

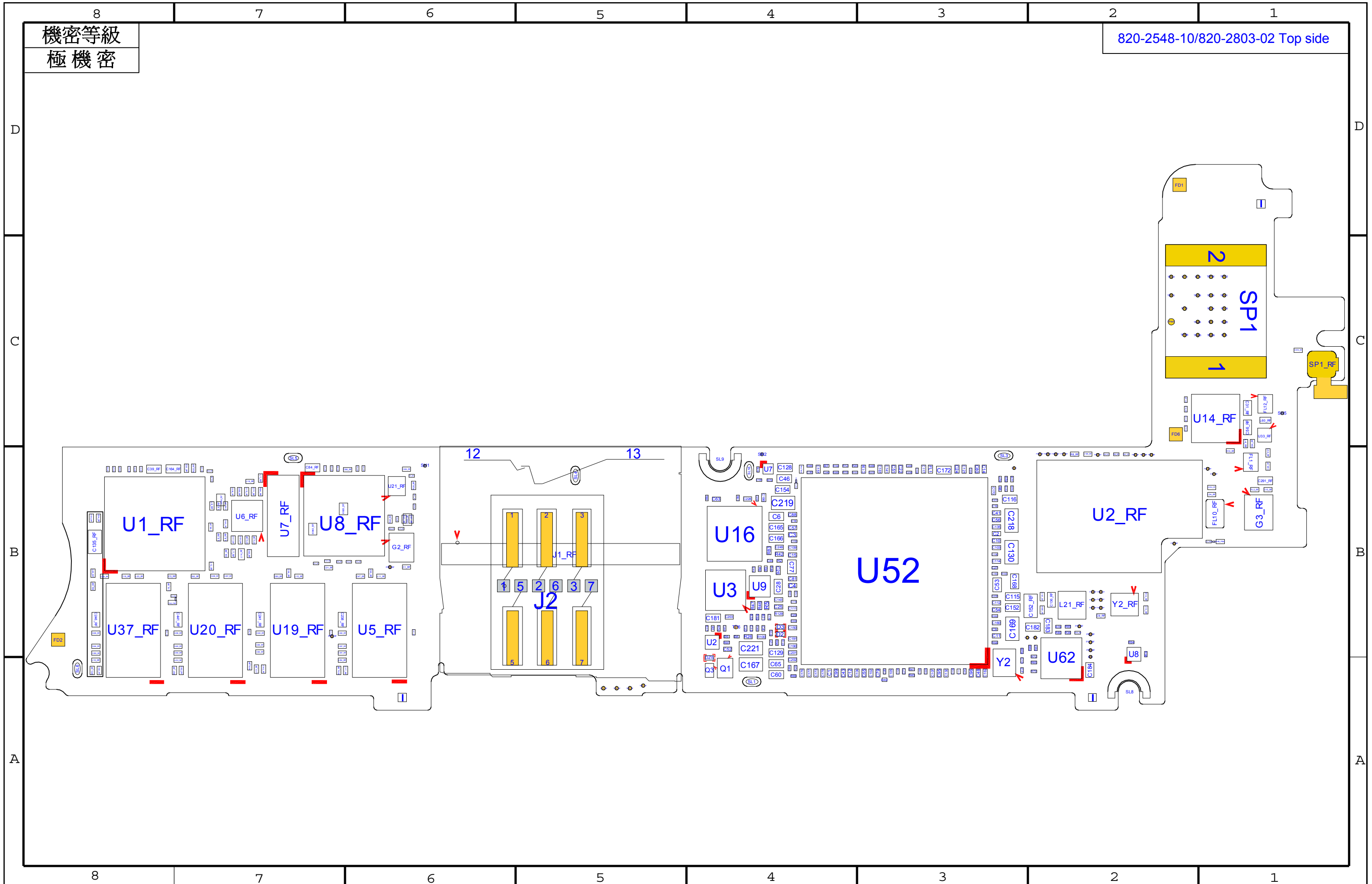
# iPhone 4 Schematic



Jailbreak By OM Tesla  
Big Thanks to Weaver &  
130877 from Mobile-files!

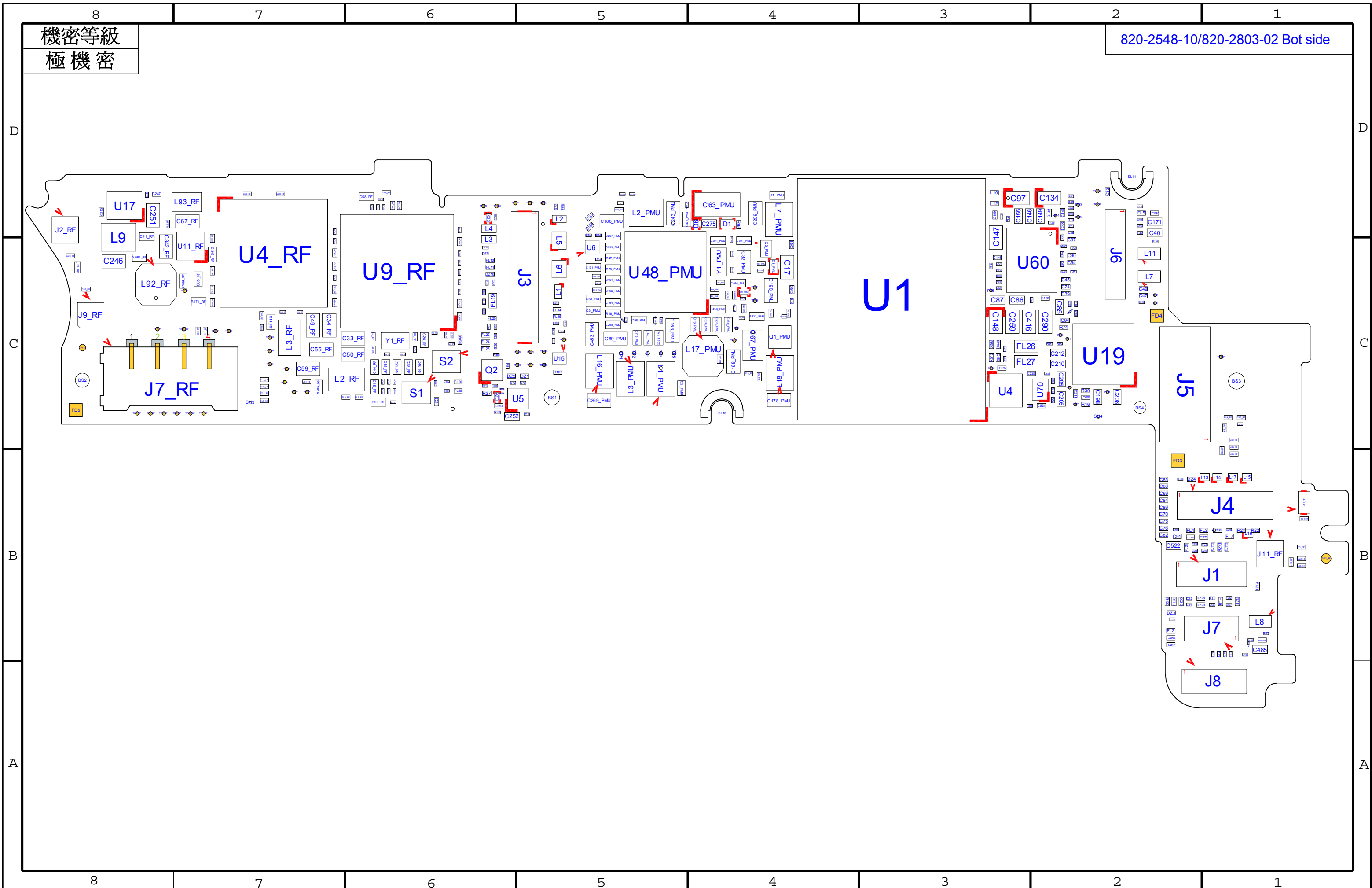
機密等級  
極機密

820-2548-10/820-2803-02 Top side



機密等級  
極機密

820-2548-10/820-2803-02 Bot side



1. ALL RESISTANCE VALUES ARE IN OHMS, 0.1 WATT +/- 5%.
2. ALL CAPACITANCE VALUES ARE IN MICROFARADS.
3. ALL CRYSTALS & OSCILLATOR VALUES ARE IN HERTZ.

REV	ECN	DESCRIPTION OF REVISION	CK APPD	DATE
A	000080153	PRODUCTION RELEASED		2010-03-23

# N90 SINGLE\_BRD PVT

Fri Apr 16 15:07:25 2010

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MCO 056-3008  
 BRD 820-2548  
 SCH 051-7921  
 BOM 639-0648 (16GB,USI)  
 BOM 630-9941 (16GB,MURATA)  
 BOM 639-0437 (32GB,USI)  
 BOM 639-0609 (32GB,MURATA)  
 BOM 639-0608 (64GB,USI)  
 BOM 639-0607 (64GB,MURATA)

## H3P ALTERNATES

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
339S0123	339S0108	?	U52	H3P + ELFIDA 512MB
339S0126	339S0108	?	U52	H3P + HYNIX 512MB

## L9 (STROBE) ALTERNATE

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
152S1173	152S0979	?	L9	

## VIDEO BUFFER ALTERNATE

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
353S2684	353S2493	?	U9	INTERSIL BUFFER

## G3\_RF ALTERNATES

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
197S0371	197S0349	?	G3_RF	
197S0364	197S0349	?	G3_RF	

## FL1\_RF ALTERNATES

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
155S0452	155S0435	?	FL1_RF	

## G2\_RF ALTERNATES

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
197S0334	197S0292	?	G2_RF	

## Y1\_RF ALTERNATES

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
197S0329	197S0299	?	Y1_RF	
197S0369	197S0299	?	Y1_RF	

## Y2\_RF ALTERNATE

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
197S0342	197S0297	?	Y2_PMU	

## L2\_PMU ALTERNATE

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
152S1172	152S0928	?	L2_PMU	

## L7\_PMU ALTERNATE

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
152S1051	152S0927	?	L7_PMU	

## LCD BL DRIVER ALTERNATE

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
376S0769	376S0768	?	Q1_PMU	LCD BL FET DRIVER

## Y1\_PMU ALTERNATE

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
197S0329	197S0299	?	Y1_PMU	
197S0369	197S0299	?	Y1_PMU	

## PMU POWER IND ALTERNATE

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
607-6810	607-6809	?	L1_L3_L16_L18_PMU	CYNTEC INDUCTORS
197S0369	197S0299	?	Y1_PMU	

## SCH & PCB BOM CALLOUT

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
051-7921	1	N90_SCHEMATIC_TOP	SCH	Y	?
820-2548	1	N90_SINGLE_BOARD	PCB	Y	?

## H3P BOM CALLOUT

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
339S0108	1	H3P WITH 512MB SAMSUNG DDR	U52	Y	?

## BB MEMORY BOM CALLOUT

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
341S2509	1	BB_MEM_PROGRAMMED	U4_RF	Y	BB_MEM

## N90 EEE BOM LABELS

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
825-2029	1	EEE FOR 630-9941 (16G)	EEE_6LU	Y	GOOD_MURATA
825-2029	1	EEE FOR 639-0609 (32G)	EEE_D7F	Y	BETTER_MURATA
825-2029	1	EEE FOR 639-0607 (64G)	EEE_D7D	Y	BEST_MURATA
825-2029	1	EEE FOR 639-0648 (16G)	EEE_DFM	Y	GOOD_USI
825-2029	1	EEE FOR 639-0437 (32G)	EEE_BA0	Y	BETTER_USI
825-2029	1	EEE FOR 639-0608 (64G)	EEE_D7E	Y	BEST_USI

## NAND BOM OPTIONS

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
335S0682	1	16GB SAMSUNG 35NM FLASH WLG52	U1	Y	GOOD_MURATA
335S0665	1	32GB SAMSUNG 35NM FLASH TLGA52	U1	Y	BETTER_MURATA
335S0707	1	64GB SAMSUNG 35NM FLASH LGA52	U1	Y	BEST_MURATA
117S0161	2	64GB NAND CE7 CE8 JUMPERS	R101, R102	Y	BEST_MURATA
335S0682	1	16GB SAMSUNG 35NM FLASH WLG52	U1	Y	GOOD_USI
335S0665	1	32GB SAMSUNG 35NM FLASH TLGA52	U1	Y	BETTER_USI
335S0707	1	64GB SAMSUNG 35NM FLASH LGA52	U1	Y	BEST_USI
117S0161	2	64GB NAND CE7 CE8 JUMPERS	R101, R102	Y	BEST_USI

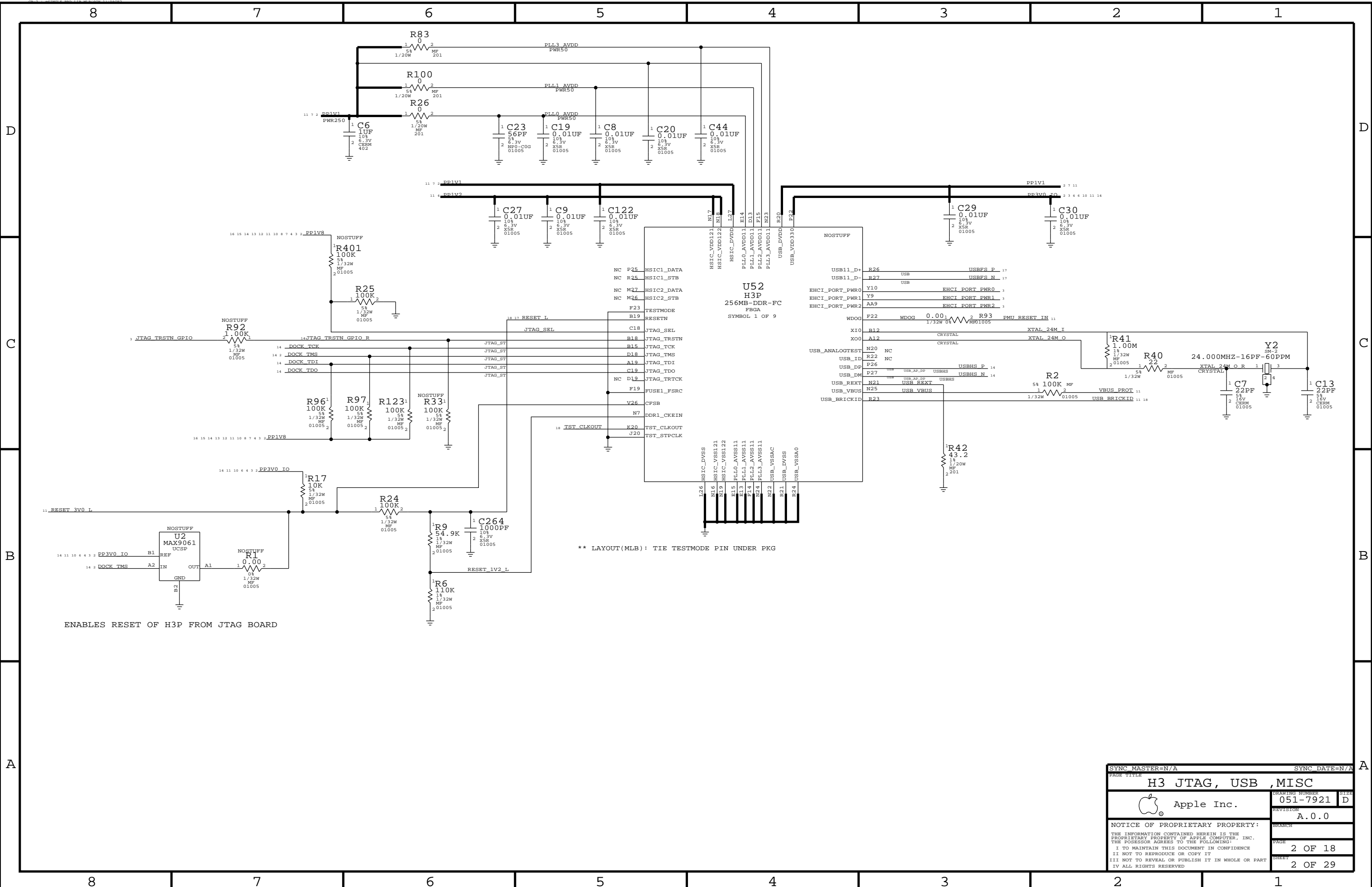
## WIFI/BT BOM OPTIONS

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
339S0092	1	MURATA WIFI_BT MODULE	U2_RF	Y	GOOD_MURATA
117S0161	1	MURATA ID RESISTOR	R47_RF	Y	GOOD_MURATA
339S0092	1	MURATA WIFI_BT MODULE	U2_RF	Y	BETTER_MURATA
117S0161	1	MURATA ID RESISTOR	R47_RF	Y	BETTER_MURATA
339S0092	1	MURATA WIFI_BT MODULE	U2_RF	Y	BEST_MURATA
117S0161	1	MURATA ID RESISTOR	R47_RF	Y	BEST_MURATA
339S0091	1	USI WIFI_BT MODULE	U2_RF	Y	GOOD_USI
117S0161	1	USI ID RESISTOR	R46_RF	Y	GOOD_USI
339S0091	1	USI WIFI_BT MODULE	U2_RF	Y	BETTER_USI
117S0161	1	USI ID RESISTOR	R46_RF	Y	BETTER_USI
339S0091	1	USI WIFI_BT MODULE	U2_RF	Y	BEST_USI
117S0161	1	USI ID RESISTOR	R46_RF	Y	BEST_USI

## PMU POWER IND CALLOUT

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
607-6809	1	POWER INDUCTORS	L1_L3_L16_L18_PMU	Y	?

