MangOH Red Platform

SHEET 1 TABLE OF CONTENTS

SHEET 2 CF3 SOCKET

SHEET 3 RF, USB, IOT connectors

SHEET 4 RESET, CTRL switch, I2C HUB

SHEET 5 AUDIO (ANALOG & PCM)

SHEET 6 SIM cards, SD card, SDIO mux

SHEET 7 USB HUB, GPIO Expander, FTDI conv

SHEET 8 Battery Charger and USB power

SHEET 9 1V8,3V3,5V0 Power Supply

SHEET 10 WIFI and BT

Project Variants

	1600643		
DNI	N		
MIC_OMTP	N		
MIC_CTIA	Y		

Variants description

DNI = Do Not Install
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
51h = EEPROM with Board ID
64h = Battery gauge
60h = 6 Axis IMU
6Bh = Buck+batt charger
71h = I2C Hub
76h = Pressure Sensor

REFERENCE

1600674 PCA, MANGOH
5302303 PCB, MANGOH

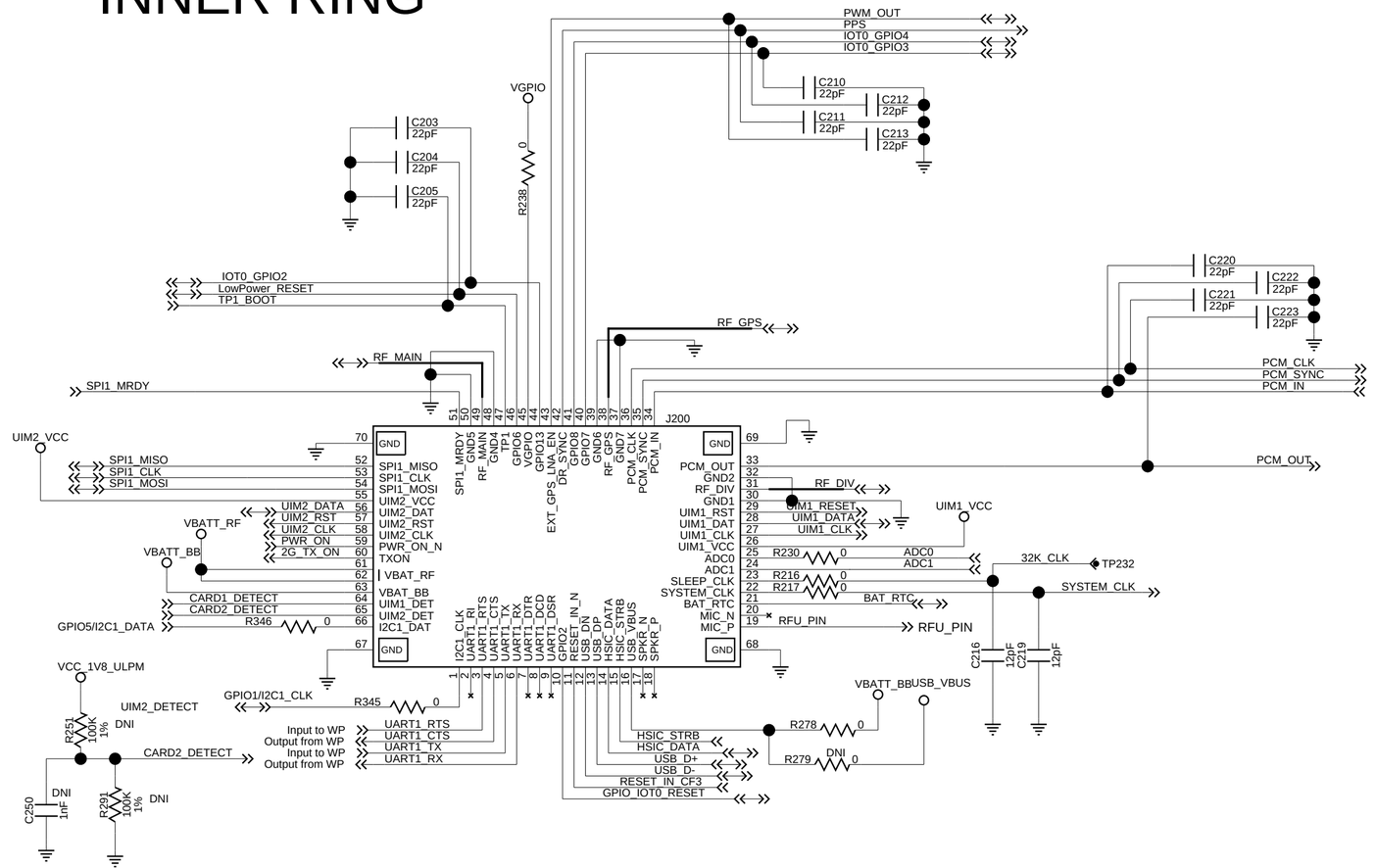
This document contains information which is proprietary to Sierra Wireless Inc. and is licensed pursuant to Creative Commons Attribution 4.0 International License.

Copyright (C) 2016

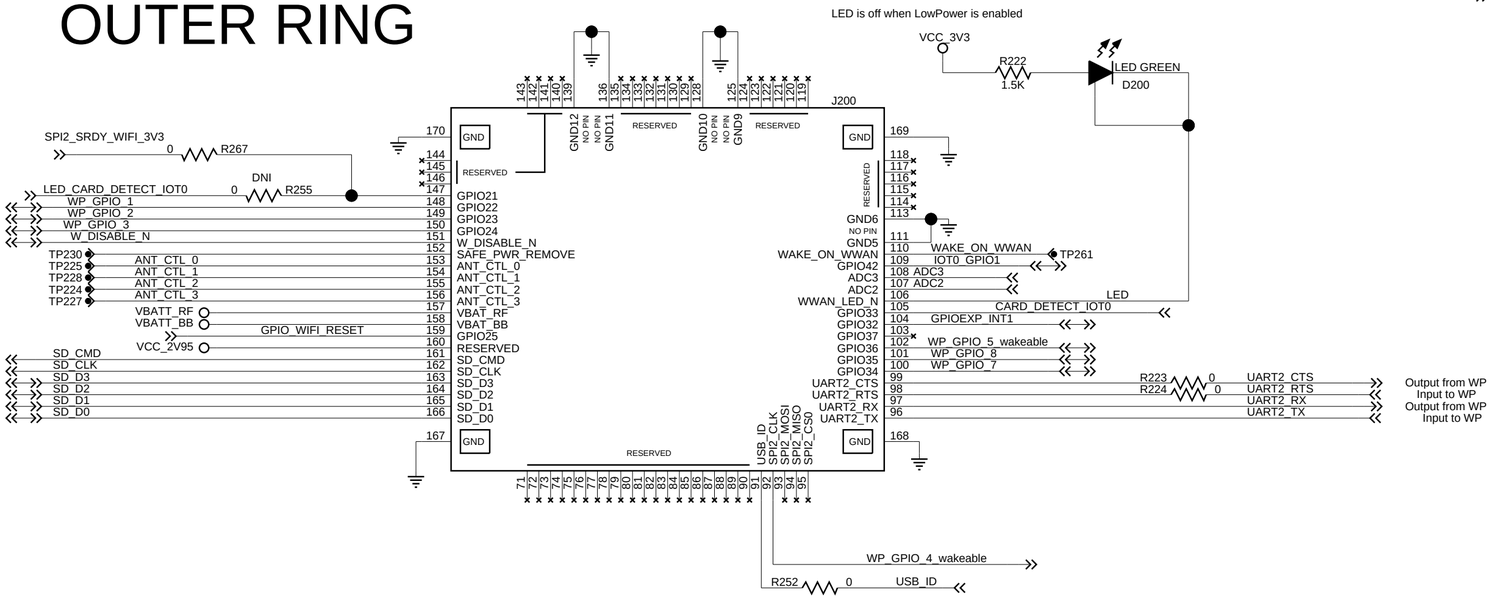
SIERRA WIRELESS™

SITE	CTO Office
LEAD ENGINEER	Ashish Syal
REV SCH	46
REV PCB	4
PROJECT	MANGO RED
DATE/TIME	19-04-2017_11:01
SCHEMATIC	2500927
PAGE	1 OF 10

