MangoH Green Platform

Project Variants

	1600643		
DNI	N		
UFL_M_RF	Y		
SMA_RF	N		
MIC_OMTP	N		
MIC_CTIA	Y		

Variants description

DNI = Do Not Install
UFL_M_RF = Add U.FL conn. on Main CF3 (do not define SMA_RF)
SMA_RF = Add SMA conn. on Main CF3 (do not define UFL_M_RF)
MIC_OMTP = OMTP headphones config (do not define MIC_CTIA)
MIC_CTIA = CTIA/AHJ headphones config (do not define MIC_OMTP)

I2C address list

08h = 3503 USB hub
3Eh = I/O expander 1
3Fh = I/O expander 2
55h = Battery gauge
6Ah = Accelerometer sensor
6Bh = Buck+batt charger
70h = I/O expander 3
71h = I2C Hub

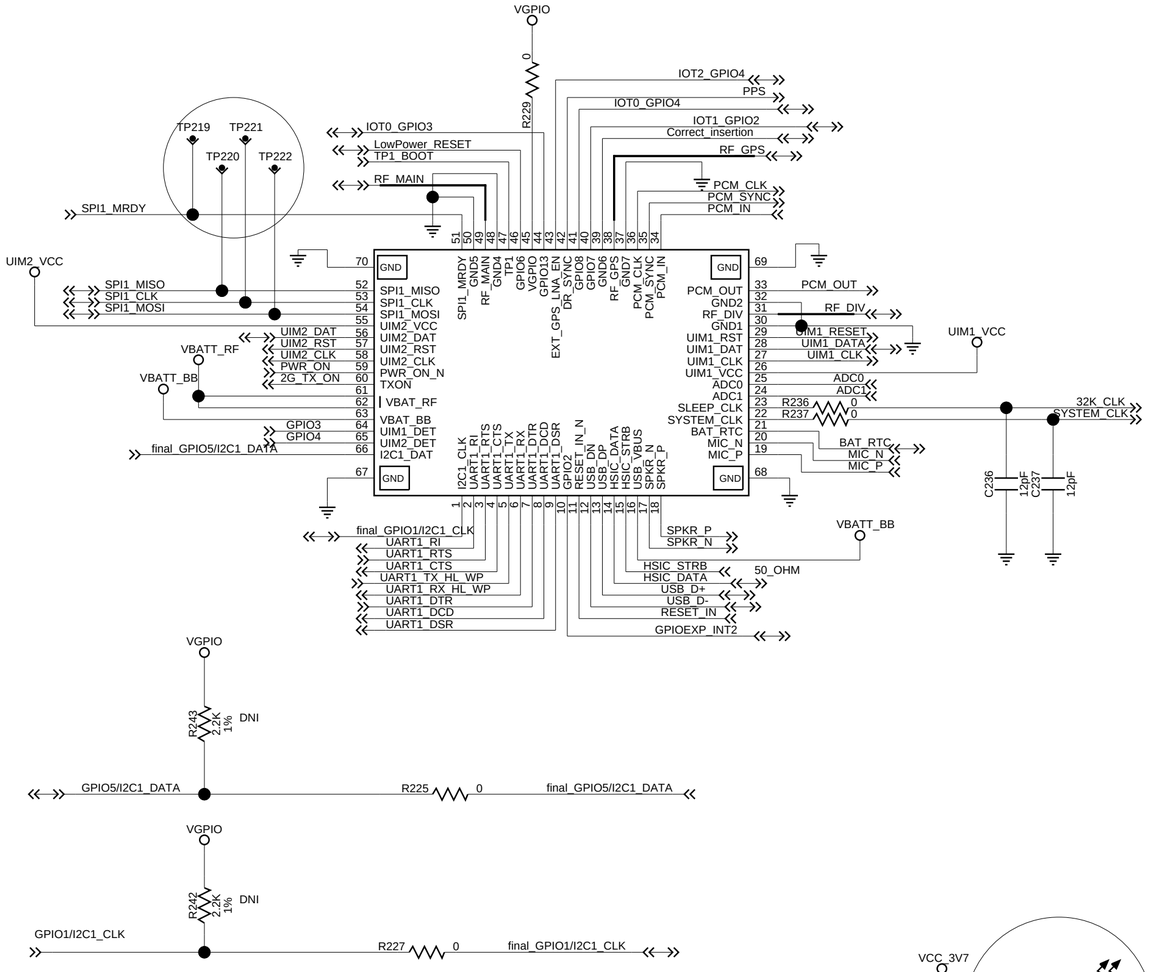
REFERENCE

1600643 PCA, MANGOH
1401063 PCB, MANGOH

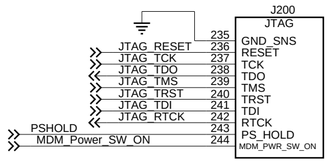
SIERRA WIRELESS™

SITE	RMD
LEAD ENGINEER	Ashish Syal
REV SCH	34
REV PCB	8
PROJECT	MANGO GREEN
DATE/TIME	29-01-2016_11:36
SCHEMATIC	2500905
PAGE	1 OF 15

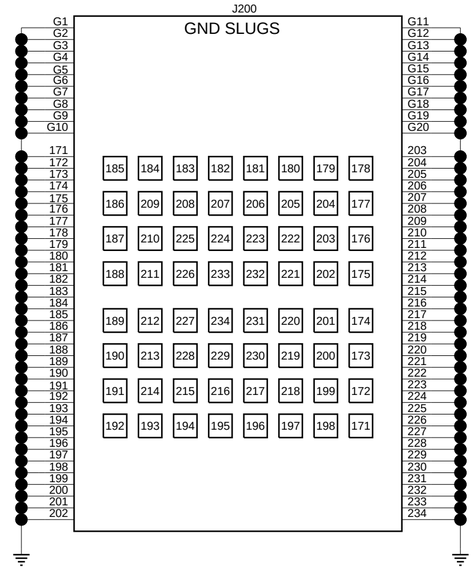
INNER RING

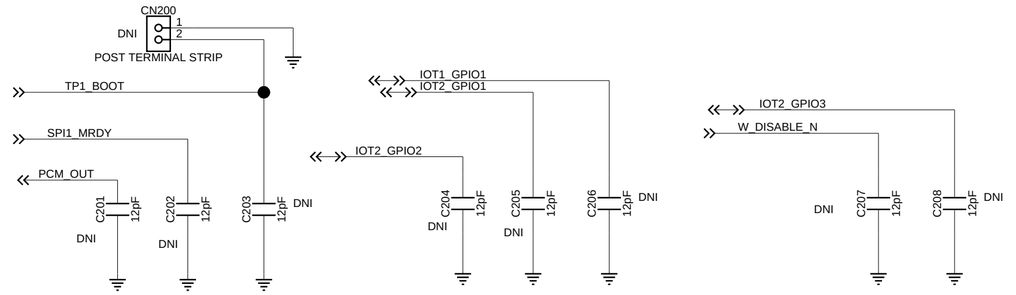


JTAG



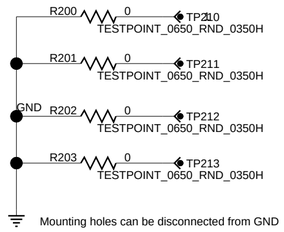
GROUND SLUG

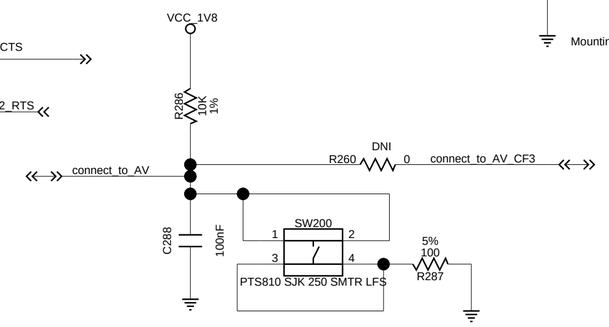


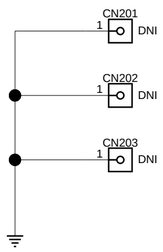


OUTER RING

Mounting Holes







SIERRA WIRELESS™

SITE	CTO Office
LEAD ENGINEER	Ashish Syal
REV SCH	See P1
REV PCB	See P1
PROJECT	MANGO GREEN
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SCHEMATIC	2500905
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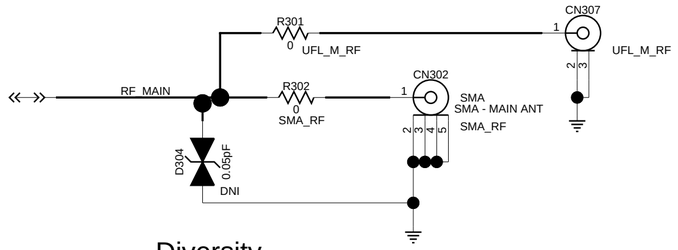
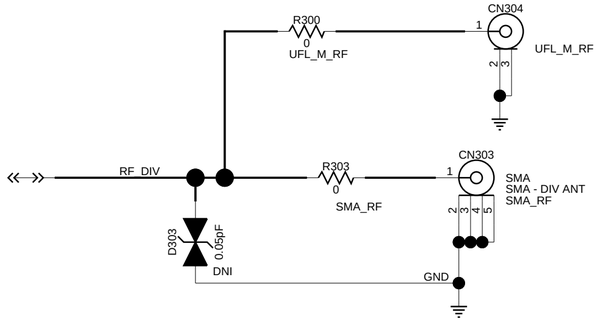
MAIN CF3 Socket

