



# Service Manual

## Intonato24

### Monitor Management Tuning System





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# INTONATO | 24

## Monitor Management Tuning System



*Intonato 24 shown with included microphone and optional Intonato Desktop Controller*

### HIGHLIGHTS ■

**Configurable monitoring in mono, stereo, surround and immersive formats of up to 24 speakers**

**24 analog, digital and network input sources**

**Internal router/mixer**  
allows user-configurable down mixes and routings

**Save and recall project-specific monitoring configurations and speaker tunings**

**Automated speaker calibration with included microphone**

**Comprehensive bass management and subwoofer integration**

**Intuitive control with included Mac, Windows and tablet software\* and optional Intonato Desktop Controller**

The JBL Intonato 24 Monitor Management Tuning System provides easy setup, automated calibration and comprehensive control of professional control room monitoring systems. Housed in a 2U rack-mount enclosure, Intonato 24 precisely calibrates and controls a combination of 24 speakers configured as stereo, surround or immersive audio reference monitoring systems. You can create and instantly recall customized routings of a combination of analog, digital and networked audio sources. Included software and an optional Desktop Controller put the system's powerful monitoring features at your fingertips. With included calibration mic and software app, Intonato 24 delivers the benefits of a precisely calibrated system, and takes control room monitoring to the next level.

### Intonato

*/Into'nätö/ (intonare) **tuned** pp., **matched** adj., **in tune** adj. The primary attribute of the ideal control room monitoring environment.*

### KEY MESSAGES ■

#### COMPLETE, NEXT-GENERATION SYSTEM

While the approach to control room monitoring has remained consistent over the years, the audio signal path and production workflow have evolved tremendously. The JBL Intonato 24 and 7 Series Primary Reference Monitors provide a complete next-generation system, empowering content creators to produce consistently superior output regardless of the spaces where they find themselves, or the formats they are asked to deliver. While JBL designed Intonato 24 as the hub of the JBL 7 Series installed reference monitor system, it can be used with any passive or powered speakers.

#### A PRECISELY TUNED MONITORING ENVIRONMENT

Intonato 24 includes our latest automated speaker calibration technology, which measures and automatically optimizes monitoring system response at the listening position. Using the supplied calibration microphone, and software app, the system precisely matches the level and time-of-arrival (delay) of each speaker while setting up to 12 filters per speaker to compensate for low-frequency anomalies related to the geometry and construction of the room. Eight additional user full-range EQ filters allow project-specific response curves and compensation for transmission loss when speakers

are placed behind a perforated cinema screen.

#### IMMERSIVE READY—THE MOST I/O IN ITS CLASS

Intonato 24 comes standard with the most I/O in its class. With the connections and power to manage monitoring systems of up to 24 speakers, Intonato 24 makes immersive monitoring a reality in existing control rooms. 24 analog, 24 AES3, and up to 256 networked input connections\* enable you to use a broad range of equipment including analog and digital mixing consoles, work stations and playback sources. Intonato 24 features internal routing and a mixer to provide unprecedented monitoring flexibility. Any combination of up to 24 connected analog and digital sources can be patched, routed and selectively monitored via any of the connected speakers or headphone systems. You can also create, store and instantly recall customized down-mix configurations.

\* Intonato is Dante format compatible with the optional BSS BLUDAN interface

# INTONATO|24

## Monitor Management Tuning System



### MAC, WINDOWS, TABLET\* SOFTWARE ■

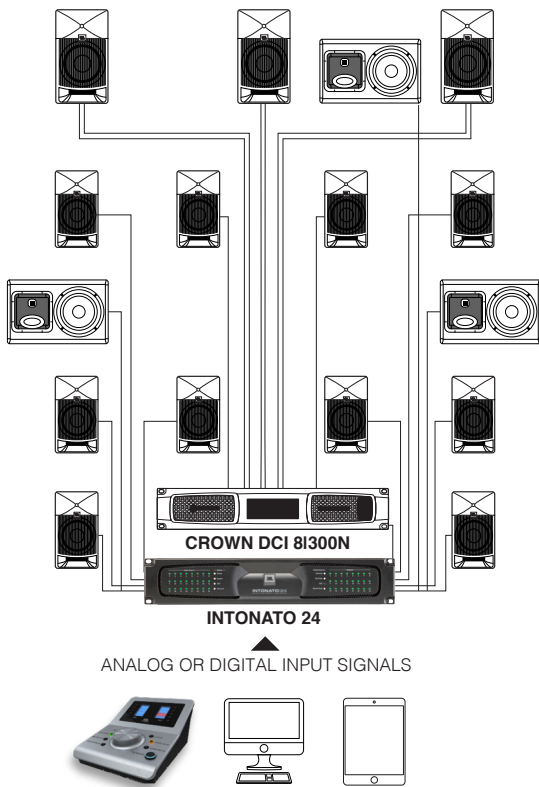
Intonato 24 software provides real-time control of System Volume, Mute and Dim controls, individual speaker Mute and Solo, input source and speaker selection, user-configured down-mixes and more. The software provides easy, intuitive setup and calibration of monitoring systems and input sources.



\* iOS and Android Tablet Software available summer 2017

### INTONATO 24 DESKTOP CONTROLLER ■

In an elegant compact form factor, the optional Intonato Desktop Controller provides live control of the features needed during sessions. Instant recall of user-created Scenes allows down-mix monitoring and monitoring of selected sources via main and alternate speaker systems. The Desktop Controller is connected to Intonato 24 using a single CAT5 cable and powered over Ethernet.



Control using Computer, Tablet and Intonato Desktop Controller

### A COMPLETE SOLUTION FOR ANY CONTROL ROOM ■

Intonato 24 pairs with JBL 7 Series studio monitors to create the first complete monitoring system designed for immersive audio production in control rooms of any size. Intonato 24 includes tuning presets for JBL 7 Series Installed Monitors and M2 Primary Reference Monitors, and can also be used with any passive or powered speakers. In addition, the HARMAN BLU link network protocol allows Intonato 24 to be digitally networked with Crown power amplifiers and a wide assortment of system components.

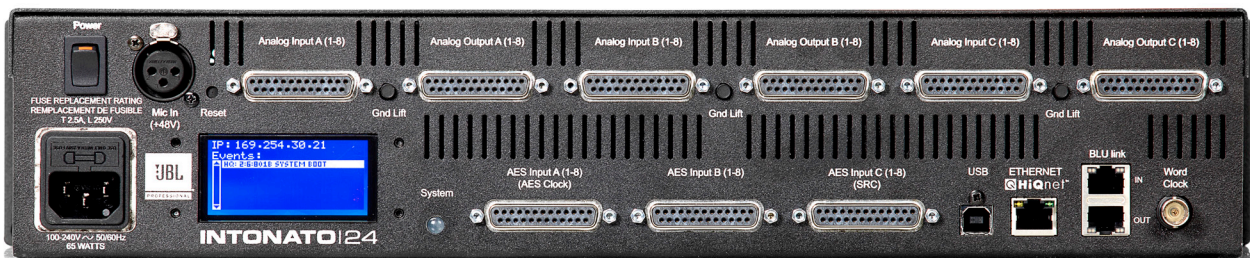
# INTONATO|24

## Monitor Management Tuning System



### FULL FEATURES AND BENEFITS ■

- Intonato 24 can be used with any studio monitors
- 24 balanced analog line-level speaker outputs allow connection of powered studio monitors and power amplifiers
- Automated Speaker Calibration with included microphone precisely balances, tunes and aligns all speakers to deliver greater accuracy to the mix position in any room
- 12 bands of Room EQ, Delay and Level per speaker
- 8-band User EQ allows standard and customized response curves, such as X-Curve, and compensation for perforated screen transmission loss
- 24 balanced analog inputs with selectable input sensitivity and gain trims allow connection to a broad range of professional and consumer equipment
- 24 AES3 Inputs, 8 Sample-Rate Converters, and Word Clock Input allow connection of a broad range of digital sources
- RJ45 BLU link port allows convenient CAT5 connection to Crown power amplifiers and other HARMAN BLU link equipped devices; optional BSS BLUDAN interface
- connects Intonato 24 to Dante networks
- Input gain trim controls and level indicators on each channel allow precise calibration
- Internal router/mixer allows user-configurable down-mixes and selective monitoring of any input via any or all speakers
- Integration of up to 4 subwoofers for LFE channels and bass management
- Variable Audio/Video Sync delay allows compensation for video display latency
- Stereo Aux Out with dedicated level control, EQ and talk back system allows an independent feed to be sent to talent or a remote “green room”
- Scenes allow instant recall of down-mixes, input source and speaker selection
- Profiles allow configurations and project-specific EQ to be saved and recalled
- Intuitive setup and control with included Macintosh, Windows and iOS/Android tablet software or optional Intonato Desktop Controller
- Low-noise fan for quiet operation





# INTONATO | 24

## Monitor Management Tuning System



### SPECIFICATIONS ■

#### OUTPUTS

**Total Simultaneous Outputs:**  
24 analog outputs and 24 simultaneous BLU link outputs

**Connectors:** 3 female 25-pin D-Sub connectors

**24 Balanced ANALOG OUTPUTS:** Female XLR

**Max Output Level:** +24 dBu, balanced, ≤ .006% THD

#### BLU LINK AUDIO

**Connectors:** 2 x RJ45 connectors

**Maximum Cable Length:**

100m/328ft on Category 5e or higher cable between devices

**Latency:** 11/Fs [0.23ms@48k, 0.11ms@96k]

**Pass Through Latency:** 4/Fs [0.08ms@48k, 0.04ms@96k]

#### INPUTS

**Total Simultaneous Inputs:** 24 (selectable among the available 24 analog, 24 AES3, and 24 BLU link input channels)

#### ANALOG INPUTS

**Connectors:** 3 female 25-pin D-Sub connectors

**Type:** Electronically balanced, RF filtered

**Impedance:** > 48 k $\Omega$  balanced, > 24 k $\Omega$  unbalanced

**Input Sensitivity:** Selectable in software per D-Sub connector: -10 dBV with 18 dB of headroom, +4 dBu with 20 dB of headroom, +8 dBu with 24 dB of headroom

**Max Input Level:** +28 dBu, ≤0.008% THD

**CMRR:** > 47 dB @ 1 kHz

#### 24 AES3 DIGITAL INPUTS

**8 Sample Rate Conversion:** selectable in software

1 Calibration MIC / Talk back Mic INPUT

**With Phantom Power:** +48 VDC

#### WORD CLOCK INPUT

**Supported Sample Rates:** 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz Tolerance: ±50 ppm max

#### SYSTEM PERFORMANCE

**A/D Converter:** 24-bit

**A/D Dynamic Range:** 114 dB A-weighted

**D/A Converter:** 24-bit

**D/A Dynamic Range:** 115 dB A-weighted

**Internal Processing Word**

**Length:** 32-bit floating point

**Supported Sample Rates:** 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz; 32-192 kHz, sample-rate converters enabled.

**Dynamic Range:** 114 dB A-weighted; 112 dB unweighted

**THD+Noise:** 0.007% typical at +4 dBu, 1 kHz, 0 dB input gain

**Frequency Response:** 20 Hz – 20 kHz, +0 /- 0.5 dB

**Latency:** Analog IN to analog OUT (96 kHz): 2.28 ms

**AES IN to analog OUT (96 kHz):** 2.15 ms

**BLU link input to BLU link output (96 kHz):** 0.04ms

#### SIGNAL PROCESSING

**Included Speaker Tuning**

**Presets:** JBL 705i, 708i, M2

**User EQ:** 8-band fully parametric EQ w/ selectable filter type

**Room EQ:** 12-band fully parametric EQ

**Bass Management Crossover:** Variable

**Speaker Output Delay:** Up to 18 ms per output channel for speaker time-of-arrival offset)

**A/V Synchronization Delay:** Up to 150 ms (globally applied to all output channels except aux outputs)

**Aux Out Delay:** Up to 150 ms

**Primary Volume Control:** -120 dB to 0 dB

**Dim Control:** User-adjustable, -120 dB to 0 dB

#### POWER SUPPLY

**Type:** Universal switch-mode

**Operating Voltage:** 100-240 VAC, 50/60 Hz

**Power Consumption:** 85 Watts

#### PHYSICAL

**Rack Height:** 2U

**Unit Weight:** 14.30 lbs (6.4kg)

**Shipping Weight:** 19.04 lbs. (8.64 kg)

**Dimensions:** 3.5" (H) x 13.75" (D) x 19.0" (W)  
88.9mm (H) 349.25mm (D) x 482.6mm (W)

**Order SKU:** INTONATO24MX

UPC 691991006197

#### RECOMMENDED AUDIO CABLES (not included)

Analog In/Out DB25 (Female);

AES In DB25 (Female)

Wired according to industry-standard TASCAM DB25 pinout

#### INCLUDED ITEMS

**Power Cords:** 1 ea. US and 1 ea. European (SHUKO-plug)

Operation Manual and Setup Guide

**Calibration Microphone**

**Set Up and Control Software (via download)**

#### OPTIONAL ACCESSORIES:

**Intonato Desktop Controller**

**Unit Weight:** 1.0 lbs (0.45 kg)

**Dimensions:** 2.84" (H) x 6.73" (D) x 4.70" (W)  
72.0mm (H) 117.0mm (D) x 119.4mm (W)

**Shipping Weight:** 1.7 lbs (0.76 kg)

**Shipping Carton dimensions:** 8.75" L x 7" W x 5.75" H ( 222.25 mm L x 177.8 mm W x 146 mm H)

**Order SKU:** INTONATO-DC-M

UPC 691991006203

Complete Specifications are available in the Intonato 24 Operation Manual at [www.jblpro.com/intonato](http://www.jblpro.com/intonato)

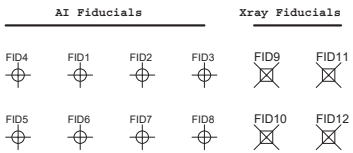
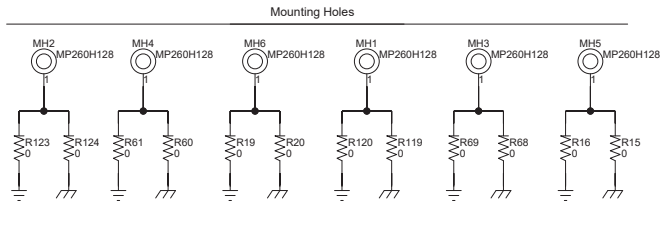
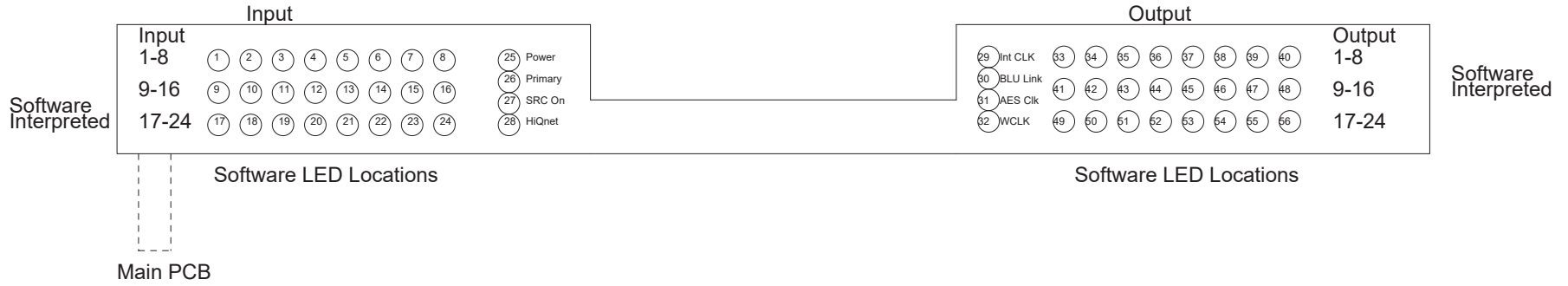


JBL Professional 8500 Balboa Blvd. Northridge, CA 91329 USA

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[www.jblpro.com](http://www.jblpro.com)

REVISION HISTORY					
DATE	REV	DESCRIPTION	BY	CHKD	APVD
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**RoHS**  
RESTRICTION OF HAZARDOUS SUBSTANCES  
ALL MATERIALS USED IN THIS PART MUST BE  
RoHS COMPLIANT.  
SUPPLIER SHALL PROVIDE A CERTIFICATE OF  
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PROPRIETARY AND CONFIDENTIAL PROPERTY OF  
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PUBLISH WITHOUT APPROVAL.

**CAUTION:**  
CONTAINS PARTS AND ASSEMBLIES  
SUSCEPTIBLE TO DAMAGE BY  
ELECTROSTATIC DISCHARGE (ESD).

DRN BY B. WILSON	DATE 8 OCT 2015
ENGR B. WILSON	DATE 8 OCT 2015

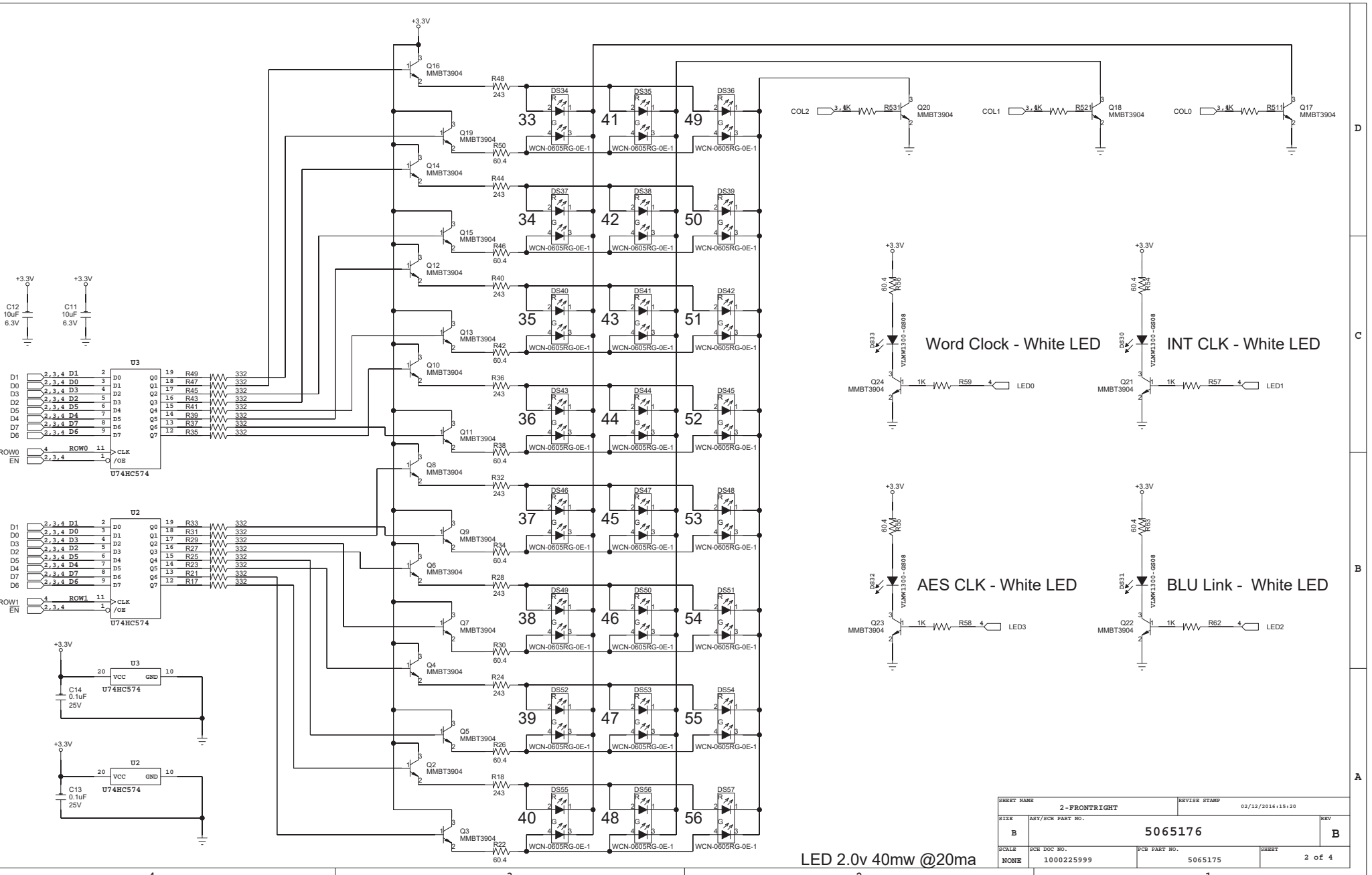
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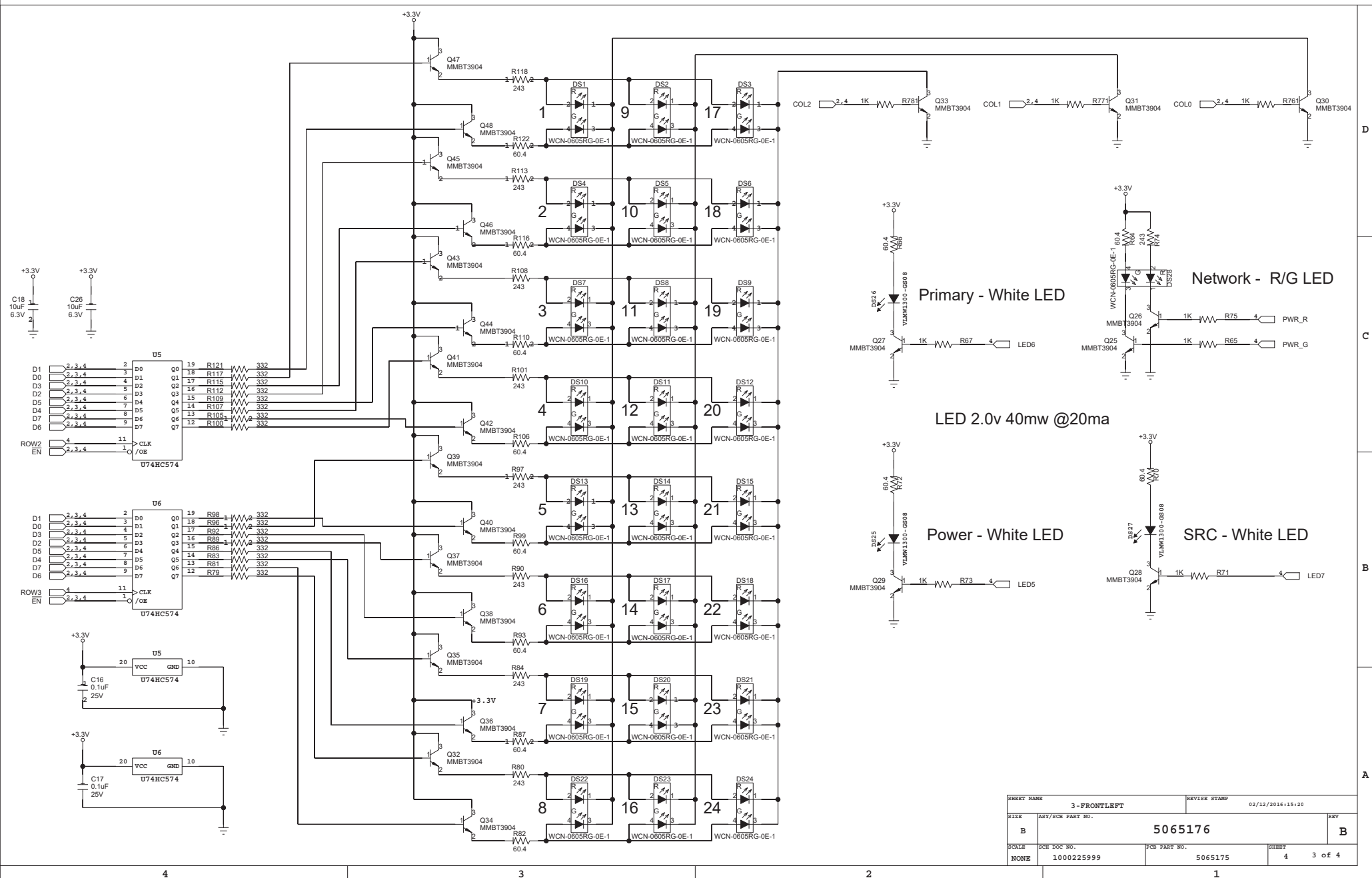
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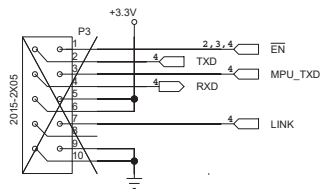
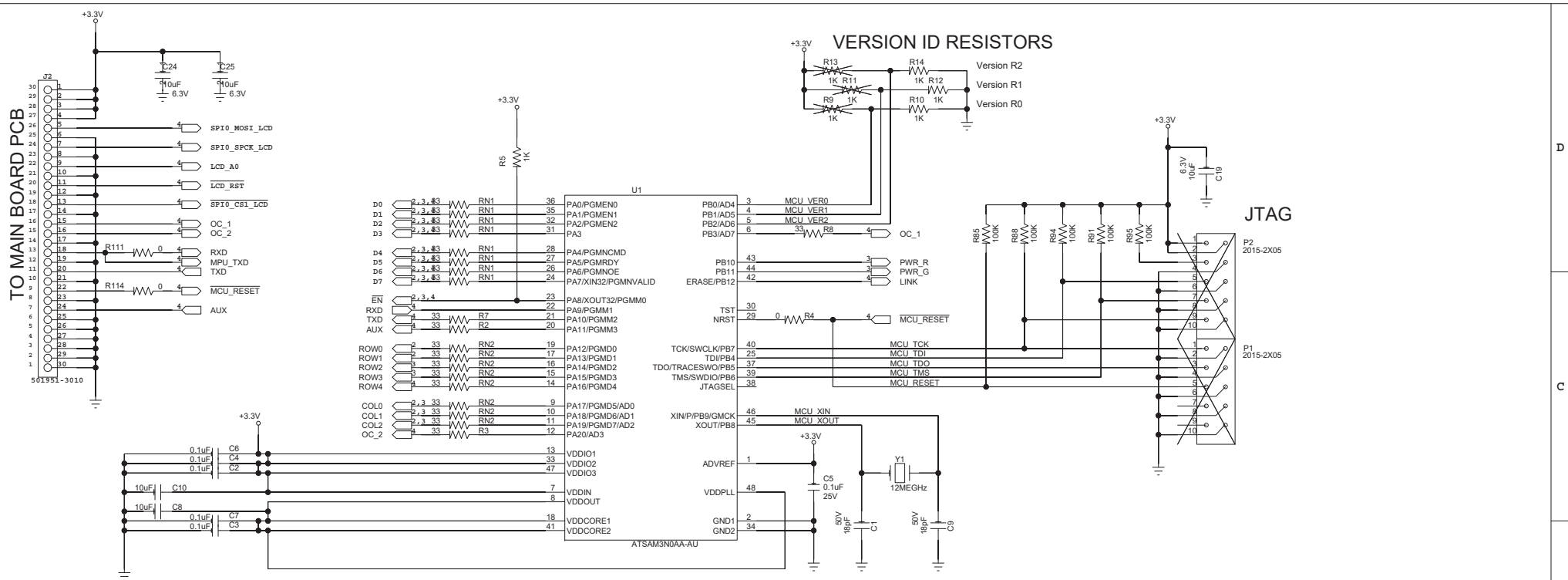
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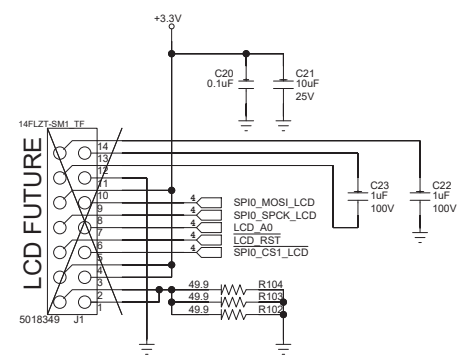
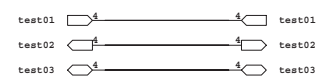
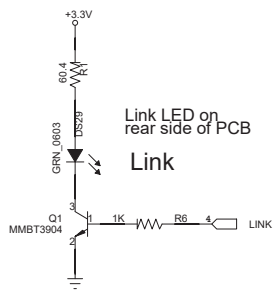
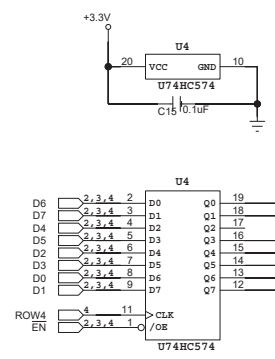
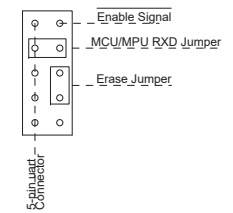




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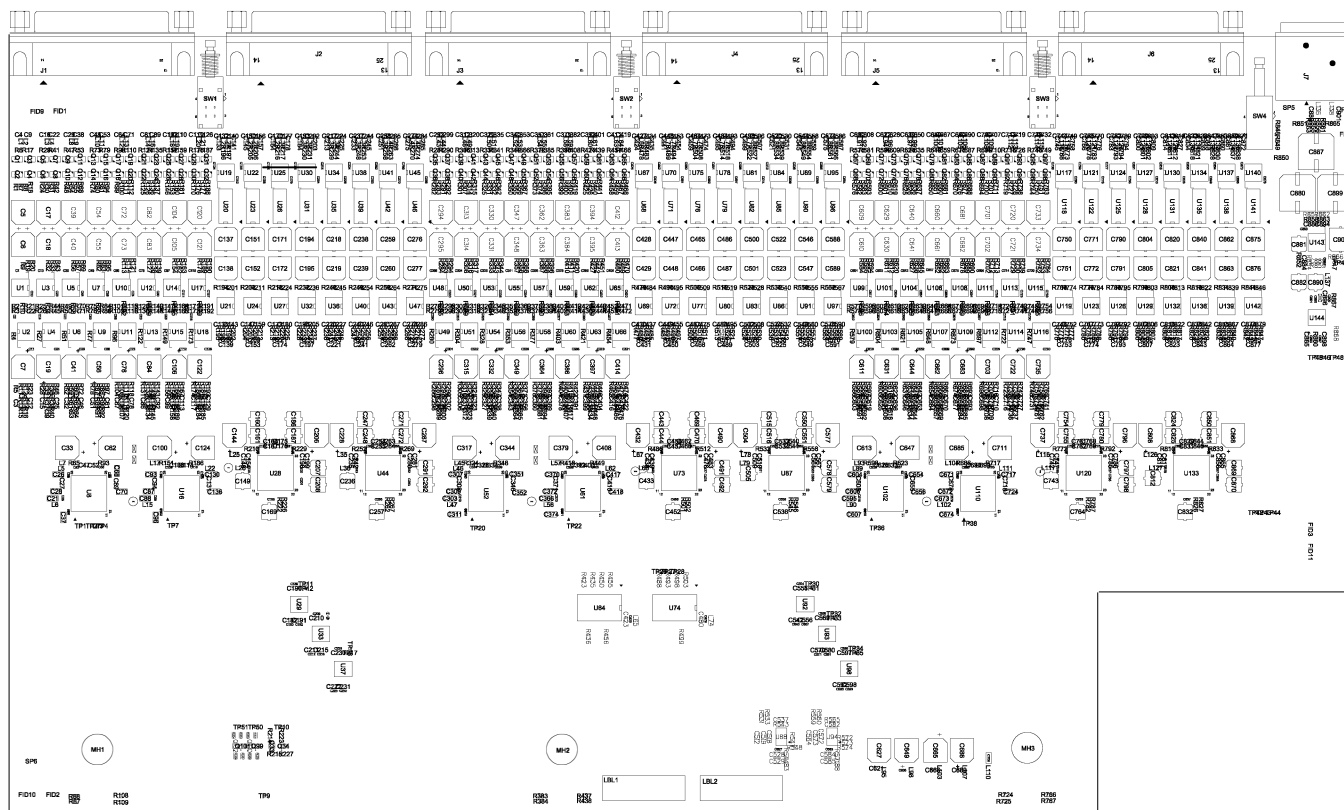
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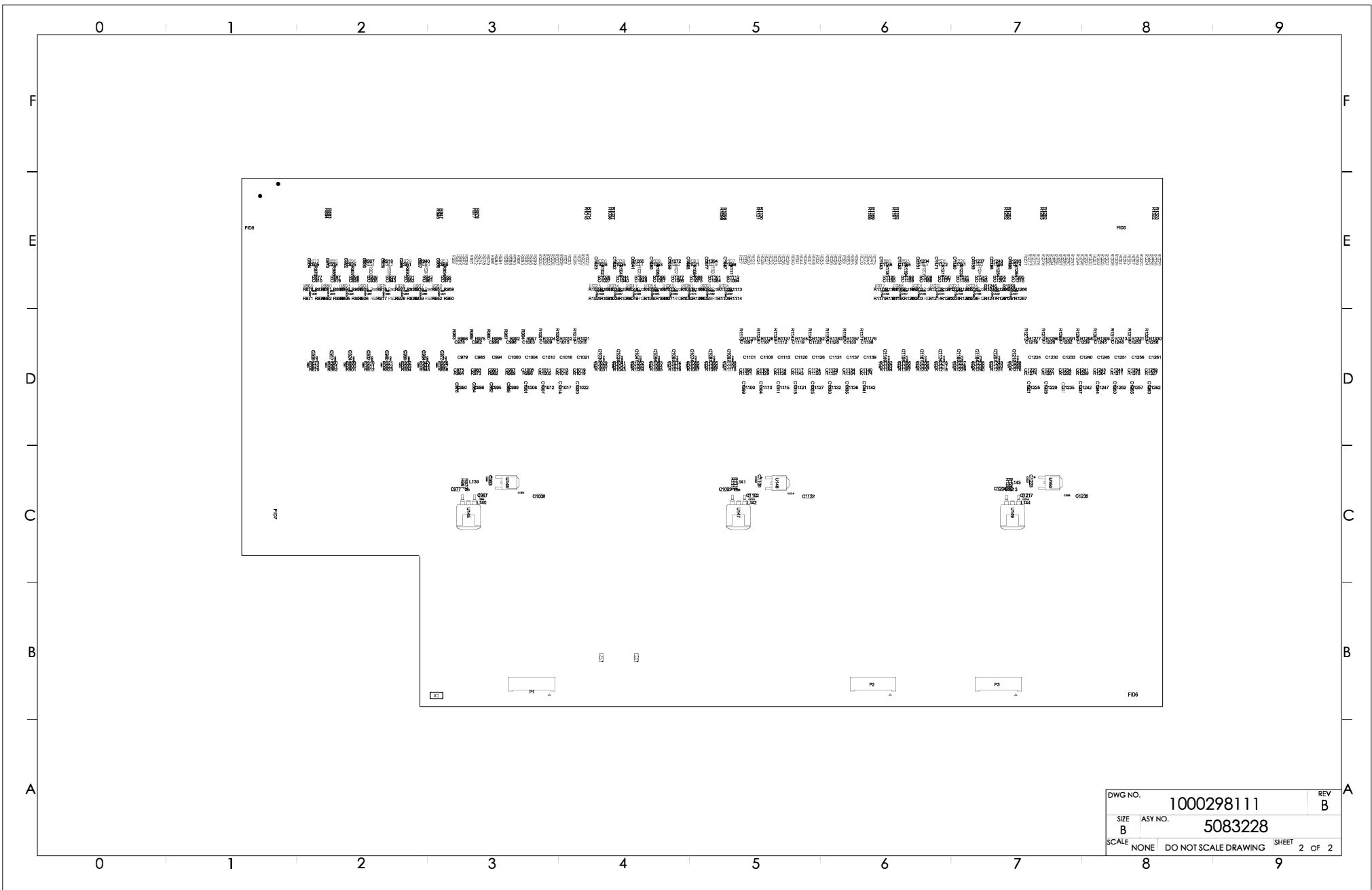


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 XX ±.01 (0.254)  
 XXX ±.005 (0.127)  
 ALL DIMENSIONS ARE IN INCHES (MM)  
 ALL DIMENSIONS APPLY AFTER FINISH

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 ALL MATERIALS USED IN THIS PART  
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 SUPPLIER SHALL PROVIDE A  
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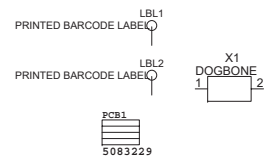
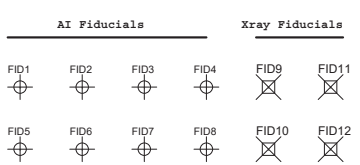
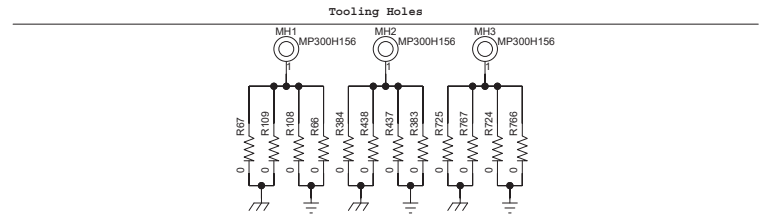
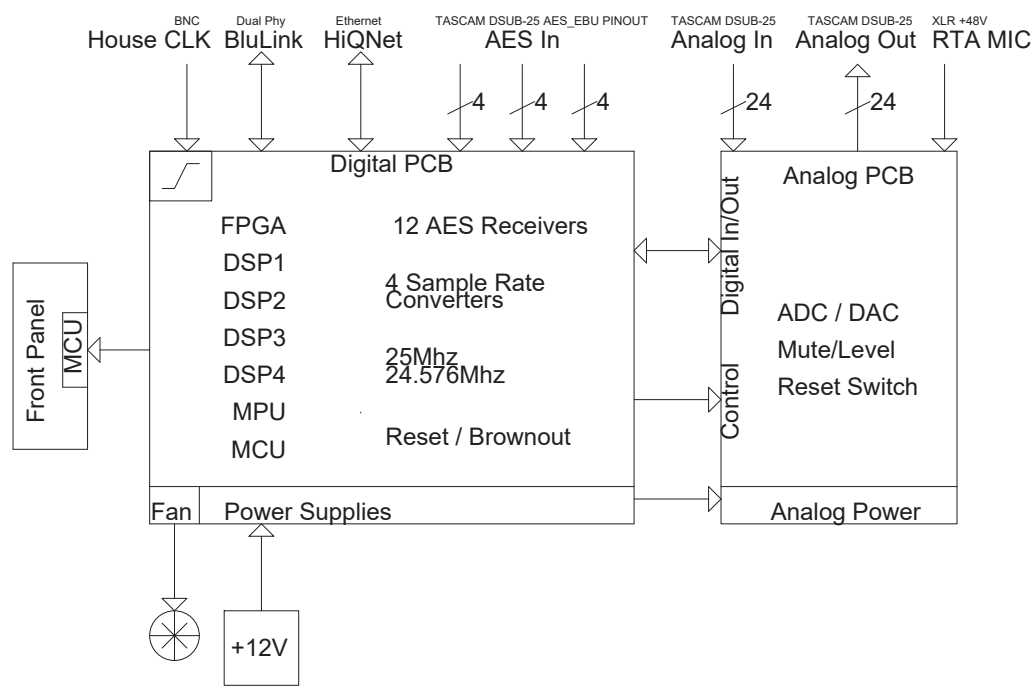
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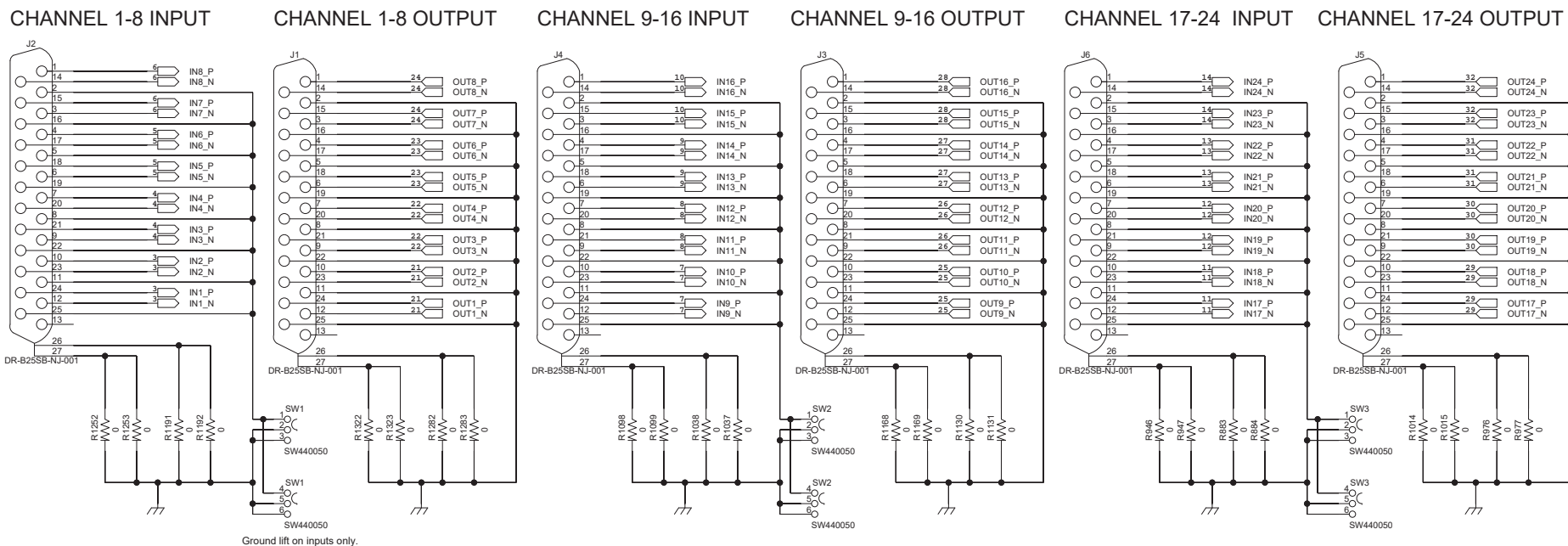
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7 Analog In 9 10	27 Analog Out 13 14
8 Analog In 11 12	28 Analog Out 15 16
9 Analog In 13 14	29 Analog Out 17 18
10 Analog In 15 16	30 Analog Out 19 20
11 Analog In 17 18	31 Analog Out 21 22
12 Analog In 19 20	32 Analog Out 23 24
13 Analog In 21 22	33 RTA Mic
14 Analog In 23 24	34 Power 1
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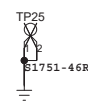


<p><b>RoHS</b></p> <p>RESTRICTION OF HAZARDOUS SUBSTANCES ALL MATERIALS USED IN THIS PART MUST BE RoHS COMPLIANT.</p> <p>SUPPLIER SHALL PROVIDE A CERTIFICATE OF RoHS COMPLIANCE WITH THE FIRST ARTICLE.</p> <p>PROPRIETARY AND CONFIDENTIAL PROPERTY OF HARMAN. DO NOT DISCLOSE, REPRODUCE, OR PUBLISH WITHOUT APPROVAL.</p>		<p><b>CAUTION:</b></p> <p>CONTAINS PARTS AND ASSEMBLIES SUSCEPTIBLE TO DAMAGE BY ELECTROSTATIC DISCHARGE (ESD).</p> <p>DRAWN BY: B. Wilson ENGINEER: B. Wilson DATE: 22Dec2016 DATE: 12JAN2017</p>	<p>SHEET NAME: 1-Title Page REVISE STAMP: 14/02/2017:13:27</p> <p><b>HARMAN</b></p> <p>TITLE: PCB SCH, YellowTail_Analog_AV1</p> <p>SIZE: B ASV/SCH PART NO.: 5083228 REV: B</p> <p>SCALE: NONE SCH DOC NO.: 1000298113 PCB PART NO.: 5083229 SHEET: 1 of 35</p>
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**TASCAM DB-25 Pinout Standard  
Through-Hole DSUBS**



ESD options. Grounding DSUB shield to chassis required.  
Mechanical suspension of Analog PCB uses DSUB connectors.  
A Chassis ground strip is on Analog PCB under DSUB and front end filter caps.  
Chassis ground is not connected to digital PCB via any connector.  
Options to connect shield ground to chassis ground at front of PCB via standoffs.



