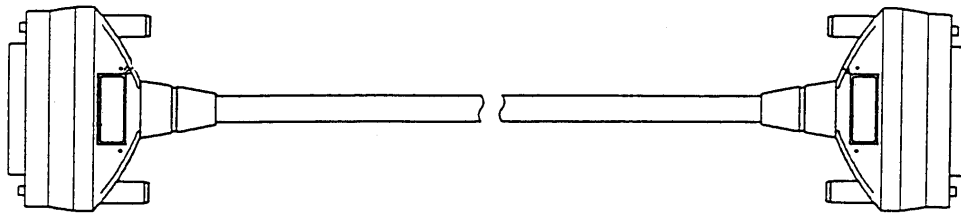


- 1 pce. 5336 3570-00 Connector Plug, 15 pin D-Sub (Male)
- 1 pce. 1315 2907- Connector Socket, 15 pin D-Sub (Female)
- 2 pcs. 5336 3580-00 Case Assy, 15 pin D-Sub

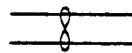
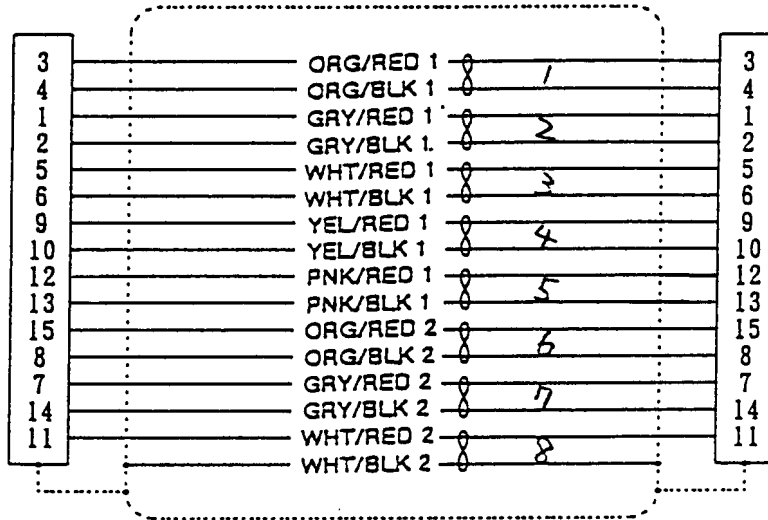
Cable Assy, MMC-38

Male
DA-38 SYNC IN

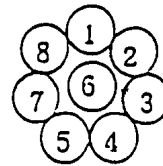
Female
MMC-38 REMOTE OUT



← 1000 ± 30 mm →

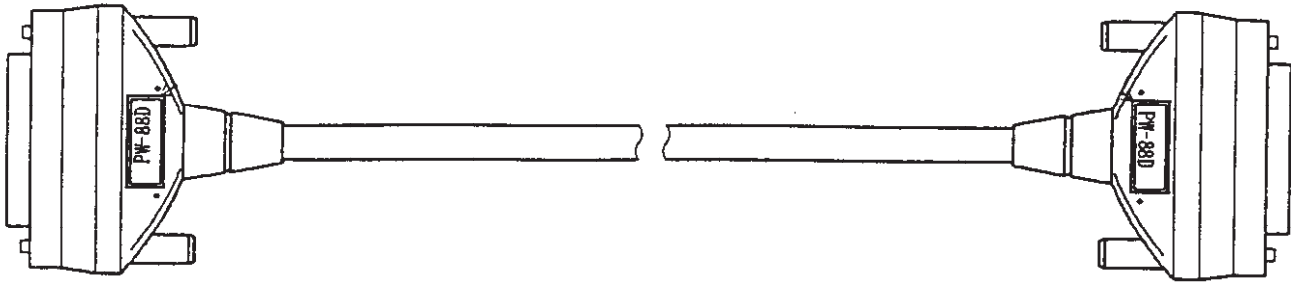


means Twisted wire



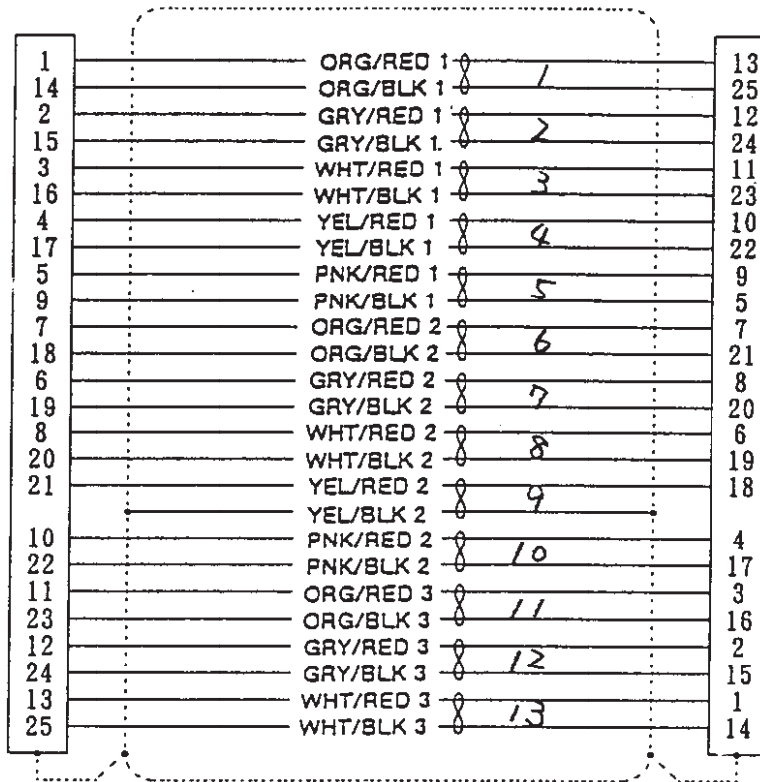
- | | | |
|-------|-------------|--|
| 1 pce | 53363570-00 | Connector Plug, 15 pin D-Sub(Male) |
| 1 pce | 13152907 | Connector Socket, 15 pin D-Sub(Female) |
| 2 pcs | 53363580-00 | Case Assy, 15 pin D-Sub |