Main Antenna

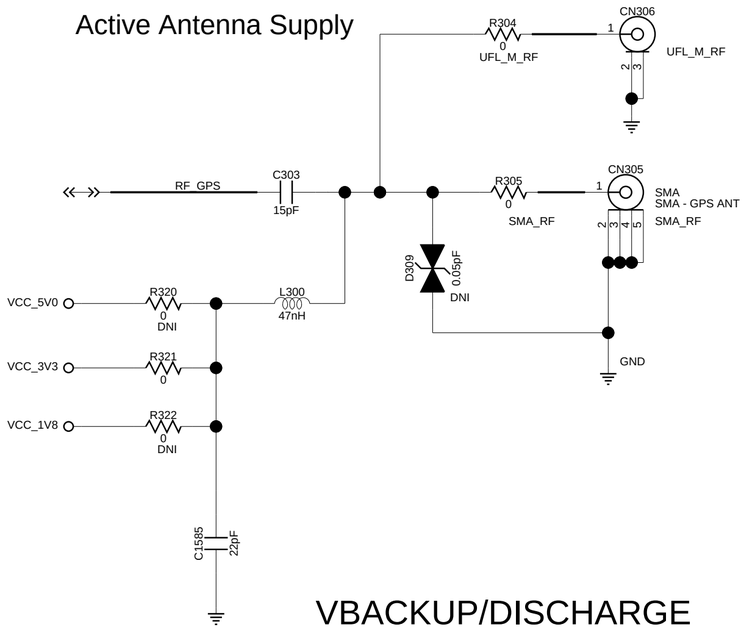


Diversity

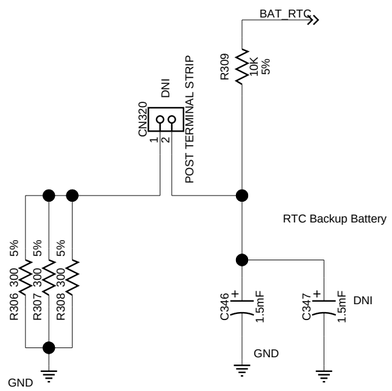


GPS

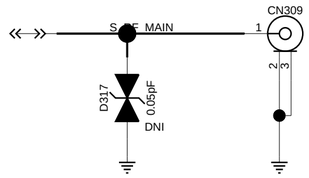
Active Antenna Supply



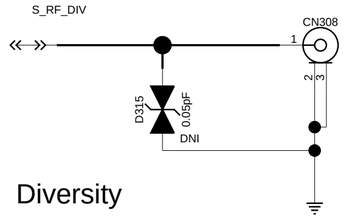
VBACKUP/DISCHARGE



SECONDARY CF3 Socket

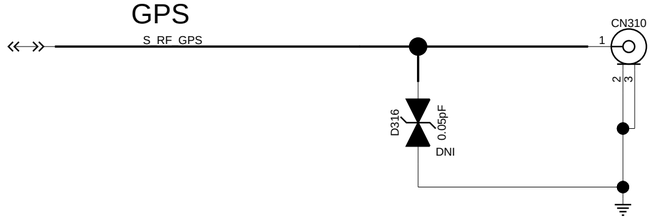


Main Antenna



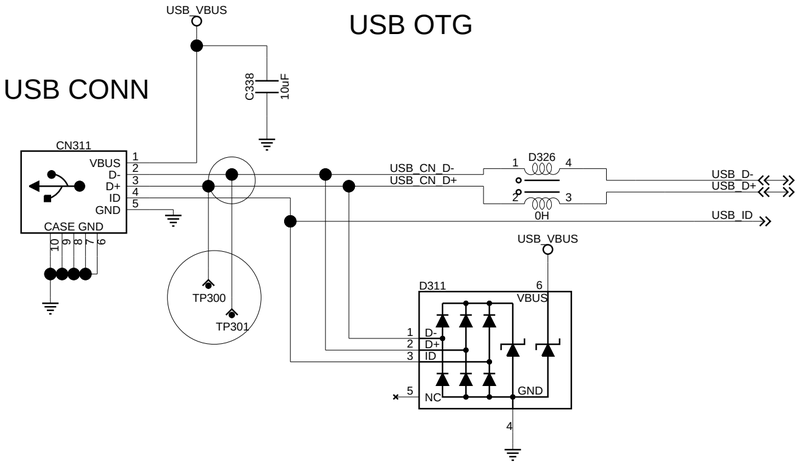
Diversity

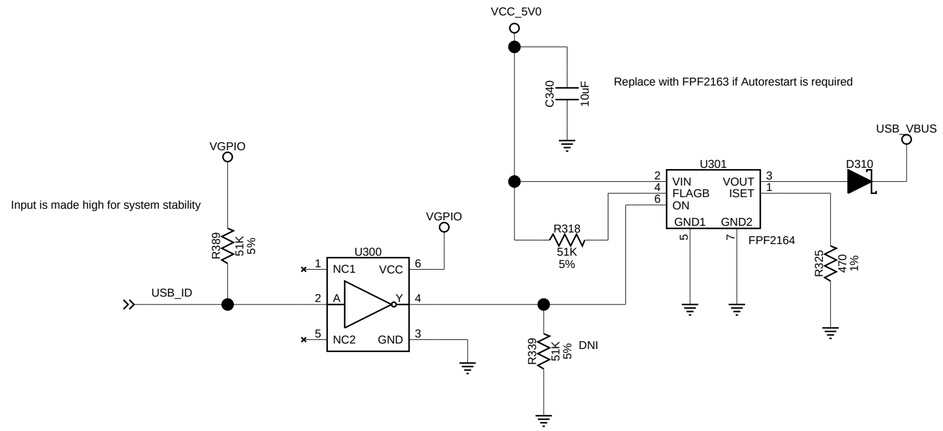
GPS



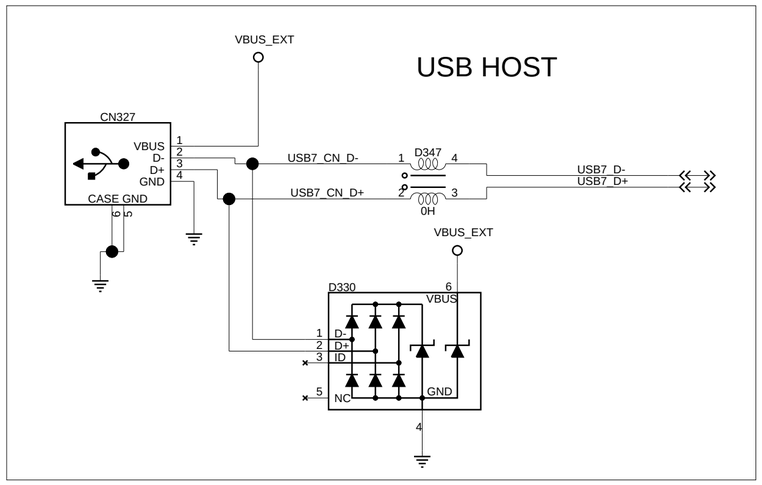
USB OTG

USB CONN

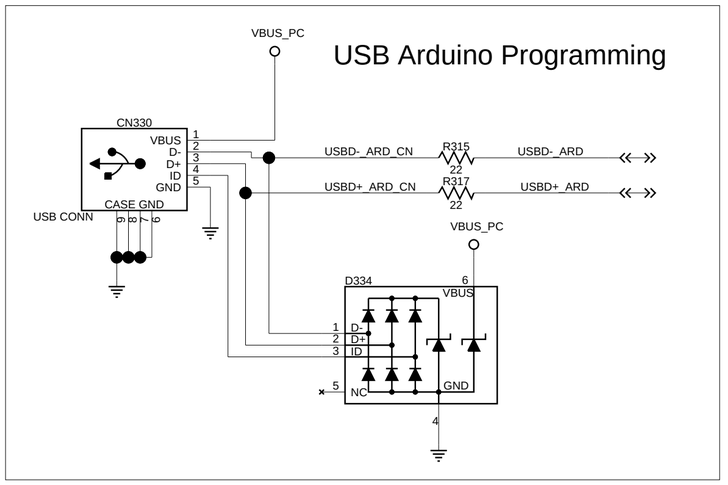




USB HOST



USB Arduino Programming



SIERRA WIRELESS™

SITE	CTO Office
LEAD ENGINEER	Ashish Syal
REV SCH	See P1
REV PCB	See P1
PROJECT	MANGO GREEN
SCHEMATIC	2500905
DATE/TIME	27-01-2016_10:22
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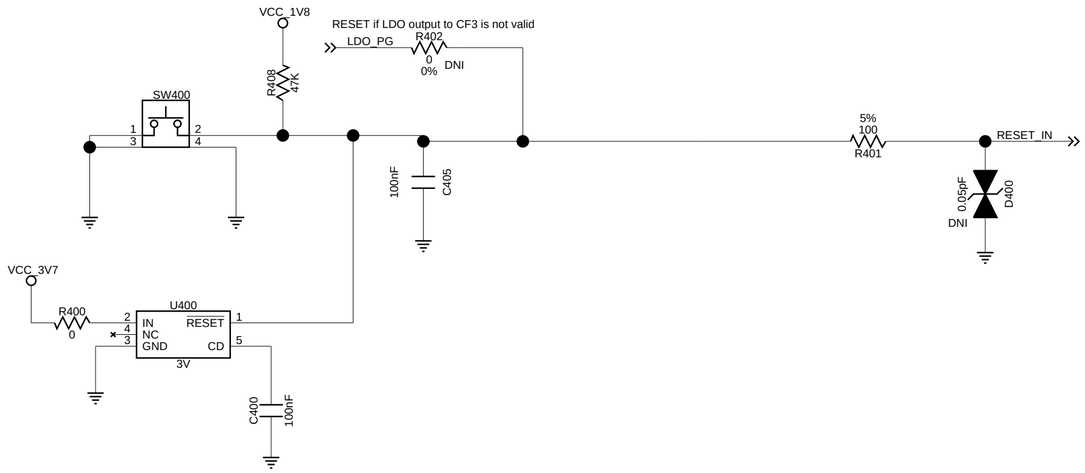
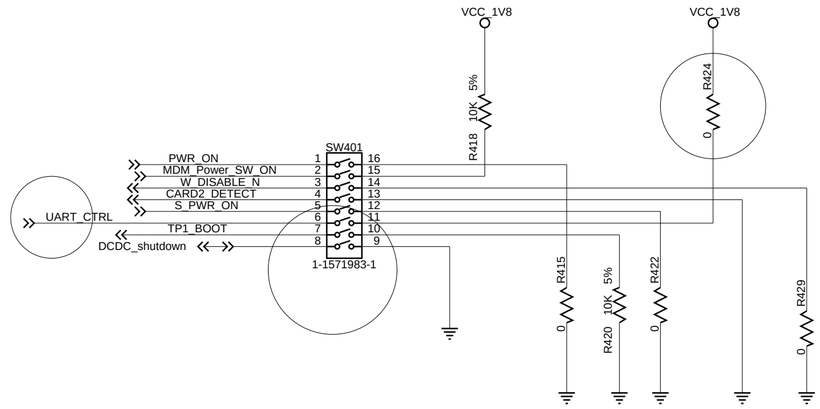
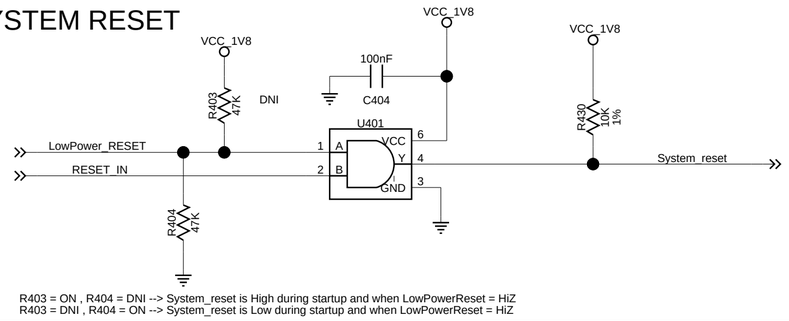
OPHW Platform RESET