**YellowTail Analog PCB**

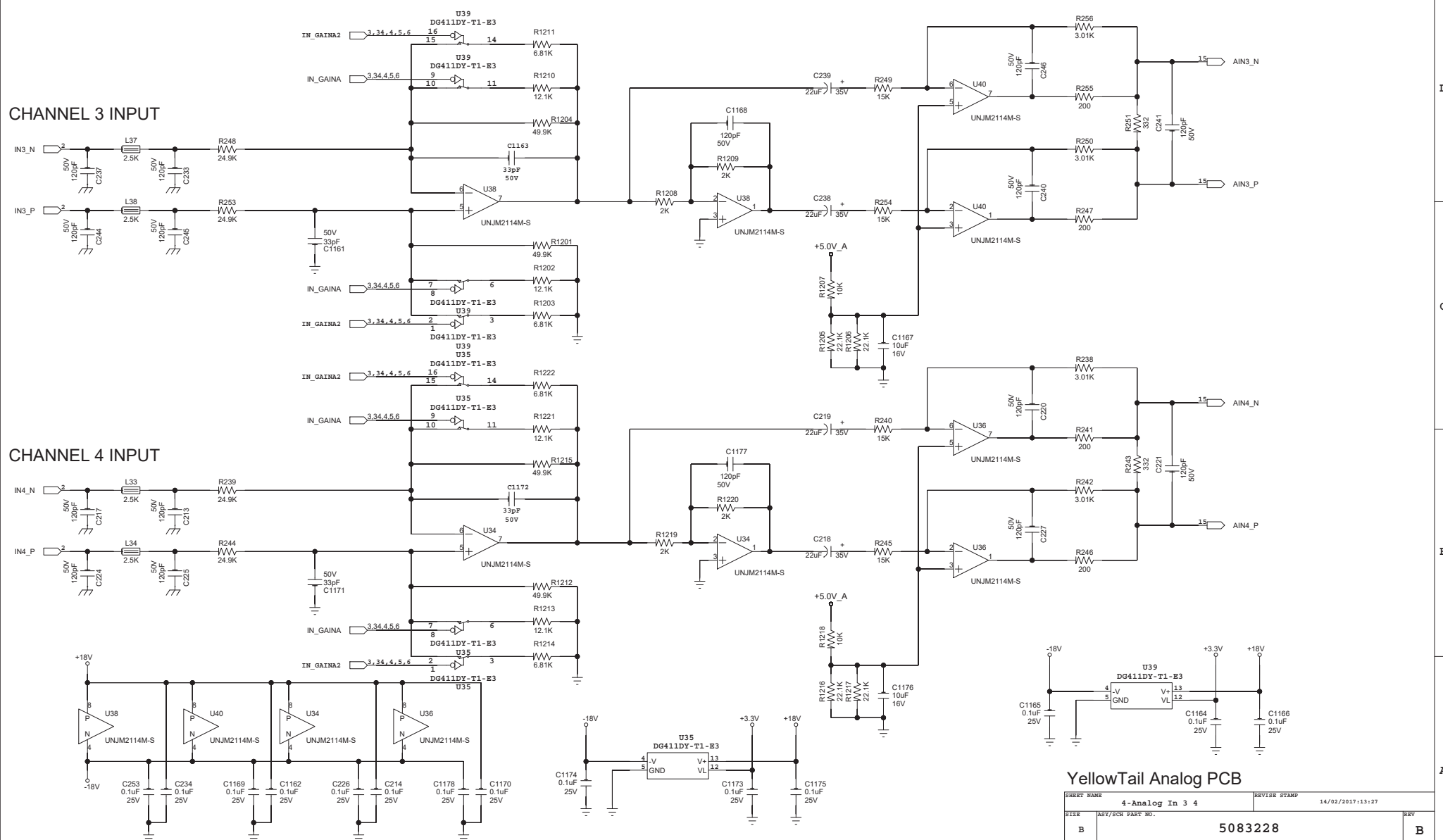
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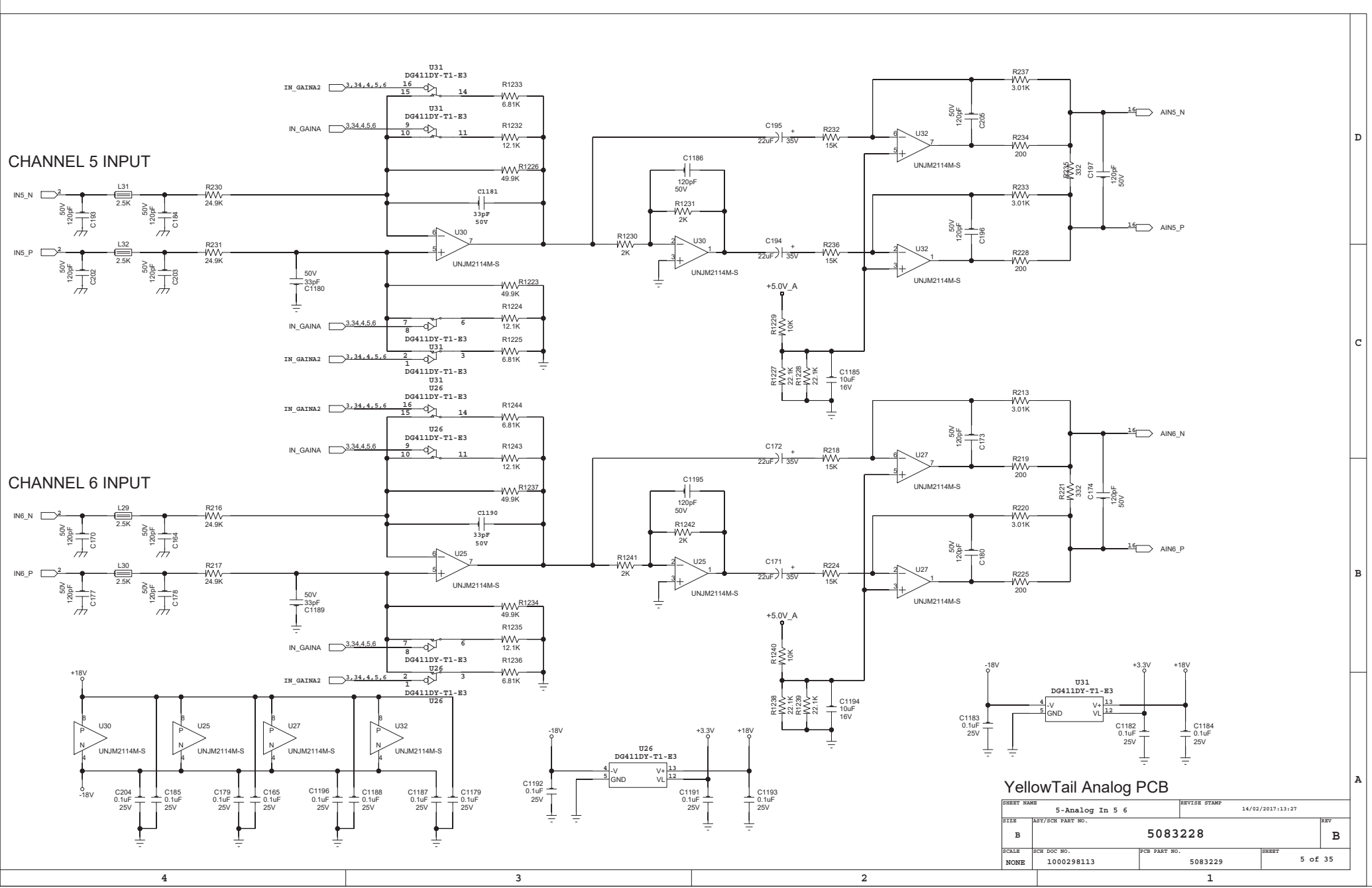
CHANNEL 3 INPUT

CHANNEL 4 INPUT



YellowTail Analog PCB

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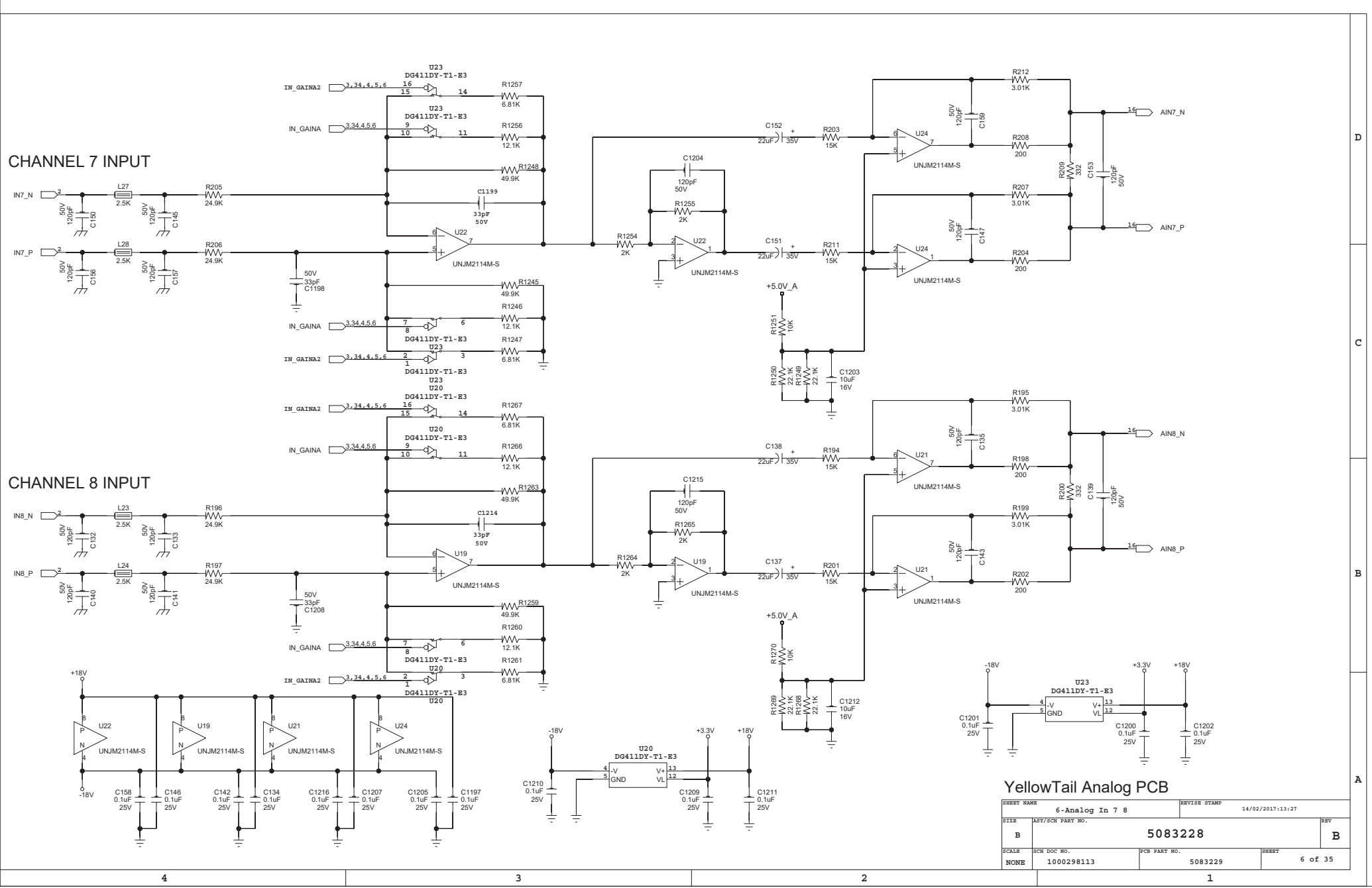


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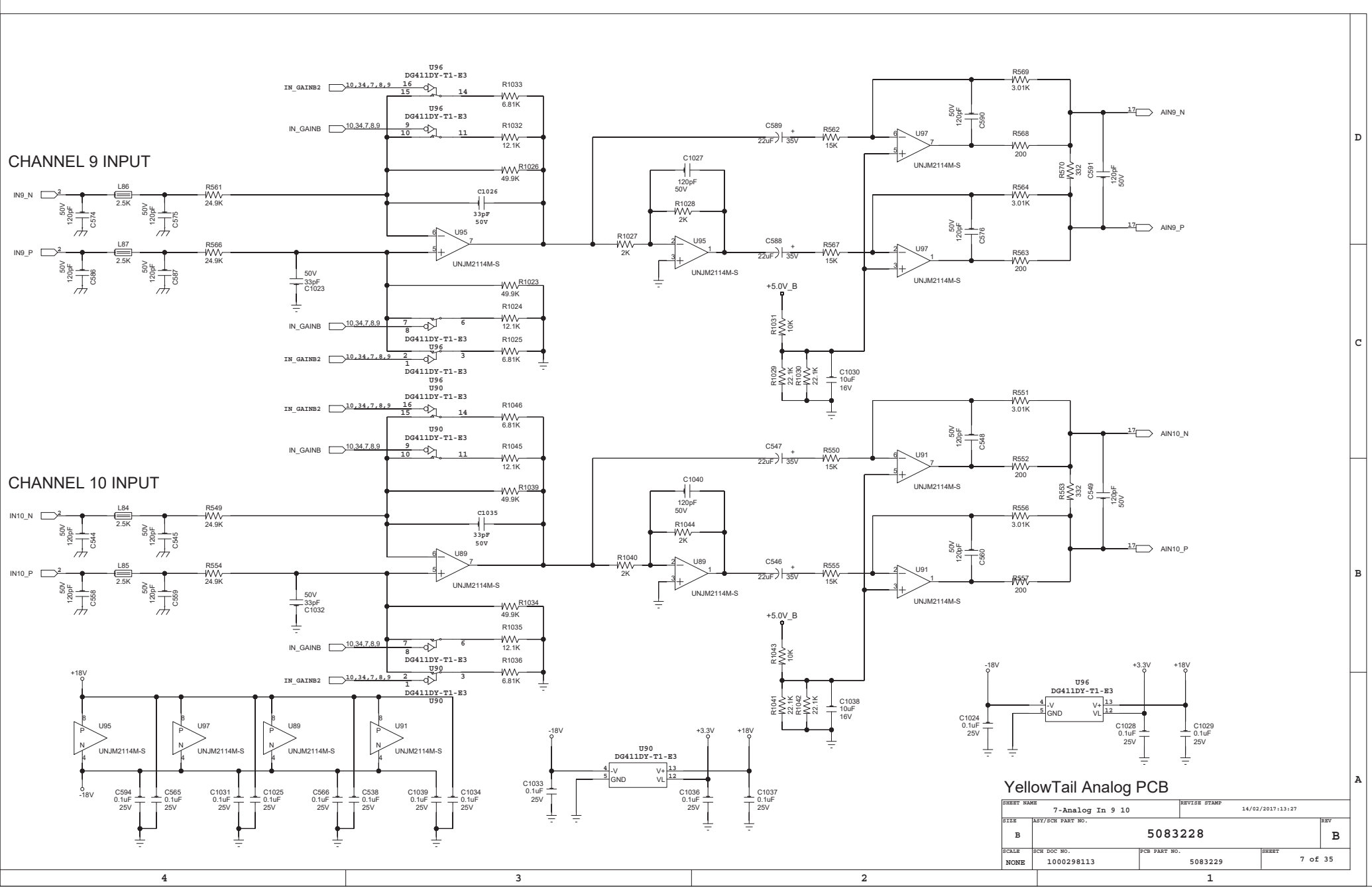


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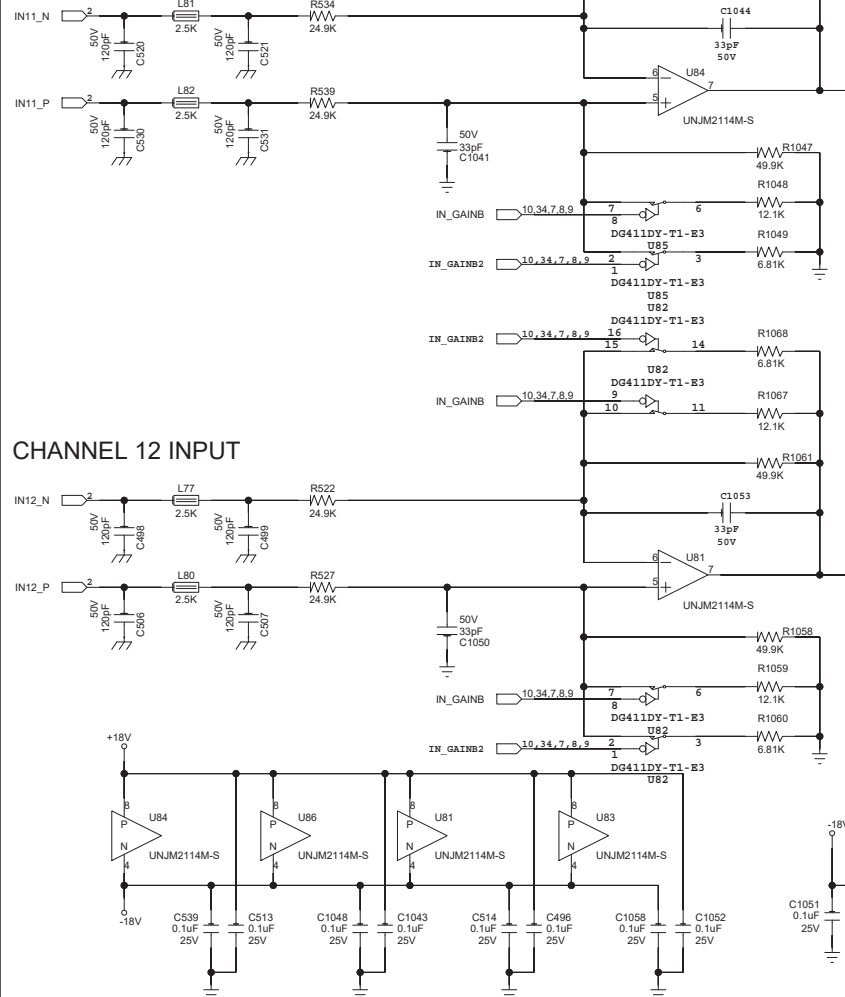
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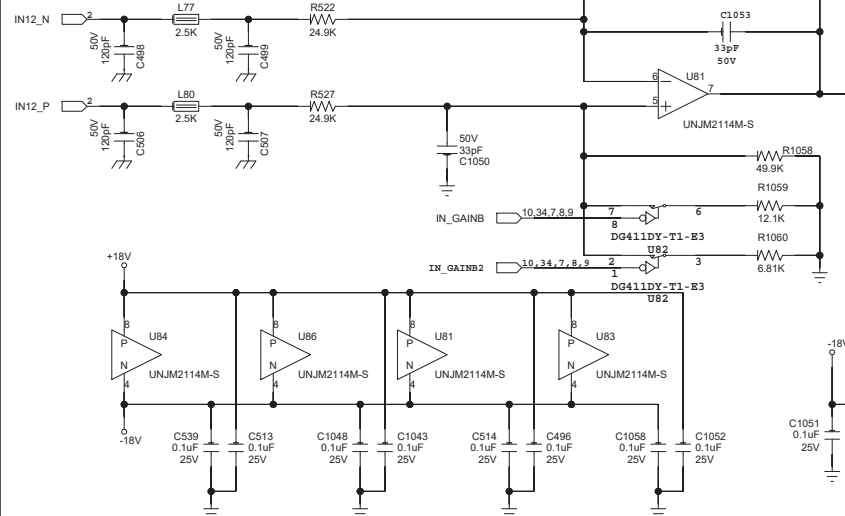
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### CHANNEL 11 INPUT



### CHANNEL 12 INPUT



### YellowTail Analog PCB

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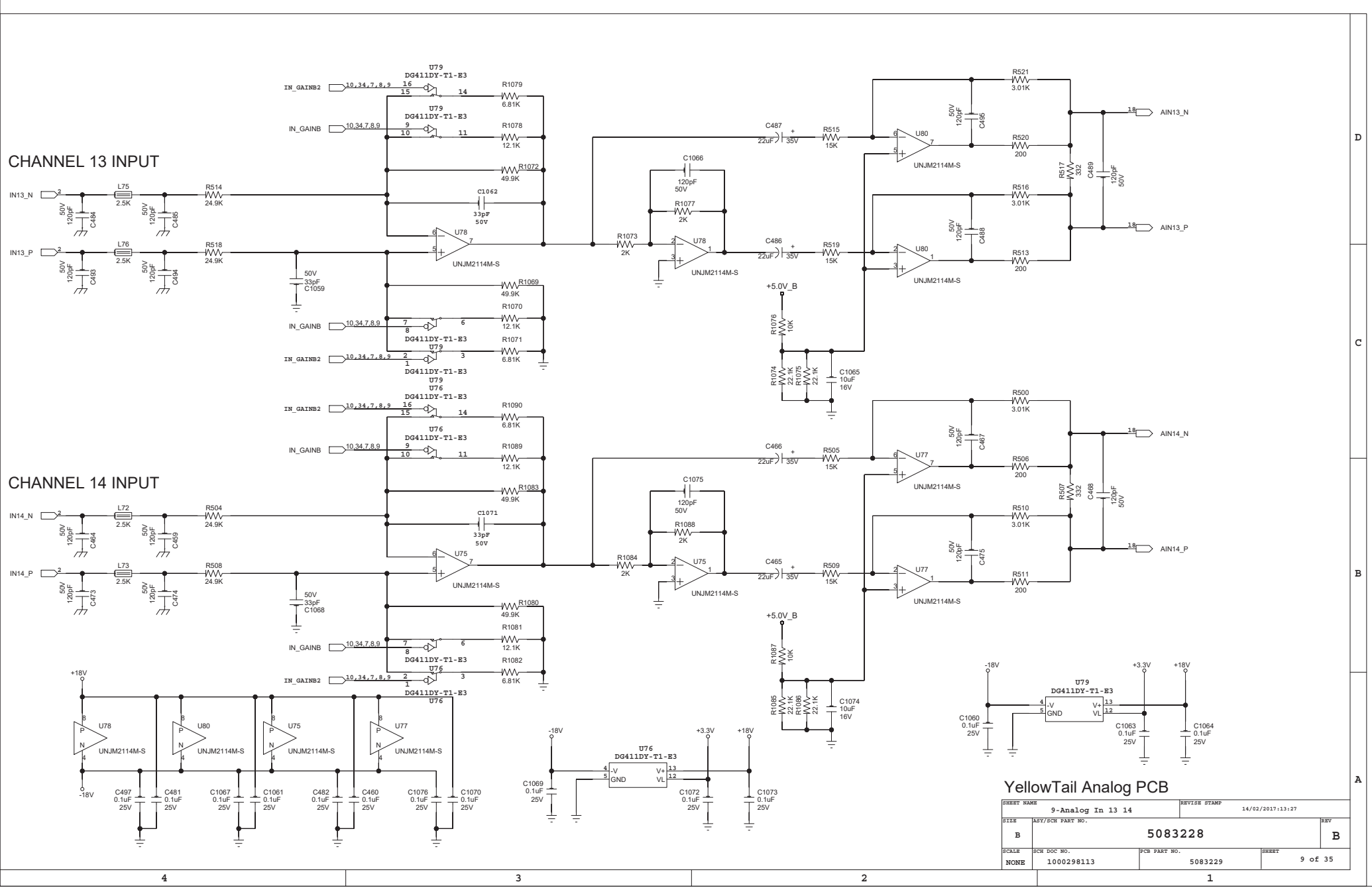
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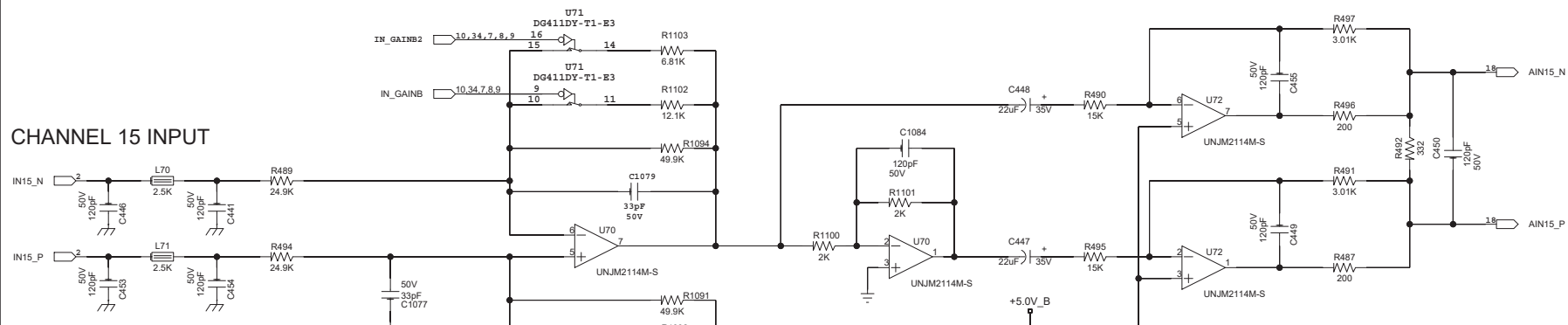


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9-Analog In 13 14		14/02/2017:13:27	
SIZE	ASV/SCH PART NO.	REV	
B	5083228	B	
SCALE	SCH DOC NO.	PCB PART NO.	SHEET
NONE	1000298113	5083229	9 of 35

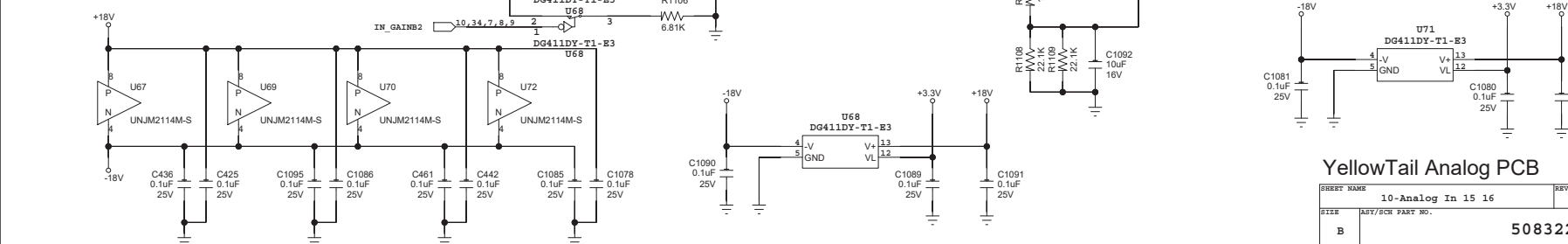
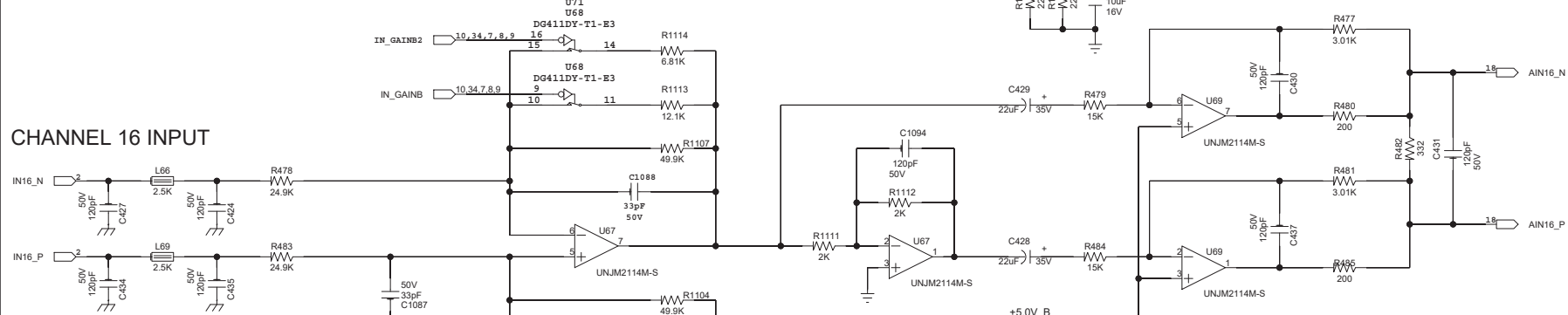
4 3 2 1

D  
C  
B  
A

CHANNEL 15 INPUT



CHANNEL 16 INPUT



YellowTail Analog PCB

SHEET NAME 10-Analog In 15 16		REVISE STAMP 14/02/2017:13:27	
SIZE B	ASV/SCH PART NO. 5083228	REV B	
SCALE NONE	SCH DOC NO. 1000298113	PCB PART NO. 5083229	SHEET 10 of 35

D

C

B

A

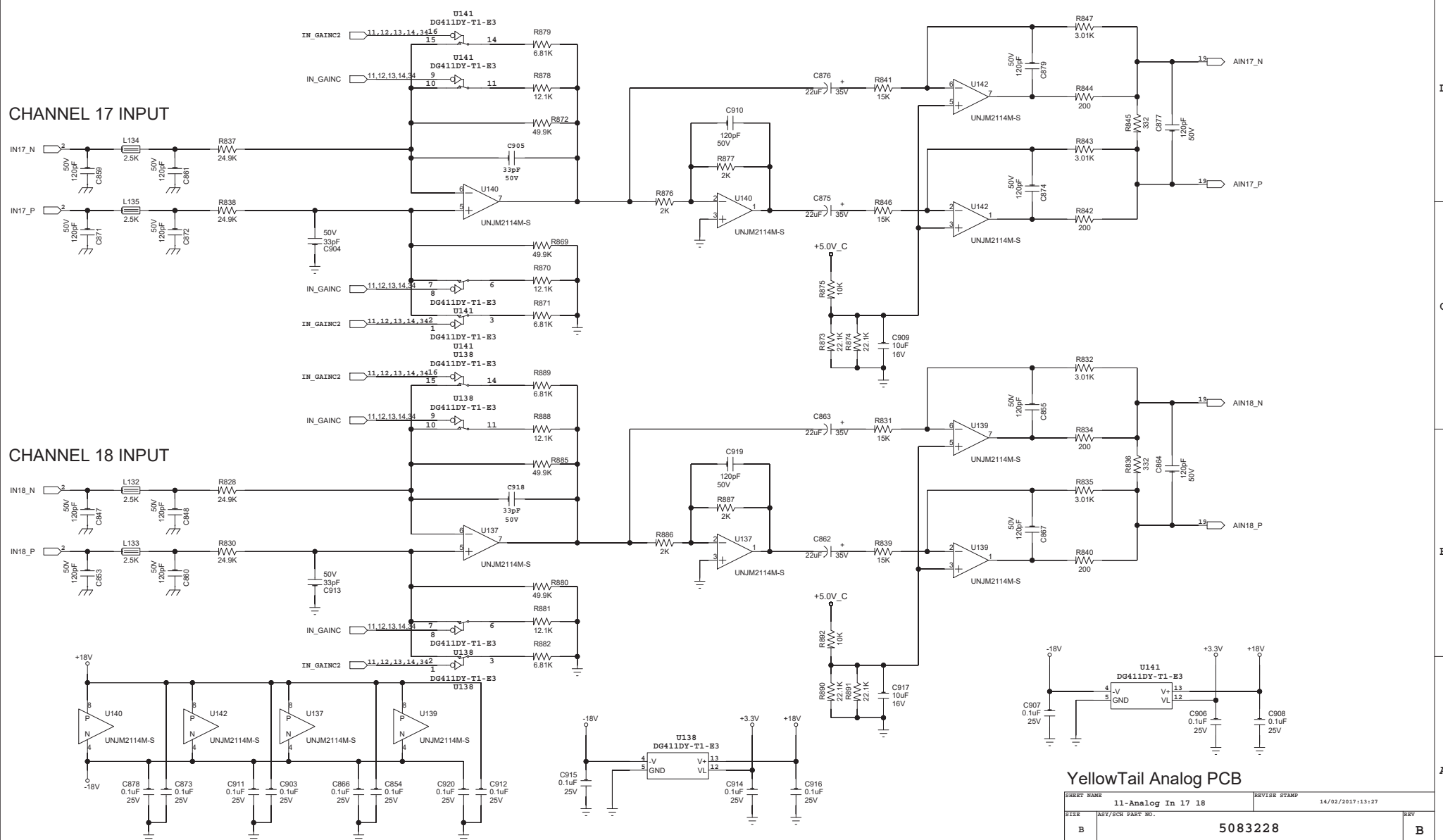
4

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1

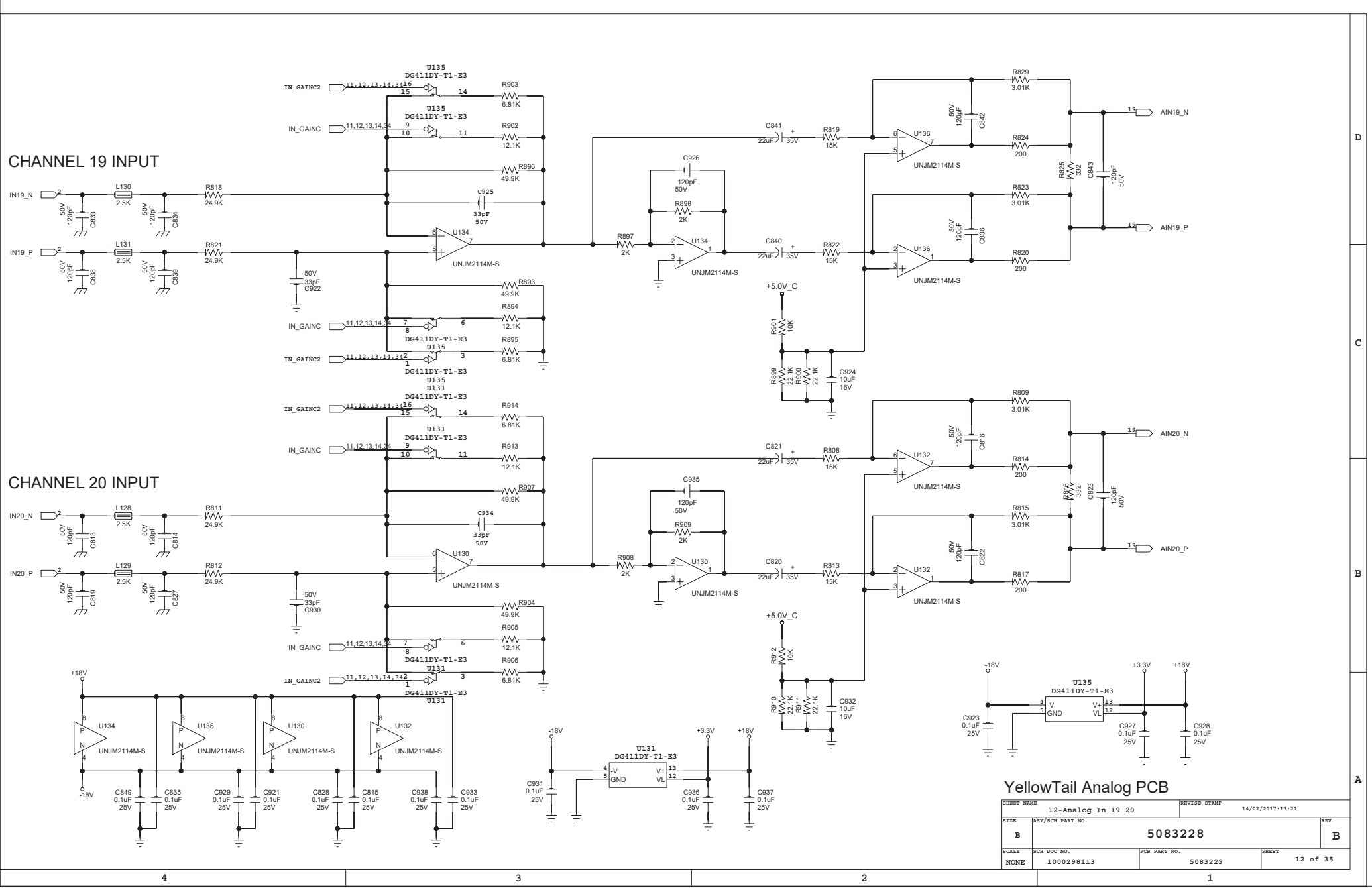
CHANNEL 17 INPUT



CHANNEL 18 INPUT

YellowTail Analog PCB

SHEET NAME		11-Analog In 17 18		REVISE STAMP		14/02/2017:13:27	
SIZE		ASV/SCH PART NO.		5083228		REV	
SCALE		SCH DOC NO.		PCB PART NO.		SHEET	
NONE		1000298113		5083229		11 of 35	



SHEET NAME		12-Analog In 19 20		REVISE STAMP		14/02/2017:13:27	
SIZE	ASV/SCH PART NO.	5083228				REV	
SCALE	SCH DOC NO.	PCB PART NO.	SHEET	12 of 35			
NONE	1000298113	5083229					

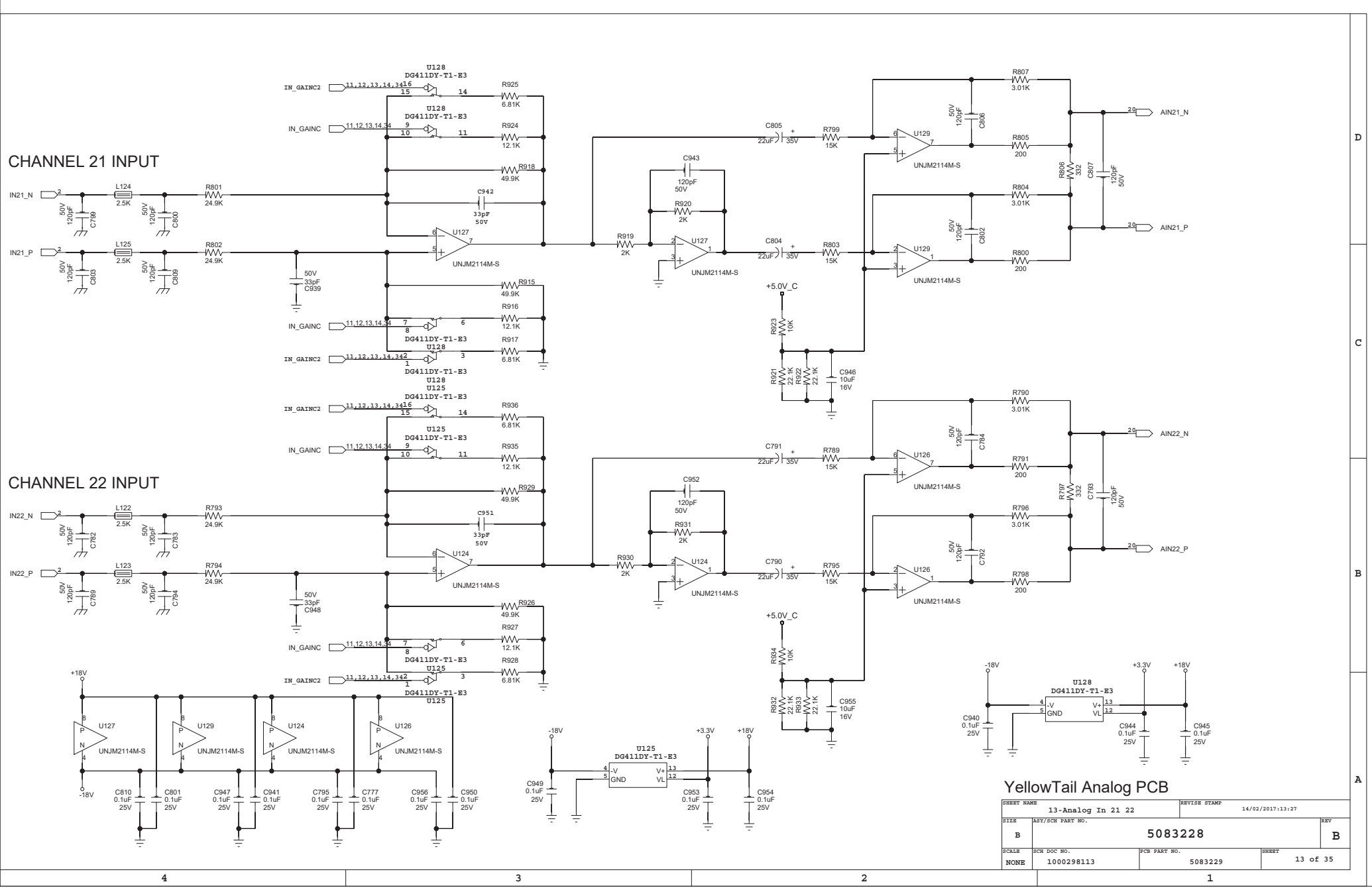
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3

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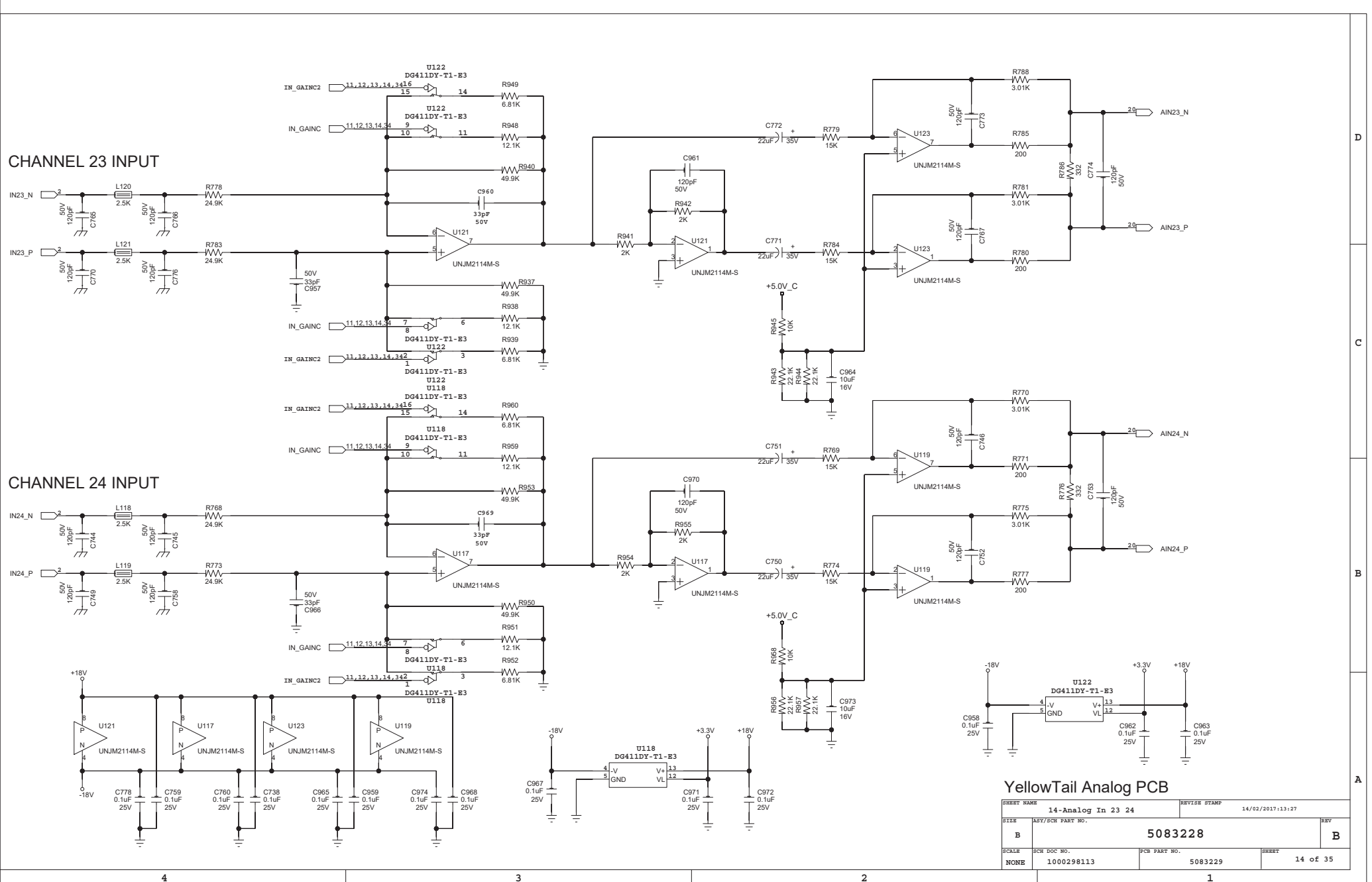
1

D  
C  
B  
A



YellowTail Analog PCB

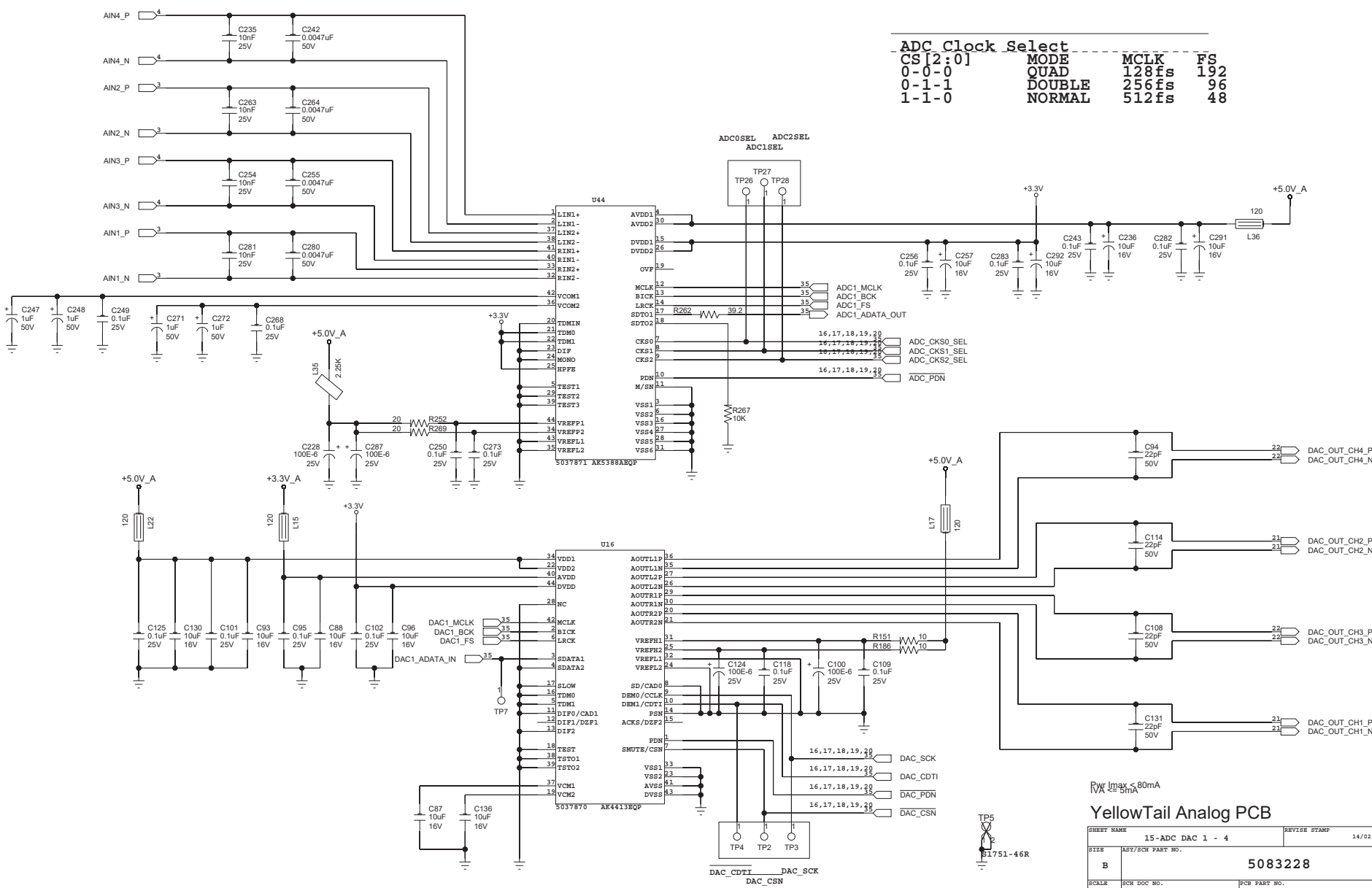
SHEET NAME		13-Analog In 21 22		REVISE STAMP		14/02/2017:13:27	
SIZE		ASV/SCH PART NO.		5083228		REV	
SCALE		SCH DOC NO.		PCB PART NO.		SHEET	
NONE		1000298113		5083229		13 of 35	