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DRAWING TITLE			
TABLE OF CONTENTS			
DRAWING NUMBER	051-7921	SIZE	D
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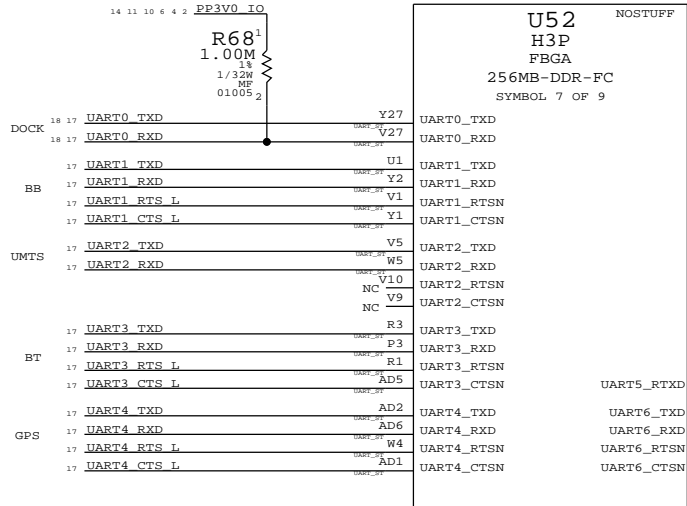
\*\* LAYOUT (MLB): TIE TESTMODE PIN UNDER PKG

ENABLES RESET OF H3P FROM JTAG BOARD

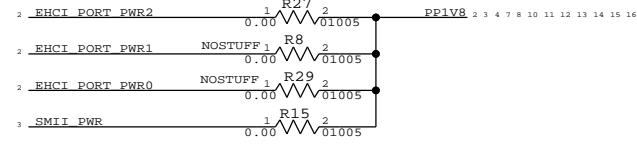
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<b>H3 JTAG, USB, MISC</b>			
Apple Inc.		DRAWING NUMBER	051-7921
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13 11	MENU KEY_BUFF_L	F6	GPIO0
18 16 13 11	HOLD KEY_L	B6	GPIO1
18 13 10	VOL_UP_L	B7	GPIO2
18 13 10	VOL_DWN_L	D9	GPIO3
18 13 11 10	RINGER_A	D5	GPIO4
12	GYRO_INT2	A6	GPIO5
17	WLAN_RESET_L	A7	GPIO6
17	BT_WAKE	B9	GPIO7
17	BT_RESET_L	E6	GPIO8
17 5	RADIO_ON	A9	GPIO9
17	BB_RESET_L	C5	GPIO10
17	BB_RESET_DET_L	C9	GPIO11
17	IPC_SRDY	C6	GPIO12
11	PMU_IRO_L	D6	GPIO13
9	CODEC_RESET_L	F5	GPIO14
	NC - DIF_MIC_SEL	E5	GPIO15
13	AUDIENCE_RESET_L	F9	GPIO16
9	JTAG_TRSTN_GPIO	F3	GPIO17
8	CODEC_INT_L	F4	GPIO18
11	KKEEFACT	C10	GPIO19
15	GRAPE_RESET_L	F10	GPIO20
18 15	NIMBUS_INT_L	E10	GPIO21
15 13	LCD_RESET_L	A4	GPIO22
15	LCD_HIFA	B4	GPIO23
10	COMPASS_BRD_INT	E4	GPIO24
	NC - GPIO25_CONFIG1	E2	GPIO25
14	FORCE_DFU	D10	GPIO26
	NC - DFU_STATUS	E9	GPIO27
9	GPIO28_CONFIG2	L2	GPIO28
9	GPIO29_CONFIG3	G1	GPIO29
17	GPS_RESET_AP_L	G2	GPIO30
17	GPS_STANDBY_AP_L	F3	GPIO31
17	GPS_INTR_L	R3	GPIO32
12	GYRO_INT1	A3	GPIO33
16	CAM_VGA_SHUTDOWN_L	B2	GPIO34
		H2	GPIO35
12	ACCEL_INT1_L	L1	GPIO36
16	ALS_INT_L	H1	GPIO37
12	ACCEL_INT2_L	E1	GPIO38
6	VIDEOAMP_EN_3V0	W24	GPIO_3V0
	NC - SEL_SECURE_BOOT_3V0	W25	GPIO_3V1

U52 H3P 256MB-DDR-FC FBGA SYMBOL 6 OF 9			
SENSOR_CLK	W20	CAM_CLK	14
SENSOR_RST	V21	CAM_5MP_SHUTDOWN	14
SPDIF	R18	NC	
TMR32_PWM0	AB25	L61HP_CLK_PWM	3 13
TMR32_PWM1	AB27	VIB_PWM_EN	11
TMR32_PWM2	AB26	CAM_STROBE_EN	12 14
SMII_CLKSEL0	K18	AP_PMU_EXTON	11 17
SMII_CLKSEL1	K19	GPS_SYNC	17
SMII_TXD	G18	A1_GND	4
SMII_RXD	J18	A27_GND	4
SMII_SYNC	G19	SPKRAMP_EN	14
SMII_CLK	K23	AG1_GND	4
SMII_RDY	K21	HP_GPIO_A	13
SMII_SRDY	K22	IPC_GPIO	17
SMII_WAKE	J19	AG27_GND	4
SMII_PWR	H19	SMII_PWR	3



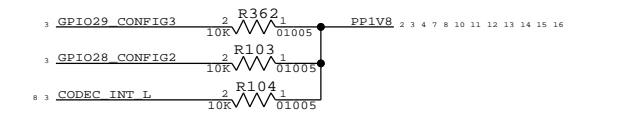
```
BOARD_REV[3:0]={EHCI_PORT_PWR2,EHCI_PORT_PWR1,EHCI_PORT_PWR0,SMII_PWR}
1111  PROTO0
1110  PROTO1
1101  PROTO2
1100  EVT1
1011  EVT2
1010  EVT2_COMPBUTTON
1001  DVT <---SELECTED
```



```
BOARD_ID[0:2]={SPI0_SCLK,SPI0_MOSI,SPI0_MISO}
000  N90_MLB <---SELECTED
100  N90_DEV
010  XXX_AP
110  XXX_DEV
001  XXX_AP
101  XXX_DEV
```

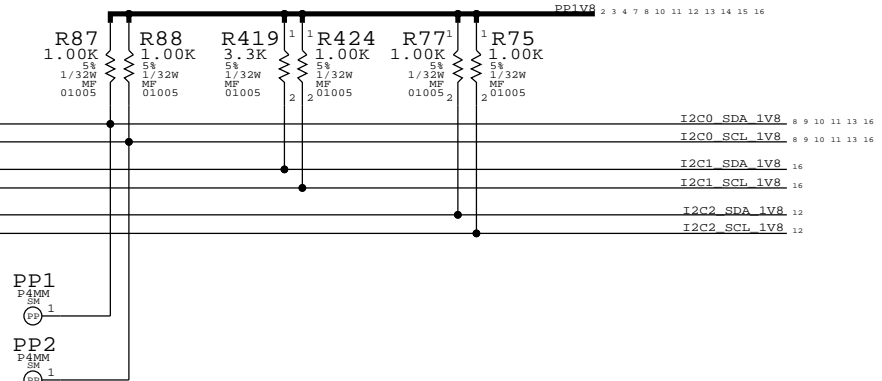
NOTE: NO COMPONENTS REQUIRED!

```
FLOAT=LOW, PULLUP=HIGH
BOOT_CONFIG[3:0]={GPIO29_CONFIG3,GPIO28_CONFIG2,GPIO25_CONFIG1,CODEC_INT_L}
0000  SPI0
0001  SPI3
0010  SPI0_W/TEST
0011  SPI3_W/TEST
0100  FMIO_2CS
0101  FMIO_4CS
0110  FMIO_4CS_W/TEST
0111  RESERVED
1000  FM11_2_CS
1001  FM11_4_CS
1010  FM11_4CS_W/TEST
1100  FMIO/1_2/2_CS
1101  FMIO/1_4/4_CS <---SELECTED
1110  FMIO/1_4/4_CS_W/TEST
1111  RESERVED
```



U52 H3P FBGA 256MB-DDR-FC SYMBOL 5 OF 9		
WLAN_SDIO_DATA<3:0>	J24	SDIO0_DATA0
	J25	SDIO0_DATA1
	J26	SDIO0_DATA2
	J27	SDIO0_DATA3
WLAN_SDIO_CMD	K25	SDIO0_CMD
WLAN_SDIO_CLK	J21	SDIO0_CLK
	V4	SPI0_SCLK
	W7	SPI0_MOSI
	V6	SPI0_MISO
	W3	SPI0_SSIN
SPI1_SCLK	V3	SPI1_SCLK
SPI1_MOSI	W8	SPI1_MOSI
SPI1_MISO	U2	SPI1_MISO
SPI1_CS_L	V2	SPI1_SSIN
SPI2_SCLK	AA2	SPI2_SCLK
SPI2_MOSI	AA1	SPI2_MOSI
SPI2_MISO	V7	SPI2_MISO
SPI2_MRDY	W6	SPI2_SSIN

U52 H3P FBGA 256MB-DDR-FC SYMBOL 5 OF 9			
** BACKUP IN CASE I2S0_MCK DOES NOT WORK			
I2S0_DIN	W21	I2S0_DIN	8
I2S0_DOUT	W22	I2S0_DOUT	8
I2S0_BCLK	V23	I2S0_BCLK	8
I2S0_LRCLK	V18	I2S0_LRCLK	8
I2S0_MCK	V20	I2S0_MCK	8
I2S1_DIN	V24	I2S1_DIN	13 17
I2S1_DOUT	W19	I2S1_DOUT	13 17
I2S1_BCLK	V25	I2S1_BCLK	13 17
I2S1_LRCLK	V15	I2S1_LRCLK	13 17
I2S1_MCK	AB22	I2S1_MCK	8
I2S2_DIN	R17	I2S2_DIN	13 17
I2S2_DOUT	R16	I2S2_DOUT	13 17
I2S2_BCLK	V26	I2S2_BCLK	13 17
I2S2_LRCLK	AB23	I2S2_LRCLK	13 17
I2S2_MCK	W23	I2S2_MCLK	13
I2C0_SDA	AB6	I2C0_SDA_1V8	8 9 10 11 13 16
I2C0_SCL	AB5	I2C0_SCL_1V8	8 9 10 11 13 16
I2C1_SDA	AB4	I2C1_SDA_1V8	16
I2C1_SCL	AB3	I2C1_SCL_1V8	16
I2C2_SDA	AD15	I2C2_SDA_1V8	12
I2C2_SCL	AC15	I2C2_SCL_1V8	12



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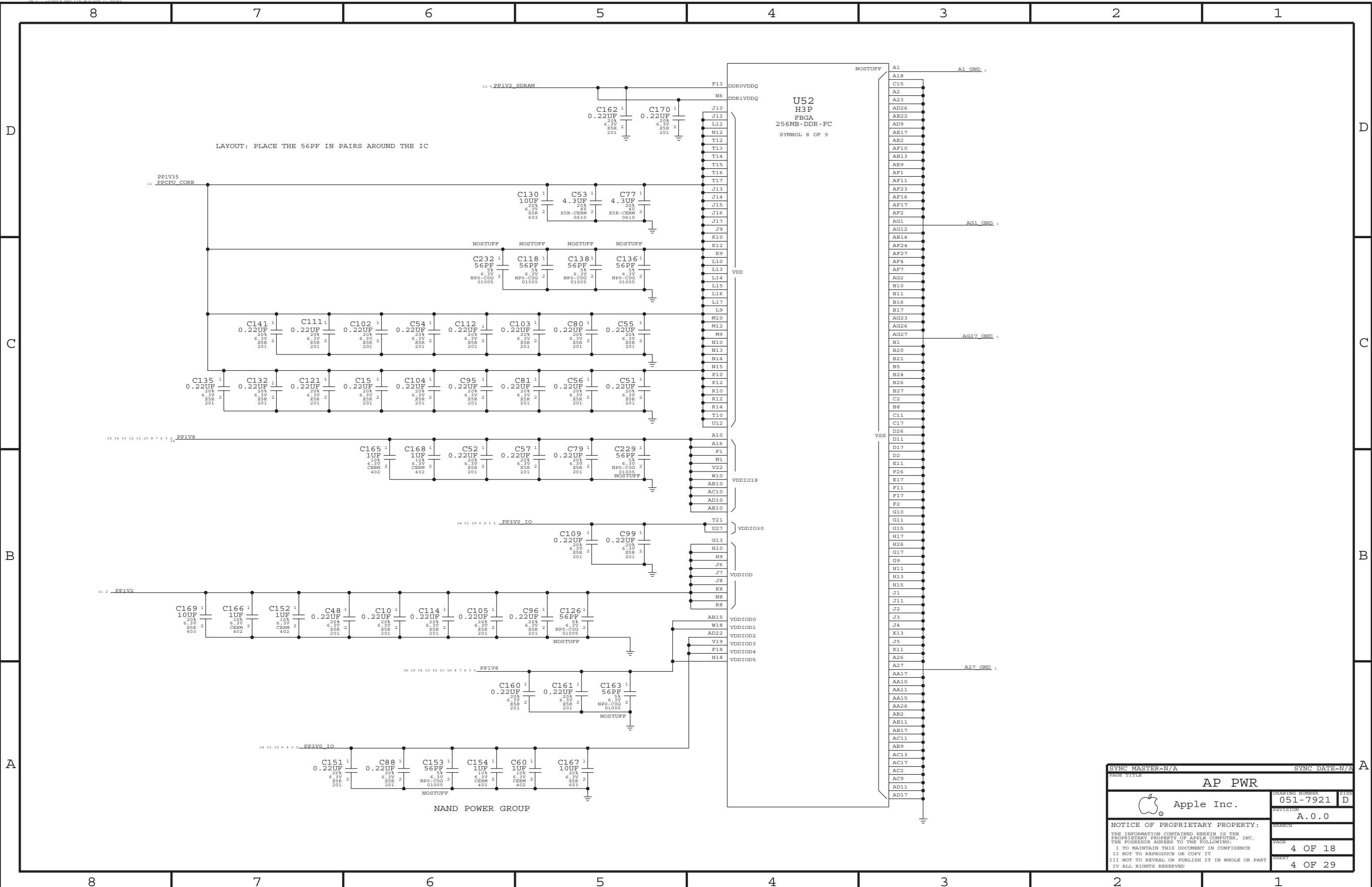
**H3 GPIO, UART, SPI, I2S, I2C, SDIO**

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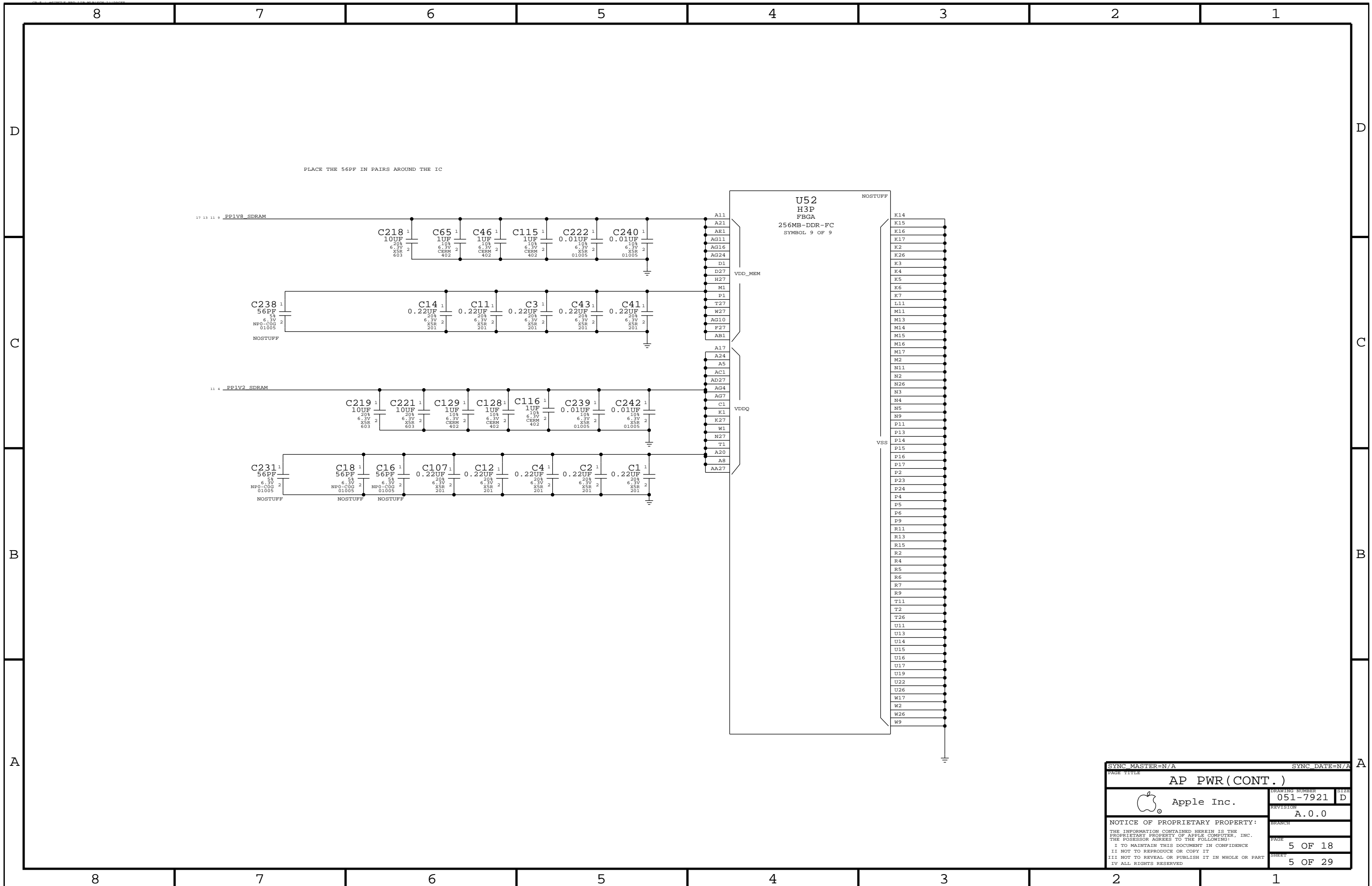
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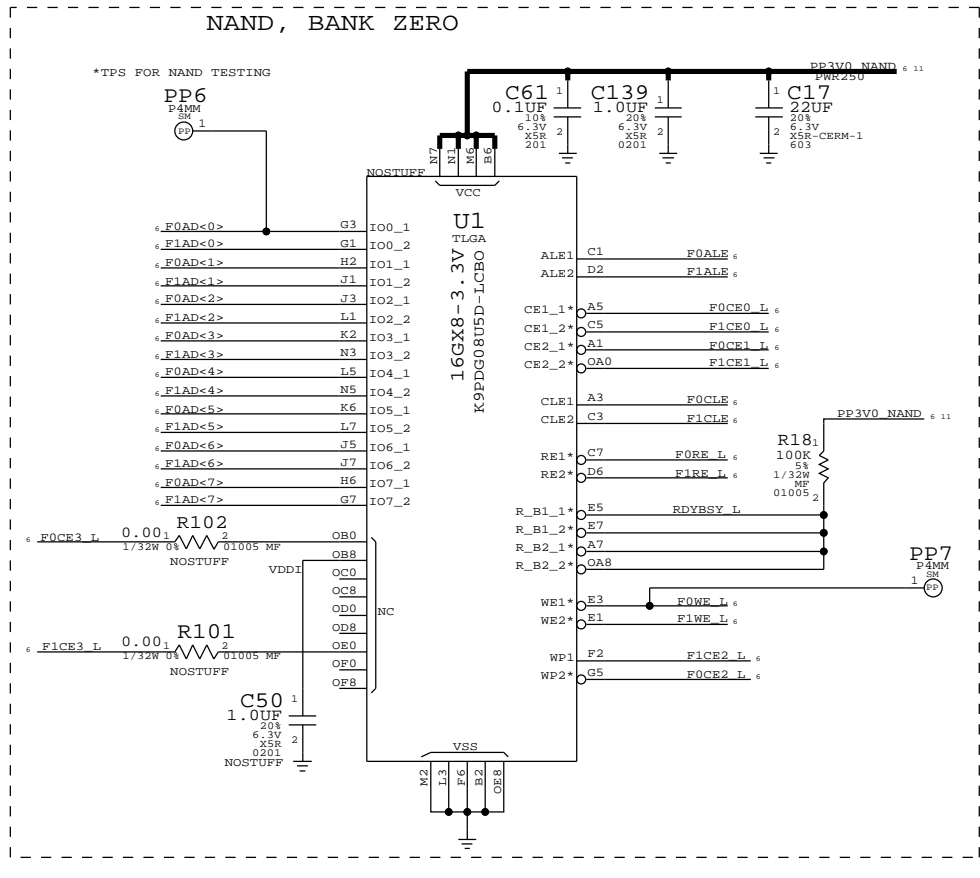
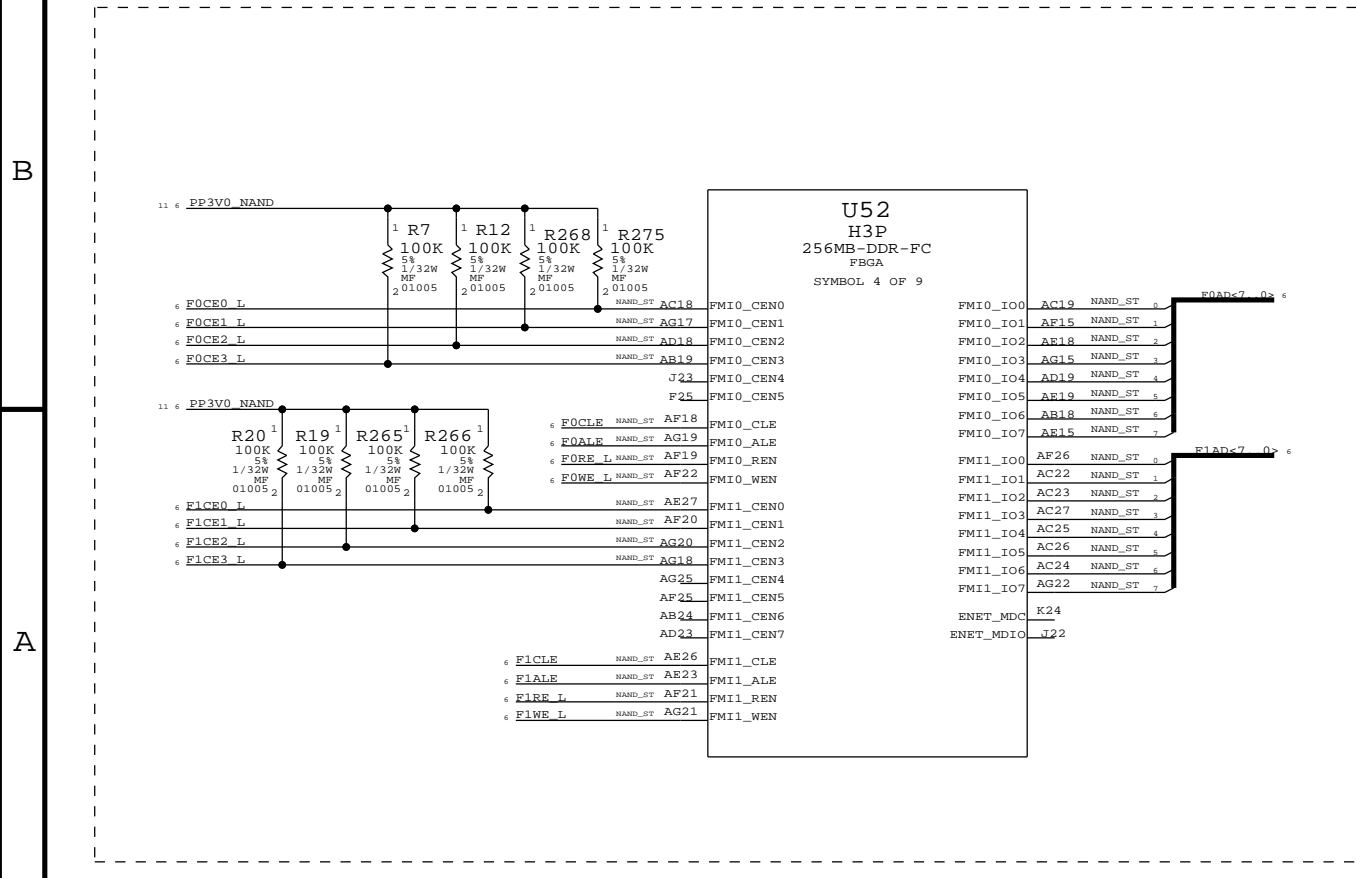
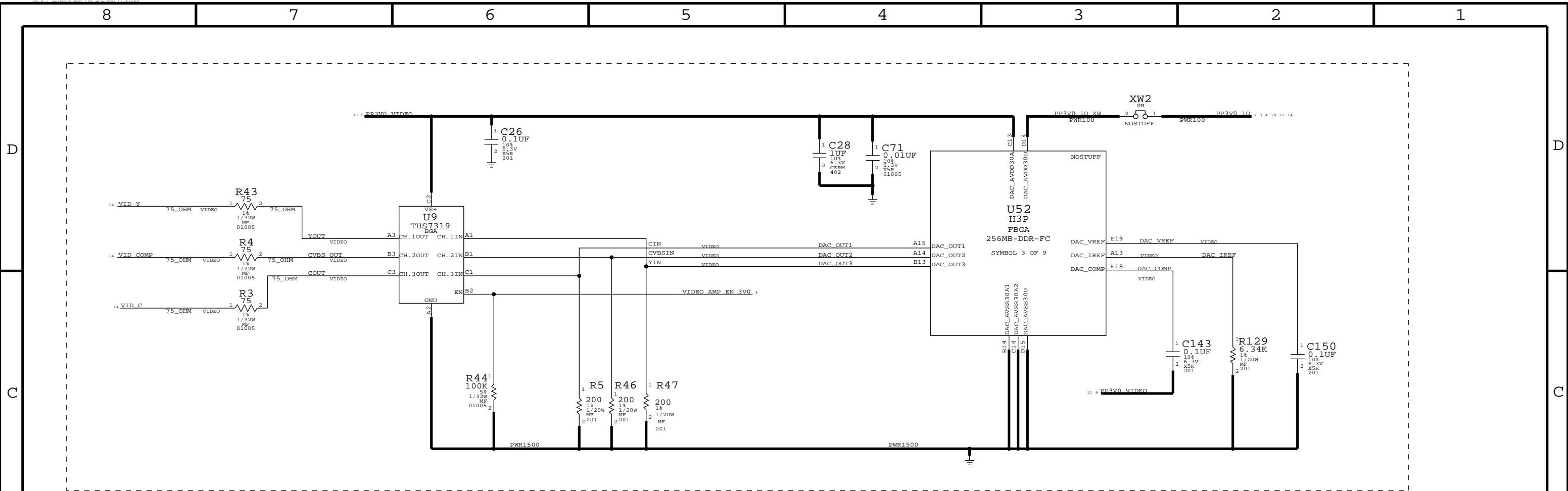