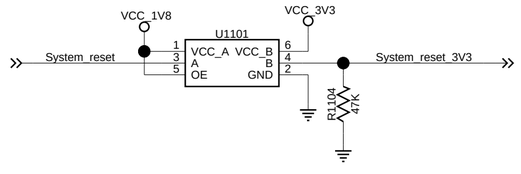


CONTRL SWITCH

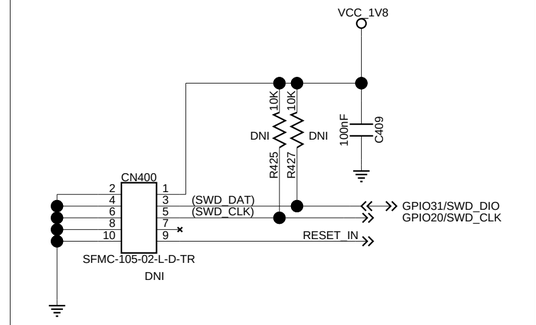


SYSTEM RESET

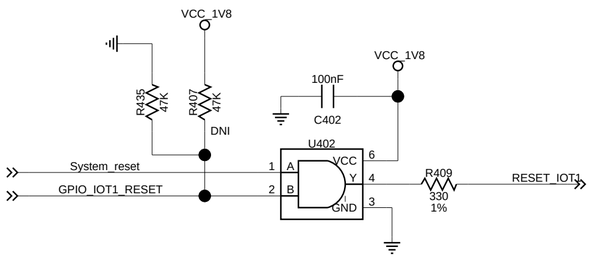




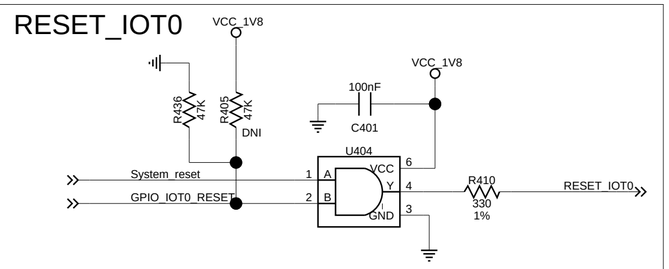
uC DEBUG

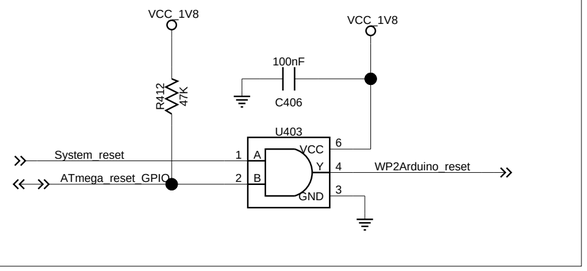


RESET_IOT1

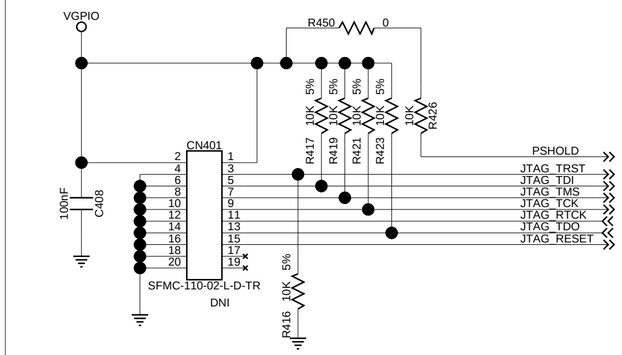


RESET_IOT0

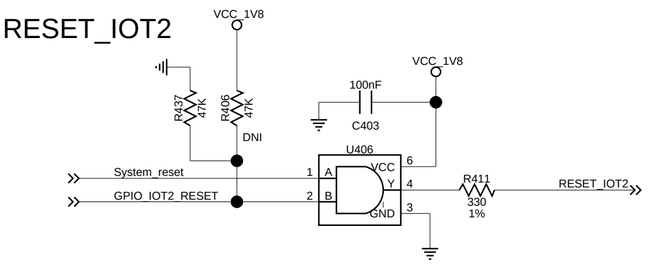




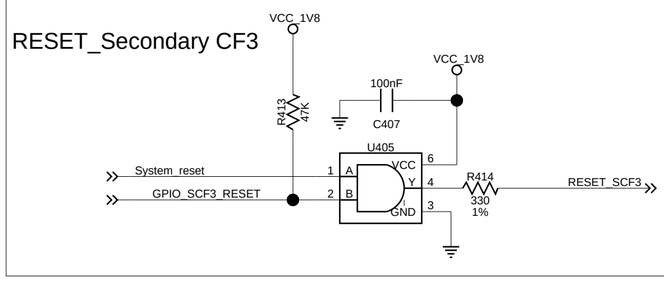
JTAG



RESET_IOT2



RESET_Secondary CF3



SIERRA WIRELESS™

SITE	CTO Office
LEAD ENGINEER	Ashish Syal
REV SCH	See P1
REV PCB	See P1
PROJECT	MANGO GREEN
DATE/TIME	26-01-2016_14:46
SCHEMATIC	2500905
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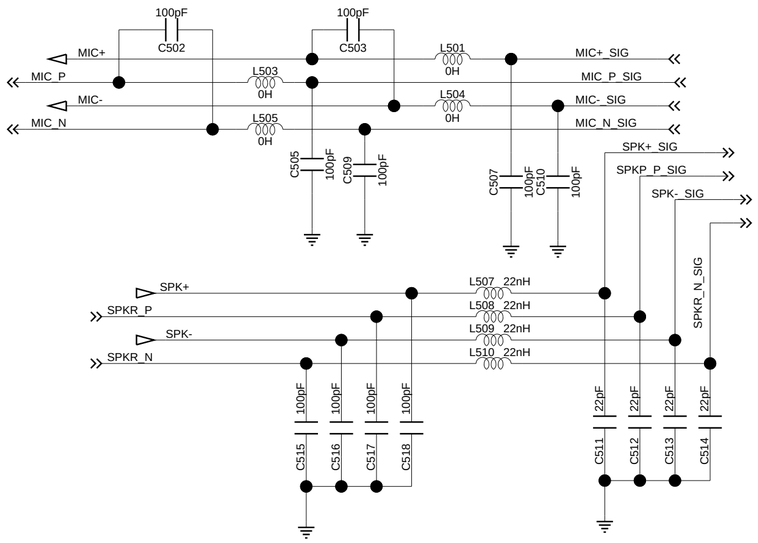
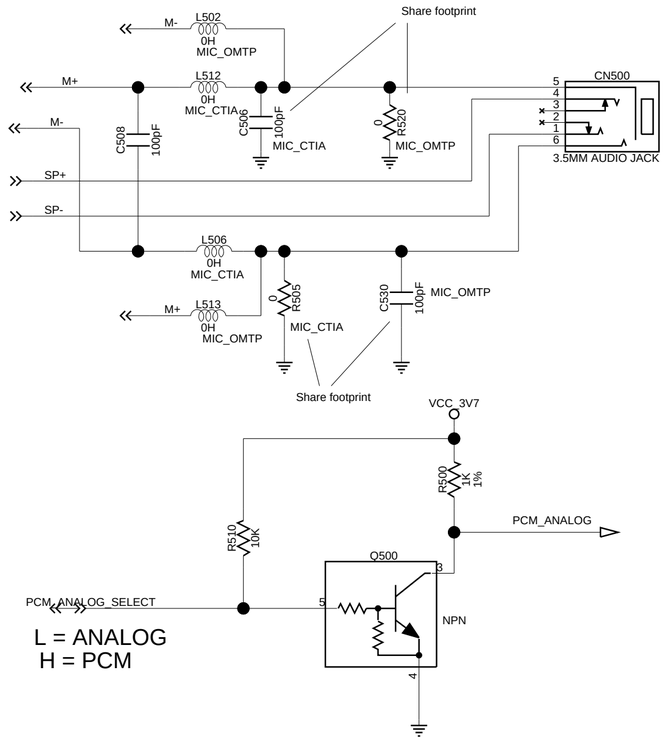
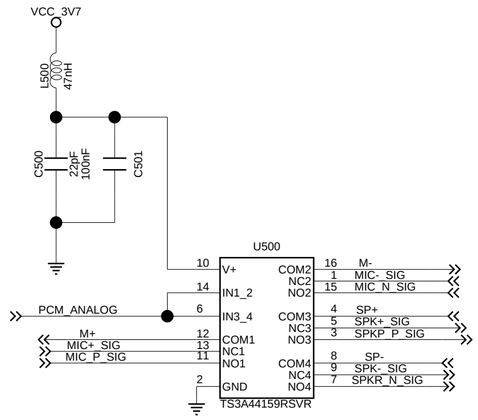
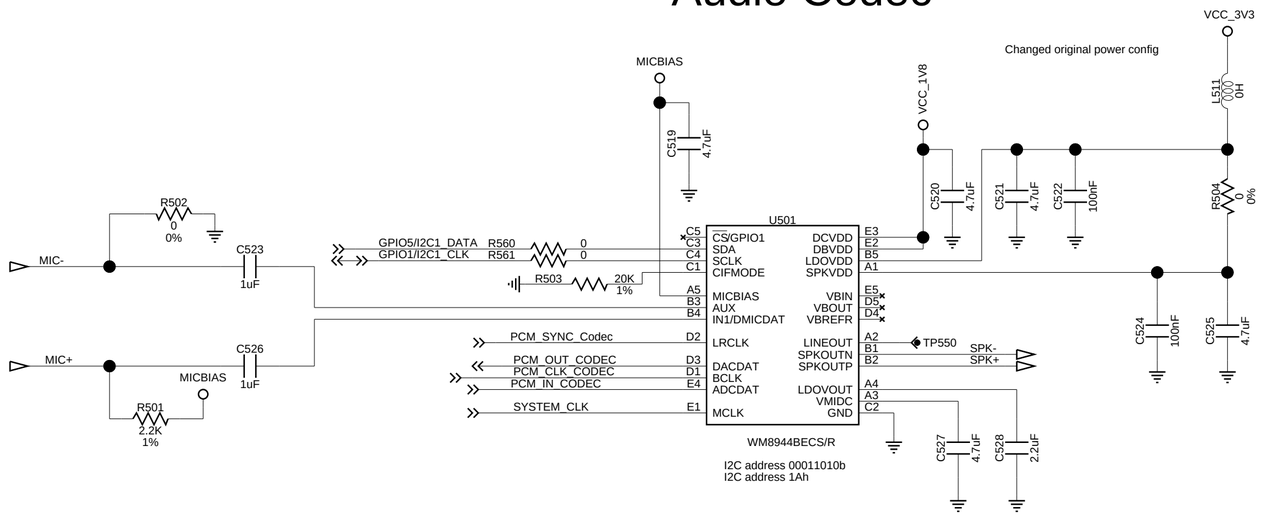
Audio Source Selection







Audio Codec



SIERRA WIRELESS™

SITE	CTO Office
LEAD ENGINEER	Ashish Syal
REV SCH	See P1
REV PCB	See P1
PROJECT	MANGO GREEN
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SCHEMATIC	2500905
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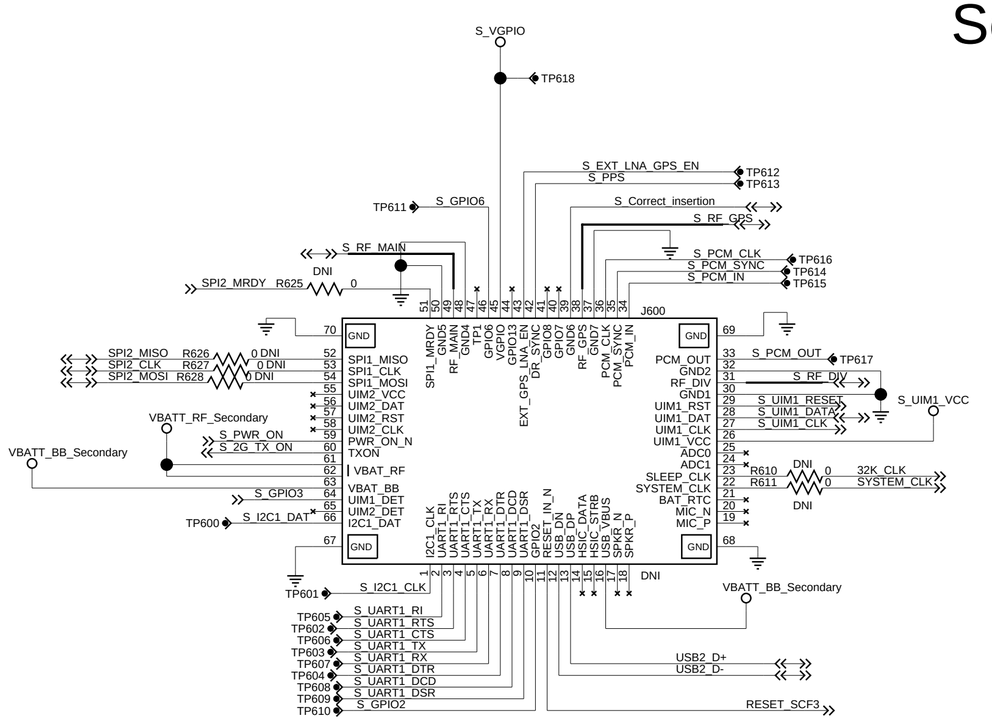
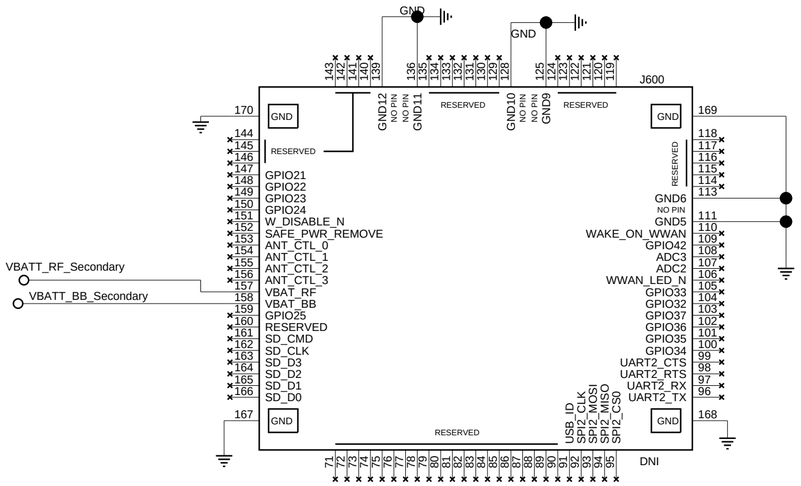
Secondary LGA SOCKET

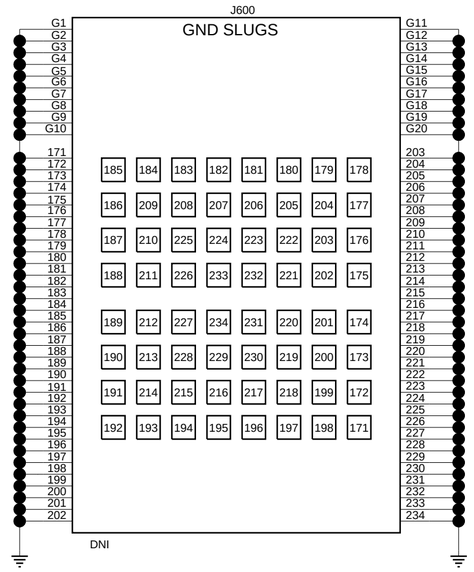




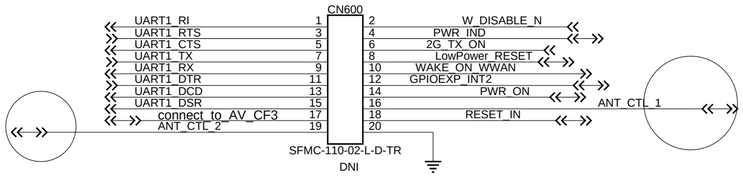
J601

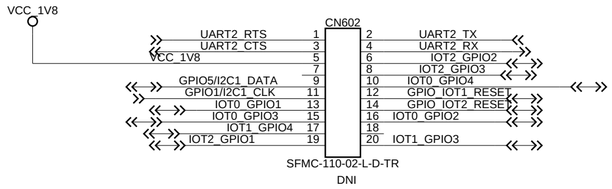
3900283

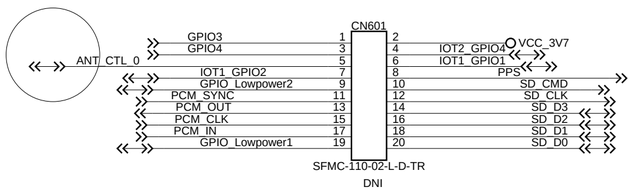
J601 is CF3 socket essential that ovelap J600