INNER RING

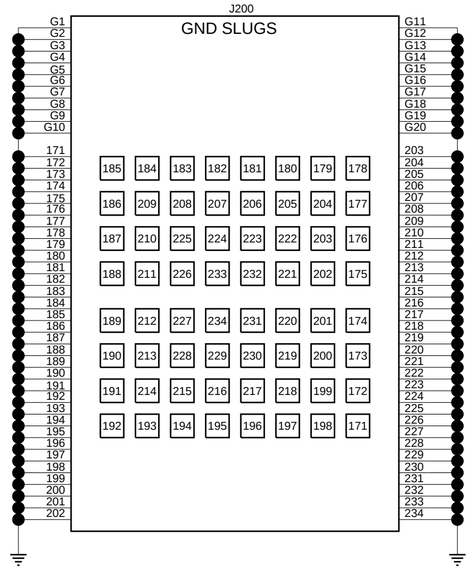


OUTER RING

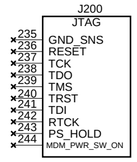


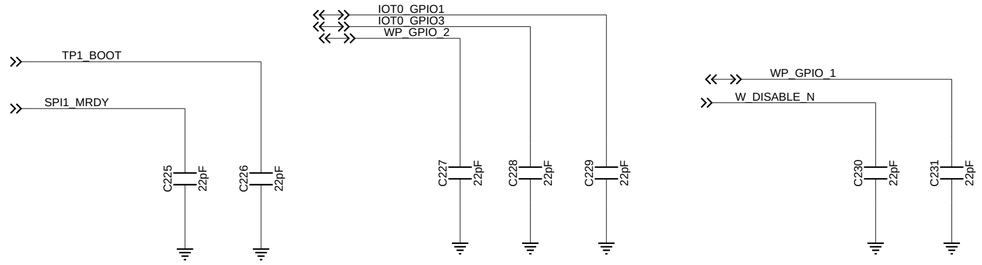
No Pull UP on
GPIO_35
GPIO_2
TX_ON
ANT_CNTL1
ANT_CNTL2
GPIO_8
GPIO_33

GROUND SLUG

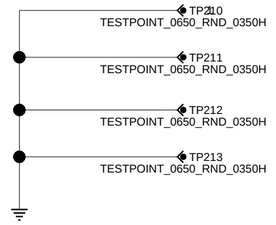


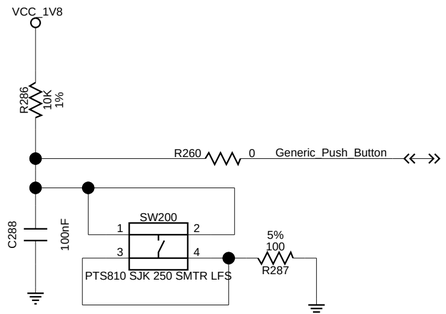
JTAG





Mounting Holes





This document contains information which is proprietary to Sierra Wireless Inc. and is licensed pursuant to Creative Commons Attribution 4.0 International License.

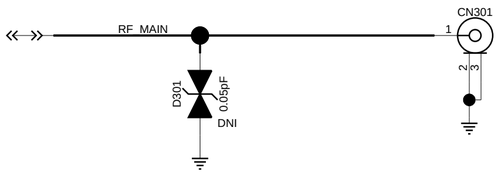
Copyright (C) 2016

SIERRA WIRELESS™

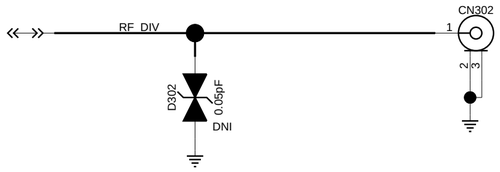
SITE	CTO Office
LEAD ENGINEER	Ashish Syal
REV SCH	See P1
REV PCB	See P1
PROJECT	MANGO RED
DATE/TIME	19-04-2017_10:54
SCHEMATIC	2500927
PAGE	2 OF 10