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ANALOG VIDEO,H3 NAND, NAND	
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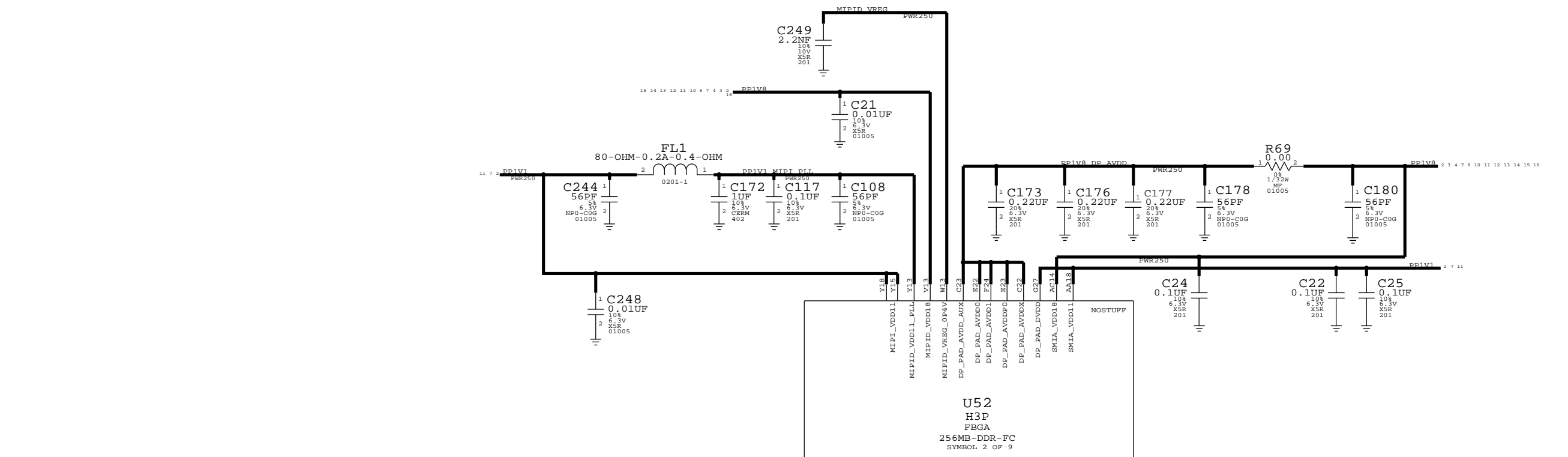
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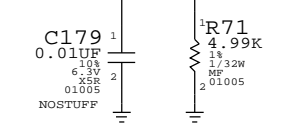
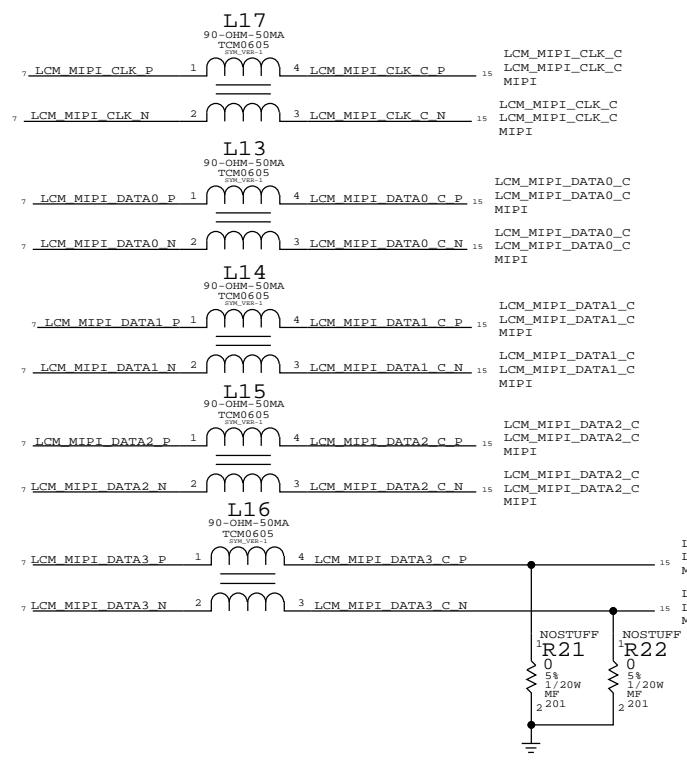
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A



NC	AG13	MIPI_VSYNC
7	LCM_MIPI_DATA0_P	AG3 MIPI_DPDATA0
7	LCM_MIPI_DATA0_N	AF3 MIPI_DNDATA0
7	LCM_MIPI_DATA1_P	AE6 MIPI_DPDATA1
7	LCM_MIPI_DATA1_N	AE5 MIPI_DNDATA1
7	LCM_MIPI_DATA2_P	AG6 MIPI_DPDATA2
7	LCM_MIPI_DATA2_N	AF6 MIPI_DNDATA2
7	LCM_MIPI_DATA3_P	AF8 MIPI_DPDATA3
7	LCM_MIPI_DATA3_N	AG8 MIPI_DNDATA3
7	LCM_MIPI_CLK_P	AF5 MIPI_DPCLK
7	LCM_MIPI_CLK_N	AG5 MIPI_DNCLK
16	CAM_MIPI_DATA0_P	AG9 MIPI_DPDATA0
16	CAM_MIPI_DATA0_N	AF9 MIPI_DNDATA0
16	CAM_MIPI_DATA1_P	AF13 MIPI_DPDATA1
16	CAM_MIPI_DATA1_N	AF12 MIPI_DNDATA1
16	CAM_MIPI_CLK_P	AE13 MIPI_DPCLK
16	CAM_MIPI_CLK_N	AE14 MIPI_DNCLK

SWI_DATA	AA19	SWI_BLCCTRL	11
DP_HPD	R19	DP_HPD	14
DP_PAD_AUXP	E27	DP_AUX_P	14
DP_PAD_AUXN	E26	DP_AUX_N	14
DP_PAD_DC_TP	A22 NC		
DP_PAD_R_BIAS	E25		
DP_PAD_TX0+	C27	DP_DATA0_P	14
DP_PAD_TX0-	C26	DP_DATA0_N	14
DP_PAD_TX1+	A25	DP_DATA1_P	14
DP_PAD_TX1-	B25	DP_DATA1_N	14
SMIA_RX_DATA+	AD14	SMIA_DATA_P	16
SMIA_RX_DATA-	AD13	SMIA_DATA_N	16
SMIA_RX_CLK+	AF14	SMIA_CLK_P	16
SMIA_RX_CLK-	AG14	SMIA_CLK_N	16



SYNC MASTER=N/A SYNC DATE=N/A

**H3 MIPI, DPORT, SMIA**

Apple Inc.

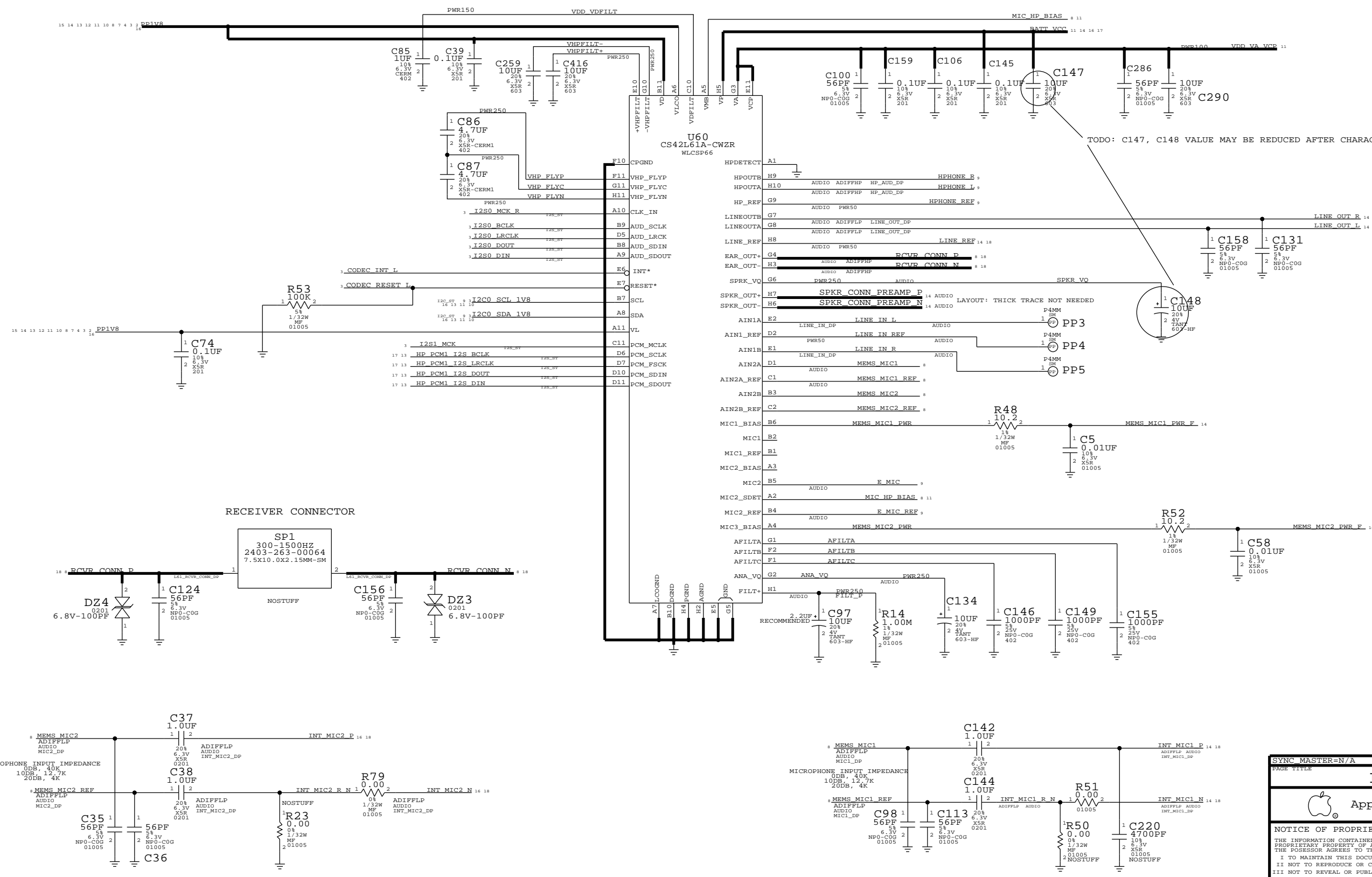
DRAWING NUMBER: 051-7921  
REVISION: A.0.0

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PAGE: 7 OF 18  
SHEET: 7 OF 29

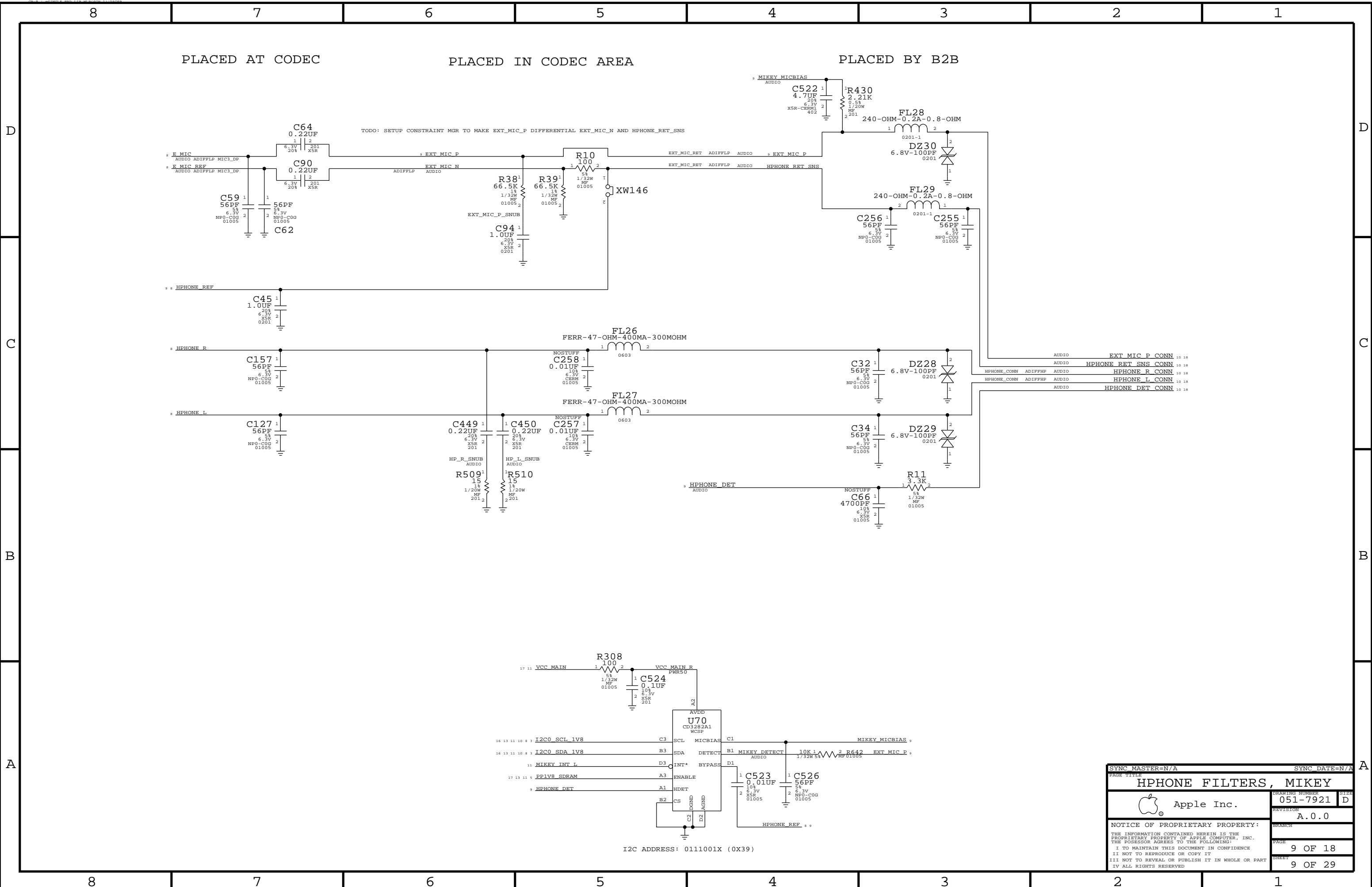
# L61 AUDIO INTERFACE

I2C ADDRESS: 1001010X



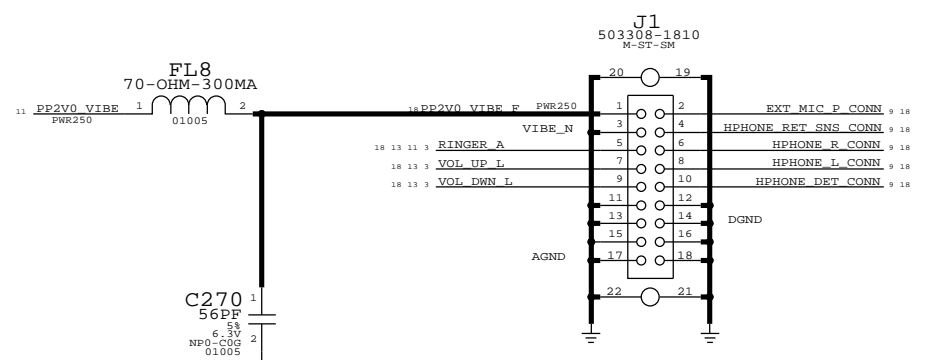
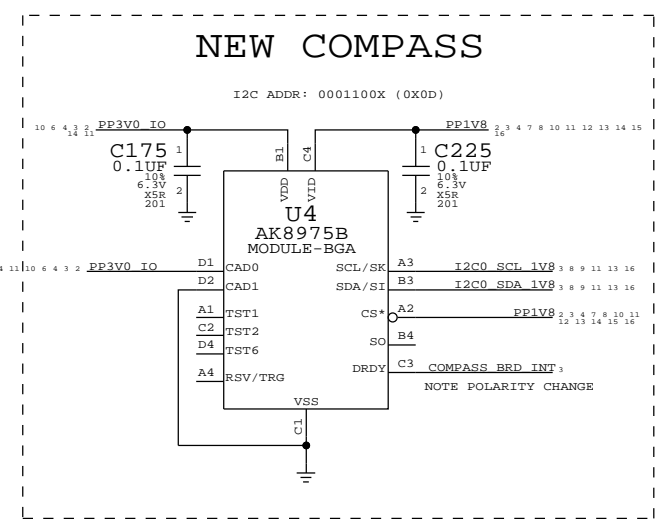
TODO: C147, C148 VALUE MAY BE REDUCED AFTER CHARACTERIZATION