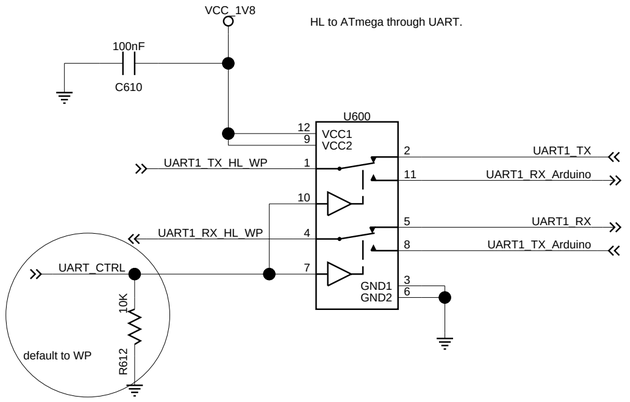


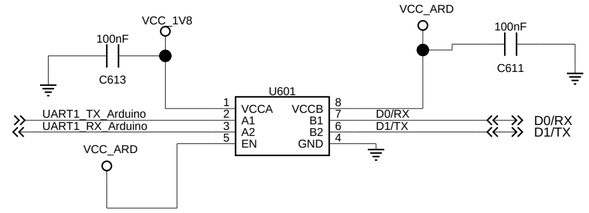
Additional Hardware Pins

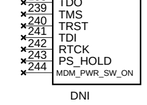












SIERRA WIRELESS™

SITE	CTO Office
LEAD ENGINEER	Ashish Syal
REV SCH	See P1
REV PCB	See P1
PROJECT	MANGO GREEN
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DATE/TIME	28-01-2016_15:24
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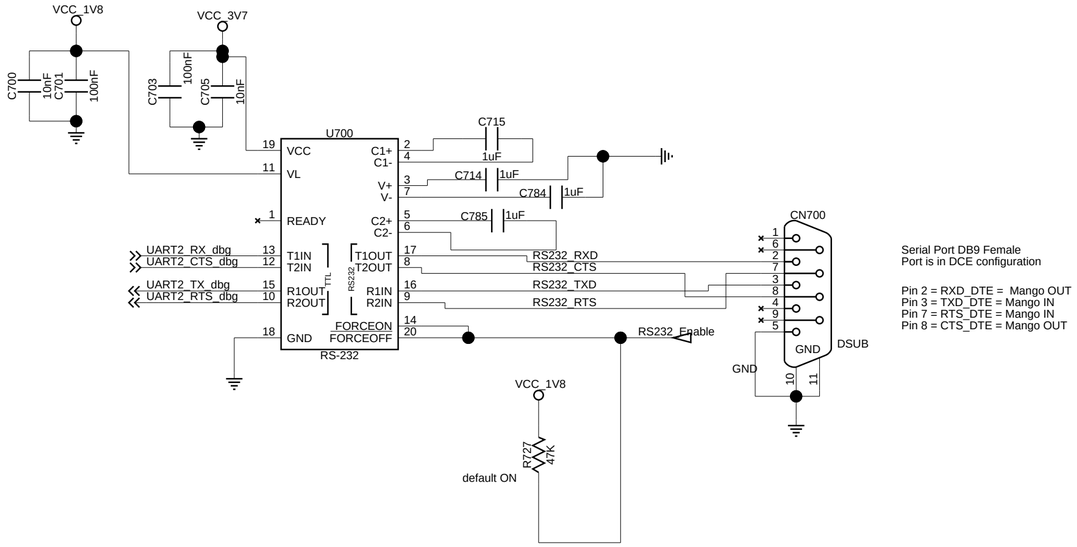
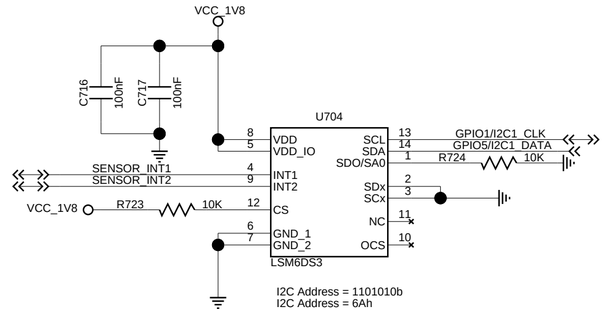
UART (MAX 1MBPS)



Serial Port DB9 Female
Port is in DCE configuration

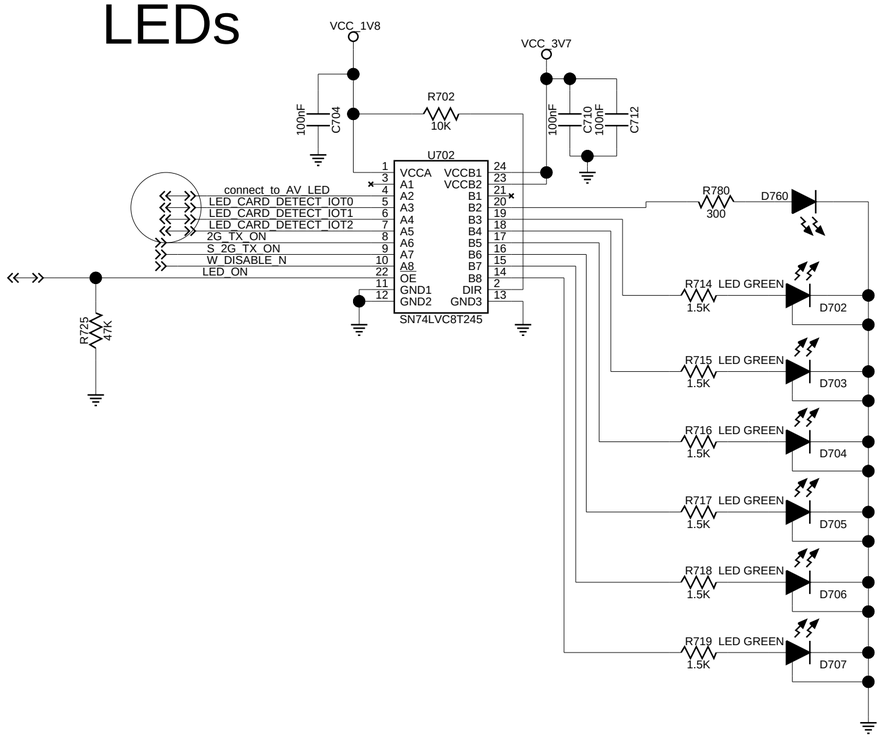
Pin 2 = RXD_DTE = Mango OUT
Pin 3 = TXD_DTE = Mango IN
Pin 7 = RTS_DTE = Mango IN
Pin 8 = CTS_DTE = Mango OUT

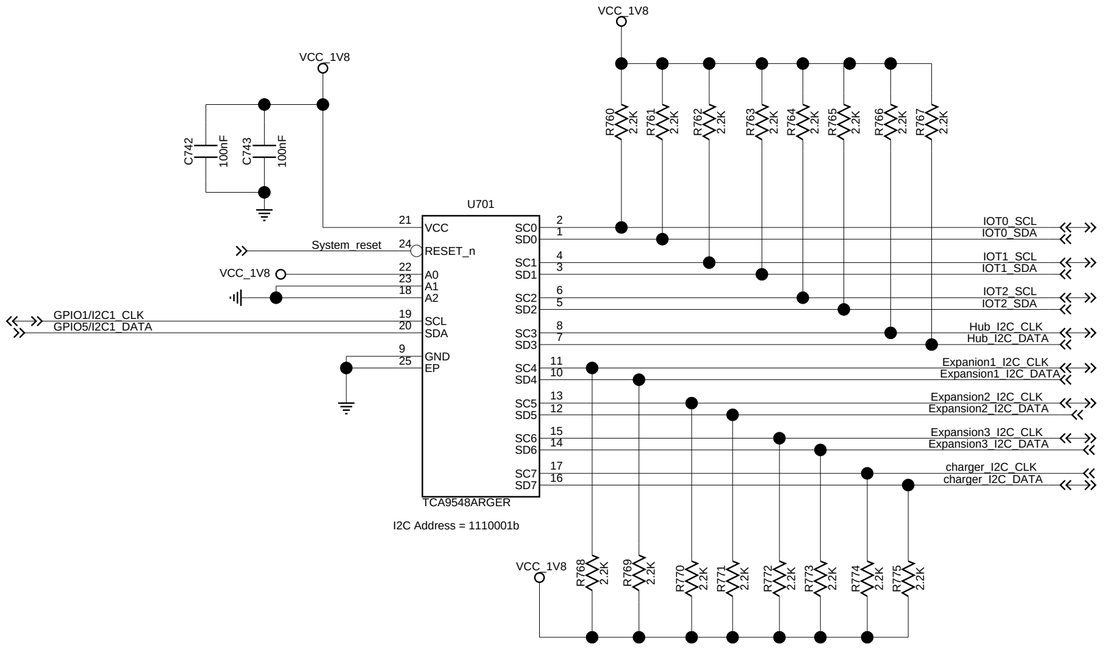
ACCELEROMETER AND GYROSCOPE



I2C Address = 1101010b
I2C Address = 6Ah

LEDs





I2C Address = 1110001b

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REV SCH	See P1
REV PCB	See P1
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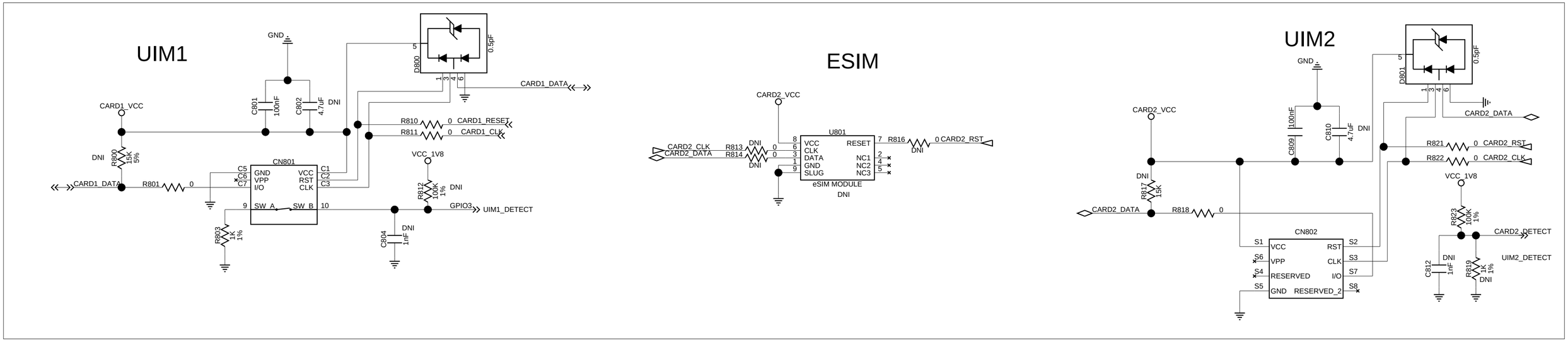

