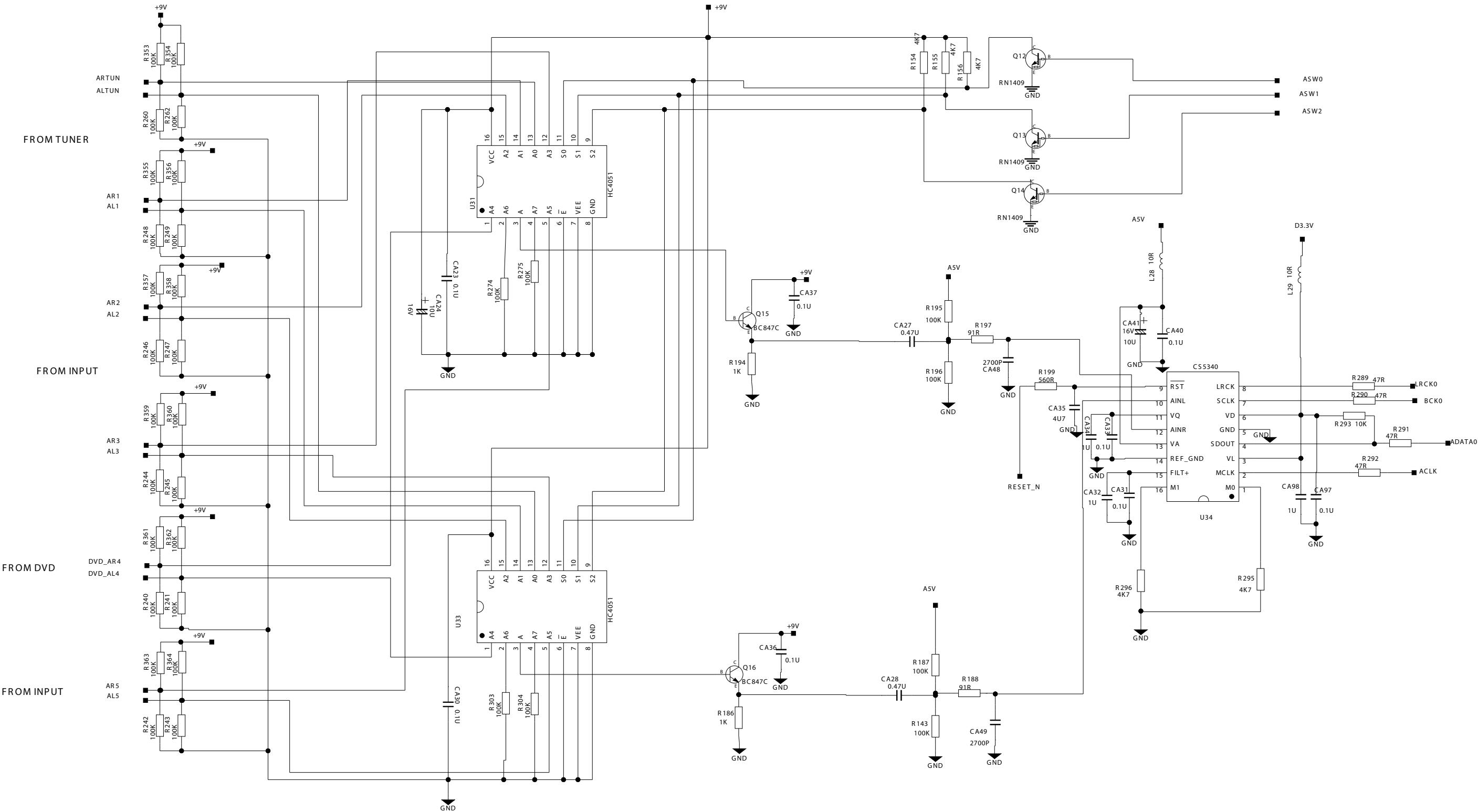
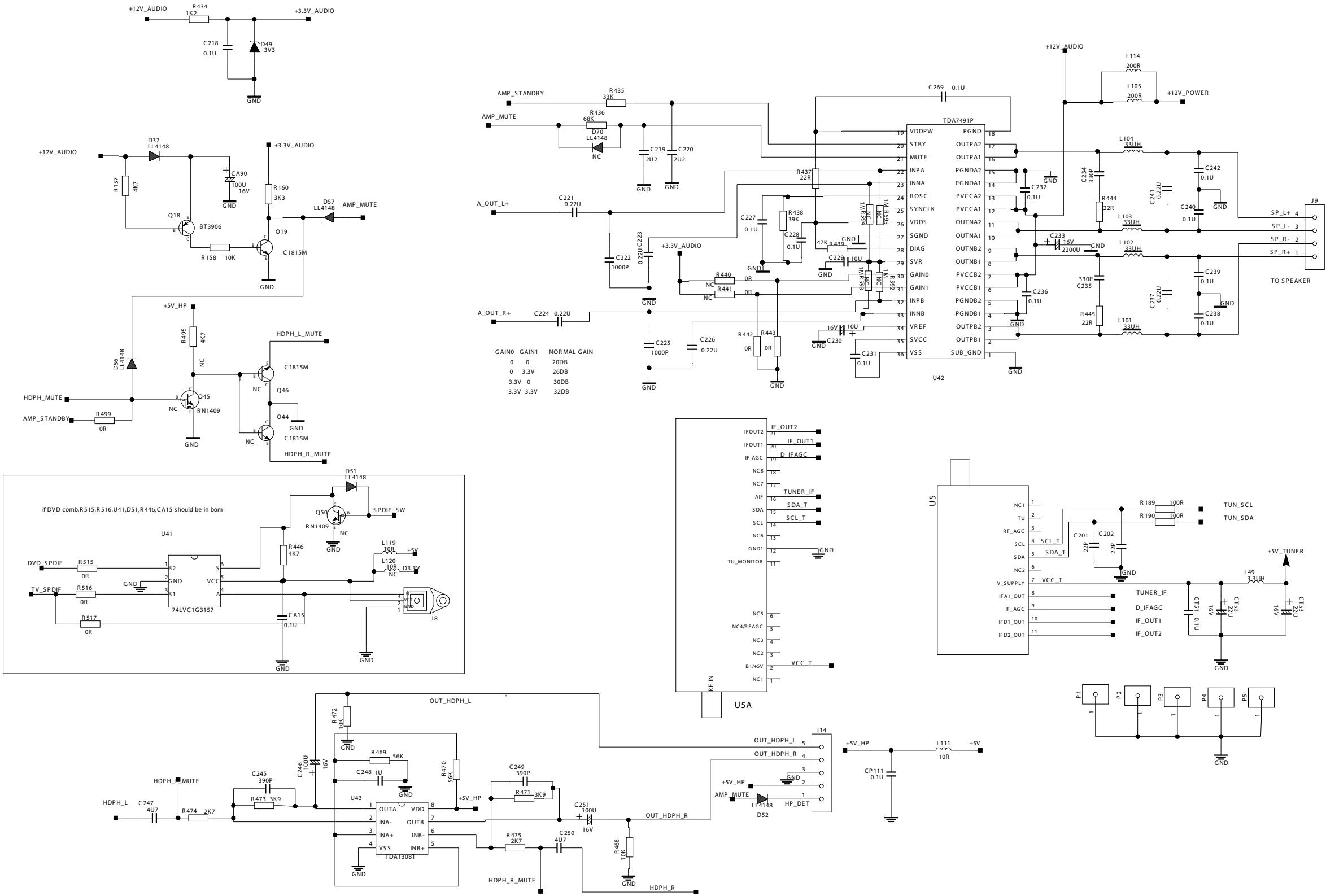