SHEET NAME		REVISE STAMP	
14-Analog In 23 24		14/02/2017:13:27	
SIZE	ASV/SCH PART NO.	REV	
B	5083228	B	
SCALE	SCH DOC NO.	PCB PART NO.	SHEET
NONE	1000298113	5083229	14 of 35

4 3 2 1





ADC Clock Select			
CS[2:0]	MODE	MCLK	FS
0-0-0	QUAD	128fs	192
0-1-1	DOUBLE	256fs	96
1-1-0	NORMAL	512fs	48

$R_{\text{IN}} I_{\text{max}} \leq 80\text{mA}$   
 $R_{\text{IN}} I_{\text{max}} \leq 5\text{mA}$

**YellowTail Analog PCB**

SHEET NAME		15-ADC DAC 1 - 4	REVISE STAMP	14/02/2017:13:27
SIZE	ASV/SCH PART NO.	5083228		REV
SCALE	SCH DOC NO.	1000298113	PCB PART NO.	5083229
NONE			SHEET	15 of 35

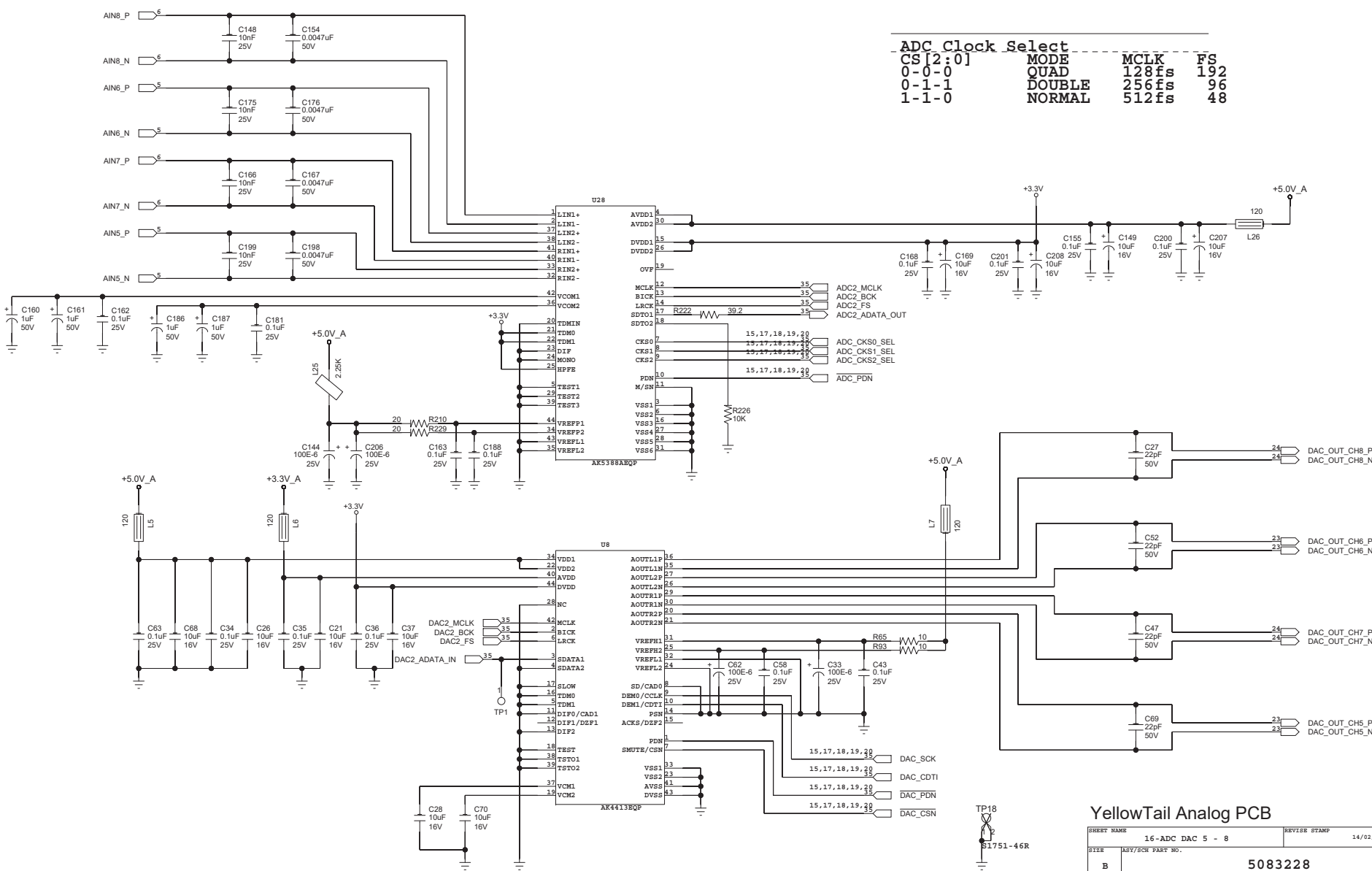
4

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D  
C  
B  
A

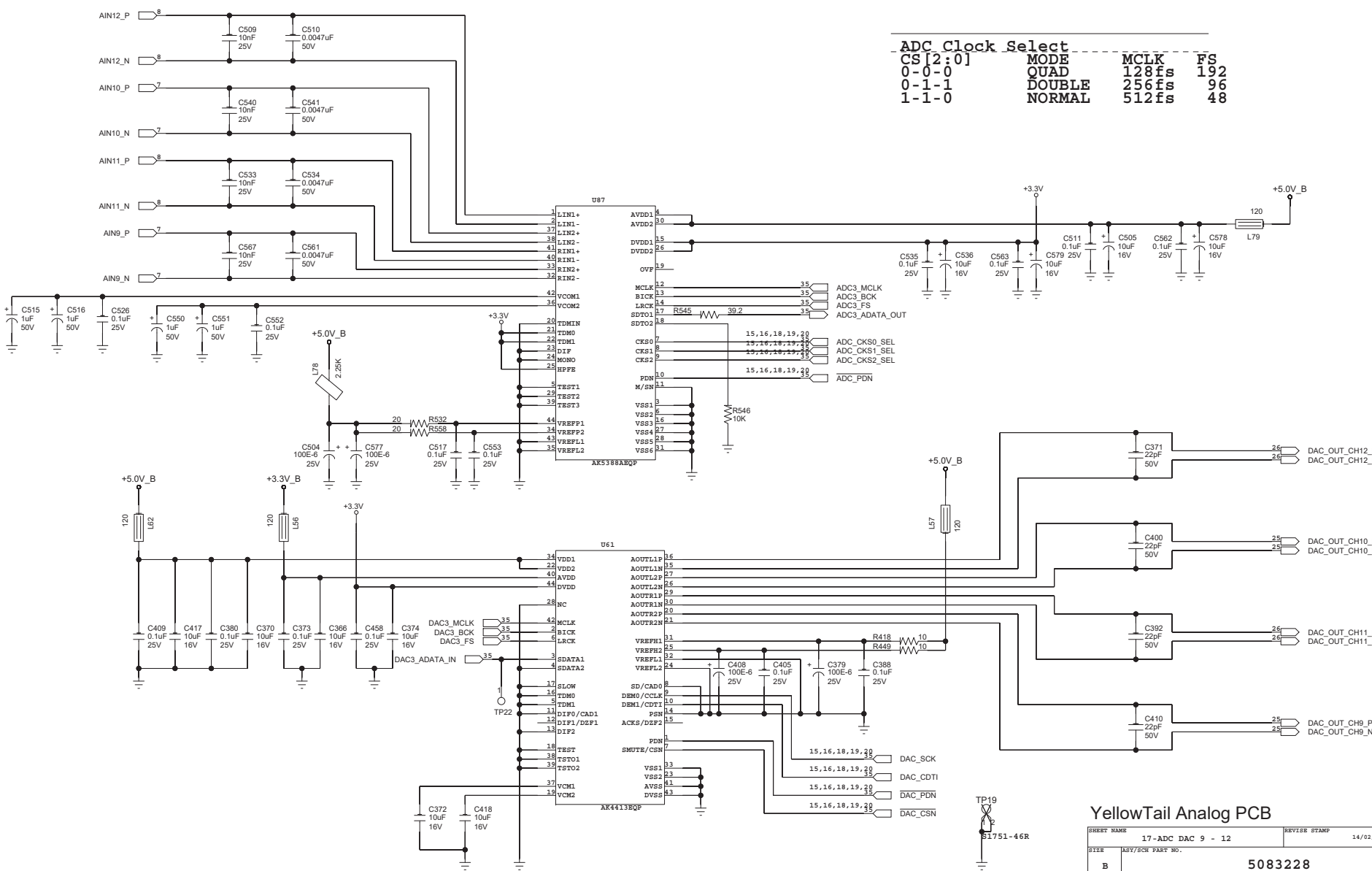


ADC Clock Select

CS[2:0]	MODE	MCLK	FS
0-0-0	QUAD	128fs	192
0-1-1	DOUBLE	256fs	96
1-1-0	NORMAL	512fs	48

YellowTail Analog PCB

SHEET NAME		16-ADC DAC 5 - 8	REVISE STAMP	14/02/2017:13:27
SIZE	ASV/SCH PART NO.	5083228		REV
SCALE	SCH DOC NO.	PCB PART NO.	SHEET	16 of 35
NONE	1000298113	5083229		



CS[2:0]	MODE	MCLK	FS
0-0-0	QUAD	128fs	192
0-1-1	DOUBLE	256fs	96
1-1-0	NORMAL	512fs	48

YellowTail Analog PCB

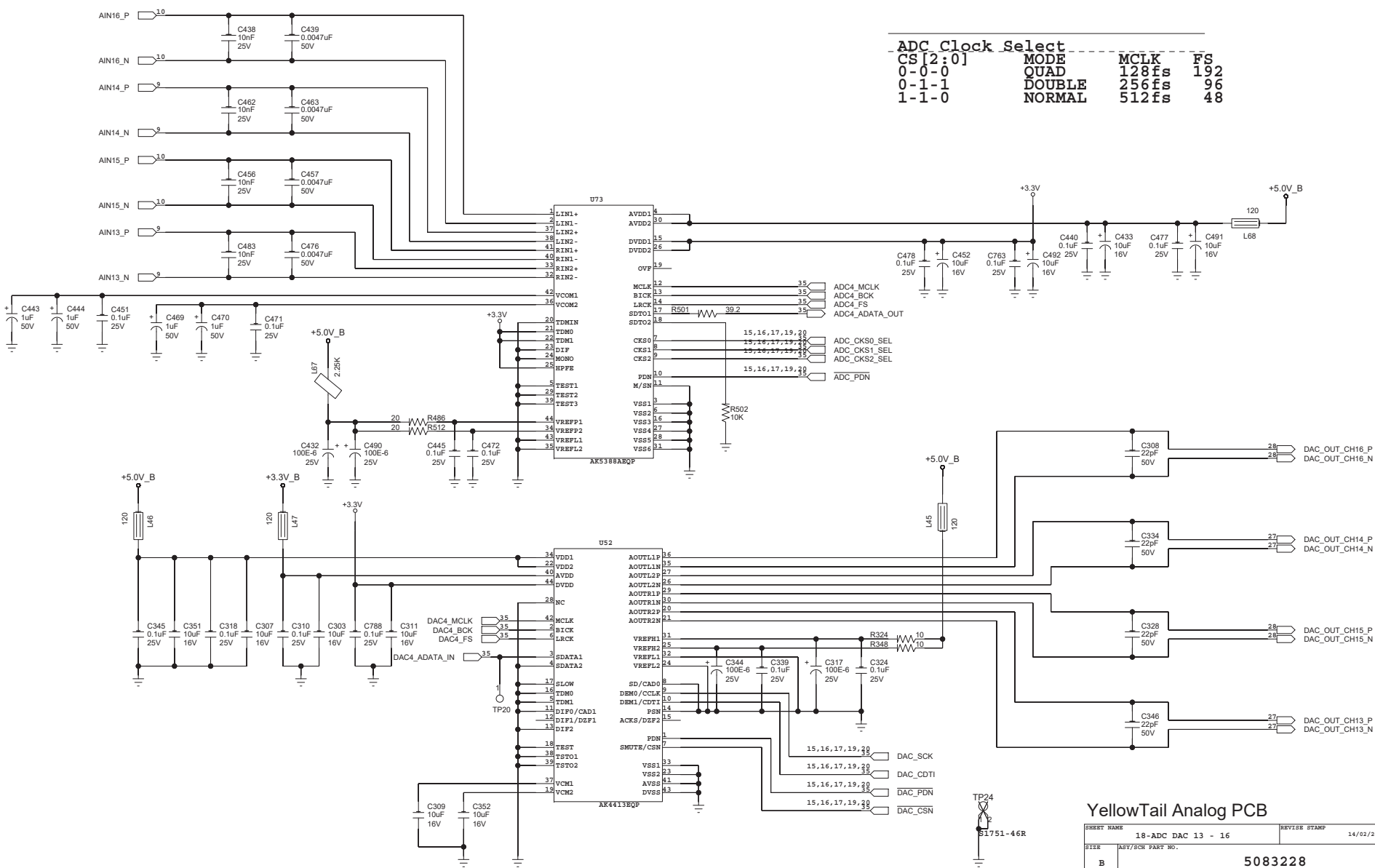
SHEET NAME		17-ADC DAC 9 - 12		REVISE STAMP		14/02/2017:13:27	
SIZE		ASV/SCH PART NO.		5083228		REV	
SCALE		SCH DOC NO.		PCB PART NO.		SHEET	
NONE		1000298113		5083229		17 of 35	

4

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1



YellowTail Analog PCB

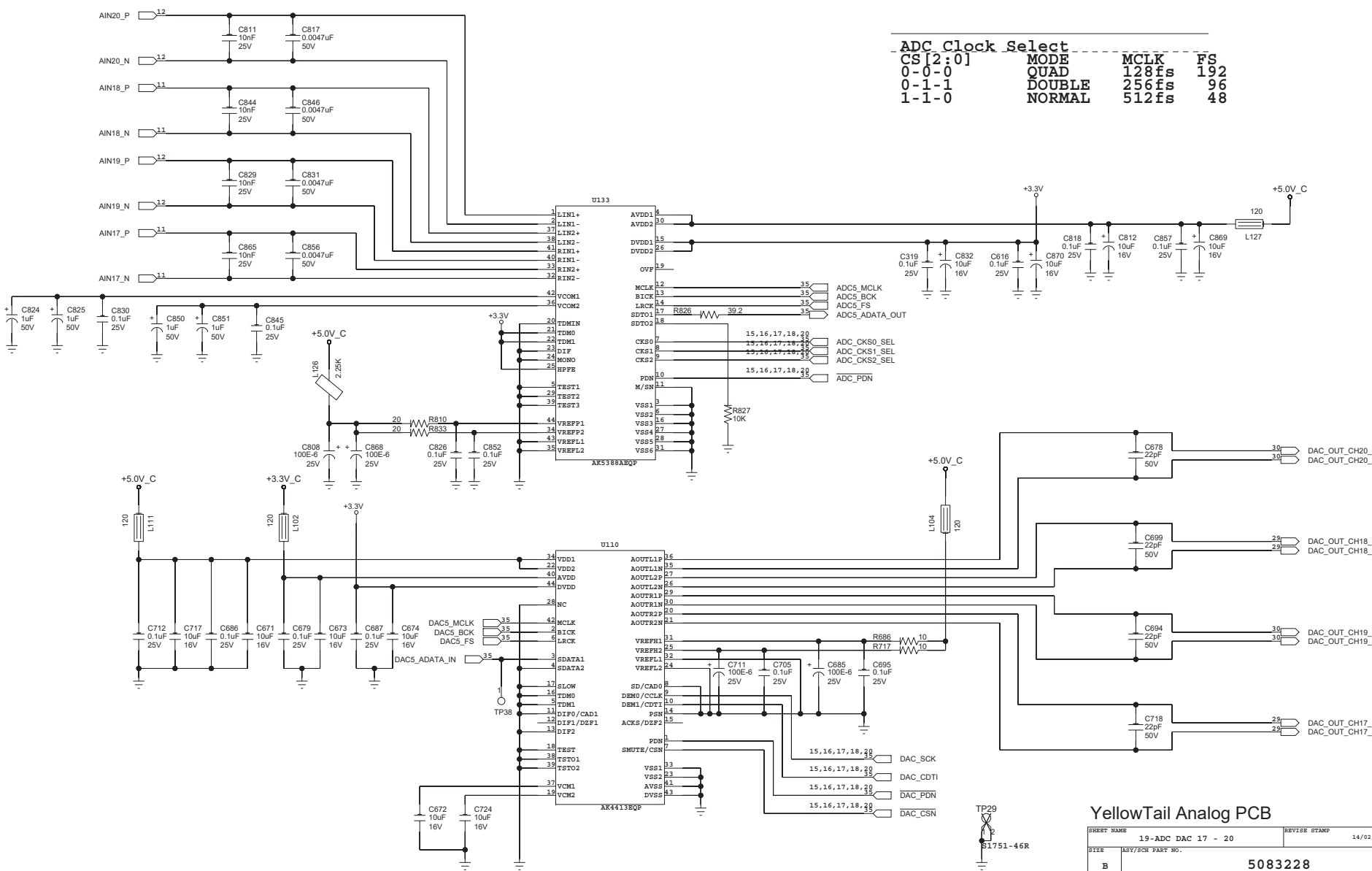
SHEET NAME		REVISE STAMP	
18-ADC DAC 13 - 16		14/02/2017:13:27	
SIZE	ASV/SCH PART NO.	REV	
B	5083228	B	
SCALE	SCH DOC NO.	PCB PART NO.	SHEET
NONE	1000298113	5083229	18 of 35

4

3

2

1



YellowTail Analog PCB

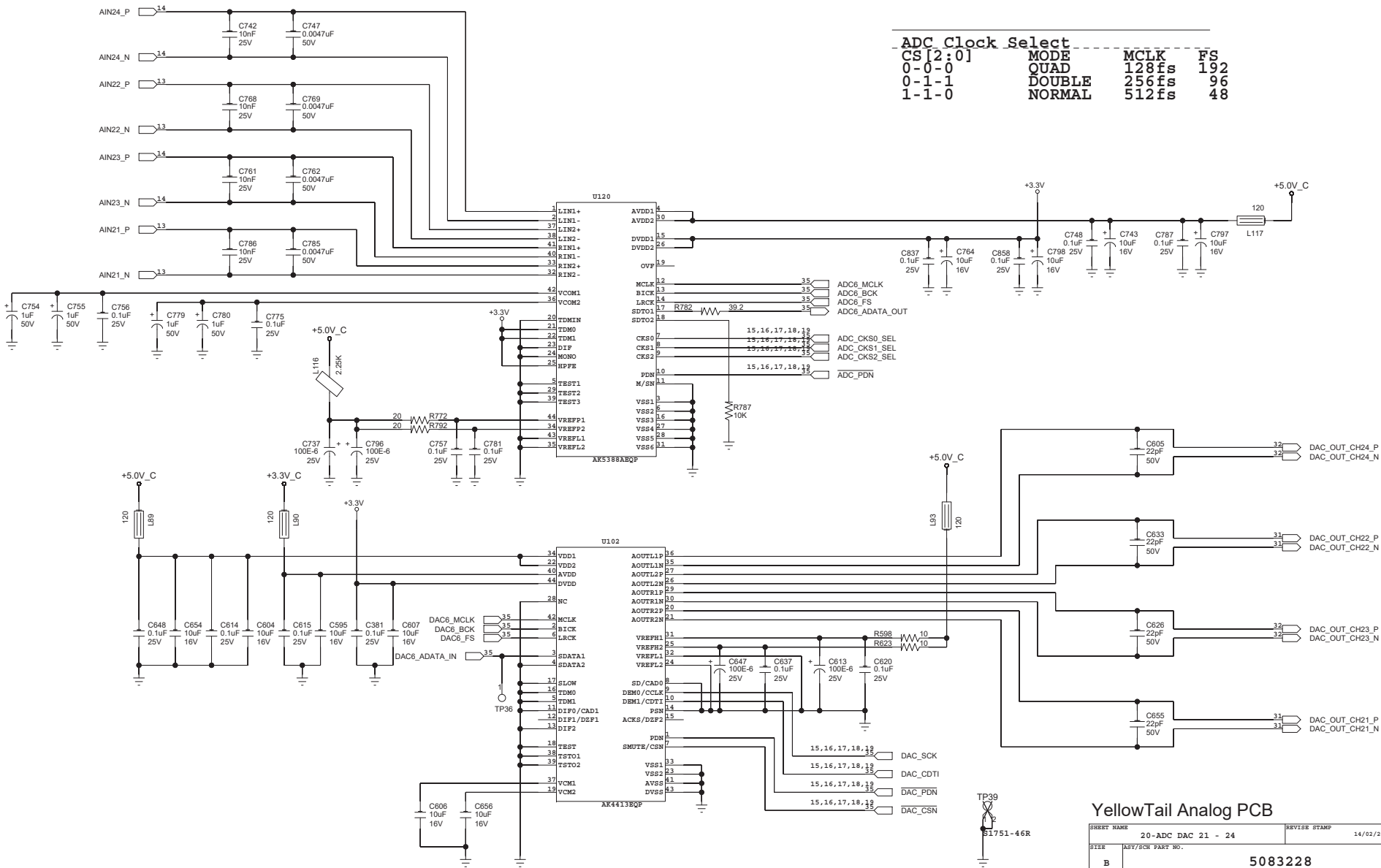
SHEET NAME 19-ADC DAC 17 - 20		REVISE STAMP 14/02/2017:13:27	
SIZE B	ASV/SCH PART NO. 5083228	REV B	
SCALE NONE	SCH DOC NO. 1000298113	PCB PART NO. 5083229	SHEET 19 of 35

4

3

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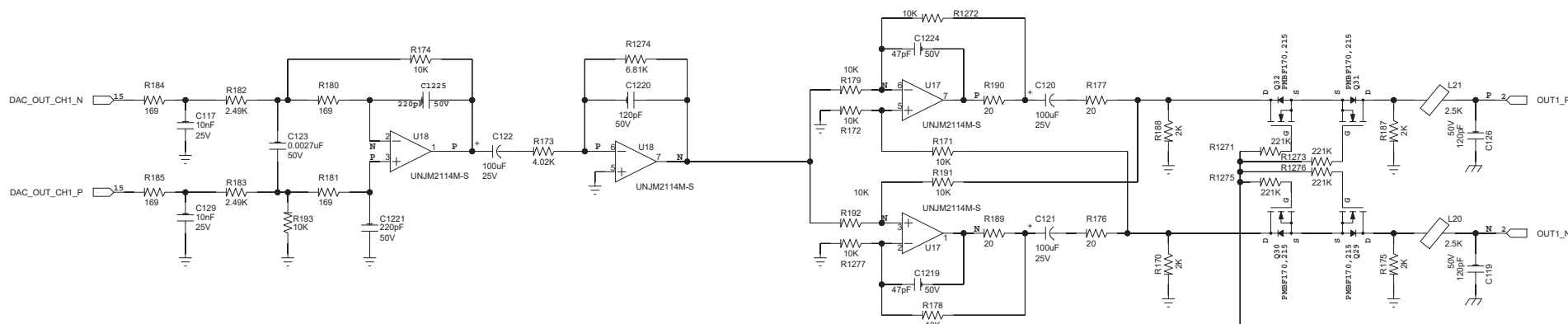


YellowTail Analog PCB

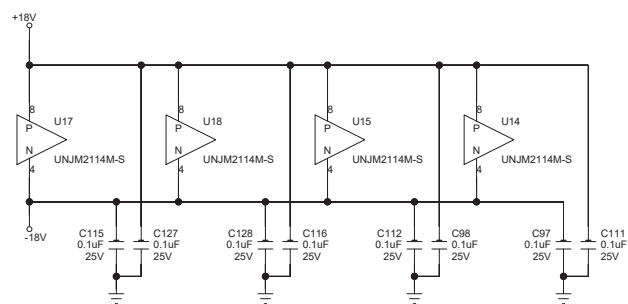
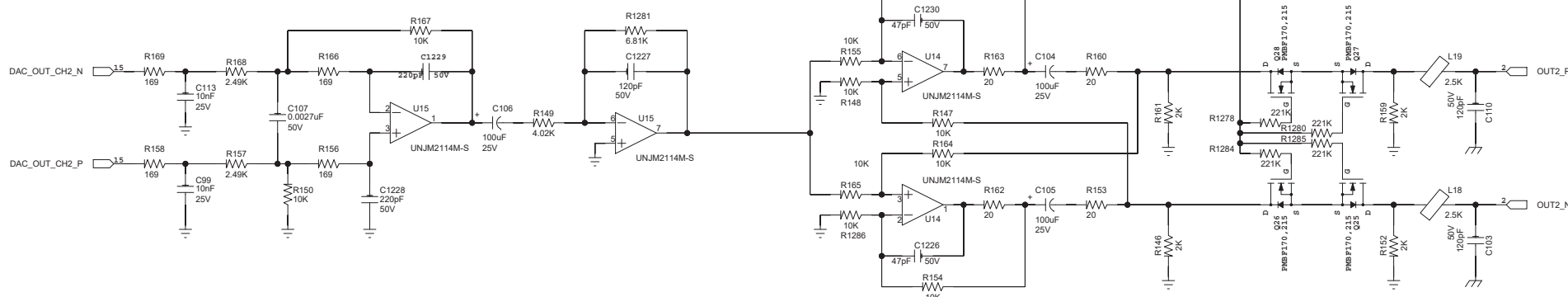
SHEET NAME 20-ADC DAC 21 - 24		REVISE STAMP 14/02/2017:13:27	
SIZE B	ASV/SCH PART NO. 5083228	REV B	
SCALE NONE	SCH DOC NO. 1000298113	PCB PART NO. 5083229	SHEET 20 of 35



CHANNEL 1 OUTPUT Max Output from DAC = 2.8Vpp



CHANNEL 2 OUTPUT



YellowTail Analog PCB

SHEET NAME 21-Analog Out 1 2		REVISE STAMP 14/02/2017:13:27	
SIZE B	ASV/SCH PART NO. 5083228		REV B
SCALE NONE	SCH DOC NO. 1000298113	PCB PART NO. 5083229	SHEET 21 of 35

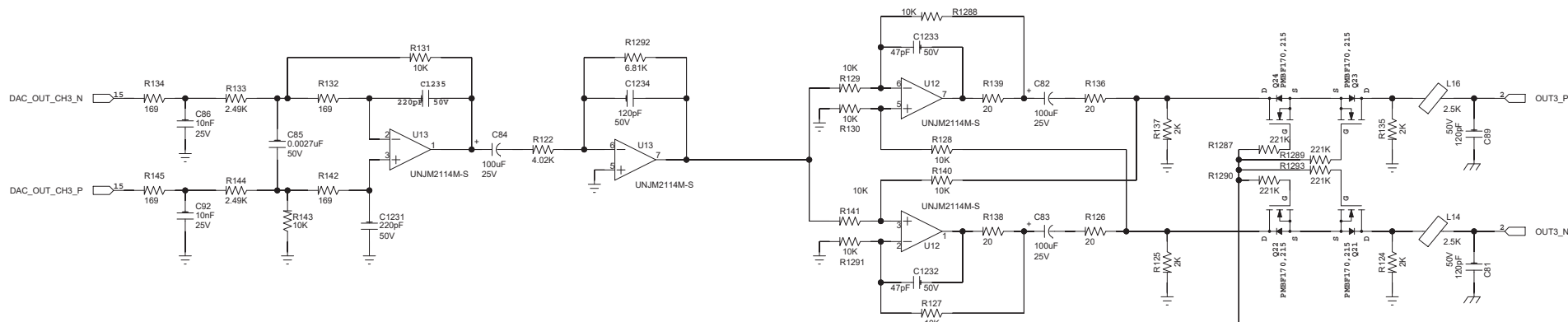
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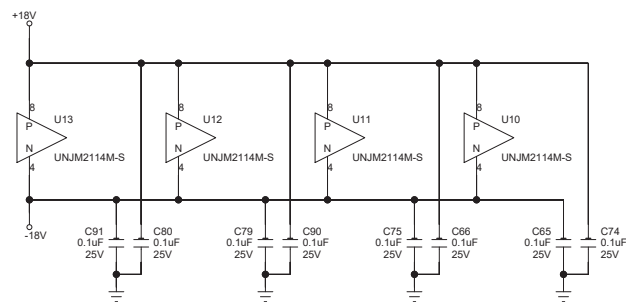
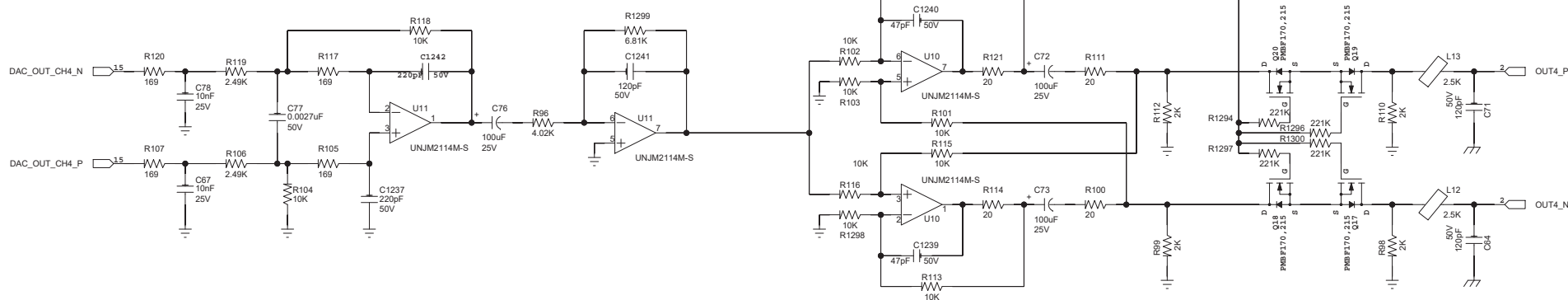
2

1

CHANNEL 3 OUTPUT



CHANNEL 4 OUTPUT



YellowTail Analog PCB

SHEET NAME 22-Analog Out 3 4		REVISE STAMP 14/02/2017:13:27	
SIZE B	ASV/SCH PART NO. 5083228		REV B
SCALE NONE	SCH DOC NO. 1000298113	PCB PART NO. 5083229	SHEET 22 of 35

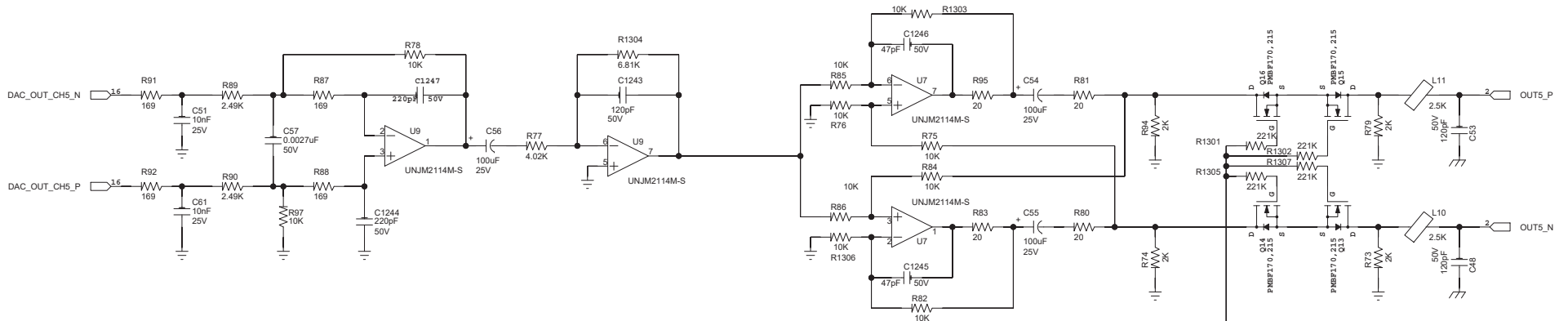
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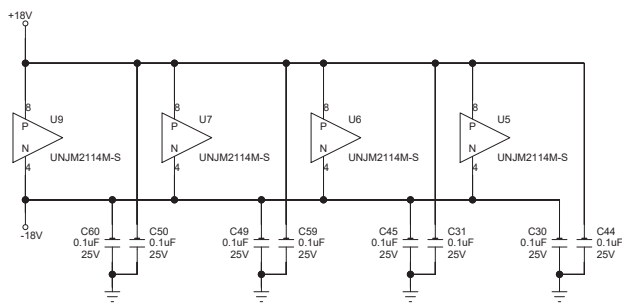
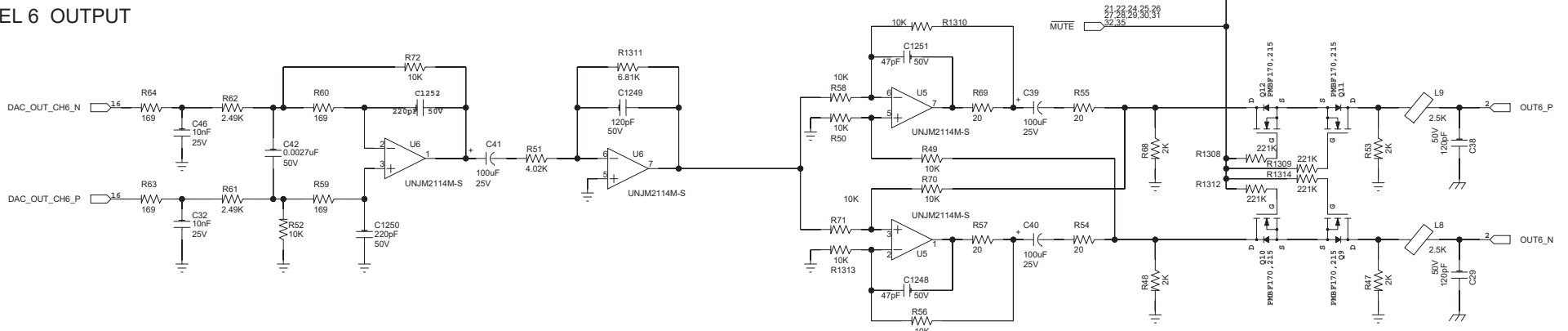
2

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CHANNEL 5 OUTPUT



CHANNEL 6 OUTPUT



YellowTail Analog PCB

SHEET NAME 23-Analog Out 5 6		REVISE STAMP 14/02/2017:13:27	
SIZE B	ASV/SCH PART NO. 5083228		REV B
SCALE NONE	SCH DOC NO. 1000298113	PCB PART NO. 5083229	SHEET 23 of 35

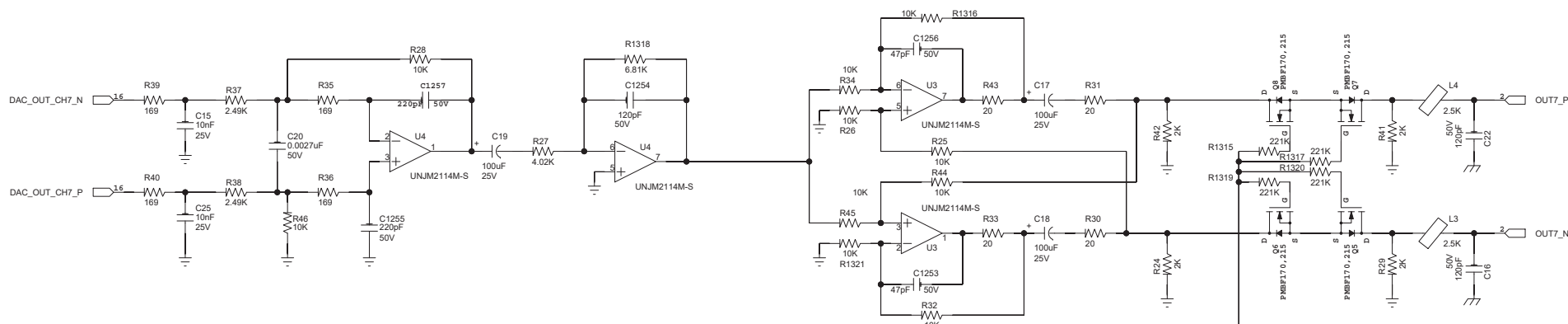
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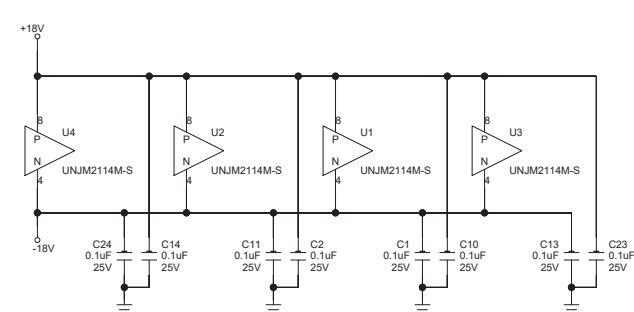
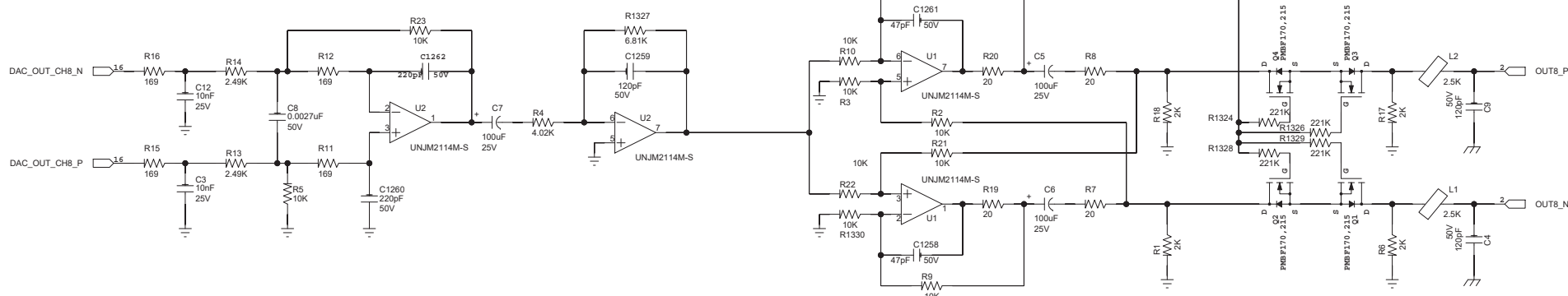
2

1

CHANNEL 7 OUTPUT



CHANNEL 8 OUTPUT



YellowTail Analog PCB

SHEET NAME 24-Analog Out 7 8		REVISE STAMP 14/02/2017:13:27	
SIZE B	SCH PART NO. 5083228		REV B
SCALE NONE	SCH DOC NO. 1000298113	PCB PART NO. 5083229	SHEET 24 of 35

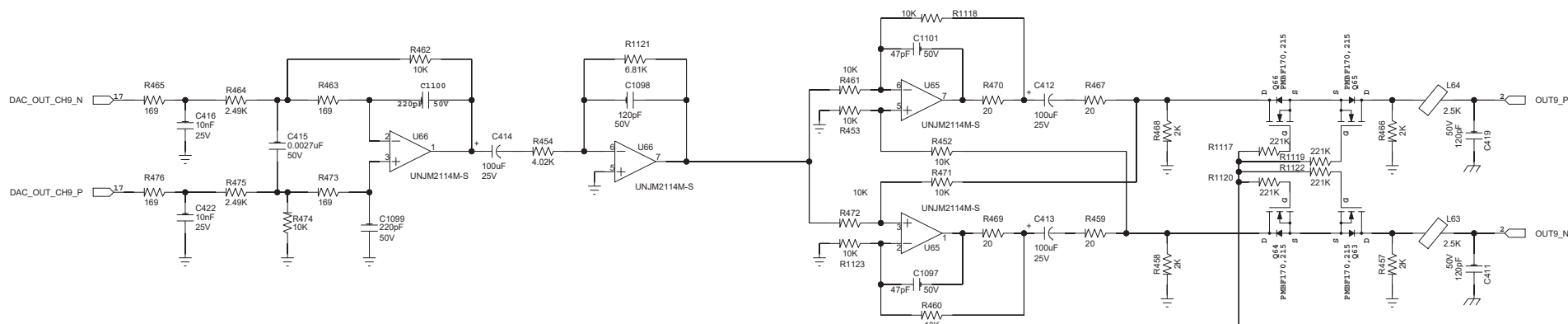
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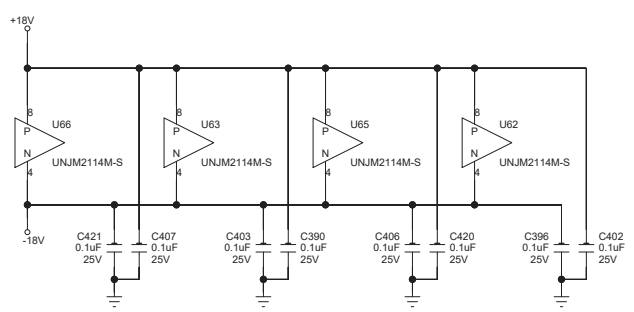
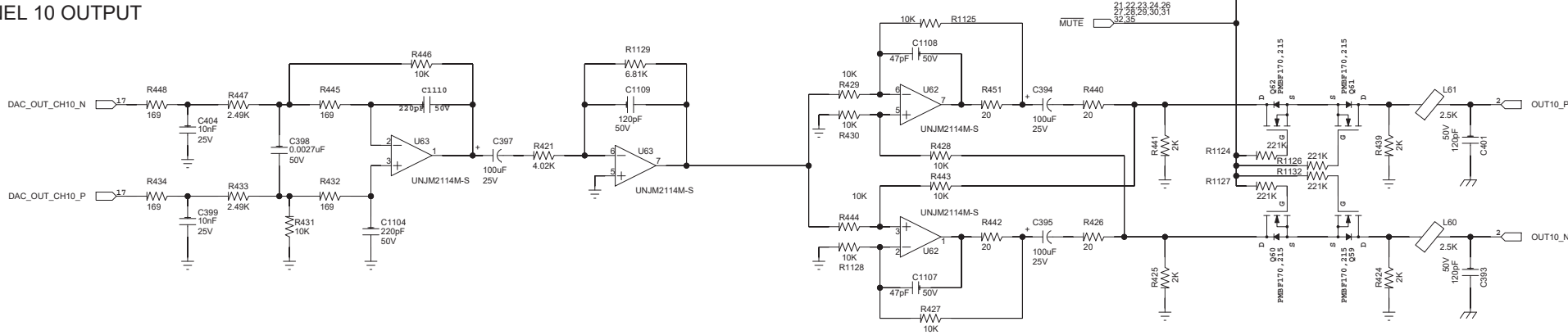
2

1

CHANNEL 9 OUTPUT



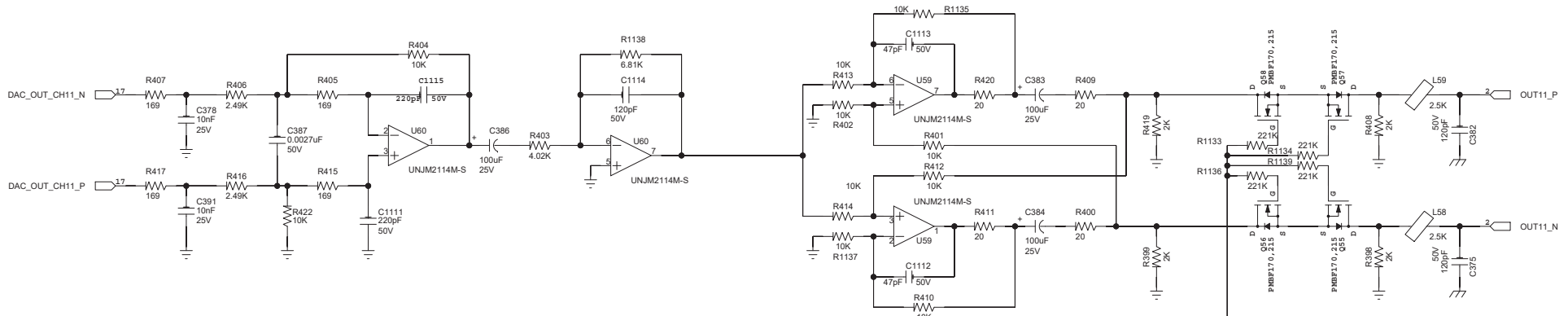
CHANNEL 10 OUTPUT



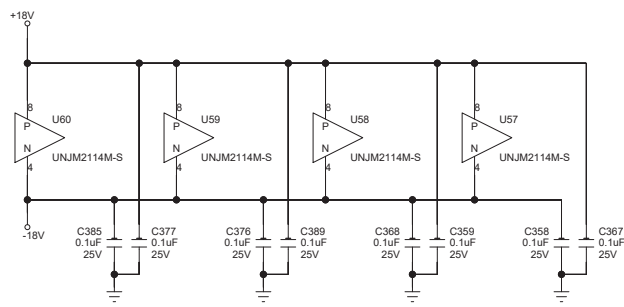
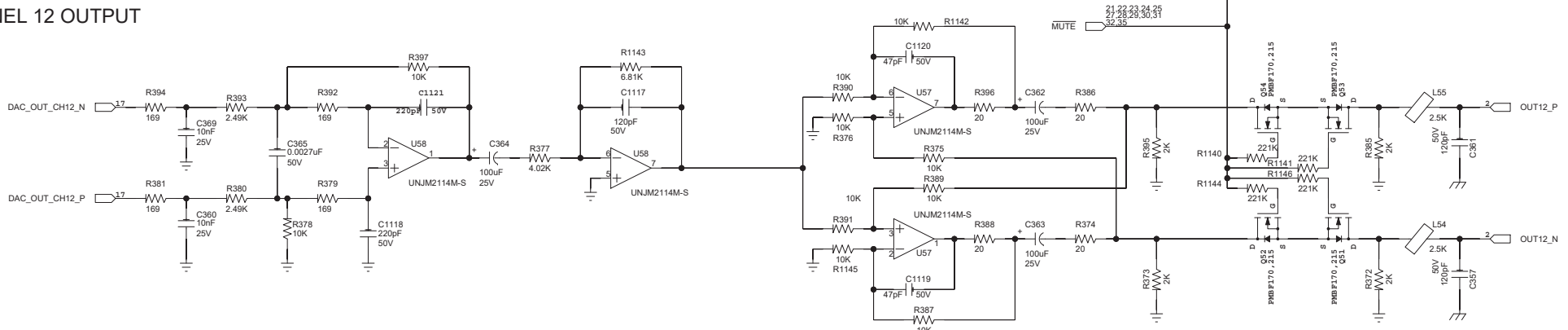
YellowTail Analog PCB