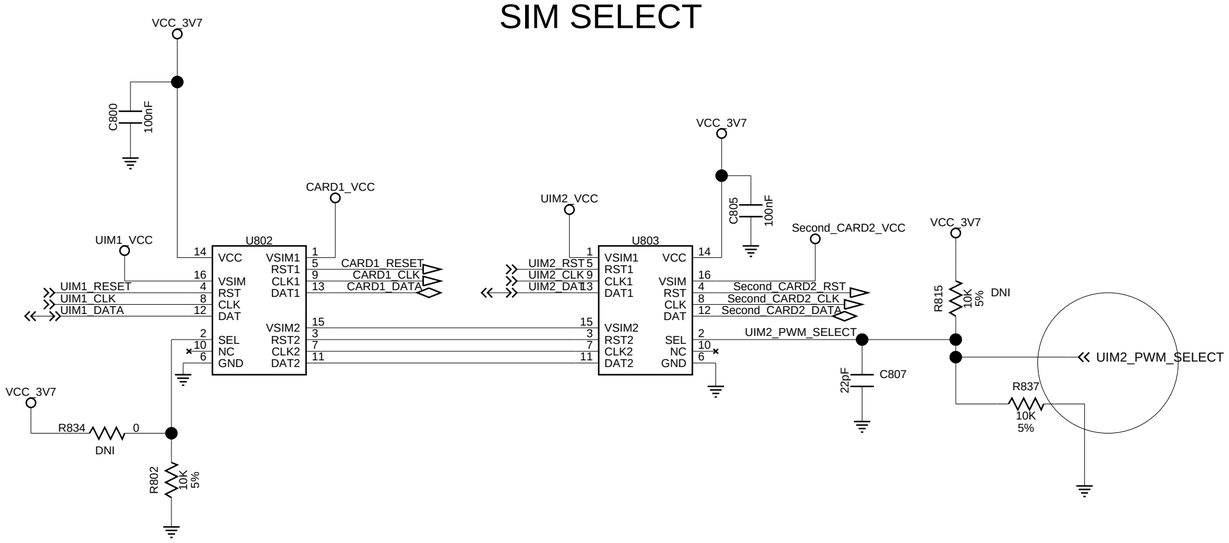

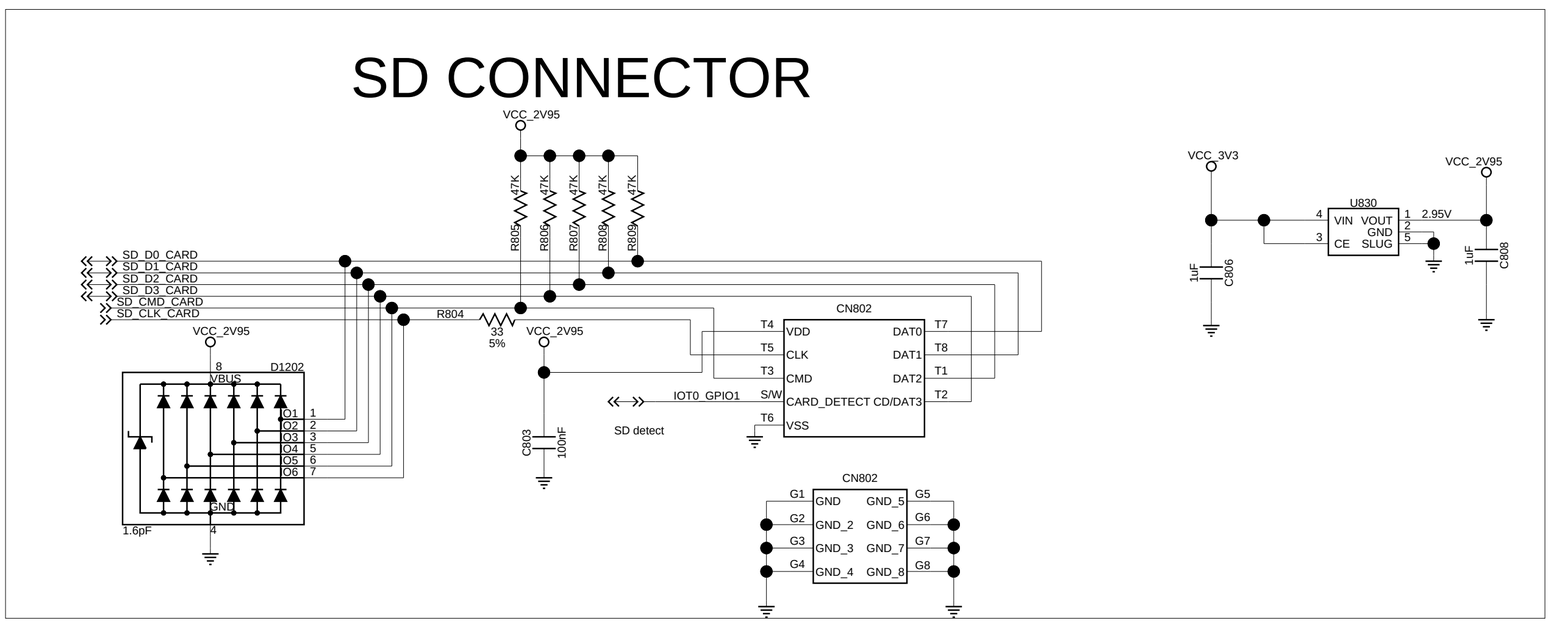

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REV SCH	See P1
REV PCB	See P1
PROJECT	MANGO GREEN
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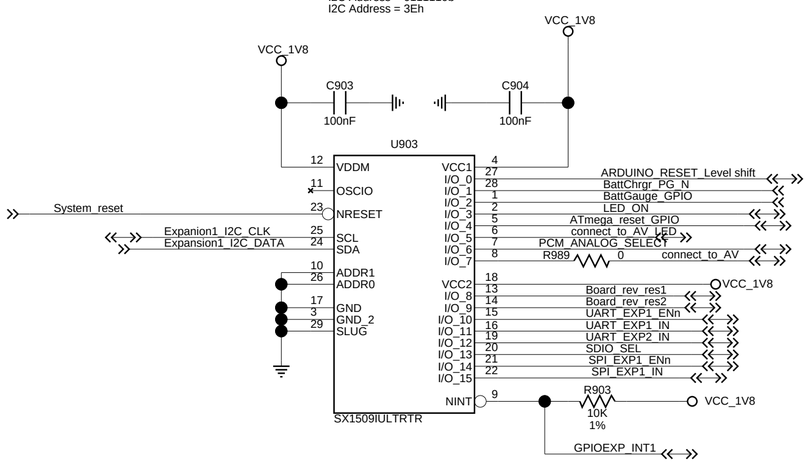
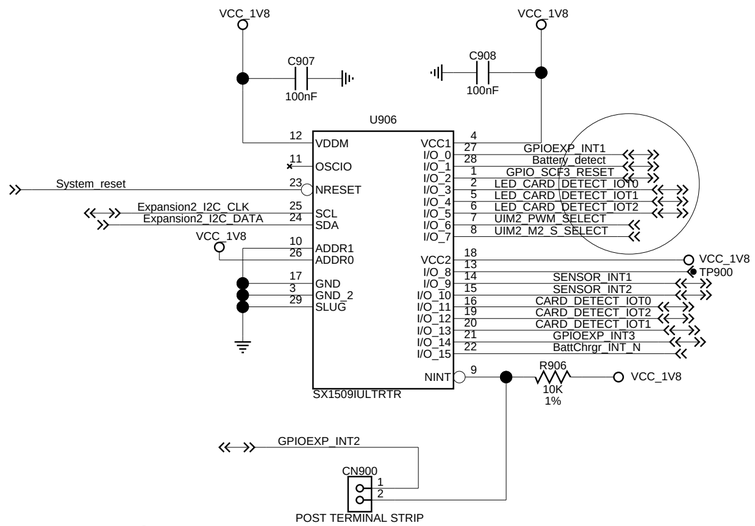
GPIO Expander#1

I2C Address = 0111110b
I2C Address = 3Eh



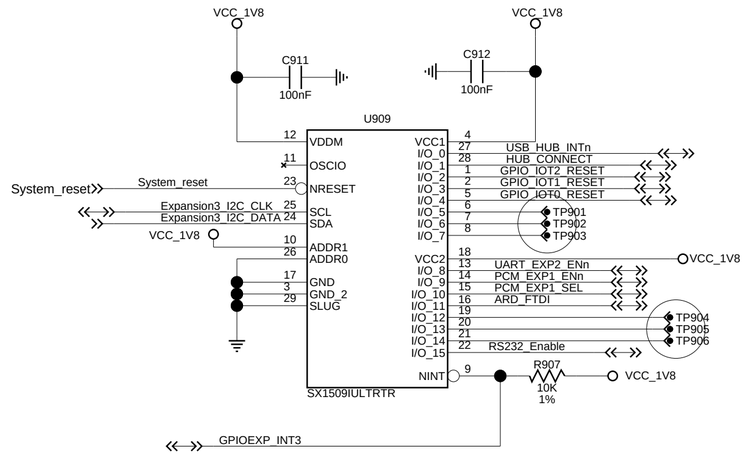
GPIO Expander#2

I2C Address = 0111111b
I2C Address = 3Fh

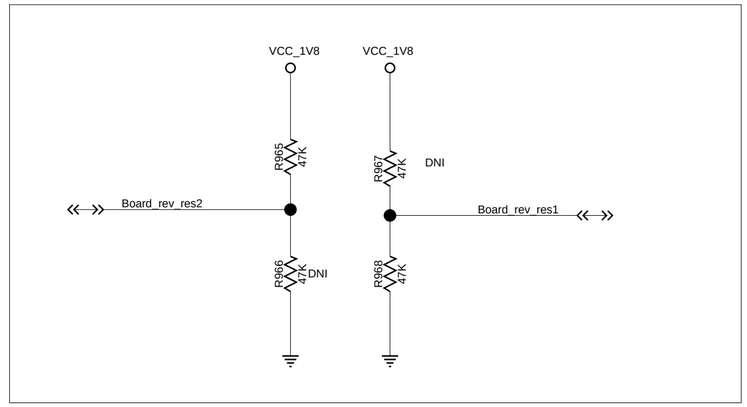


GPIO Expander#3

I2C Address = 1110000b
I2C Address = 70h

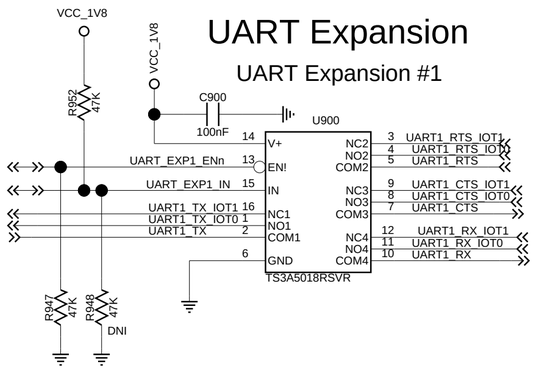


SPI Expansion

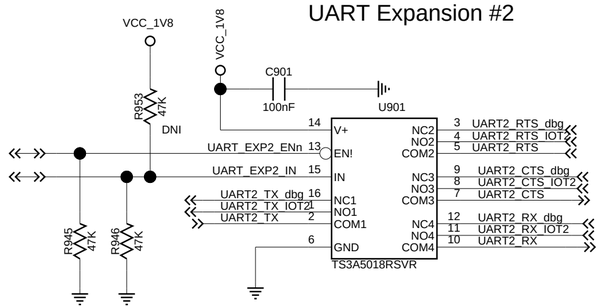


UART Expansion

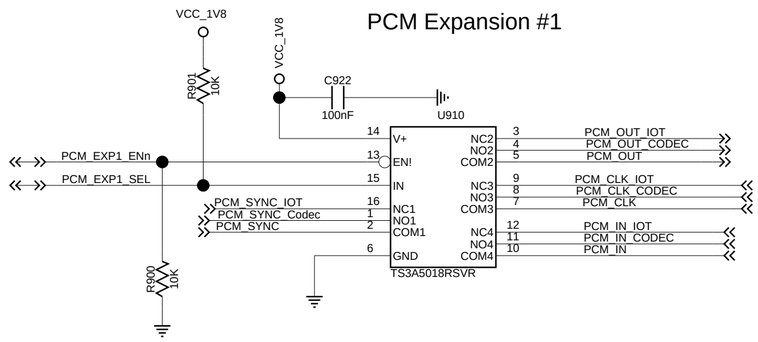
UART Expansion #1



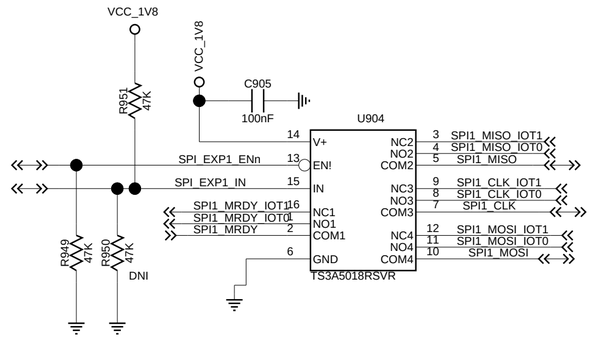
UART Expansion #2

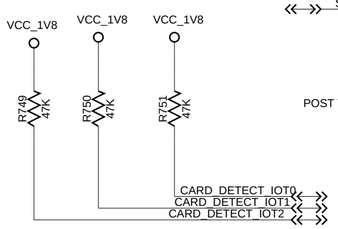


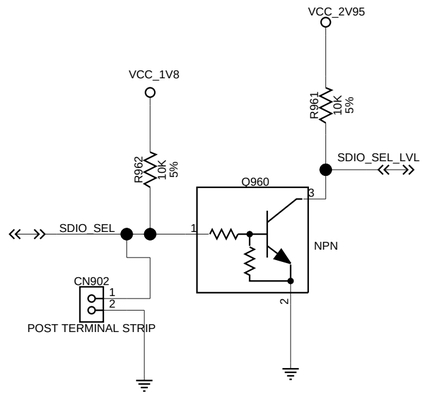
PCM Expansion #1



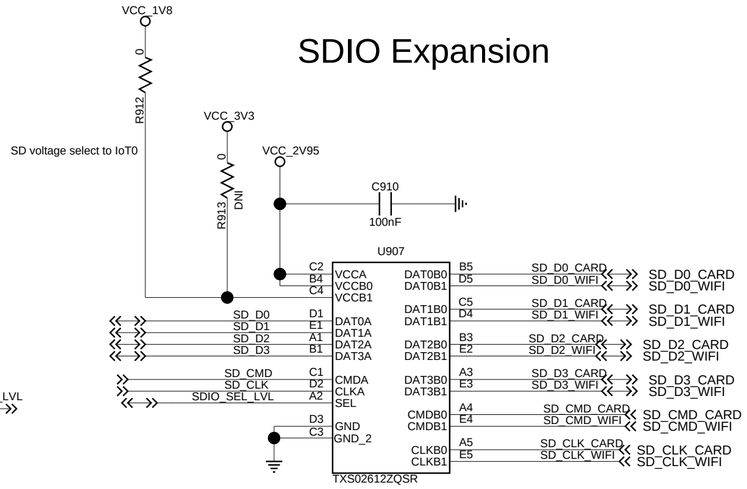
Default config = PCM to internal Codec







SDIO Expansion



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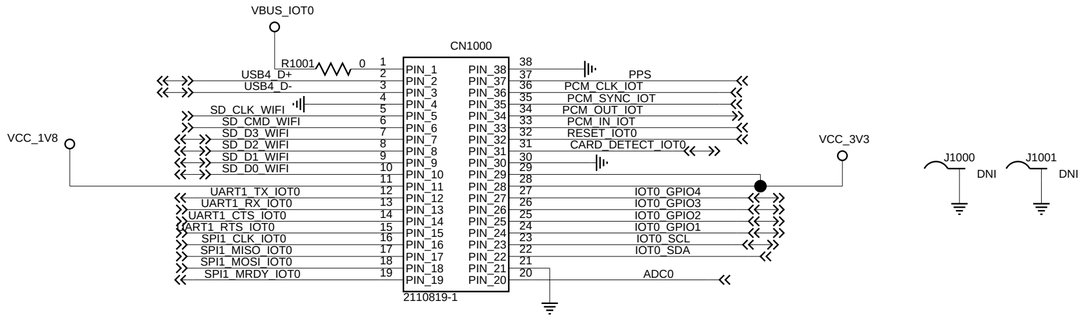
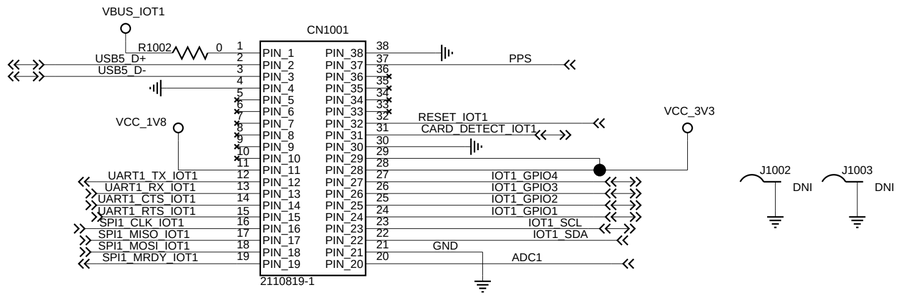
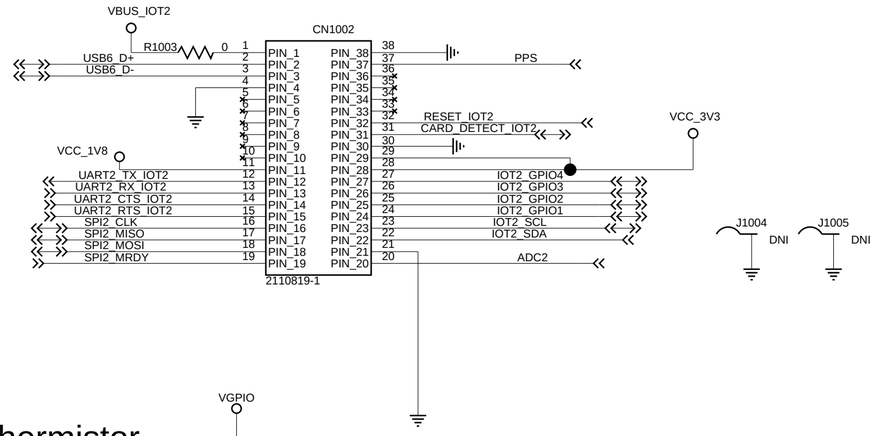
IOT#0



