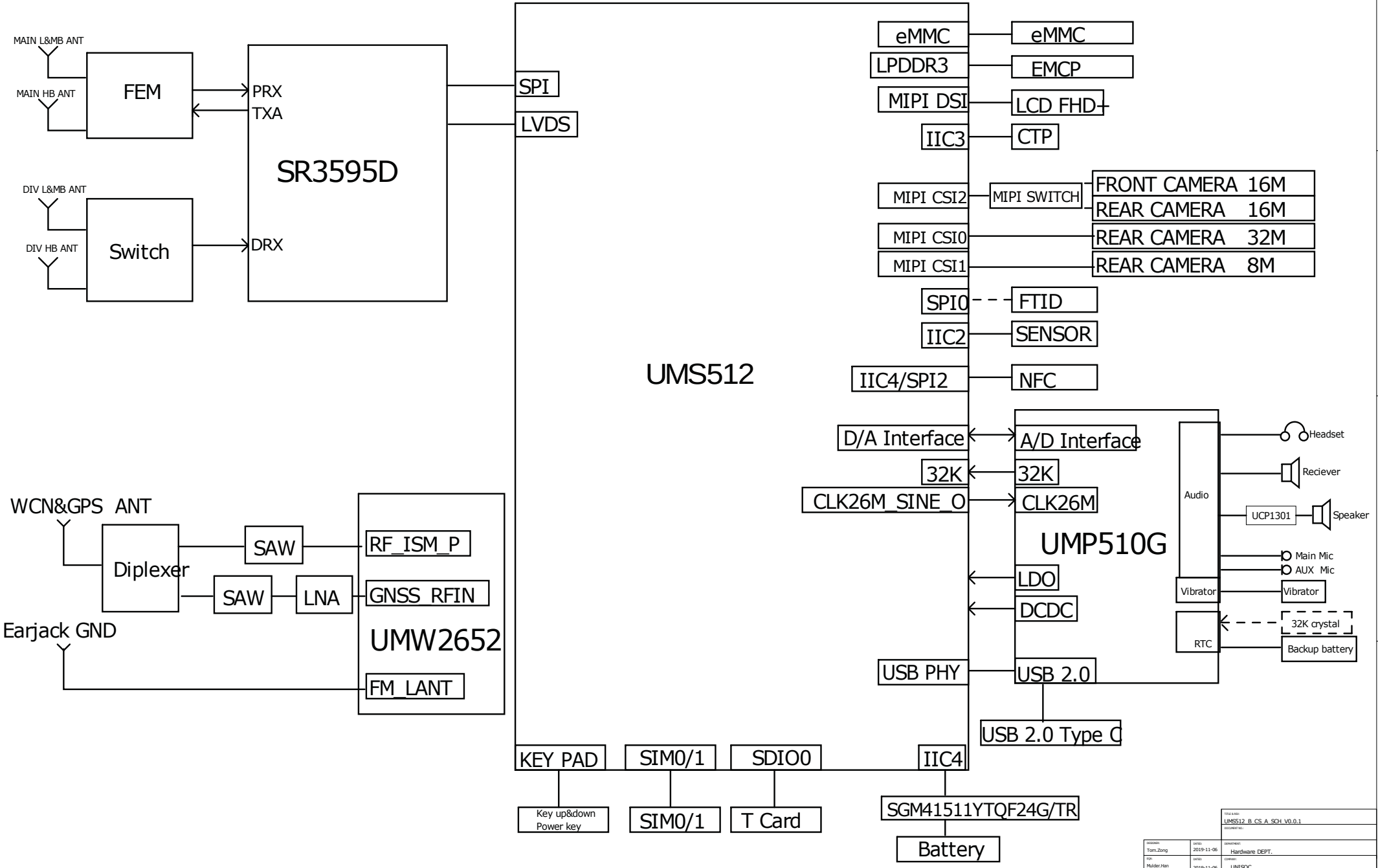
# BLOCK DIAGRAM




| REVISION RECORD | | | |
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| LTR | ECO NO. | APPROVED | DATE |

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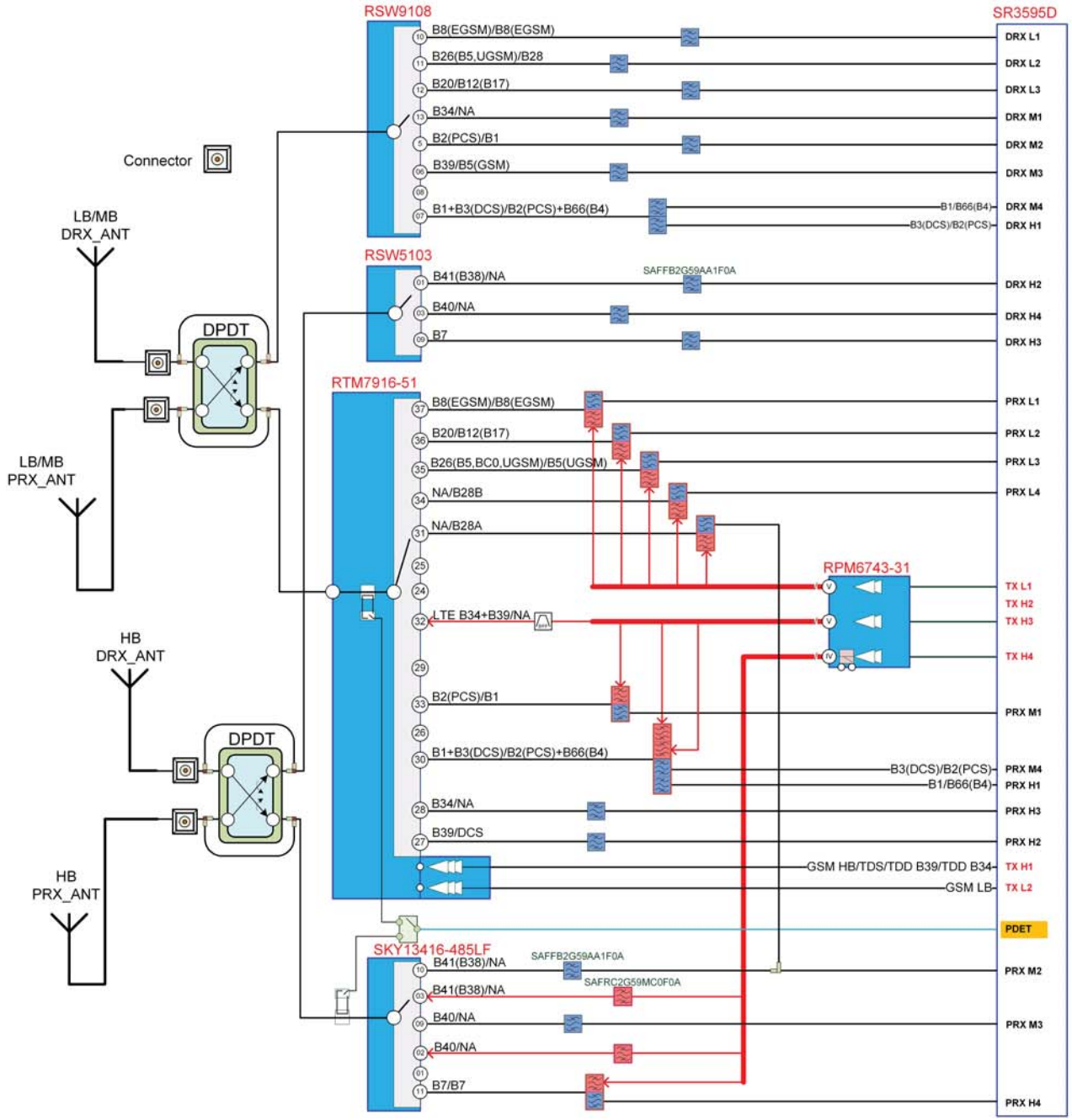
|---|---|---|---|
| TITLE & SIZE: UMS512_B_CS_A_SCH_V0.0.1 | | | |
| DOCUMENT NO.: | | | |
| DESIGNED: Tom.Zong | DATED: 2019-11-06 | DEPARTMENT: Hardware DEPT. | |
| SCH: Mulder.Han | DATED: 2019-11-06 | COMPANY: UNISOC | |
| APPROVED: Li.Hongqing | DATED: 2019-11-06 | CONFIDENTIAL AND PROPRIETARY | |