SHEET NAME 25-Analog Out 9 10		REVISE STAMP 14/02/2017:13:27	
SIZE B	ASV/SCH PART NO. 5083228	REV B	
SCALE NONE	SCH DOC NO. 1000298113	PCB PART NO. 5083229	SHEET 25 of 35

CHANNEL 11 OUTPUT



CHANNEL 12 OUTPUT



YellowTail Analog PCB

SHEET NAME 26-Analog Out 11 12		REVISE STAMP 14/02/2017:13:27	
SIZE B	ASV/SCH PART NO. 5083228	REV B	
SCALE NONE	SCH DOC NO. 1000298113	PCB PART NO. 5083229	SHEET 26 of 35

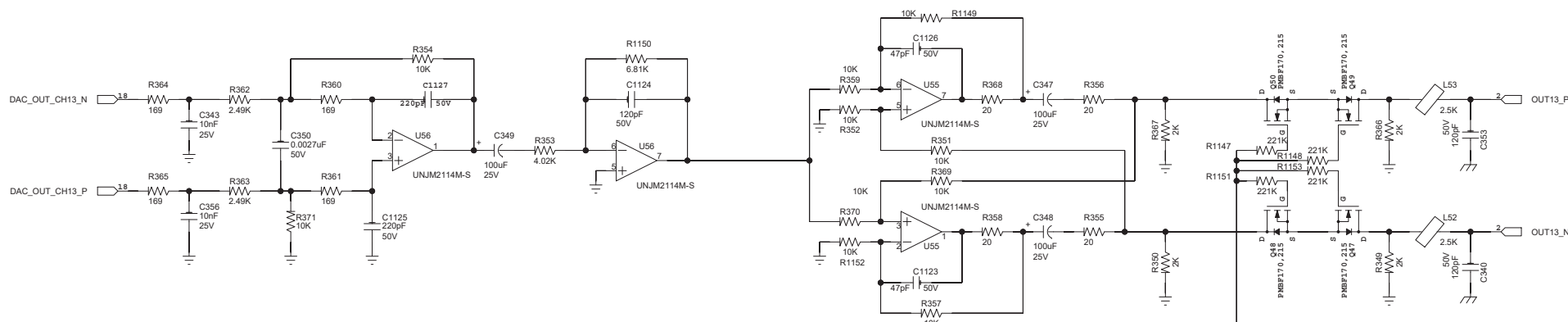
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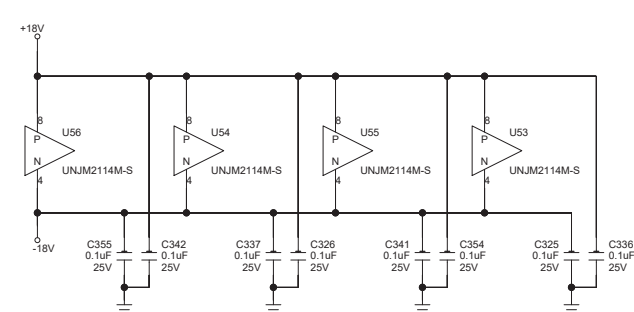
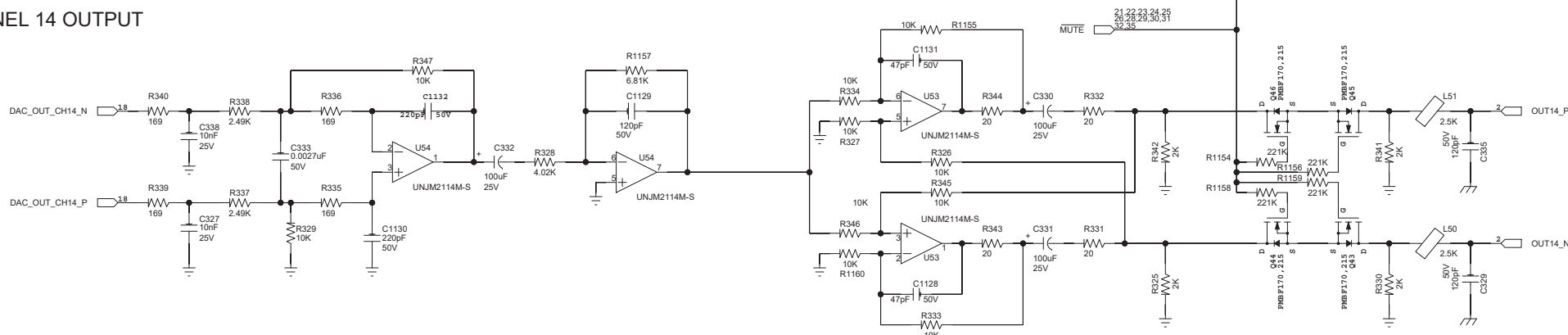
2

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CHANNEL 13 OUTPUT



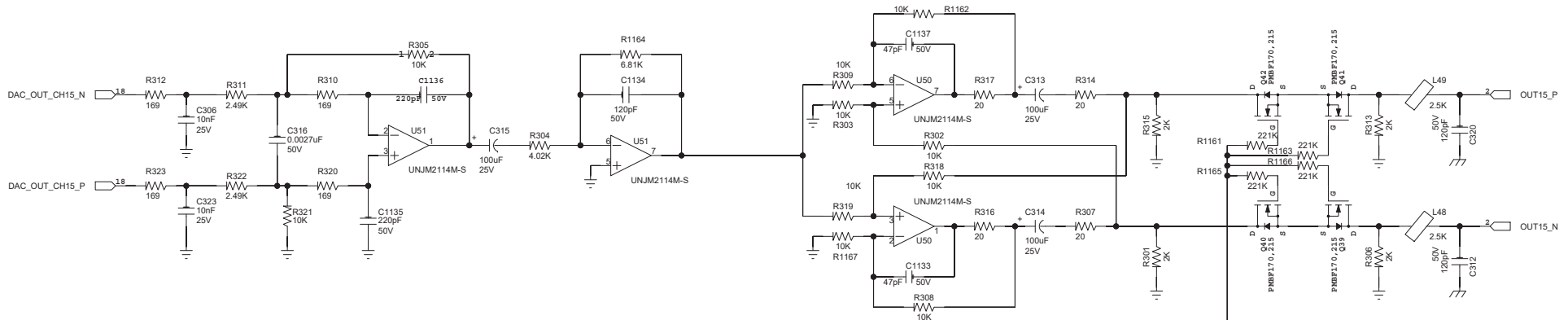
CHANNEL 14 OUTPUT



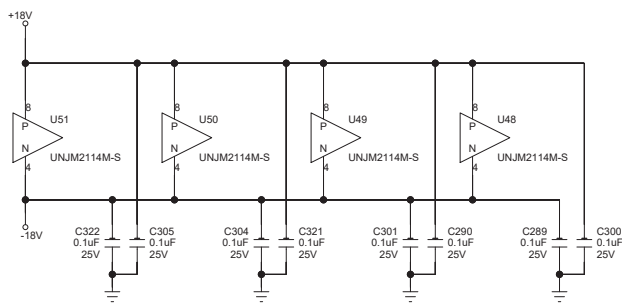
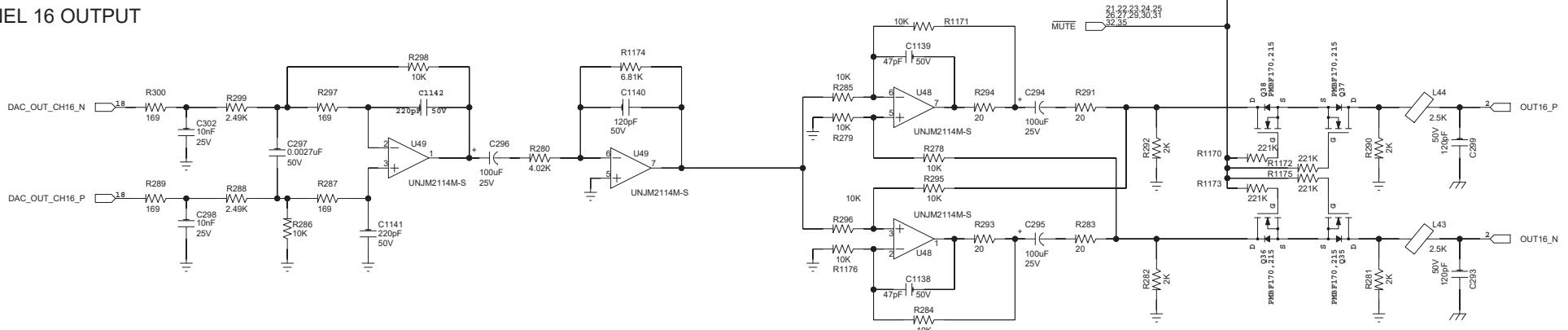
YellowTail Analog PCB

SHEET NAME 27-Analog Out 13 14		REVISE STAMP 14/02/2017:13:27	
SIZE B	ASV/SCH PART NO. 5083228	REV B	
SCALE NONE	SCH DOC NO. 1000298113	PCB PART NO. 5083229	SHEET 27 of 35

CHANNEL 15 OUTPUT



CHANNEL 16 OUTPUT



YellowTail Analog PCB

SHEET NAME 28-Analog Out 15 16		REVISE STAMP 14/02/2017:13:27	
SIZE B	ASV/SCH PART NO. 5083228		REV B
SCALE NONE	SCH DOC NO. 1000298113	PCB PART NO. 5083229	SHEET 28 of 35

4

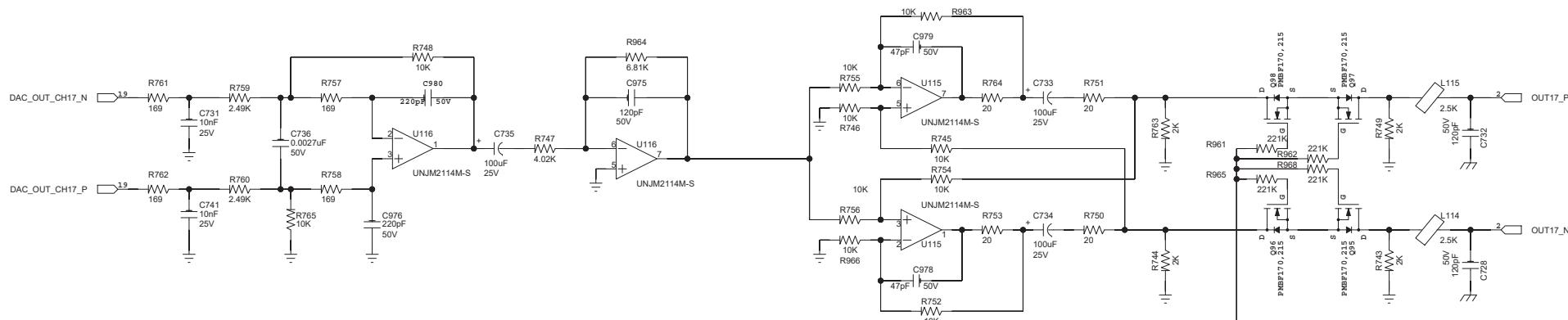
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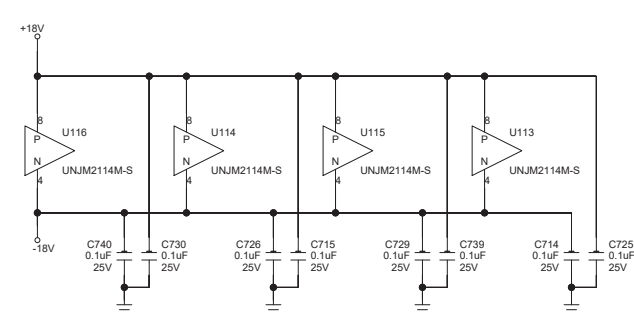
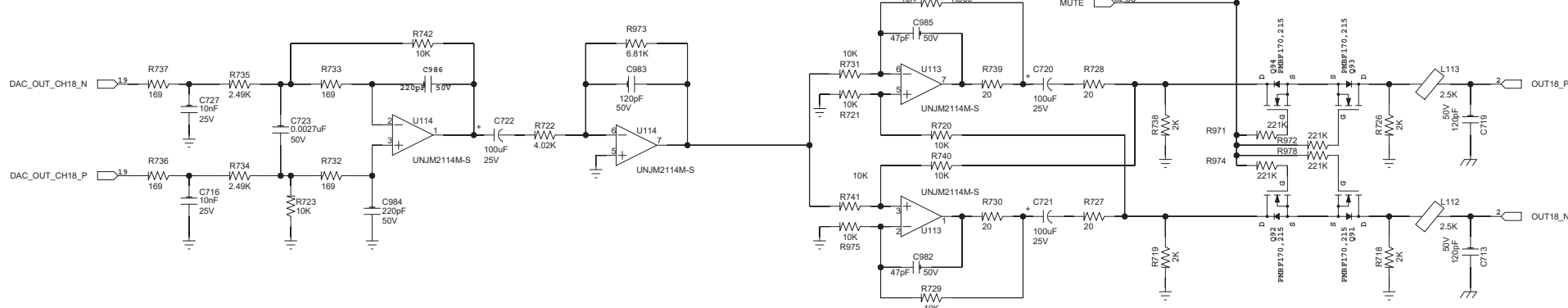
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CHANNEL 17 OUTPUT



CHANNEL 18 OUTPUT



YellowTail Analog PCB

SHEET NAME 29-Analog Out 17 18		REVISE STAMP 14/02/2017:13:27	
SIZE B	ASV/SCH PART NO. 5083228		REV B
SCALE NONE	SCH DOC NO. 1000298113	PCB PART NO. 5083229	SHEET 29 of 35

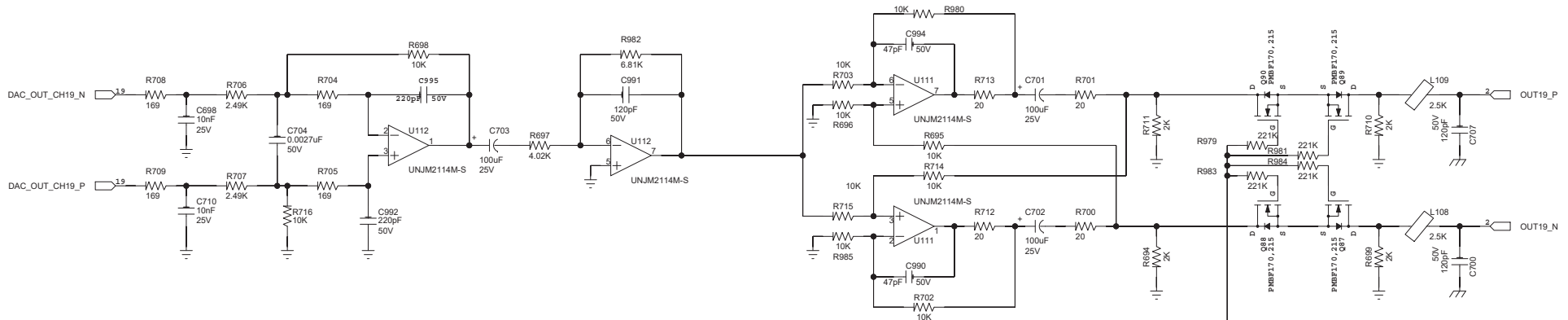
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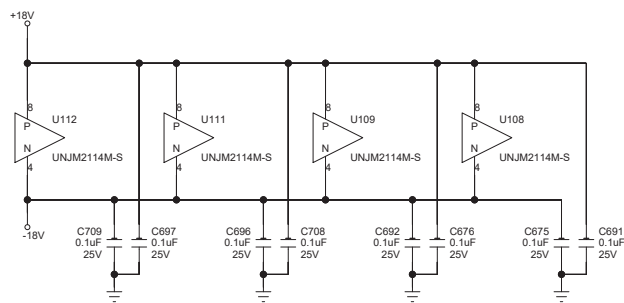
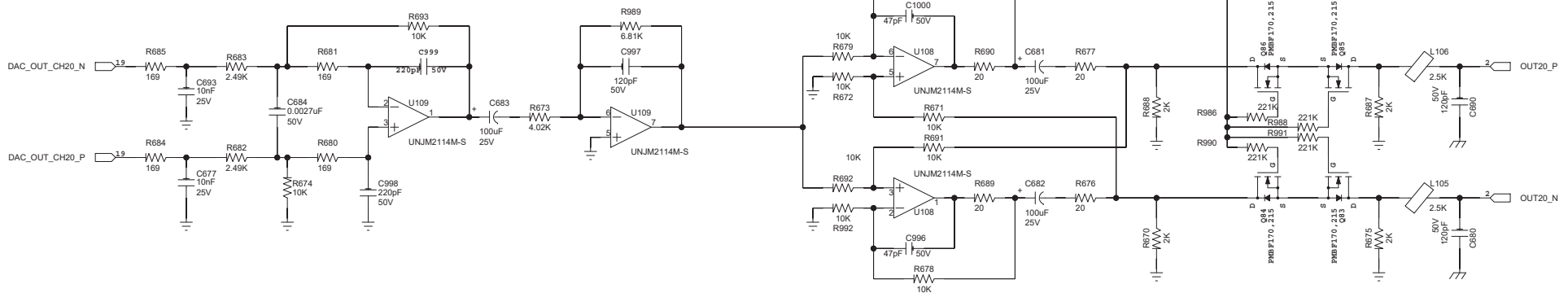
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CHANNEL 19 OUTPUT



CHANNEL 20 OUTPUT



YellowTail Analog PCB

SHEET NAME 30-Analog Out 19 20		REVISE STAMP 14/02/2017:13:27	
SIZE B	ASV/SCH PART NO. 5083228	REV B	
SCALE NONE	SCH DOC NO. 1000298113	PCB PART NO. 5083229	SHEET 30 of 35

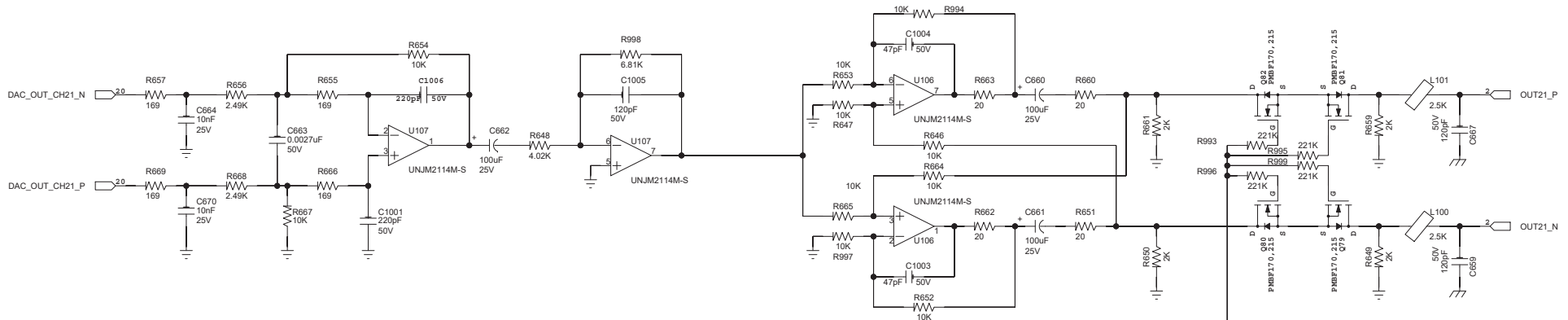
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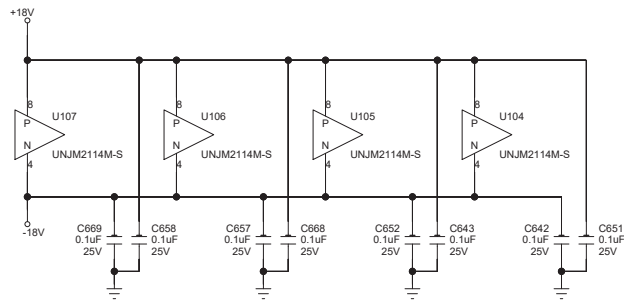
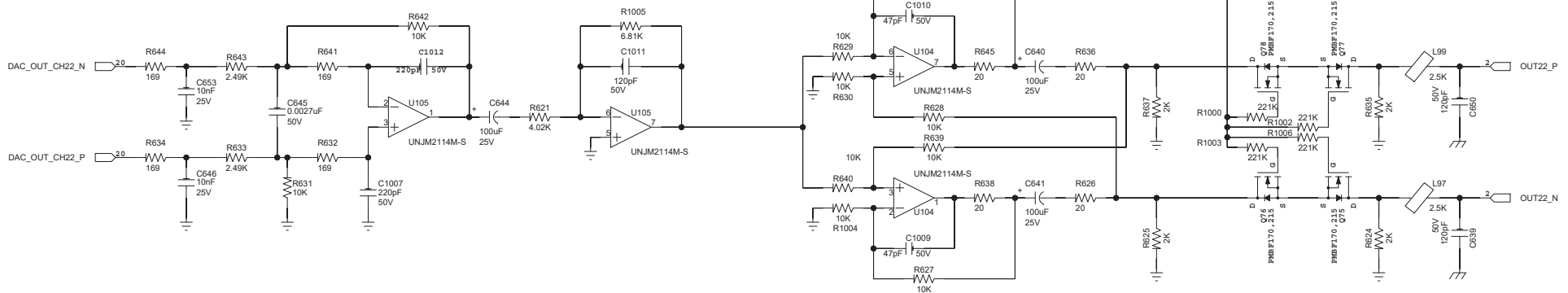
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CHANNEL 21 OUTPUT



CHANNEL 22 OUTPUT



YellowTail Analog PCB

SHEET NAME 31-Analog Out 21 22		REVISE STAMP 14/02/2017:13:27	
SIZE B	ASV/SCH PART NO. 5083228	REV B	
SCALE NONE	SCH DOC NO. 1000298113	PCB PART NO. 5083229	SHEET 31 of 35

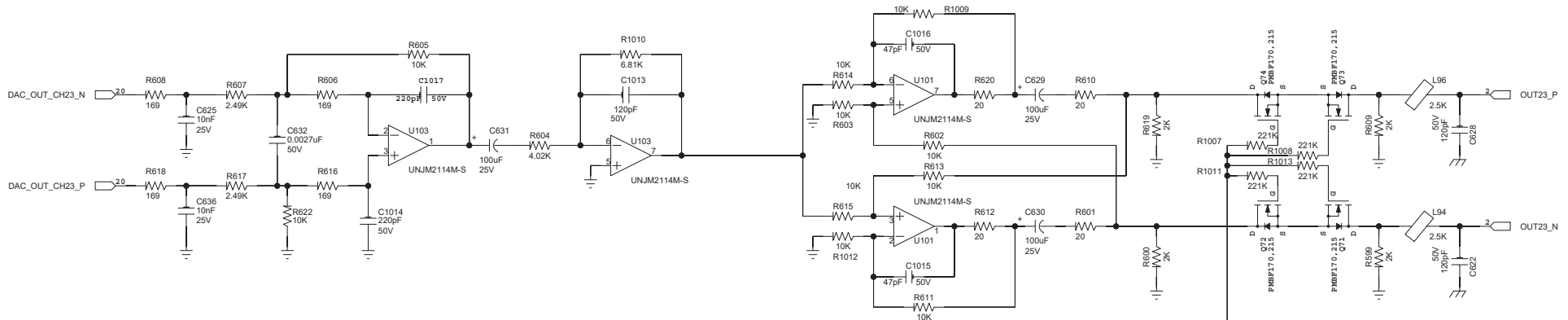
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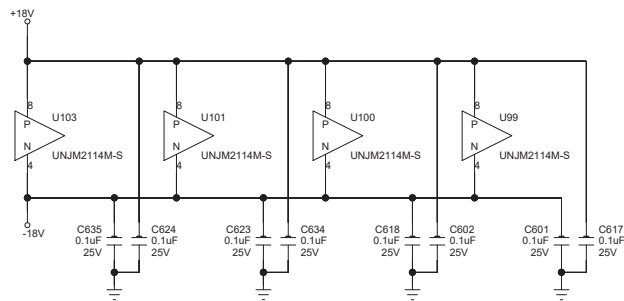
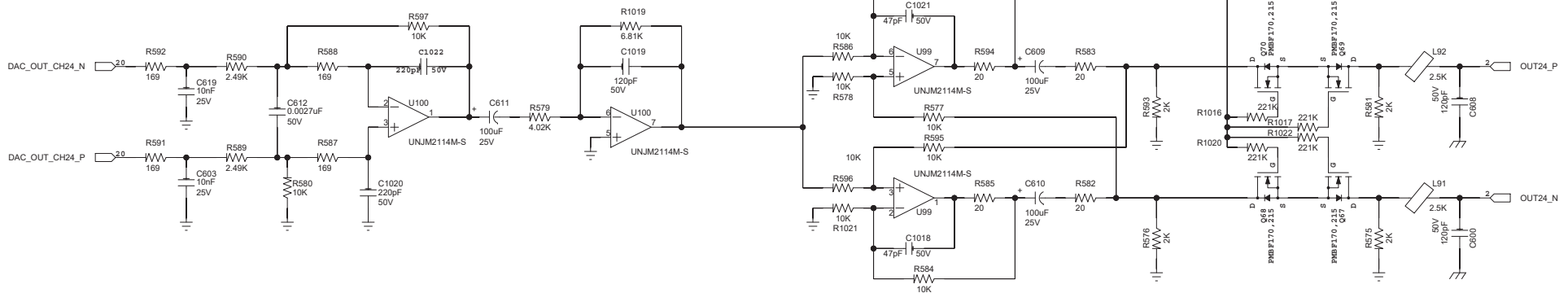
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CHANNEL 23 OUTPUT



CHANNEL 24 OUTPUT



YellowTail Analog PCB

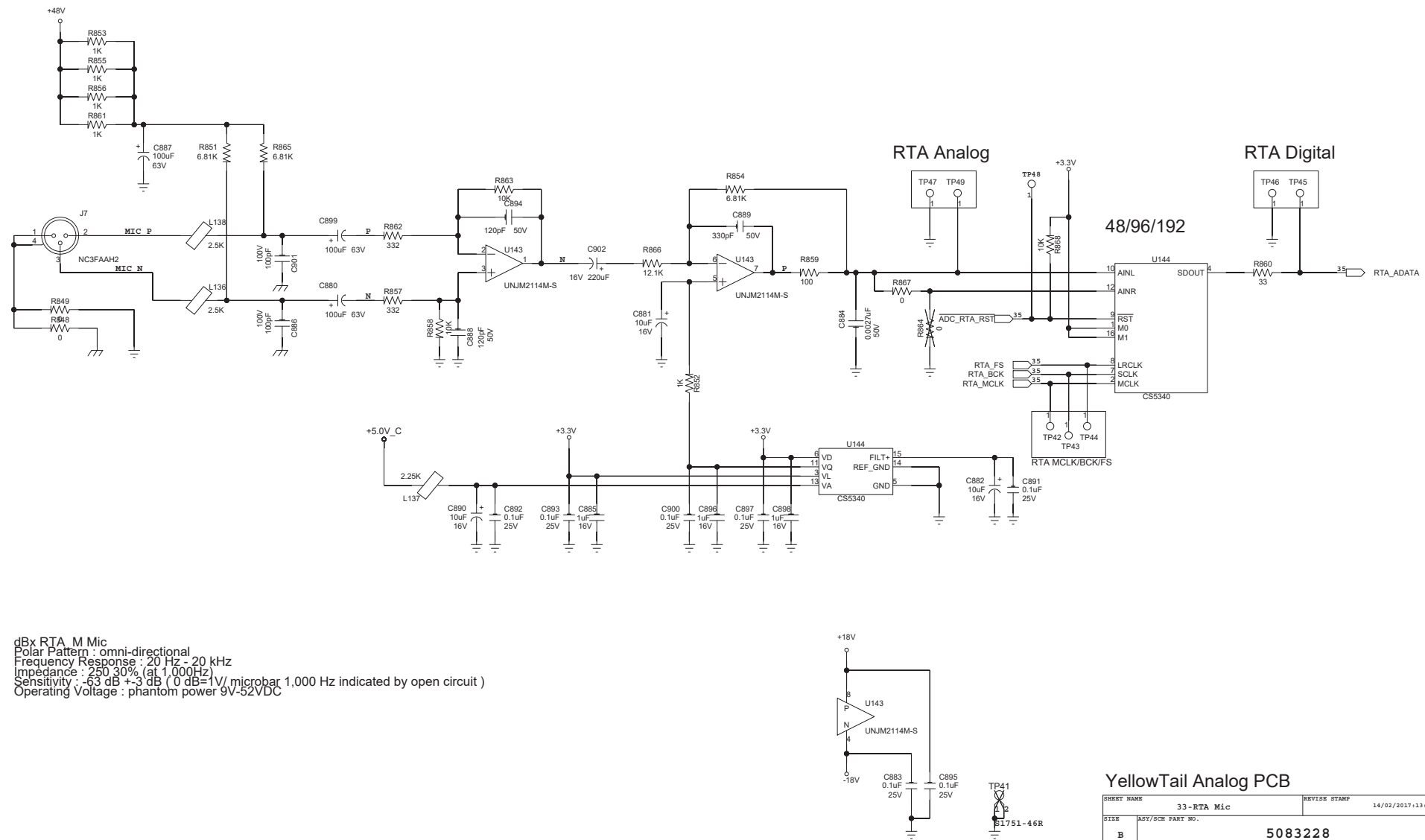
SHEET NAME 32-Analog Out 23 24		REVISE STAMP 14/02/2017:13:27	
SIZE B	ASV/SCH PART NO. 5083228	REV B	
SCALE NONE	SCH DOC NO. 1000298113	PCB PART NO. 5083229	SHEET 32 of 35

4

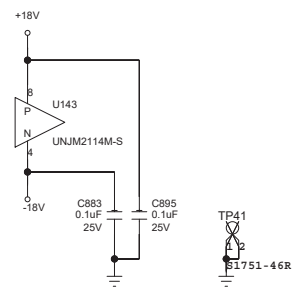
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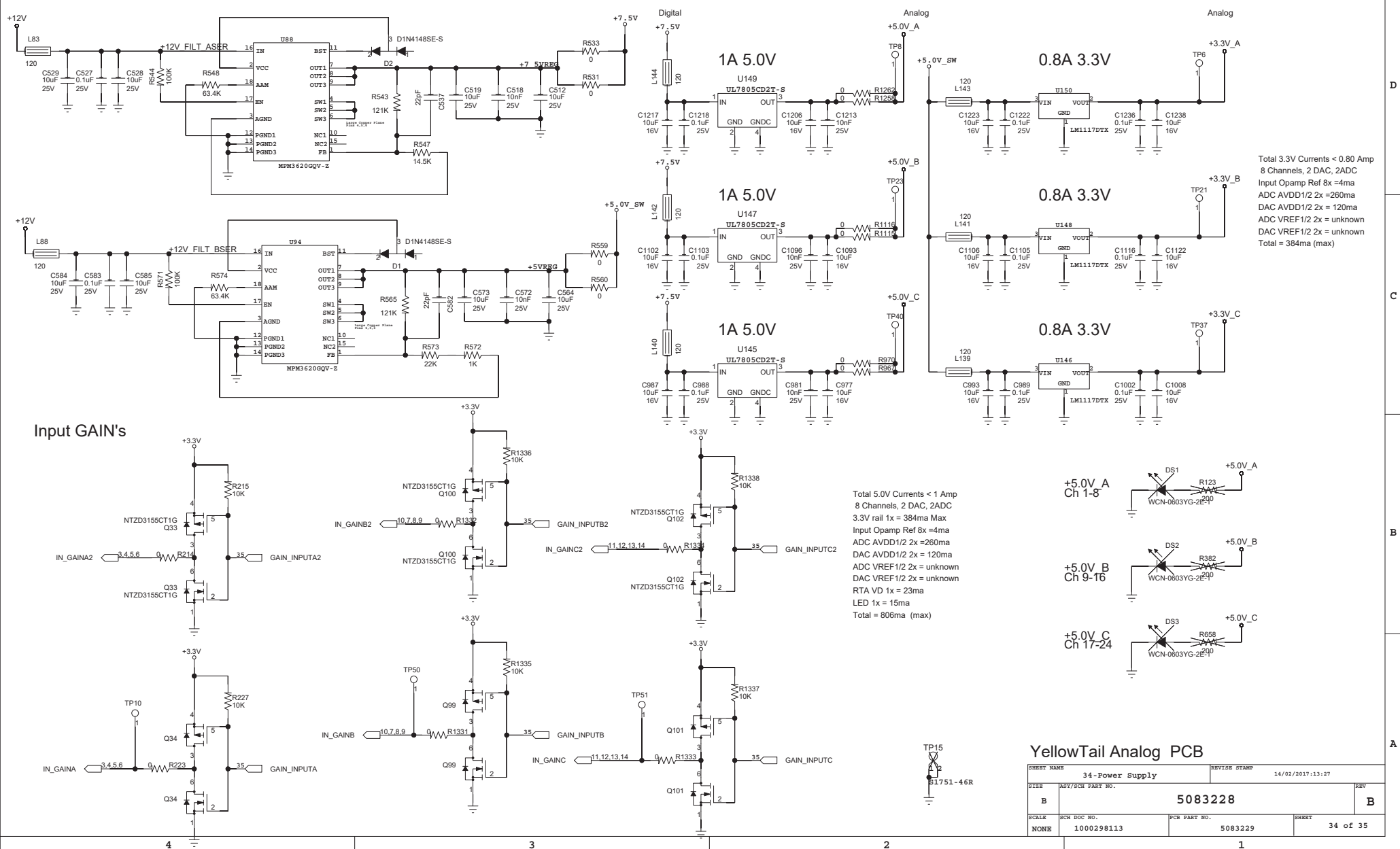


dBx RTA M Mic  
Polar Pattern : omni-directional  
Frequency Response : 20 Hz - 20 kHz  
Impedance : 250, 30% (at 1,000Hz)  
Sensitivity : -63 dB +3 dB (0 dB=1V/ microbar 1,000 Hz indicated by open circuit )  
Operating Voltage : phantom power 9V-52VDC



YellowTail Analog PCB

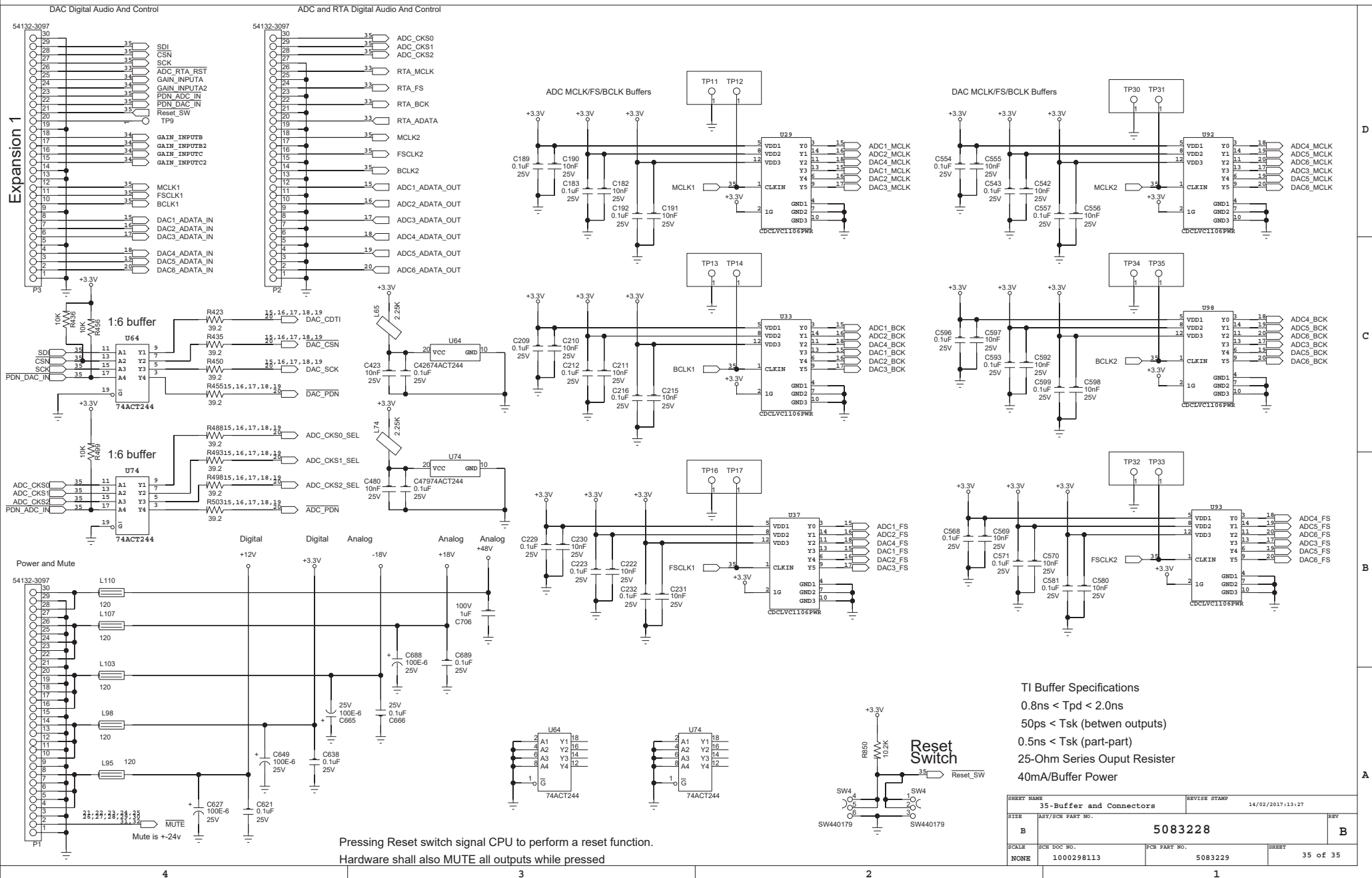
SHEET NAME		REVISE STAMP	
33-RTA Mic		14/02/2017:13:27	
SIZE	ASV/SCH PART NO.	REV	
B	5083228	B	
SCALE	SCH DOC NO.	PCB PART NO.	SHEET
NONE	1000298113	5083229	33 of 35



YellowTail Analog PCB

SHEET NAME		34 - Power Supply		REVISE STAMP		14/02/2017:13:27	
SIZE		ASV/SCH PART NO.		5083228		REV	
SCALE		SCH DOC NO.		PCB PART NO.		SHEET	
NONE		1000298113		5083229		34 of 35	

D  
C  
B  
A

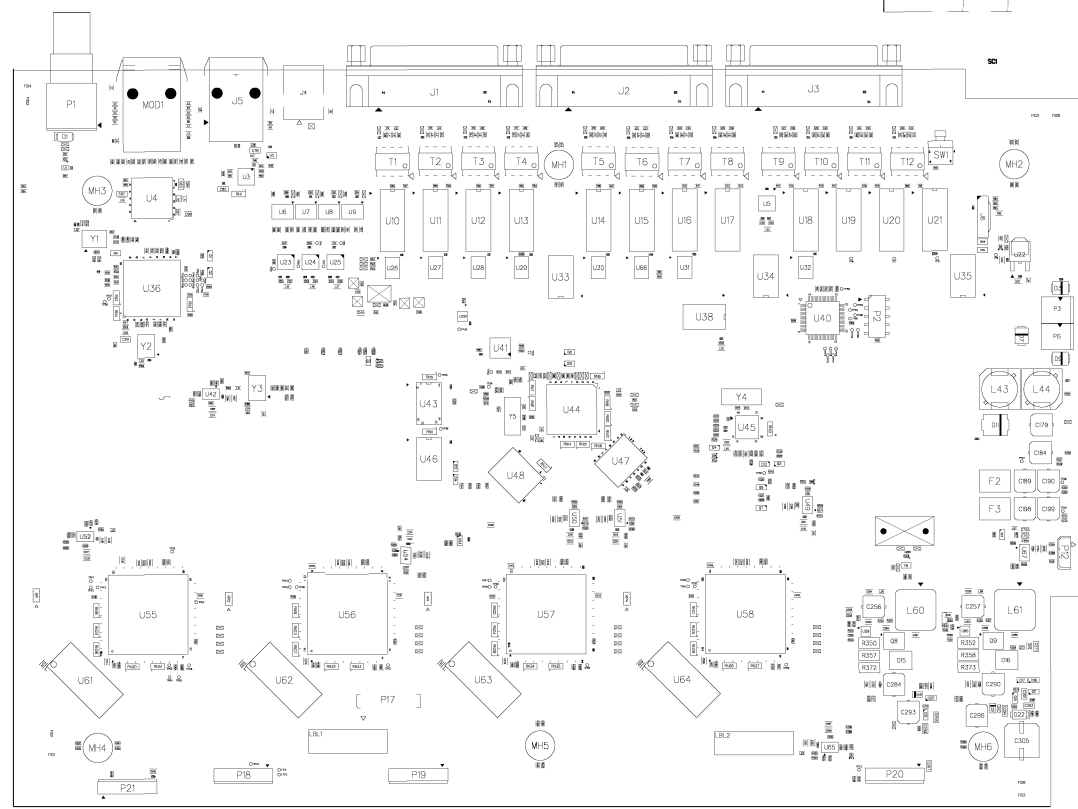


Pressing Reset switch signal CPU to perform a reset function.  
Hardware shall also MUTE all outputs while pressed

SHEET NAME		REVISE STAMP	
35-Buffer and Connectors		14/02/2017:13:27	
SIZE	ASV/SCH PART NO.	REV	
B	5083228	B	
SCALE	SCH DOC NO.	PCB PART NO.	SHEET
NONE	1000298113	5083229	35 of 35

PROPRIETARY AND CONFIDENTIAL PROPERTY OF HARMAN. DO NOT DISCLOSE, REPRODUCE, OR PUBLISH WITHOUT WRITTEN HARMAN APPROVAL.