SYNC MASTER=N/A		SYNC DATE=N/A	
<b>L61 CODEC</b>			
Apple Inc.		DRAWING NUMBER	051-7921
		REVISION	A.0.0
		PAGE	8 OF 18
		SHEET	8 OF 29
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SYNC MASTER=N/A		SYNC DATE=N/A	
<b>HPHONE FILTERS, MIKEY</b>			
DRAWING NUMBER		051-7921	SIZE
REVISION		A.0.0	D
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PAGE		9 OF 18	
SHEET		9 OF 29	

8 7 6 5 4 3 2 1



BUTTON FLEX CONNECTOR

D  
C  
B  
A

D  
C  
B  
A

SYNC MASTER=N/A		SYNC DATE=N/A	
PAGE TITLE <b>BUTTON B2B, COMPASS</b>			
DRAWING NUMBER <b>051-7921</b>		SIZE <b>D</b>	
REVISION <b>A.0.0</b>		BRANCH	
NOTICE OF PROPRIETARY PROPERTY: THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE COMPUTER, INC. THE POSSESSOR AGREES TO THE FOLLOWING: I TO MAINTAIN THIS DOCUMENT IN CONFIDENCE II NOT TO REPRODUCE OR COPY IT III NOT TO REVEAL OR PUBLISH IT IN WHOLE OR PART IV ALL RIGHTS RESERVED			
PAGE <b>10 OF 18</b>		SHEET <b>10 OF 29</b>	

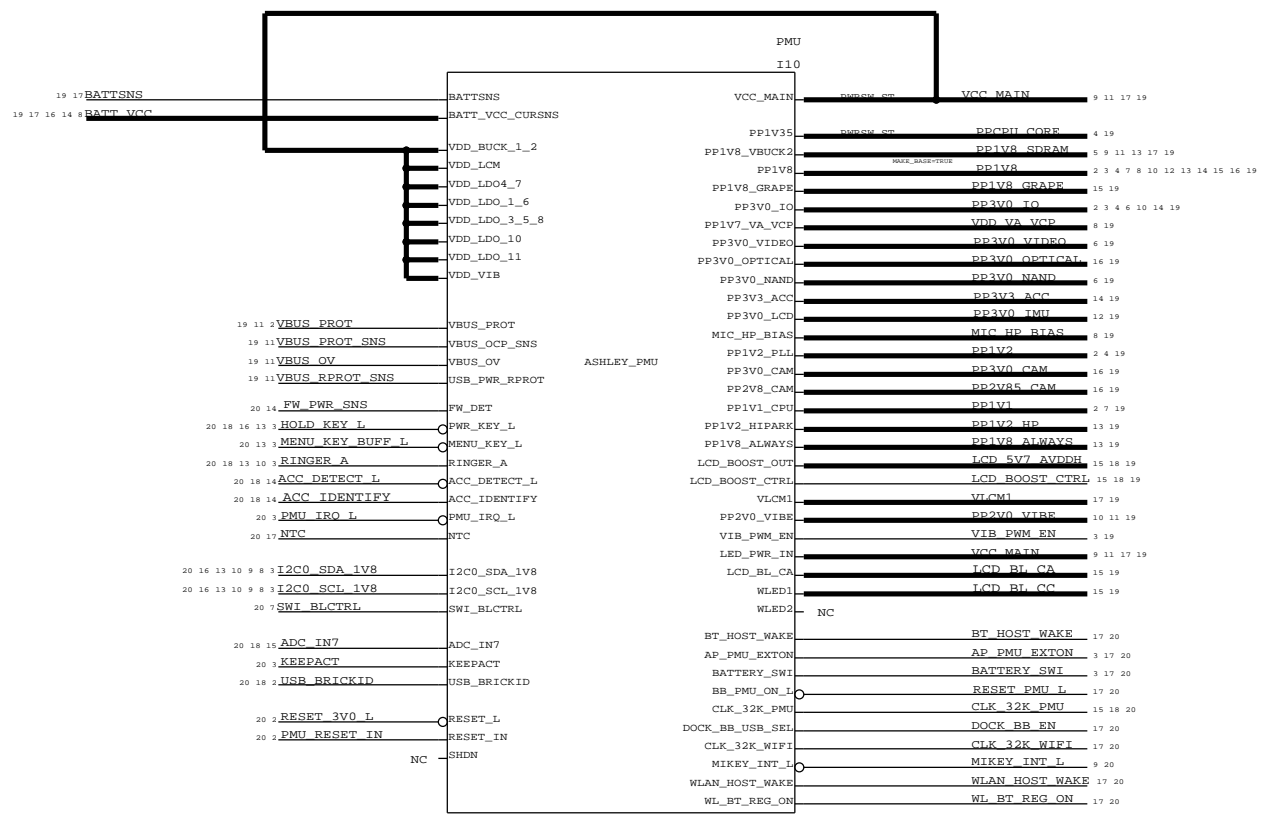
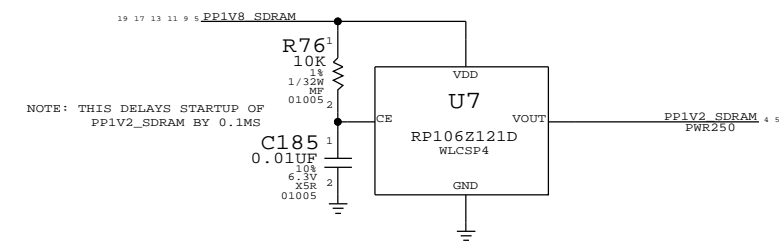
8 7 6 5 4 3 2 1

D

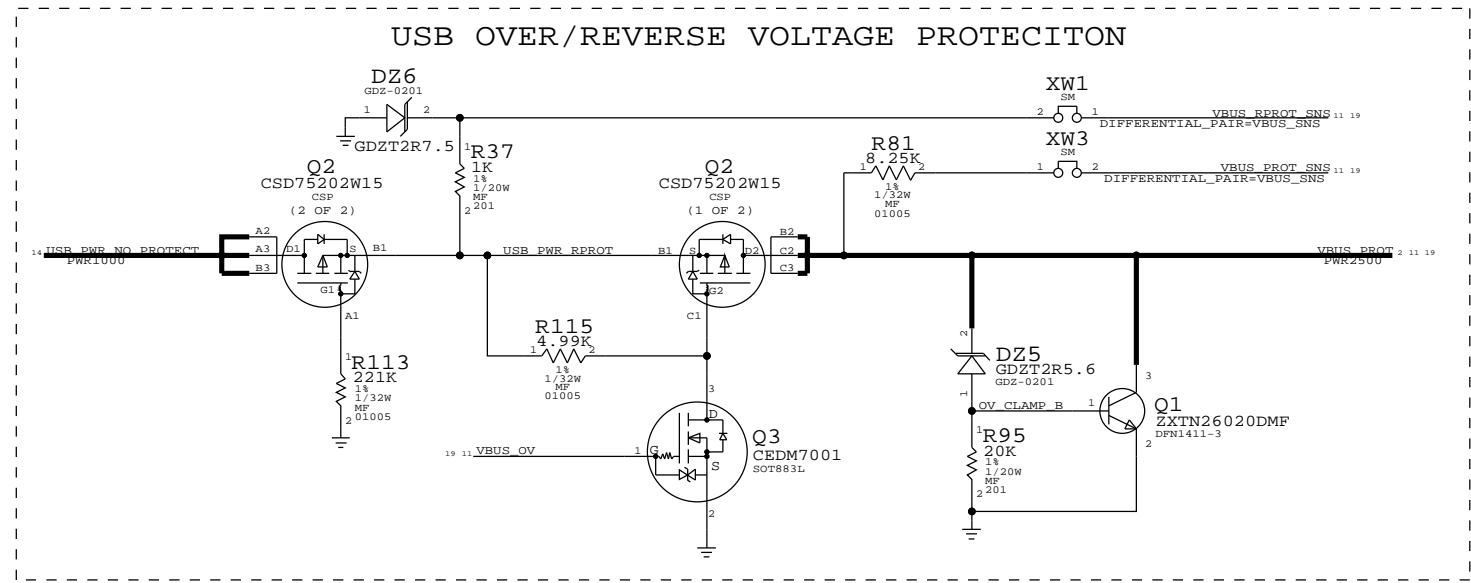
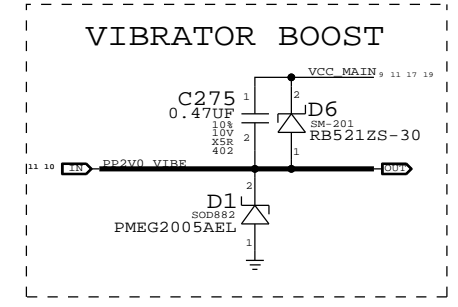
C

B

A



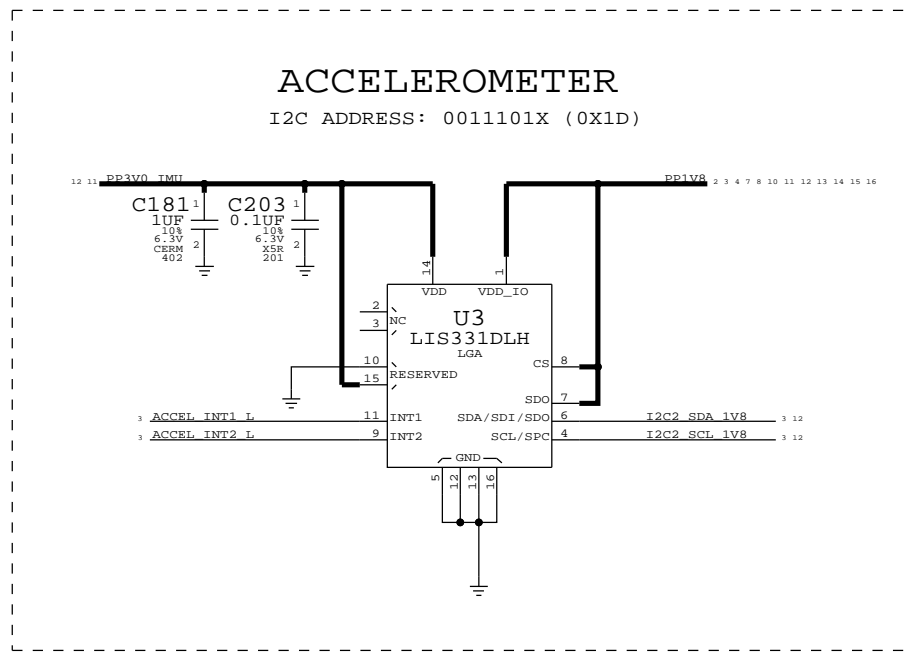
LOCATED ON PP 19 - 20



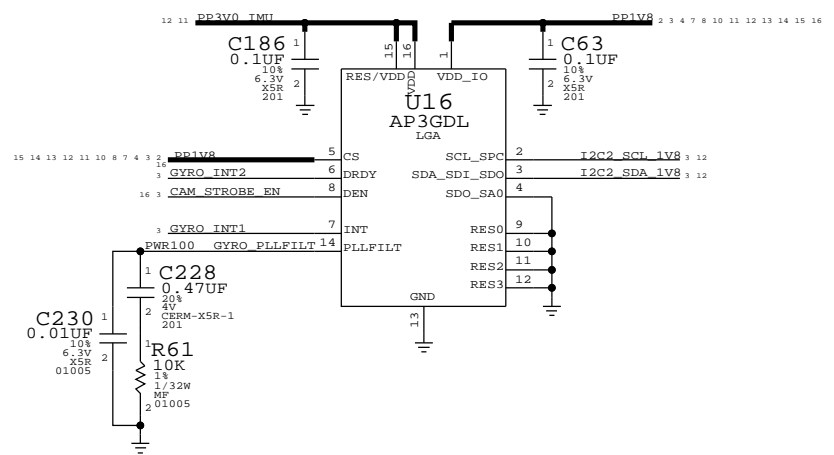
SYNC MASTER=N/A		SYNC DATE=N/A	
PAGE TITLE			
<b>ASHLEY PMU</b>			
Apple Inc.		DRAWING NUMBER	SIZE
Apple Inc.		051-7921	D
REVISION		A.0.0	
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PAGE	11 OF 18		
SHEET	11 OF 29		

### ACCELEROMETER

I2C ADDRESS: 0011101X (0X1D)



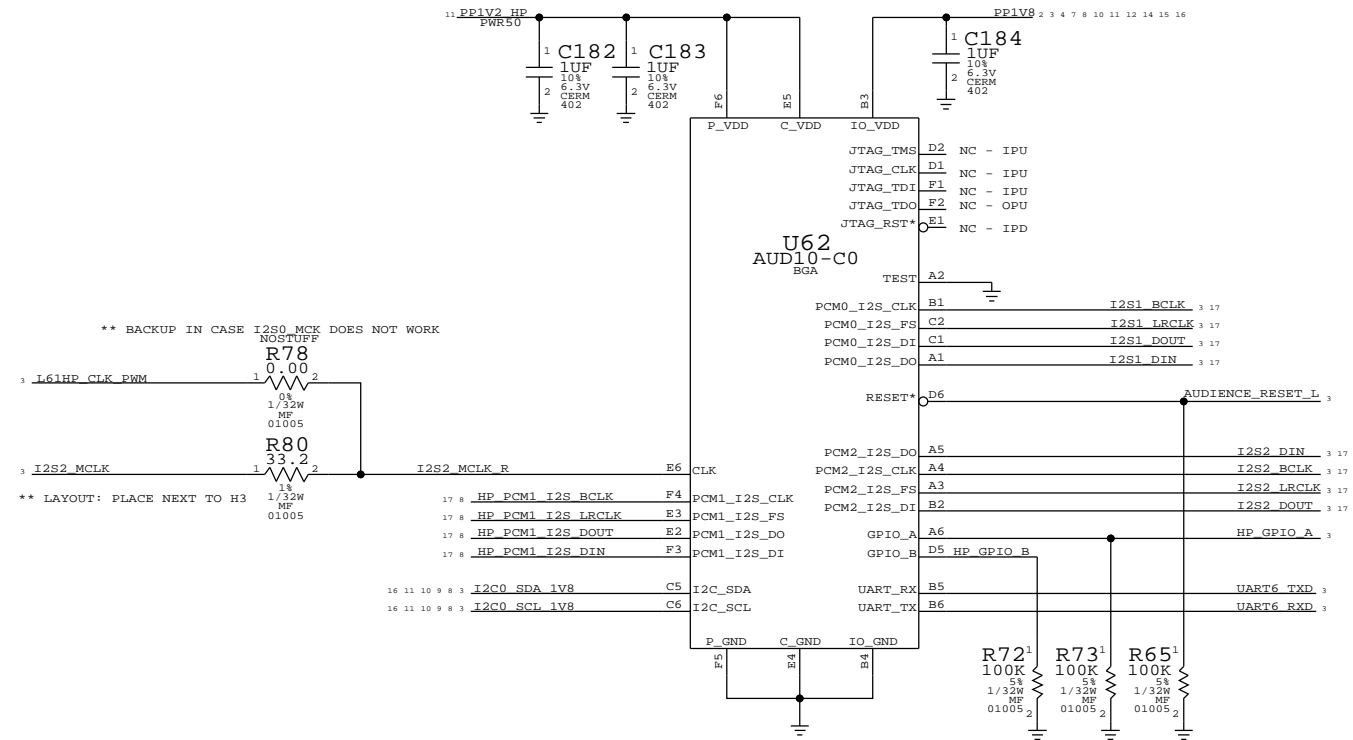
### GYRO



SYNC MASTER=N/A		SYNC DATE=N/A	
ACCEL, GYRO			
Apple Inc.		DRAWING NUMBER	SIZE
		051-7921	D
		REVISION	
		A.0.0	
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		PAGE	12 OF 18
		SHEET	12 OF 29

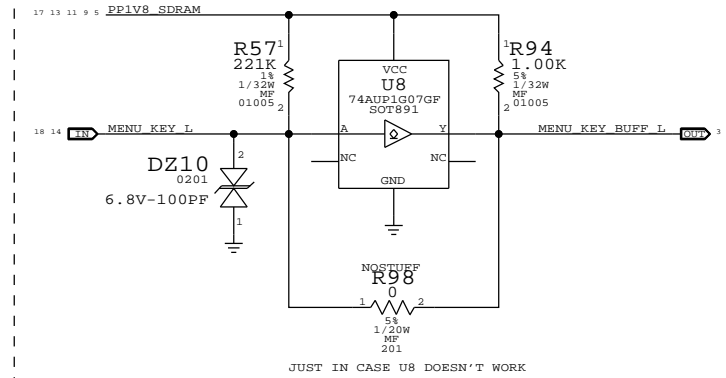
# HIGHLAND PARK

I2C ADDRESS: 0111110X (0X3E)

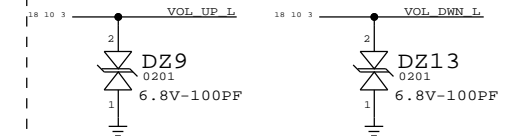


## MENU KEY PU, ESD AND BUFFER

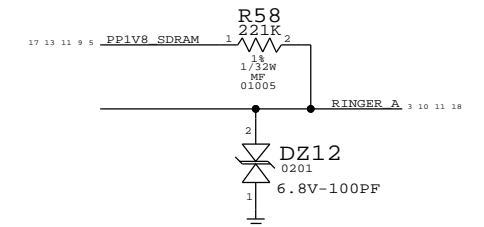
BUFFER IS NEEDED BECAUSE OF IT'S LOW V<sub>IH</sub> AND LEAKAGE  
IT MUST BE OPEN DRAIN SO THAT WHEN PPIV8\_SDRAM IS DOWN,  
MENU\_KEY\_BUFF\_L IS PULLED LOW THROUGH R94 AND INTERNAL  
PULLDOWN IN ASHLEY.