# RF BLOCK DIAGRAM




**Platform:**
UMS512+SR3595D

**Product support:**
Global

**Band support:**
**China+Europe+India**
TDD LTE: B34/38/39/40/41N
FDD LTE: B1/3/7/8/20/26(5)
WCDMA: B1/2/5/8(HW support WCDMA diversity)
TDSCDMA: B34/39
CDMA: BC0
GSM: B2/3/5/8(HW support GSM diversity)
DL CA: 1C,3C,5B,7B,7C,8B,38C,39C,40C,41C;
3A-3A,5A-5A,7A-7A,40A-40A,41A-41A;
1A-3A,1A-7A,3A-7A,3A-40A,3A-41A,5A-40A,
7A-8A,7A-20A,8A-40A,8A-41A,39A-41A.
UL CA: 1C,3C,5B,7C,8B,38C,39C,40C,41C

**LATAM**
FDD LTE: B1/2/5/7/12(17)/28/66(4)
WCDMA: B1/2/4/5/8(HW support WCDMA diversity)
GSM: B2/3/5/8(HW support GSM diversity)
DL CA: 1C,5B,7B,7C,66C;
2A-2A,4A-4A,5A-5A,7A-7A,12A-12A,66A-66A;
2A-4A,2A-7A,5A-7A,7A-28A.
UL CA: 1C,7C

**Key Part:**
RTM7916-51
RPM6743-31
RSW9108
RSW5103
SKY13416-485LF

CA cases with underline are not list in MRD
B7 sensitivity has high risk when B8 served as PCC of CA 7A-8A.
B41 sensitivity has high risk when B8 served as PCC of CA 8A-41A.

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| GPIO Configuration For UMS512_B_CS_A_SCH_V0.0.1 | | | | | | | |
|---|---|---|---|---|---|---|---|
| GPIO1 | PCC_RFSDA | GPIO51 | LCM_FMARK | GPIO101 | EMMC_D7 | GPIO151 | TF_SD0_D0 |
| GPIO2 | PCC_RFSCK | GPIO52 | ESE_SPI_CSN | GPIO102 | EMMC_CLK | GPIO152 | TF_SD0_D1 |
| GPIO3 | PCC_RFSEN | GPIO53 | ESE_SPI_DI | GPIO103 | EMMC_D5 | GPIO153 | TF_SD0_CLK0 |
| / | / | GPIO54 | ESE_SPI_DO | GPIO104 | EMMC_D4 | GPIO154 | I2C4_SCL |
| / | / | GPIO55 | ESE_SPI_CLK | GPIO105 | EMMC_RCLK | GPIO155 | I2C4_SDA |
| GPIO6 | WF_SD1_D3 | GPIO56 | BT_PCM_OUT | GPIO106 | EMMC_D3 | GPIO156 | CHG_INT |
| GPIO7 | COEXIST_LTE_GPS | GPIO57 | BT_PCM_IN | GPIO107 | EMMC_RST | GPIO157 | SIM0_CLK |
| GPIO8 | MIPI_SWITCH_SEL | GPIO58 | BT_PCM_CLK | GPIO108 | EMMC_D1 | GPIO158 | SIM0_DA |
| GPIO9 | SIM1_DET | GPIO59 | BT_PCM_SYNC | GPIO109 | EMMC_D2 | GPIO159 | SIM0_RST |
| GPIO10 | WB_WCI_2_RXD | GPIO60 | WCN_U0RXD | GPIO110 | DNS_D0 | GPIO160 | SIM1_CLK |
| GPIO11 | WB_WCI_2_TXD | GPIO61 | WCN_U0TXD | GPIO111 | DNS_D1 | GPIO161 | SIM1_DA |
| GPIO12 | SCC_RFSDA | GPIO62 | WCN_U0RTS | GPIO112 | COLOR_SENSOR_INT | GPIO162 | SIM1_RST |
| GPIO13 | SCC_RFSCK | GPIO63 | WCN_U0CTS | GPIO113 | TOF_XSHUT | | |
| GPIO14 | SCC_RFSEN | GPIO64 | WF_SD1_CLK | GPIO114 | TOF_GPIO | | |
| GPIO15 | EAR_CTL1 | GPIO65 | WF_SD1_CMD | GPIO115 | NFC_PD | | |
| GPIO16 | EAR_CTL2 | GPIO66 | WF_SD1_D0 | GPIO116 | NFC_WAKE_HOST | | |
| GPIO17 | GPS_U1RXD | GPIO67 | WF_SD1_D1 | / | / | | |
| GPIO18 | GPS_U1TXD | GPIO68 | WF_SD1_D2 | / | / | | |
| GPIO19 | RFCTL_0 | / | / | / | / | | |
| GPIO20 | RFCTL_1 | / | / | / | / | | |
| GPIO21 | RFCTL_2 | GPIO71 | BB_U1RXD | GPIO121 | WF_WAKE_HOST | | |
| GPIO22 | RFCTL_3 | GPIO72 | #N/A | GPIO122 | BOARD_ID2 | | |
| GPIO23 | RFCTL_4 | GPIO73 | #N/A | GPIO123 | WF_HOST_WAKE | | |
| GPIO24 | RFCTL_5 | GPIO74 | I2C1_SCL | / | / | | |
| GPIO25 | RFCTL_6 | GPIO75 | I2C1_SDA | / | / | | |
| GPIO26 | RFCTL_7 | / | / | GPIO126 | VDDCAMCORE_EN | | |
| GPIO27 | RFCTL_8 | GPIO77 | LCM_BL_PWM | GPIO127 | I2C2_SCL | | |
| GPIO28 | RFCTL_9 | GPIO78 | TF_DET | GPIO128 | I2C2_SDA | | |
| GPIO29 | RFCTL_10 | GPIO79 | BUA_BAT_DET | GPIO129 | CON_32K_IN | | |
| GPIO30 | RFCTL_11 | GPIO80 | I2C6_SCL | GPIO130 | FTID_INT | | |
| GPIO31 | SIM0_DET | GPIO81 | I2C6_SDA | GPIO131 | FTID_RSTN | | |
| GPIO32 | WB_TX_REQ | GPIO82 | MTCK | GPIO132 | LCM_SOURCE_AVDDEN | | |
| GPIO33 | VDDCAMA_EN | GPIO83 | MTMS | GPIO133 | LCM_SOURCE_AVEEEN | | |
| GPIO34 | GPS_U1RTS | GPIO84 | NFC_CLK_REQ | GPIO134 | UCP1301_RSTN | | |
| GPIO35 | GPS_U1CTS | GPIO85 | NFC_HOST_WAKE | GPIO135 | MIPI_SWITCH_EN | | |
| GPIO36 | PCC_RFFE_SCK0 | GPIO86 | AG_INT0 | GPIO136 | CAMERA_FLASH_CHIPEN | | |
| GPIO37 | PCC_RFFE_SDA0 | GPIO87 | AG_INT1 | GPIO137 | CAMERA_FLASH_EN | | |
| GPIO38 | BB_U5TXD | GPIO88 | PROX_INT | GPIO138 | CAMERA_FLASH_SYNC | | |
| GPIO39 | BB_U5RXD | / | / | GPIO139 | CAMERA_TORCH_EN | | |
| GPIO40 | CAM_PWDN2 | GPIO90 | FTID_SPI_CS | / | / | | |
| GPIO41 | CAM_RST2 | GPIO91 | FTID_SPI_DI | / | / | | |
| / | / | GPIO92 | FTID_SPI_DO | / | / | | |
| GPIO43 | CAM_MCLK1 | GPIO93 | FTID_SPI_CLK | GPIO143 | WB_CHIP_EN | | |
| GPIO44 | CAM_RST0 | GPIO94 | WB_INT | GPIO144 | CTP_INT | | |
| GPIO45 | CAM_RST1 | GPIO95 | WB_RST | GPIO145 | CTP_RST | | |
| GPIO46 | CAM_PWDN0 | GPIO96 | PDM_CLK1 | GPIO146 | CTP_SDA | | |
| GPIO47 | CAM_PWDN1 | GPIO97 | PDM_DATA1 | GPIO147 | CTP_SCL | | |
| GPIO48 | I2C0_SCL | GPIO98 | EMMC_D0 | GPIO148 | TF_SD0_D3 | | |
| GPIO49 | I2C0_SDA | GPIO99 | EMMC_CMD | GPIO149 | TF_SD0_D2 | | |
| GPIO50 | LCM_RSTN | GPIO100 | EMMC_D6 | GPIO150 | TF_SD0_CMD | | |