REVISION HISTORY			
DATE	REV.	DESCRIPTION	BY
-	-	SEE CN	-

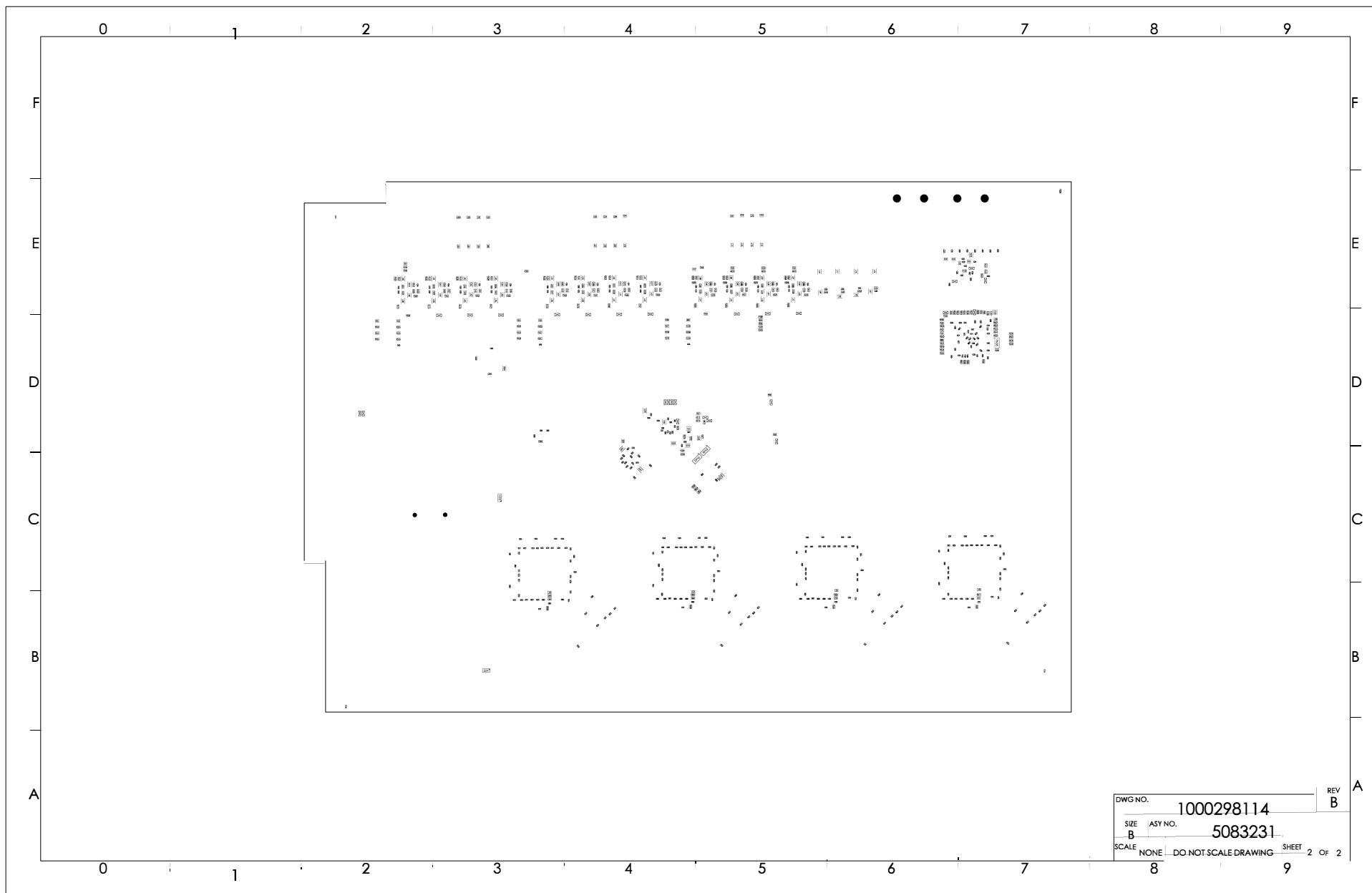


TOLERANCES UNLESS OTHERWISE SPECIFIED  
FINISHED DRILL: ±.003 (0.0762)  
REGISTRATION: ±.003 (0.0762)  
MINIMUM ANNULAR RING: .002 (0.0508)  
XX ±.01 (0.254)  
.XXX ±.005 (0.127)  
ALL DIMENSIONS ARE IN INCHES (MM)  
ALL DIMENSIONS APPLY AFTER FINISH

**ROHS**  
RESTRICTION OF HAZARDOUS SUBSTANCES  
ALL MATERIALS USED IN THIS PART  
MUST BE ROHS COMPLIANT PER  
HARMAN SPECIFICATION:  
"1234567890 ROHS PROCEDURE"  
SUPPLIER SHALL PROVIDE A  
CERTIFICATE OF ROHS COMPLIANCE  
WITH THE FIRST ARTICLE

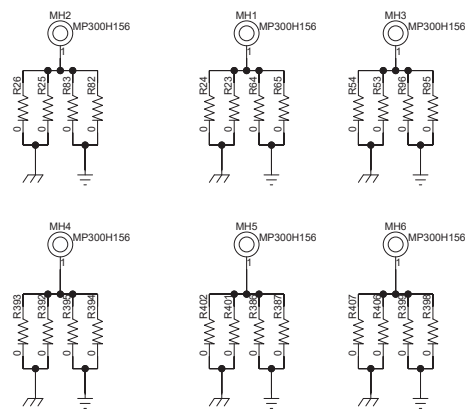
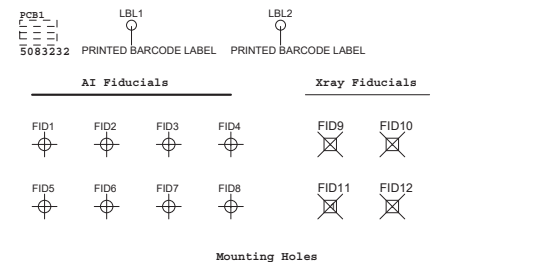
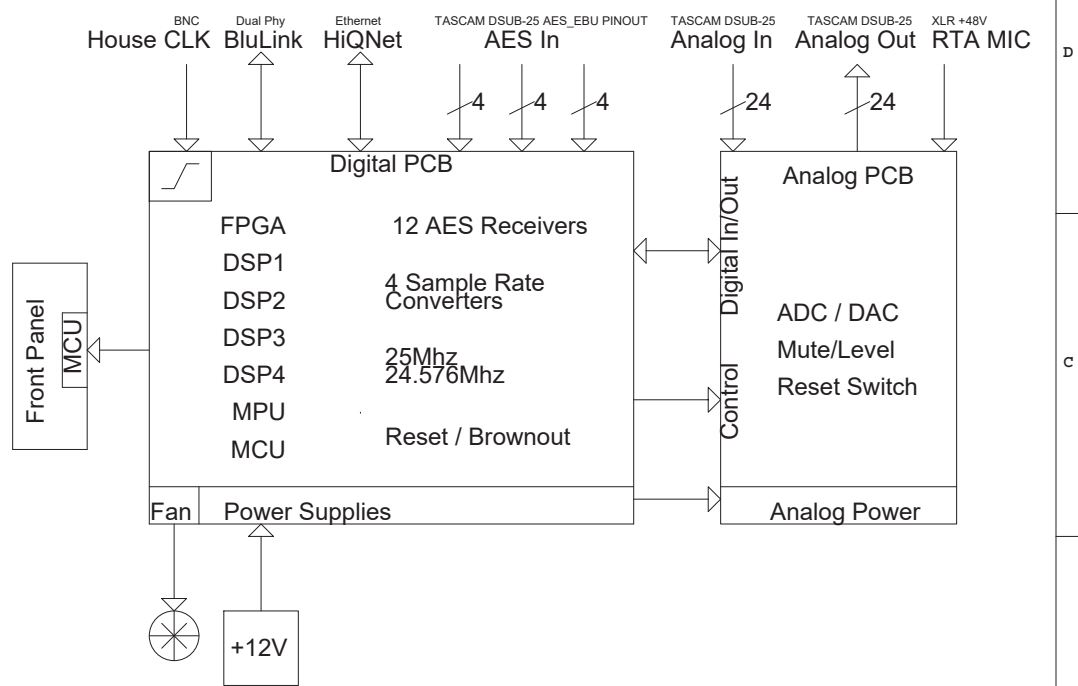
<b>HARMAN</b>	
TITLE PCB ASSY, INTONATO24, DIGITAL	
DWGNO. 1000298114	REV B
SIZE B	ASSY NO 5083231
SCALE 1:1	DO NOT SCALE DRAWING
SHEET 1 OF 2	





1-Title Page	13-AES inputs 9-12
2-FPGA PHY IO	14-AES inputs 5-8
3-BLU Link PHY	15-AES inputs 1-4
4-FPGA DSP	16-AES Receivers 9-12
5-DSP1	17-AES Receivers 5-8
6-DSP2	18-AES Receivers 1-4
7-DSP3	19-SRC 9-12
8-DSP4	20-MCU
9-MPU DDR JTAG	21-Buffers
10-MPU Flash Fan	22-Power Supply 1
11-MPU Front Panel IO	23-Power Supply 2
12-Ethernet PHY	24-Power Supply 3
	25-Expansion

REVISION HISTORY					
DATE	REV	DESCRIPTION	BY	CHKD	APVD
	-	SEE CHANGE NOTICE FOR HISTORY			



**RoHS**  
RESTRICTION OF HAZARDOUS SUBSTANCES  
ALL MATERIALS USED IN THIS PART MUST BE RoHS COMPLIANT.  
SUPPLIER SHALL PROVIDE A CERTIFICATE OF RoHS COMPLIANCE WITH THE FIRST ARTICLE.  
PROPRIETARY AND CONFIDENTIAL PROPERTY OF HARMAN. DO NOT DISCLOSE, REPRODUCE, OR PUBLISH WITHOUT APPROVAL.

**CAUTION:**  
CONTAINS PARTS AND ASSEMBLIES SUSCEPTIBLE TO DAMAGE BY ELECTROSTATIC DISCHARGE (ESD).

DRN BY	DATE
Ben Wilson	22DEC2016
ENGR	DATE
Ben Wilson	22DEC2016

SHEET NAME 1-Title Page		REVISE STAMP 29/05/2018:11:18	
<b>HARMAN</b>			
PCB SCH, Yellowtail Digital, AV1			
SIZE B	ASV/SCH PART NO. 5083231	REV B	
SCALE NONE	SCH DOC NO. 1000298116	PCB PART NO. 5083232	SHEET 1 of 25

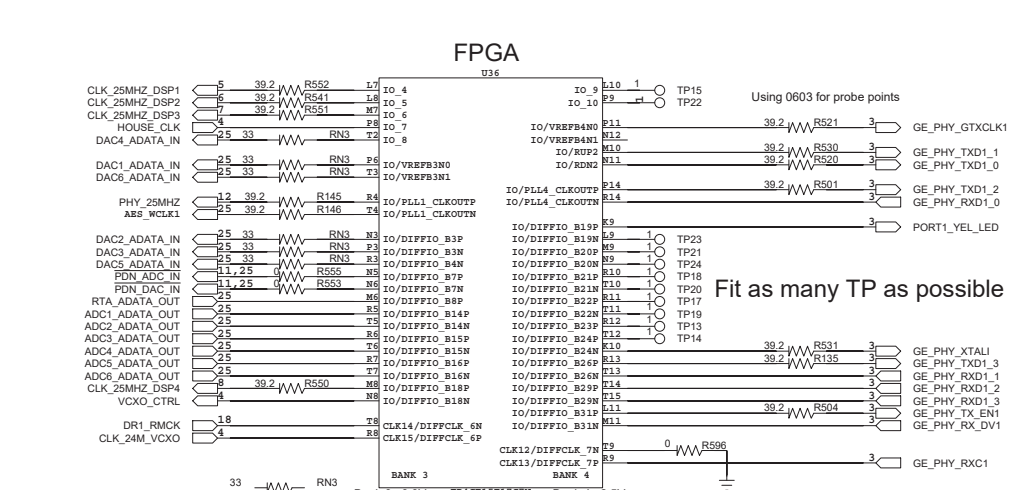
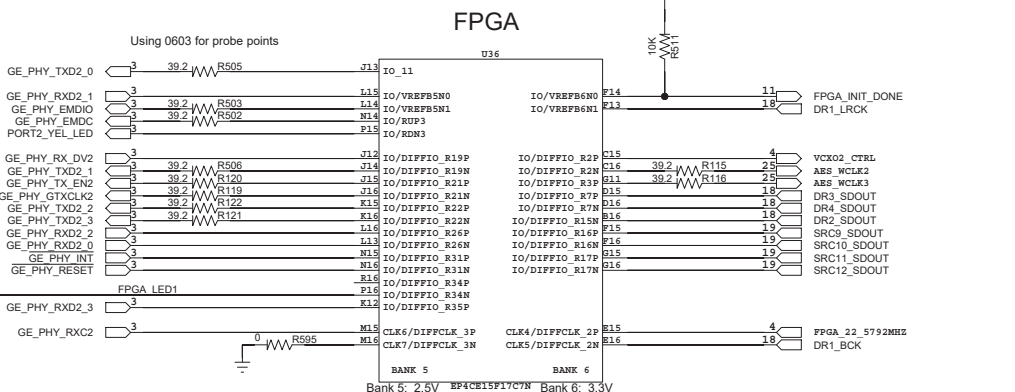
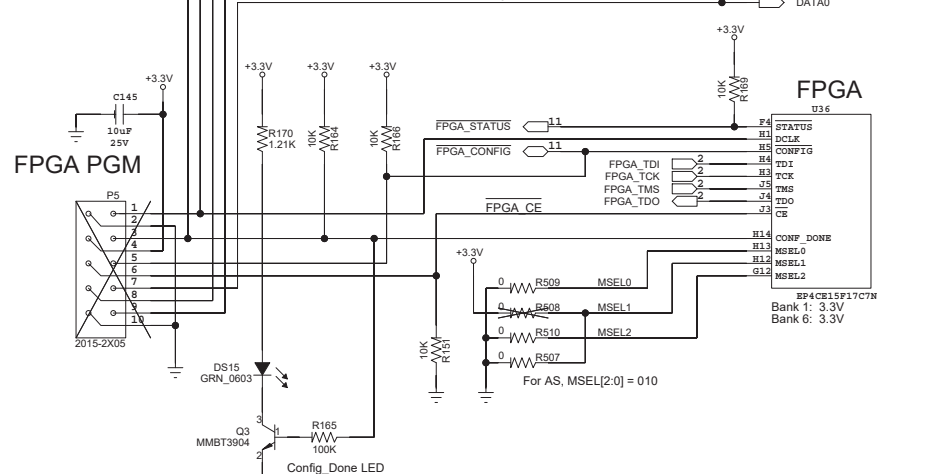
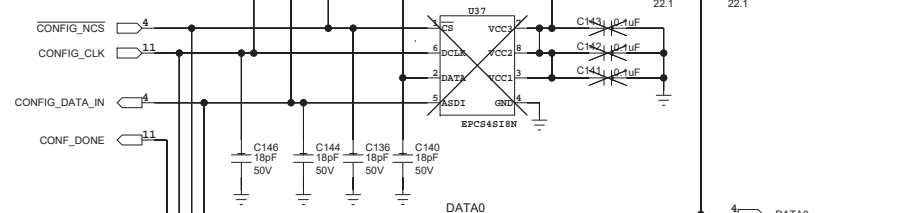
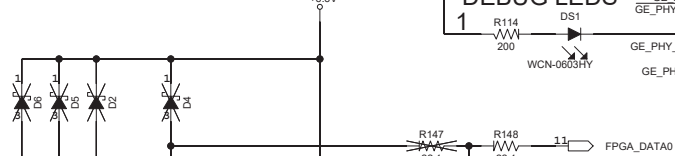
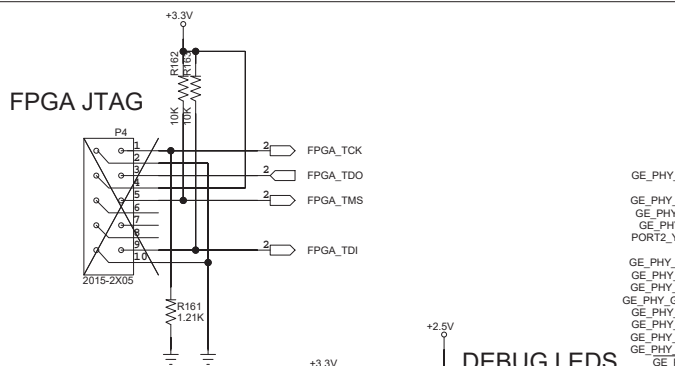
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1

FPGA, JTAG



YellowTail Digital PCB

SHEET NAME		REVISE STAMP	
2-FPGA PHY IO		29/05/2018:11:18	
SIZE	ASV/SCH PART NO.	REV	
B	5083231	B	
SCALE	SCH DOC NO.	PCB PART NO.	SHEET
NONE	1000298116	5083232	2 of 25

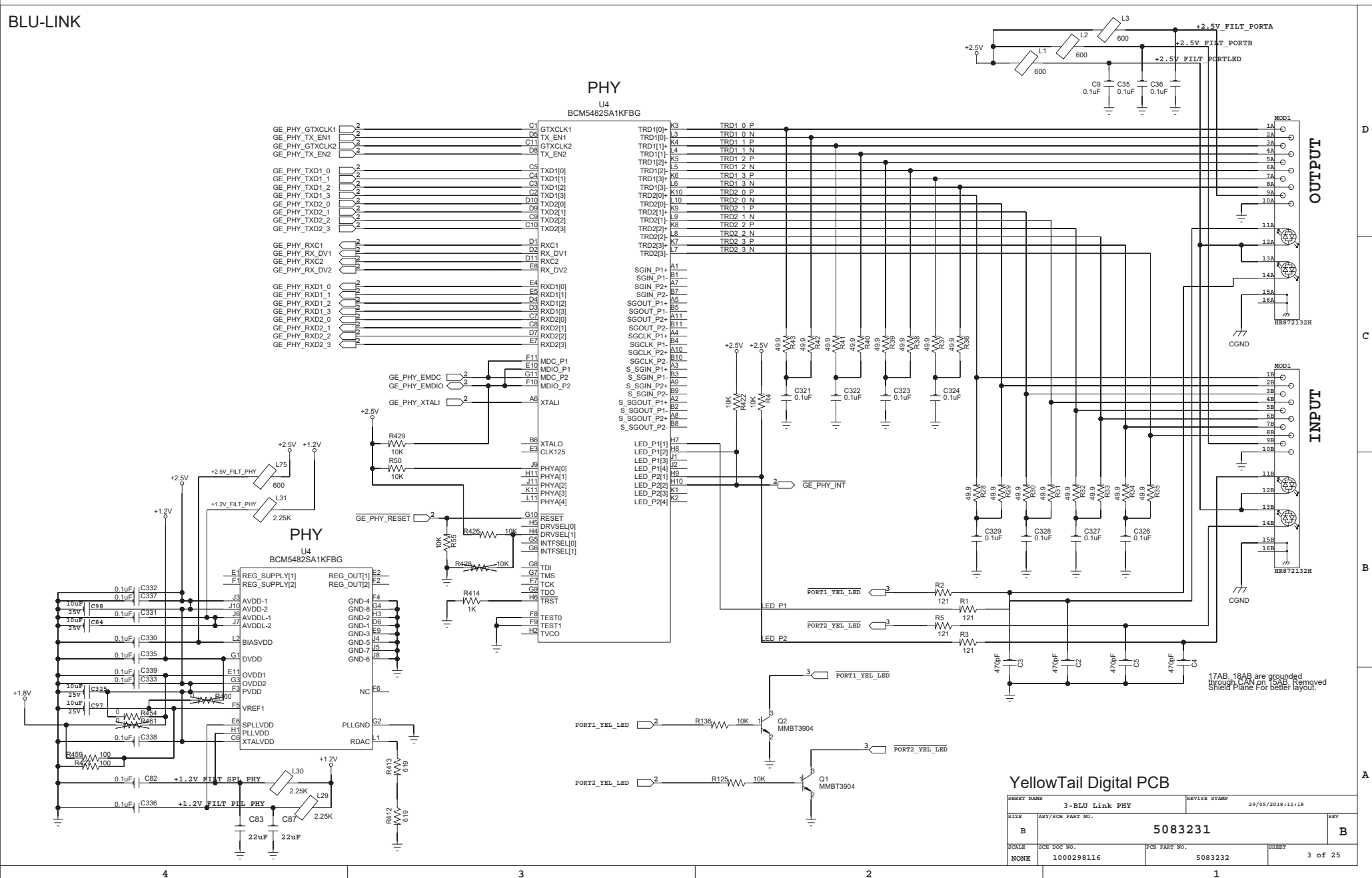
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BLU-LINK

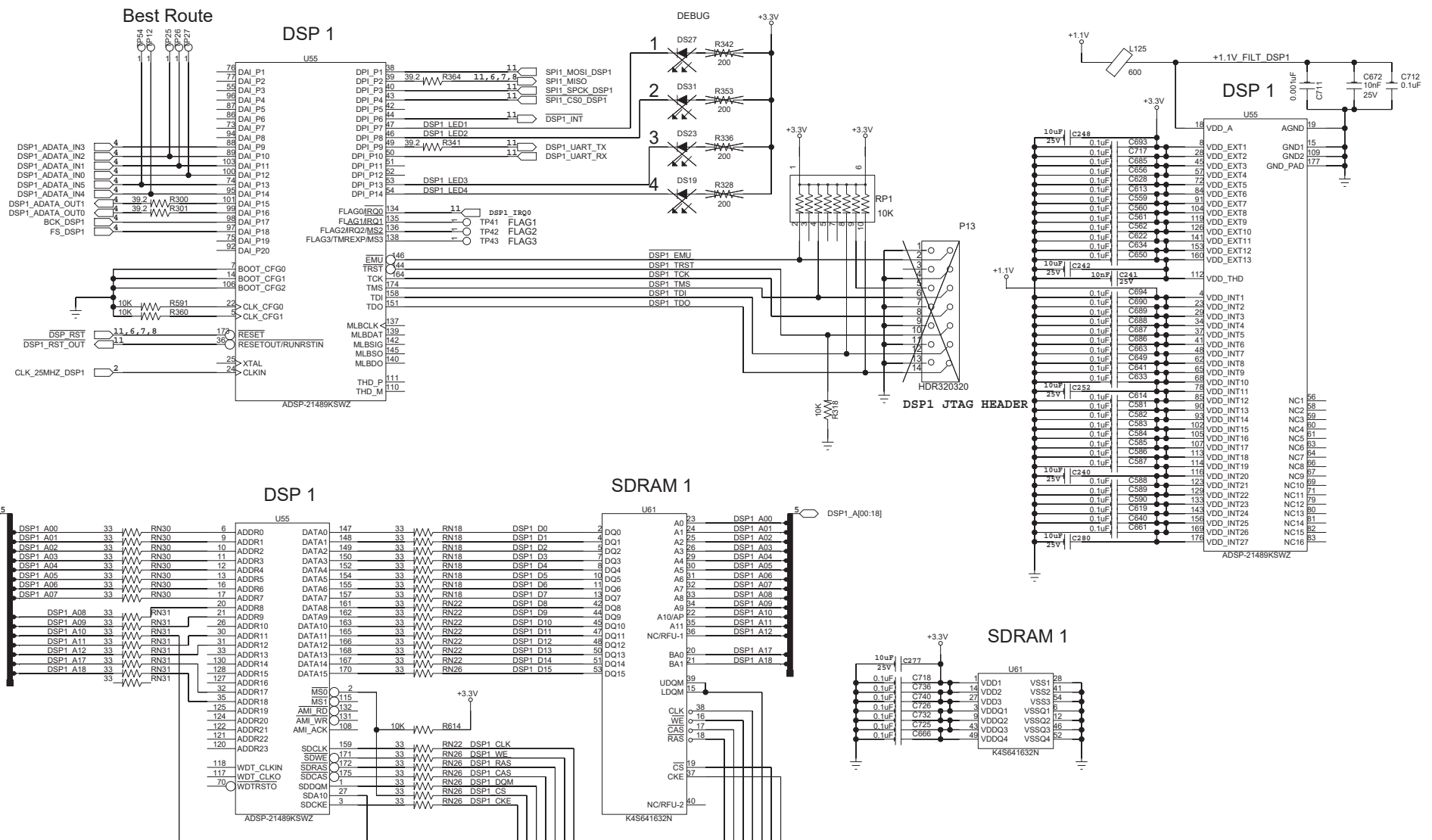


YellowTail Digital PCB

SHEET NAME		REVISE STAMP	
3-BLU Link PHY		29/05/2018:11:18	
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B			B
SCALE	SCH DOC NO.	PCB PART NO.	SHEET
NONE	1000298116	5083232	3 of 25



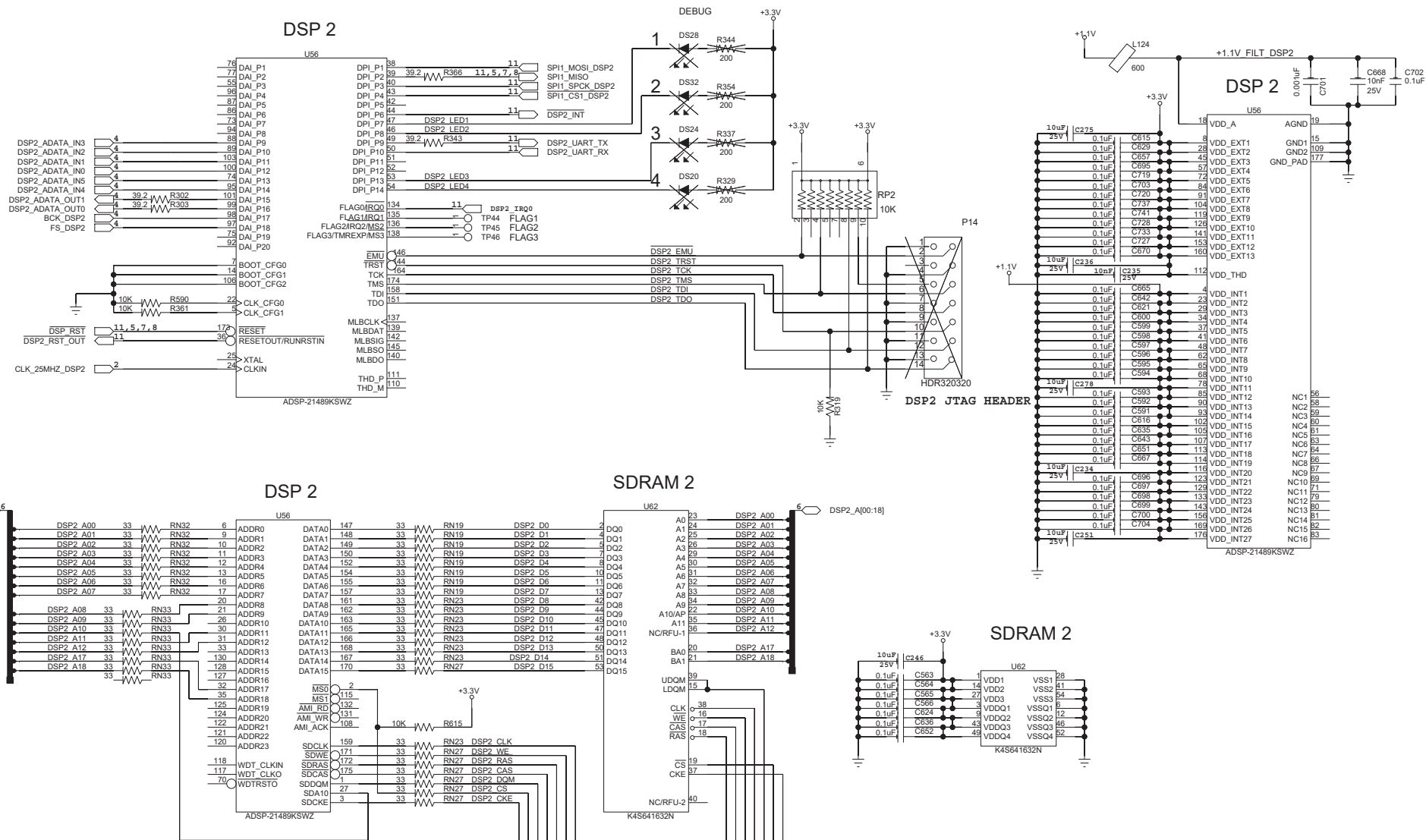
DSP 1



YellowTail Digital PCB

SHEET NAME		REVISE STAMP	
5-DSP1		29/05/2018:11:18	
SIZE	REV	PART NO.	
B	B	5083231	
SCALE	SCH DOC NO.	PCB PART NO.	SHEET
NONE	1000298116	5083232	5 of 25

DSP 2



SHEET NAME		6-DSP2		REVISE STAMP		29/05/2018:11:18	
SIZE		A5V/SCH PART NO.		5083231		REV	
SCALE		SCH DOC NO.		PCB PART NO.		SHEET	
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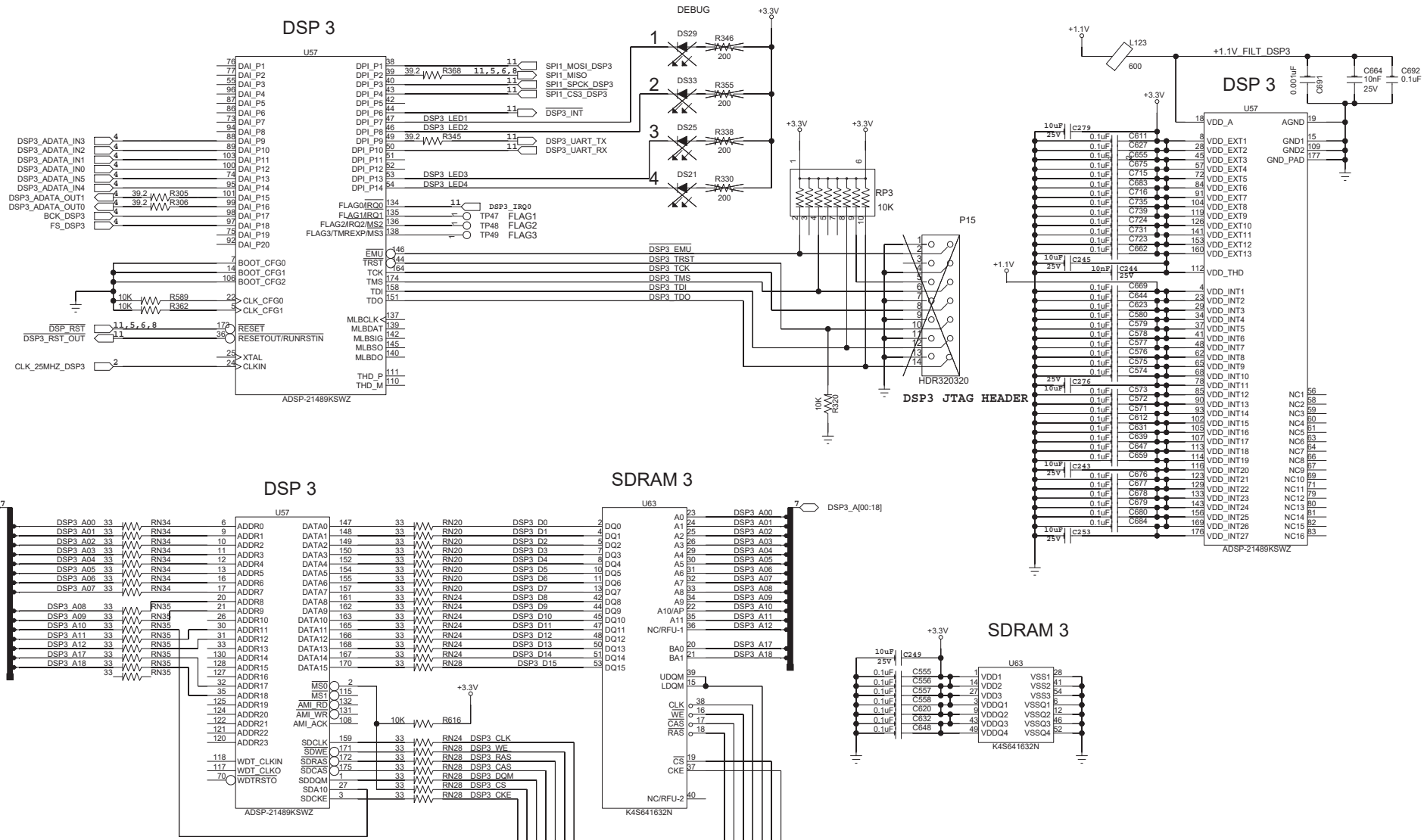
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DSP 3



YellowTail Digital PCB

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SIZE		ASV/SCH PART NO.		5083231		REV	
SCALE		SCH DOC NO.		PCB PART NO.		SHEET	
NONE		1000298116		5083232		7 of 25	

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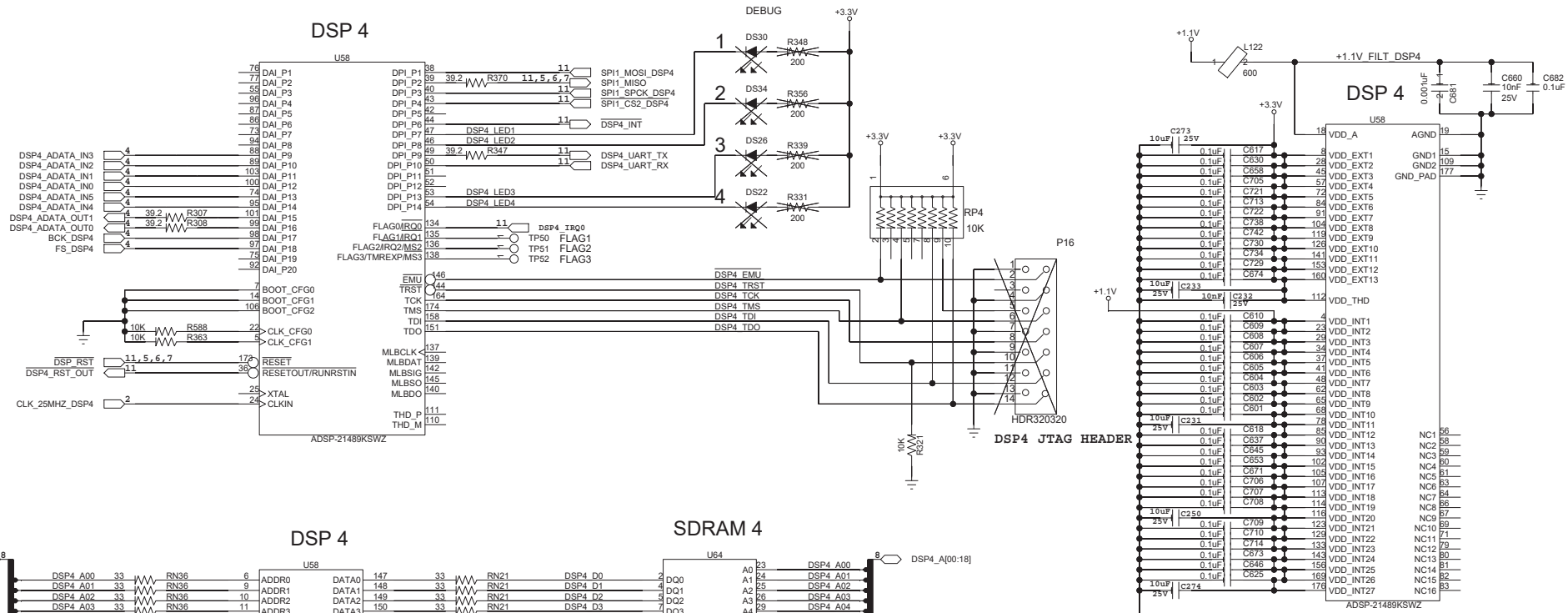
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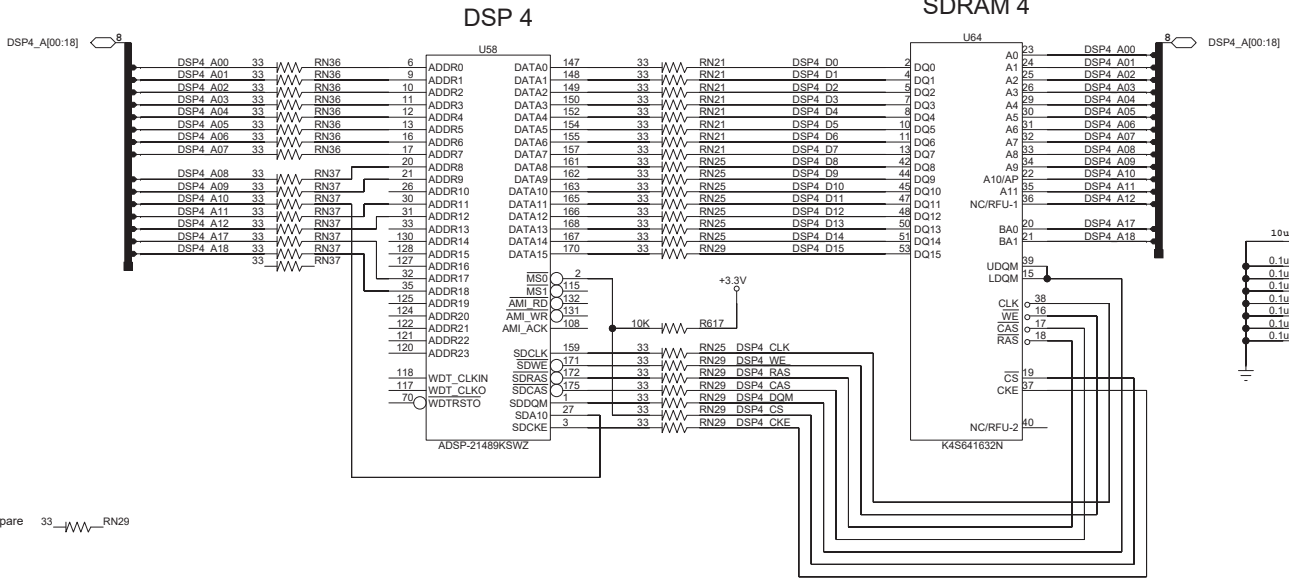
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DSP 4



DSP4\_A[00:18]

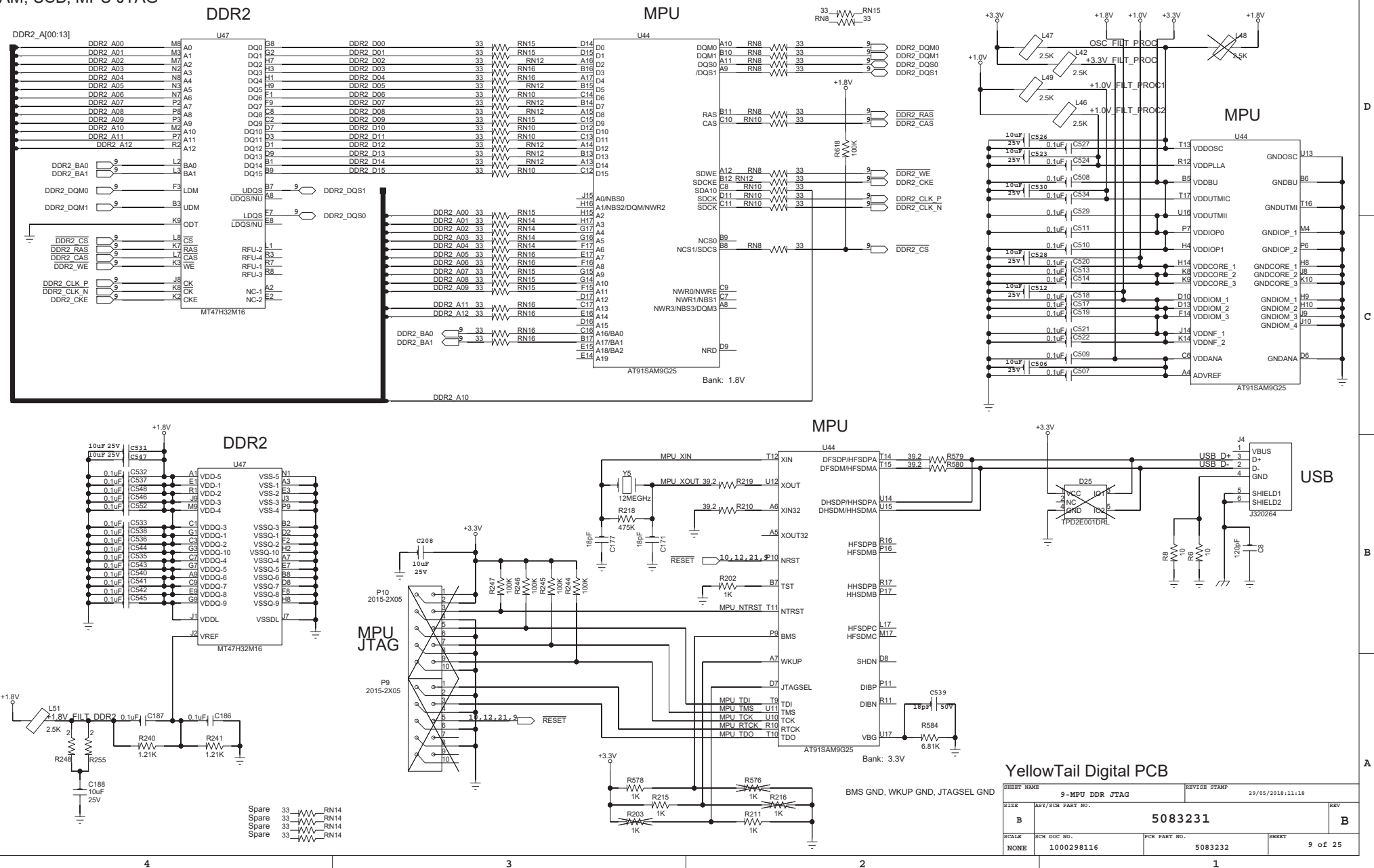


Spare 33 RN29

YellowTail Digital PCB

SHEET NAME		REVISE STAMP	
8 - DSP4		29/05/2018:11:18	
SIZE	REV	REV	
B	5083231	B	
SCALE	SCH DOC NO.	PCB PART NO.	SHEET
NONE	1000298116	5083232	8 of 25

RAM, USB, MPU JTAG



YellowTail Digital PCB

SHEET NAME		REVISE STAMP	
9-MPU DDR JTAG		29/05/2018:11:18	
SIZE	ASV/SCH PART NO.	5083231	REV
B			B
SCALE	SCH DOC NO.	PCB PART NO.	SHEET
NONE	1000298116	5083232	9 of 25

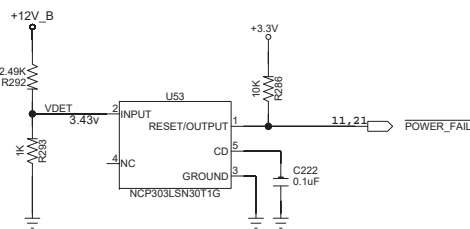
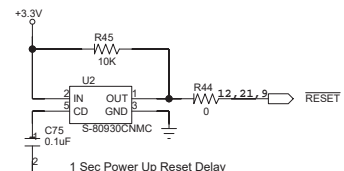
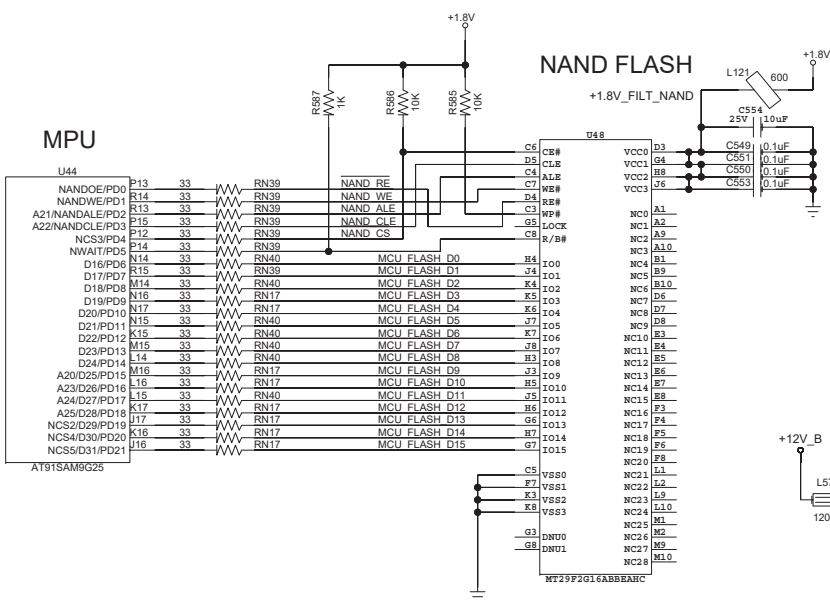
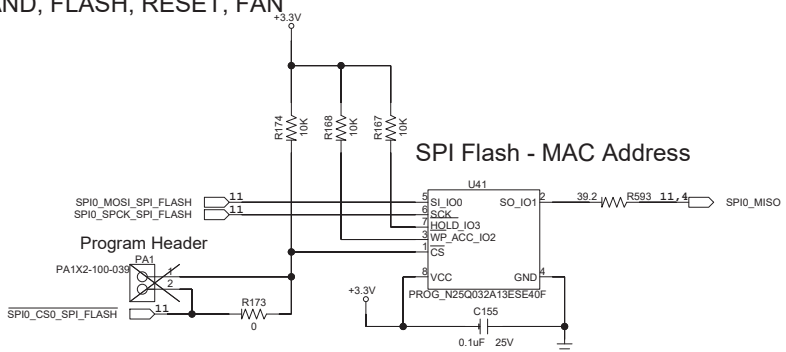
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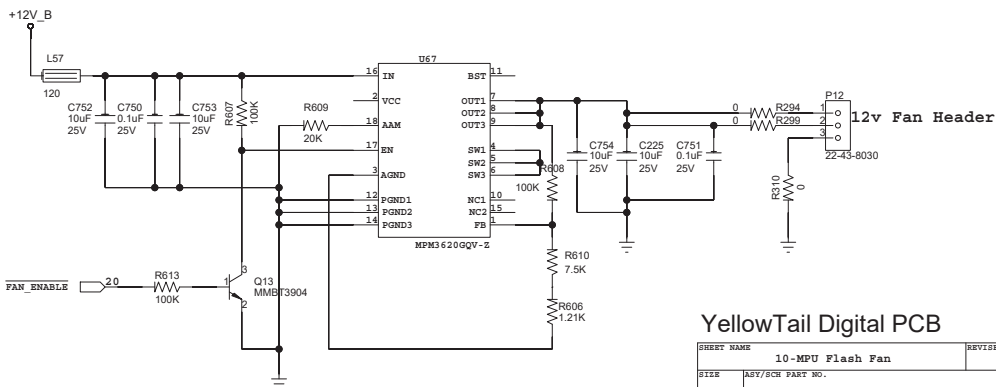
2

1

NAND, FLASH, RESET, FAN



Trigger at 3.0v. At 20% of 12V or about 9.6v. Ra=1K, Rb=2.21k  
Trigger at 3.0v. At 12% of 12V or about 10.5v. Ra=1K, Rb=2.49k



Reset and Status Signal Structure:

Signal Name	Destination	Source
RESET	MPU Reset Input	Reset Delay IC
POWER_FAIL	MPU Input	Brown Out Detect IC output at ~90%
PDN_ADC_IN	ADC Converters On Analog Board (6) (Pulled High)	MPU Output Option MCU Output Option FPGA Output Option
PDN_DAC_IN	DAC Converters On Analog Board (6) (Pulled High)	MPU Output Option MCU Output Option FPGA Output Option
FAN_FAIL	MPU Input	FAN IC Failure Signal (Pulled High)
DSP_RST	DSP0 DSP1 DSP2 DSP3 DSP4 DSP5 DSP6 DSP7 DSP8 DSP9 DSP10	MPU output (Pulled Low)
MCU_RST	Front Panel MCU Controller MCU	MCU (Pulled Low)
LCD_RST	Optional LCD	MPU (Pulled Low)
AES_RST	AES 1-12 Receivers (Pulled High)	*MPU Output Option MCU Output Option
SRC_RST	SRC 1-4 Converters (Pulled High)	*MPU Output Option MCU Output Option
GE_PHY_RST	Dual PHY Blu-Link	FPGA Output
ADC_RT_A_RST	RTA ADC On Analog Board Pulled High	*MPU Output Option MCU Output Option