MAIN CF3 Socket

Main Antenna

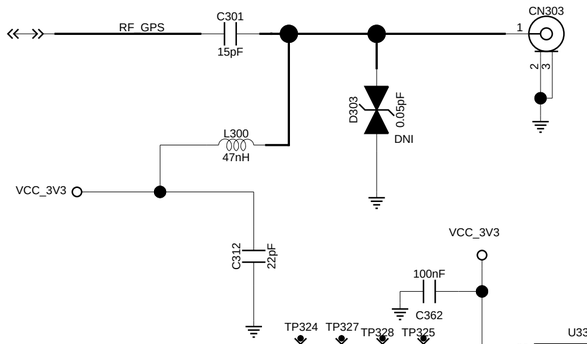


Diversity

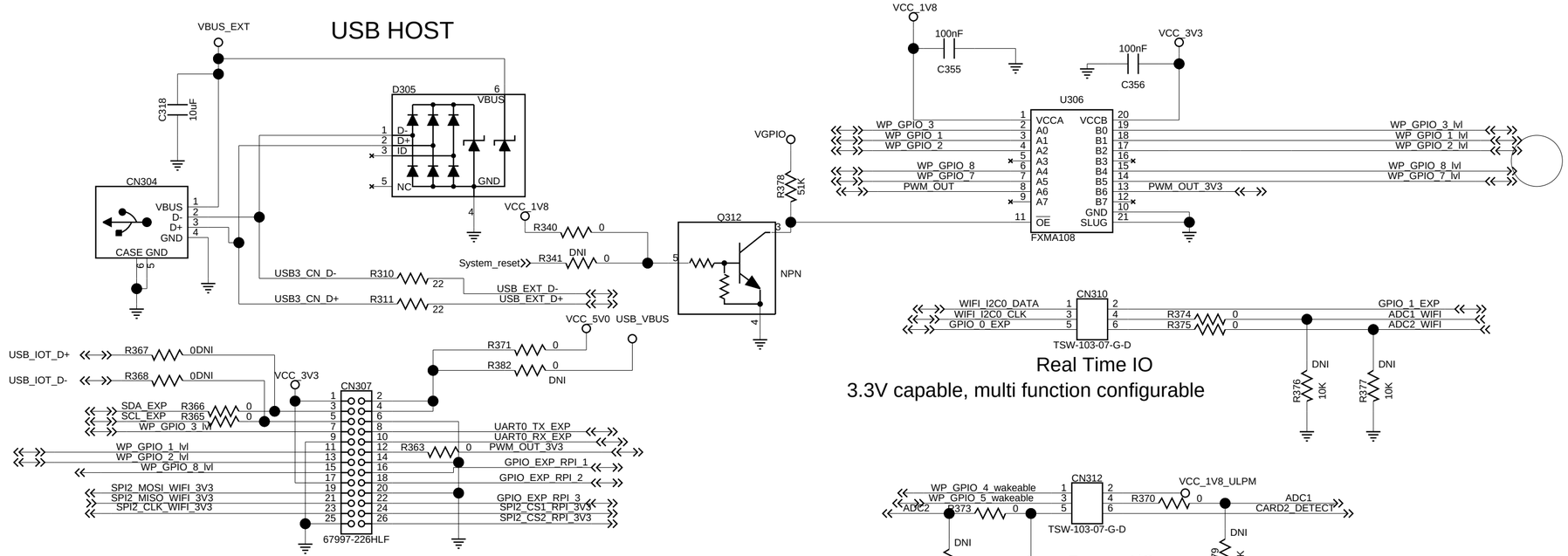


GPS

Active Antenna Supply



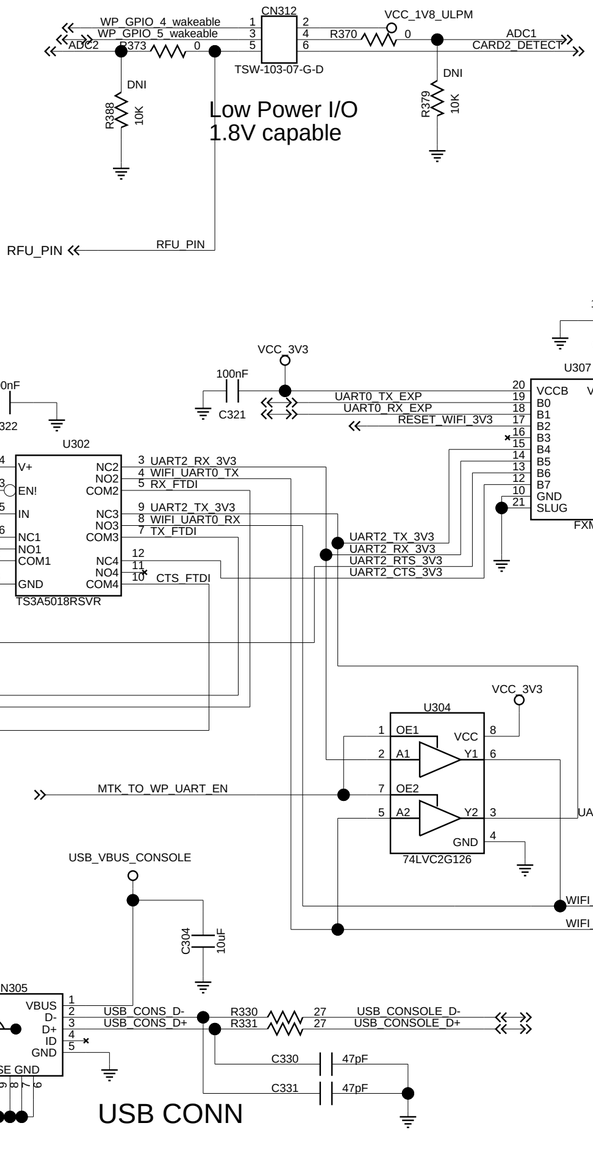
USB HOST



26 pin Raspberry Pi Compatible
3.3V capable

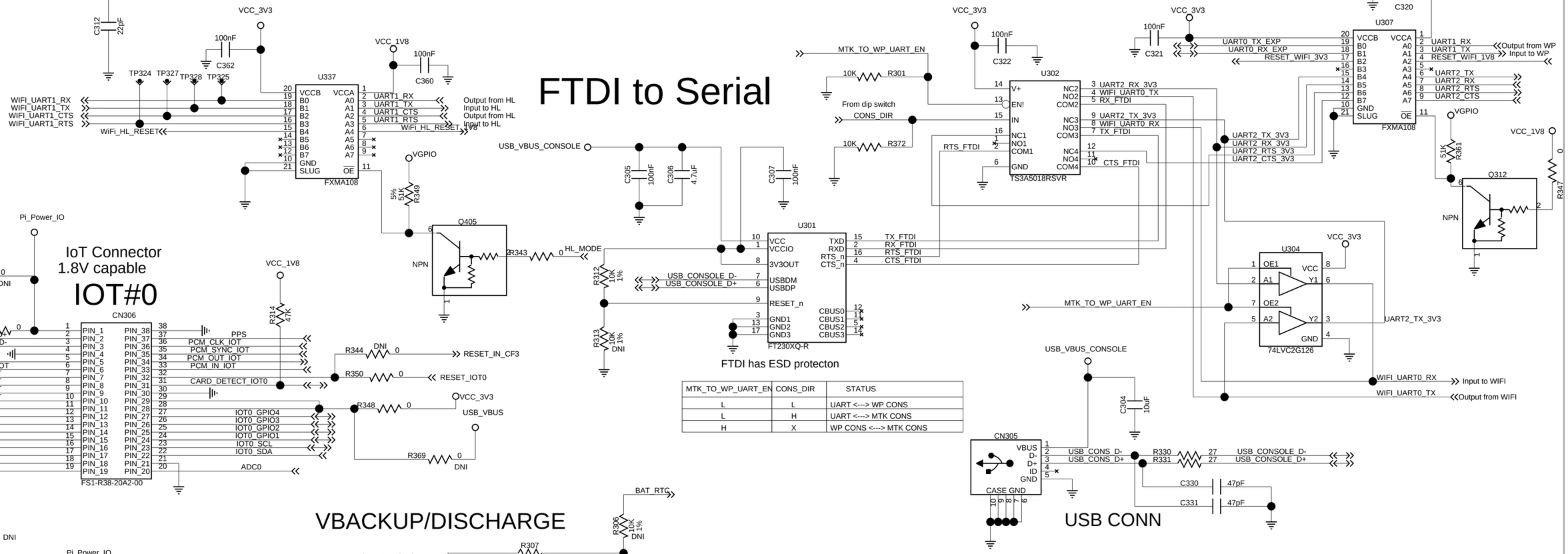
Real Time IO

3.3V capable, multi function configurable



Low Power I/O
1.8V capable

FTDI to Serial



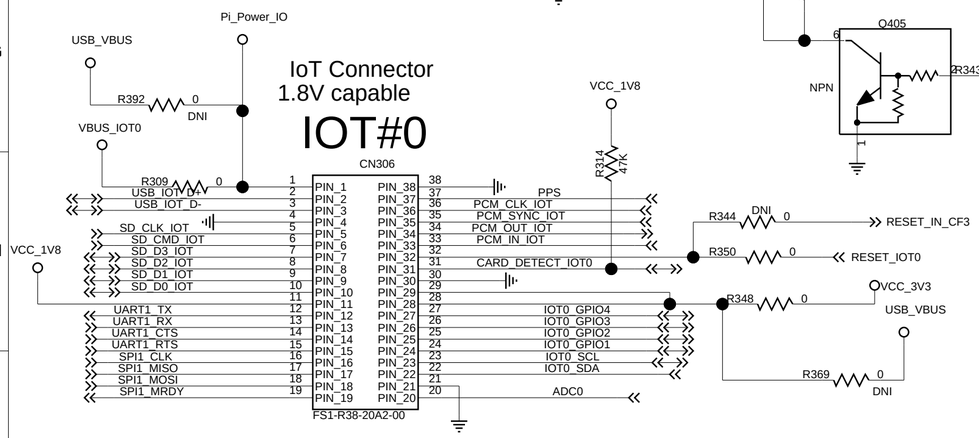
FTDI has ESD protecton

MTK_TO_WP_UART_EN	CONS_DIR	STATUS
L	L	UART <---> WP CONS
L	H	UART <---> MTK CONS
H	X	WP CONS <---> MTK CONS

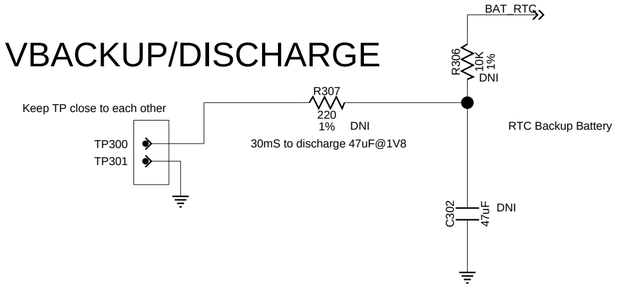
USB CONN

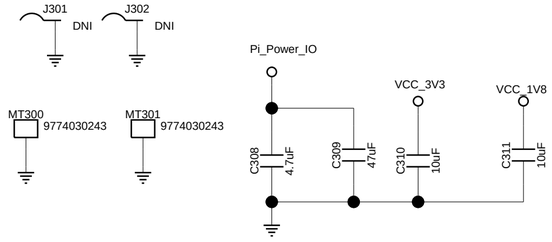
IoT Connector
1.8V capable

IOT#0



VBACKUP/DISCHARGE





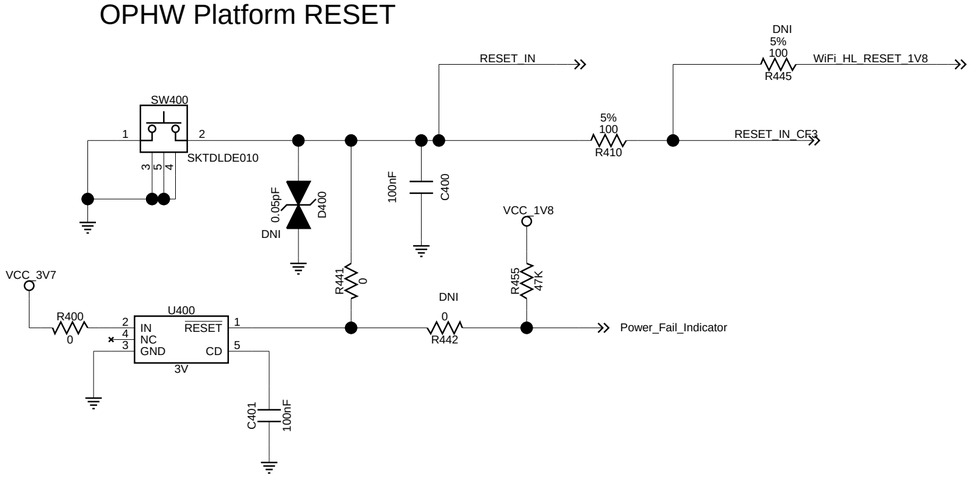
This document contains information which is proprietary to Sierra Wireless Inc. and is licensed pursuant to Creative Commons Attribution 4.0 International License.

Copyright (C) 2016

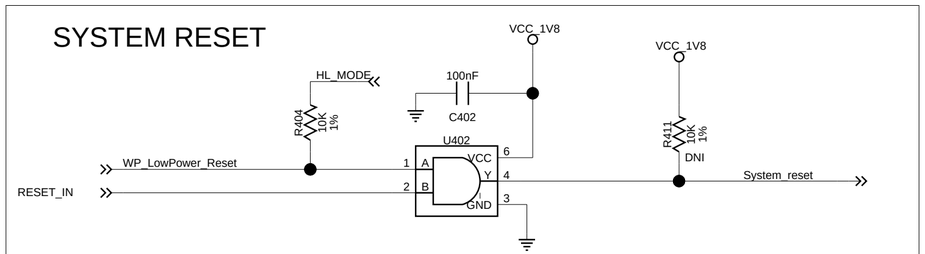
SIERRA WIRELESS™

SITE	CTO Office
LEAD ENGINEER	Ashish Syal
REV SCH	See P1
REV PCB	See P1
PROJECT	MANGO RED
DATE/TIME	07-04-2017_08:15
SCHEMATIC	2500927
PAGE	3 OF 10