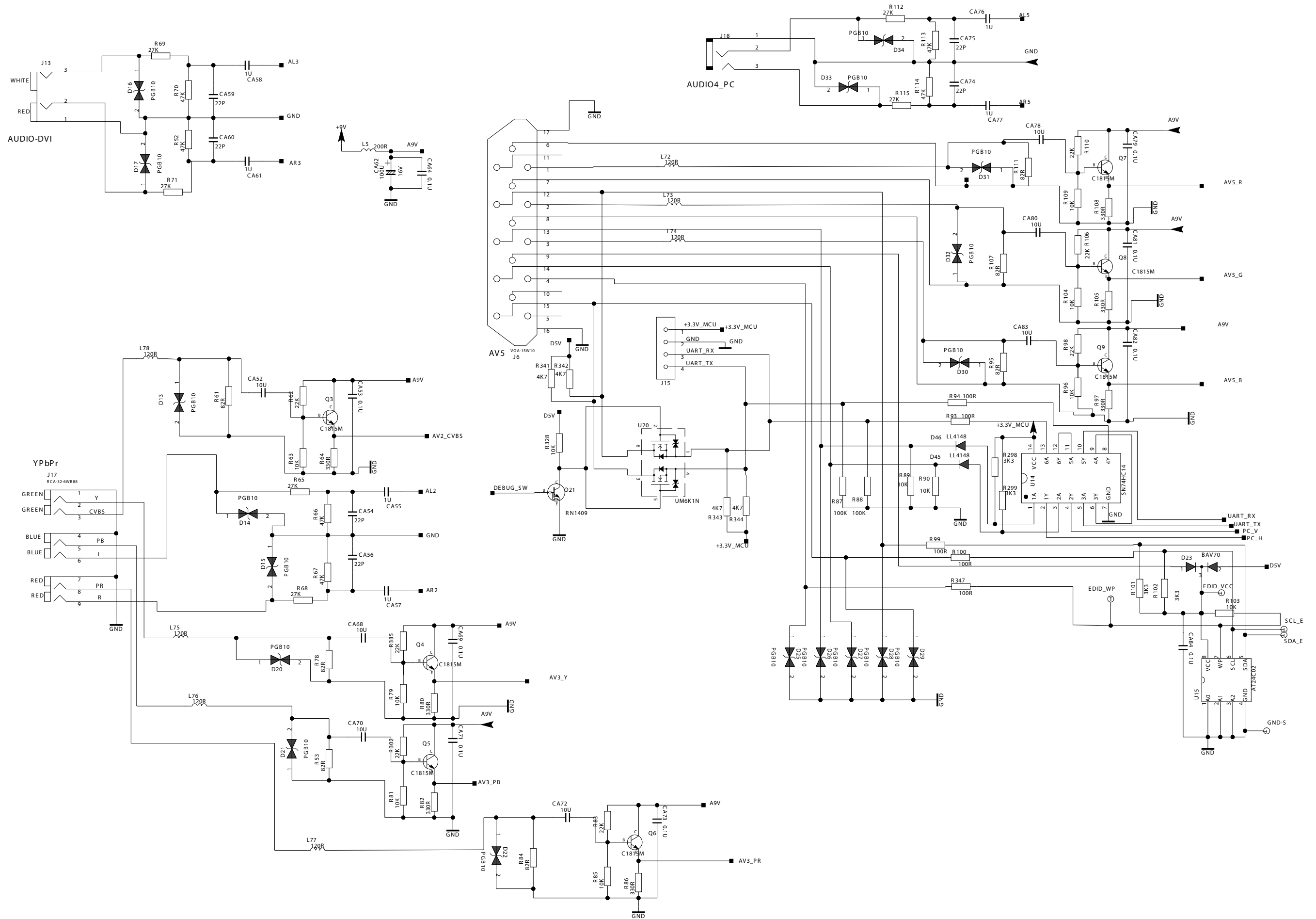
AVIF-AUDIO-IN SCHEMATIC



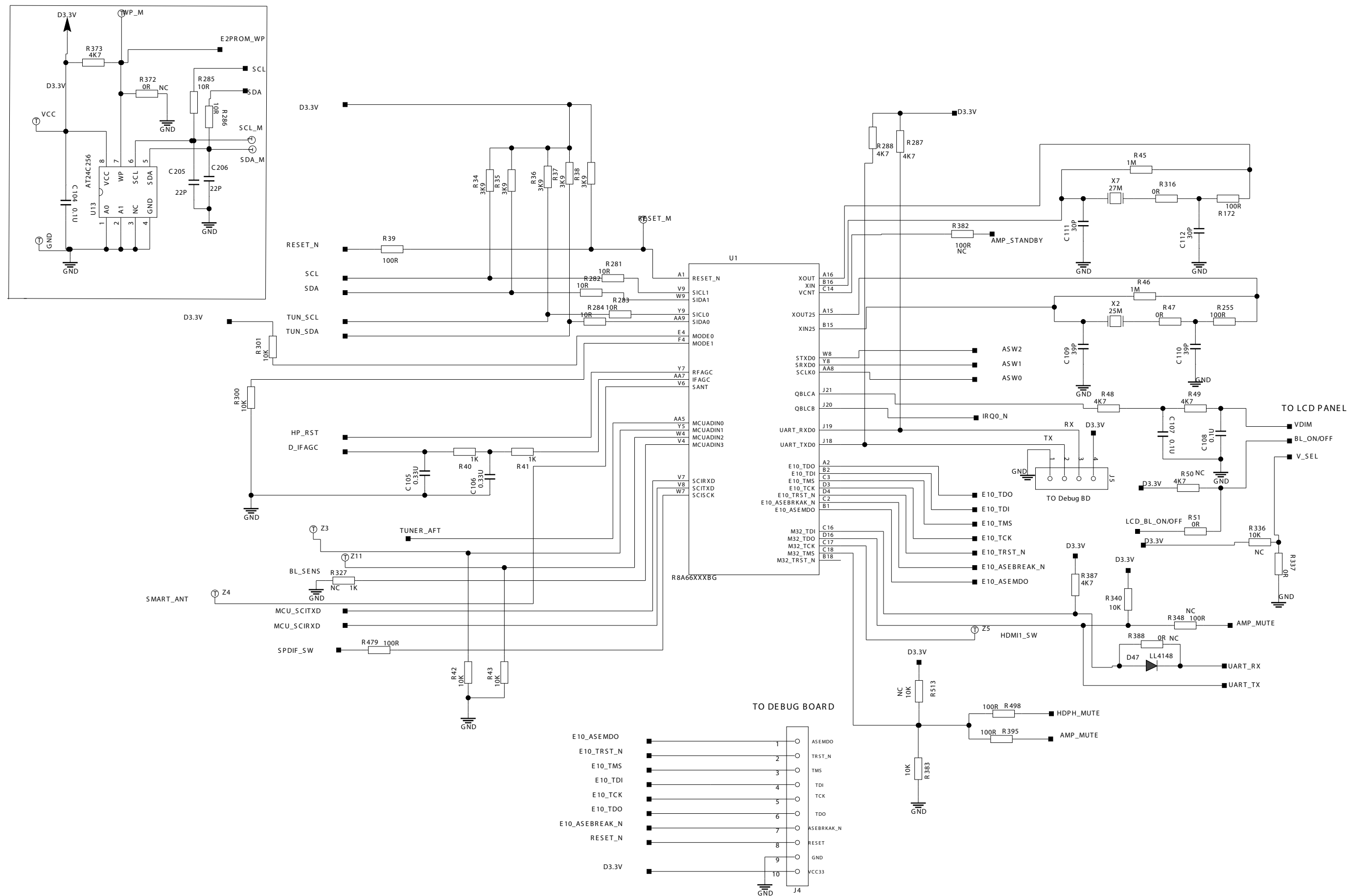
AVIF_AUDIO&VIDEO-OUT SCHEMATIC



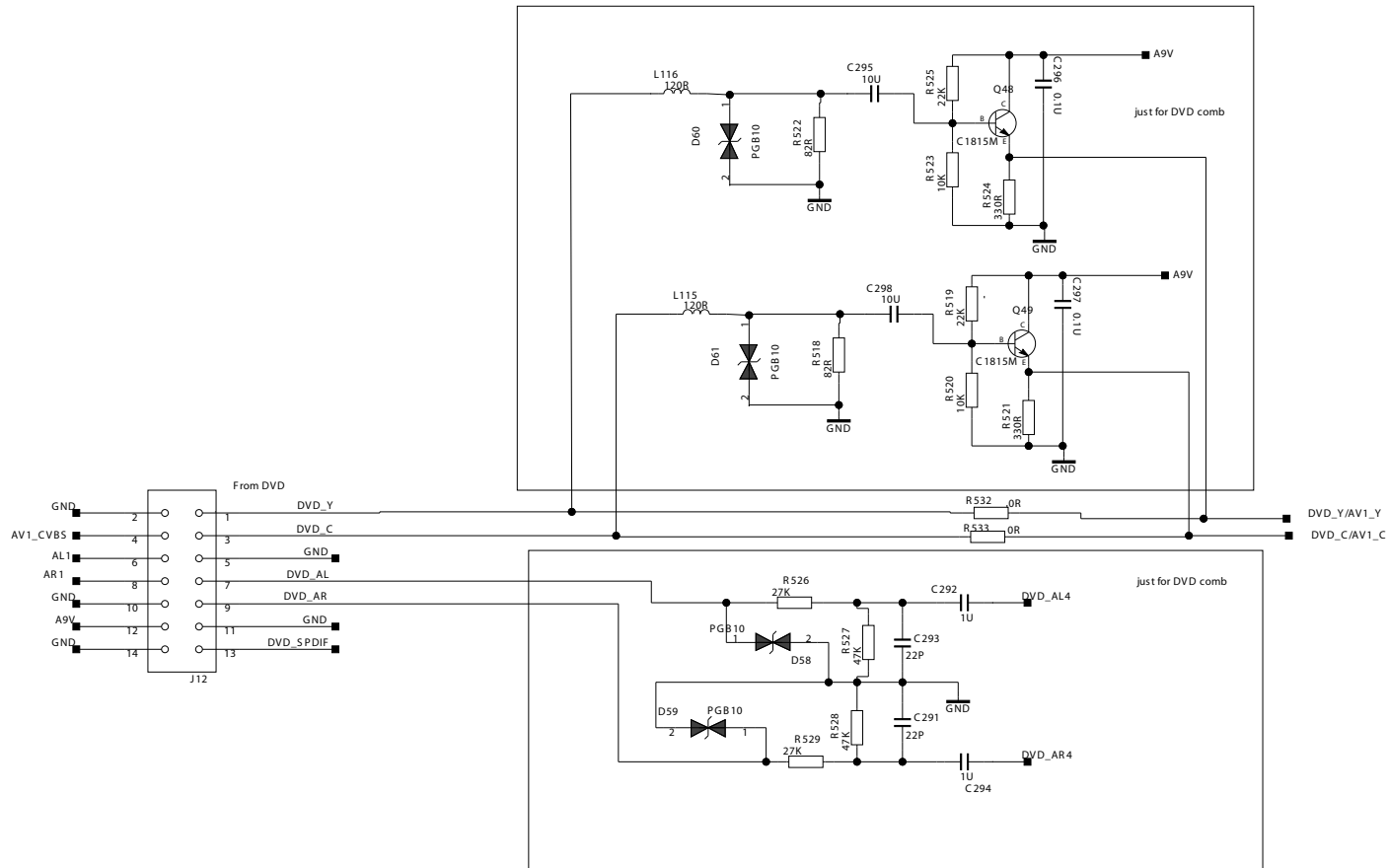
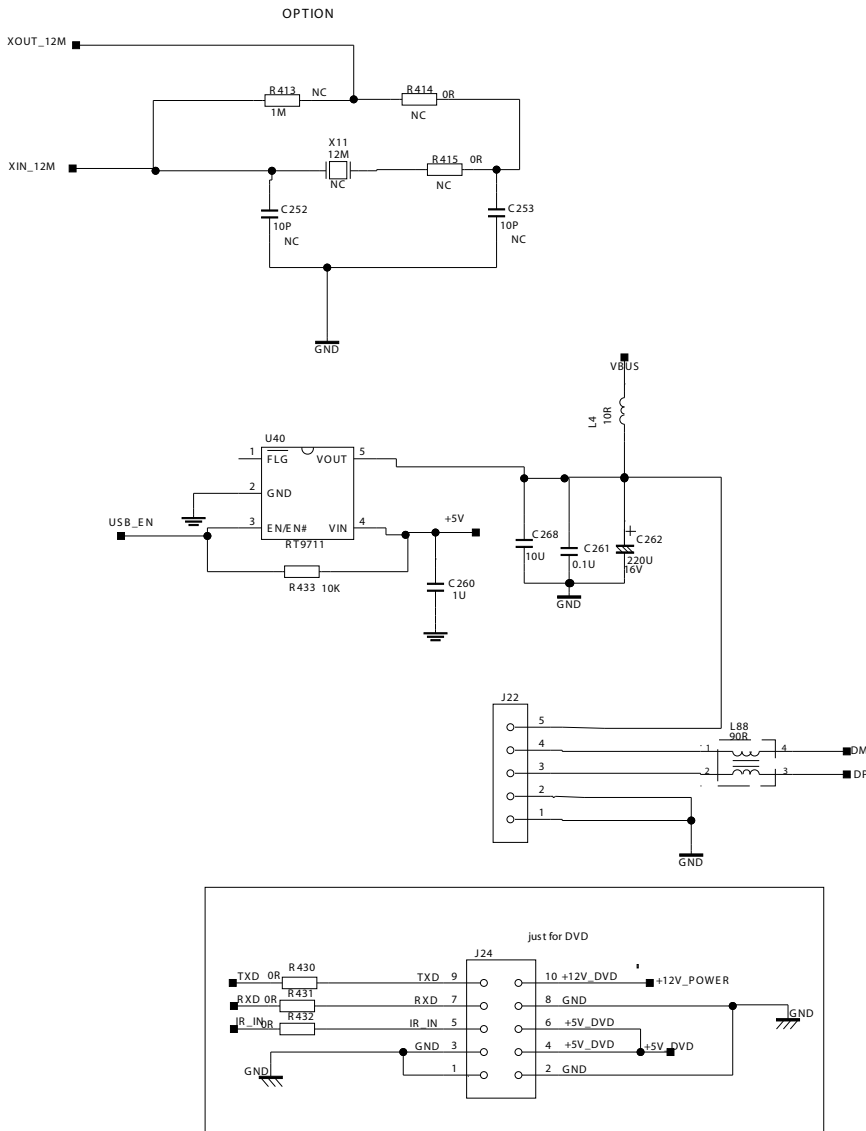
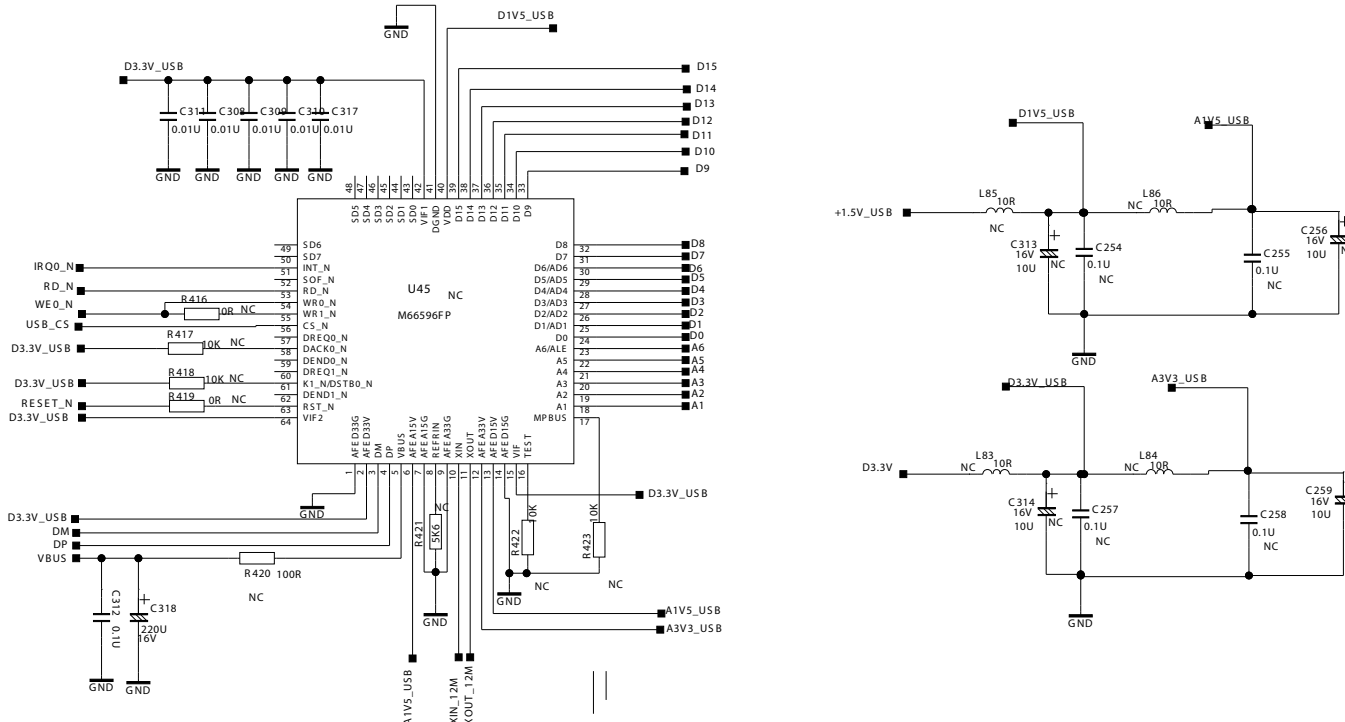
AVIF-AVIN-YPrPb SCHEMATIC