THE CABLES FOR TDIF

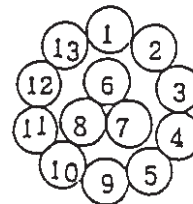


Male

Male

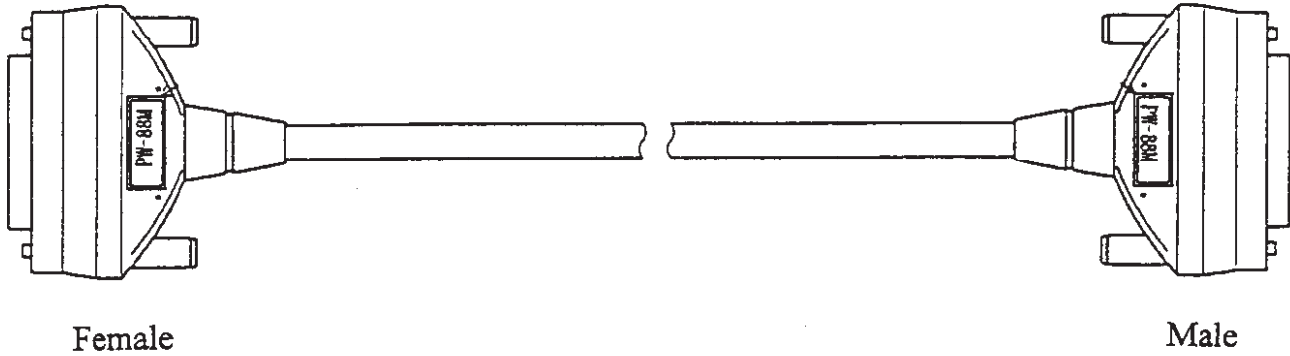


means Twisted wire



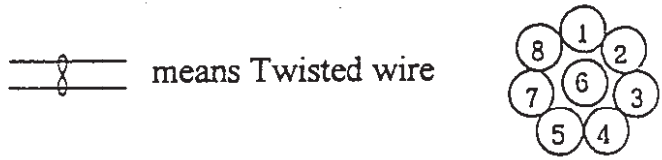
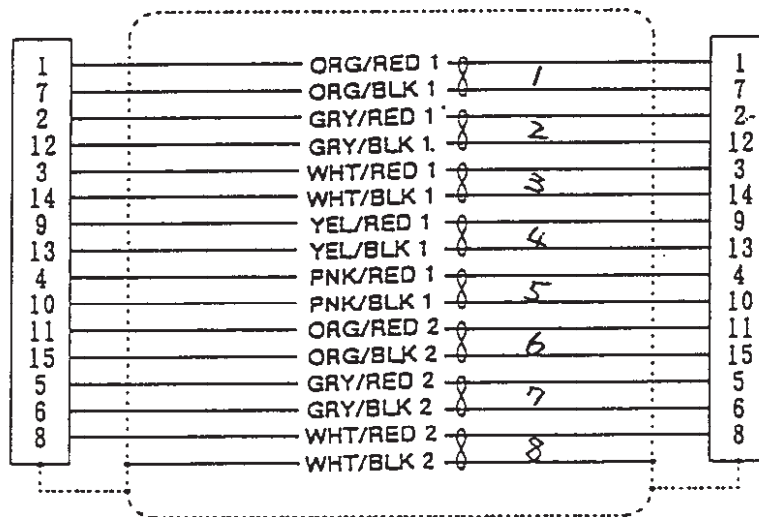
- 2 pcs. 1315 2908- Connector Plug, 25 pin D-Sub (Male)
- 2 pcs. 5336 3581-00 Case Assy, 25 pin D-Sub

THE CABLES FOR METER



Female

Male



- 1 pce. 5336 3570-00 Connector Plug, 15 pin D-Sub (Male)
- 1 pce. 1315 2907- Connector Socket, 15 pin D-Sub (Female)
- 2 pcs. 5336 3580-00 Case Assy, 15 pin D-Sub