OPHW Platform RESET

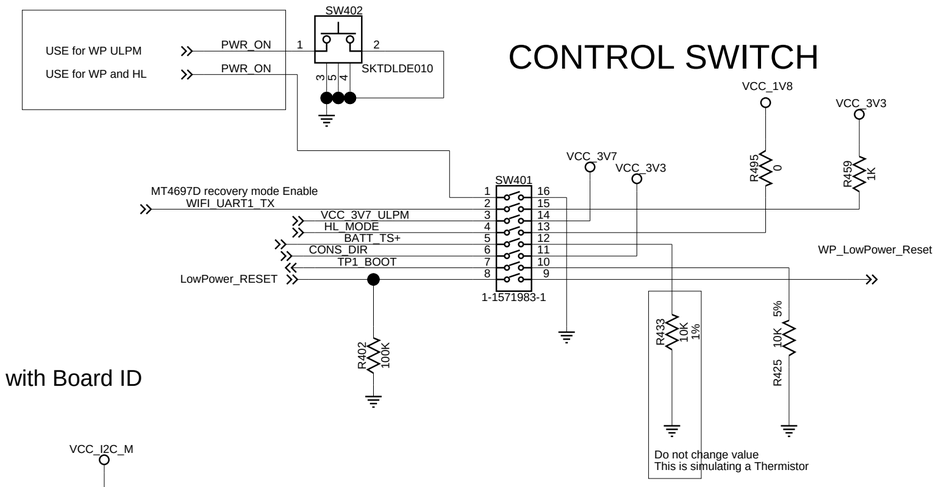


SYSTEM RESET

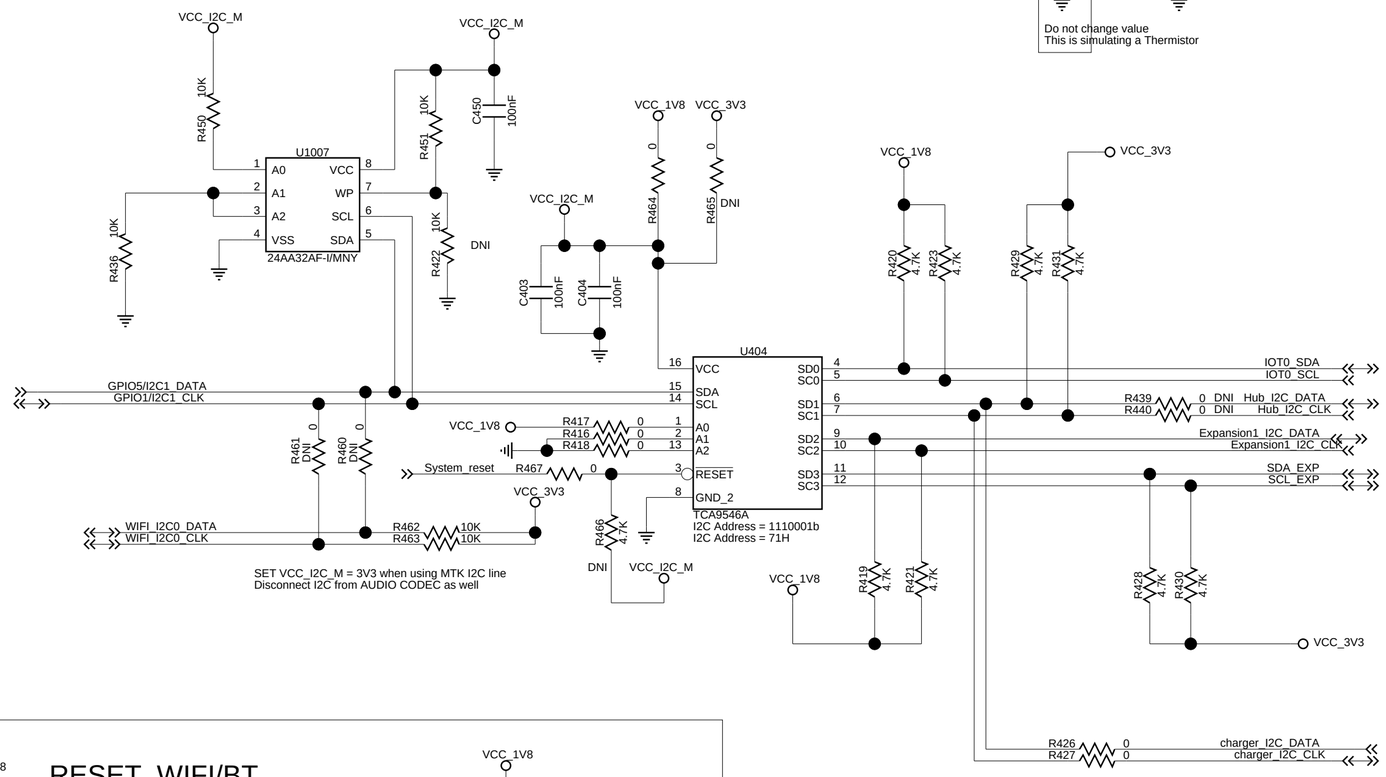


R403 = ON , R404 = DNI --> System_reset is High during startup and when LowPowerReset = HiZ
R403 = DNI , R404 = ON --> System_reset is Low during startup and when LowPowerReset = HiZ