# Hardware Configuration

| Item | Description | Main Part Number |
|---|---|---|
| Platform(AP+CP+PMU) | UMS512+SR3595D+UMP510G | UMS512+SR3595D+UMP510 |
| RF | RPM6743-31 + RTM7916-51 | RPM6743-31 + RTM7916-51 |
| Memory | eMCP(LPDDR4x) | KMDH6001DA-B422 |
| Connectivity | GPS/WIFI/BT/FM | UMW2652 |
| Charger | Switch charger 2.5A | SGM41511YTQF24G/TR |
| 26MHz ClockSolution | TSX(PMU) only | OZ26000012 |
| 32KHz ClockSolution | 32K-less | |

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| DESIGNER: | DATE(): | DEPARTMENT: |
| SQA: | DATE(): | COMPANY: |
| APPROVED: | DATE(): | CONFIDENTIAL AND PROPRIETARY |

# Change_Note

## V0.0.1

UMS512_B_CS_A_SCH_V0.0.1

### 2024/10/13

J575_V1.0Ô - À í ´ Ó J527B_610&310_D3EF_V1.1_210909Ð Þ ¸ Ä

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3.¹ â ¸ Ð ¹ ©µ ç ¸ Ä Î ª VDDLDO1
4.µ ç ³ Ø × ù µ Ä 7º Í 9PIN¸ Ä Î ª I2C £ ¬ × ö µ ç Á ¿ ¼Æ Ê ¹ Ó Ä

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1.Ôö ¼Ó EMMC £ ¬ º æ ± ¾¸ Ä Î ª D3EF V1.1
2.Ì ý Í ² Ôö ¼Ó Ò » × é º ¸ Å Ì

### 2025/03/20 É ý ¼¶ V2.1

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| TITLE & NO.: | | |
| DOCUMENT NO.: | | |
| DESIGNER: | DATED: | DEPARTMENT: Hardware DEPT. |
| PCB: | DATED: | COMPANY: Spreadtrum communications, Inc. |
| APPROVED: | DATED: | CONFIDENTIAL AND PROPRIETARY |

| REVISION RECORD | | | |
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# Change_Note

## V0.0.1

UMS512_B_CS_A_SCH_V0.0.1

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| DESIGNER: | DATE: | DEPARTMENT: |
| SQA: | DATE: | COMPANY: |
| APPROVED: | DATE: | |
| | | CONFIDENTIAL AND PROPRIETARY — SHEET: 1 OF 1 |

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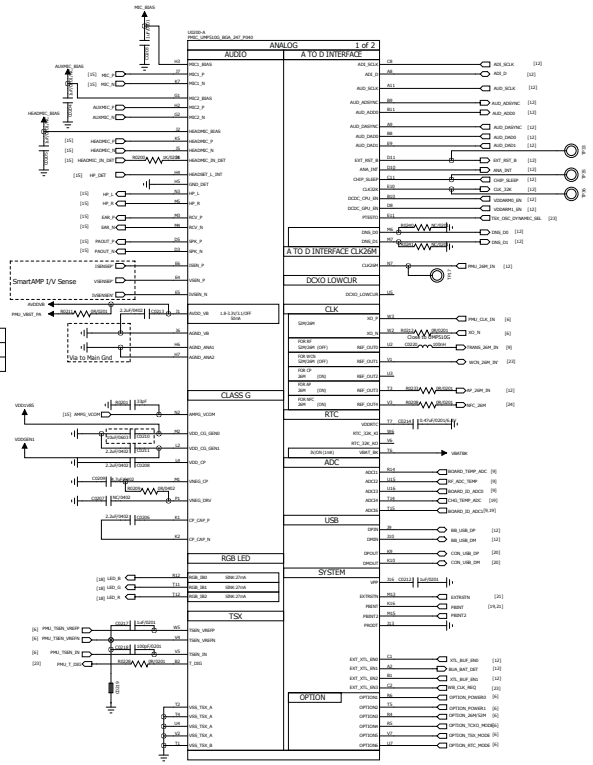
# PMU_ANALOG




| | R0211 |
|---|---|
| AUD | NC |
| Tâk | OR |

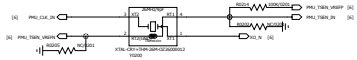
| | R0240 | R0241 |
|---|---|---|
| UMS512 | NF | NF |
| UMS512 | OR | OR |

**UMP510G 6 Interrupt Input IO**

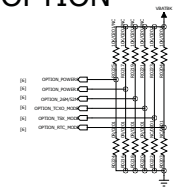
| UMP510G | | | Platform | note |
|---|---|---|---|---|
| 1st function | 2nd function | 3rd function | UMS512 | |
| EXT-XTL-EN0 | NA | | CP | |
| EXT-XTL-EN1 | VBATDET_OK | | BUA | |
| EXT-XTL-EN2 | NA | NA | Sensor Hub | |
| EXT-XTL-EN3 | NA | | UMW2652 | |
| PTESTO | EXT_XTL_EN4 | T_SEL | T_SEL | T_SEL use for select Temp-sensor from TSX or DAC |
| DCDCGPU-EN | EXT_XTL_EN5 | | | |

# BKBT

# TSX£ ¨ PMU£ ©




# OPTION




| Item | Scenario | Option1 | Option2 |
|---|---|---|---|
| 0 | UMS512+UMP510G | 0 | 0 |
| 1 | UMS512+UMP510G+DCDC | 0 | 1 |
| 2 | | 1 | 0 |
| 3 | UMS512+UMP510G+DCDC+LPDDR3/4VDDMEMQ power supply for SDRAM | 1 | 1 |

| Scenario | Option3(26M/52M) | Option4(TCXO_MODE) | Option5(TSX_MODE) | Option6(RTC_MODE) |
|---|---|---|---|---|
| 26M TCXO+32K Crystal | 0 | 1 | 0 | 0 |
| 26M TSX+32K Crystal | 0 | 0 | 1 | 0 |
| 26M TSX+32K-less from PMIC internal | 0 | 0 | 1 | 1 |
| 26M DCXO+32K-less from PMIC internal | 0 | 1 | 1 | 1 |
| 26M DCXO+32K Crystal | 0 | 1 | 1 | 0 |