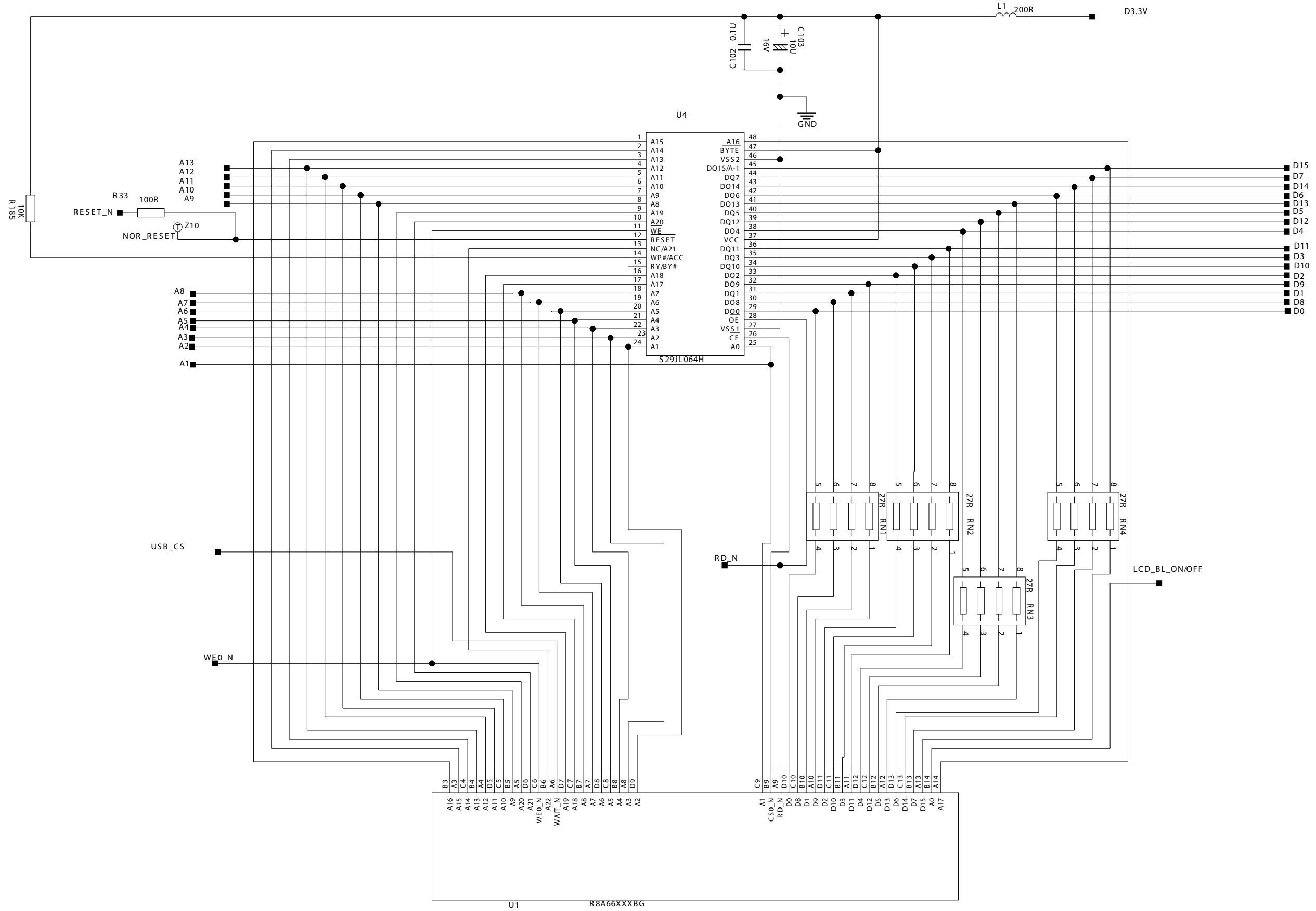
CONTROL SCHEMATIC



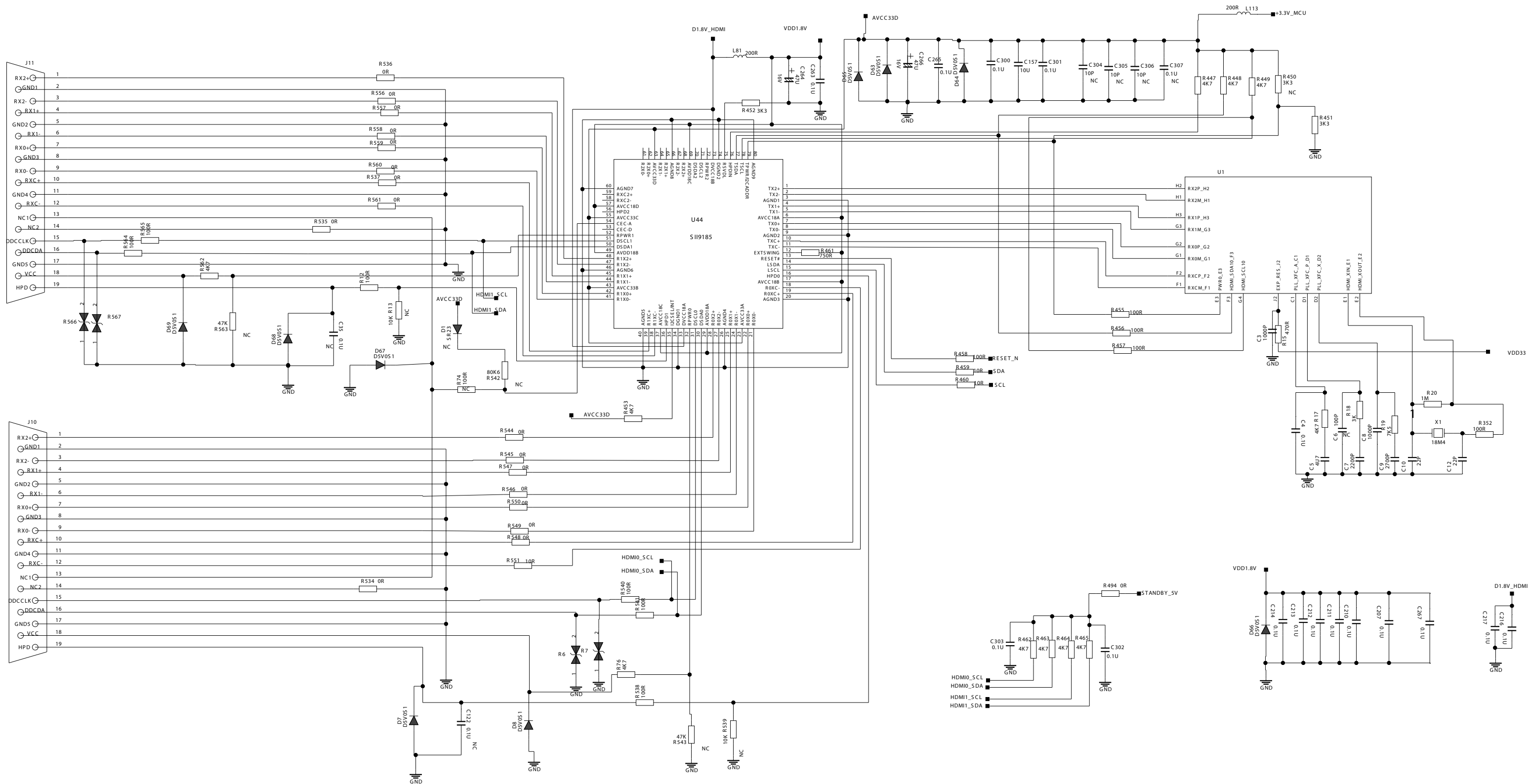
DVD & USB SCHEMATIC



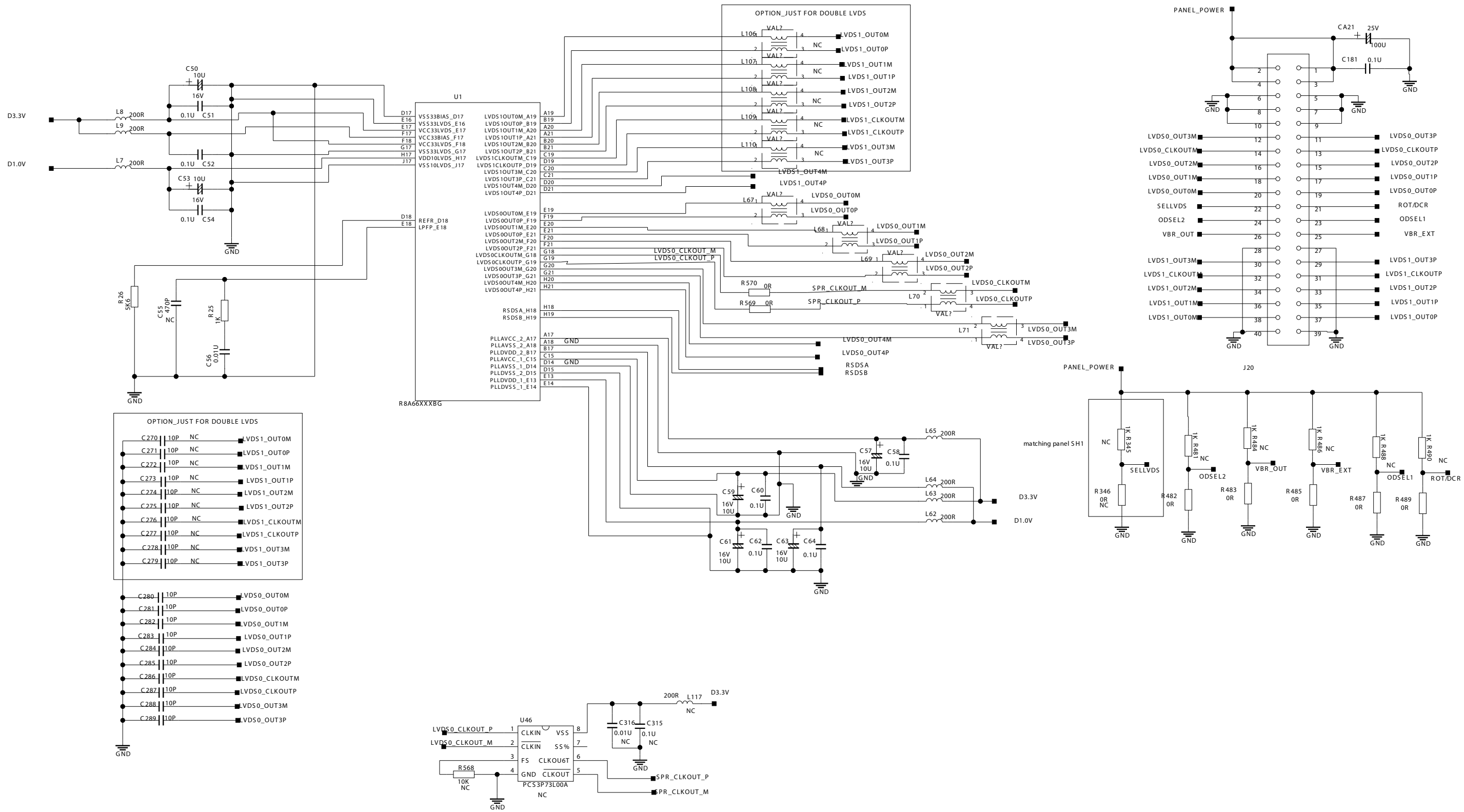
FLASH SCHEMATIC