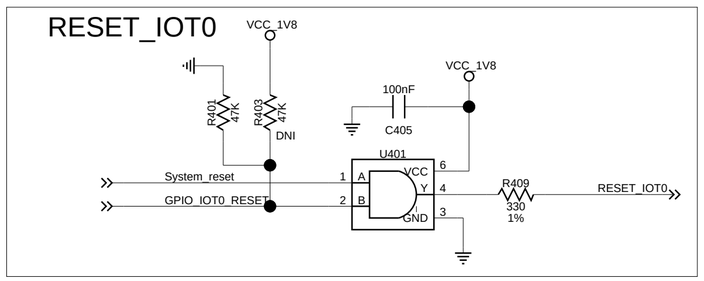
CONTROL SWITCH



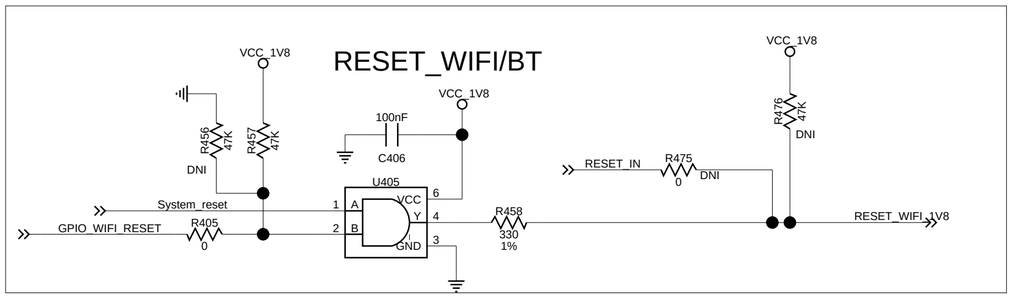
Addr 51h = EEPROM with Board ID



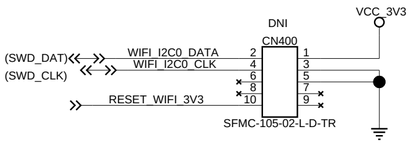
RESET_IOT0



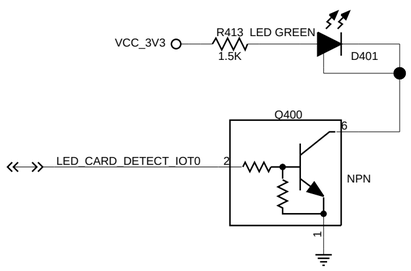
RESET_WIFI/BT

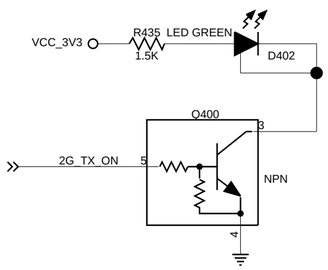


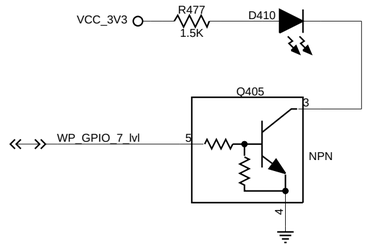
uC DEBUG

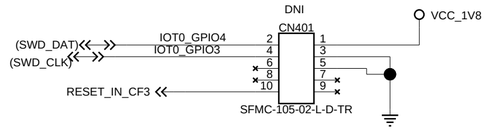


LEDs









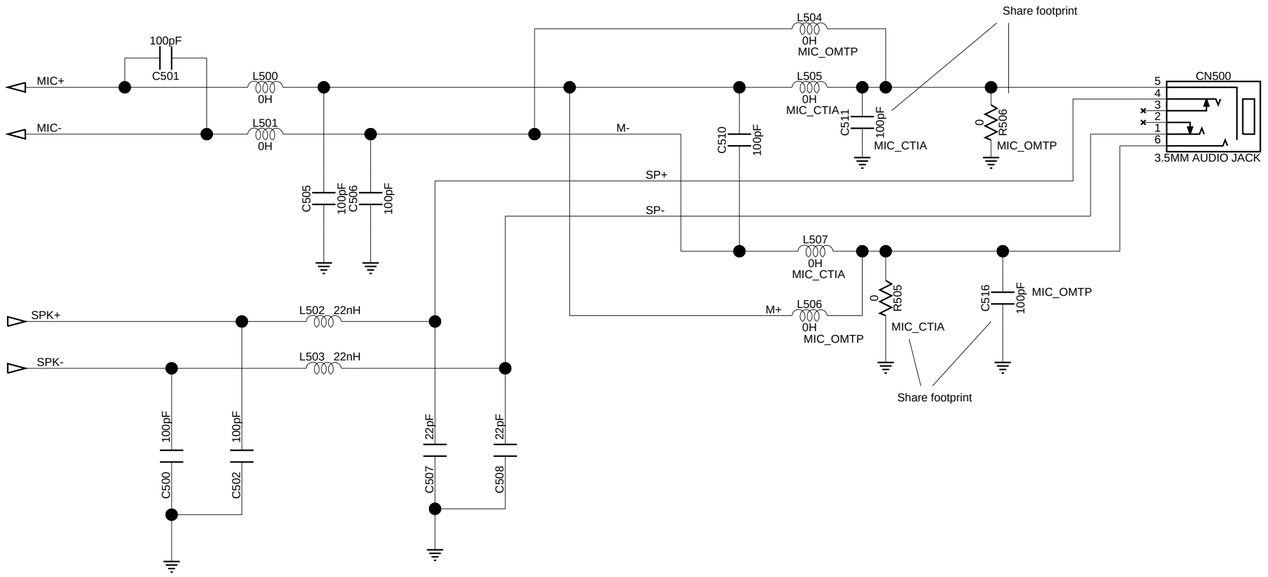
This document contains information which is proprietary to Sierra Wireless Inc. and is licensed pursuant to Creative Commons Attribution 4.0 International License.

Copyright (C) 2016

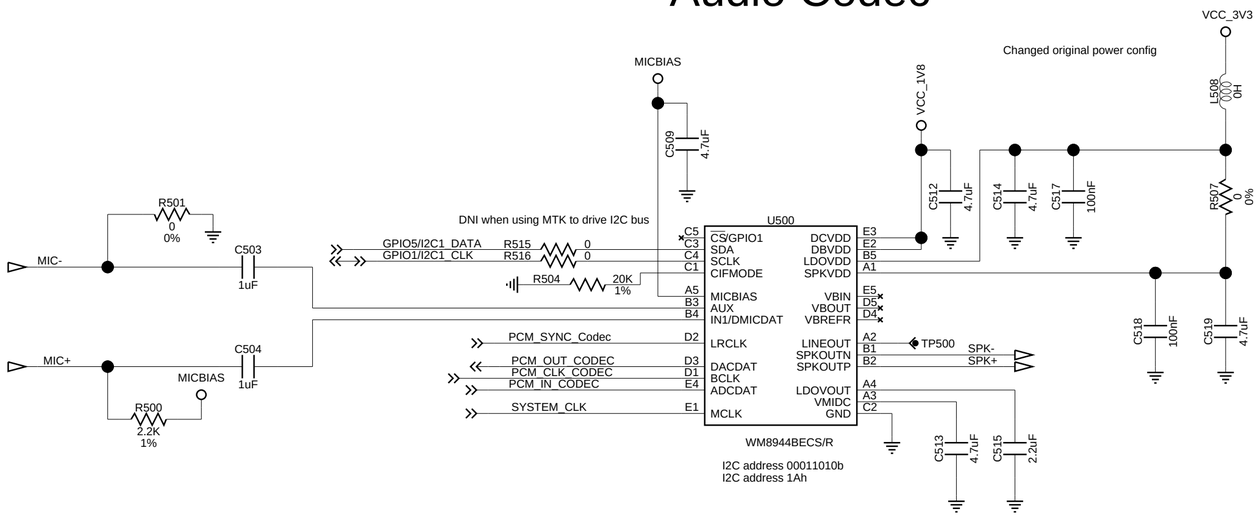
SIERRA WIRELESS™

SITE	CTO Office
LEAD ENGINEER	Ashish Syal
REV SCH	See P1
REV PCB	See P1
PROJECT	MANGO RED
DATE/TIME	07-04-2017_08:13
SCHEMATIC	2500927
PAGE	4 OF 10

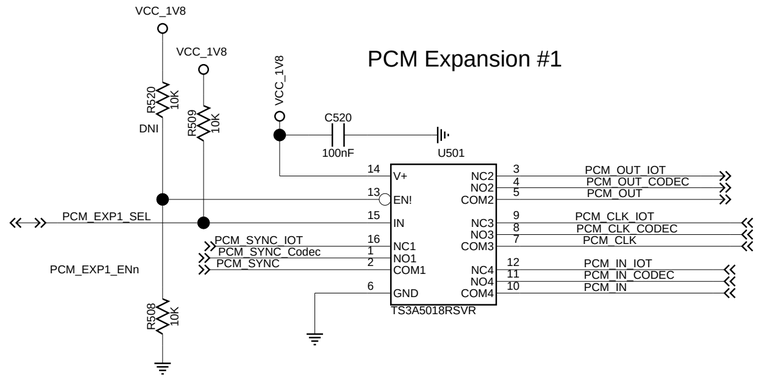
Audio Source Selection



Audio Codec



PCM Expansion #1



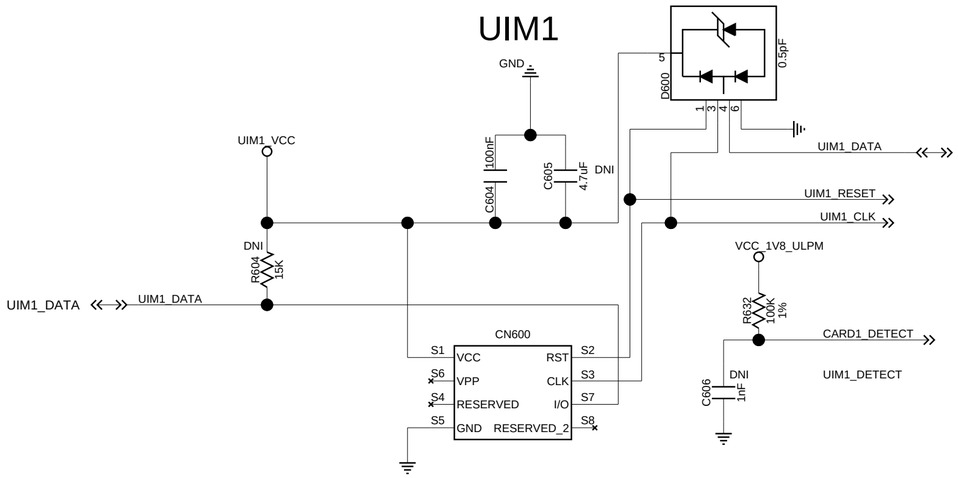
Default config = PCM to mangoh Red Codec

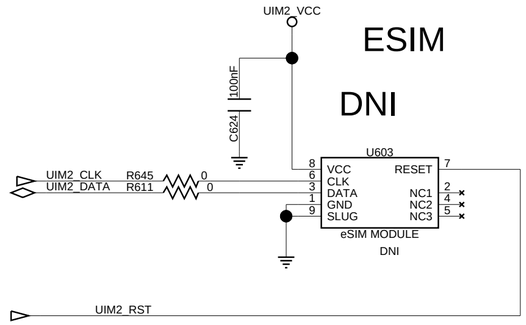
This document contains information which is proprietary to Sierra Wireless Inc. and is licensed pursuant to Creative Commons Attribution 4.0 International License.

Copyright (C) 2016

SIERRA WIRELESS™

SITE	CTO Office
LEAD ENGINEER	Ashish Syal
REV SCH	See P1
REV PCB	See P1
PROJECT	MANGO RED
DATE/TIME	16-12-2016_15:31
SCHEMATIC	2500927
PAGE	5 OF 10