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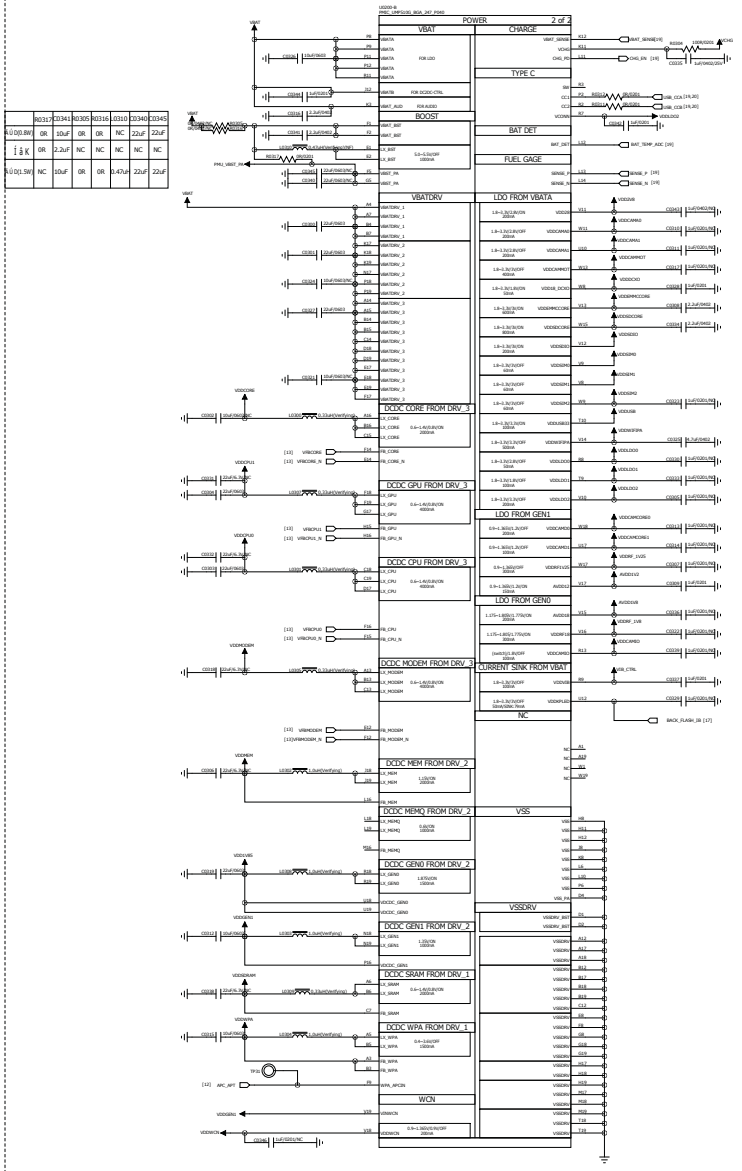
# PMU_POWER




| | R0317 | C0341 | R0305 | R0316 | C0310 | C0340 | C0345 |
|---|---|---|---|---|---|---|---|
| 0.0 0(0.8W) | 0R | 10uF | 0R | 0R | NC | 22uF | 22uF |
| 0.0 0(1.5W) | 0R | 2.2uF | NC | NC | NC | NC | NC |
| 0.0 0(1.5W) | NC | 10uF | 0R | 0R | 0.47uF | 22uF | 22uF |

## UMP510G DCDC output

| Input Power | Power Name | Output Voltage (V) | Output Current (mA) | Default Voltage (V) | Default |
|---|---|---|---|---|---|
| VBAT | DCDC CORE | 0.3-1.3 | 2000 | 0.8 | ON |
| | DCDC GPU | 0.3-1.3 | 4000 | 0.8 | ON |
| | DCDC CPU | 0.3-1.3 | 4000 | 0.8 | ON |
| | DCDC MODEM | 0.3-1.3 | 4000 | 0.8 | ON |
| | DCDC MEM | 0.25-1.25 | 2000 | 1.15 | ON |
| | DCDC MEMQ | 0.25-1.25 | 1000 | 0.6 | ON |
| | DCDC GEN0 | 1.8-2.5 | 1500 | 1.85 | ON |
| | DCDC GEN1 | 0.6-1.5 | 1000 | 1.3 | ON |
| | DCDC SRAM | 0.3-1.3 | 2000 | 0.8 | ON |
| | DCDC WPA | 0.6-3.3 | 1500 | / | OFF |

## UMP510G LDO output

| Input Power | Power Name | Output Voltage (V) | Output Current (mA) | Default Voltage (V) | Default |
|---|---|---|---|---|---|
| VBAT | VDD28 | 1.8-3.3 | 200 | 2.8 | ON |
| | VDDCAMA0 | 1.8-3.3 | 200 | 2.8 | OFF |
| | VDDCAMA1 | 1.8-3.3 | 200 | 2.8 | OFF |
| | VDDCAMMOT | 1.8-3.3 | 400 | 3 | OFF |
| | VDD18_DCXO | 1.8-3.3 | 50 | 1.8 | ON |
| | VDDEMMCCORE | 1.8-3.3 | 600 | 3 | ON |
| | VDDSDCORE | 1.8-3.3 | 800 | 3 | ON |
| | VDDSDIO | 1.8-3.3 | 200 | 3 | ON |
| | VDDSIM0 | 1.8-3.3 | 60 | 3 | OFF |
| | VDDSIM1 | 1.8-3.3 | 60 | 3 | OFF |
| | VDDSIM2 | 1.8-3.3 | 60 | 3 | OFF |
| | VDDUSB33 | 1.8-3.3 | 100 | 3.3 | ON |
| | VDDWIFIPA | 1.8-3.3 | 500 | 3.3 | OFF |
| | VDDLDO0 | 1.8-3.3 | 50 | 2.8 | OFF |
| | VDDLDO1 | 1.8-3.3 | 100 | 3.3 | OFF |
| | VDDLDO2 | 1.8-3.3 | 200 | 3.3 | OFF |
| GEN1 | VDDCAMD0 | 1.0-1.25 | 400 | 1.1 | OFF |
| | VDDCAMD1 | 1.0-1.25 | 200 | 1.1 | OFF |
| | VDDRF1V25 | 1.0-1.25 | 300 | 1.25 | OFF |
| | AVDD12 | 1.0-1.25 | 150 | 1.2 | ON |
| GEN0 | AVDD18 | 1.2-1.8 | 200 | 1.8 | ON |
| | VDDRF18 | 1.2-1.8 | 300 | 1.8 | ON |
| | VDDCAMIO | 1.2-1.8 | 100 | 1.8 | OFF |
| GEN1 | WCN | 1.0-1.6 | 200 | 1 | OFF |