33k resistor RN39 Spare  
33k resistor RN40 Spare

YellowTail Digital PCB

SHEET NAME		REVISE STAMP	
10-MPU Flash Fan		29/05/2018:11:18	
SIZE	ASV/SCH PART NO.	5083231	REV
B			B
SCALE	SCH DOC NO.	PCB PART NO.	SHEET
NONE	1000298116	5083232	10 of 25

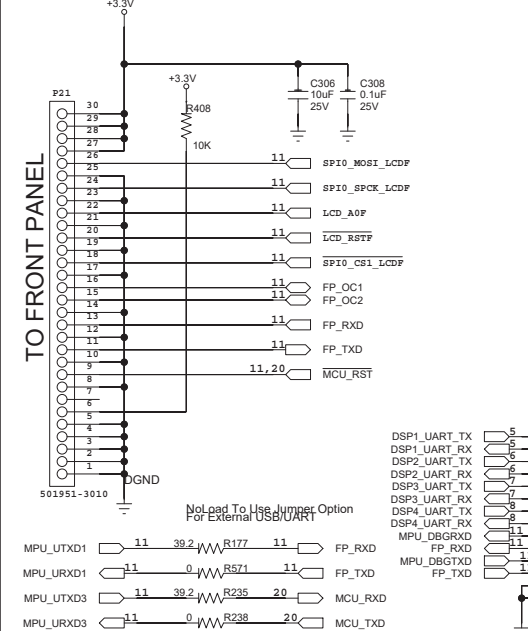
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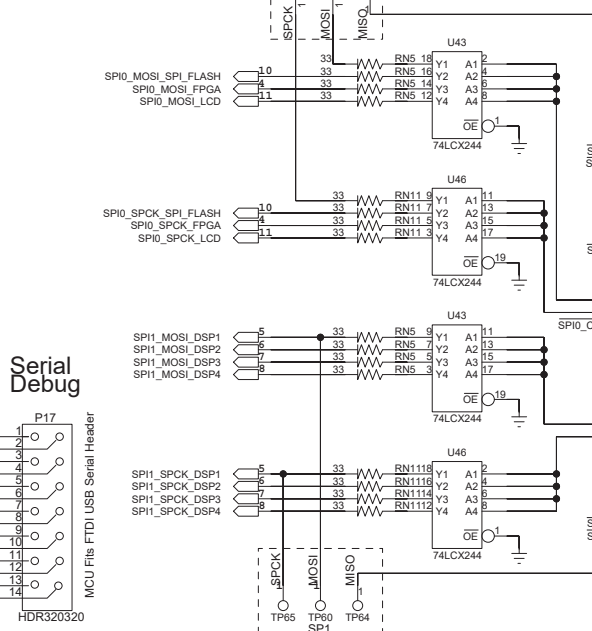
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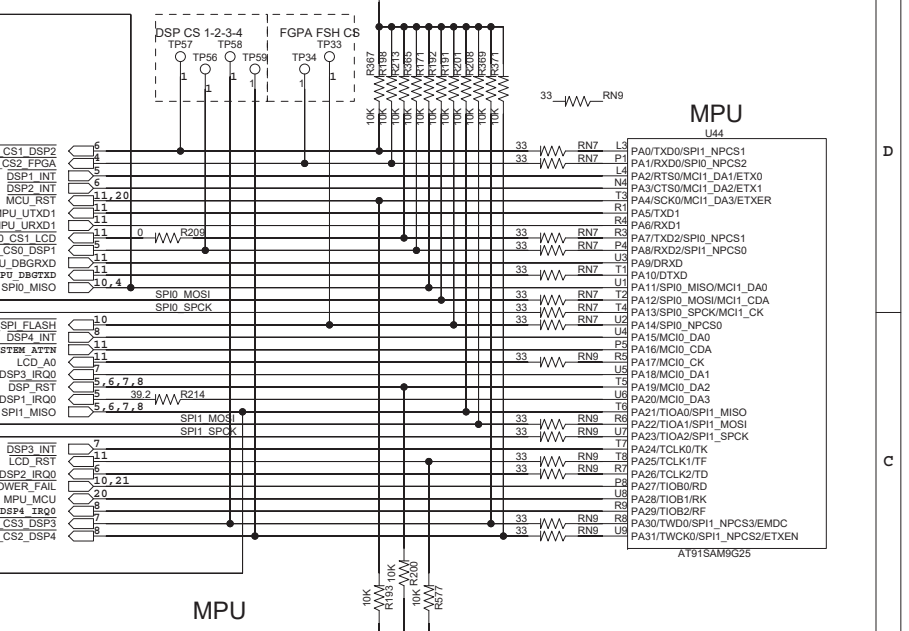
MPU and FRONT PANEL



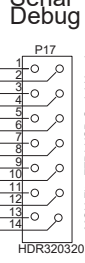
SPI Flash Buffer



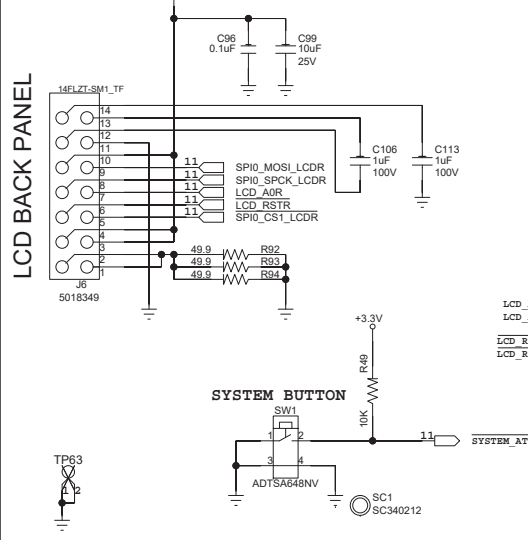
MPU



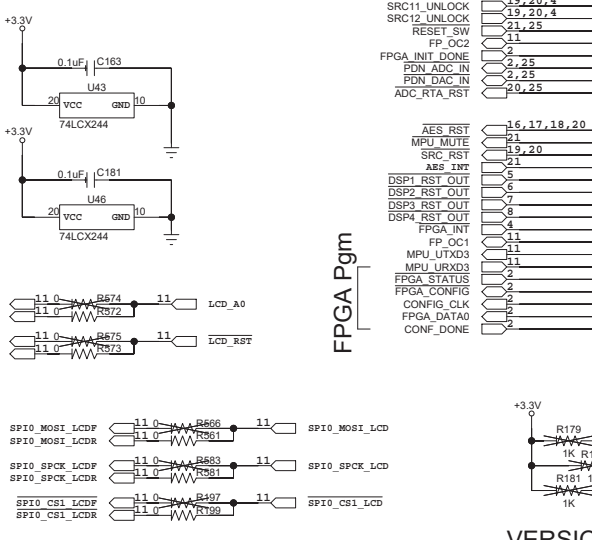
Serial Debug



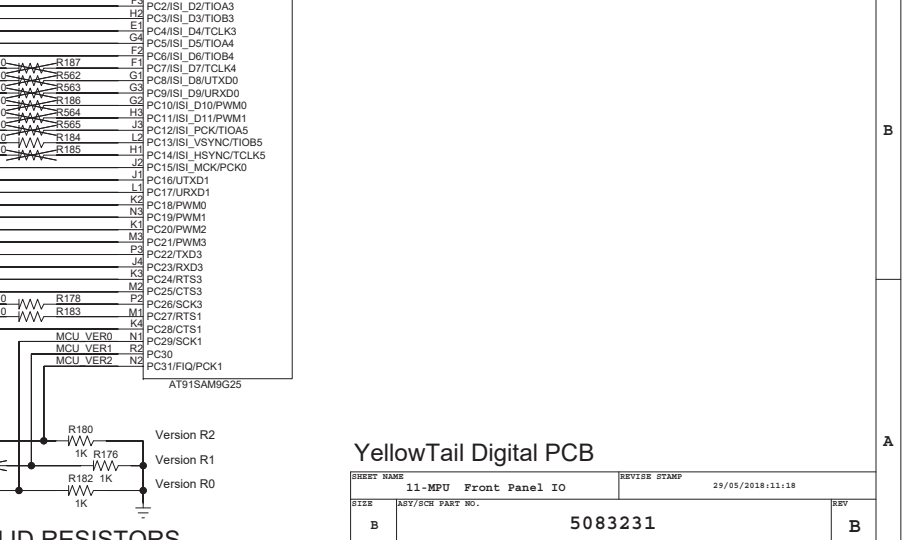
LCD BACK PANEL



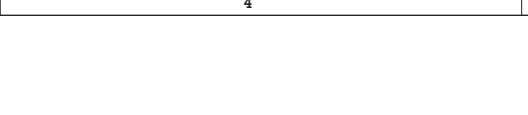
FPGA Pgm



MPU



SYSTEM BUTTON



VERSION ID RESISTORS



YellowTail Digital PCB

SHEET NAME		REVISE STAMP	
11-MPU Front Panel IO		29/05/2018:11:18	
SIZE	REV	REV	
B	ASV/SCH PART NO.	5083231	
SCALE	SCH DOC NO.	PCB PART NO.	SHEET
NONE	1000298116	5083232	11 of 25

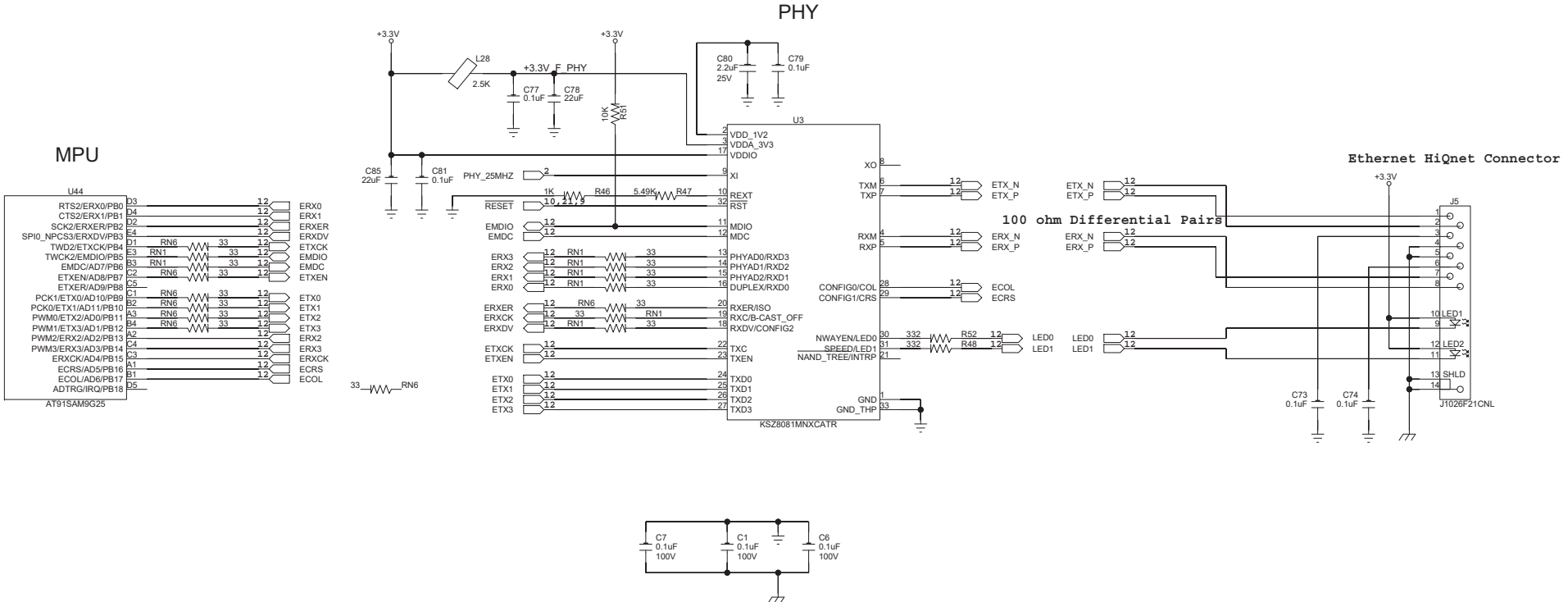
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Ethernet



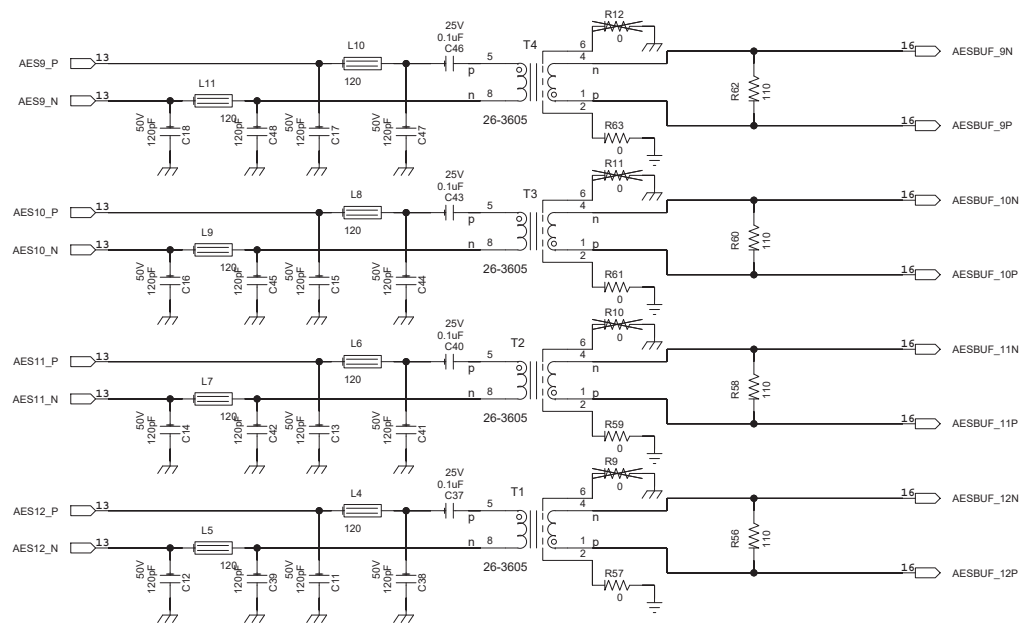
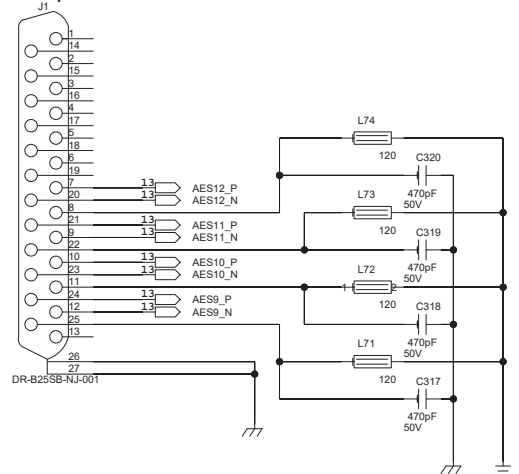
D  
C  
B  
A

YellowTail Digital PCB

SHEET NAME 12-Ethernet PHY			REVISE STAMP 29/05/2018:11:18		
SIZE	ASV/SCH PART NO.	5083231		REV	B
SCALE	SCH DOC NO.	PCB PART NO.	SHEET	12 of 25	
NONE	1000298116	5083232			

AES Input 9-12 TASCAM Standard

AES Input 9-12 TASCAM Standard



YellowTail Digital PCB

SHEET NAME		13-AES inputs 9-12		REVISE STAMP		29/05/2018:11:18	
SIZE	A5V/SCH PART NO.			5083231			REV
B							B
SCALE	SCH DOC NO.	PCB PART NO.	SHEET		13 of 25		
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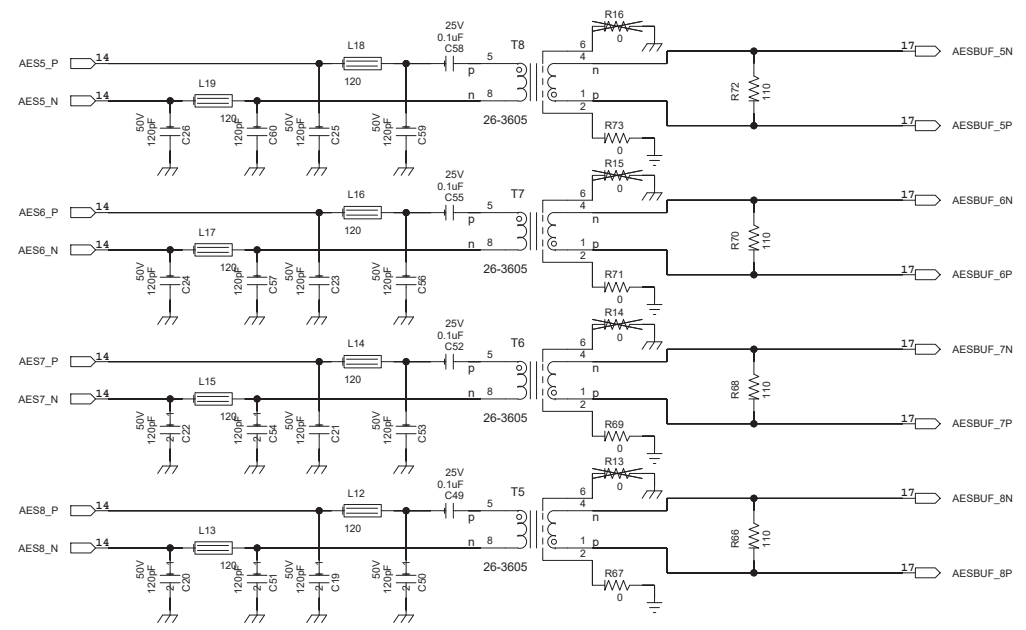
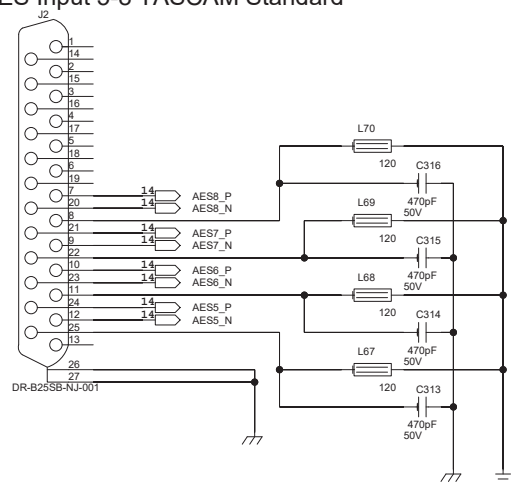
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D  
C  
B  
A

AES Input 5-8 TASCAM Standard

AES Input 5-8 TASCAM Standard



YellowTail Digital PCB

SHEET NAME		REVISE STAMP	
14-AES inputs 5-8		29/05/2018:11:18	
SIZE	ASV/SCH PART NO.	REV	
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SCALE	SCH DOC NO.	PCB PART NO.	SHEET
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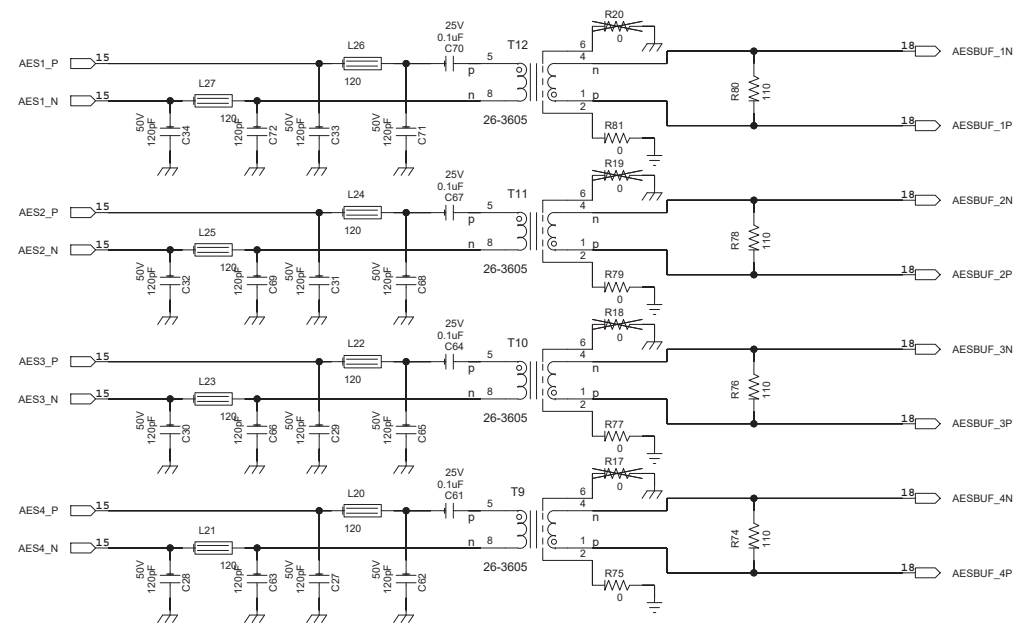
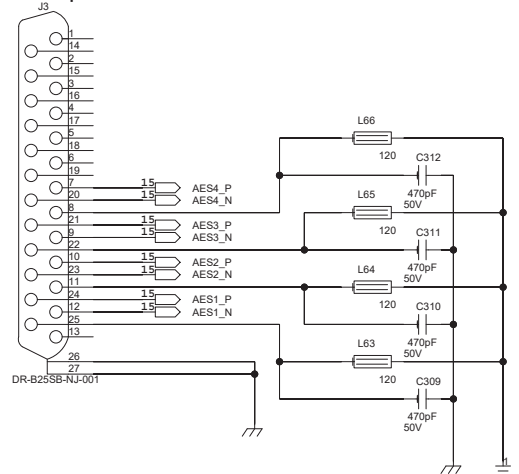
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1

D  
C  
B  
A

AES Input 1-4 TASCAM Standard

AES Input 1-4 TASCAM Standard



YellowTail Digital PCB

SHEET NAME 15-AES inputs 1-4		REVISE STAMP 29/05/2018:11:18	
SIZE B	ASV/SCH PART NO. 5083231	REV B	
SCALE NONE	SCH DOC NO. 1000298116	PCB PART NO. 5083232	SHEET 15 of 25

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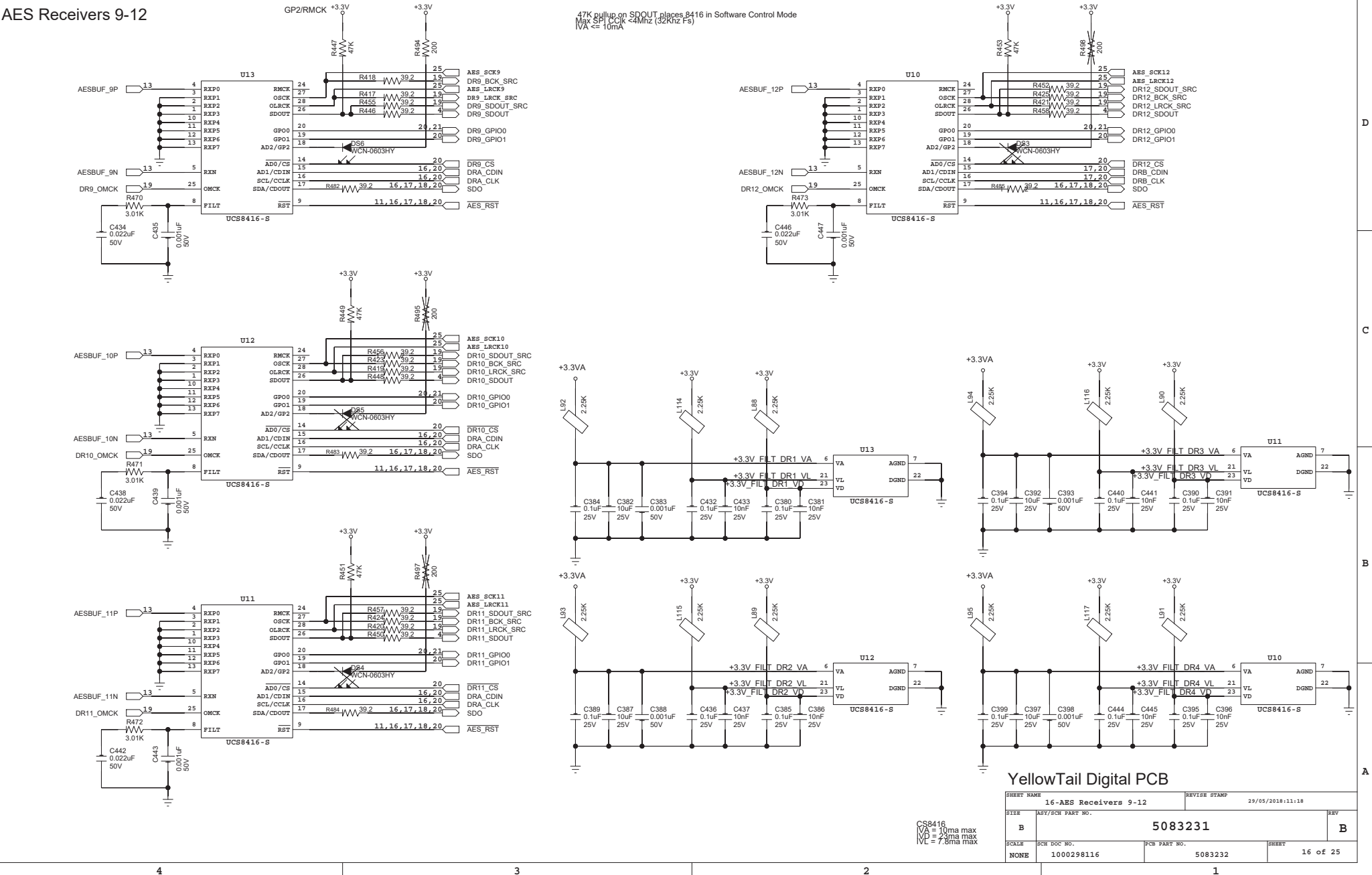
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D  
C  
B  
A



AES Receivers 9-12



47K pullup on SDOUT places 8416 in Software Control Mode  
Max SPI Clock <4MHz (32KHz FS)  
I<sub>VA</sub> <= 10mA

CS8416  
I<sub>VA</sub> = 10mA max  
I<sub>VD</sub> = 2.3mA max  
I<sub>VL</sub> = 7.8mA max

YellowTail Digital PCB

SHEET NAME 16-AES Receivers 9-12		REVISE STAMP 29/05/2018:11:18	
SIZE B	ASV/SCH PART NO. 5083231	REV B	
SCALE NONE	SCH DOC NO. 1000298116	PCB PART NO. 5083232	SHEET 16 of 25

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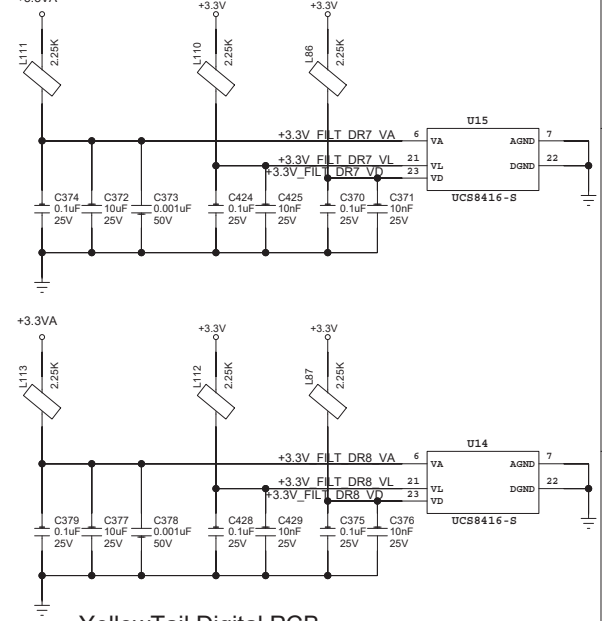
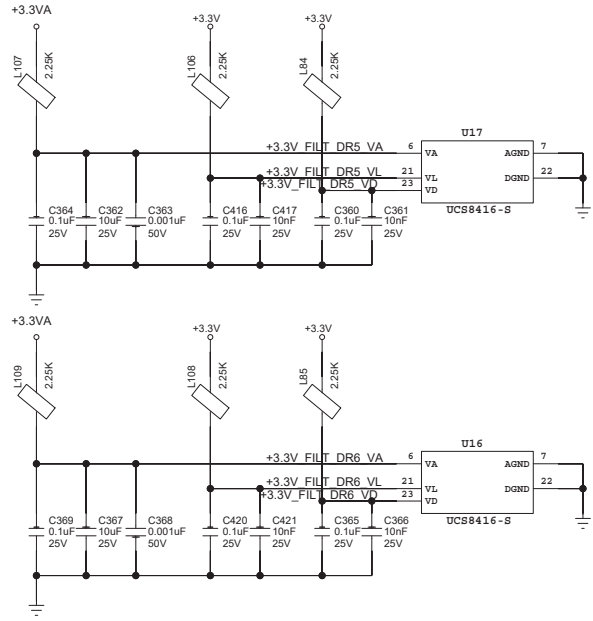
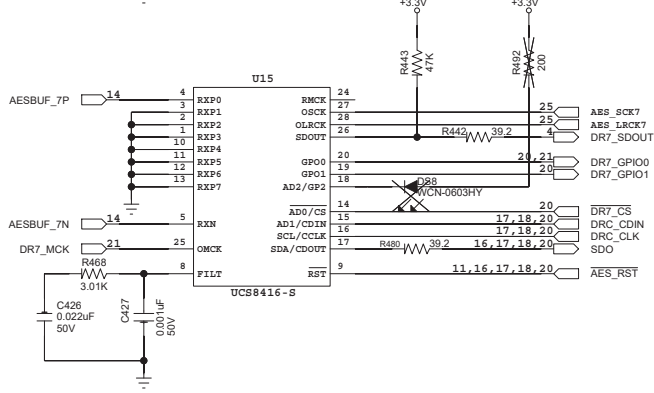
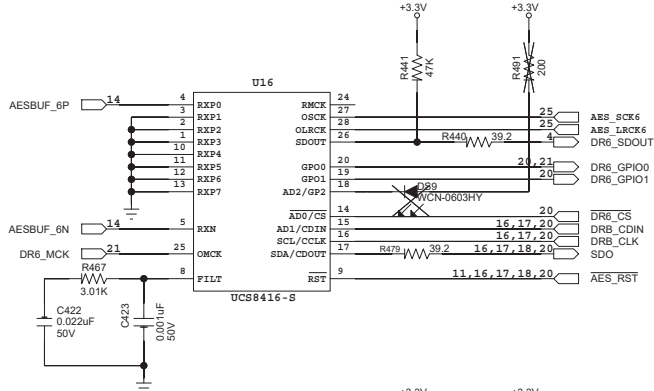
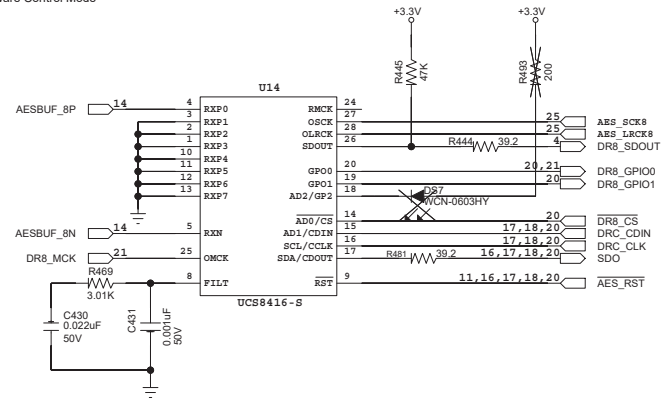
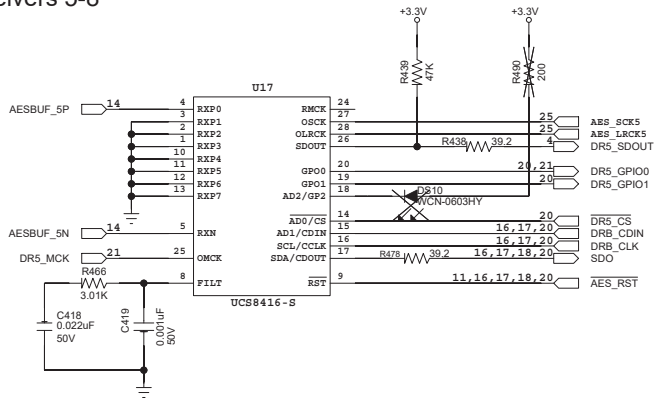
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AES Receivers 5-8

47K pullup on SDOUT places 8416 in Software Control Mode  
Max SPI Clock <4MHz (32KHz FS)  
IVA <= 10mA

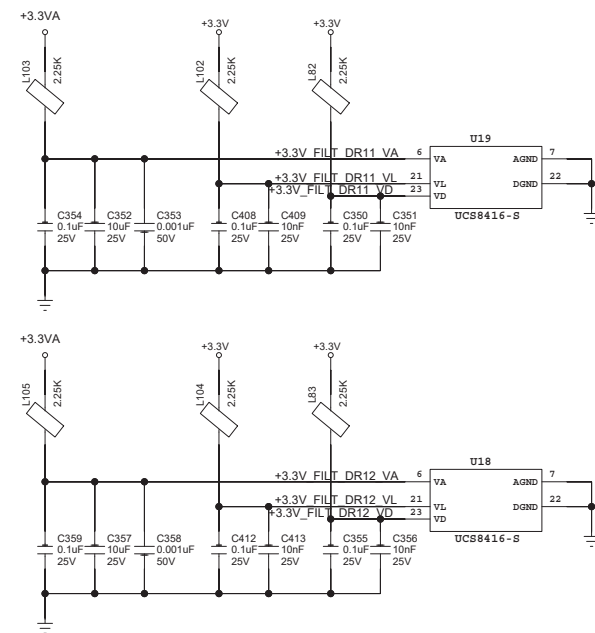
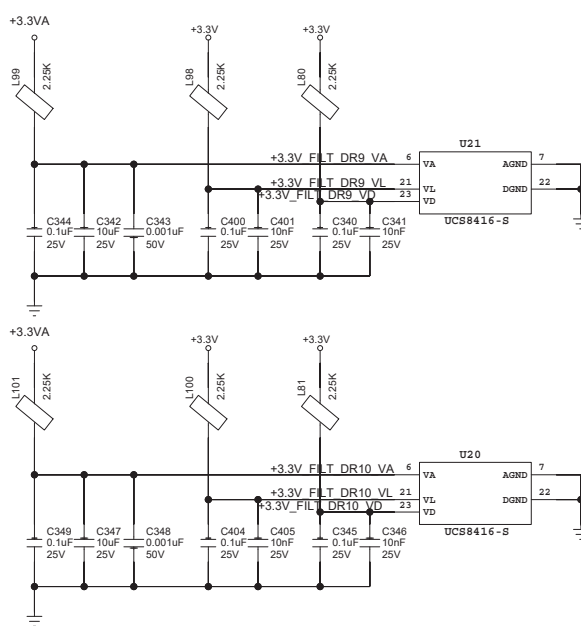
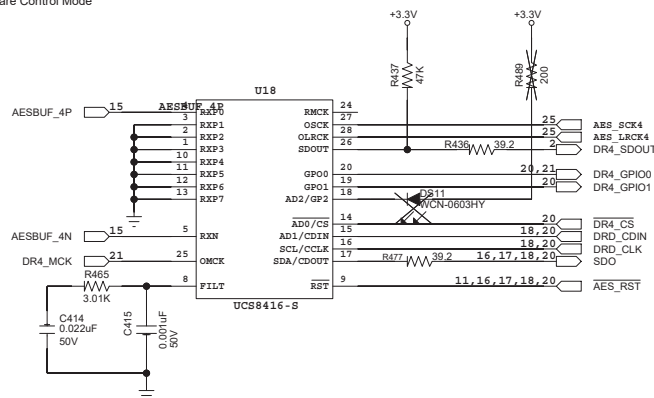
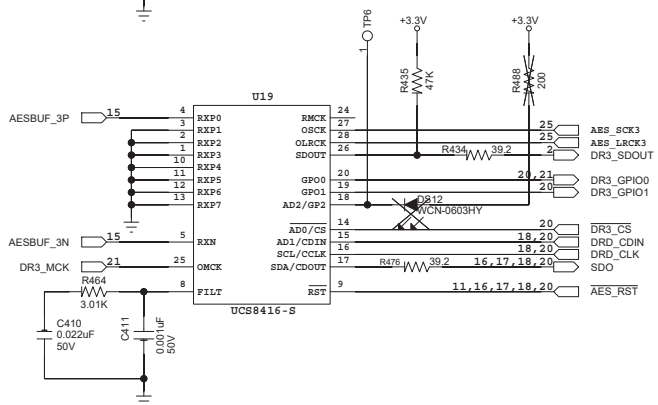
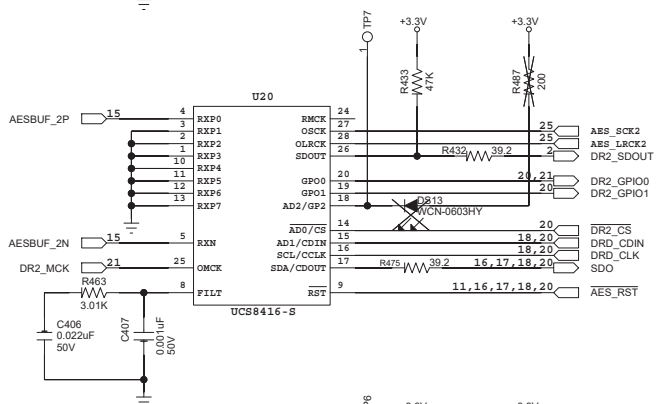
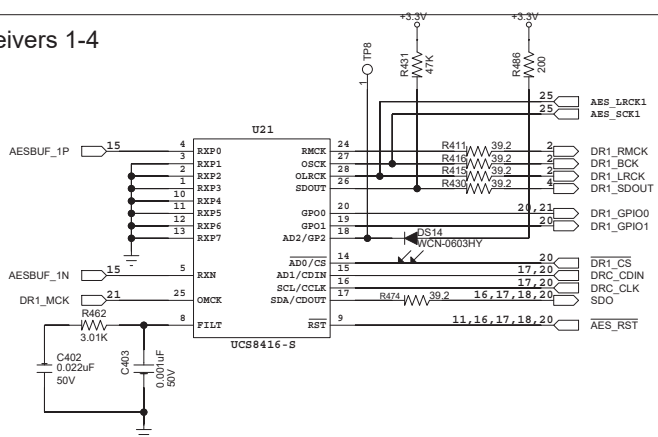


YellowTail Digital PCB

SHEET NAME		REVISE STAMP	
17-AES Receivers 5-8		29/05/2018:11:18	
SIZE	ASV/SCH PART NO.	REV	
B	5083231	B	
SCALE	SCH DOC NO.	PCB PART NO.	SHEET
NONE	1000298116	5083232	17 of 25

AES Receivers 1-4

47K pullup on SDOUT places 8416 in Software Control Mode  
Max SPI Clock <4MHz (32KHz FS)  
I<sub>VA</sub> <= 10mA



YellowTail Digital PCB

SHEET NAME 18-AES Receivers 1-4		REVISE STAMP 29/05/2018:11:18	
SIZE B	ASV/SCH PART NO. 5083231	REV B	
SCALE NONE	SCH DOC NO. 1000298116	PCB PART NO. 5083232	SHEET 18 of 25

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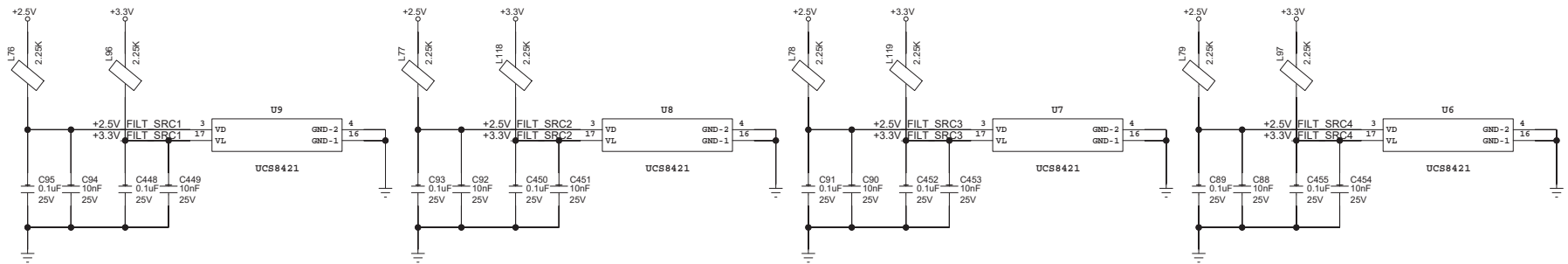
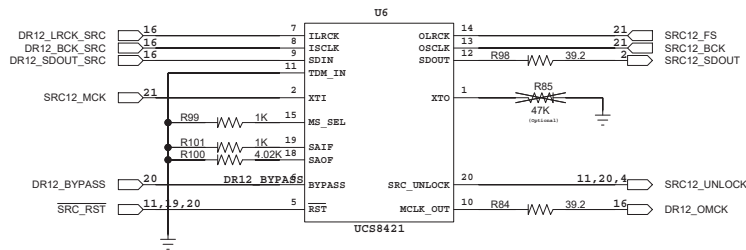
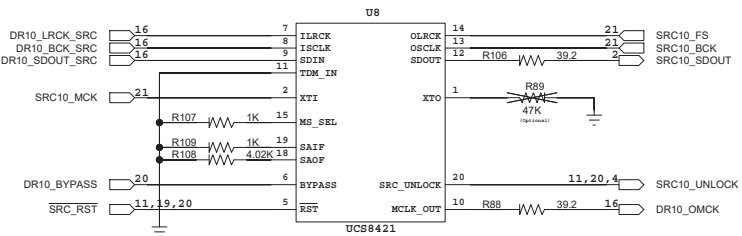
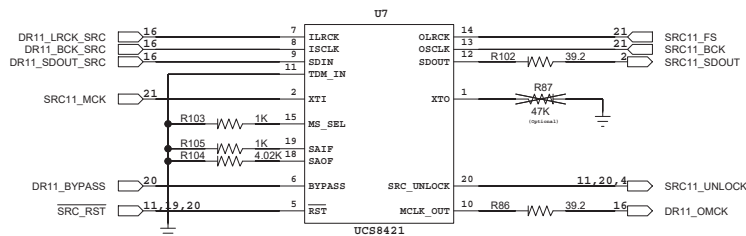
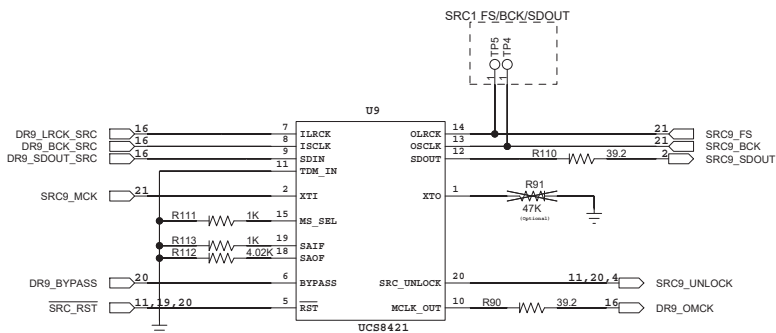
2

1

SRC 9-12

MODE	MS_SEL	SAIF	SAOF
I/O Dependent	1K to GND	-	-
I2S	-	1K to GND	-
24-bit	-	-	4.02K to GND

\* = Can Be Tied To Ground



YellowTail Digital PCB

SHEET NAME		REVISE STAMP	
19-SRC 9-12		29/05/2018:11:18	
SIZE	ASV/SCH PART NO.	REV	
B	5083231	B	
SCALE	SCH DOC NO.	PCB PART NO.	SHEET
NONE	1000298116	5083232	19 of 25