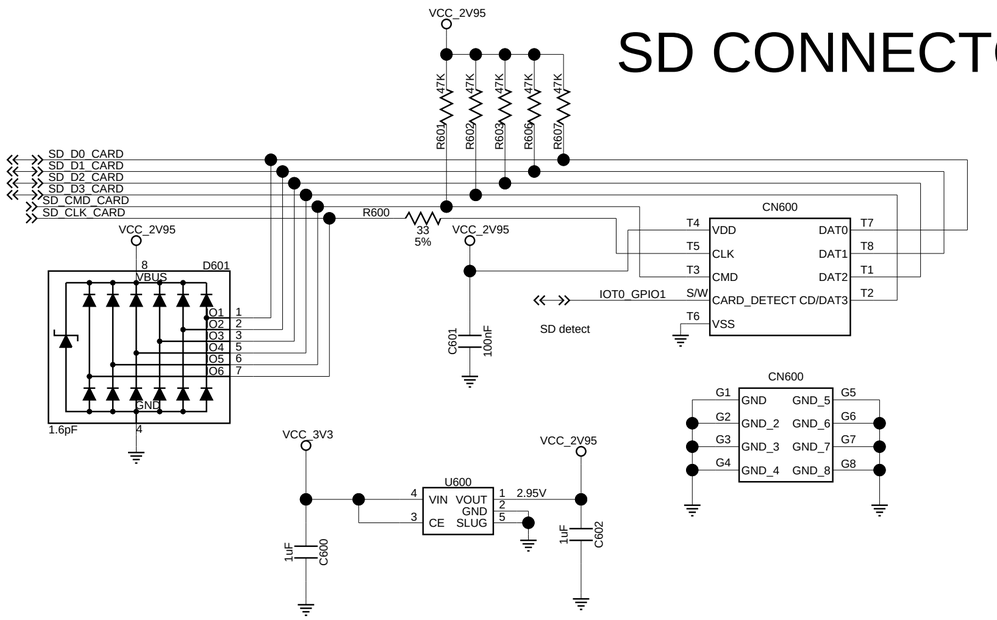


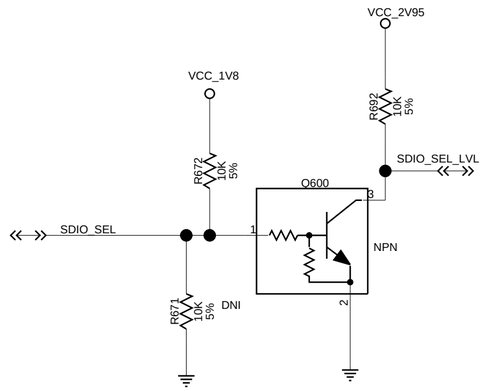


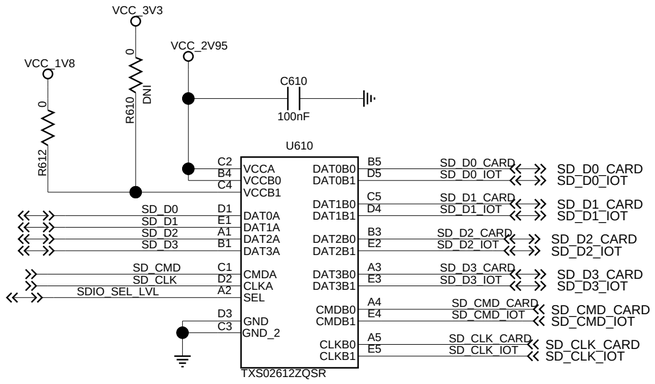
SIM card detected only if present at startup
Check required

SDIO Expansion

SD CONNECTOR







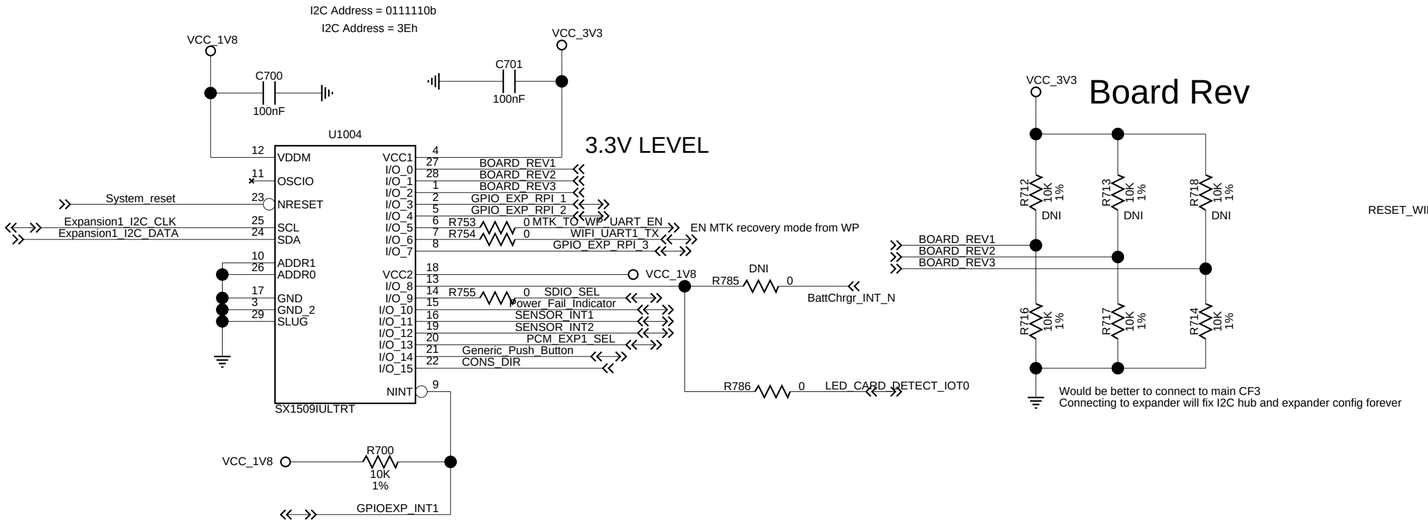
This document contains information which is proprietary to Sierra Wireless Inc. and is licensed pursuant to Creative Commons Attribution 4.0 International License.

Copyright (C) 2016

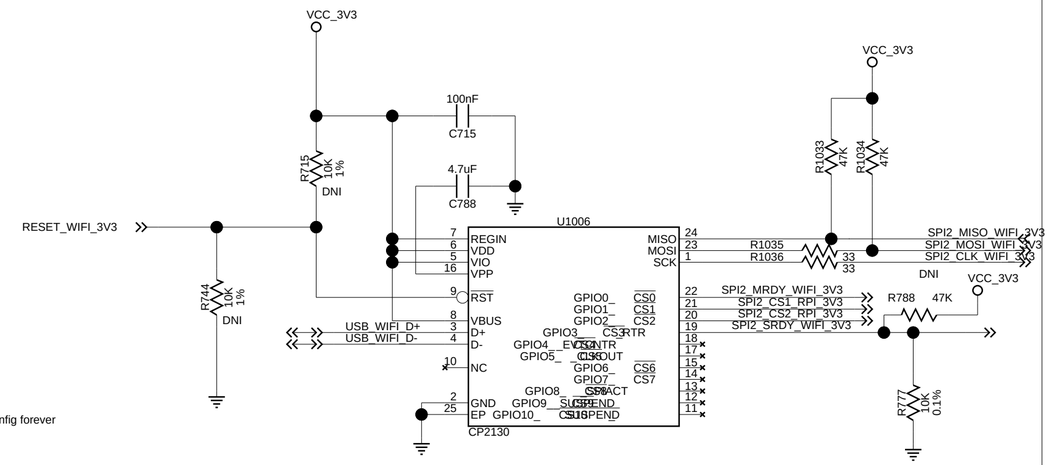
SIERRA WIRELESS™

SITE	CTO Office
LEAD ENGINEER	Ashish Syal
REV SCH	See P1
REV PCB	See P1
PROJECT	MANGO RED
DATE/TIME	31-01-2017_08:38
SCHEMATIC	2500927
PAGE	6 OF 10