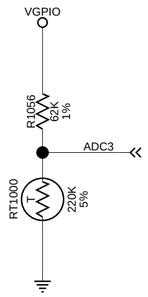
IOT#1

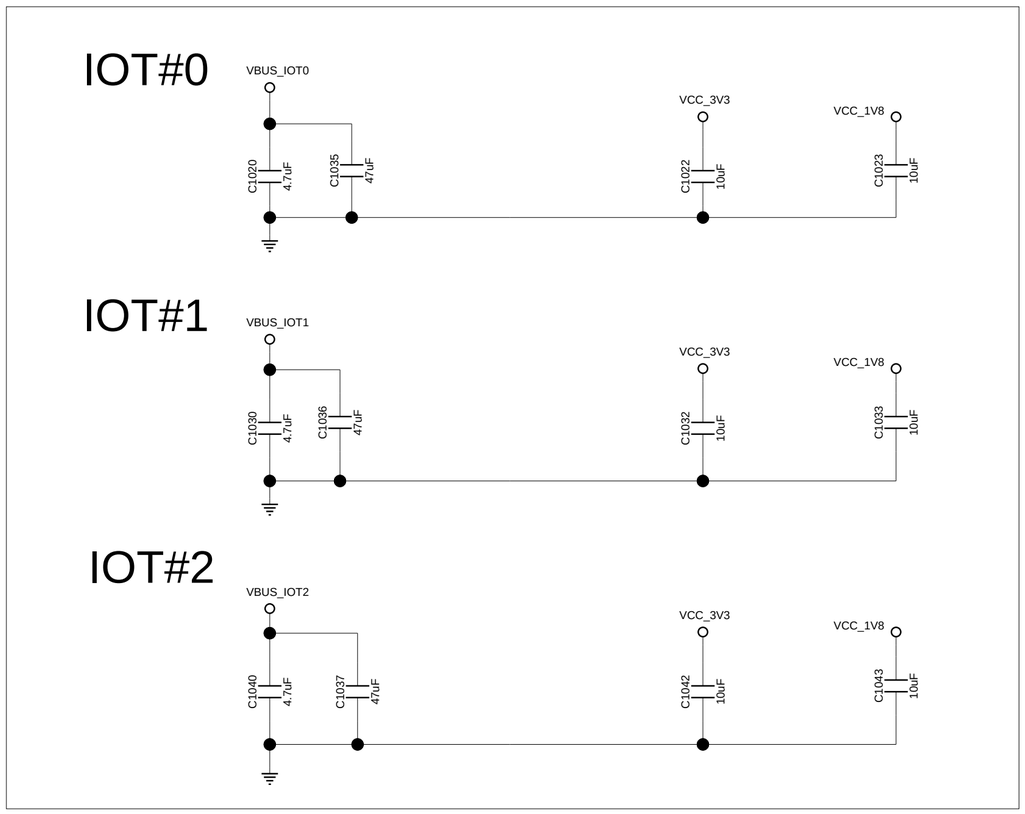


IOT#2



On Board Thermistor





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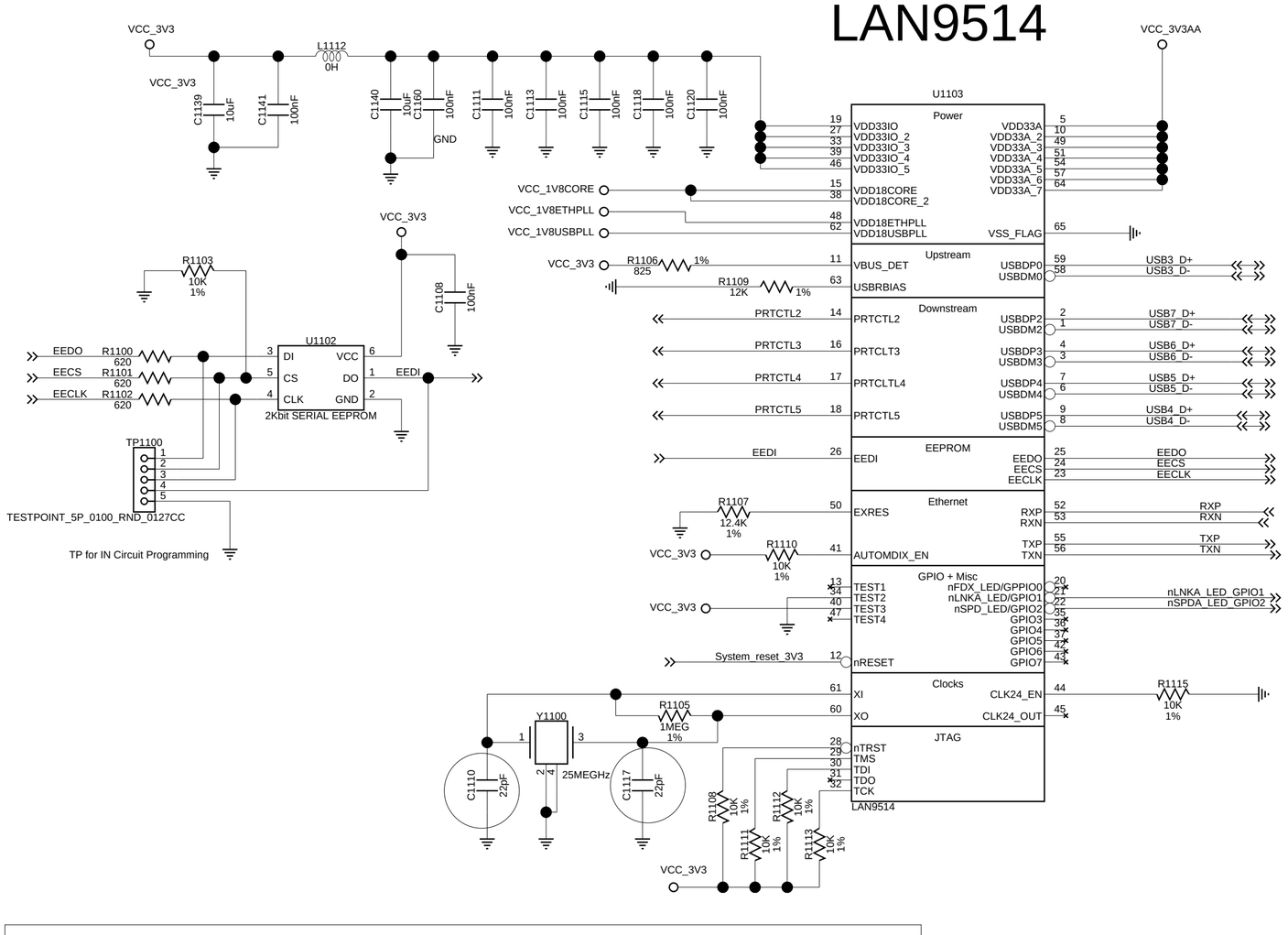
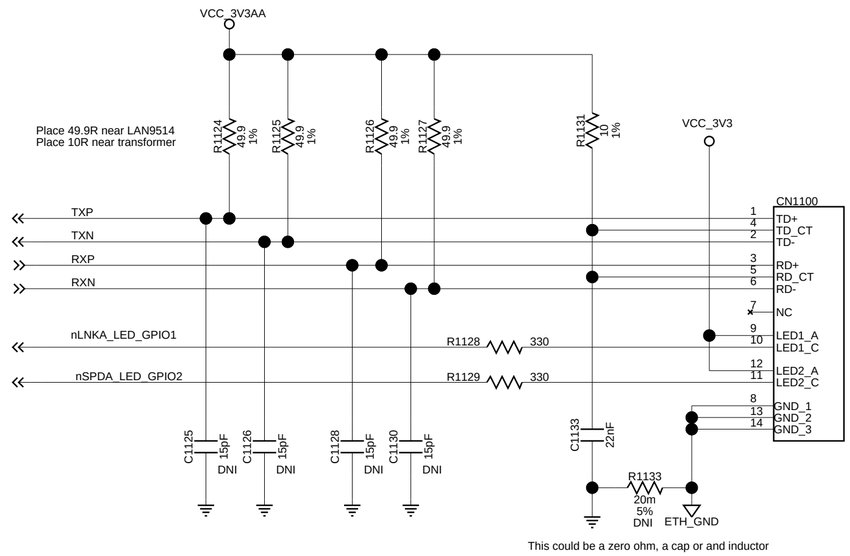
LAN9514

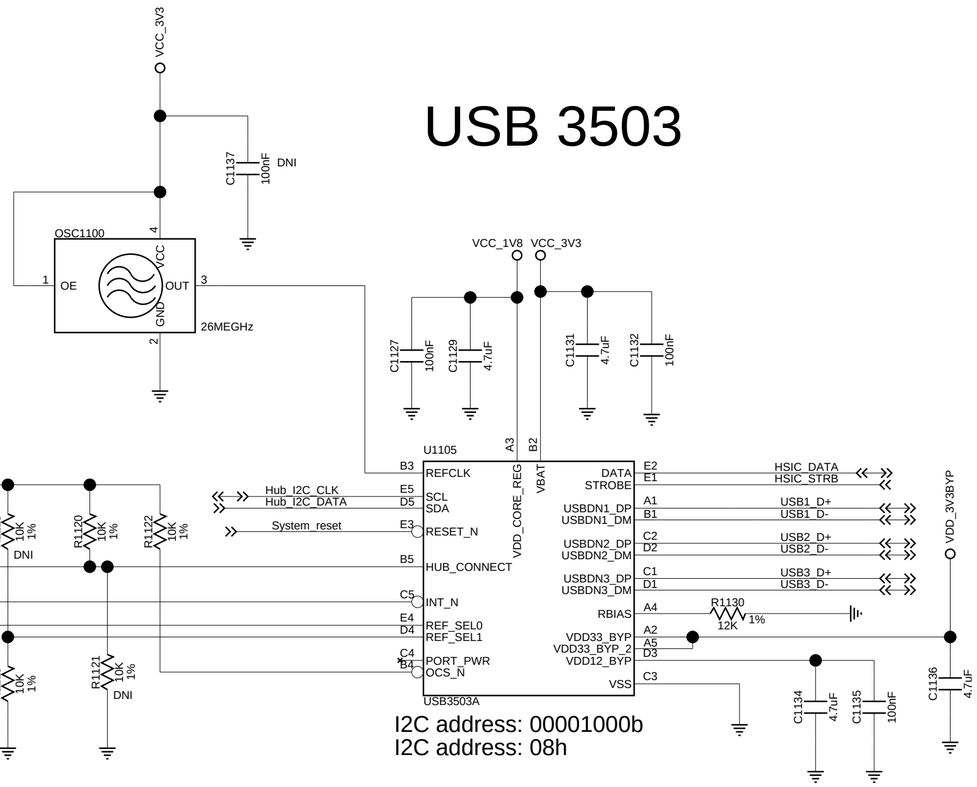


ETHERNET JACK



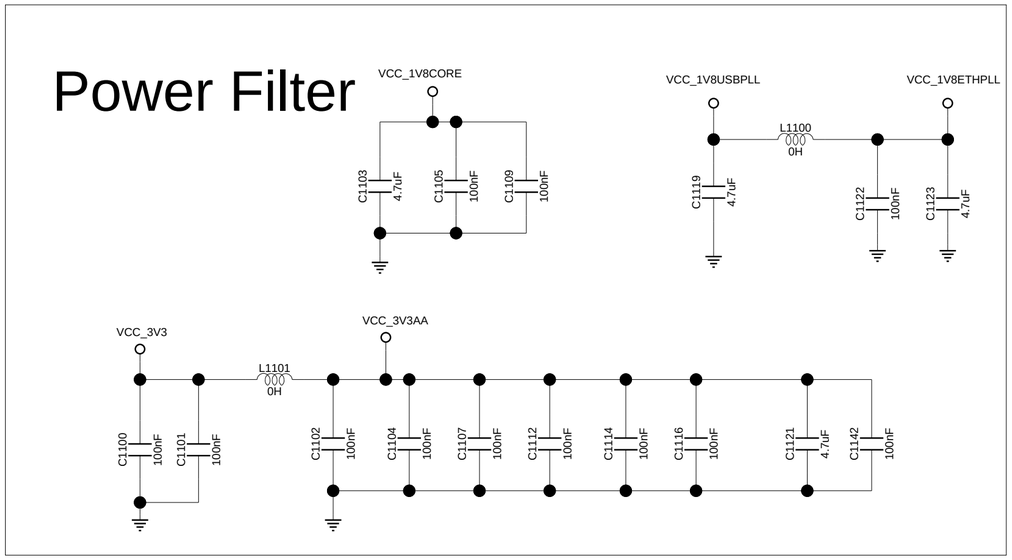
This could be a zero ohm, a cap or and inductor