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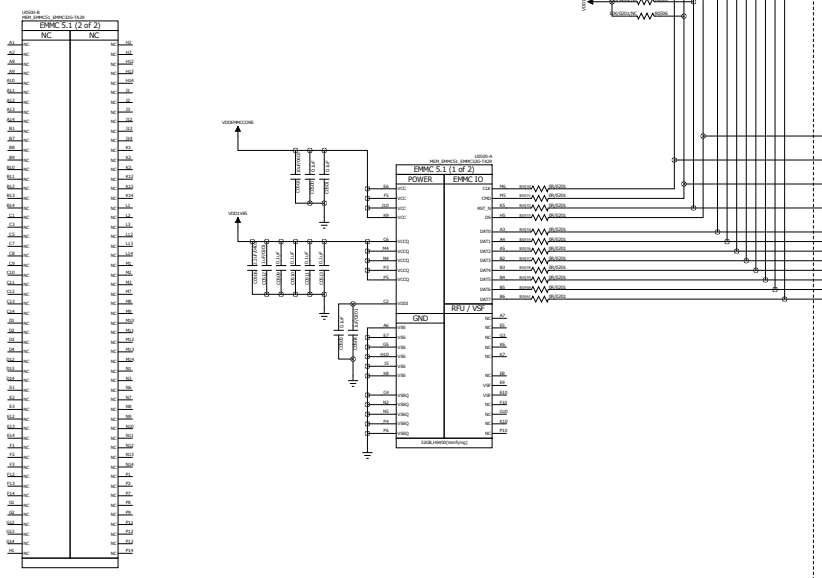
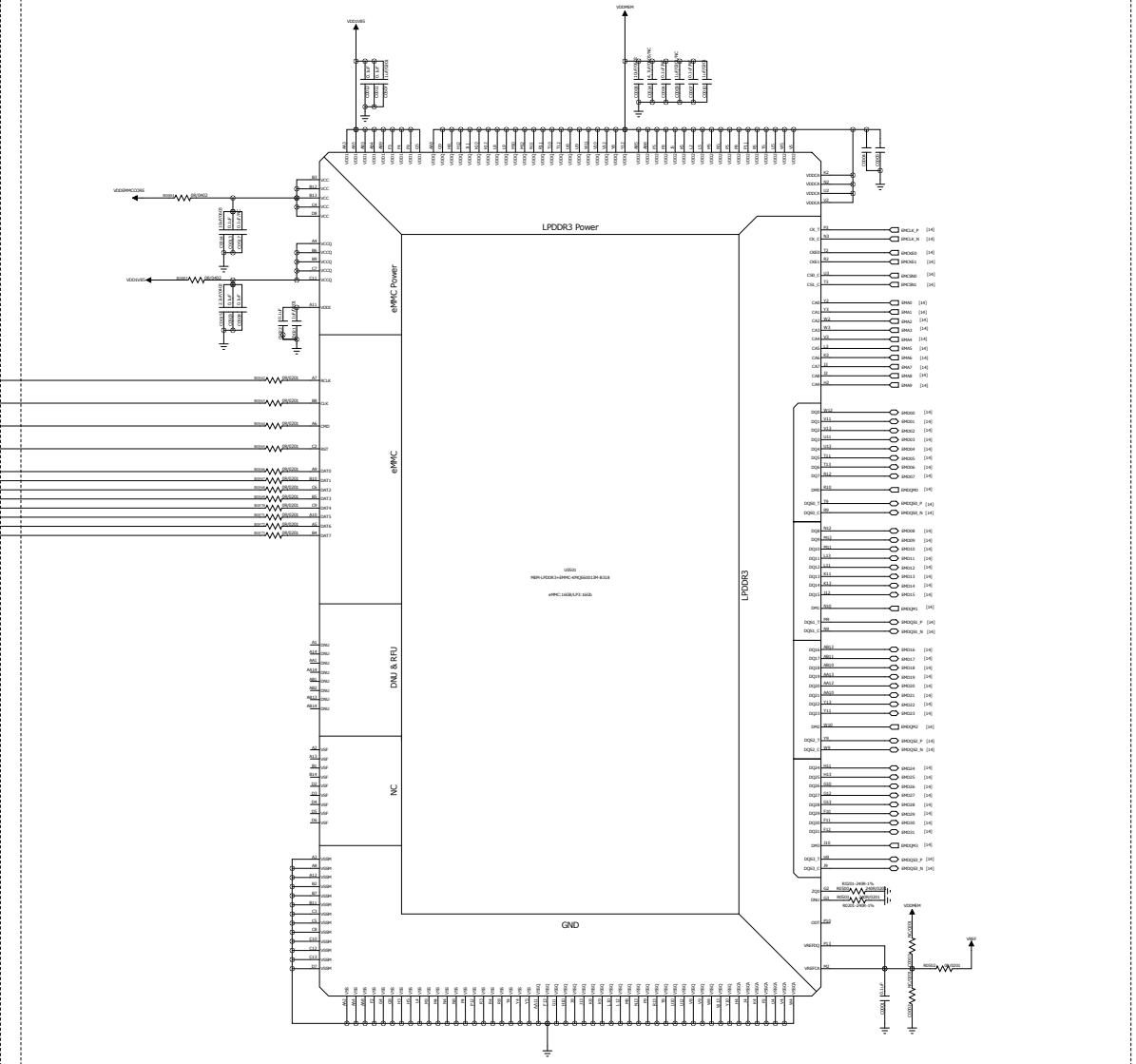
# eMMC




# eMMC+LPDDR3

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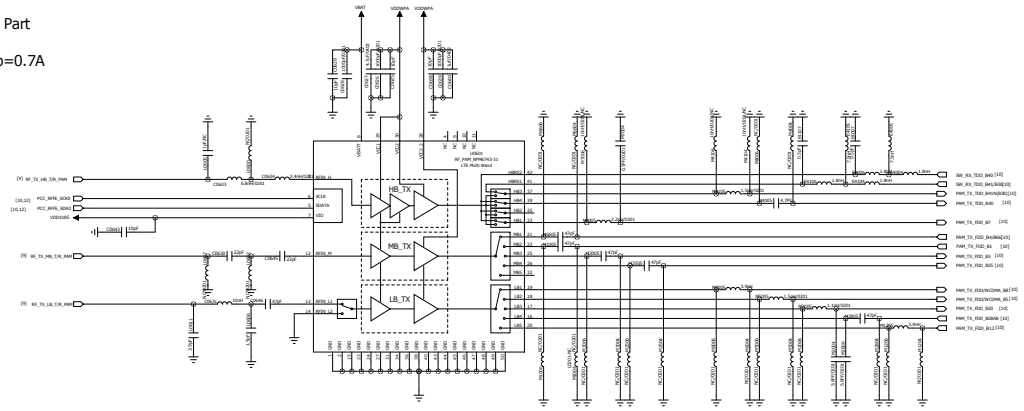
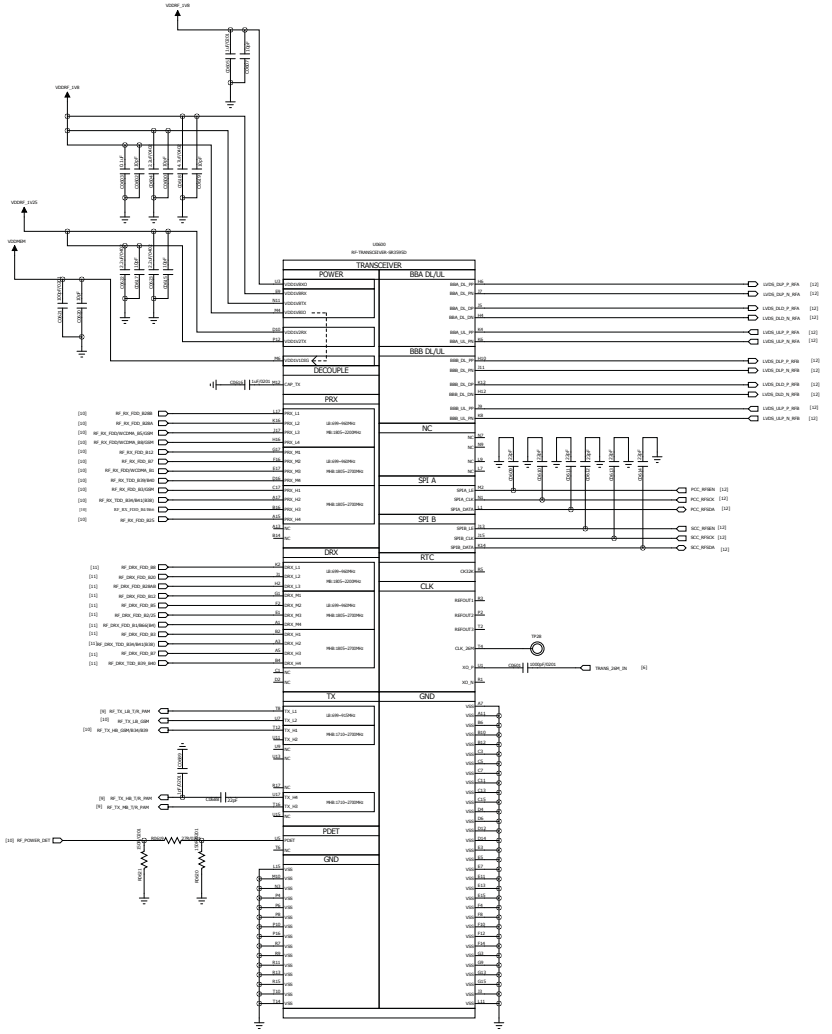
# LTE/WCDMA PAM