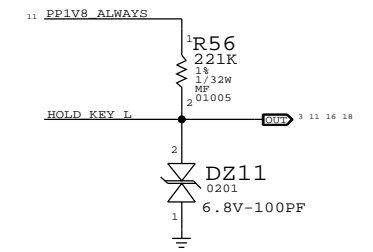
## VOLUME SWITCH ESD



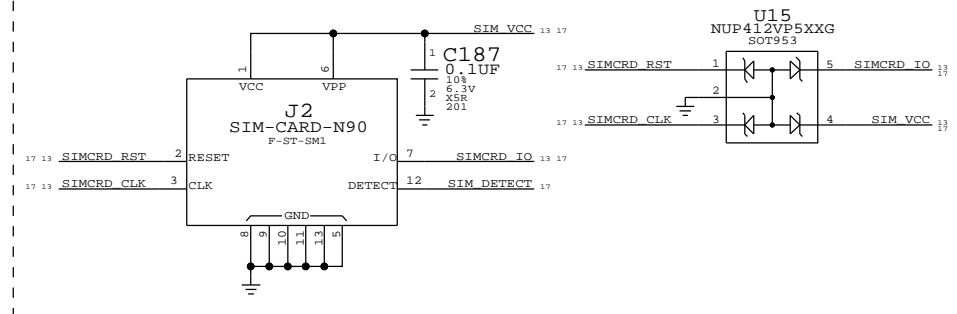
## RINGER A/B SWITCH PU AND ESD



## POWER/HOLD KEY PU AND ESD



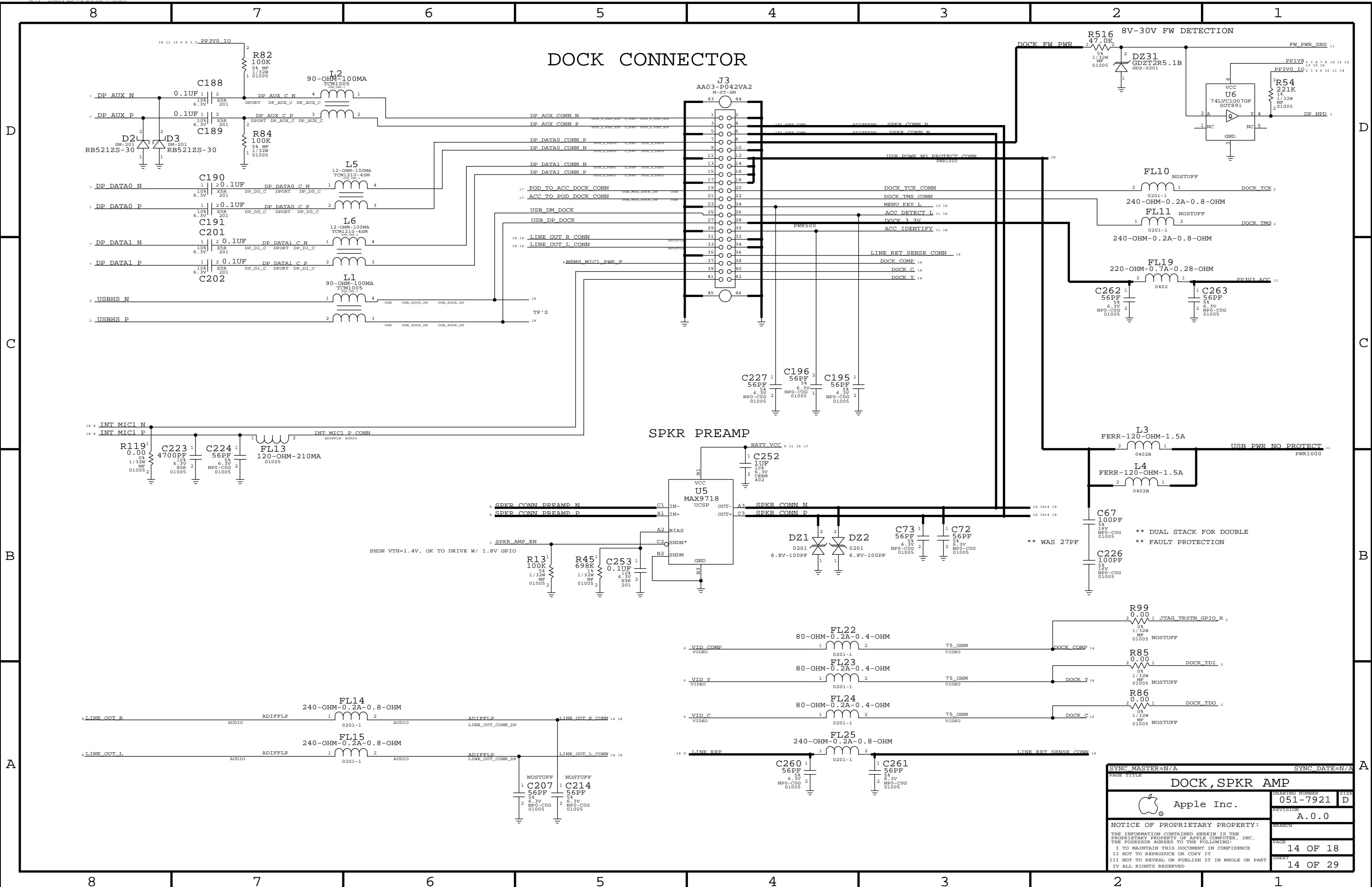
## SIM CARD SLOT AND ESD



SYNC MASTER=N/A	SYNC DATE=N/A
HPARK, SWITCH ESD, SIM CARD	
Apple Inc.	DRAWING NUMBER: 051-7921
	REVISION: A.0.0
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# DOCK CONNECTOR

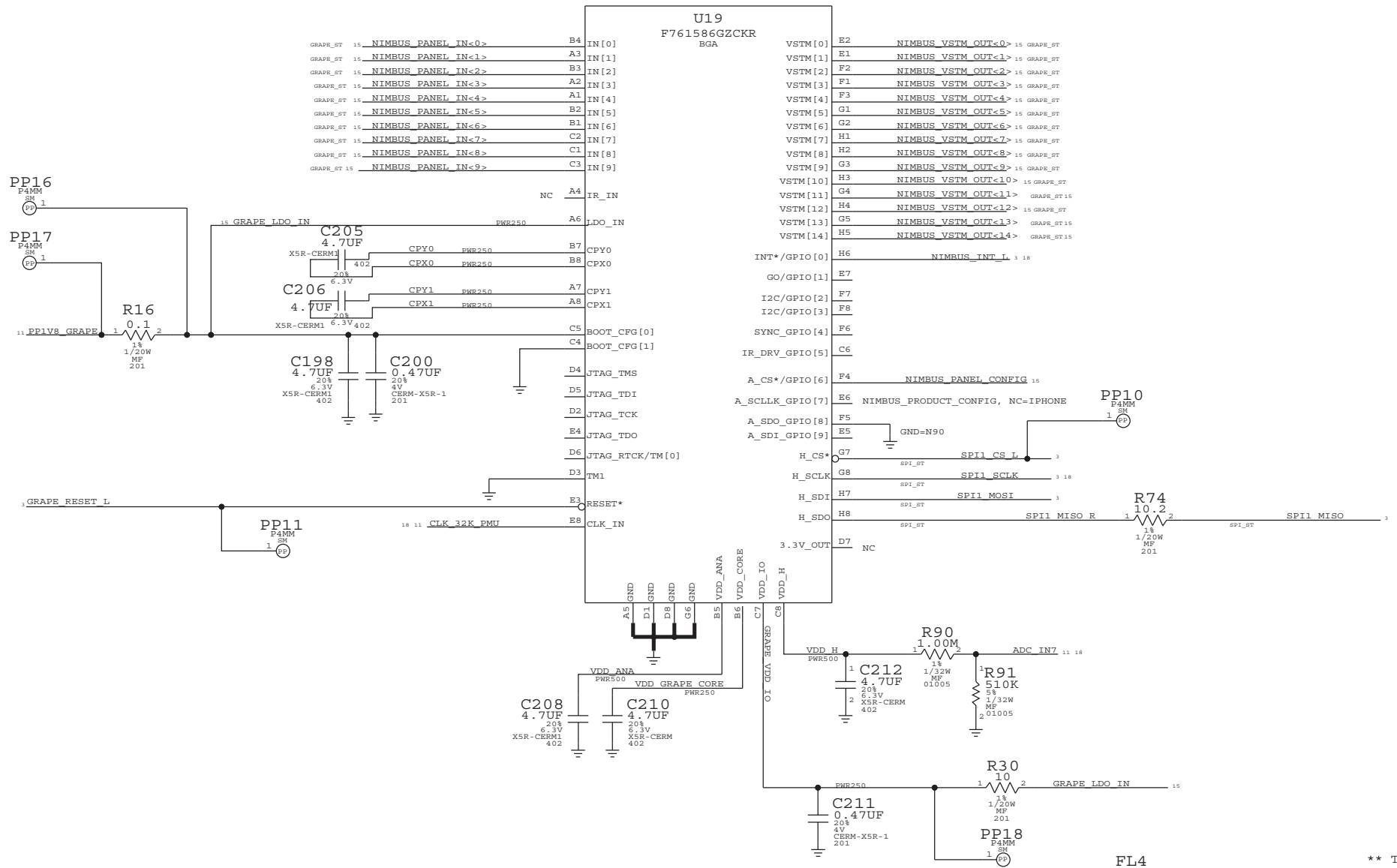
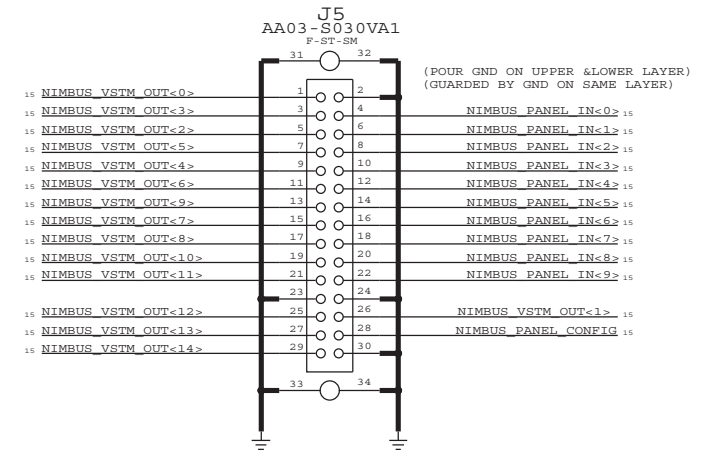


PAGE TITLE		SYNC DATE=N/A	
<b>DOCK, SPKR AMP</b>			
Apple Inc.		DRAWING NUMBER	051-7921
		REVISION	A.0.0
		PAGE	14 OF 18
		SHEET	14 OF 29

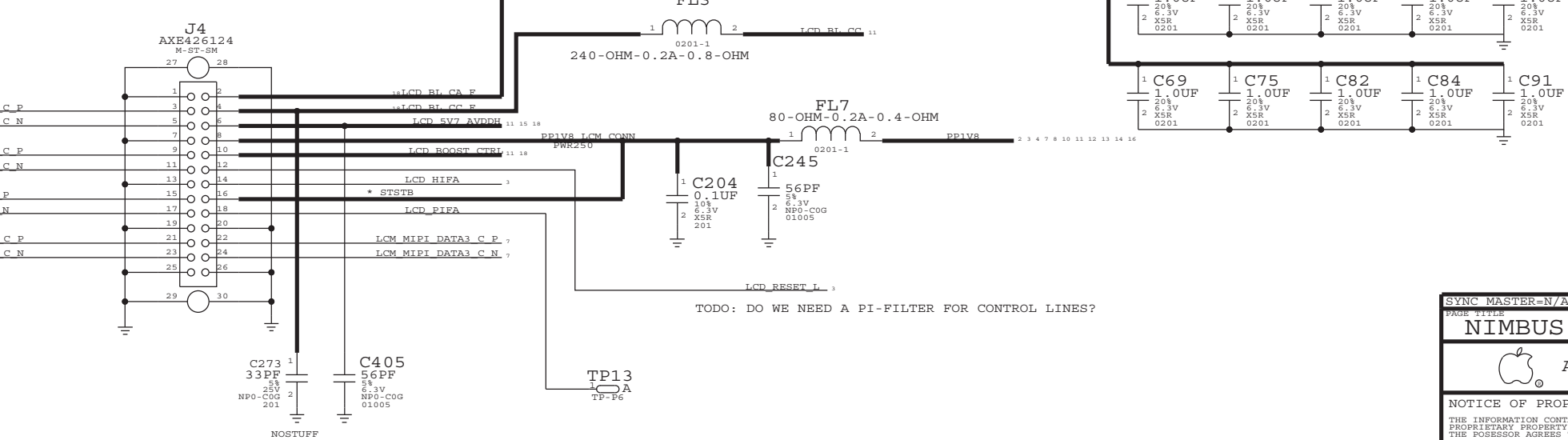
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# NIMBUS

## GRAPE CONNECTOR N90 NIMBUS CONNECTOR



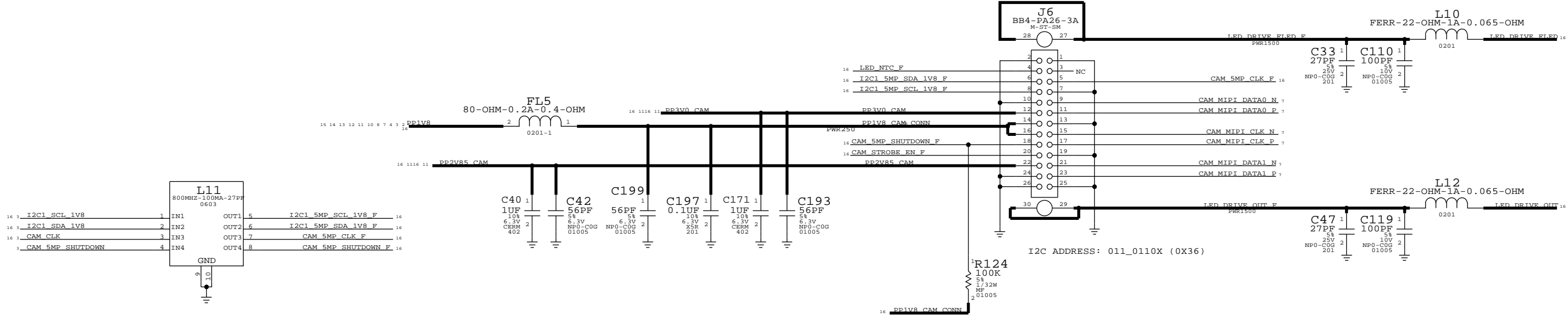
## N90 LCD CONNECTOR



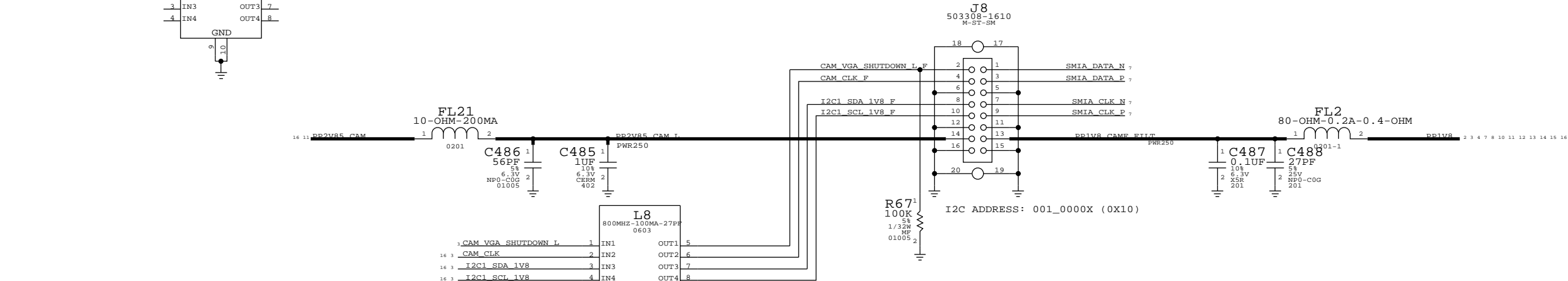
\*\* THESE 10 CAPS ARE TO REPLACE 1 4.7 UF CAP IN ORDER TO REDUCE HEIGHT IN THE FORHEAD AREA

PAGE TITLE		DRAWING NUMBER		SIZE
NIMBUS, GRAPE, LCD CONN.		051-7921		D
REVISION		A.0.0		
NOTICE OF PROPRIETARY PROPERTY:		PAGE		15 OF 18
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# 5MP CAMERA CONNECTOR

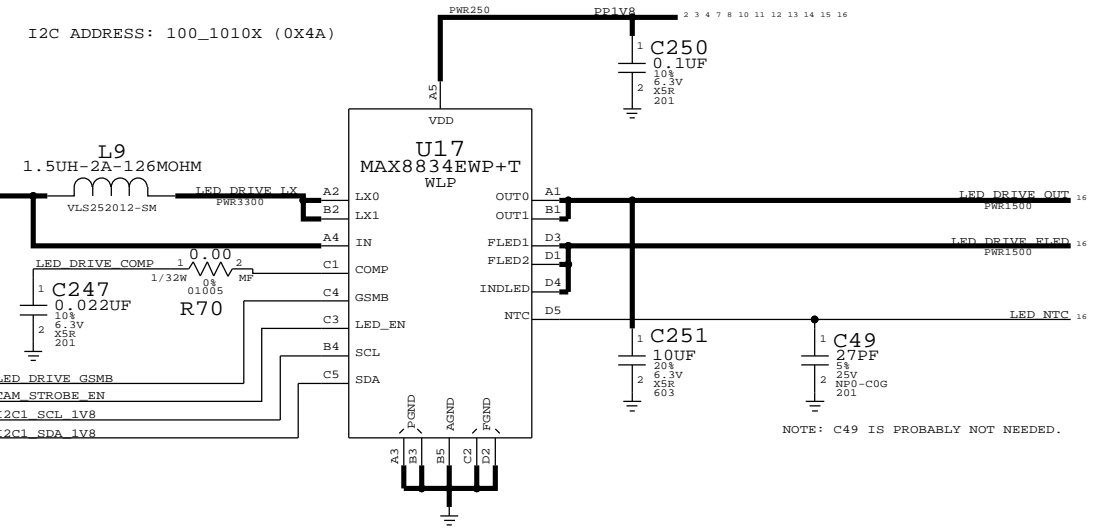


# VGA CAMERA CONN



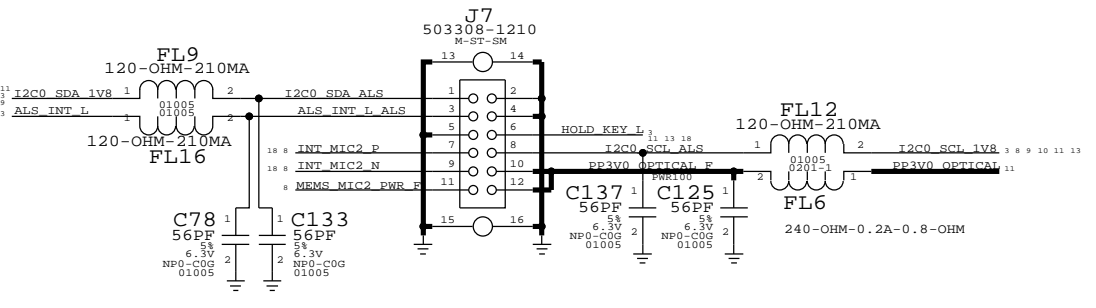
# LED DRIVER

\* PLACE CLOSE TO BATTERY \*

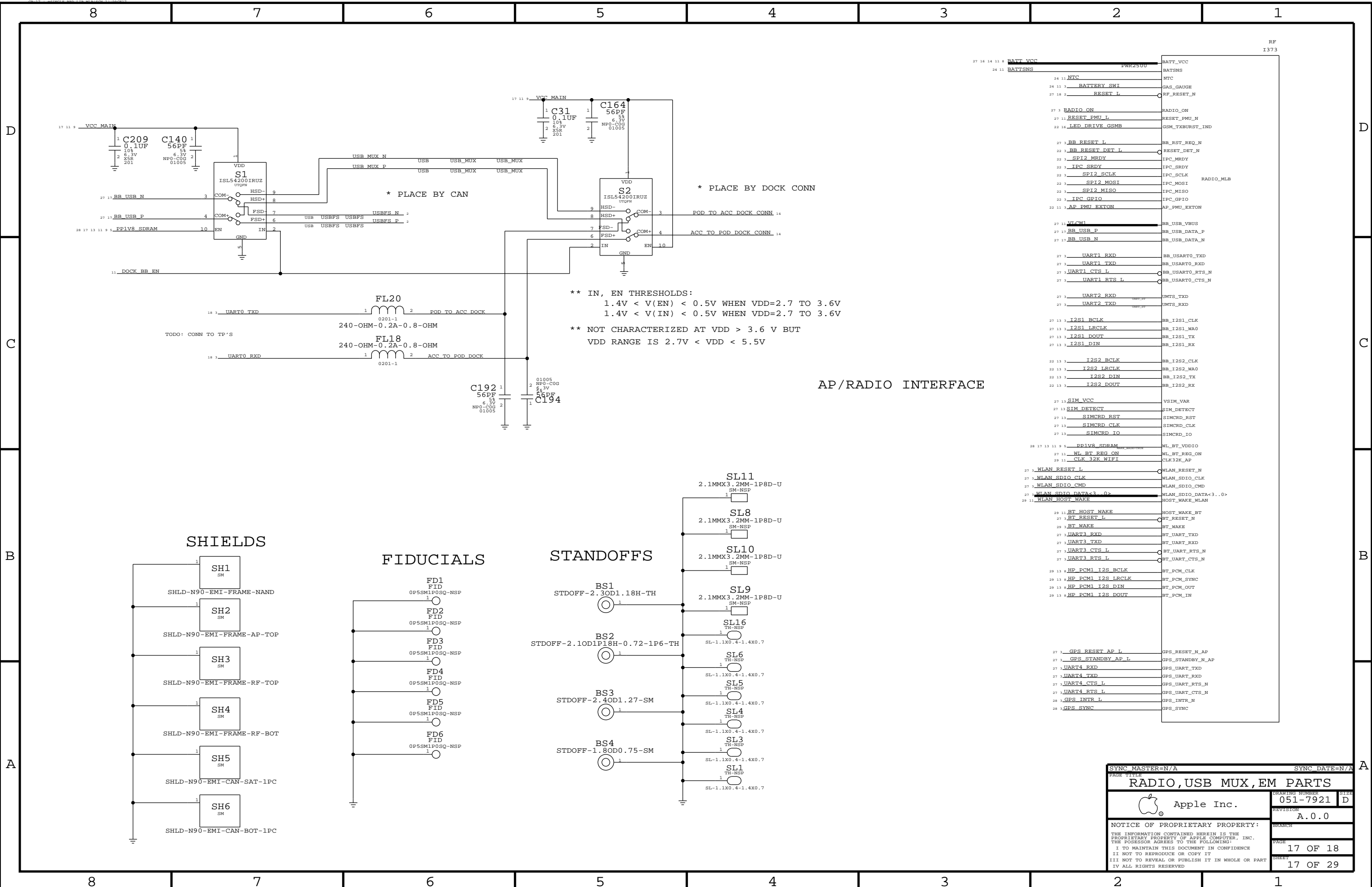


# ALS/PROX

I2C ADDRESS: 011\_1001X (0X39)