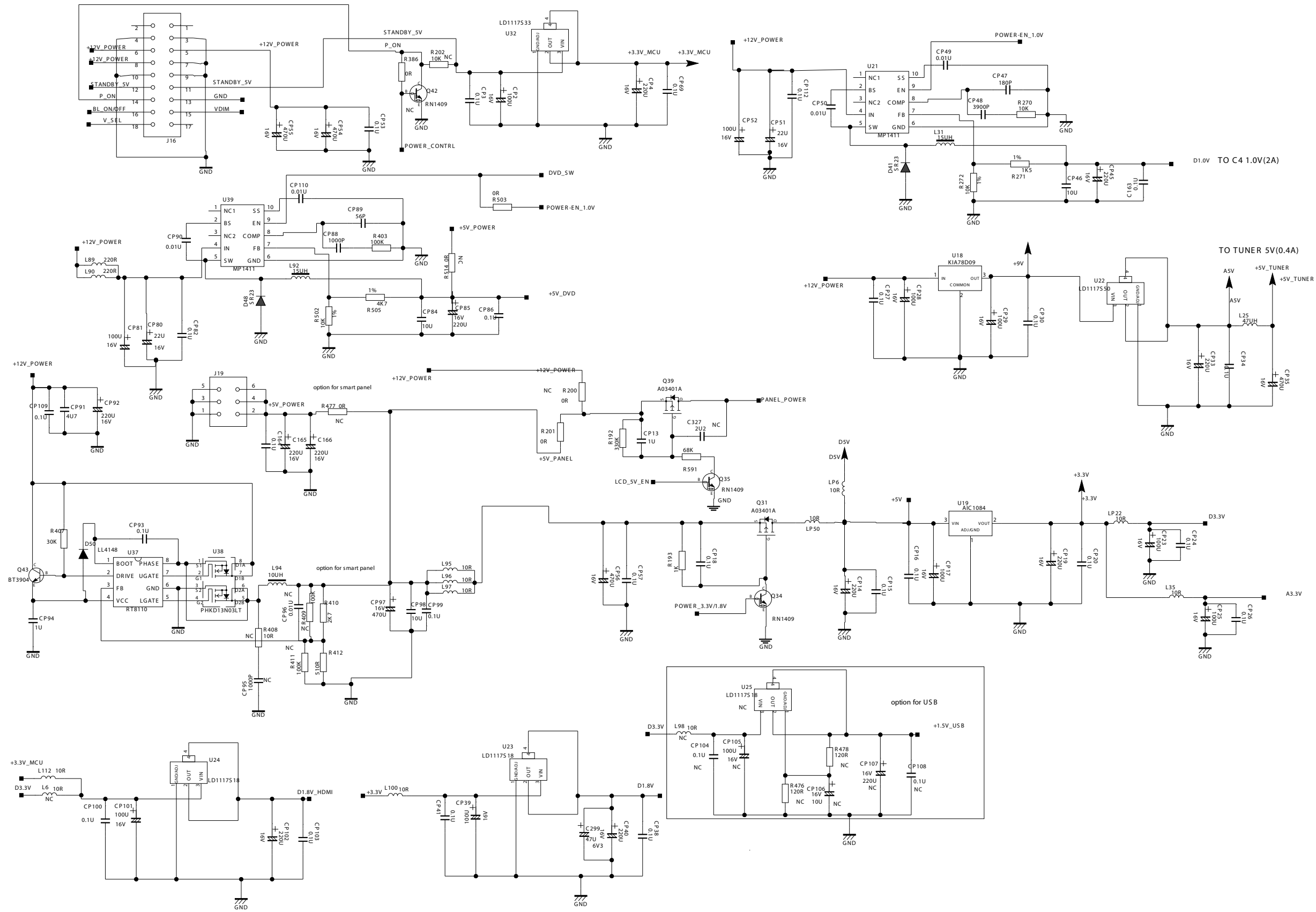
HDMI SCHEMATIC



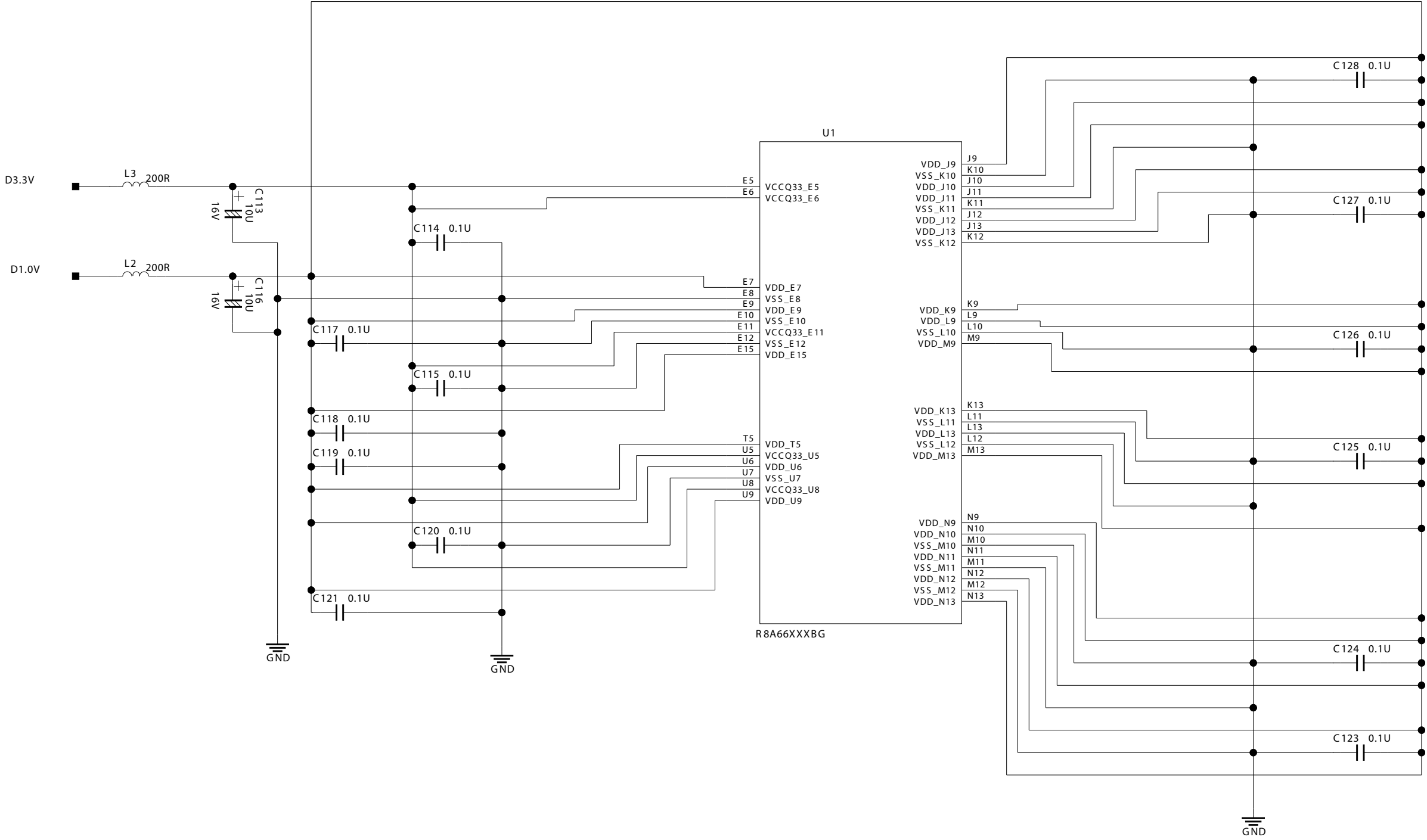
LVDS&PLL SCHEMATIC



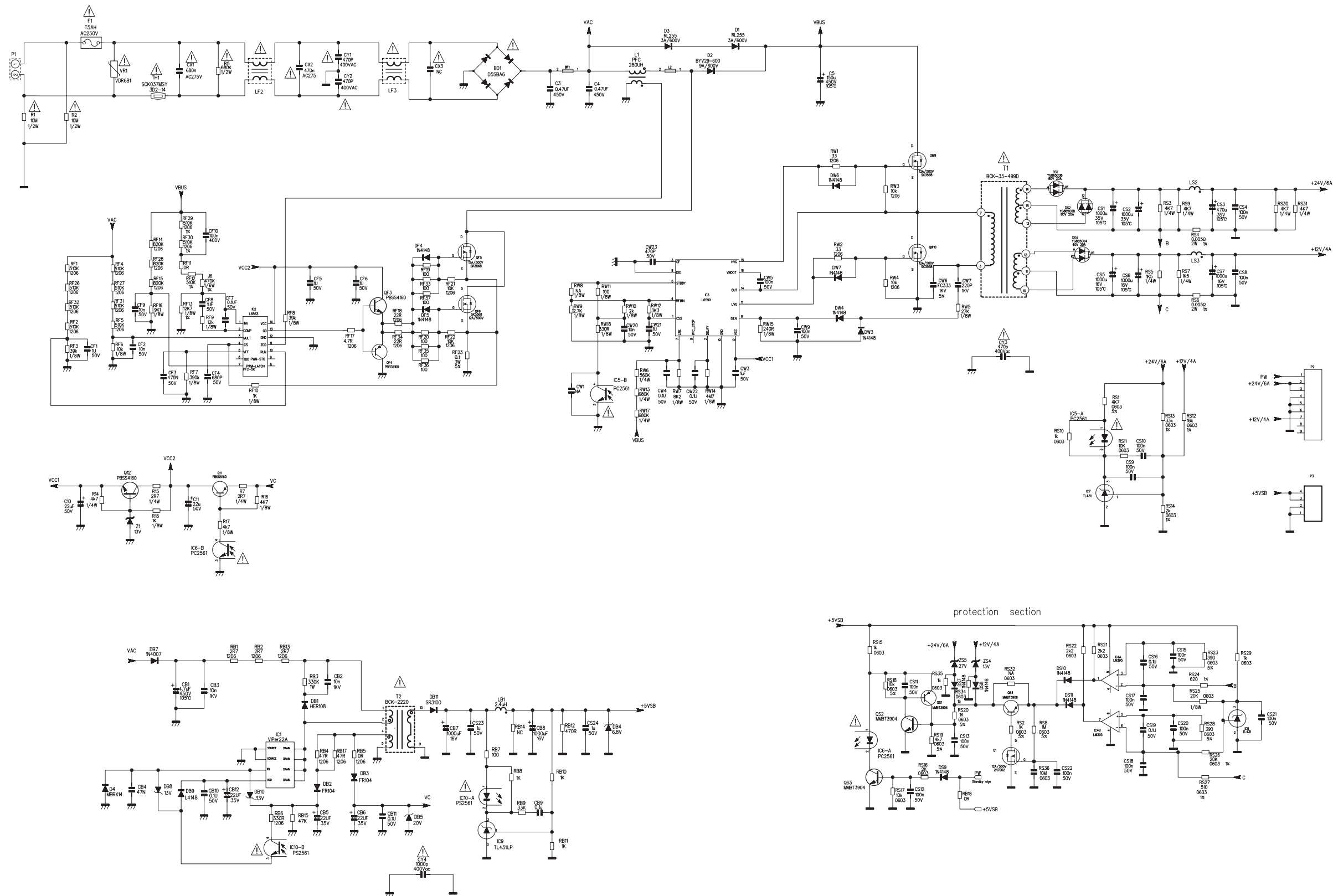
POWER 1 SCHEMATIC