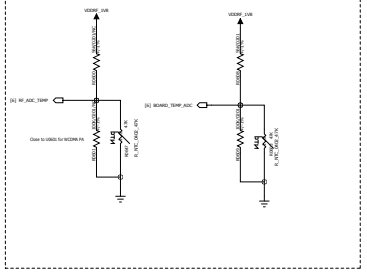
PA Part

Ipp=0.7A

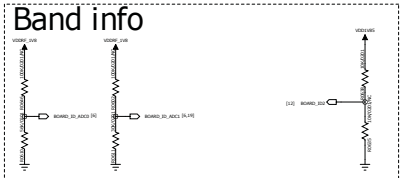



# NTC



# Band info



| BOARD_ID_ADC0 | R0610 | |
|---|---|---|
| | 36K | Eu 2c |
| | 47K | LATAM |

| BOARD_ID_ADC1 | R0611 | Memory |
|---|---|---|
| | 36K | LPDDR3 |
| | 47K | LPDDR4x eMCP |
| | 20K | Discrete LPDDR4x |

| BOARD_ID2 | GPIO54 | WCN Clock |
|---|---|---|
| | 0 | TCXO |
| | 1 | TSX |

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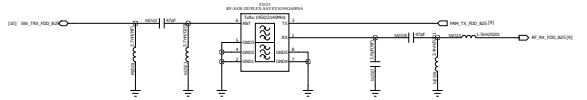
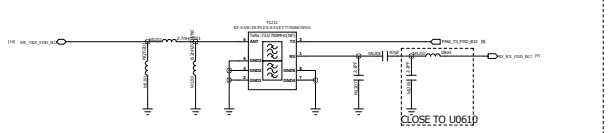
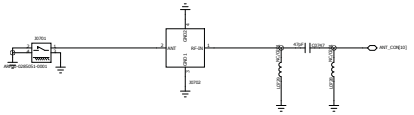
## FDD_LTE_B2/B25