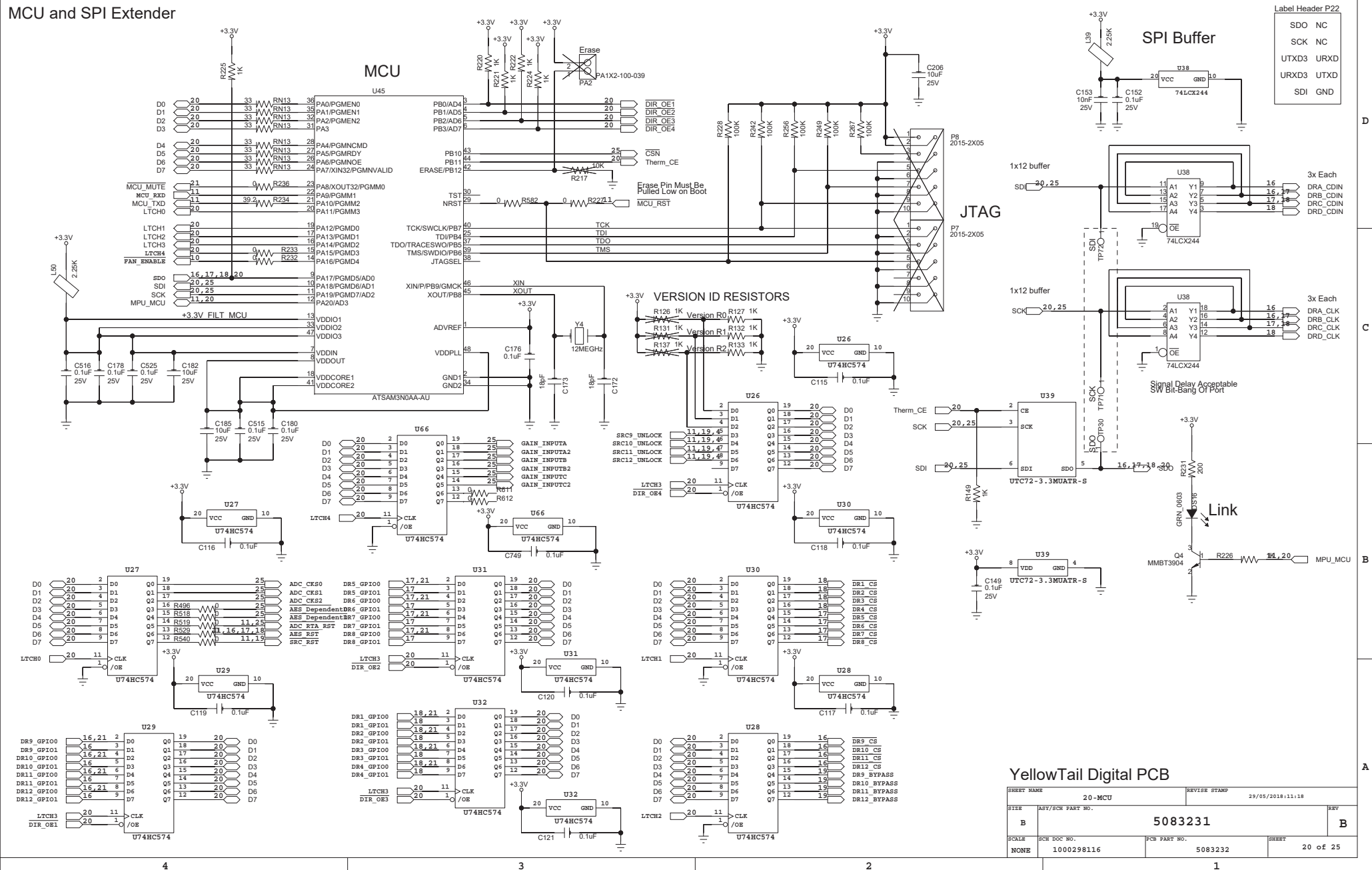
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MCU and SPI Extender



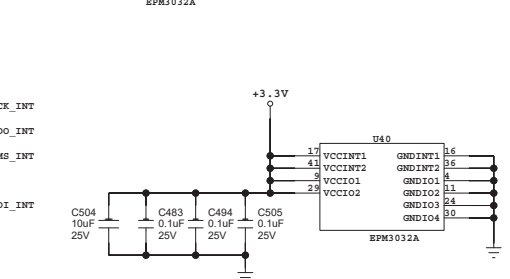
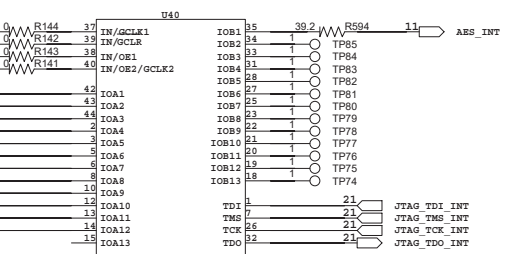
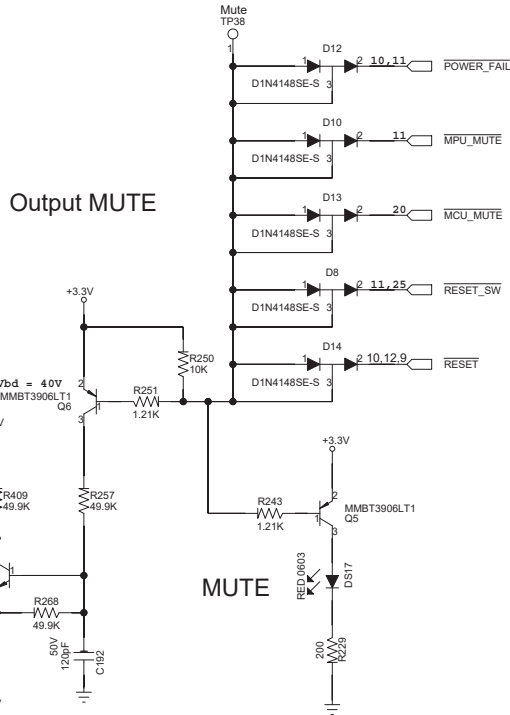
Label Header P22

SDO	NC
SCK	NC
UTXD3	URXD
URXD3	UTXD
SDI	GND

YellowTail Digital PCB

SHEET NAME		20-MCU	REVISE STAMP		29/05/2018:11:18
SIZE	ASV/SCH PART NO.	5083231			REV
B					B
SCALE	SCH DOC NO.	PCB PART NO.	SHEET	20 of 25	
NONE	1000298116	5083232			

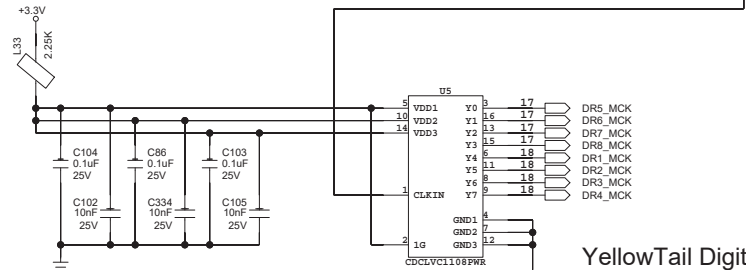
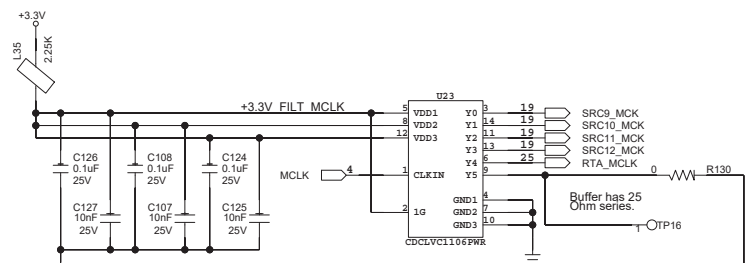
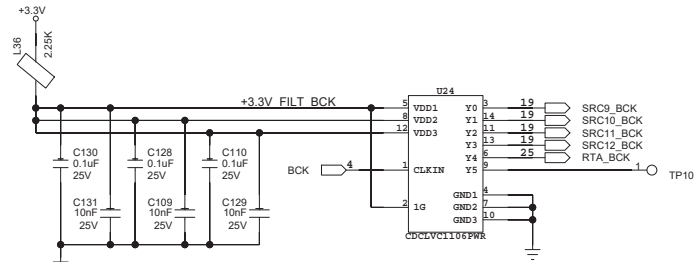
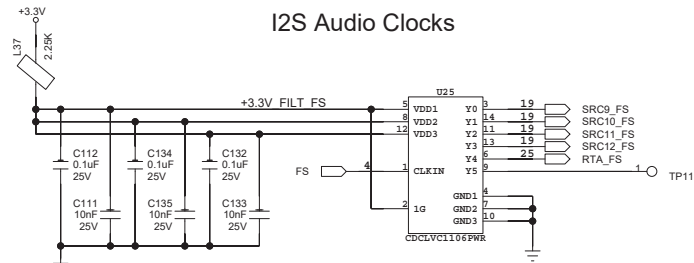
Buffers, MUTE and Interrupt



4

3

I2S Audio Clocks



T1 Buffer Specifications  
0.8ns < Pd < 2.0ns  
50s < Tsk (between outputs)  
0.5ns < Tsk (part-part)  
25-Ohm Series Output Resistor  
40mA/Buffer Power

YellowTail Digital PCB

SHEET NAME		REVISE STAMP	
21-Buffers		29/05/2018:11:18	
SIZE	ASV/SCH PART NO.	5083231	REV
B			B
SCALE	SCH DOC NO.	PCB PART NO.	SHEET
NONE	1000298116	5083232	21 of 25

1

D

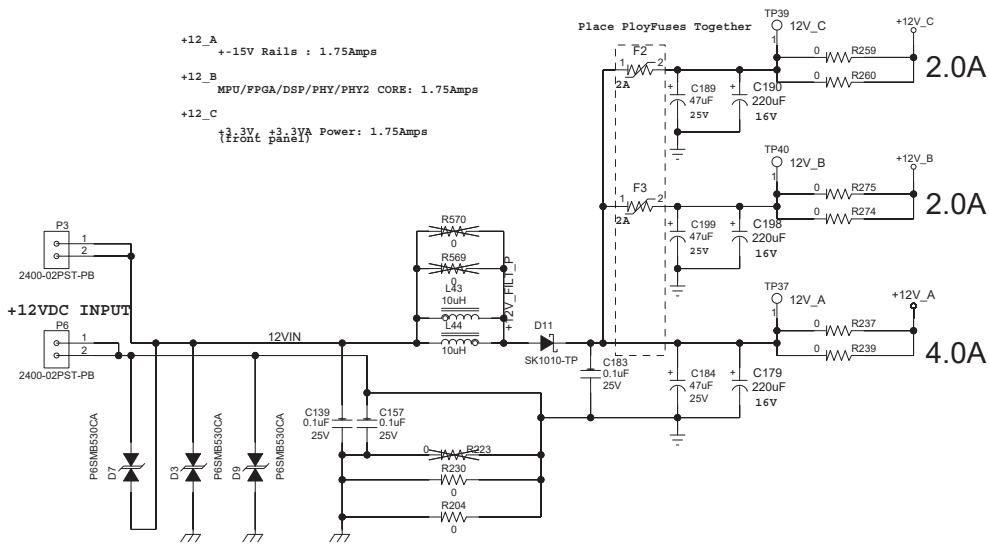
C

B

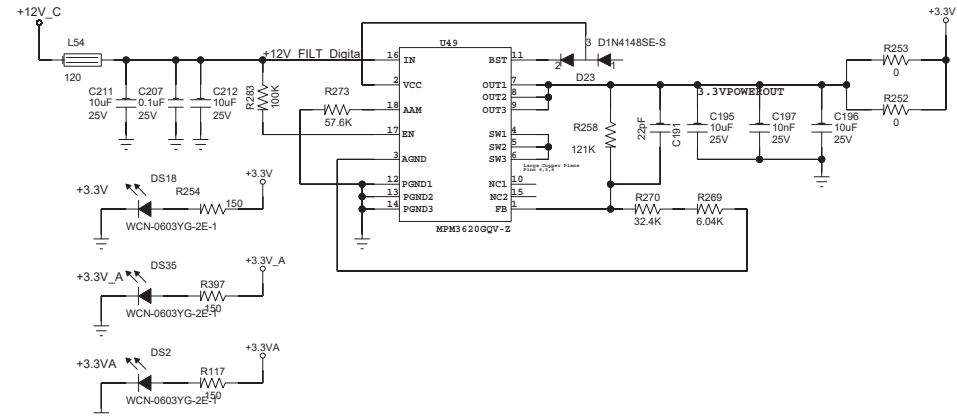
A

POWER

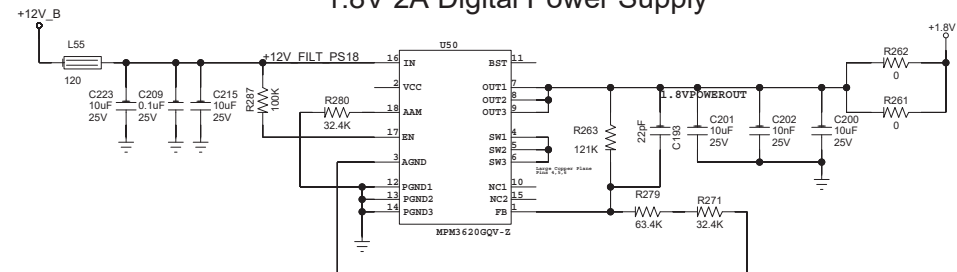
+12V DC INPUT @ 65 Watt



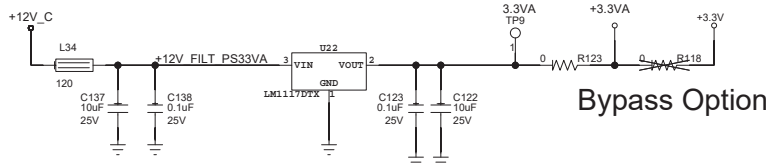
3.3V 2A Digital Power Supply



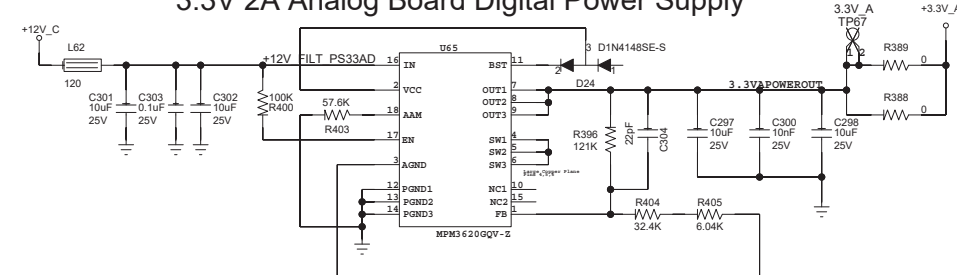
1.8V 2A Digital Power Supply



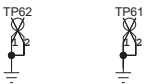
3.3V 800mA Digital Board Analog Power Supply



3.3V 2A Analog Board Digital Power Supply



YellowTail Digital PCB



SHEET NAME		REVISE STAMP	
22-Power Supply 1		29/05/2018:11:18	
SIEE	ASV/SCH PART NO.	REV	
B	5083231	B	
SCALE	SCH DOC NO.	PCB PART NO.	SHEET
NONE	1000298116	5083232	22 of 25

4

3

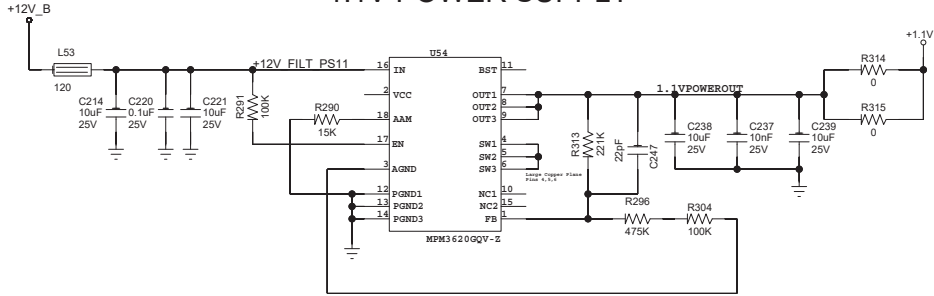
2

1

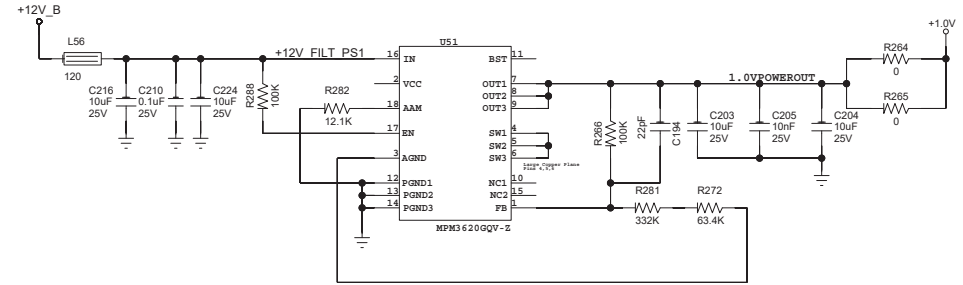
POWER

Replace 0 ohm resistors with trace before shipping on each output  
These are for measuring current draw in prototypes

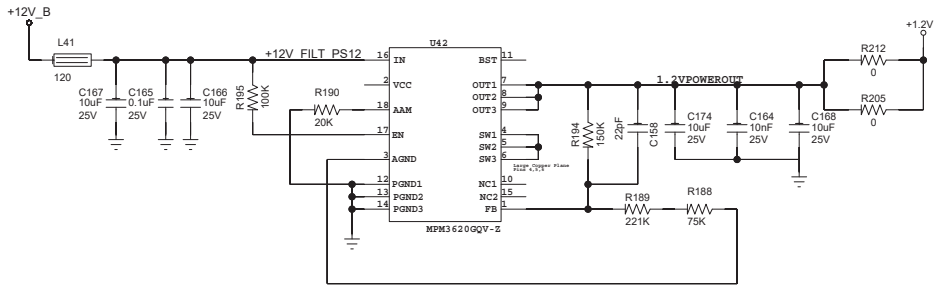
1.1V POWER SUPPLY



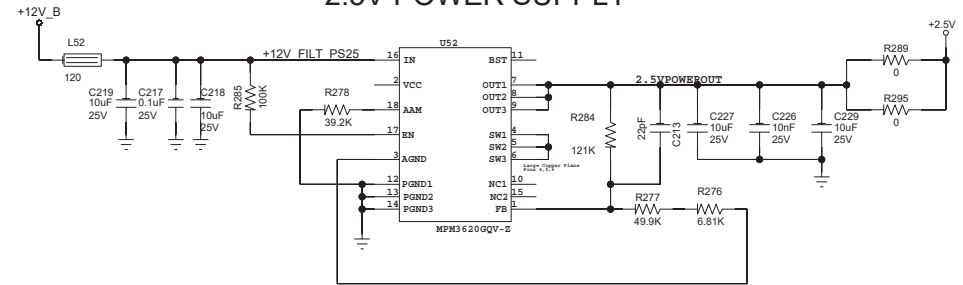
1.0V POWER SUPPLY



1.2V POWER SUPPLY



2.5V POWER SUPPLY



	1.0v	1.075v	1.1v	1.2v	1.8v	2.5v	3.3v	5.0v
R1	100k	332k	221k	150k	121k	121k	121k	150k
R2_1	332k	475k	475k	221k	63.4k	49.9k	32.4k	15k
R2_2	63.4k	475k	100k	75k	32.4k	6.81k	6.04k	13.3k
RAAM	12.7k		17.7k	19.6k	32.4k	42.4k	56k	63.4k
Volts	0.999	1.077	1.104	1.202	1.806	2.5	3.09	5.028

YellowTail Digital PCB

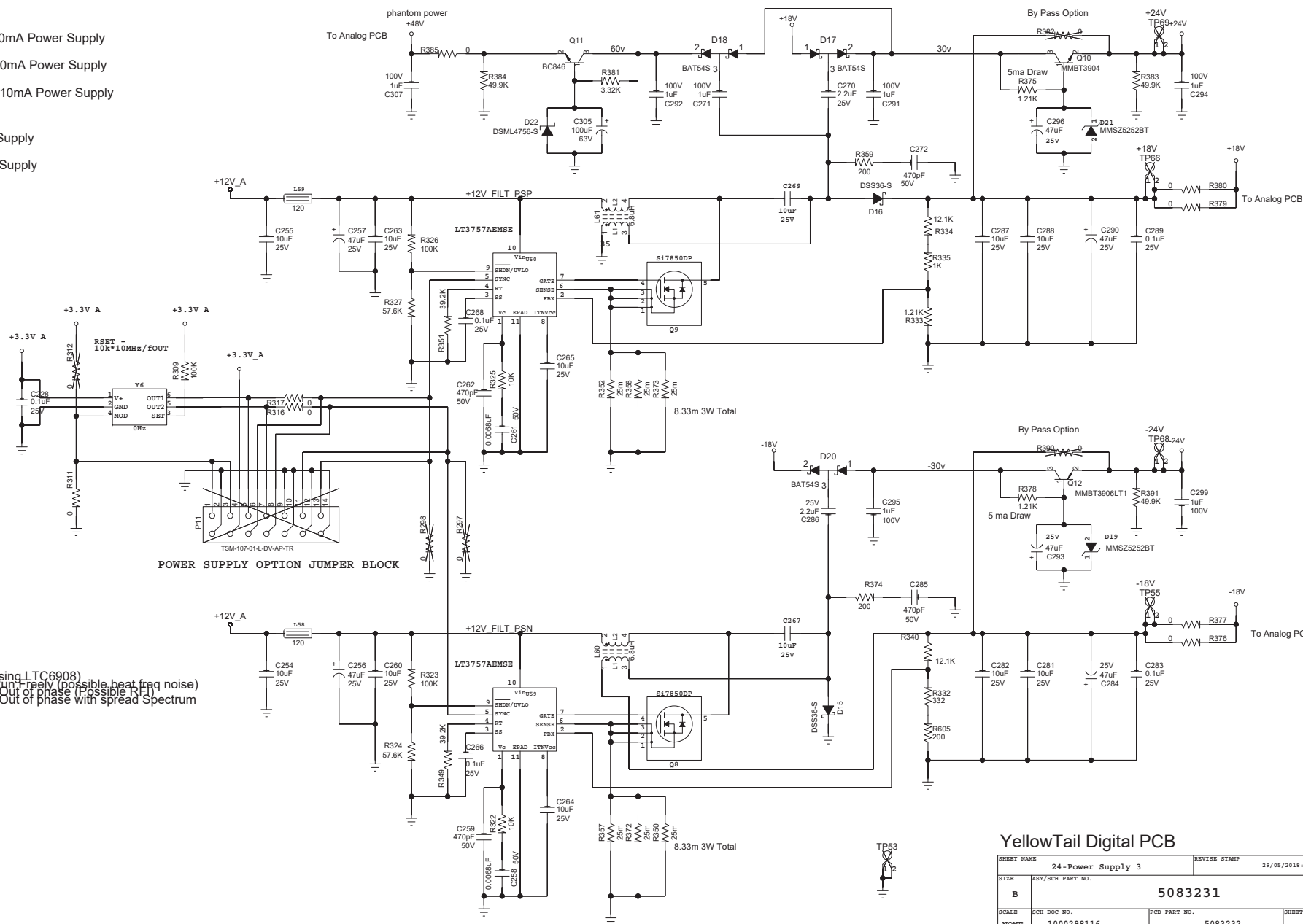
SHEET NAME		REVISE STAMP	
23-Power Supply 2		29/05/2018:11:18	
SIZE	ASV/SCH PART NO.	REV	
B	5083231	B	
SCALE	SCH DOC NO.	PCB PART NO.	SHEET
NONE	1000298116	5083232	23 of 25



POWER

- Phantom +48V 10mA Power Supply
- FET Mute -24V 10mA Power Supply
- FET Mute +24V 10mA Power Supply

- 18V 2A Power Supply
- + 18V 2A Power Supply



Options (using LTC6908)  
(with) 180 Out of phase (possible RF)  
(with) 180 Out of phase with spread Spectrum

YellowTail Digital PCB

SHEET NAME 24-Power Supply 3		REVISE STAMP 29/05/2018:11:18	
SIZE B	ASV/SCH PART NO. 5083231	REV B	
SCALE NONE	SCH DOC NO. 1000298116	PCB PART NO. 5083232	SHEET 24 of 25

4

3

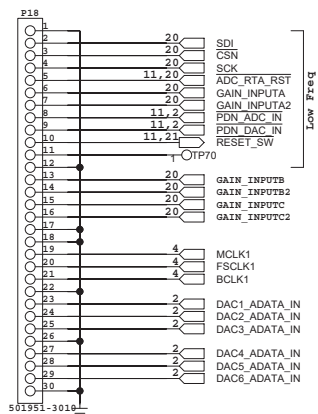
2

1

INTERCONNECT

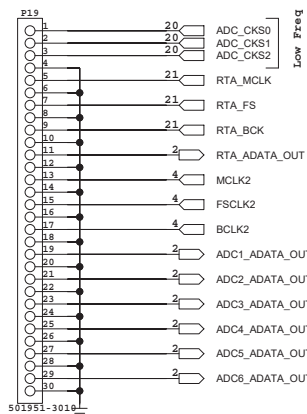
Analog Board P1

DAC Digital Audio And Control



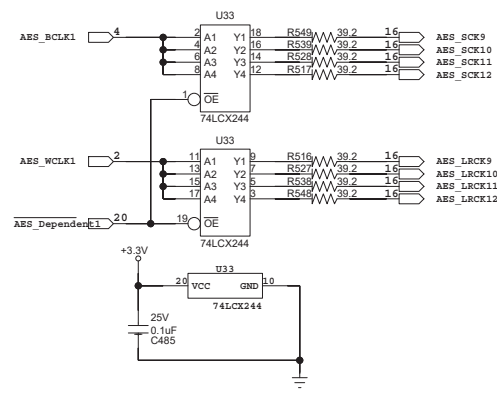
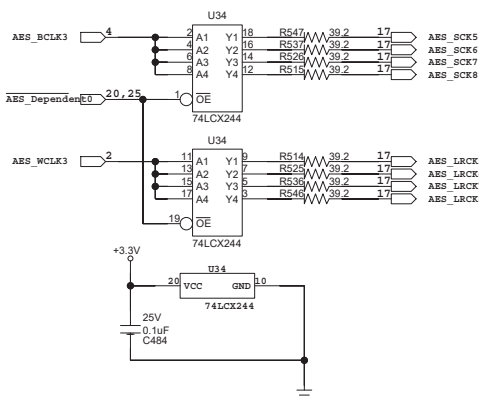
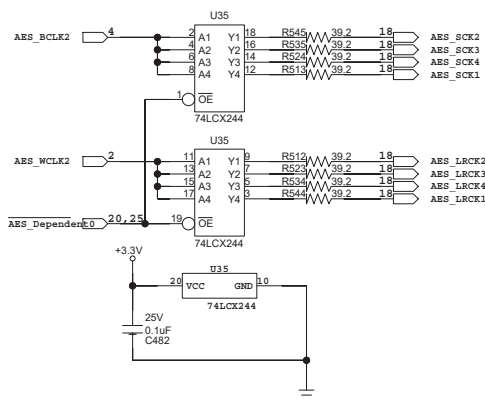
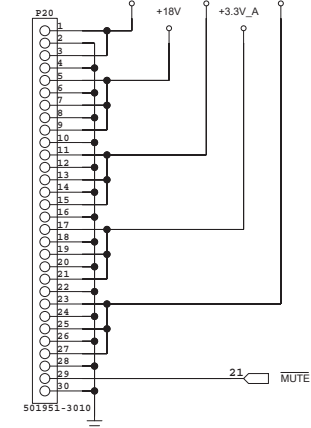
Analog Board P2

ADC and RTA Digital Audio



Analog Board P3

Power and Mute



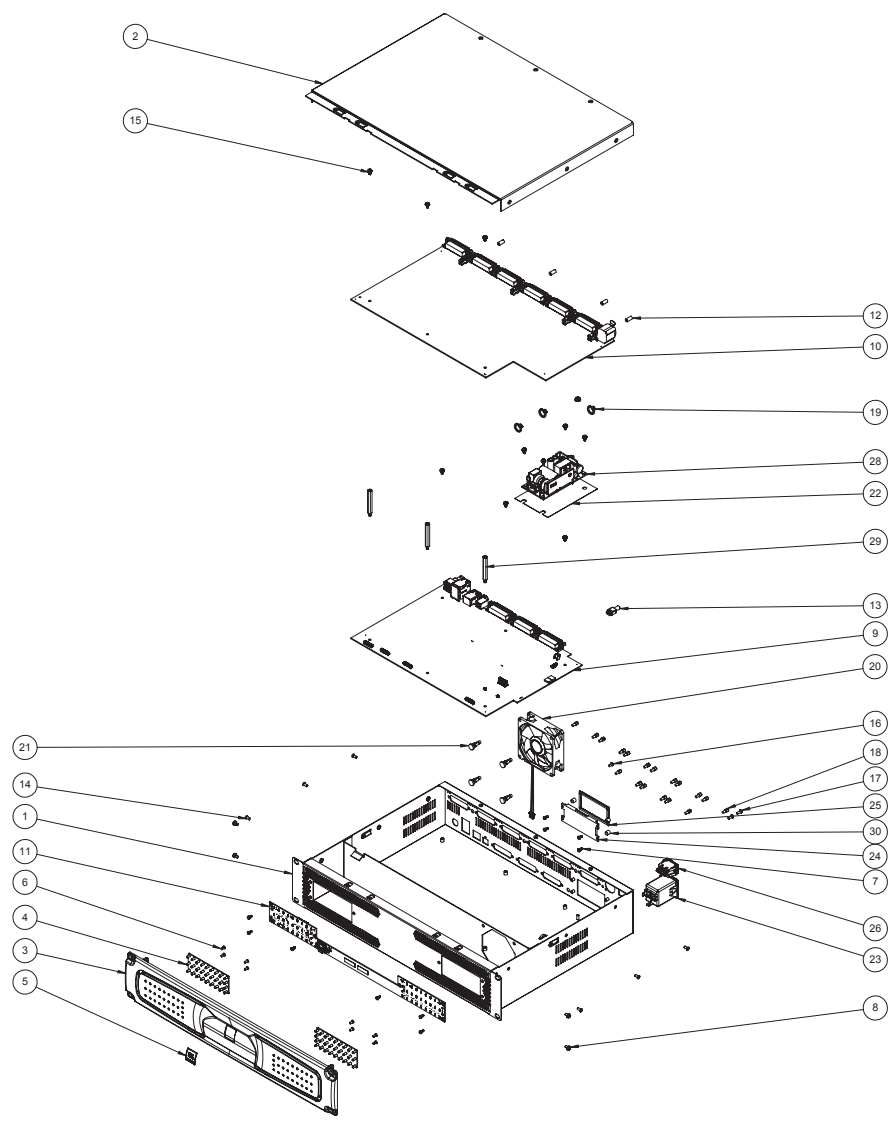
YellowTail Digital PCB

SHEET NAME		REVISE STAMP	
25-Interconnect		29/05/2018:11:18	
SIZE	REV	REV	
B	5083231	B	
SCALE	SCH DOC NO.	PCB PART NO.	SHEET
NONE	1000298116	5083232	25 of 25

# Exploded View Diagram

ITEM NO.	PART NUMBER	NAME	QTY.
1	5084982	ENCL.CHAS.YELLOWTAIL.FIN.OS	1
2	5084990	ENCL.LID.YELLOWTAIL.FIN.OS	1
3	5065471	ENCL.PNL.FRNT.YELLOWTAIL.FIN	1
4	5065486	OPT.LTTP.ARRAY.3X8.4X1	2
5	5081135	JBL LOGO_L.SR706P	1
6	28-0178	SCREW 4-40X1/4 UNDERCUT FLAT BLK	8
7	28-0292	SCREW 4-40X1/4 PHIP PAN BLK	10
8	103435-70604	SEMS. 6-32X.25 MACHINE TORX PNHD STAR	4
9	5083231	PCB.ASY.SP.LEX.YT.DIGITAL.AV1	1
10	5083228	PCB.ASY.SP.LEX.YT.ANALOG.AV1	1
11	5065176	PCB.ASY.YELLOWTAIL.COMB.FRONT.AV1	1
12	34-0125	SWITCHCAP.RND.BLACK.2.8mm.MINI	4
13	34-0212	SWITCH.CAP.6MM.ROUND	1
14	100331-70605	MSCR. 6-32X.312 UNDCUT FLTHD T10 BZ	9
15	5009114	FSTNR.MSCR.PH-PNH.6-32x1/4.EX.SEMS.Zn	10
16	28-0271	SCREW M3x6mm PAN POZI BLK ISO BIN	1
17	28-0267	SCREW #4X1/8 PHIL PAN PLASTITE BLK	2
18	28-0250	SCREW 4-40 D-CON CVR LOCK ZINC	18
19	C 8812-7	TIE. CABLE 5.5" OR MORE 18 LB	3
20	5085405	THRMMGT.FAN.5081097.w.CONNECTOR	1
21	5058458	FSTNR.RVT.FAN.MNT.RUBBER.5mmX10.3mm	4
22	70-0258	INSUL.SAFETY.BSS.BLU100.SMPS	1
23	32-1008	RCPT.3CND.6A.AC.FILTER.FUSED.SNAP-IN.TTI	1
24	5042464	OPTO.DSPL.LCD.128x64.NEG.LED.BLU.6.O'CLK	1
25	5043824	HDW.LENS.WDO.LCD.DBXAFS2.FIN	1
26	5081700	SW.RCKR.SPST.10A@125/250AC.TV5	1
27	28-0065	NUT.HEX.6-32.KEPS.ZINC	1
28	5031271	PSU.OEM.SMPS.100W.12VDC	1
29	5081784	FSTNR.STDIF.6-32.1.75"ML-FEM.HEX	3
30	5091693-00	FSTNR.SPCR.NYLON.175IDx.245ODx.228"	4
N/A	5078981	CBL.WA.1CND.4.5 INCH 20AWG BLK FASTONS	1
N/A	5079012	CBL.WA.2CND.3.5" & 5.5" 20AWG MAIN PWR	1
N/A	5079013	CBL.WA.4CND.9 INCH 18AWG BLK/RED PWR	1
N/A	5047636	CBL.FFC.30CND.1X30.0.5mmSPC.254mmLNG.ML	4
N/A	5054609	CKT.PROTN.FUSE.2.5A.250V.5X20mm.GDC	2
N/A	38-0114	HRN.1CND.1X1.18AWG.4.50 GRN/YEL GND TERM	1

REVISION HISTORY				
DATE	REV.	PREVIOUS PART NO.	DESCRIPTION	DONE BY
07/01/2017	A	5084101	Drawing created (Items 1, 2, 20 and 30 differ from previous assembly).	NL



RECOMMENDED ASSEMBLY TORQUES:

ITEM NO.	PART NUMBER	TORQUE
6	28-0178	8+1 IN-LBS
7	28-0292	3.5+1 IN-LBS
8	103435-70604	10+1 IN-LBS
14	100331-70605	8+1 IN-LBS
15	5009114	10+1 IN-LBS
16	28-0271	3.5+1 IN-LBS
17	28-0267	6+1 IN-LBS
18	28-0250	3.5+1 IN-LBS
27	28-0065	18+1 IN-LBS
29	5081784	12+1 IN-LBS

TORQUE VALUES ARE APPROXIMATE AND MAY NEED TO BE ADJUSTED PER MANUFACTURER

NOTES:  
1. Bill of Materials shown is for reference only and does not represent actual product Bill of Materials. Please refer to Bill of Materials in ProCom or SAP.

<p>ROHS RESTRICTION OF HAZARDOUS SUBSTANCES ALL MATERIALS SHALL BE COMPLIANT WITH THE REQUIREMENTS OF THE ROHS DIRECTIVE AND RECORDS SHALL BE MAINTAINED TO VERIFY THIS COMPLIANCE.</p>	<p>THIS DRAWING IS THE PROPERTY OF HARMAN INTERNATIONAL COMPANY. IT IS TO BE USED ONLY FOR THE PURPOSES SPECIFIED HEREIN. IT IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF HARMAN INTERNATIONAL COMPANY.</p>	<p>HARMAN DWG.ASY.,JBL.YELLOWTAIL</p> <p>DESIGNED BY: King Tyler DATE: 11/09/2017</p> <p>REVIEWED BY: King Tyler DATE: 5/2/2011</p> <p>PART NO.: 5085239 REV: A</p> <p>DATE: D SCALE: 14 SHEET: 1 OF 1</p>
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Bill of Materials - Inonato24

Bill of Materials			
Ref ID	Manufacturer Part Number	Description	QTY
-	INTONATO24FX	JBL,MONITOR MANAGEMENT TUNING SYSTEM	-
-	-	MECHASY,BSS,YELLOWTAIL,PHM	1
-	Harman, 5085405	THRMMGT,FAN,5081097 w CONNECTOR	1
-	RADIUS POWER,RP184SN-6-2.2-QD-S`	RCPT 3CND 6A AC FILTER FUSED SNAP-IN TTI	1
-	ASSEMBLY MASTERS,5078981	CBL,WA,1CND,4.5 INCH 20AWG BLK FASTONS	1
-	HONGYUAN TECHNOLOGY GROUP,5065471	ENCL,PNL,FRNT,YELLOWTAIL,FIN	1
-	BISCO INDUSTRIES,4-40X1/4PAN PH ST BO	SCREW 4-40X1/4 PHIP PAN BLK	10
-	KIAN SOON HARDWARE & TRADING,43932	SCREW #4X5/16 PHIL PAN PLASTITE BLK	2
-	APEX FASTENERS,MM03C006PZPSB	SCREW M3x6mm PAN POZI BLK ISO BIN	1
-	Harman, 5031271	PSU,OEM,SMPS,100W,12VDC	1
-	KEYSTONE ELECTRONICS,7215	FSTNR,STDF,6-32,1.75",ML-FEM,HEX	3
-	BISCO INDUSTRIES,4-40X1/4FTU PH ST BO	SCREW 4-40X1/4 UNDERCUT FLAT BLK	8
-	Harman, 5079013	CBL,WA,4CND,9 INCH 18AWG BLK/RED PWR	1
-	KEYSTONE ELECTRONICS,7230-5	SCREW 4-40 D-CON CVR LOCK ZINC	18
-	APEX FASTENERS,SE06C025PPESZR	FSTNR,MSCR,PH-PNH,6-32x1/4,EX SEMS,Zn	10
-	NKK SWITCHES,JWM11RAA	SW,RCKR,SPST,10A@125/250AC,TV5	1
-	LITTELFUSE,021302.5MX	CKT PROT,FUSE,2.5A,250V,5X20mm,GDC	2
-	DEXM-WORLDSOURCE FASTENERS,6CNKEZC	NUT HEX 6-32 KEPS ZINC	1
-	BOYD,HAR568-700258	INSUL SAFETY BSS BLU100 SMPS	1
-	Harman,5079012	CBL,WA,2CND,3.5"X5.5" 20AWG MAIN PWR	1
-	DAYTONE ELECTRONICS,DT-2014081501	CBL,FFC,30CND,1X30,0.5mmSPC,254mmLNG,ML	4
-	Harman,5043824	HDW,LENS,WDO,LCD,DBXAFS2,FIN	1
-	ESSENTRA COMPONENTS,FM-4	FSTNR,RVT,FAN MNT,RUBBER,5mmX10.3mm	4
-	-	SEMS, 6-32X.25 MACHINE TORX PNHD STAR	4
-	-	HRN 1CND 1X1 18AWG 4.50 GRN/YEL GND TERM	1
-	Harman, 5042464	OPTO,DSPL,LCD,128x64,NEG,LED,BLU,6 O'CLK	1
-	-	SWITCHCAP RND BLACK 2.8mm MINI	4
-	MICRO PLASTICS,13RSSR0027	FSTNR,SPCR,NYLON,.175IDx.245ODx.228"	4
-	B&B THREADED COMPONENTS,100331-70605	MSCR, 6-32X.312 UNDC T FLTHD T10 BZ	9
-	Harman, 34-0212-1	SWITCH CAP 6MM ROUND	1
-	-	JBL LOGO, LSR705P	1
-	Harman, 36-0059	CBL,PCRD,AC EU 7' W/EUROPEAN PLUG	1
-	-	PCB,ASY,SP_LEX_YT_DIGITAL,AV1	1
Y3	GOLLEDGE ELECTRONICS,GVXO-753F/SB 24.576MHZ	XTLO,VCXO,24M576,3V3,50ppm,SM	1
U3	MICROCHIP TECHNOLOGY,KSZ8081MNXCATR	IC,INTFC,PHY,10BASE-T/100BASE-TX,w/LED	1
C88,C90,C92,C94,C102,C105,C107,C109,C111,C125,C127,C129,C131,C133,C135,C147-C148,C153,C159-C162,C164,C170,C197,C202,C205,C226,C232,C235,C237,C241,C244,C300,C334,C341,C346,C351,C356,C361,C366,C371,C376,C381,C386,C391,C396,C401,C405,C409,C413,C417,C421,C425,C429,C433,C437,C441,C445,C449,C451,C453-C454,C456-C457,C660,C664,C668,C672,C744-C748	WALSIN TECHNOLOGY,0603N103J250CT	CAP,10n0,5%,25V,CER,COG,0603	74
C158,C191,C193-C194,C213,C247,C304	MURATA MANUFACTURING,GRM1885C1H220JA01D	CAP,22p0,5%,50V,CER,COG,0603	7
R114,R229,R231,R359,R374,R486,R494,R605	KOA SPEER ELECTRONICS,RK73H1JT2000F	RES,200R,1%,63mW,THKF,0603	8
U4	BROADCOM,BCM5482SHA1KFBG	IC,BCM5482S,10/100/1000BASE-T,GBE PHY	1
C402,C406,C410,C414,C418,C422,C426,C430,C434,C438,C442,C446	KEMET ELECTRONICS,C0603C223K5RACTU	CAP,22n0,10%,50V,CER,X7R,0603	12
D8,D10,D12-D14,D23-D24	ON SEMICONDUCTOR,MMBD7000LT1G	DIO,GP,MMBD4148SE,100V,200mA,SOT23	7
U48	MICRON TECHNOLOGY,MT29F2G16ABBEAHC:E TR	IC,MEM,NAND,PARALLEL,1.8V,2G,63VFBGA	1
R273,R324,R327,R403	VISHAY INTERTECHNOLOGY,CRCW060357K6FKEA	RES,57k6,1%,63mW,THKF,0603	4
SW1	APEM,ADTSA648NV	SW,TACT,LT-TOUCH,RTANG,12V,50MA,BRN	1
L28,L32,L38,L40,L42,L45-L47,L49,L51	MURATA MANUFACTURING,BLM18BD252SN1D	IDCTR,FBD,2K50@100MHz,50mA,0603	10

Ref ID	Manufacturer Part Number	Description	QTY
C84,C97- C99,C122,C137,C145,C150,C 166- C168,C174,C182,C185,C188, C195-C196,C200-C201,C203- C204,C206,C208,C211- C212,C214-C216,C218- C219,C221,C223- C225,C227,C229-C231,C233- C234,C236,C238-C240,C242- C243,C245-C246,C248- C255,C260,C263- C265,C267,C269,C273- C282,C287-C288,C297- C298,C301- C302,C306,C325,C342,C347, C352,C357,C362,C367,C372, C377,C382,C387,C392,C397, C458,C504,C506,C512,C523, C526,C528,C530- C531,C547,C554,C752-C754	MURATA MANUFACTURING,GRM21BR61E106KA73L	CAP,10u0,10%,25V,CER,X5R,0805	106
U36	INTEL,EP4CE15F17A7N	IC,PROGLGC,FPGA,EP4CE15F17C7N,FBGA256	1
R269,R405	YAGEO,RC0603FR-076K04L	RES,6k04,1%,100mW,THKF,0603	2
R281	KOA SPEER ELECTRONICS,RK73H1JTDD3323F	RES,332k,1%,63mW,THKF,0603	1
R100,R104,R108,R112	YAGEO,RC0603FR-074K02L_DUPLICATE	RES,4k02,1%,100mW,THKF,0603	4
D22	MICRO COMMERCIAL COMPONENTS,SMAJ4756A-TP	DIO,ZENR,SML4756,47V,5m5A,1W,DO214	1
R350,R352,R357-R358,R372- R373	YAGEO,RL2512FK-070R025L	RES,R025,1%,1W,THKF,2512	6
U47	WINBOND ELECTRONICS,W9751G6KB-25	IC DDR2 512MBIT 32Mx16 667MHZ 84FBGA SM	1
U41	Harman,5082230	IC,PROG,JBL,YELLOWTAIL,32Mb,FLASH,SO8W	1
J1-J3	Harman,5021803	CON,DSUB,RIGHT ANGLE,FEMALE 25PIN,PTH	3
R21,R56,R58,R60,R62,R66,R68, R70,R72,R74,R76,R78,R80	YAGEO,RC0603JR-07110R	RES,110R,5%,63mW,THKF,0603	13
L43-L44	PULSE ELECTRONICS,PA4320.103NLT	IND 10uH 5.8A 12.3X12.3X10 SM TA	2
U42,U49-U52,U54,U65,U67	MONOLITHIC POWER SYSTEMS,MPM3620GQV-Z	IC,VREG,MPM3620,ADJ,SW,2.0A,QFN18	8
C2- C5,C259,C262,C272,C285,C3 09-C320	MURATA MANUFACTURING,GRM1885C1H471JA01D	CAP,470p,5%,50V,CER,COG,0603	20
C78,C83,C85,C87,C114,C151	AVX,12066D226MAT2A	CAP,22u0,CER,6V3,20%,X5R,1206	6
RN1-RN40	PANASONIC,EXB2HV330JV	RES,ARRAY,33R0,5%,63mW,D402x8	40
R27,R84,R86,R88,R90,R97- R98,R102,R106,R110,R115- R116,R119-R122,R124,R128- R129,R134-R135,R138- R140,R145-R146,R150,R152- R157,R177,R210,R214,R219,R2 34-R235,R300-R303,R305- R308,R341,R343,R345,R347,R3 64,R366,R368,R370,R411,R415- R421,R423- R425,R430,R432,R434,R436,R4 38,R440,R442,R444,R446,R448, R450,R452,R455-R458,R474- R485,R501-R506,R512- R517,R520-R528,R530- R539,R541-R552,R554,R556- R560,R579-R580,R592-R594	YAGEO,RC0603FR-0739R2L_DUPLICATE	RES,39R2,1%,100mW,THKF,0603	148
U6-U9	CIRRUS LOGIC,CS8421-CZZR	IC CS8421 32BIT 192KHz SMPL RT CON SM AV	4
C258,C261	TDK,CGA4C2NP01H682J060AA	CAP,6n8,5%,50V,CER,COG,0805	2
J6	JST MFG,14FLZT-SM1-TF (LF)(SN)	CON,HDR,14PIN,2X7 0.5MM, SPC ZIF FM VRT SM	1
Y1	GOLLEDGE ELECTRONICS,GVXO-753F/SC 22.57920MHz	XTLO,VCXO,22M5792,3V3,25ppm,SM	1
DS17	WORLD COMPONENTS NETWORK SERVICE,WCN-0603HR-1E	LED RED HI EFF 635 nm 0603 SMT TR	1
U33-U35,U38,U43,U46	FAIRCHILD SEMICONDUCTOR,74LCX244WMX	IC 74LCX244 LOW VOLT BUFFER/LINE DRIV SM	6
U10-U21	CIRRUS LOGIC,CS8416-CSZR	IC CS8416 192KHz 3.3V DIG AUD RCVR SM AV	12
U2	SEIKO EPSON,S-80930CNMC-G80T2G	IC,LIN,V-DET,3.0V,LOW OUT DLY,SOT-23-5	1
P17	OUPIN ENTERPRISE,2015-2X07G00DB/SN	CON,HDR,2X7,2.54mm,VERT,ML,SM	1
R282,R334,R340	YAGEO,RC0603FR-0712K1L_DUPLICATE	RES,12k1,1%,63mW,THKF,0603	3
U40	INTEL,EPM3032AIC44-10N	IC CPLD EPM3032A TQFP44	1
RP1-RP4	PANASONIC,EXBE10C103J	RESNET 10K 5% 62.5mW BUS(1,6) 8E SM TA	4
P1	TE CONNECTIVITY,5227161-6	CON,COAX,BNC,JACK,50R,RA,PANEL MT,BLK	1