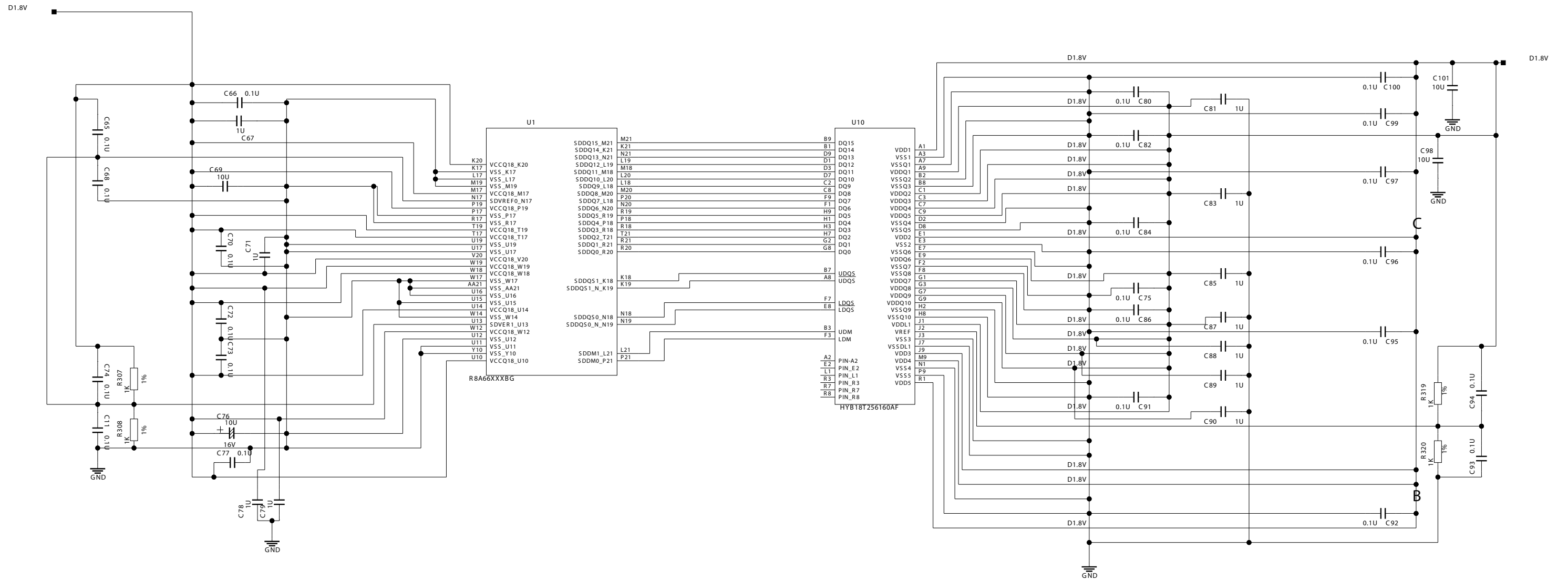
POWER_C4 SCHEMATIC



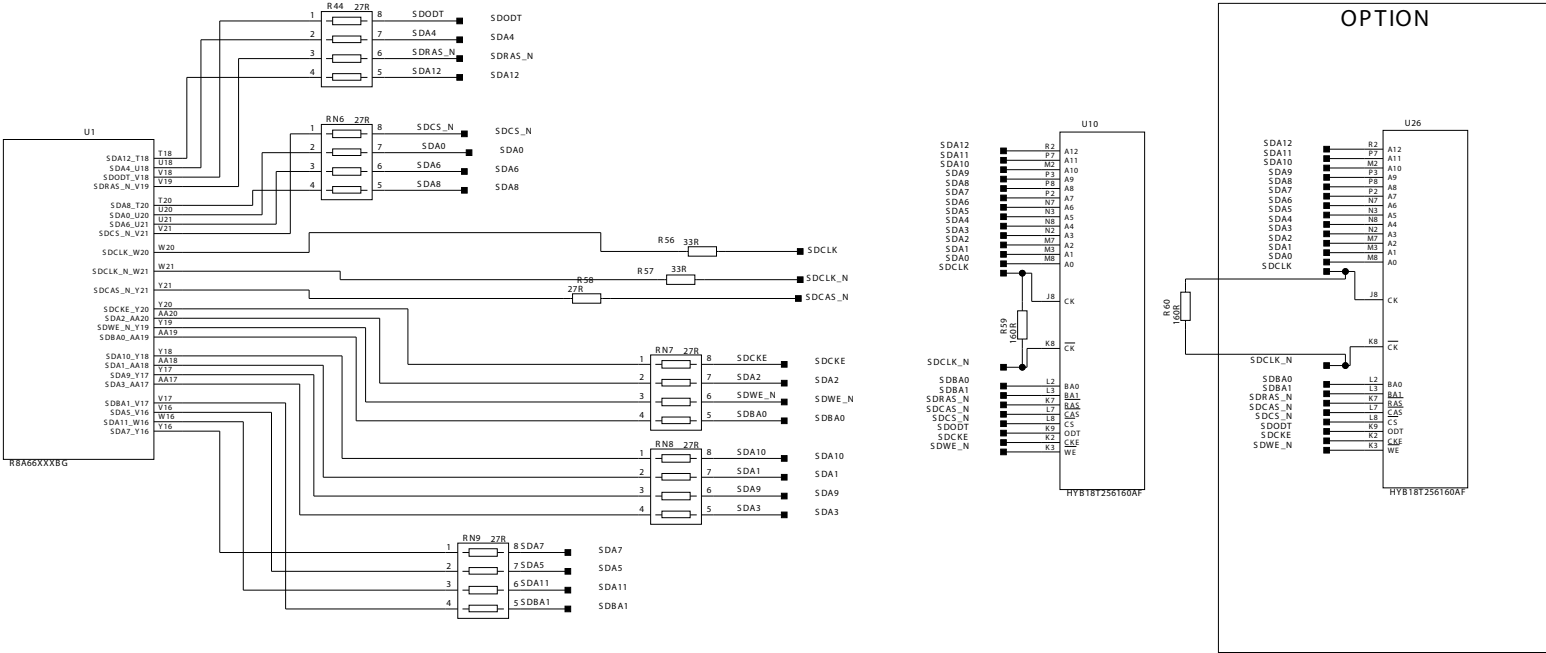
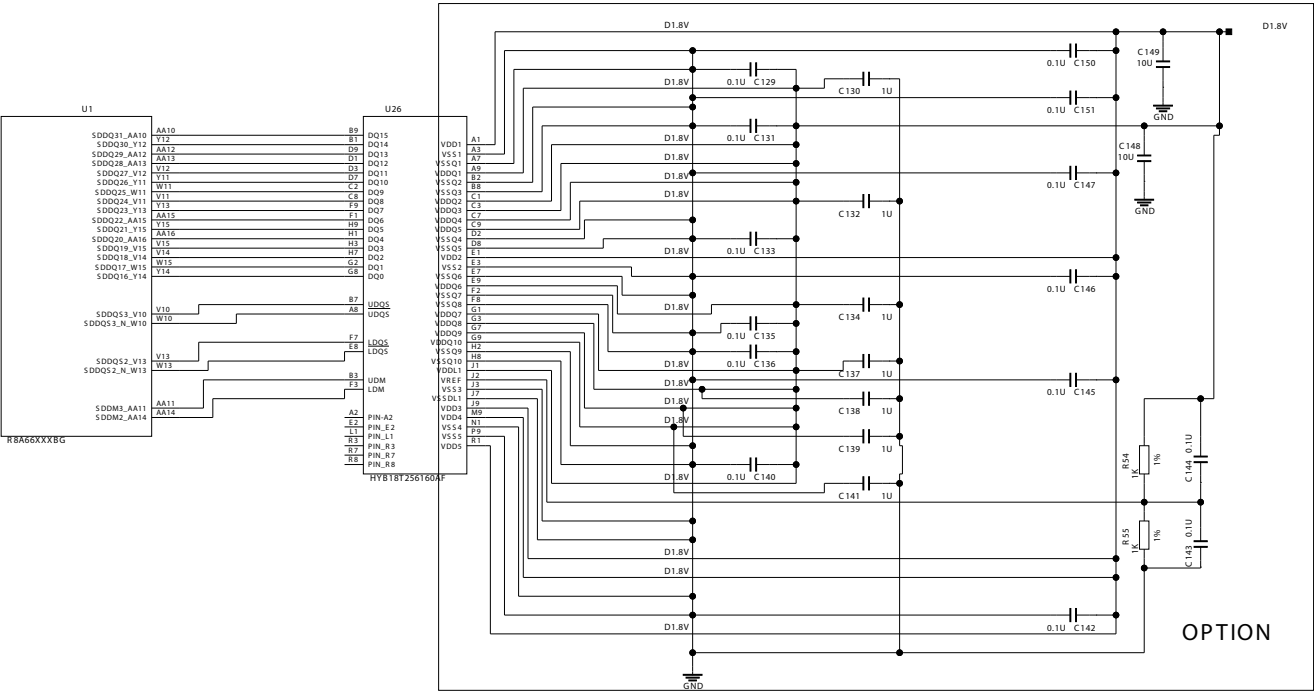
L32HD31 POWER SUPPLY SCHEMATIC