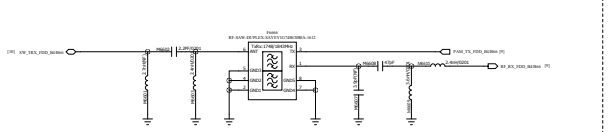
## FDD_LTE_B12/17



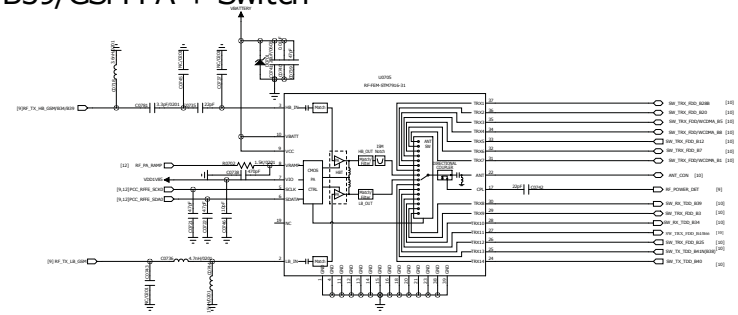

## Primary Antenna



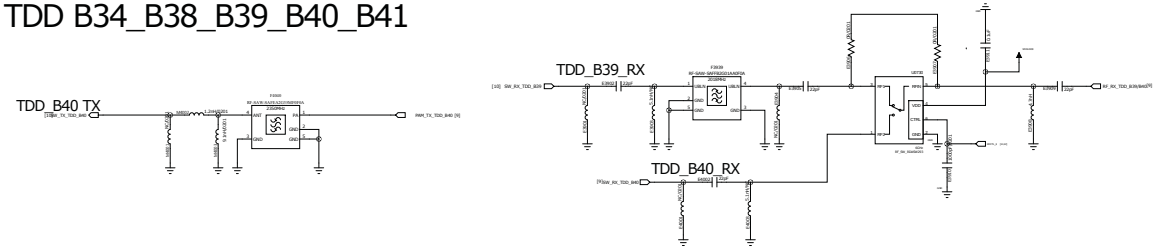
## FDD_LTE_WCDMA_B4/B66

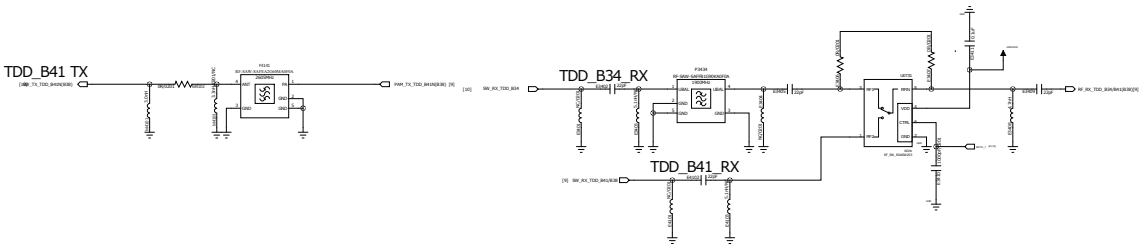


## TDD B34/B39/GSM PA + Switch

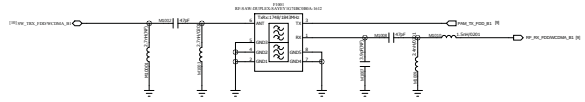


## TDD B34_B38_B39_B40_B41

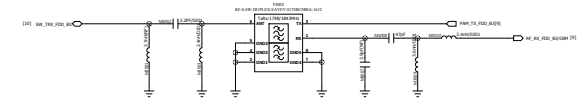


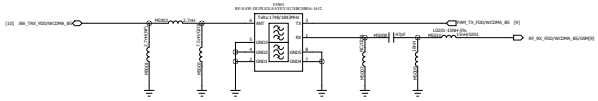

## FDD_LTE_B1



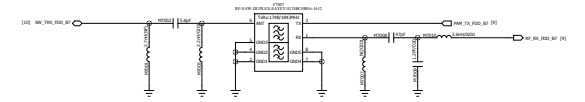
## FDD_LTE_B3



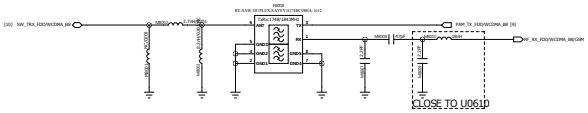
## FDD_LTE_B5/B26_WCDMA_B5_GSM



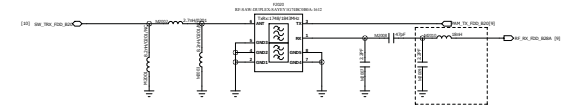
## FDD_LTE_B7



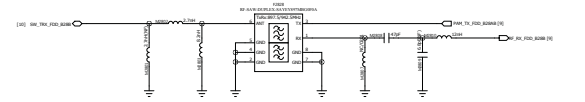
## FDD_LTE_WCDMA_B8




## FDD_LTE_B20



## FDD_LTE_B28AB



## GSM1900

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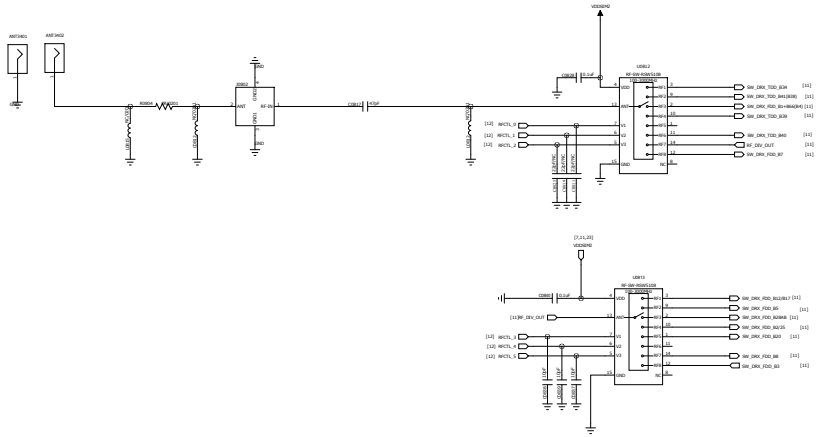
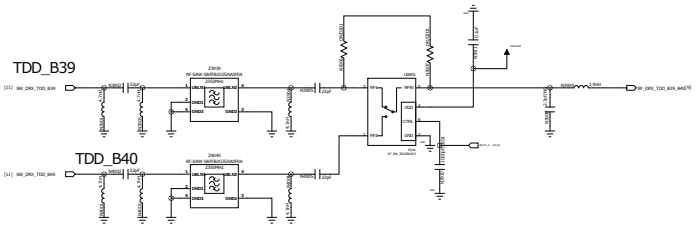
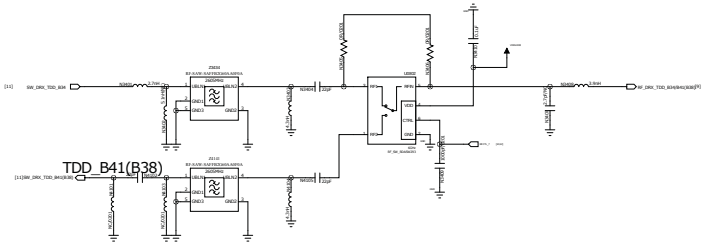
# Diversity LTE Path



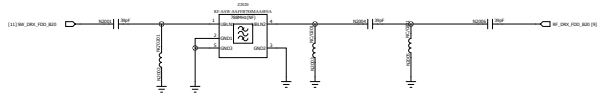
## TDD_B39_B40_Diversity RX path



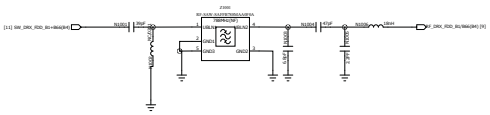

## TDD_B34_B38/B41_Diversity RX path



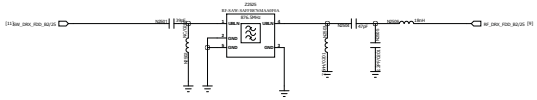

## FDD_B20_Diversity RX path



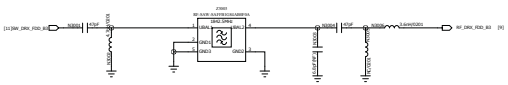
## FDD_B1/B4/B66_Diversity RX path



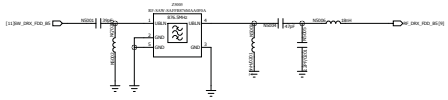
## FDD_B2/B25_Diversity RX path



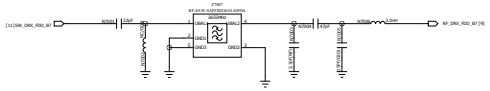
## FDD_B3_Diversity RX path



## FDD_B5/B18/B19/B26_Diversity RX path



## FDD_B7_Diversity Rx path



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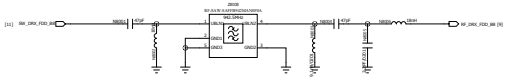
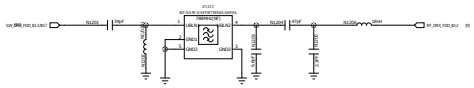
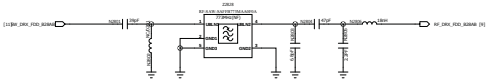


## FDD_B12/B13/B17_Diversity RX path



## FDD_B28AB_Diversity RX path



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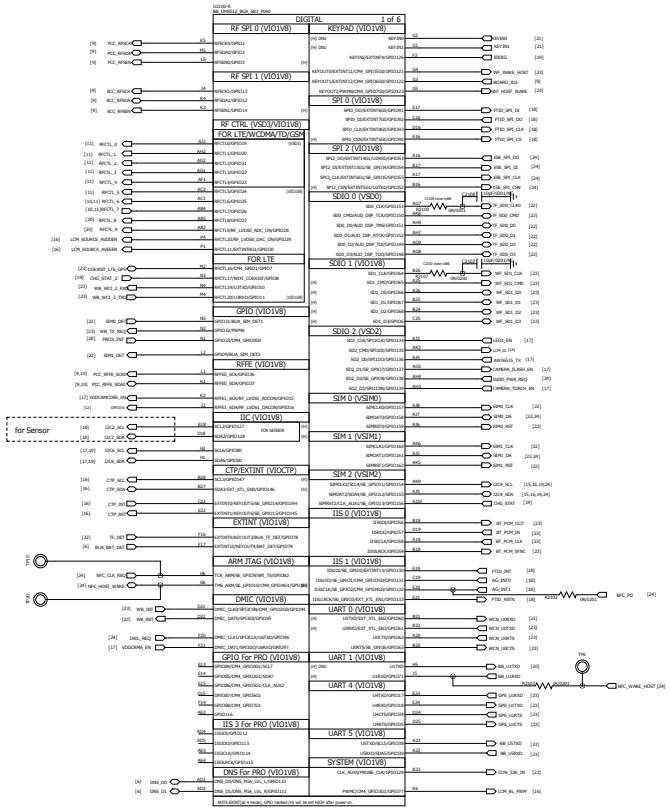


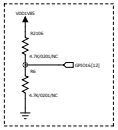


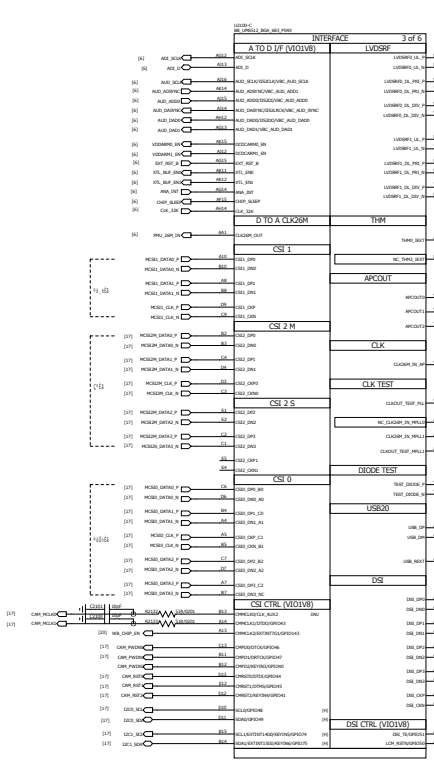


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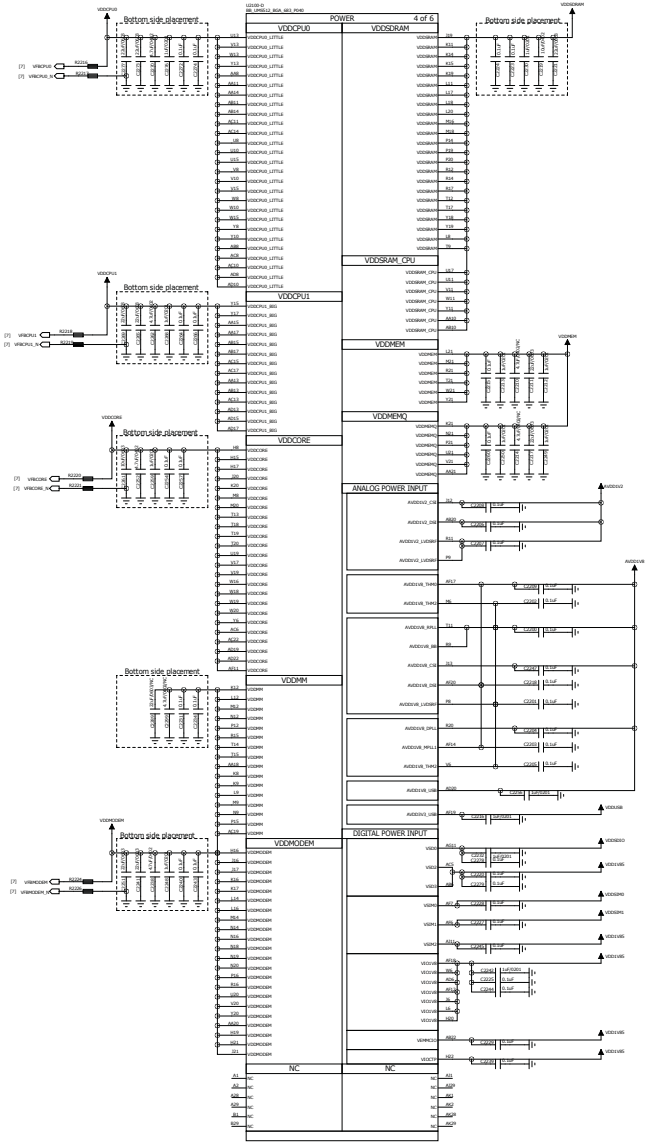