SYNC MASTER=N/A		SYNC DATE=N/A	
<b>CAMERA, STROBE, SENSOR B2B</b>			
Apple Inc.		DRAWING NUMBER	051-7921
		REVISION	A.0.0
		PAGE	16 OF 18
		SHEET	16 OF 29
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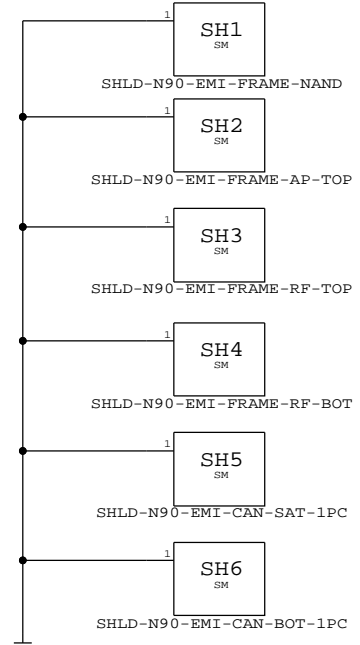
**\*\* IN, EN THRESHOLDS:**  
 1.4V < V(EN) < 0.5V WHEN VDD=2.7 TO 3.6V  
 1.4V < V(IN) < 0.5V WHEN VDD=2.7 TO 3.6V

**\*\* NOT CHARACTERIZED AT VDD > 3.6 V BUT  
 VDD RANGE IS 2.7V < VDD < 5.5V**

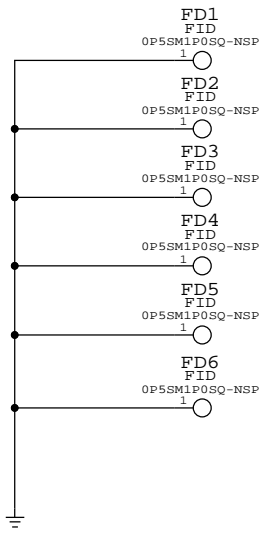
**AP/RADIO INTERFACE**

RF I373	
27 14 11 8	BATT_VCC
24 11	BATTSENS
24 11	NTC
24 11 3	BATTERY SWI
27 18 2	RESET L
27 3	RADIO_ON
27 11	RESET_PMU_L
22 16	LED_DRIVE_GSM
27 3	BB_RESET_L
22 3	BB_RESET_DET_L
22 3	SPI2_MRDY
22 3	SPI2_SRDY
22 3	SPI2_SCLK
22 3	SPI2_MOSI
22 3	SPI2_MISO
22 3	IPC_GPIO
22 11	AP_PMU_EXTON
27 11	WFCM1
27 17	BB_USB_P
27 17	BB_USB_N
27 3	UART1_RXD
27 3	UART1_TXD
27 3	UART1_CTS_L
27 3	UART1_RTS_L
27 3	UART2_RXD
27 3	UART2_TXD
27 13 3	I2S1_BCLK
27 13 3	I2S1_LRCLK
27 13 3	I2S1_DOUT
27 13 3	I2S1_DIN
22 13 3	I2S2_BCLK
22 13 3	I2S2_LRCLK
22 13 3	I2S2_DIN
22 13 3	I2S2_DOUT
27 13	SIM_VCC
27 13	SIM_DETECT
27 13	SIMCRD_RST
27 13	SIMCRD_CLK
27 13	SIMCRD_IO
28 17 13 11 9 5	PP1V8_SDRAM
27 11	WL_BT_REG_ON
29 11	CLK_32K_WIFI
27 3	WLAN_RESET_L
27 3	WLAN_SDIO_CLK
27 3	WLAN_SDIO_CMD
27 3	WLAN_SDIO_DATA<3..0>
29 11	WLAN_HOST_WAKE
29 11	BT_HOST_WAKE
27 3	BT_RESET_L
29 11	BT_WAKE
27 3	UART3_RXD
27 3	UART3_TXD
27 3	UART3_CTS_L
27 3	UART3_RTS_L
29 13 8	HP_PCM1_I2S_BCLK
29 13 8	HP_PCM1_I2S_LRCLK
29 13 8	HP_PCM1_I2S_DIN
29 13 8	HP_PCM1_I2S_DOUT
27 3	GPS_RESET_AP_L
27 3	GPS_STANDBY_AP_L
27 3	UART4_RXD
27 3	UART4_TXD
27 3	UART4_CTS_L
27 3	UART4_RTS_L
28 3	GPS_INTR_N
28 3	GPS_SYNC
27 3	GPS_RESET_N_AP
27 3	GPS_STANDBY_N_AP
27 3	GPS_UART_TXD
27 3	GPS_UART_RXD
27 3	GPS_UART_RTS_N
27 3	GPS_UART_CTS_N
27 3	GPS_INTR_N
27 3	GPS_SYNC

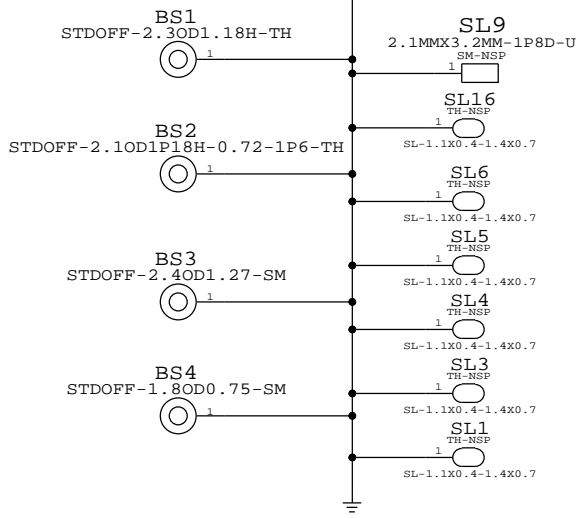
**SHIELDS**



**FIDUCIALS**

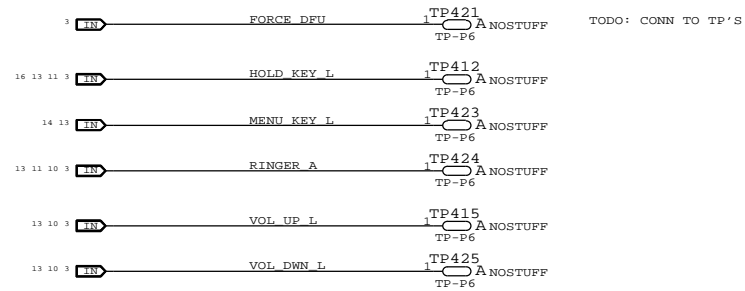


**STANDOFFS**



SYNC MASTER=N/A		SYNC DATE=N/A	
DRAWING TITLE			
<b>RADIO, USB MUX, EM PARTS</b>			
Apple Inc.		DRAWING NUMBER	SIZE
051-7921		051-7921	D
REVISION		A.0.0	
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17 OF 18		17 OF 29	

### GPIO

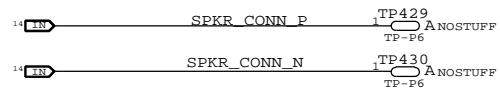


### TEST

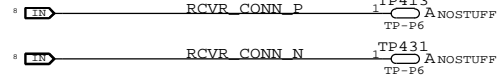


### AUDIO

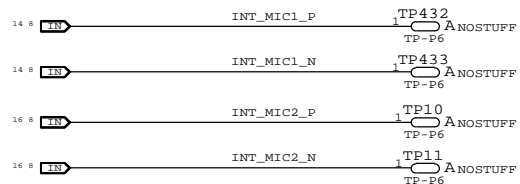
#### SPEAKER



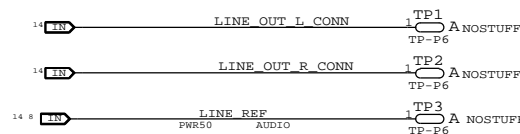
#### RECEIVER



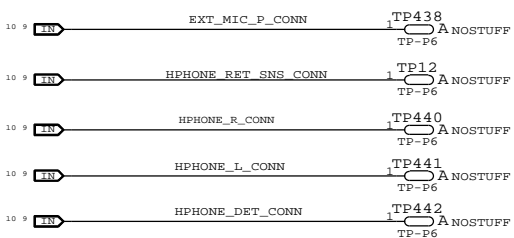
#### MIC



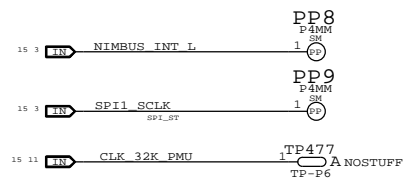
#### LINE OUT



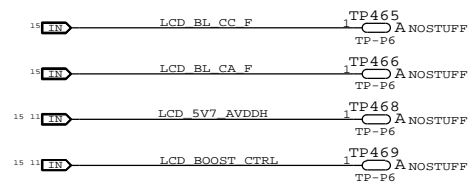
#### HEADPHONE



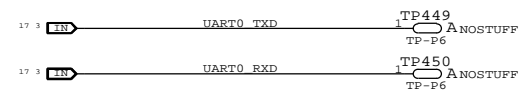
### GRAPE



### LCM



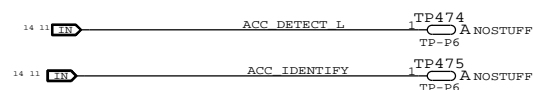
### UART



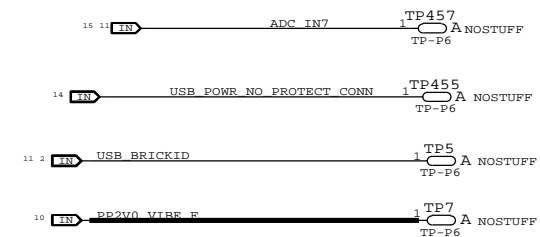
### USB



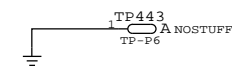
### ACCESSORY DETECT



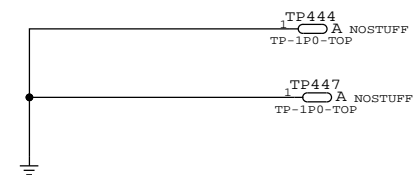
### POWER



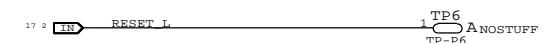
### SIGNAL GND (SENSE)



### POWER GND



### RESET



SYNC MASTER=N/A		SYNC DATE=N/A	
PAGE TITLE			
<b>TEST POINTS</b>			
Apple Inc.		DRAWING NUMBER	SIZE
		051-7921	D
		REVISION	
		A.0.0	
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SHEET	18 OF 29		

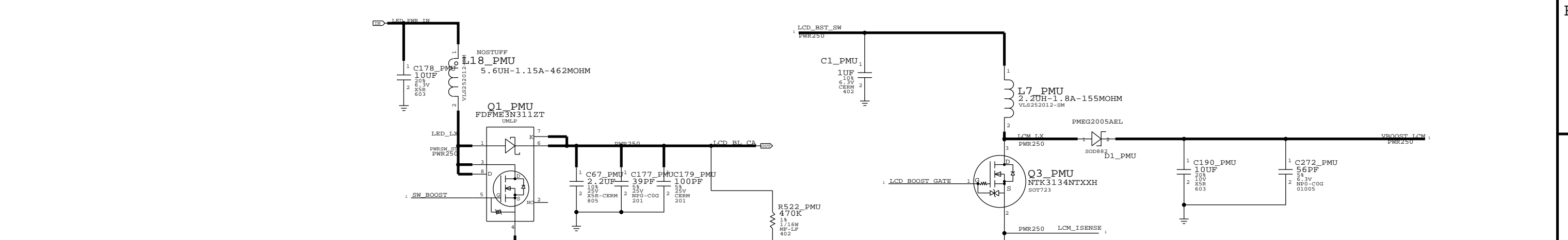
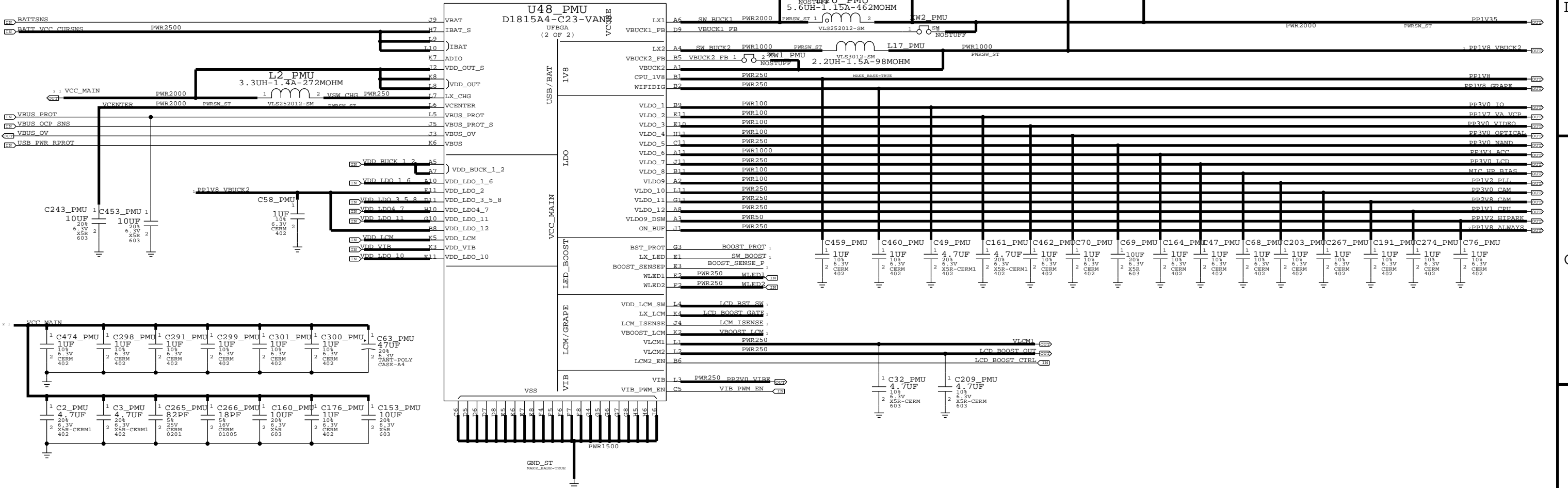
1. ALL RESISTANCE VALUES ARE IN OHMS, 0.1 WATT +/- 5%.
2. ALL CAPACITANCE VALUES ARE IN MICROFARADS.
3. ALL CRYSTALS & OSCILLATOR VALUES ARE IN HERTZ.

# N90 ASHLEY\_PMU SUB-DESIGN

Thu Mar 18 14:15:23 2010

REV	ECN	DESCRIPTION OF REVISION	CK APPD	DATE
A	0000880153	PRODUCTION RELEASED		2010-03-23

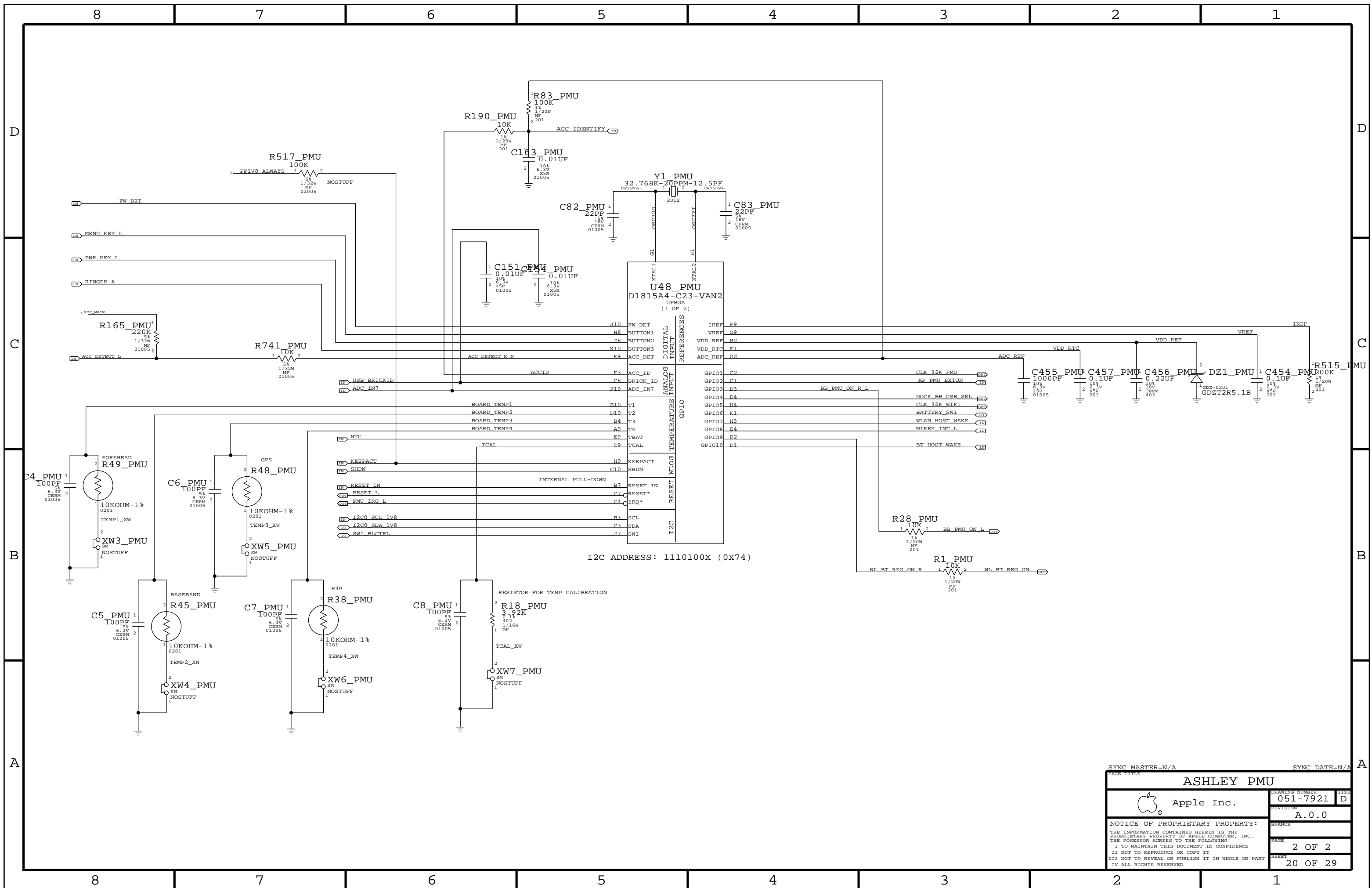
LAYOUT: PLACE XW1 AND XW2 REMOTELY BY AP



SCH # : 051-8351

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
607-6809	1	TDK POWER INDUCTORS	L1_PMU, L3_PMU, L6_PMU, L8_PMU	Y	?