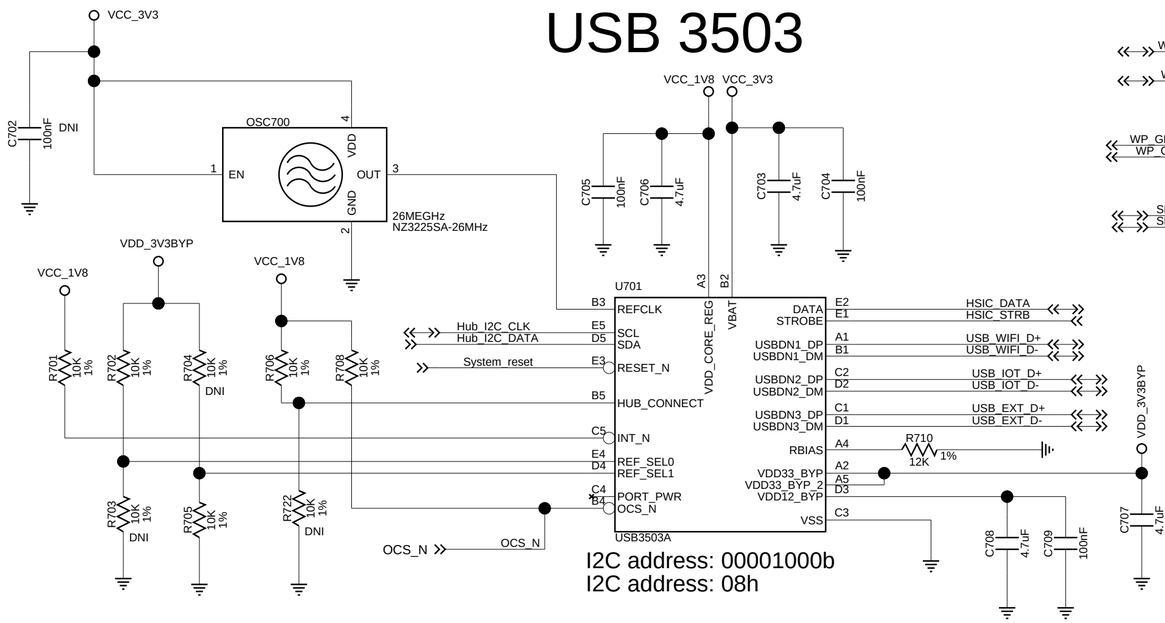
GPIO Expander#1

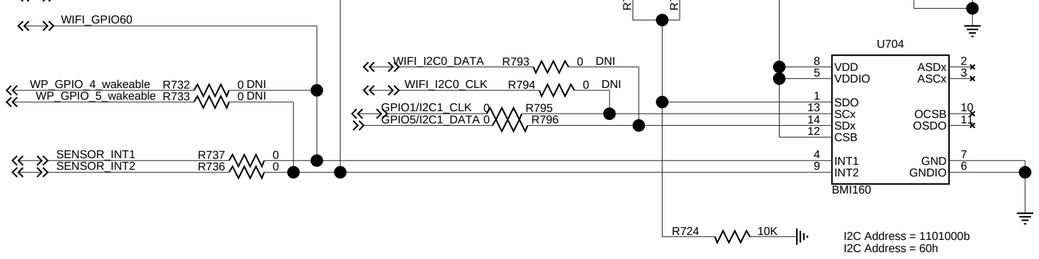


Board Rev



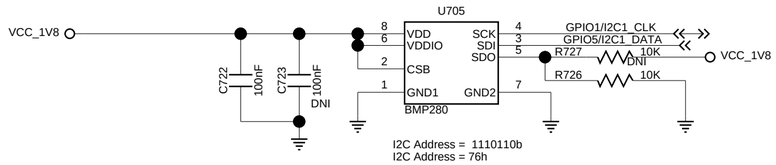
USB 3503



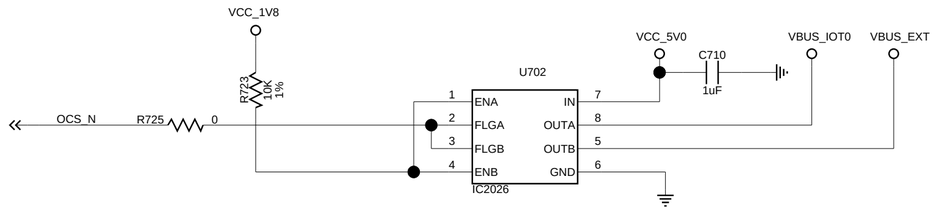


ACCELEROMETER AND GYROSCOPE

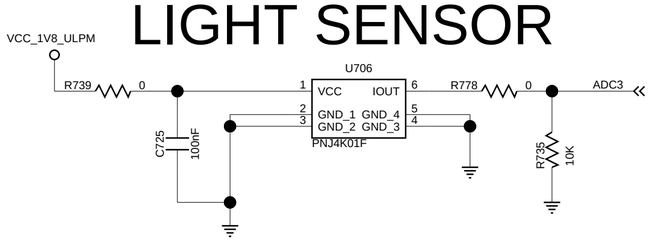
PRESSURE SENSOR



USB Downstream Power



LIGHT SENSOR



This document contains information which is proprietary to Sierra Wireless Inc. and is licensed pursuant to Creative Commons Attribution 4.0 International License.

Copyright (C) 2016

SIERRA WIRELESS™

SITE	CTO Office
LEAD ENGINEER	Ashish Syal
REV SCH	See P1
REV PCB	See P1
PROJECT	MANGO RED
DATE/TIME	19-04-2017_10:56
SCHEMATIC	2500927
PAGE	7 OF 10

PSU Front End and 3.7V DC/DC converter

Power can come from either
Main or uUSB-Power connectors

CF3 Main USB

USB_VBUS_CONSOLE
CN804
USB_VBUS
POST TERMINAL STRIP
C803 10uF
CN801
VBUS
D-
D+
ID
GND
CASE GND
USB_CN_D-
USB_CN_D+
L800 0H
USB_D-
USB_D+
USB_ID
USB_VBUS
D800
VBUS
D-
D+
ID
NC
GND

INPUT VOLTAGE = 5V
USB_VBUS
L802 0H
C807 220nF
C809 220nF
VBUS ESD protected through D800
V_IN
TP804

V_SYS_BATT
DNI
R809 10K 1%
DNI
300 R810
D801
DNI
R811 47K
DNI

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_3V3
R822 1.5K
D803

V_BATT_ULP
R826 0 DNI
VCC_3V7
TP805
R820 0

V_IN
C800 22uF
C801 220nF
C802 1uF
PWR_GND_BQ
Raplace to 10uF for USB compliance
C804 1uF
C805 10uF
Place as close as possible
U800
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
TS
QON
PGND_2
PGND_3
BQ24296RGER
BattChrgr_PG_N
STAT_BATT4
charger_I2C_DATA
charger_I2C_CLK
I2C address 1010101b
I2C address 6BH
Default value 2.2uH
L801 3.3uH
C806 47nF
V_SYS_BATT
REGN_BATT
V_BATT
C808 10uF
C818 10uF
DNI
C810 4.7uF
C811 100nF
C812 47uF
PWR_GND_BQ
R814 150 1%
I_lim_max = 3.5A

TP806
DNI
V_BATT_ULP
U801
AL /CC
SCL
SDA
SENSE+
SENSE-
GND
LTC2942I
V_BATT_CONN
charger_I2C_CLK
charger_I2C_DATA
I2C address 1100100b
I2C address 64H

R802 10K 1%
R803 10K 1%
R804 10K 1%
DNI
R805 10K 1%
DNI
R806 10K 1%
R807 10K 1%
DNI
R808 10K 1%
BattChrgr_INT_N
R825 0 DNI
USB_ID
PWR_GND_BQ

REGN_BATT
R812 10K 1%
DNI
R813 15K 1%
DNI
R816 5.23K 1%
R815 30.1K 1%
BATT_TS+

TP802
TP803
V_BATT
R827 0 0%
V_BATT_ULP
R828 68m 1%
V_BATT_CONN
CN802
B2B-PH-K-S
BATT_TS+
Ideal battery should have a 103-AT thermistor inside
If using battery with no thermistor then short Pin1 and Pin2 of CN1203

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

Labeled as 5V on PCB --> fix silkscree

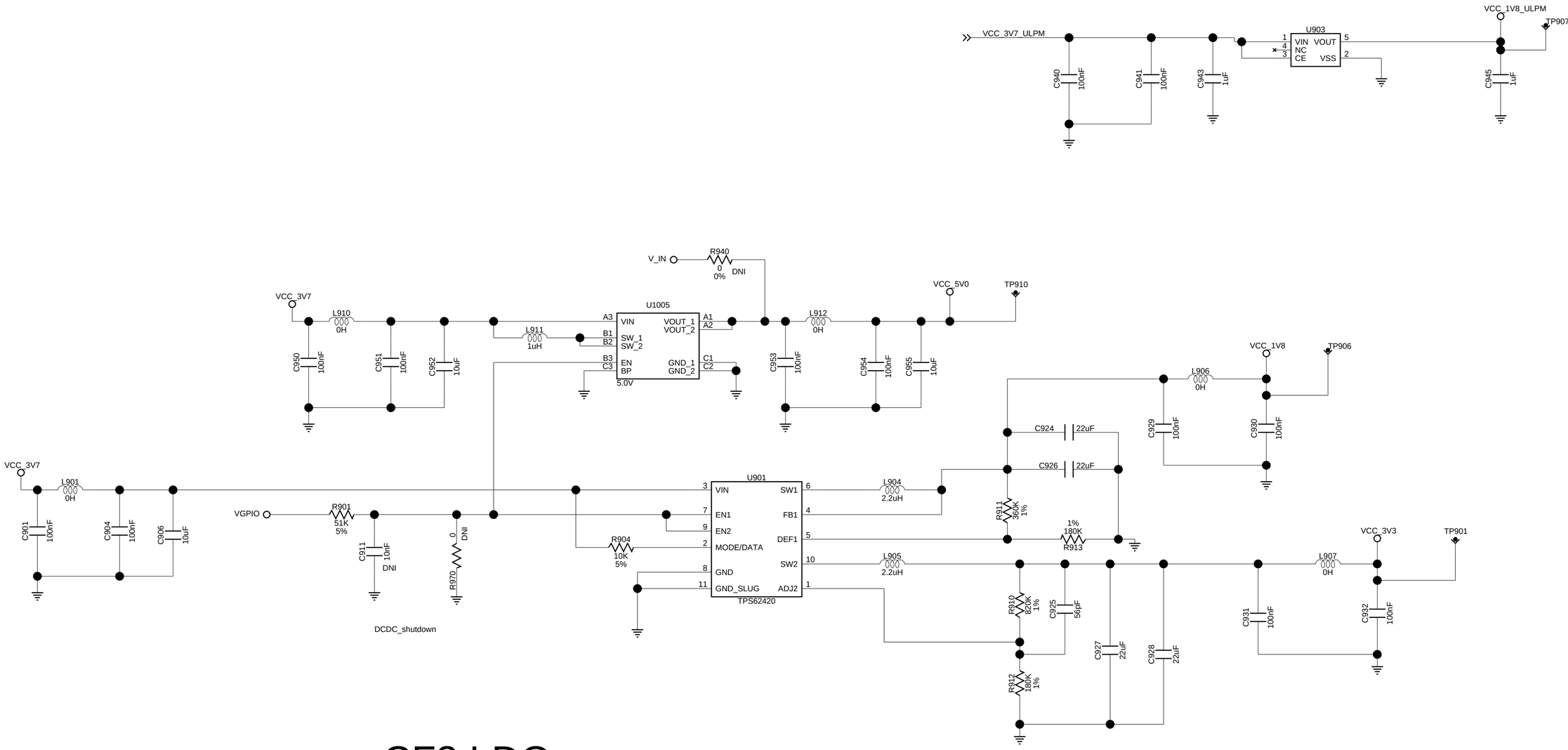
This document contains information which is proprietary to Sierra Wireless Inc. and is licensed pursuant to Creative Commons Attribution 4.0 International License.