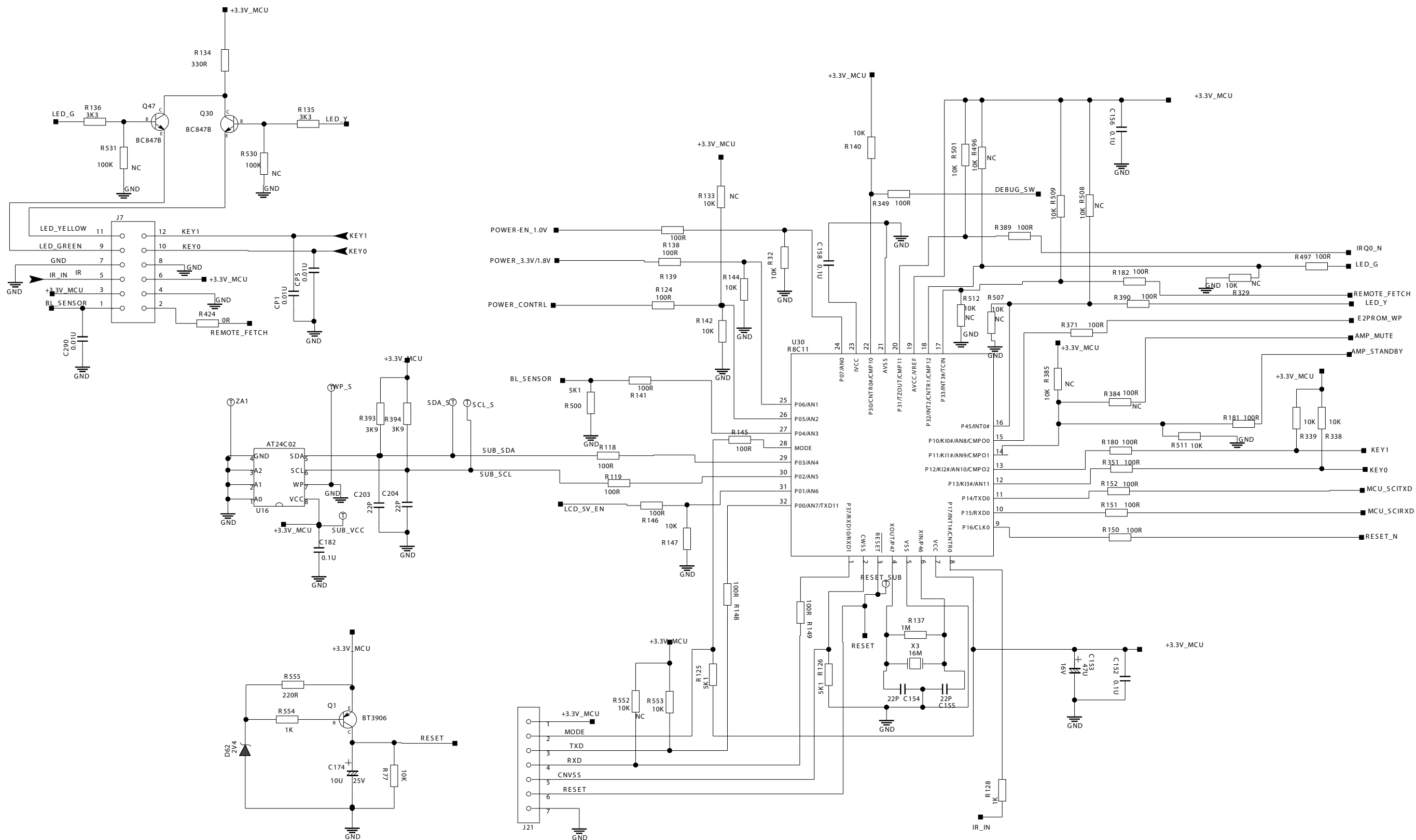
SDRAM1 SCHEMATIC



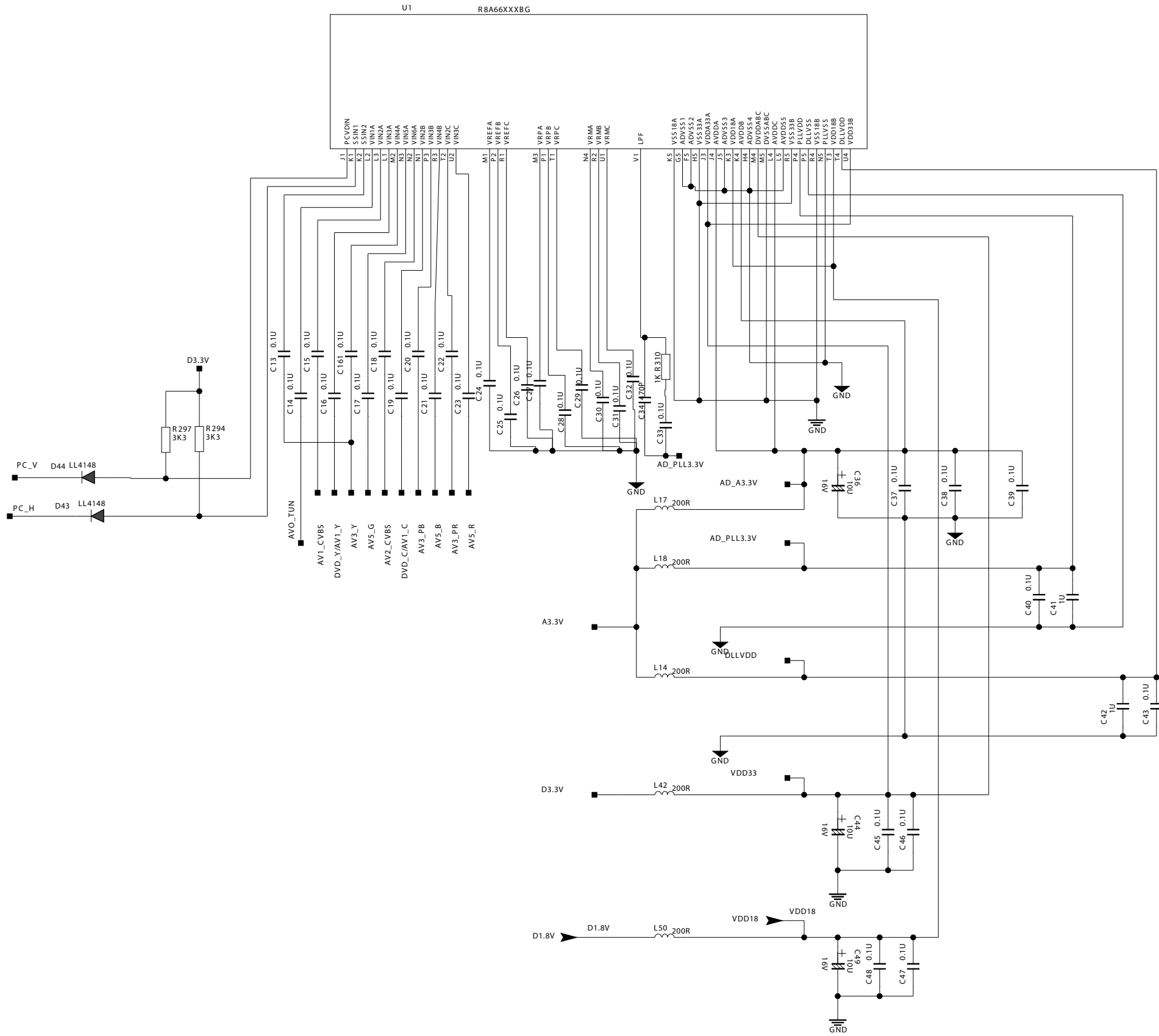
SDRAM2 SCHEMATIC



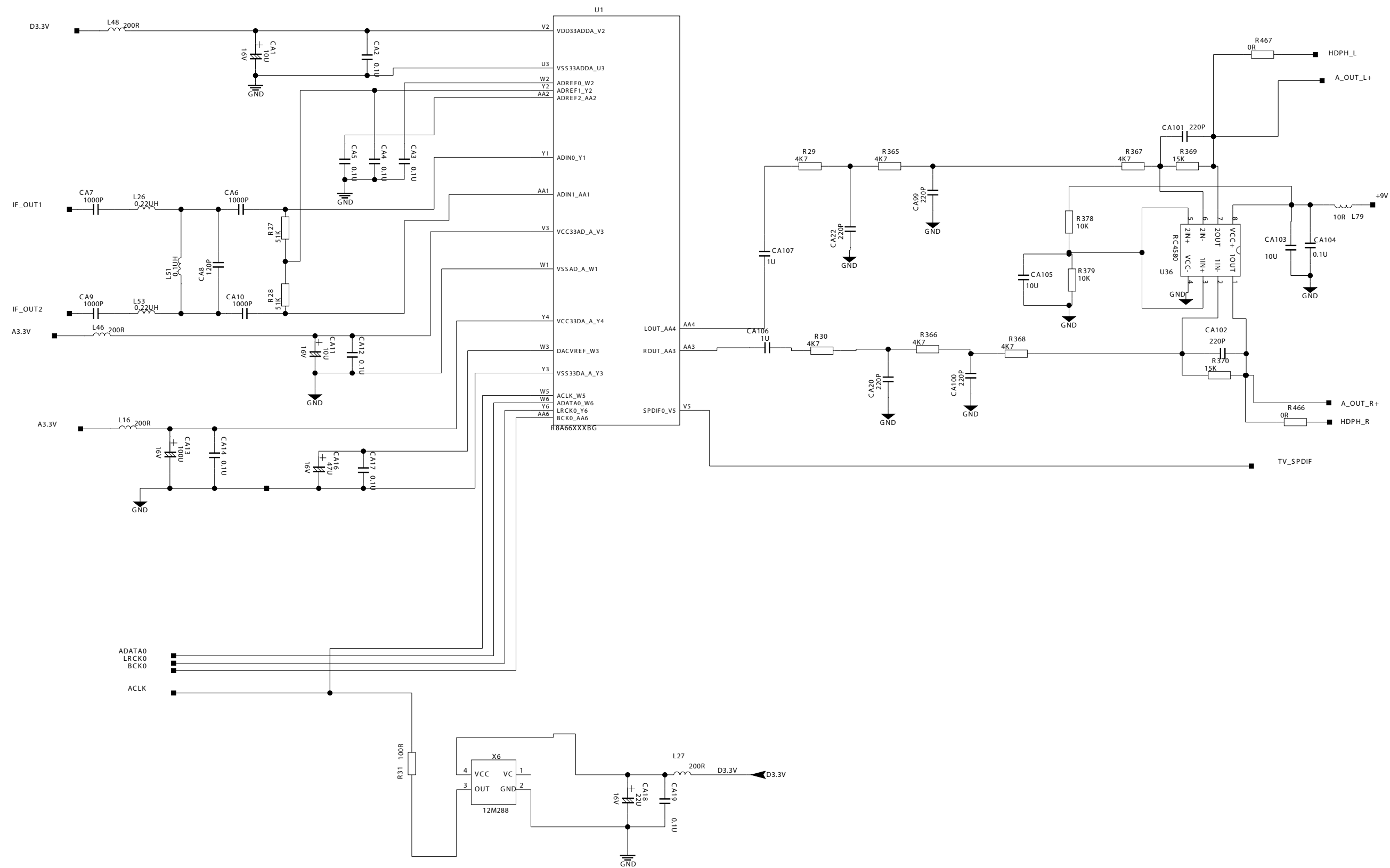
SUB-MCU SCHEMATIC



VIDEO-ADC SCHEMATIC



VSB-ADC&AUDIO-I/O SCHEMATIC



ALIGNMENT & ELECTRICAL TEST PROCEDURE

RS86A

L32HD31

V1.0

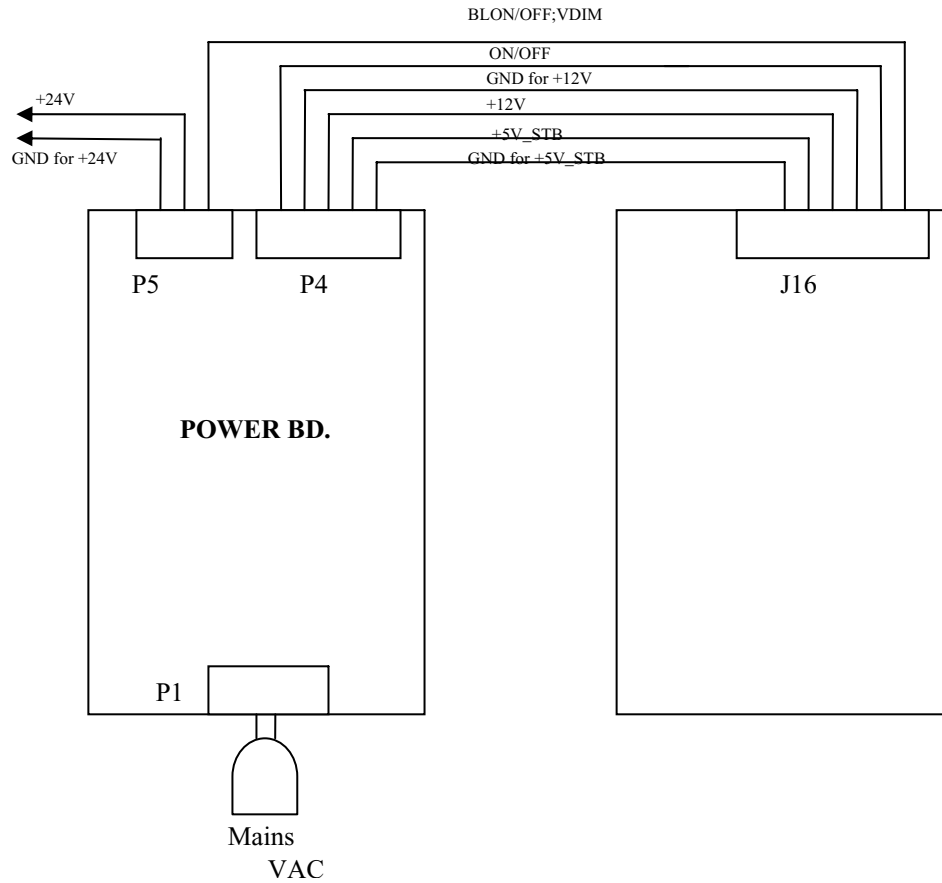


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1. Power supply

To Inverter Unit



With 120VAC input, +5V_STB is always available.