Ref ID	Manufacturer Part Number	Description	QTY
C169,C343,C348,C353,C358,C363,C368,C373,C378,C383,C388,C393,C398,C403,C407,C411,C415,C419,C423,C427,C431,C435,C439,C443,C447,C681,C691,C701,C711,C743	TDK,C1608COG1H102JT	CAP,1n0,5%,50V,CER,COG,0603	30
C80,C270,C286	SAMSUNG ELECTRONICS,CL21A225KAFNNG	CAP,2u2,10%,25V,CER,X7R,0805	3
R158-R160	STACKPOLE ELECTRONICS,RMCF0603FT4K99	RES,4k99,1%,63mW,THKF,0603	3
C9,C35-C37,C40,C43,C46,C49,C52,C55,C58,C61,C64,C67,C70,C73 C77,C79,C81-C82,C86,C89,C91,C93,C95-C96,C100-C101,C103-C104,C108,C110,C112,C115-C121,C123-C124,C126,C128,C130,C132,C134,C138-C139,C149,C152,C154-C157,C163,C165,C175-C176,C178,C180-C181,C183,C186-C187,C207,C209-C210,C217,C220,C222,C228,C266,C268,C283,C289,C303,C308,C321-C324,C326-C333,C335-C340,C344-C345,C349-C350,C354-C355,C359-C360,C364-C365,C369-C370,C374-C375,C379-C380,C384-C385,C389-C390,C394-C395,C399-C400,C404,C408,C412,C416,C420,C424,C428,C432,C436,C440,C444,C448,C450,C452,C455,C459-C503,C505,C507-C511,C513-C522,C524-C525,C527,C529,C532-C538,C540-C546,C548-C553,C555-C659,C661-C663,C665-C667,C669-	SURGE COMPONENTS,SCM05F104ZANCA	CAP 0.1uF 25V +80%/-20% Y5V 0402 TA TII	406
R462-R473	YAGEO,RC0603FR-073K01L_DUPLICATE	RES,3k01,1%,100mW,THKF,0603	12
L60-L61	COILCRAFT,MSD1278-682MLD	IDCTR,6.8uH,SPCLTY,24Mhz,13.1A	2
R196,R206-R207,R381,R602-R604	VISHAY INTERTECHNOLOGY,CRCW0603K32FKEB	RES,3k32,1%,100mW,THKF,0603	7
R292	STACKPOLE ELECTRONICS,RMCF0603FT2K49	RES,2k49,1%,100mW,THKF,0603	1
DS1,DS6,DS14	WORLD COMPONENTS NETWORK SERVICE,WCN-0603HY-0E	LED YELLOW HI EFF 590 nm 0603 SMT TR	3
SC1	Harman,34-0212	SWITCH CAP 6MM ROUND	1
J5	Harman, 5009346	CON,SKT,RJ45,10/100,1x1,TAB-UP,w/LED	1
MOD1	HANRUN ELECTRONICS,HR872132H	CON,MOD,RJ45,DUAL,TRAN,YEL/GRN LED	1
D17-D18,D20	TAIWAN SEMICONDUCTOR,BAT54S	DIO,SCHOTTKY,BAT54S,DUAL,200mA,30V,SOT23	3
R46,R99,R101,R103,R105,R107,R109,R111,R113,R127,R132-R133,R149,R176,R180,R182,R202,R211,R215,R220-R222,R224-R226,R293,R335,R414,R578,R587	YAGEO,RC0603FR-071KL_DUPLICATE	RES,1k00,1%,100mW,THKF,0603	30
R188	KOA SPEER ELECTRONICS,RK73H1JTJD7502F	RES,75k0,1%,63mW,THKF,0603	1
U22	TEXAS INSTRUMENTS,LM1117DTX-3.3/NOPB	IC,VREG,LM1117DTX,3.3V,0.8A,TO-252	1
J4	Harman, 32-0264	CON JACK USB SHD I/O TYPE B RCPTL W/TAB	1
R270-R271,R280,R404	PANASONIC,ERJ3EKF3242V	RES,32k4,1%,63mW,THKF,0603	4
F2-F3	TE CONNECTIVITY,SMD200F-2	FUSE 2A POLY SWITCH RESETABLE	2
C305	NICHICON,UUX1J101MNR1GS	CAP,100u,20%,63V,EL,105C,10x10.2,SM	1
R117,R254,R397	PANASONIC,ERJ3EKF1500V	RES,150R,1%,100mW,THKF,0603	3
R148	KOA SPEER ELECTRONICS,RK73H1JTJD22R1F	RES,22R1,1%,100mW,THKF,0603	1
P12	NEUTRIK,NC3FAH10	CON,HDR,1X3,2.54mm,POL,SHRD,VERT,ML	1
C179,C190,C198	PANASONIC,EEEFK1C221XP	CAP,220u,20%,16V,EL,105C,6.3X8,SM	3

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R4,R45,R49- R51,R55,R125,R136,R151,R162- R164,R166- R169,R171,R174,R191- R193,R198,R200- R201,R208,R213,R250,R286,R3 18-R322,R325,R360- R363,R365,R367,R369,R371,R4 08,R422,R426,R429,R511,R577, R585-R586,R588-R591,R614- R617	STACKPOLE ELECTRONICS,RMCF0603FT10K0	RES,10k0,1%,100mW,THKF,0603	58
C136,C140,C144,C146,C171- C173,C177,C539	MURATA MANUFACTURING,GRM1885C1H180JA01D	CAP,18p0,5%,50V,CER,COG,0603	9
Q8-Q9	VISHAY INTERTECHNOLOGY,SI7850DP-T1-GE3	XSTR,MFET,N-CH,60V,8.7A,SO-8,SM	2
R431,R433,R435,R437,R439,R4 41,R443,R445,R447,R449,R451, R453	YAGEO,RC0603FR-0747K1	RES,47k0,1%,100mW,THKF,0603	12
R194	YAGEO,RC0603FR-07150KL_DUPLICATE	RES,150k,1%,100mW,THKF,0603	1
P2	MAJOR LEAGUE ELECTRONICS,CRD-082409-A	CON,HDR,2X5,2.54mm,VERT,ML,SM	1
R22,R190,R609	VISHAY INTERTECHNOLOGY,CRCW060320K0FKEA	RES,20k0,1%,100mW,THKF,0603	3
Y6	LINEAR TECHNOLOGY,LTC6908CS6-1#TRPBF	XTLO,PROG,LTC-6908-1,SOT23	1
R23-R26,R44,R53- R54,R57,R59,R61,R63- R65,R67,R69,R71,R73,R75,R77, R79,R81-R83,R95- R96,R123,R130,R141- R144,R173,R178,R183- R184,R199,R204- R205,R209,R212,R227,R230,R2 32-R233,R236-R239,R252- R253,R259-R262,R264- R265,R274-R275,R289,R294- R295,R299,R310-R311,R314- R317,R376-R377,R379- R380,R385-R389,R392- R395,R398-R399,R401- R402,R406- R407,R410,R454,R496,R500,R5 07,R509-R510,R518- R519,R529,R540,R553,R555,R5 61,R571-R573,R581-R582,R595- R601,R611-R612	TE CONNECTIVITY,CRG0603F0R0	RES,0R00,1A,THKF,0603	115
U39	MICROCHIP TECHNOLOGY,TC72-3.3MUATR	IC TC72-3.3MUATR SNSR THERM SPI 3.3V FU	1
C1,C6-C7	MURATA MANUFACTURING,GRM188R72A104KA35D	CAP,100n,10%,100V,CER,X7R,0603	3
R258,R263,R284,R396	YAGEO,RC0603FR-07121KL_DUPLICATE	RES,121k,1%,100mW,THKF,0603	4
R272,R279	KOA SPEER ELECTRONICS,RK73H1JTTD6342F	RES,63k4,1%,63mW,THKF,0603	2
DS2,DS15-DS16,DS18,DS35	BRIGHT LED ELECTRONICS,BL-HGF36A-AV-TRB	OPTO,LED,YELGRN,573nm,CLR,50mcd,0603	5
C184,C189,C199,C256- C257,C284,C290,C293,C296	TEAPO ELECTRONIC,VSV476M025SOANE01K	CAP,47u0,20%,25V,EL,85C,6.3x6,SM	9
C8,C11-C34,C38-C39,C41- C42,C44-C45,C47-C48,C50- C51,C53-C54,C56-C57,C59- C60,C62-C63,C65-C66,C68- C69,C71-C72,C192	WALSIN TECHNOLOGY,0603N121J500LT	CAP,120p,5%,50V,CER,COG,0603	50
U23-U25	TEXAS INSTRUMENTS,CDCLVC1106PWR	IC,LGC,CLK BFR,1:6,250 MHz,14-TSSOP	3
R48,R52,R332	STACKPOLE ELECTRONICS,RMCF0603FT332R	RES,332R,1%,100mW,THKF,0603	3
U44	MICROCHIP TECHNOLOGY,AT91SAM9G25-CU	IC,MIPRCS,ARM9,AT91SAM9G25,BGA217	1
Y2	GOLLEDGE ELECTRONICS,GXO-7531/B 25.0MHZ (MA01053)	XTLO,25M000,3V3,FXO-31,50ppm,SM	1
L29-L31,L33,L35- L37,L39,L50,L76-L119	MURATA MANUFACTURING,BLM21BD222SN1D	IDCTR,FBD,2k25,70MHZ,200mA,0805	53
U1	NEXPERIA,74LVC1G14GW,125	IC,LGC,74LVC1G14GW,SCHMITT,INV,SOT353-1	1
D15-D16	VISHAY INTERTECHNOLOGY,SS36-E3/571	DIO,SCHOTTKY,SS36,60V,3A,DO214AB	2
R278,R349,R351	VISHAY INTERTECHNOLOGY,CRCW060339K2FKEA	RES,39k2,1%,100mW,THKF,0603	3
U45	MICROCHIP TECHNOLOGY,ATSAM3N0AA-AU	IC,MIPRCS,SAM3N,32K_FLASH,LQFP48	1
R276,R584	YAGEO,RC0603FR-076k81L_DUPLICATE	RES,6k81,1%,63mW,THKF,0603	2
D3,D7,D9	LITTELFUSE,P6SMB530CA	DIO,TVS,477V,BI DIR,SMB	3
R189,R313	PANASONIC,ERJ3EKF2213V	RES,221k,1%,100mW,THKF,0603	2
D1	ON SEMICONDUCTOR,1SMA15CAT3	DIO TVS 1SMA15CAT3 BI-Dir VBR=16.7 SM	1
U26-U32,U66	NEXPERIA,74HC574PW,118	IC 74HC574 OCTAL"D"FLIP FLOP TSSOP SM AV	8
Q7,Q11	ON SEMICONDUCTOR,BC846BLT1G	XSTR BC846 NPN SOT-23 AV	2
R47	KOA SPEER ELECTRONICS,RK73H1JTTD5491F	RES,5k49,1%,63mW,THKF,0603	1

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R290	STACKPOLE ELECTRONICS,RMCF0603FT15K0	RES,15k0,1%,100mW,THKF,0603	1
U55-U58	ANALOG DEVICES,ADSP-21489KSWZ-4B	IC,DSP,ADSP-21489KSWZ-4B,400MHz,176,LQFP	4
R248,R255	STACKPOLE ELECTRONICS,RMCF0603FT2R00	RES,2R00,1%,100mW,THKF,0603	2
Q5-Q6,Q12	ON SEMICONDUCTOR,MMBT3906LT1G	XSTR,BJT,PNP,MMBT3906,200mA,40V,SOT23	3
R427,R459	PANASONIC,ERJ2RKF1000V	RES,100R,1%,63mW,THKF,0402	2
L4-L27,L34,L41,L52-L59,L62-L74	MURATA MANUFACTURING,BLM18PG121SN1D	IND FBD 120 OHM @ 100Hz 2000mA 0603 TA	47
L1-L3,L75	MURATA MANUFACTURING,BLM18KG601SN1D	IDCTR,FBD,600R,100MHZ,1300mA, 0603	4
U5	TEXAS INSTRUMENTS,CDCLVC1108PWR	IC,LGC,CLK BFR,1:8,250 MHz,TSSOP16	1
R218,R296	STACKPOLE ELECTRONICS,RMCF0603FT475K	RES,475k,1%,63mW,THKF,0603	2
R165,R195,R228,R242,R244-R247,R249,R256,R266-R267,R283,R285,R287-R288,R291,R304,R309,R323,R326,R400,R607-R608,R613,R618	PANASONIC,ERJ3EKF1003V	RES,100k,1%,100mW,THKF,0603	26
C106,C113,C271,C291-C292,C294-C295,C299,C307	WALSIN TECHNOLOGY,1206B105K101CT	CAP,1u0,10%,100V,CER,X7R,1206	9
R257,R268,R277,R383-R384,R391,R409	VISHAY INTERTECHNOLOGY,CRCW060349K9FKEA	RES,49k9,1%,100mW,THKF,0603	7
T1-T12	TMC-TOP MAGNETICS,ER9.504N6-T540	XFMR SHIELDED DIGITAL AUDIO SM	12
R1-R3,R5	STACKPOLE ELECTRONICS,RMCF0603FT121R	RES,121R,1%,63mW,THKF,0603	4
R28-R43,R92-R94,R172	PANASONIC,ERJ3EKF49R9V	RES,49R9,1%,100mW,THKF,0603	20
L120-L125	TDK,MMZ1608S601A	IDCTR,FBD,600R@100MHz,500mA,0603	6
P3,P6	SINGATRON ENTERPRISE,2400-02PST-PB	CON,HDR,2PIN,7A,3.96mm SPC,LCK,VRT,ML	2
R6,R8	YAGEO,RC0603FR-1310RL	RES,10R0,1%,100mW,THKF,0603	2
D19,D21	DIODES INCORPORATED,MMSZ5252B	DIO,ZENR,24V,500mW,SOD123	2
Q1-Q4,Q10,Q13	INFINEON TECHNOLOGIES,MMBT3904LTI	XSTR,BJT,2N3904,NPN,SOT-23	6
R412-R413	PANASONIC,ERJ3EKF6190V	RES,619R,1%,100mW,THKF,0603	2
-	Harman, 5065176	PCB,ASY,YELLOWTAIL_COMB_FRONT,AV1	1
R5-R6,R10,R12,R14,R51-R53,R57-R59,R62,R65,R67,R71,R73,R75-R78	YAGEO,RC0603FR-071KL_DUPLICATE	RES,1k00,1%,100mW,THKF,0603	20
C8,C10,C19,C24-C25	TDK,C2012X7R0J106K125AB	CAP,10u0,10%,6V3,CER,X7R,0805	5
R17,R21,R23,R25,R27,R29,R31,R33,R35,R37,R39,R41,R43,R45,R47,R49,R79,R81,R83,R86,R89,R92,R96,R98,R100,R105,R107,R109,R112,R115,R117,R121	STACKPOLE ELECTRONICS,RMCF0603FT332R	RES,332R,1%,100mW,THKF,0603	32
DS1-DS24,DS28,DS34-DS57	WORLD COMPONENTS NETWORK SERVICE,WCN-0605RG-0E-1	OPTO,LED,RED/GRN,DUAL,0606,SM	49
U1	MICROCHIP TECHNOLOGY,ATSAM3N0AA-AU	IC,MIPRCS,SAM3N,32K_FLASH,LQFP48	1
R85,R88,R91,R94-R95	PANASONIC,ERJ3EKF1003V	RES,100k,1%,100mW,THKF,0603	5
R1,R22,R26,R30,R34,R38,R42,R46,R50,R54-R56,R63-R64,R66,R70,R72,R82,R87,R93,R99,R106,R110,R116,R122	YAGEO,RC0603FR-0760R4L	RES,60R4,1%,63mW,THKF,0603	25
R18,R24,R28,R32,R36,R40,R44,R48,R74,R80,R84,R90,R97,R101,R108,R113,R118	YAGEO,RC0603FR-07243RL	RES,243R,1%,63mW,THKF,0603	17
R4,R15-R16,R19-R20,R60-R61,R68-R69,R111,R114,R119-R120,R123-R124	TE CONNECTIVITY,CRG0603F0R0	RES,0R00,1A,THKF,0603	15
J2	MOLEX,501951-3010	CON,FFC,1X30,0.5MM,VERT,SM	1
C11-C12,C18,C26	MURATA MANUFACTURING,GRM21BR61C106KE15L	CAP,10u0,10%,6V3,CER,X5R,0805	4
U2-U6	NEXPERIA,74HC574PW,118	IC 74HC574 OCTAL"D"FLIP FLOP TSSOP SM AV	5
DS29	BRIGHT LED ELECTRONICS,BL-HGF36A-AV-TRB	OPTO,LED,YELGRN,573nm,CLR,50mcd,0603	1
C22-C23	WALSIN TECHNOLOGY,1206B105K101CT	CAP,1u0,10%,100V,CER,X7R,1206	2
C21	MURATA MANUFACTURING,GRM21BR61E106KA73L	CAP,10u0,10%,25V,CER,X5R,0805	1
Q1-Q48	INFINEON TECHNOLOGIES,MMBT3904LTI	XSTR,BJT,2N3904,NPN,SOT-23	48
C1,C9	MURATA MANUFACTURING,GRM1885C1H180JA01D	CAP,18p0,5%,50V,CER,C0G,0603	2
DS25-DS27,DS30-DS33	VISHAY INTERTECHNOLOGY,VLMW1300-GS08	OPTO,LED,WHITE,0603,TR	7
Y1	RALTRON ELECTRONICS,AS-12-000-18-SMD-T	XTLO,XTAL,12M000,18p,MTL,LP,SM	1
R2-R3,R7-R8	EZENTEK,FCF03FT-330P	RES,33R,1%,100mW,THKF,0603	4
RN1-RN2	PANASONIC,EXB2HV330JV	RES,ARRAY,33R0,5%,63mW,0402x8	2
R102-R104	PANASONIC,ERJ3EKF49R9V	RES,49R9,1%,100mW,THKF,0603	3
C2-C7,C13-C17,C20	SURGE COMPONENTS,SCM05F104ZANCA	CAP 0.1uF 25V +80%/-20% Y5V 0402 TA TTI	12
-	Harman, 36-0061	CORD PWR AC US/JA 7" BME TYPE	1
-	Harman, 5082085	MICSYS,OEM,RTA,JBL LOGO RTA-1	1
-	Harman, 5083228	PCB,ASY,SP_LEX_YT_ANALOG,AV1	1



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C21,C26,C28,C37,C68,C70,C87-C88,C93,C96,C130,C136,C303,C307,C309,C311,C351-C352,C366,C370,C372,C374,C417-C418,C595,C604,C606-C607,C654,C656,C671-C674,C717,C724,C909,C917,C924,C932,C946,C955,C964,C973,C977,C987,C993,C1008,C1030,C1038,C1047,C1056,C1065,C1074,C1083,C1092-C1093,C1102,C1106,C1122,C1149,C1158,C1167,C1176,C1185,C1194,C1203,C1206,C1212,C1217,C1223,C1238	WALSIN TECHNOLOGY,1206B106K160CT	CAP,10u0,10%,16V,CER,X7R,1206	72
Q33-Q34,Q99-Q102	ON SEMICONDUCTOR,NTZD3155CT1G	XSTR,MFET,DUAL,N/P-CH,20V,430mA,SOT-563	6
R573	TE CONNECTIVITY,CRG0603F22K	RES,22k0,1%,100mW,THKF,0603	1
R850	STACKPOLE ELECTRONICS,RMCF 1/16 10.2K 1% R_DUPLICATE	RES,10k2,1%,63mW,THKF,0603	1
C880,C887,C899	NICHICON,UUX1J101MNR1GS	CAP,100u,20%,63V,EL,105C,10x10.2,SM	3
C512,C519,C528-C529,C564,C573,C584-C585	MURATA MANUFACTURING,GRM21BR61E106KA73L	CAP,10u0,10%,25V,CER,X5R,0805	8
R873-R874,R890-R891,R899-R900,R910-R911,R921-R922,R932-R933,R943-R944,R956-R957,R1029-R1030,R1041-R1042,R1052-R1053,R1063-R1064,R1074-R1075,R1085-R1086,R1095-R1096,R1108-R1109,R1182-R1183,R1195-R1196,R1205-R1206,R1216-R1217,R1227-R1228,R1238-R1239,R1249-R1250,R1268-R1269	YAGEO,RC0603FR-0722K1L	RES,22k1,1%,63mW,THKF,0603	48
C149,C169,C207-C208,C236,C257,C291-C292,C433,C452,C491-C492,C505,C536,C578-C579,C743,C764,C797-C798,C812,C832,C869-C870,C881-C882,C890	LELON ELECTRONICS,VE-100M1CTR-0405	CAP,10u0,20%,16V,EL,85C,4x5.5,SM	27
C902	SURGE COMPONENTS,16CAE220S/SIZE 6.3X7.7	CAP,220u,20%,16V,EL,85C,6.3X7.7,SM	1

Ref ID	Manufacturer Part Number	Description	QTY
C1-C2,C10-C11,C13-C14,C23- C24,C30-C31,C34-C36,C43- C45,C49-C50,C58- C60,C63,C65-C66,C74- C75,C79-C80,C90- C91,C95,C97-C98,C101- C102,C109,C111-C112,C115- C116,C118,C125,C127- C128,C134,C142,C146,C155, C158,C162- C163,C165,C168,C179,C181, C183,C185,C188- C189,C192,C200- C201,C204,C209,C212,C214, C216,C223,C226,C229,C232, C234,C243,C249-C250,C252- C253,C256,C268- C270,C273,C282-C283,C288- C290,C300-C301,C304- C305,C310,C318-C319,C321- C322,C324-C326,C336- C337,C339,C341- C342,C345,C354-C355,C358- C359,C367-C368,C373,C376- C377,C380-C381,C385,C388- C390,C396,C402-C403,C405- C407,C409,C420-C421,C425- C426,C436,C440,C442,C445, C451,C458,C460-C461,C471- C472,C477-C479,C481- C482,C496-C497,C511,C513- C514,C517,C526- C527,C535,C538- C539,C543,C552-	SURGE COMPONENTS,SCM05F104ZANCA	CAP 0.1uF 25V +80%/-20% Y5V 0402 TA TTI	390
C3,C12,C15,C25,C32,C46,C5 1,C61,C67,C78,C86,C92,C99, C113,C117,C129,C148,C166, C175,C182,C190- C191,C199,C210- C211,C215,C222,C230- C231,C235,C254,C263,C281, C298,C302,C306,C323,C327, C338,C343,C356,C360,C369, C378,C391,C399,C404,C416, C422- C423,C438,C456,C462,C480, C483,C509,C518,C533,C540, C542,C555-C556,C567,C569- C570,C572,C580,C592,C597- C598,C603,C619,C625,C636, C646,C653,C664,C670,C677, C693,C698,C710,C716,C727, C731,C741- C742,C761,C768,C786,C811, C829,C844,C865,C981,C1096 ,C1213	WALSIN TECHNOLOGY,0603N103J250CT	CAP, 10n0,5%,25V,CER,COG,0603	97
R869,R872,R880,R885,R893,R8 96,R904,R907,R915,R918,R926, R929,R937,R940,R950,R953,R1 023,R1026,R1034,R1039,R1047 ,R1050,R1058,R1061,R1069,R1 072,R1080,R1083,R1091,R1094 ,R1104,R1107,R1177,R1180,R1 188,R1193,R1201,R1204,R1212 ,R1215,R1223,R1226,R1234,R1 237,R1245,R1248,R1259,R1263	VISHAY INTERTECHNOLOGY,CRCW060349K9FKEA	RES,49k9,1%,100mW,THKF,0603	48

Ref ID	Manufacturer Part Number	Description	QTY
C5-C7,C17-C19,C33,C39-C41,C54-C56,C62,C72-C73,C76,C82-C84,C100,C104-C106,C120-C122,C124,C144,C206,C228,C287,C294-C296,C313-C315,C317,C330-C332,C344,C347-C349,C362-C364,C379,C383-C384,C386,C394-C395,C397,C408,C412-C414,C432,C490,C504,C577,C609-C611,C613,C627,C629-C631,C640-C641,C644,C647,C649,C660-C662,C665,C681-C683,C685,C688,C701-C703,C711,C720-C722,C733-C735,C737,C796,C808,C868	PANASONIC,EEEFK1E101XP	CAP,100u,20%,25V,EL,85C,6.3x7.7,SM	100
R2-R3,R5,R9-R10,R21-R23,R25-R26,R28,R32,R34,R44-R46,R49-R50,R52,R56,R58,R70-R72,R75-R76,R78,R82,R84-R86,R97,R101-R104,R113,R115-R116,R118,R127-R131,R140-R141,R143,R147-R148,R150,R154-R155,R164-R165,R167,R171-R172,R174,R178-R179,R191-R193,R215,R226-R227,R267,R278-R279,R284-R286,R295-R296,R298,R302-R303,R305,R308-R309,R318-R319,R321,R326-R327,R329,R333-R334,R345-R347,R351-R352,R354,R357,R359,R369-R371,R375-R376,R378,R387,R389-R391,R397,R401-R402,R404,R410,R412-R414,R422,R427-R431,R436,R443-R444,R446,R452-R453,R456,R460-R462,R471-R472,R474,R499,R502,R546,R577-R578,R580,R584,R586,R595-R597,R602-R603,R605,R611,R613-R615,R622,R627-R631,R639-R640,R642,R646-R647,R652-R654,R664-R665,R667,R671-R672,R674,R678-R679,R691-	STACKPOLE ELECTRONICS,RMCF0603FT10K0	RES,10k0,1%,100mW,THKF,0603	282
U29,U33,U37,U92-U93,U98	TEXAS INSTRUMENTS,CDCLVC1106PWR	IC,LGC,CLK BFR,1:6,250 MHz,14-TSSOP	6
U145,U147,U149	STMICROELECTRONICS,L7805CD2T	REG L7805CD2T +5V 1A D2PAK TA FU	3
U1-U7,U9-U15,U17-U19,U21-U22,U24-U25,U27,U30,U32,U34,U36,U38,U40-U41,U43,U45,U47-U51,U53-U60,U62-U63,U65-U67,U69-U70,U72,U75,U77-U78,U80-U81,U83-U84,U86,U89,U91,U95,U97,U99-U101,U103-U109,U111-U117,U119,U121,U123-U124,U126-U127,U129-U130,U132,U134,U136-U137,U139-U140,U142-U143	NEW JAPAN RADIO,NJM#2114MTE1	IC NJM2114M Op Amp High-Drive SM FU	97

Ref ID	Manufacturer Part Number	Description	QTY
R7-R8,R19-R20,R30-R31,R33,R43,R54-R55,R57,R69,R80-R81,R83,R95,R100,R111,R114,R121,R126,R136,R138-R139,R153,R160,R162-R163,R176-R177,R189-R190,R210,R229,R252,R269,R283,R291,R293-R294,R307,R314,R316-R317,R331-R332,R343-R344,R355-R356,R358,R368,R374,R386,R388,R396,R400,R409,R411,R420,R426,R440,R442,R451,R459,R467,R469-R470,R486,R512,R532,R558,R582-R583,R585,R594,R601,R610,R612,R620,R626,R636,R638,R645,R651,R660,R662-R663,R676-R677,R689-R690,R700-R701,R712-R713,R727-R728,R730,R739,R750-R751,R753,R764,R772,R792,R810,R833	YAGEO,RC0603FR-0720R	RES,20R0,1%,63mW,THKF,0603	108
P1-P3	MOLEX,54132-3092	HCN 30PIN 1X30 0.5MM SPC ZIF RA FM SM	3
C154,C167,C176,C198,C242,C255,C264,C280,C439,C457,C463,C476,C510,C534,C541,C561,C747,C762,C769,C785,C817,C831,C846,C856	KEMET ELECTRONICS,C0603C472J5GACTU	CAP,4n7,5%,50V,CER,COG,0603	24
R198,R202,R204,R208,R219,R225,R228,R234,R241,R246-R247,R255,R260,R266,R268,R276,R480,R485,R487,R496,R506,R511,R513,R520,R525,R530,R536,R541,R552,R557,R563,R568,R771,R777,R780,R785,R791,R798,R800,R805,R814,R817,R820,R824,R834,R840,R842,R844	KOA SPEER ELECTRONICS,RK73H1JTTD2000F	RES,200R,1%,63mW,THKF,0603	48
R200,R209,R221,R235,R243,R251,R261,R273,R482,R492,R507,R517,R526,R538,R553,R570,R776,R786,R797,R806,R816,R825,R836,R845,R857,R862	STACKPOLE ELECTRONICS,RMCF0603FT332R	RES,332R,1%,100mW,THKF,0603	26
R4,R27,R51,R77,R96,R122,R149,R173,R280,R304,R328,R353,R377,R403,R421,R454,R579,R604,R621,R648,R673,R697,R722,R725,L35,L65,L67,L74,L78,L116,L126,L137	YAGEO,RC0603FR-074K02L_DUPLICATE	RES,4k02,1%,100mW,THKF,0603	24
J7	MURATA MANUFACTURING,BLM21BD222SN1D	IDCTR,FBD,2k25,70MHZ,200mA,0805	9
U88,U94	NEUTRIK,NC3FAAH2	CON,XLR,RA,3PIN,FEM,CHAS,PLSTC	1
U20,U23,U26,U31,U35,U39,U42,U46,U68,U71,U76,U79,U82,U85,U90,U96,U118,U122,U125,U128,U131,U135,U138,U141	MONOLITHIC POWER SYSTEMS,MPM3620GQV-Z	IC,VREG,MPM3620,ADJ,SW,2.0A,QFN18	2
U20,U23,U26,U31,U35,U39,U42,U46,U68,U71,U76,U79,U82,U85,U90,U96,U118,U122,U125,U128,U131,U135,U138,U141	VISHAY INTERTECHNOLOGY,DG411DY-T1-E3	IC,DG411,QUAD,CMOS,ANALOG SWITCH	24
C976,C980,C984,C986,C992,C995,C998-C999,C1001,C1006-C1007,C1012,C1014,C1017,C1020,C1022,C1099-C1100,C1104,C1110-C1111,C1115,C1118,C1121,C1125,C1127,C1130,C1132,C1135-C1136,C1141-C1142,C1221,C1225,C1228-C1229,C1231,C1235,C1237,C1242,C1244,C1247,C1250,C1252,C1255,C1257,C1260,C12	SAMSUNG ELECTRONICS,CL10C221JB8NNNC	CAP,220p,5%,50V,CER,COG,0603	48
R860	EZENTEK,FCF03FT-330P	RES,33R,1%,100mW,THKF,0603	1
U28,U44,U73,U87,U120,U133	ASAHI KASEI MICRODEVICES,AK5388AEQ	IC,CONV,ADC,AK5388,24BIT 192kHz,44PIN LQFP	6

Ref ID	Manufacturer Part Number	Description	QTY
R547	WALSIN TECHNOLOGY,WF06Q1452BTL	RES,14k5,0.1%,100mW,TF,0603	1
L5-L7,L15,L17,L22,L26,L36,L45-L47,L56-L57,L62,L68,L79,L83,L88-L90,L93,L95,L98,L102-L104,L107,L110-	MURATA MANUFACTURING,BLM18PG121SN1D	IND FBD 120 OHM @ 100Hz 2000mA 0603 TA	37
R543,R565	YAGEO,RC0603FR-07121KL_DUPLICATE	RES,121k,1%,100mW,THKF,0603	2
C4,C9,C16,C22,C29,C38,C48,C53,C64,C71,C81,C89,C103,C110,C119,C126,C132-C133,C135,C139-C141,C143,C145,C147,C150,C153,C156-C157,C159,C164,C170,C173-C174,C177-C178,C180,C184,C193,C196-C197,C202-C203,C205,C213,C217,C220-C221,C224-C225,C227,C233,C237,C240-C241,C244-C246,C251,C258,C261-C262,C265-C267,C274-C275,C278-C279,C284-C286,C293,C299,C312,C320,C329,C335,C340,C353,C357,C361,C375,C382,C393,C401,C411,C419,C424,C427,C430-C431,C434-C435,C437,C441,C446,C449-C450,C453-C455,C459,C464,C467-C468,C473-C475,C484-C485,C488-C489,C493-C495,C498-C499,C502-C503,C506-C508,C520-C521,C524-C525,C530-C532,C544-C545,C548-C549,C558-C560,C574-C576,C586-C587,C590-C591,C600,C608,C622,C628,	WALSIN TECHNOLOGY,0603N121J500LT	CAP,120p,5%,50V,CER,COG,0603	266
R961-R962,R965,R968,R971-R972,R974,R978-R979,R981,R983-R984,R986,R988,R990-R991,R993,R995-R996,R999-R1000,R1002-R1003,R1006-R1008,R1011,R1013,R1016-R1017,R1020,R1022,R1117,R1119-R1120,R1122,R1124,R1126-R1127,R1132-R1134,R1136,R1139-R1141,R1144,R1146-R1148,R1151,R1153-R1154,R1156,R1158-R1159,R1161,R1163,R1165-R1166,R1170,R1172-R1173,R1175,R1271,R1273,R1275-R1276,R1278,R1280,R1284-R1285,R1287,R1289-R1290,R1293-R1294,R1296-R1297,R1300-R1302,R1305,R1307-R1309,R1312,R1314-R1315,R1317,R1319-R1320,R1324,R1326,R1328-R1329	PANASONIC,ERJ3EKF2213V	RES,221k,1%,100mW,THKF,0603	96

Ref ID	Manufacturer Part Number	Description	QTY
R851,R854,R865,R871,R879,R882,R889,R895,R903,R906,R914,R917,R925,R928,R936,R939,R949,R952,R960,R964,R973,R982,R989,R998,R1005,R1010,R1019,R1025,R1033,R1036,R1046,R1049,R1057,R1060,R1068,R1071,R1079,R1082,R1090,R1093,R1103,R1106,R1114,R1121,R1129,R1138,R1143,R1150,R1157,R1164,R1174,R1179,R1187,R1190,R1200,R1203,R1211,R1214,R1222,R1225,R1233,R1236,R1244,R1247,R1257,R1261,R1267,R1274,R1281,R1292,R1299,R1304,R1311,R1318,R1327	YAGEO,RC0603FR-076K81L_DUPLICATE	RES,6k81,1%,63mW,THKF,0603	75
C8,C20,C42,C57,C77,C85,C107,C123,C297,C316,C333,C350,C365,C387,C398,C415,C612,C632,C645,C663,C684,C704,C723,C736,C884	SAMSUNG ELECTRONICS,CL10C272JB8NFNC	CAP,2n7,5%,50V,CER,COG,0603	25
R66-R67,R108-R109,R214,R223,R383-R384,R437-R438,R531,R533,R559-R560,R724-R725,R766-R767,R848-R849,R867,R883-R884,R946-R947,R967,R970,R976-R977,R1014-R1015,R1037-R1038,R1098-R1099,R1115-R1116,R1130-R1131,R1168-R1169,R1191-R1192,R1252-R1253,R1258,R1262,R1282-R1283,R1322-R1323,R1331-R1334	TE CONNECTIVITY,CRG0603F0R0	RES,0R00,1A,THKF,0603	55
C904-C905,C913,C918,C922,C925,C930,C934,C939,C942,C948,C951,C957,C960,C966,C969,C1023,C1026,C1032,C1035,C1041,C1044,C1050,C1053,C1059,C1062,C1068,C1071,C1077,C1079,C1087-C1088,C1143,C1146,C1152,C1155,C1161,C1163,C1171-C1172,C1180-C1181,C1189-C1190,C1198-C1199,C1208,C1214	AVX,06035A330JAT2A	CAP,33p0,5%,50V,CER,COG,0603	48
R866,R870,R878,R881,R888,R894,R902,R905,R913,R916,R924,R927,R935,R938,R948,R951,R959,R1024,R1032,R1035,R1045,R1048,R1056,R1059,R1067,R1070,R1078,R1081,R1089,R1092,R1102,R1105,R1113,R1178,R1186,R1189,R1199,R1202,R1210,R1213,R1221,R1224,R1232,R1235,R1243,R1246,R1256,R1260,	YAGEO,RC0603FR-0712K1L_DUPLICATE	RES,12k1,1%,63mW,THKF,0603	49
U64,U74	FAIRCHILD SEMICONDUCTOR,74ACT244SCX_NL	IC 74ACT244 OCTAL BUF/LIN DRIVER 3-ST SM	2
U146,U148,U150	TEXAS INSTRUMENTS,LM1117DTX-3.3/NOPB	IC,VREG,LM1117DTX,3.3V,0.8A,TO-252	3
C886,C901	MURATA MANUFACTURING,GRM1885C2A101JA01D	CAP,100p,5%,100V,CER,COG,0603	2
C160-C161,C186-C187,C247-C248,C271-C272,C443-C444,C469-C470,C515-C516,C550-C551,C754-C755,C779-C780,C824-C825,C850-C851	NIC COMPONENTS,NACE1R0M50V4X5.5TR13F	CAP,1u0,20%,50V,EL,85C,4x5.5,SM	24
U8,U16,U52,U61,U102,U110	ASAHI KASEI MICRODEVICES,AK4413EQ	IC,CONV,DAC,AK4413,24BIT 192kHz,44PIN LQFP	6

Ref ID	Manufacturer Part Number	Description	QTY
L1-L4,L8-L14,L16,L18-L21,L23-L24,L27-L34,L37-L44,L48-L55,L58-L61,L63-L64,L66,L69-L73,L75-L77,L80-L82,L84-L87,L91-L92,L94,L96-L97,L99-L101,L105-L106,L108-L109,L112-L115,L118-L125,L128-L136,L138	MURATA MANUFACTURING,BLM18BD252SN1D	IDCTR,FBD,2K50@100MHz,50mA,0603	98
R222,R262,R423,R435,R450,R455,R488,R493,R498,R501,R503,R545,R782,R826	YAGEO,RC0603FR-0739R2L_DUPLICATE	RES,39R2,1%,100mW,THKF,0603	14
R195,R199,R207,R212-R213,R220,R233,R237-R238,R242,R250,R256-R257,R265,R272,R277,R477,R481,R491,R497,R500,R510,R516,R521,R524,R529,R537,R542,R551,R556,R564,R569,R770,R775,R781,R788,R790,R796,R804,R807,R809,R815,R823,R829,R832,R835,R843,R847	YAGEO,RC0603FR-073K01L_DUPLICATE	RES,3k01,1%,100mW,THKF,0603	48
R859	YAGEO,RC0603FR-07100RL	RES,100R,1%,100mW,THKF,0603	1
U144	CIRRUS LOGIC,CS5340-CZZR	IC A/D CS5340 101dB 192kHz AV	1
C885,C896,C898	SAMSUNG ELECTRONICS,CL10A105KO8NNND	CAP,1u0,10%,16V,CER,X5R,0603	3
J1-J6	Harman, 5021803	CON,DSUB,RIGHT ANGLE,FEMALE 25PIN,PTH	6
C978-C979,C982,C985,C990,C994,C996,C1000,C1003-C1004,C1009-C1010,C1015-C1016,C1018,C1021,C1097,C1101,C1107-C1108,C1112-C1113,C1119-C1120,C1123,C1126,C1128,C1131,C1133,C1137-C1139,C1219,C1224,C1226,C1230,C1232-C1233,C1239-C1240,C1245-C1246,C1248,C1251,C1253,C1256,C1258,C1261	DARFON ELECTRONICS,C1608COG470JGA	CAP,47p0,5%,50V,CER,COG,0603	48
C889	NIC COMPONENTS,NMC0603NPO331J50TRP	CAP,330p,5%,50V,CER,COG,0603	1
SW4	E-SWITCH,PBH2UOANAGX	SW DPDT PUSH-PUSH MOMENT MINI 6PIN	1
R194,R201,R203,R211,R218,R224,R232,R236,R240,R245,R249,R254,R259,R264,R271,R275,R479,R484,R490,R495,R505,R509,R515,R519,R523,R528,R535,R540,R550,R555,R562,R567,R769,R774,R779,R784,R789,R795,R799,R803,R808,R813,R819,R822,R831,R839,R841,R846	STACKPOLE ELECTRONICS,RMCF0603FT15K0	RES,15k0,1%,100mW,THKF,0603	48
C137-C138,C151-C152,C171-C172,C194-C195,C218-C219,C238-C239,C259-C260,C276-C277,C428-C429,C447-C448,C465-C466,C486-C487,C500-C501,C522-C523,C546-C547,C588-C589,C750-C751,C771-C772,C790-C791,C804-C805,C820-C821,C840-C841,C862-C863,C875-C876	NICHICON,UWX1V220MCL1GB	CAP,22u0,20%,35V,EL,85C,6.3x5.5,SM	48
R572,R852-R853,R855-R856,R861	YAGEO,RC0603FR-071KL_DUPLICATE	RES,1k00,1%,100mW,THKF,0603	6

Ref ID	Manufacturer Part Number	Description	QTY
R196-R197,R205-R206,R216-R217,R230-R231,R239,R244,R248,R253,R258,R263,R270,R274,R478,R483,R489,R494,R504,R508,R514,R518,R522,R527,R534,R539,R549,R554,R561,R566,R768,R773,R778,R783,R793-R794,R801-R802,R811-R812,R818,R821,R828,R830,R837-R838	KOA SPEER ELECTRONICS,RK73H1JTTD2492F	RES,24k9,1%,100mW,THKF,0603	48
C27,C47,C52,C69,C94,C108,C114,C131,C308,C328,C334,C346,C371,C392,C400,C410,C537,C582,C605,C626,C633,C655,C678,C694,C699,C718	MURATA MANUFACTURING,GRM1885C1H220JA01D	CAP,22p0,5%,50V,CER,COG,0603	26
R1,R6,R17-R18,R24,R29,R41-R42,R47-R48,R53,R68,R73-R74,R79,R94,R98-R99,R110,R112,R124-R125,R135,R137,R146,R152,R159,R161,R170,R175,R187-R188,R281-R282,R290,R292,R301,R306,R313,R315,R325,R330,R341-R342,R349-R350,R366-R367,R372-R373,R385,R395,R398-R399,R408,R419,R424-R425,R439,R441,R457-R458,R466,R468,R575-R576,R581,R593,R599-R600,R609,R619,R624-R625,R635,R637,R649-R650,R659,R661,R670,R675,R687-R688,R694,R699,R710-R711,R718-R719,R726,R738,R743-R744,R749,R763,R876-R877,R886-R887,R897-R898,R908-R909,R919-R920,R930-R931,R941-R942,R954-R955,R1027-R1028,R1040,R1044,R1051,R1055,R1062,R1066,R1073,R1077,R1084,R1088,R1100-R1101,R1111-R1112,R1181,R1185,R1194,R1198,R1208-R1209,R1219-R1220,R1230-R1231,R1241-	KOA SPEER ELECTRONICS,RK73H1JTP2001F	RES,2k00,1%,100mW,THKF,0603	144
R65,R93,R151,R186,R324,R348,R418,R449,R598,R623,R686,R717	YAGEO,RC0603FR-1310RL	RES,10R0,1%,100mW,THKF,0603	12
Q1-Q32,Q35-Q98	DIODES INCORPORATED,MMBF170-7-F	XSTR,MFET,MMBF170,N-CH,60V,0.3A,SOT-23	96
D1-D2	ON SEMICONDUCTOR,MMBD7000LT1G	DIO,GP,MMBD4148SE,100V,200mA,SOT23	2



Ref ID	Manufacturer Part Number	Description	QTY
R11-R12,R15-R16,R35-R36,R39-R40,R59-R60,R63-R64,R87-R88,R91-R92,R105,R107,R117,R120,R132,R134,R142,R145,R156,R158,R166,R169,R180-R181,R184-R185,R287,R289,R297,R300,R310,R312,R320,R323,R335-R336,R339-R340,R360-R361,R364-R365,R379,R381,R392,R394,R405,R407,R415,R417,R432,R434,R445,R448,R463,R465,R473,R476,R587-R588,R591-R592,R606,R608,R616,R618,R632,R634,R641,R644,R655,R657,R666,R669,R680-R681,R684-R685,R704-R705,R708-R709,R732-R733,R736-R737,R757-R758,R761-R762	YAGEO,RC0603FR-07169R	RES,169R,1%,63mW,THKF,0603	96
R548,R574	KOA SPEER ELECTRONICS,RK73H1JTDD6342F	RES,63k4,1%,63mW,THKF,0603	2
R13-R14,R37-R38,R61-R62,R89-R90,R106,R119,R133,R144,R157,R168,R182-R183,R288,R299,R311,R322,R337-R338,R362-R363,R380,R393,R406,R416,R433,R447,R464,R475,R589-R590,R607,R617,R633,R643,R656,R668,R682-R683,R706-R707,R734-R735,R759-R760	STACKPOLE ELECTRONICS,RMCF0603FT2K49	RES,2k49,1%,100mW,THKF,0603	48
C706	WALSIN TECHNOLOGY,1206B105K101CT	CAP,1u0,10%,100V,CER,X7R,1206	1
SW1-SW3	E-SWITCH,PBH2UEENAGX	SW DPDT IN/OUT MINI 6PIN	3
R544,R571	PANASONIC,ERJ3EKF1003V	RES,100k,1%,100mW,THKF,0603	2