SYNC MASTER=N/A		SYNC DATE=N/A	
DRAWING TITLE			
?			
Apple Inc.		DRAWING NUMBER	051-7921
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1. ALL RESISTANCE VALUES ARE IN OHMS, 0.1 WATT +/- 5%.  
 2. ALL CAPACITANCE VALUES ARE IN MICROFARADS.  
 3. ALL CRYSTALS & OSCILLATOR VALUES ARE IN HERTZ.


REV	ECN	DESCRIPTION OF REVISION	CK APPD DATE
A	0000880153	PRODUCTION RELEASED	2010-03-23

# N90 (ICE3) HSPA RADIO

## PVT - 04/15/10:BRD REV9

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05	GSM & UMTS TRANSCEIVER
06	POWER AMPS AND RF FRONT END
07	SYSTEM CONNECTORS
08	A-GPS
09	WLAN/BLEETOOTH RADIO

BOARD - 920-XXXX  
 SCHEMATIC - 951-XXXX  
 BOM - 630-XXXX

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# BASEBAND I/O

D

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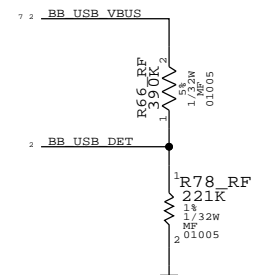
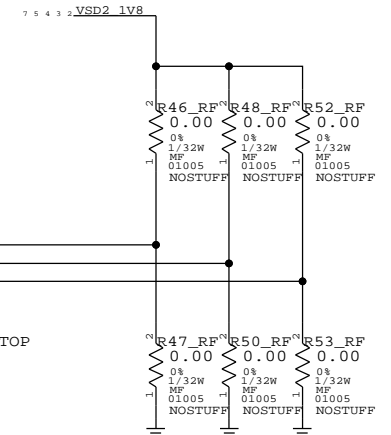
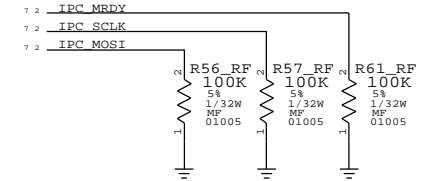
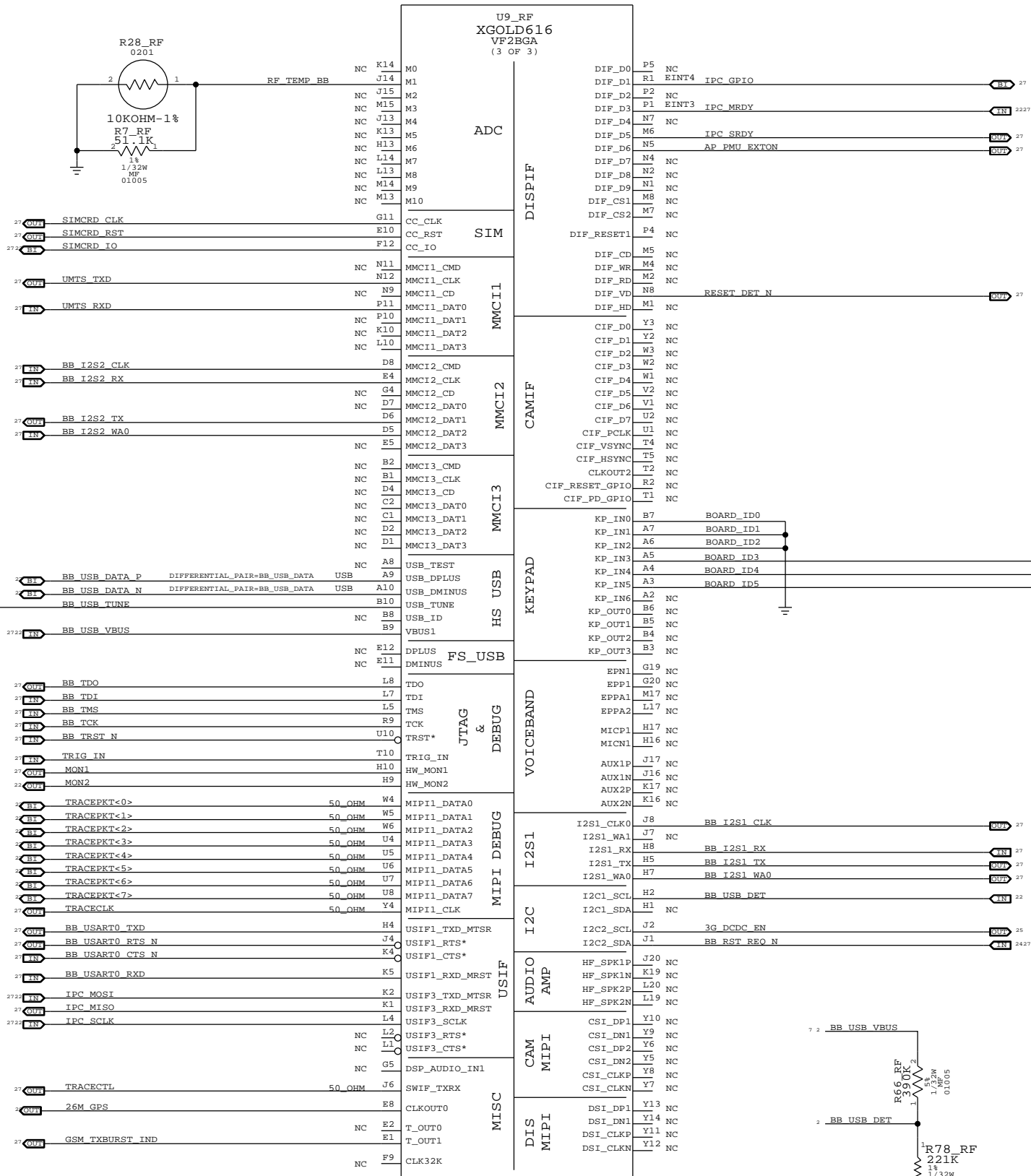
A

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WIFI MODULE VENDOR ID  
POPULATE R46/R47 AS BOM OPTION AT THE TOP

BOARD_ID3	VENDOR
NST	N/A
0	MURATA
1	USI

BOARD_ID5	FAMILY
NST	ICE3
0	ICE4
1	RESERVED

BOARD_ID4	PROJECT
NST	N90
0	RESERVED
1	RESERVED

BOARD_ID2	BOARD_ID1	BOARD_ID0	DEV
NST	NST	NST	DEV1
NST	NST	1	DEV2
NST	1	NST	DEV3
NST	1	1	DEV4
NST	NST	0	DEV5
NST	0	NST	DEV6
NST	0	0	DEV7
1	NST	NST	PROTO0
1	NST	1	PROTO1
1	1	NST	PROTO2
1	1	1	PROTO3
1	NST	0	EVT1
1	0	NST	EVT2
1	0	0	EVT3
0	NST	NST	DVT1
0	NST	1	DVT2
0	1	NST	DVT3
0	1	1	DVT4
0	0	0	PVT

## BOOT CONFIG DESCRIPTION

DSP\_AUDIO\_IN1, MON1 AND MON2 ARE ONLY ON TP AVAILABLE

DSP_AUDIO_IN1 HWCFG[3]	MON1 HWCFG[2]	MON2 HWCFG[1]	TRIG_IN HWCFG[0]	BOOT CONFIG DESCRIPTION
0	0	0	0	EXTERNAL BOOT VIA USB
0	0	0	1	NOR FLASH - EBU CONFIG: 16-BIT AD MUXED
0	0	1	0	NOR FLASH - EBU CONFIG: 16-BIT AAD MUXED

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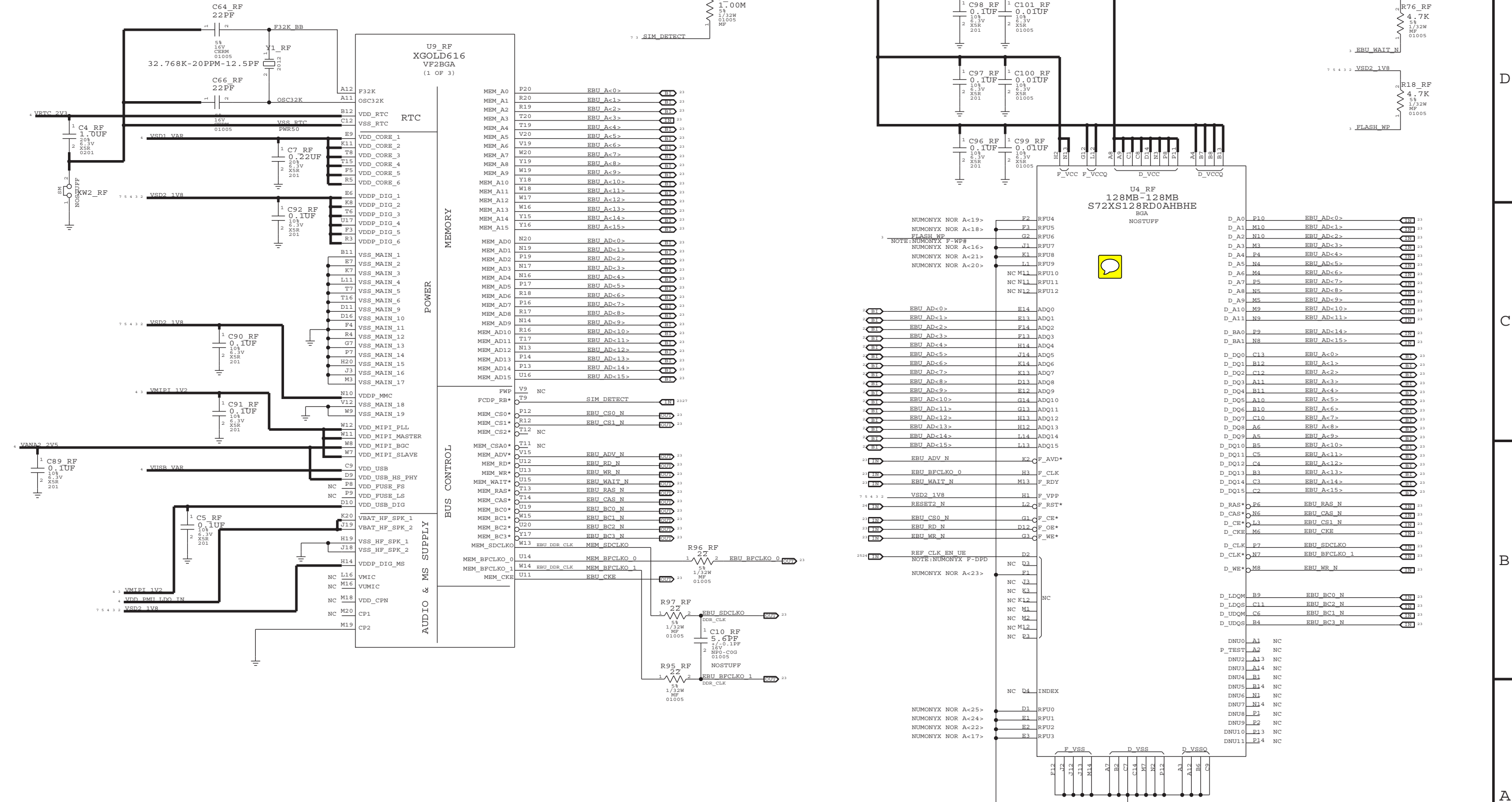
4

3

2

1

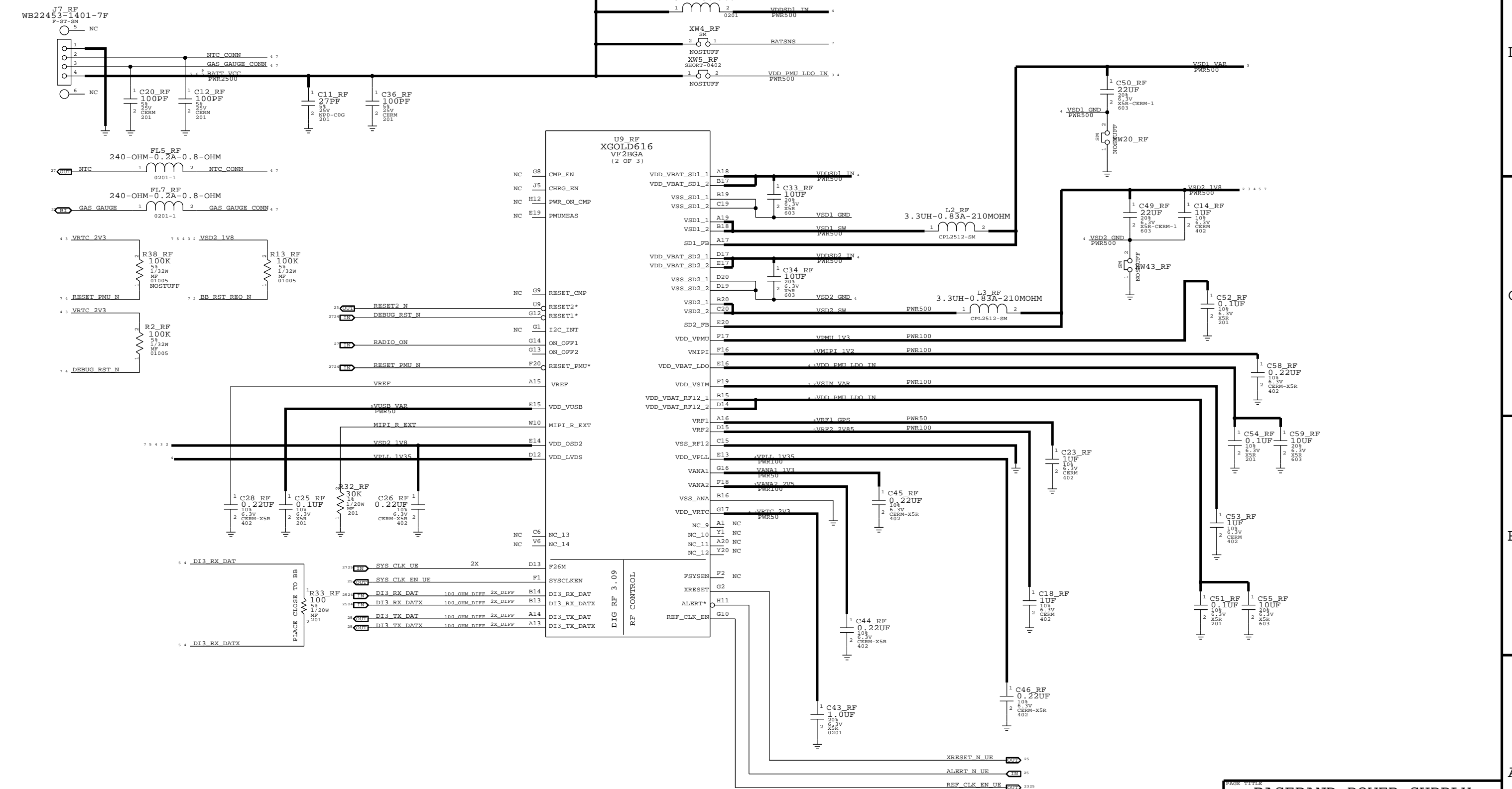
# BASEBAND MEMORY



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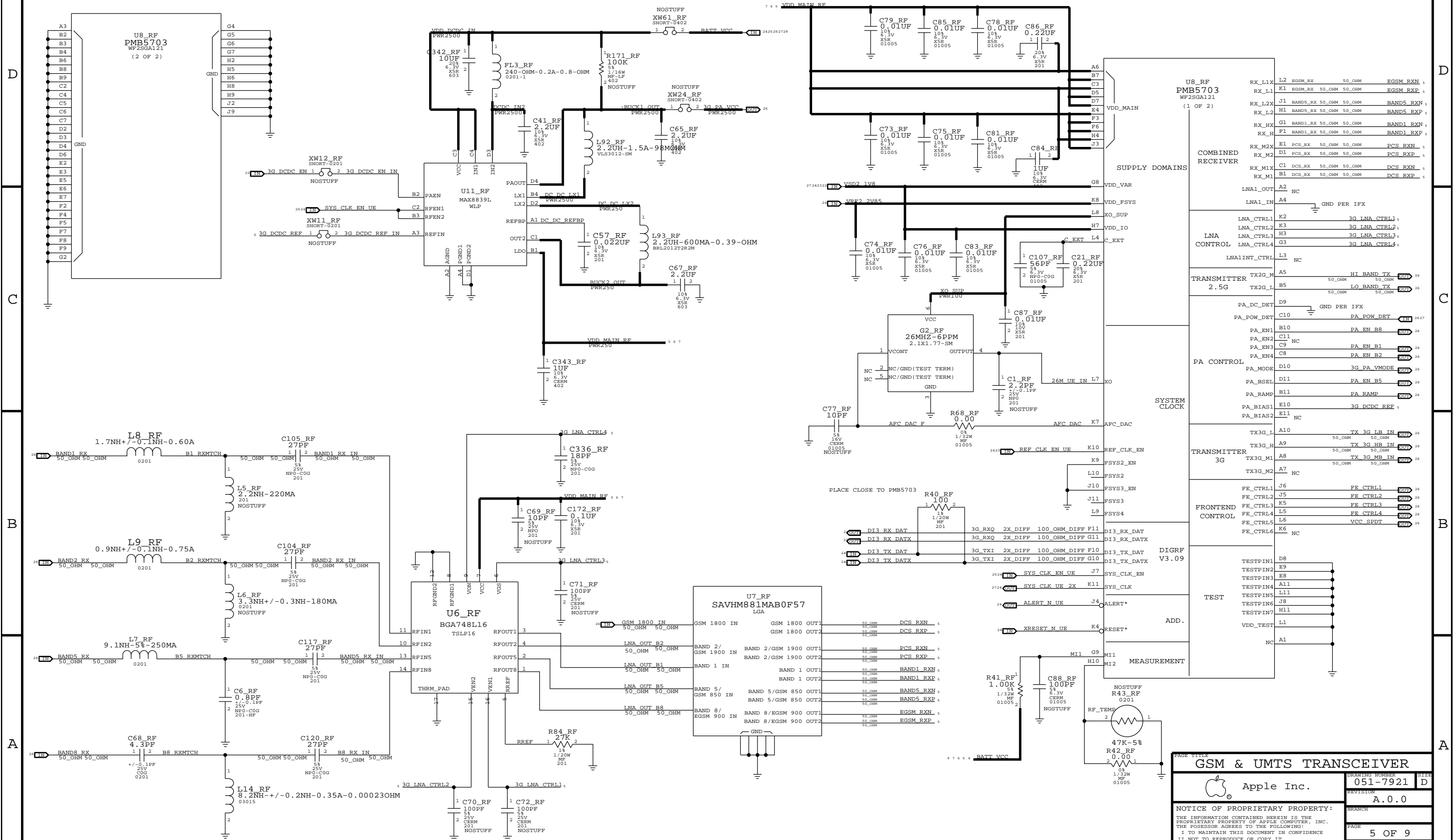
# BASEBAND POWER SUPPLY