ON/OFF signal enables the +12V and +24V.

If ON/OFF signal = 0V, +12V and +24V are not available.

If ON/OFF signal = 3.3V, +12V and +24V are available.

2. ELECTRICAL TEST

2.1 Abbreviations

HD	High	Definition
SD	Standard	Definition
VGA		Video Graphic Adapter
VESA		Video Electronics Standards Association
ADC		Analog to Digital converter
RC	Remote	Remote Control
TBD		To be determined

2.2 Preparation

Connect LVDS cable from LCD panel to J20

Connect +24V supply cables to the inverter unit of LCD panel.

Connect +12V/+5V_STB/backlight switch & control cable supply cables to J16

Connect KB & LED cable from J24 to KEYBOARD & LED BD

Connect IR & LED cable from P004 to P002

2.3 Voltage Regulator

Apply 120VAC to mains input and turn on the set under test, following voltages should exist:

Switch regulator	U38	U21	U39(Optional)
Voltage	+5.0V	+1.0V	+5.0V
Test point	Z154	Z147	Z17

Linear regulator	U23	U32	U19	U24	U25(Optional)	U18	U18
Voltage(V)	+1.8V	+3.3V	+3.3V	+1.8V	+1.5V	+9.0V	+5.0V
Test point	Z18	Z149	Z113	Z150	Z880	Z152	Z19

All the voltages should have tolerance less than 5%.

OUTPUT supply	USB		
Voltage	+5.0V		
Test point	C711(+)		

2.4 Key Board, IR receiver and RC

Apply 120VAC to mains input, when power on , LED should light up with Green/Yellow color

2.4.1 To navigate the MENU using KEYBOARD

To switch on/off the TV set.

Action: Press Power key on keyboard

Observe: Power key is equal to ON-OFF on remote control.

2.4.1 To navigate the MENU using KEYBOARD (cont)

To enter MENU Screen.

Action: Press MENU key on keyboard.

Observe: Menu screen should shown at LCD screen.

During Menu Screen:

Action: Press Menu key

Observe: Menu key is equal to OK key on remote control.

Action: Press Vol- key

Observe: Vol- key is equal to LEFT key on remote control.

Action: Press Vol+ key

Observe: Vol+ key is equal to RIGHT key on remote control.

Action: Press PR- key

Observe: PR- key is equal to DOWN key on remote control.

Action: Press PR+ key

Observe: PR+ key is equal to UP key on remote control.

2.4.2 To navigate the MENU using REMOTE CONTROL

To enter MENU Screen.

Action: Press MENU key in remote control

Observe: Menu screen should shown at LCD screen.

During Menu Screen:

Action: Press UP key or DOWN key

Observe: Highlight will goes up and down

Action: Press RIGHT or OK key

Observe: User will enter to the selection highlighted.

Action: Press GO BACK key

Observe: User will exit from the selection.

Method to enter factory menu by remote control

Menu On and inside to Picture Menu
Then inside Picture Setting Menu
And move the cursor to Contrast item.
Press the Password "1950"

To go back or exit factory menu:

Press "GO BACK" on the remote

2.5 Video functional check

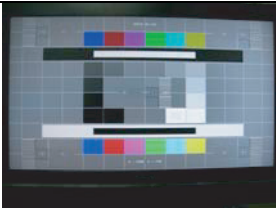
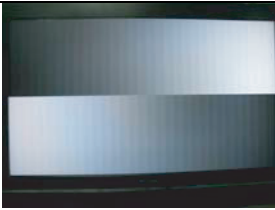
2.5.1 YPbPr

Connect Y, Pb, Pr signals to connector J17(Green/Blue/Red).

Change the display source to CMPT

signal Parameter	Source Impedance	Minimum (Vp-p)	Typical(Vp-p)	Maximum(Vp-p)
Y : Sync to Peak White	75 ohm	0.67	0.70	0.73
P_R : Sync to Peak White	75 ohm	---	±0.35	---
P_B : Sync to Peak White	75 ohm	---	±0.35	---

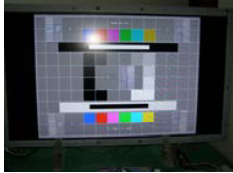
Test Pattern	SMPTE RP-133	32-step greyscale
--------------	--------------	-------------------

Picture	 (Generated by Chroma2327)		 (Generated by Chroma2327)	
Format	4:3	16:9	4:3	16:9
	480i59.94Hz	1080i60Hz	480i60Hz	
	480p59.94Hz	720p60Hz	480p60Hz	

2.5.2 VGA

Connect VGA cable with R, G, B, Hsync and Vsync signal in VESA format to J6.
Change the display source to PC Input.

signal Parameter	Source Impedance	Minimum(Vp-p)	Typical(Vp-p)	Maximum(Vp-p)
R (red)	75 ohm	0.67	0.7	0.73
G (green)	75 ohm	0.67	0.7	0.73
B (blue)	75 ohm	0.67	0.7	0.73
Hsync, Vsync	---	2.4V	2.4V	2.4V

Test Pattern	SMPTE RP-133	32-step greyscale
	 (Generated by Chroma2327)	 (Generated by Chroma2327)
Format	640x480@60Hz, 800x600@60Hz, 1024x768@60Hz	640x480@60Hz, 800x600@60Hz, 1024x768@60Hz

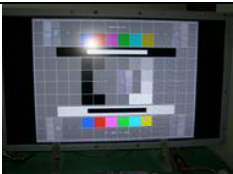
2.5.3 HDMI

2.5.3.1 DVI mode

2.5.3.1.1 Standard Monitor Format (VESA)

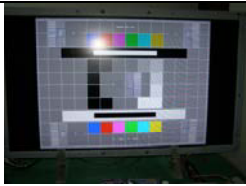
Connect HDMI cable with TMDS signal in VESA format to J9, and R/L to J13

Change the display source to HDMI 2.

Test Pattern	SMPTE 64-step	greyscale
	 (Generated by Quantun881)	 (Generated by Quantun881)
Format	640*480@60Hz 800*600@60Hz 1024*768@60Hz	640*480@60Hz 800*600@60Hz 1024*768@60Hz

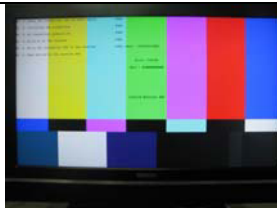
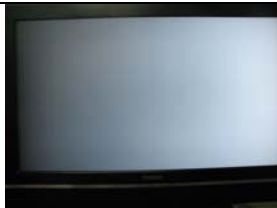
2.5.3.1.2 Standard TV Display Format

Connect HDMI cable with TMDS signal in VESA format to J9. and R/L to J13
Change the display source to HDMI 2.

Test Pattern	SMPTE-64-STEP	greyscale
	 (Generated by Quantun881)	 (Generated by Quantun881)
Format	4:3 16:9	
1H		1080i60Hz
2H	480p 60Hz	720p60Hz

2.5.3.2 HDMI mode

Connect HDMI cable with TMDS signal in VESA format to J11.
Change the display source to HDMI 1

Test Pattern	SMPTE-64-step	greyscale
	 (Generated by Quantun881)	 (Generated by Quantun881)
Format	4:3 16:9	
1H		1080i60Hz
2H	480p 60Hz	720p60Hz

2.5.4 RF

2.5.4.1 Analog RF signal input

Connect Antenna cable to tuner.

Change the display source to TV Channels.

Test Pattern	Depended on factory	Depended on factory	Depended on factory
Channel			
Picture Frequency			
Channel band	VHF-L	VHF-H	UHF

2.5.4.2 Digital RF signal input

Connect Antenna cable to tuner.

Change the display source to TV Channels.

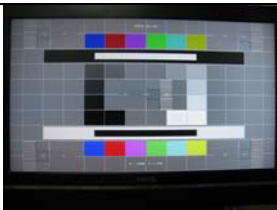
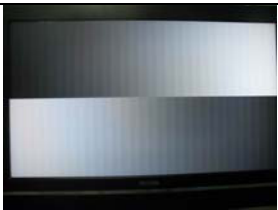
Test Pattern	Depended on factory	Depended on factory	Depended on factory
Channel			
Picture Frequency			
Channel band	VHF-L	VHF-H	UHF

2.5.5 CVBS and S-VIDEO

2.5.5.1 CVBS input

Connect AV cable with CVBS and audio L, R signal to J17 Yellow/White/Red

Change the display source to VID1

Test Pattern	SMPTE RP-133	32-step greyscale
		
Format	NTSC M (Generated by Chroma2327)	NTSC M (Generated by Chroma2327)

2.5.5.2 S-VIDEO input

Connect S-VIDEO cable to P703 on side AV BD

Change the display source to S-VIDEO

Video test pattern is the same as section 2.7.5.1.

2.5.5.2 SIDE-AV input

Connect AV cable with CVBS and audio L, R signal to P702 Yellow/White/Red on side AV BD

Change the display source to VID2

Video test pattern is the same as section 2.7.5.1.

3 Video Alignment

On RS86A platform, some alignment items could be achieved by using serial port with UART protocol

VGA socket could be used for UART purpose, pin definition as below:

Pin12: RXD

Pin15: TXD

3.1 Alignment Conditions

In order to have defined conditions for the alignment procedure, the TV set should be warmed up for 60 minutes.

3.2 ADC Calibration

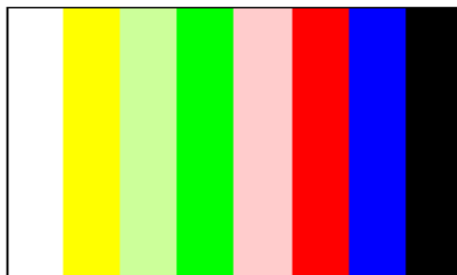
ADC calibration should be applied just for CMPT channel: SD(480i) and HD(1080i/60) .

3.2.1 Input signal spec.

Source: CMPT

Format: 480i (720x480 60Hz); 1080i/60HZ

Pattern: 100/0/100/0 8 Steps Color bar



3.2.2 Step for adjustment

3.2.2.1 ADC calibration of SD format

Input 100% color bar of 480i format to CMPT source
 Entry factory menu and choose the ADC CALIBRATION menu with the RC
 Adjust the cursor to "AUTO ADC", press "ok" on the RC
 "START Now Adjusting OK/FAIL" will display
 If Ok, ADC of SD finished
 If FAIL, do one more time till it shows OK

3.2.2.2 ADC calibration of HD format

When SD ADC calibration is ok, insert 1080i/60 format, 100% color bar signal, repeat 3.2.2.1.

Note:

The sequence of ADC calibration must be SD format then HD format. Do not exchange.

The menu show below:

ADC CALIBRATION		ACTION
SOURCE	SD/HD	
CHANNEL		Vin-A(Y) / Vin-B(Cb) / Vin-C(Cr) Calibration
TCV	0-20	47
TCH	0-20	47
Ref.Vin-A(Y)		0-255 (Default 240)
Ref.Vin-B(Cb)		0-255 (Default 240)
Ref.Vin-C(Cr)		0-255 (Default 240)
AUTO ADC		Start/OK/Now adjusting..../Fail
Gain Vin-A(Y)		0-255
Gain Vin-B(Cb)		0-255
Gain Vin-C(Cr)		0-255
Manual ADC		Start/OK/Now adjusting..../Fail
Read Vin-A(Y)		0-255
Read Vin-B(Cb)		0-255
Read Vin-C(Cr)		0-255

3.3 White balance

On RS86A platform, 5 video source need to be adjusted the white balance : DTV /AV /YUV /HDMI /RGB(PC), and each data can be stored independently.