USB 3503

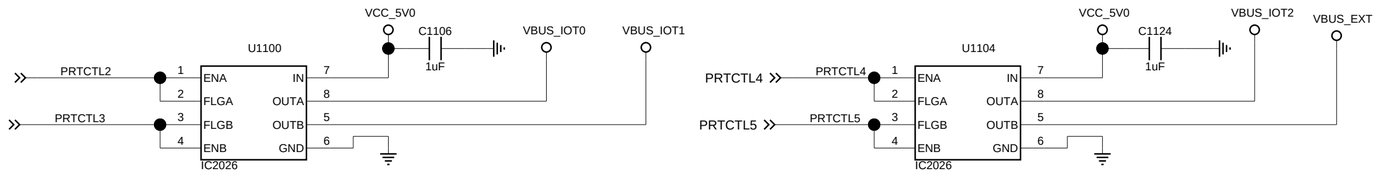


I2C address: 00001000b
I2C address: 08h

Power Filter



USB Downstream Power



SIERRA WIRELESS™

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REV SCH	See P1
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PSU Front End and 3.7V DC/DC converter

USB_VBUS

R1213 0 0% DNI

TP1200

CN1204 POST TERMINAL STRIP

MAX OPERATIVE INPUT VOLTAGE = 17V
MIN OPERATIVE INPUT VOLTAGE = 5V (3.9V with BATT)
(ABSOLUTE MAX INPUT VOLTAGE = 20V)

Q1200 Imax= 3.8A MOSFET P-CHANNEL

V_IN

CN1200 FC681465P

L1200 0H

C1202 220nF

C1203 220nF

D1200 SMAJ20CA

R1216 100K 5%

R1217 10K 1%

V_IN

V_SYS_BATT

R1210 10K 1%

R1211 300

R1212 47K

D1201

Notes:
* For High Reliability systems use the WD feature of BQ24292i
* Voltage on ILIM can be measured to monitor total input current on device

VCC_3V7

R1285 300

D1210

U1200

VBUS_1, VBUS_2, PMID, PG_n, STAT, SDA, SCL, INT, OTG, CE_n, PSEL, PGND_1, SW_1, SW_2, BTST, REGN, SYS_1, SYS_2, BAT_1, BAT_2, ILIM, TS1, TS2, PGND_2, PGND_3

BQ24192IRGER

I2C address 1010101b
I2C address 6BH

BattChrgr_PG_N

STAT_BATT4

charger_I2C_DATA

charger_I2C_CLK

Default value 2.2uH

L1201 3.3uH

C1204 47nF

V_SYS_BATT

REGN_BATT

V_BATT

C1205 4.7uF

C1208 10uF

C1206 100nF

C1209 47uF

R1223 0 0%

VCC_3V7

TP1201

C1207 22uF

C1215 220nF

C1210 1uF

C1241 1uF DNI

C1200 10uF

V > 20V
Place as close as possible

PWR_GND_BQ

R1218 150 1%

I_lim_max = 3.5A

U1201 BQ27621YZFR-G1A

GPIO1/I2C1_CLK

GPIO5/I2C1_DATA

VGPIO

R1224 10K

R1222 10K DNI

BattGauge_GPIO

I2C address 1010101b
I2C address 55H

C1213 470nF

C1214 1uF

R1229 1MEG 1% DNI

TP1203

TP1202

CN1202 B2B-PH-K-S

CN1203 POST TERMINAL STRIP

R1228 0 DNI

R1220 5.23K 1%

R1221 10K 1%

R1219 30.1K 1%

TEMP_SENS

Ideal battery should have a 103-AT thermistor inside
If using battery with no thermistor then short Pin1 and Pin2 of CN1203

R1202 10K 1%

R1203 10K 1% DNI

R1205 10K 1% DNI

R1207 10K 1% DNI

R1204 10K 1%

R1206 10K 1%

R1208 10K 1%

BattChrgr_INT_N

R1214 10K 1%

R1215 15K 1%

PCB layout note
Connect PWR_GND_BQ and Main ground together using Pin 25 as connection point

VGPIO

R1209 10K 1%

Q1201 NPN

R985 33 DNI

Battery_detect

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REV SCH	See P1
REV PCB	See P1
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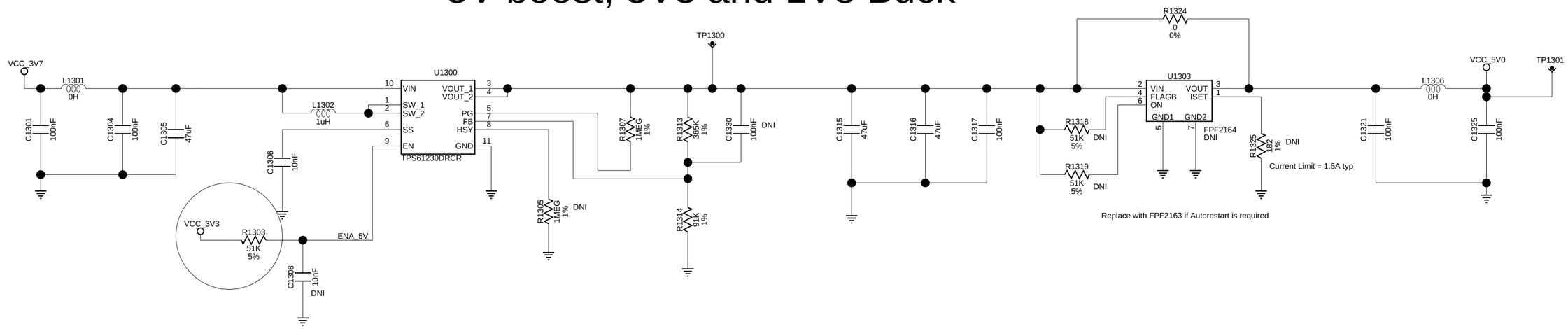
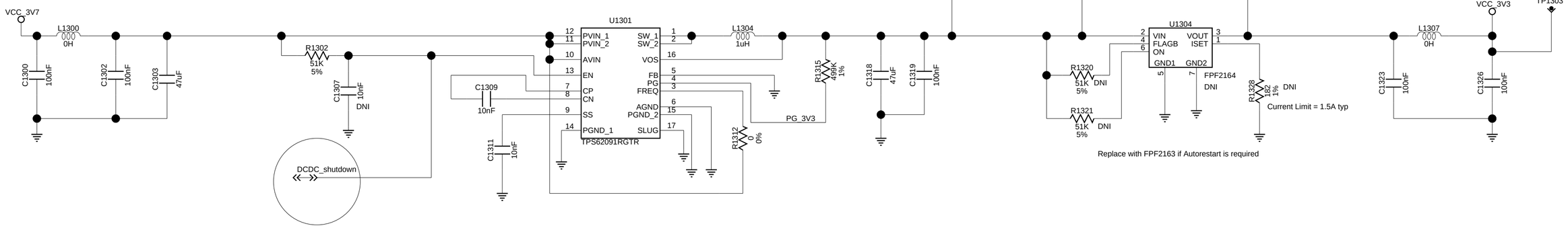
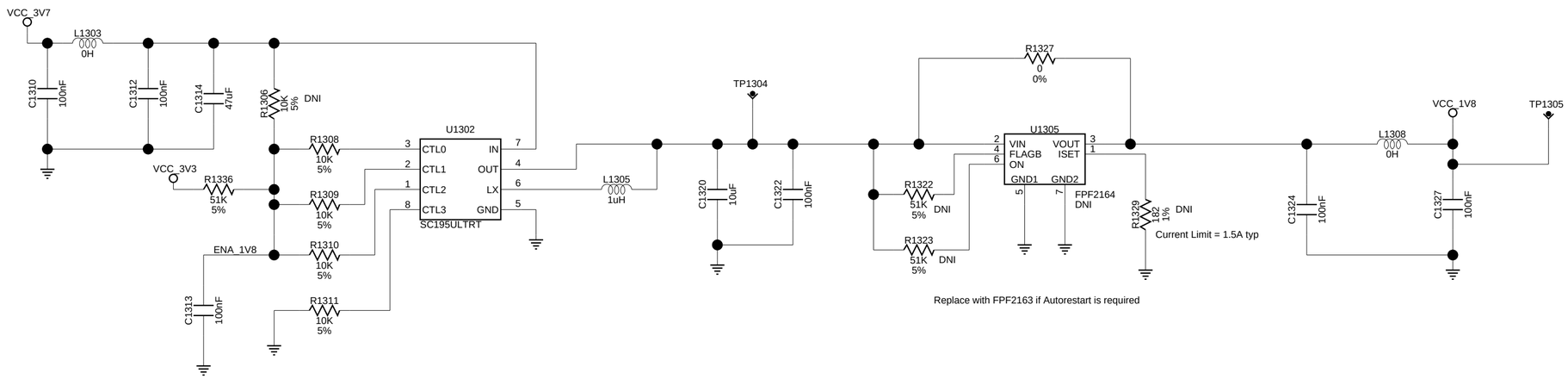
5V boost, 3V3 and 1V8 Buck