BATTERY CONNECTOR



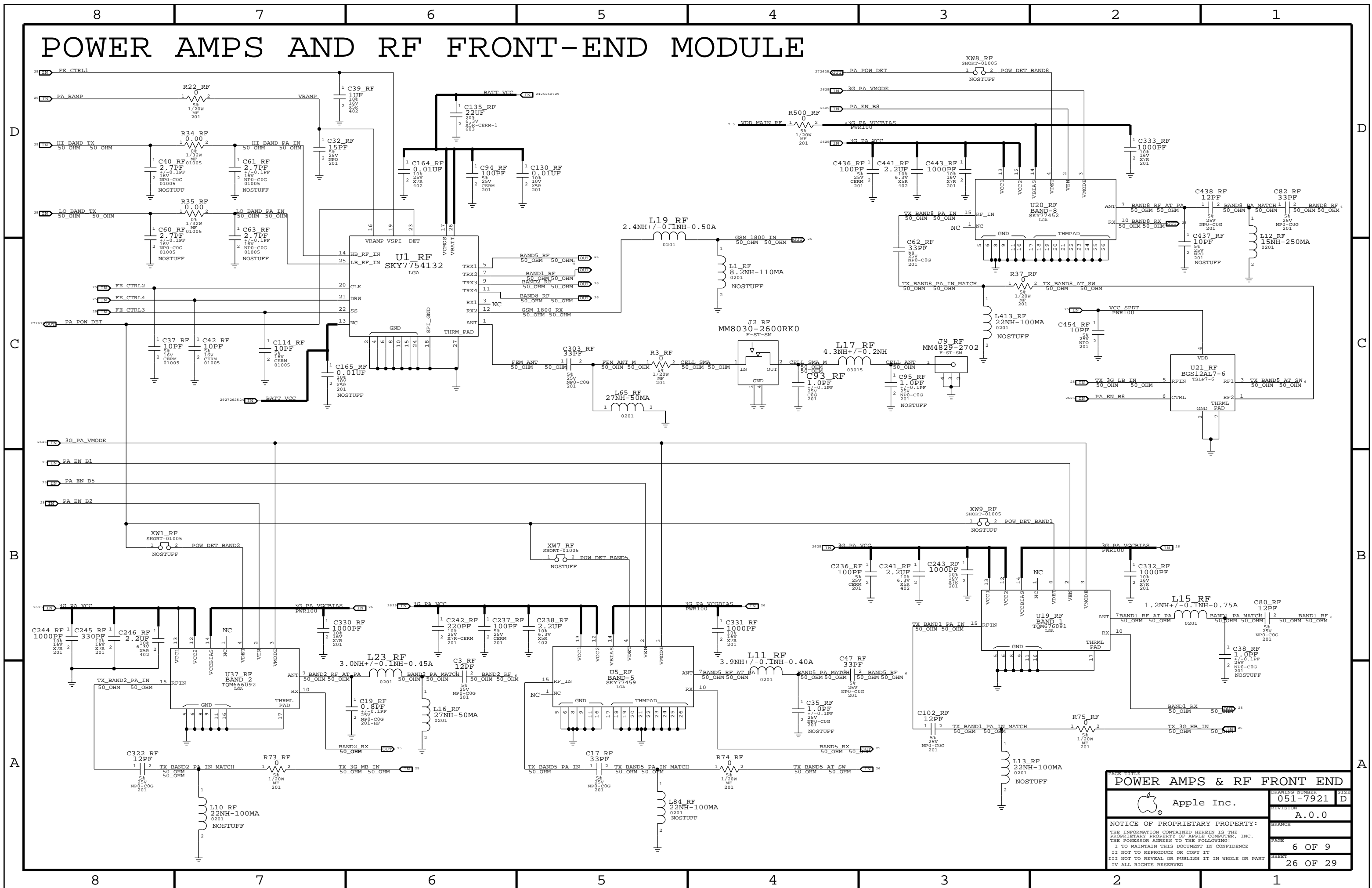
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# GSM & UMTS TRANSCEIVER - SMARTI UE



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# POWER AMPS AND RF FRONT-END MODULE

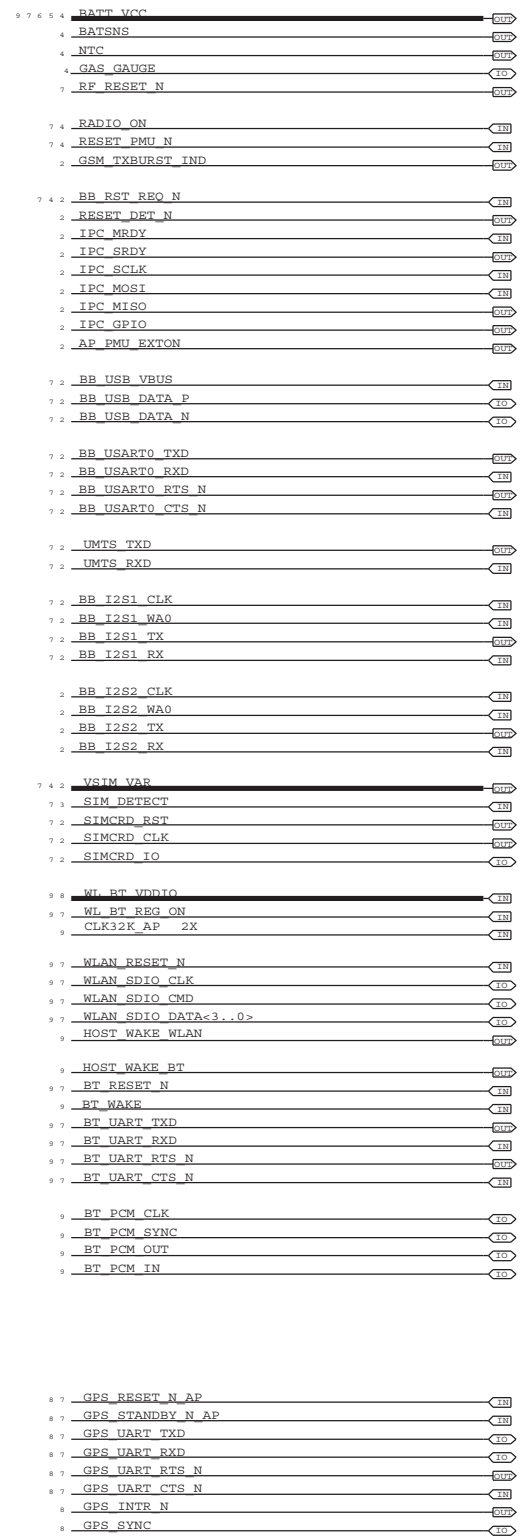


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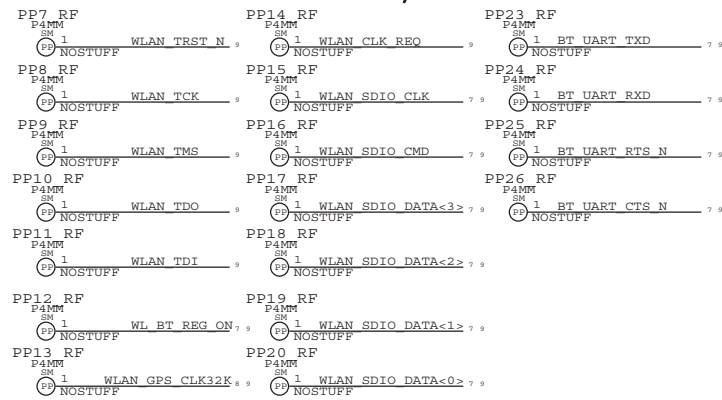
POWER AMPS & RF FRONT END  
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# SYSTEM CONNECTORS

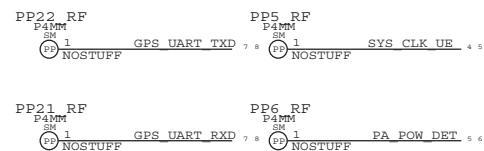
## AP CONNECTIONS



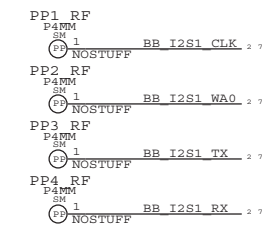
## WLAN/BT



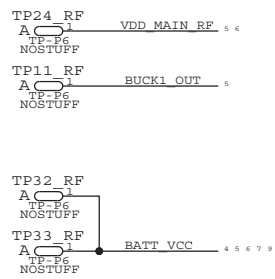
## GPS TRX



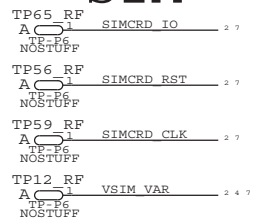
## DIGITAL AUDIO



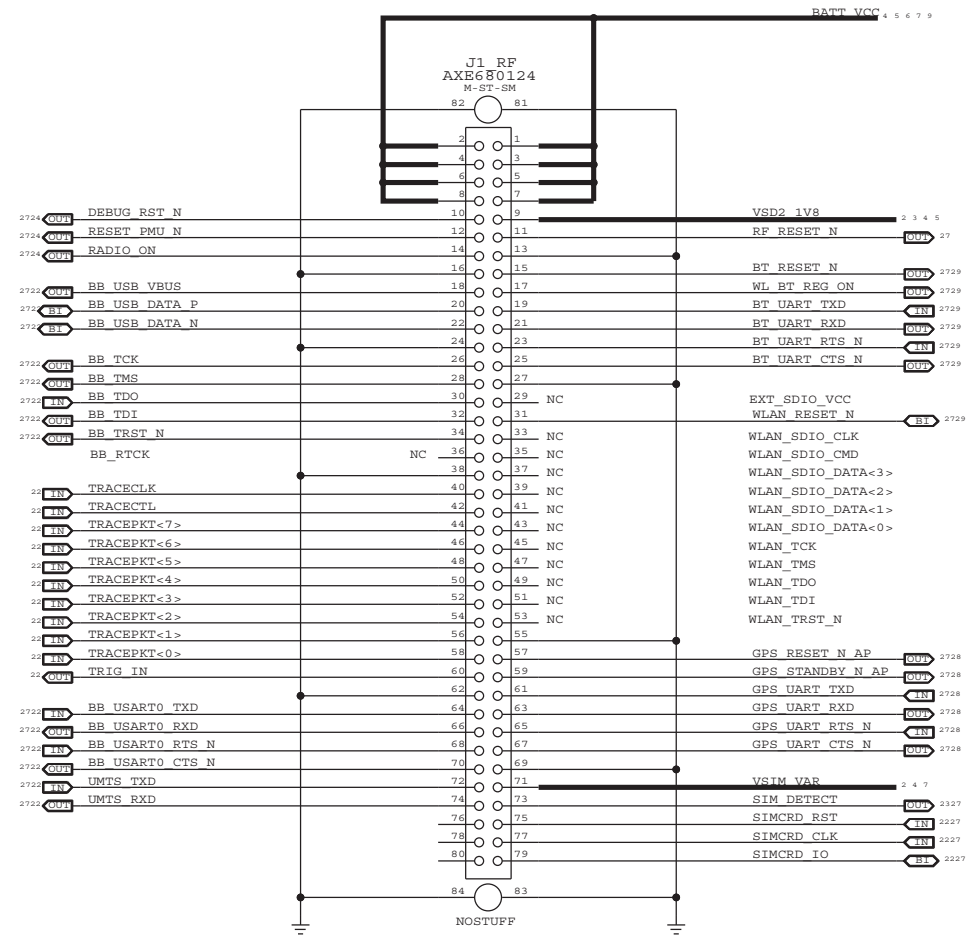
## POWER DOMAINS



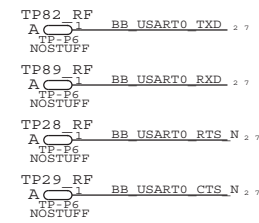
## SIM



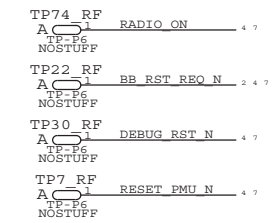
# DEBUG CONNECTOR



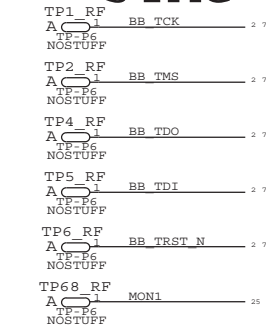
## USART0



## CONTROL



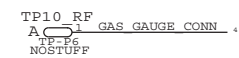
## JTAG



## NTC

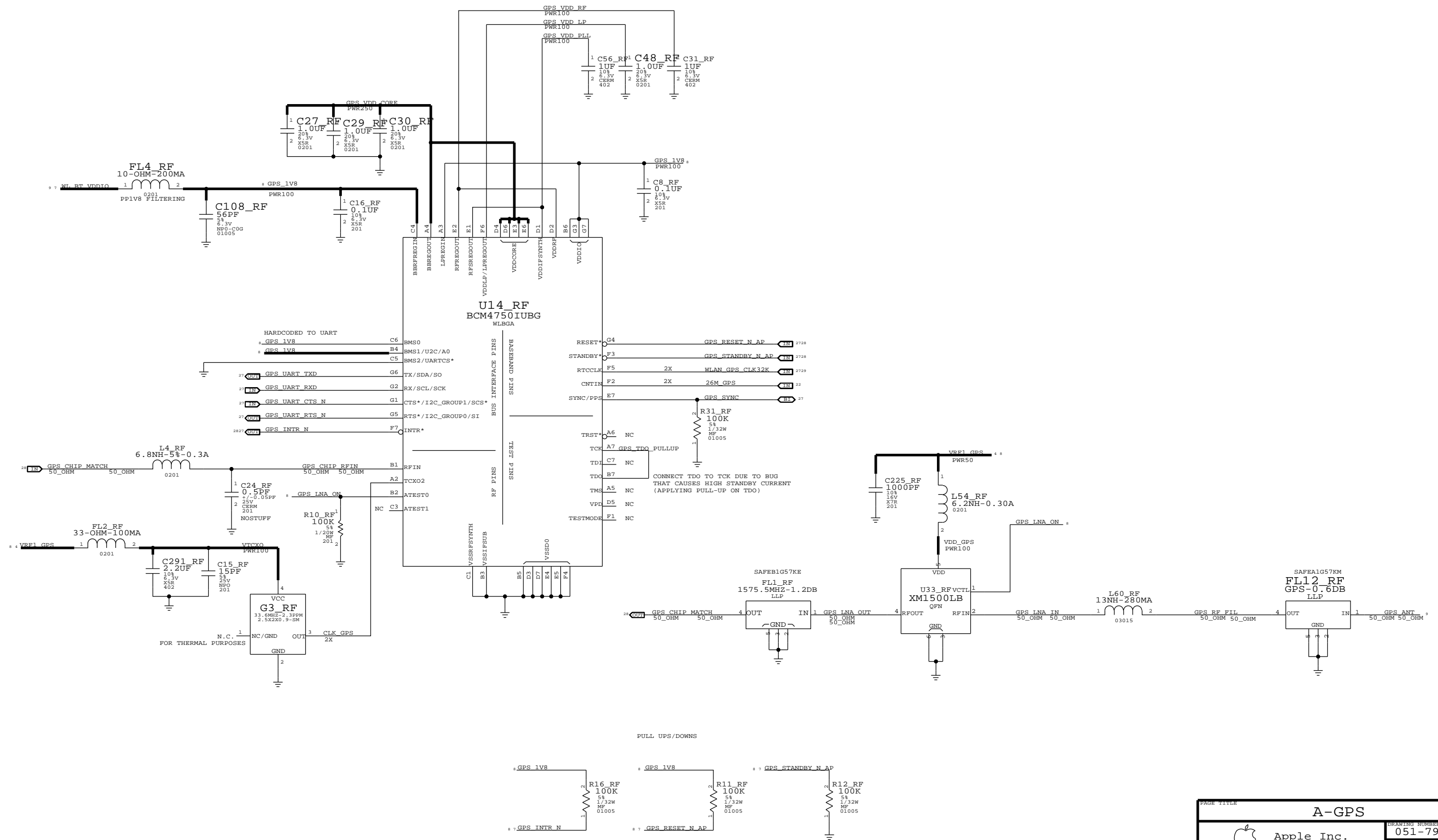



## GAS GAUGE



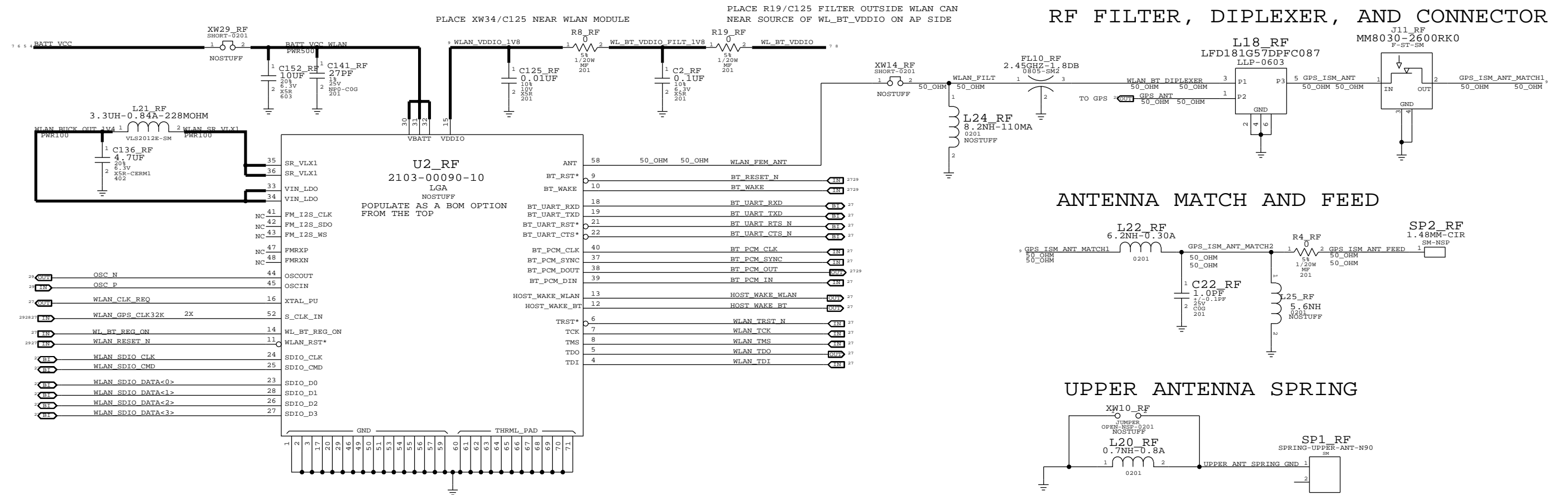
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# A-GPS



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# WLAN/BLUETOOTH/FM RADIO



## ANTENNA MATCH AND FEED

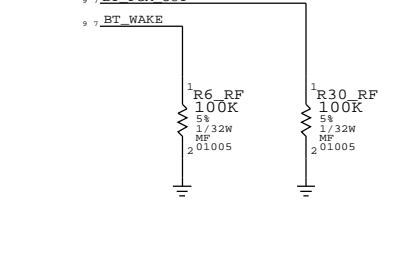
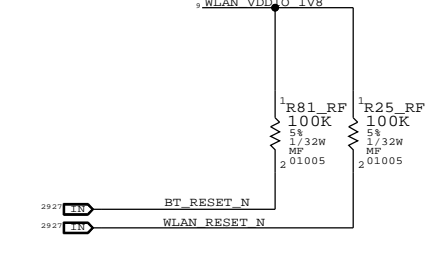
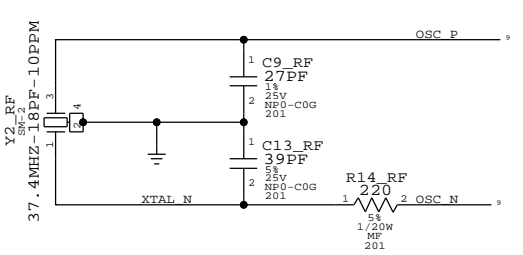
## UPPER ANTENNA SPRING

## 32K INTERFACE TO AP

## REFERENCE OSCILLATOR CRYSTAL

## PULL UP RESISTORS

## PULL DOWN RESISTORS



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