Considering that there are few signal patterns for DTV to align, so copy the HDMI source white balance as DTV .

Source	Format		
AV	480i		
PC	@		
HDMI			
CMPT			
DTV	Copy data of HDMI		

3.3.1 CUT-OFF ALIGNMENT

Cut-off alignment is used to define the colour co-ordinates for low luminance level. This alignment has to be done for the following standards:

1. Insert a grey test pattern with **25IRE** signal amplitude
2. Measure the color co-ordinates near the center of the screen
3. Adjust with "R_ ", "G_ " and "B_ " to the following color co-ordinates values:

Color Coordinates	Cold	Normal	Warm
X		283 10	
Y		291 10	

Note:

Before White balance alignment, ADC Calibration must be finished.

3.3.2 White Point

White point alignment is used to define the colour co-ordinates for bright luminance levels. This alignment has to be done for the following standards:

1. Insert a grey test pattern with 200nit signal amplitude
2. Measure the color co-ordinates near the center of the screen.
3. Adjust with "R_ ", "G_ " and "B_ " to the following color co-ordinates values:

Color Co-ordinates	Cold	Normal	Warm
X	272±10	283±1 0	314±10
Y	278±10	291±1 0	324±10

Note:

WB MENU		Remark
Source	AV/RGB/HDMI/YUV/DTV	Source select
Color Temp	Normal cool warm	Color temperature
R Correct	R-gain 0~255	
G Correct	G-gain 0~255	
B Correct	B-gain 0~255	
R Offset	R-offset 0~255	
R Offset	G-offset 0~255	
R Offset	B-offset 0~255	
Black Level	Off/on	

3.3 White balance (cont)

The default values have a close relation with panel brightness. After white balance alignment, a picture performance check should be done,; the brightest scales of 16-scale grey pattern should be distinguishable in vibrant mode (max contrast),the whole white brightness should be more than 400nits otherwise, white balance alignment should be redone. The default values should be revised according to experience in mass production.

White balance alignment for **Cold** and **Warm** mode could be achieved by writing the given values into TV set directly, The given values should be sums of white balance values in **Normal** mode and the offset values obtained from experience in mass production.

Since the White Point and Offset alignments are influencing each other, an iterative process maybe needed to get both alignments to the required values.

4 Audio Alignment

No adjustment necessary

5 Shop initial

5.1 Shop initial should be done at the last alignment.

Enter the factory menu "PRODUCTING"

Choose "SHOP INIT" and press "ok" key on the remote control

Shows "ok" on the screen, exit factory menu

Then power down.

OUT OF BOX SETTINGS

ITEM	T TING				
PICTURE					
Picture Settings		Vibrant	Natural	Gaming	Personal
Brightness	40%		50%	50%	50%
Contrast	80%		65%	60%	65%
Sharpness	60%		50%	40%	50%
Color	60%		50%	40%	50%
Tint	50%		50%	50%	50%
Color Warmth		normal			
Preset		Vibrant(retail)	Normal(home)		
Screen Format		Normal			
Film Mode		ON			
Video Noise Reduction		Normal			
SOUND					
Balance	Cente		red		
Analog TV Sound Mode		Mono			
Default Audio Language		English			
Current Audio Language		English			
CHANNEL					
Auto Ch. Search		Cable			



5 Shop initial (cont)

PARENTAL CONTROL

Lock Parental Control	UNLOCKED
Block Channel	UNCHECKED
All levels should be unlocked	

SETUP

Closed Caption

CC Setting	OFF
Analog CC Type	CC1
Digital CC Type	CS1
Digital CC Preset	Default
Digital CC Color	White
Digital CC Back Color	Black

Menu Language

English

Clock

--:--

Auto Time

UNCHECKED

Sleep Timer

OFF

6 Factory Menu

6.1 Method to enter factory menu by remote control

Menu On and inside to Picture Menu
Then inside Picture Setting Menu
And move the cursor to Contrast item.
Press the Password "1950"

6.2 To go back or exit factory menu:

Press "GO BACK" on the remote

6.3

1.GEOMETRY

GEOMETRY MENU CVBS only				
ITEM	Default		Range	remark
H START POSITION	0		-30~30	No adjustment needed
V START POSITION	0		-30~30	No adjustment needed

2 ADC CALIBRATION

ADC CALIBRATION			
ITEM		COMMENT	remark
SOURCE	SD/HD	480i/1080i	
CHANNEL	Vin-A(Y) / Vin-B(Cb) / Vin-C(Cr) Caribration	No adjustment needed	Channel for CAL
TCV	238/31 1	No adjustment needed	V co-ordinate
TCH	172/708/618 363/1800/1560	No adjustment needed	H co-ordinate
Ref.Vin-A(Y)	208	No adjustment needed	
Ref.Vin-B(Cb)	230	No adjustment needed	
Ref.Vin-C(Cr)	230	No adjustment needed	
AUTO ADC	Start/OK/Now adjusting..../Fail	Adjust as necessary	Shows result
Gain Vin-A(Y)	27	No adjustment needed	
Gain Vin-B(Cb)	26	No adjustment needed	
Gain Vin-C(Cr)	27		

Manual ADC	Start/OK/Now adjusting..../Fail	No adjustment needed	
Read Vin-A(Y)	0-255	No adjustment needed	
Read Vin-B(Cb)	0-255	No adjustment needed	
Read Vin-C(Cr)	0-255	No adjustment needed	

3. SOUND CURVE

SOUND CURVE						
ITEM	SETUP				COMMENT	remark
SOURCE	ATV	AV	HDMI	DTV		
VOL1	4	18	4	1	No adjustment needed	
VOL5	90	104	90	115	No adjustment needed	
VOL10	110	124	110	140	No adjustment needed	
VOL25	180	194	180	210	No adjustment needed	
VOL50	200	214	200	225	No adjustment needed	
VOL75	215	229	215	250	No adjustment needed	
VOL100	227	241	227	255	No adjustment needed	

4. PRODUCTING

PRODUCTIONG			
ITEM	SETUP	COMMENT	REMARK
FACTORY MODE HOTKEY	Factory only	No adjustment needed	
WARM-UP STATUS	Not Used	No adjustment needed	
EEPROM INIT	Not Used	No adjustment needed	
FACTORY CH PRESETTING	Channel 3	Channel preset on AIR(NTSC)	
SHOP INIT	Not Used	No adjustment needed	

BACKLIGHT LEVEL	20	LCD Back-Light Level	No adjustment needed
Cb DELAY (ATV only)	0	Set the Cb Delay for YCbCr	No adjustment needed
Cr DELAY (ATV only)	0	Set the Cr Delay for YCbCr	No adjustment needed
FIRST INSTALL ONOFF	ON/OFF	Factory use only	No adjustment needed

		in the wire.	factory out.
BACKLIGHT SET MIN	50	SET MIN BACKLIGHT WHEN LIGHTSENSOR SET ON IN USER MENU	
BACKLIGHT SET MAX	90	SET MIN BACKLIGHT WHEN LIGHTSENSOR SET ON IN USER MENU	$\leq \text{BACKLIGHT LEVEL} * 5$
LIGHT SENSOR MIN	30	Adjust if need	
LIGHT SENSOR MAX	192	Adjust if need	

7.INFO

INFO			
Parameter		COMMENT	REMARK
C4 VERSION	C4:V8-E62RS86-LF1V***	Main program	*** shows version
SUB VERSION	SUB:V8-E62RS86-LF2V***	For Sub_mcu	
DATE AND TIME	Aug 24 2007 23:07:15	Release time	

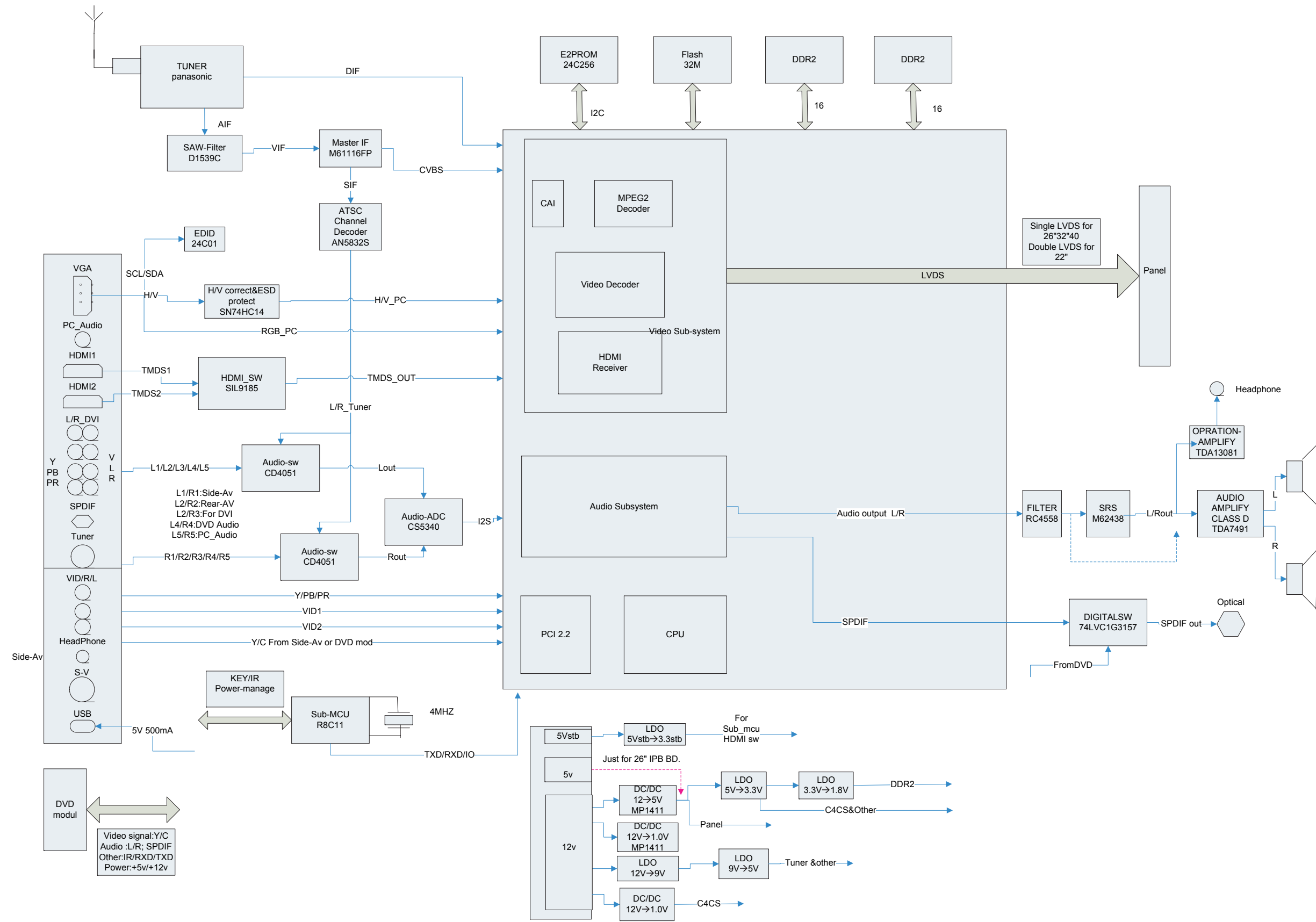
8.SETUP

SETUP			
PARAMETER		COMMENT	REMARK
TEST PATTERN		Internal test patterns, As below	
SMART-TOOL	Factory use only	Factory use only	
EAS ENABLE PRIORITY	Factory use only	Factory use only	

TEST PATTERNS

TEST PATTERN (Level 2 Sub Menu)	
TEST MODE	On/off
CHECKER	0-3
CROSSING HATCH	0-3
COLOR BAR	0-3
OTHER	0-5
RED BRIGHNESS	0-10
GREEN BRIGHNESS	0-10
BLUE BRIGHNESS	0-10
COLOR MODE	0-7

L32HD31 BLOCK DIAGRAM



L32HD31 INTERCONNECT