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REV SCH	See P1
REV PCB	See P1
PROJECT	MANGO GREEN
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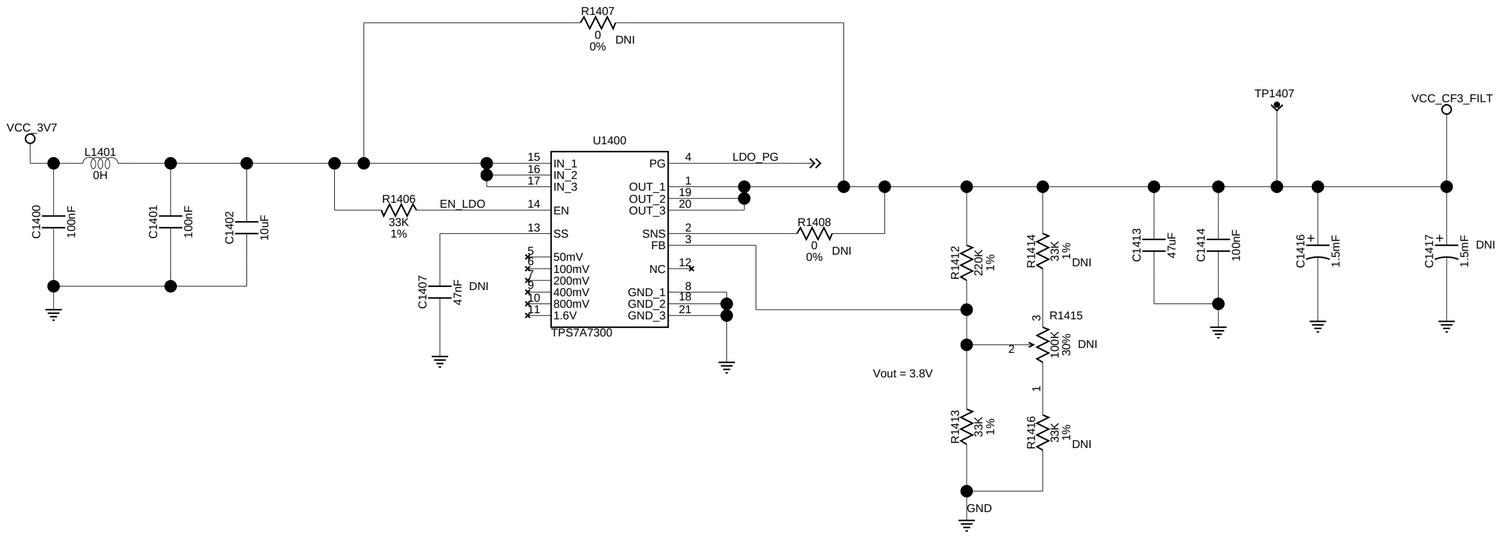
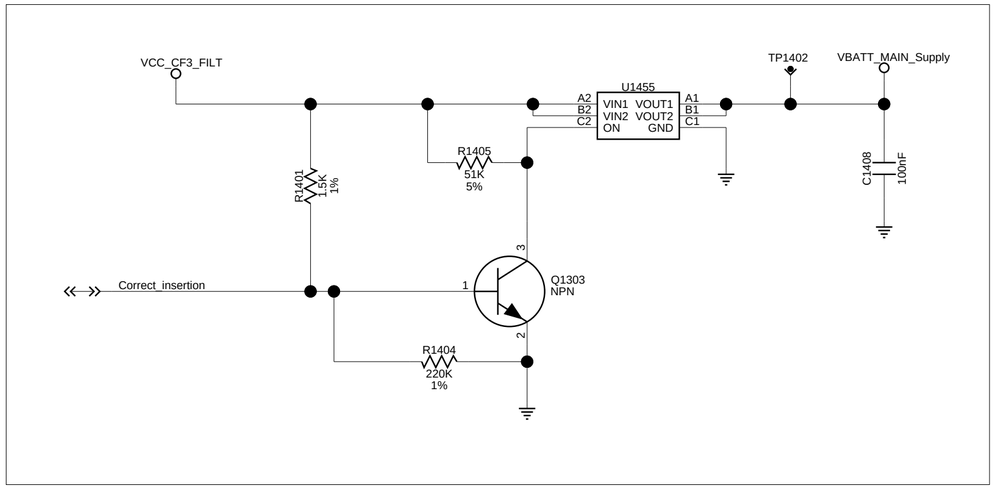
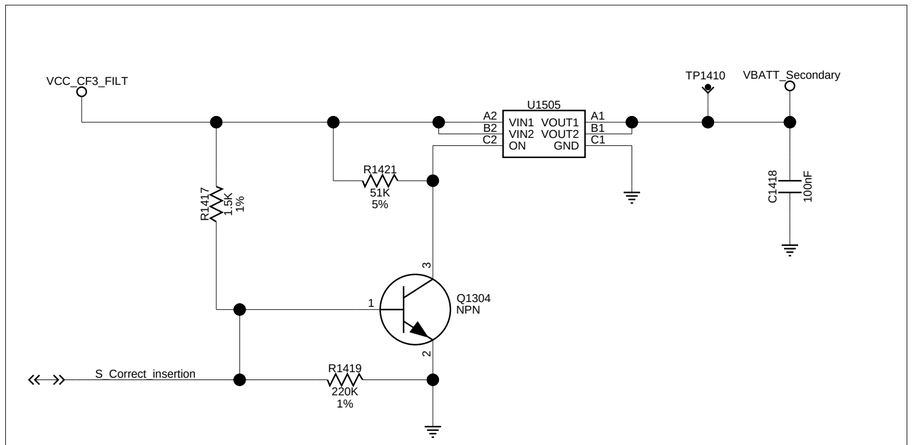
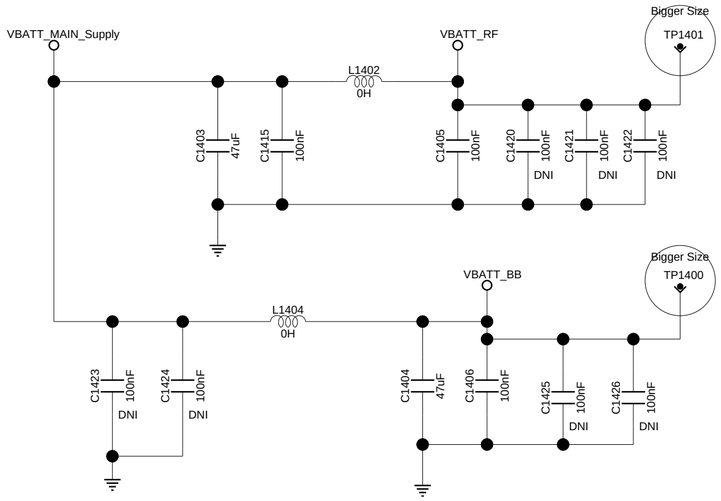
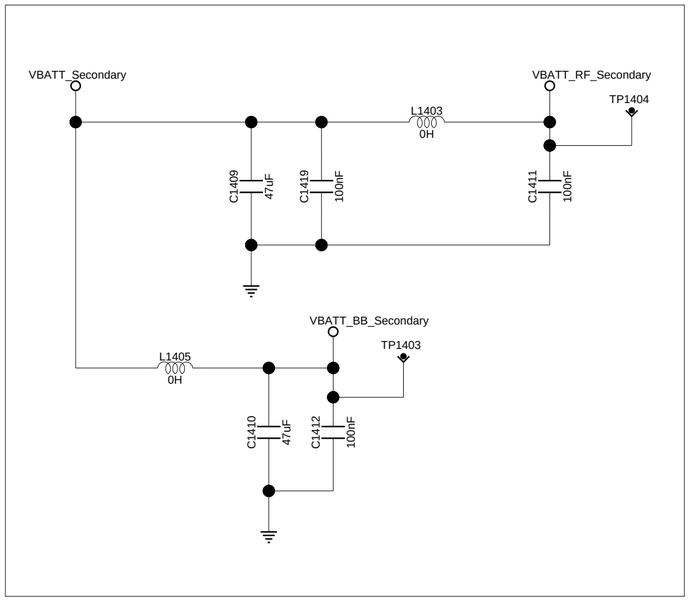
CF3 LDO

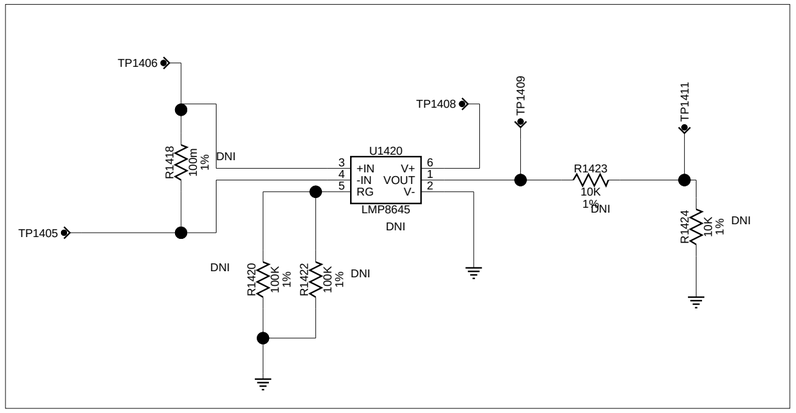












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REV SCH	See P1
REV PCB	See P1
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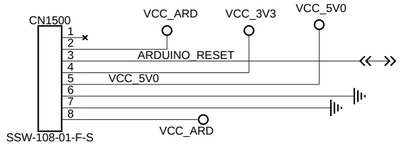
Make sure to line up Arduino connector orientation properly

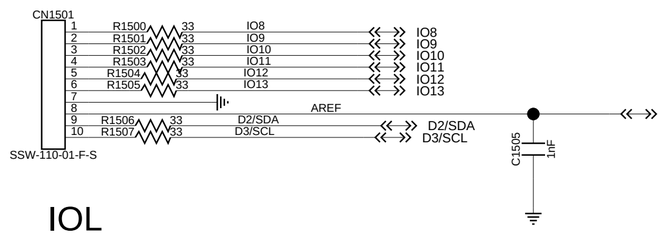
Arduino Connector

ARDUINO_RESET: Need to connect: use level shifter

Power



IOH



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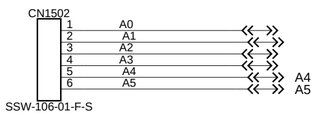

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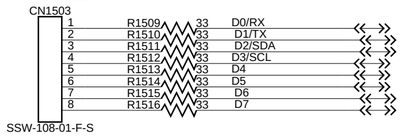
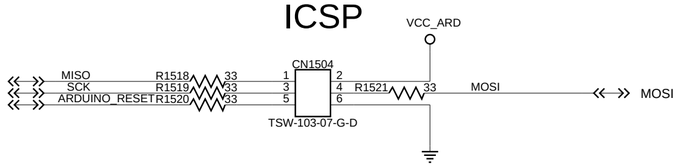
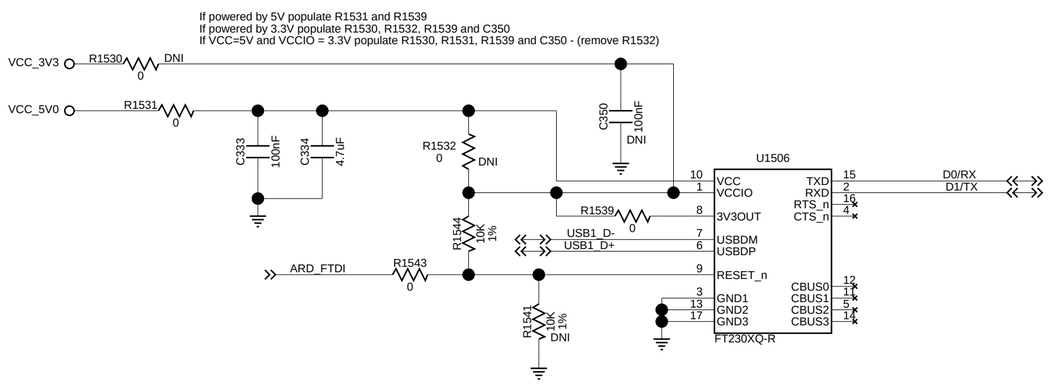


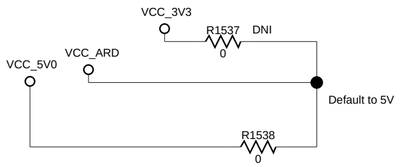
ICSP



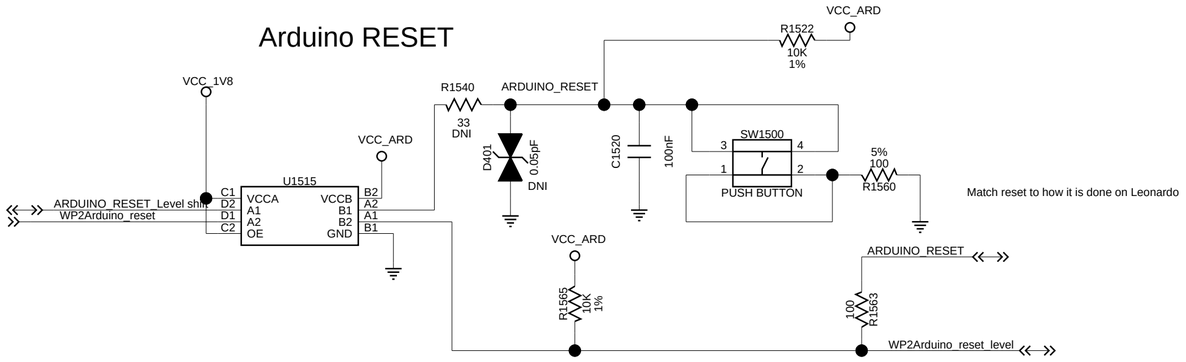
If powered by 5V populate R1531 and R1539
If powered by 3.3V populate R1530, R1532, R1539 and C350
If VCC=5V and VCCIO = 3.3V populate R1530, R1531, R1539 and C350 - (remove R1532)

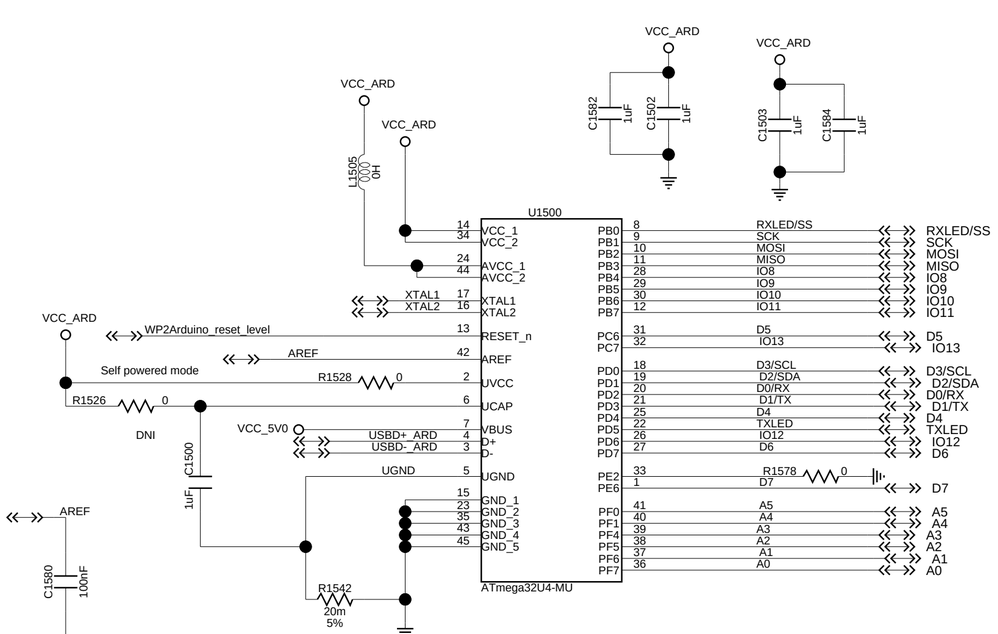


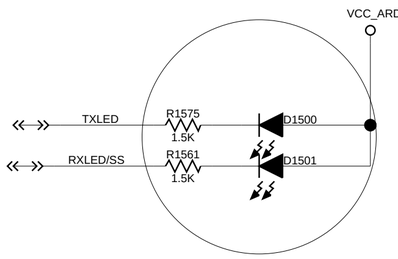
ARDUINO Voltage Select



Arduino RESET







SIERRA WIRELESS™

SITE	CTO Office
LEAD ENGINEER	Ashish Syal
REV SCH	See P1
REV PCB	See P1
PROJECT	MANGO GREEN
DATE/TIME	28-01-2016_10:18
SCHEMATIC	2500905
PAGE	15 OF 15