Copyright (C) 2016

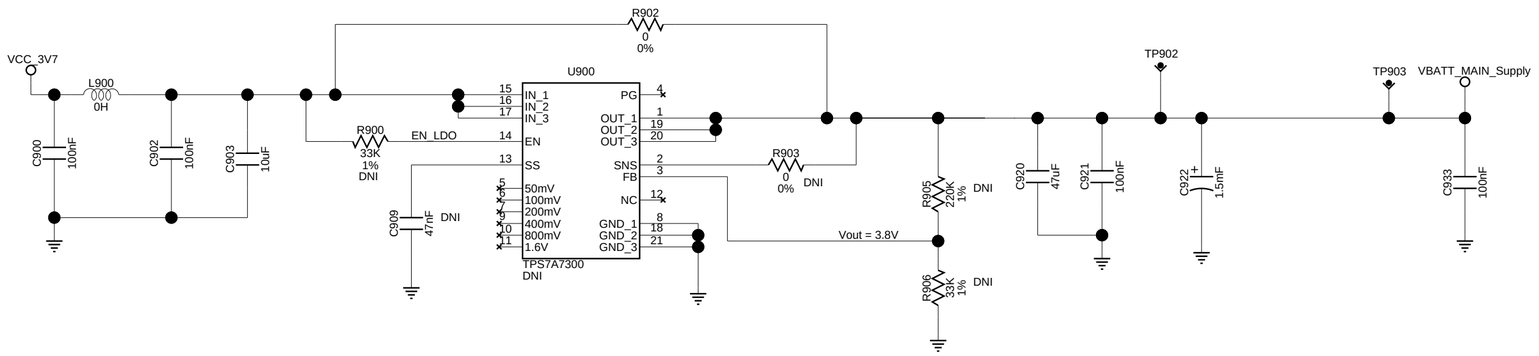
SIERRA WIRELESS™

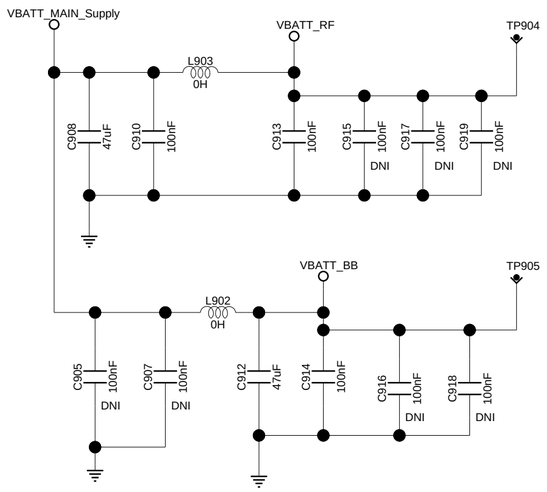
SITE	CTO Office
LEAD ENGINEER	Ashish Syal
REV SCH	See P1
REV PCB	See P1
PROJECT	MANGO RED
DATE/TIME	31-01-2017_17:33
SCHEMATIC	2500927
PAGE	8 OF 10

3V3 and 1V8 Buck * 5V0 Boost



CF3 LDO





This document contains information which is proprietary to Sierra Wireless Inc. and is licensed pursuant to Creative Commons Attribution 4.0 International License.

Copyright (C) 2016

SIERRA WIRELESS™

SITE	CTO Office
LEAD ENGINEER	Ashish Syal
REV SCH	See P1
REV PCB	See P1
PROJECT	MANGO RED
DATE/TIME	12-01-2017_08:31
SCHEMATIC	2500927
PAGE	9 OF 10

RF SECTION

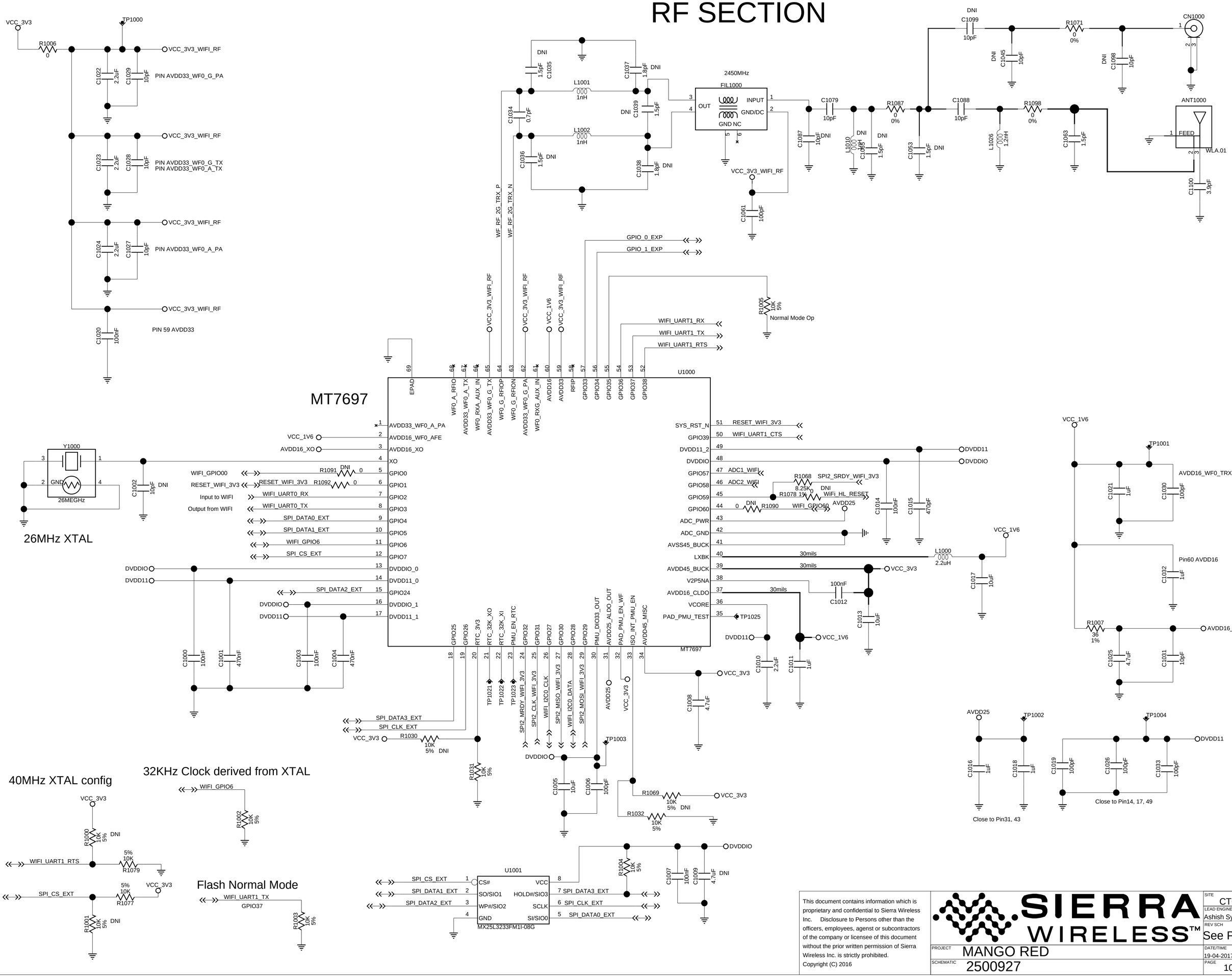
MT7697

26MHz XTAL

40MHz XTAL config

32KHz Clock derived from XTAL

Flash Normal Mode



This document contains information which is proprietary and confidential to Sierra Wireless Inc. Disclosure to Persons other than the officers, employees, agenst or subcontractors of the company or licensee of this document without the prior written permission of Sierra Wireless Inc. is strictly prohibited.
Copyright (C) 2016

SIERRA WIRELESS™

SITE	CTO Office
LEAD ENGINEER	Ashish Syal
REV SCH	See P1
REV PCB	See P1
PROJECT	MANGO RED
DATE/TIME	19-04-2017_10:53
SCHEMATIC	2500927
PAGE	10 OF 10