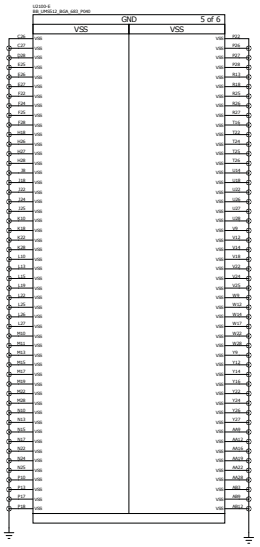


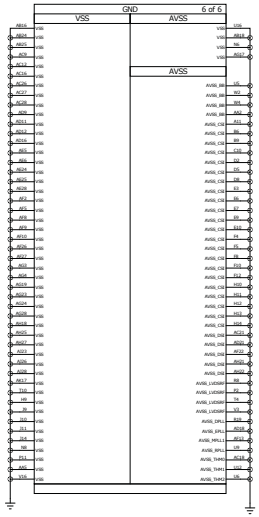


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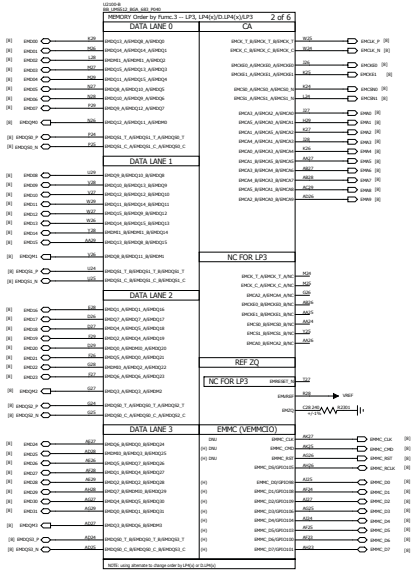
# MEMORY

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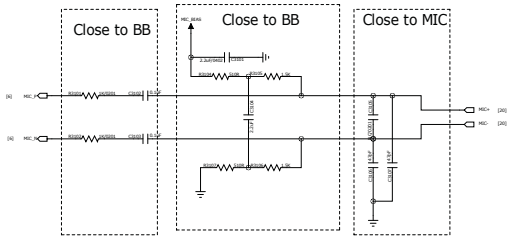
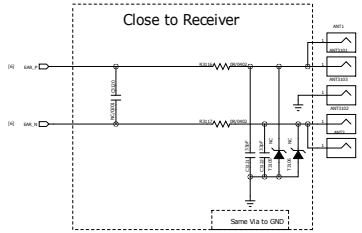
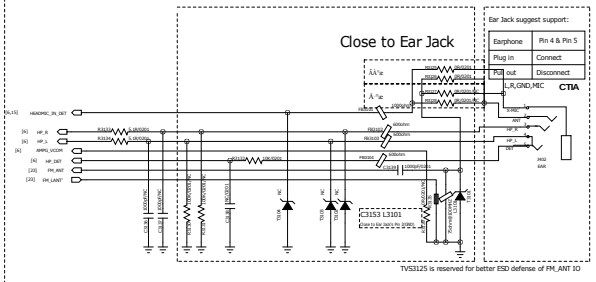
# MAIN MIC



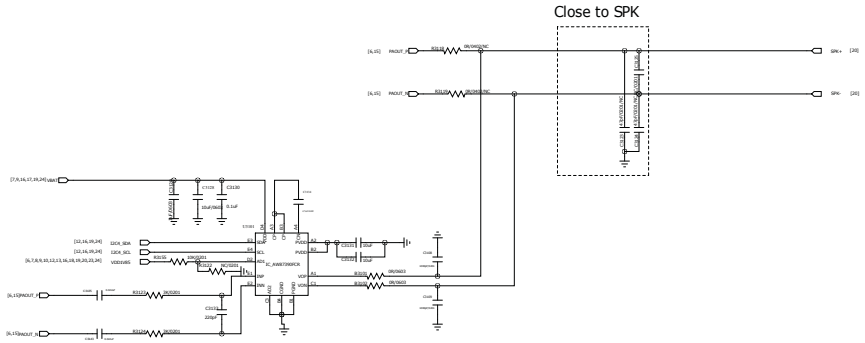

# RECEIVER



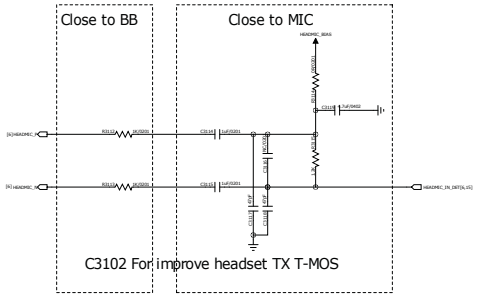

# 3.5mm Ear Jack TypeC Ear Jack




# SPEAKER




# HEAD MIC

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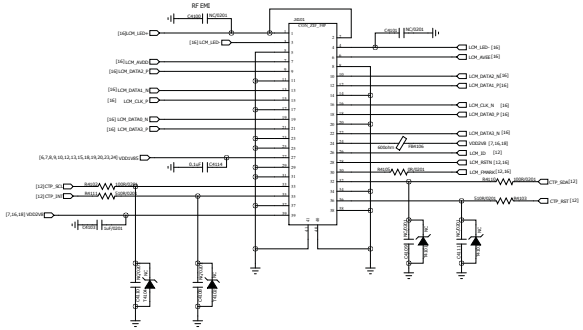
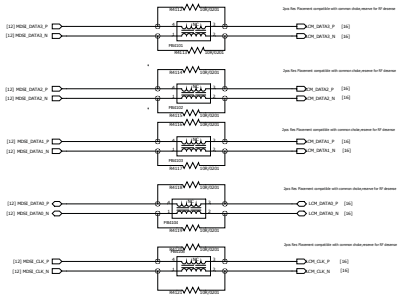
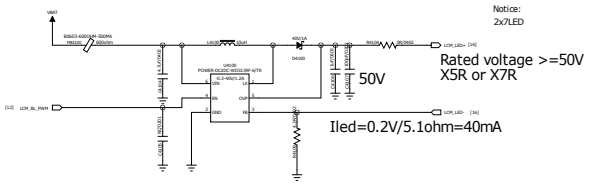
# 5.99" LCM(MIPI)

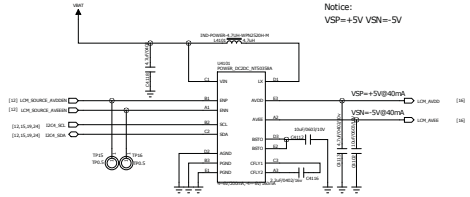



## Back Light Driver




## Source Driver

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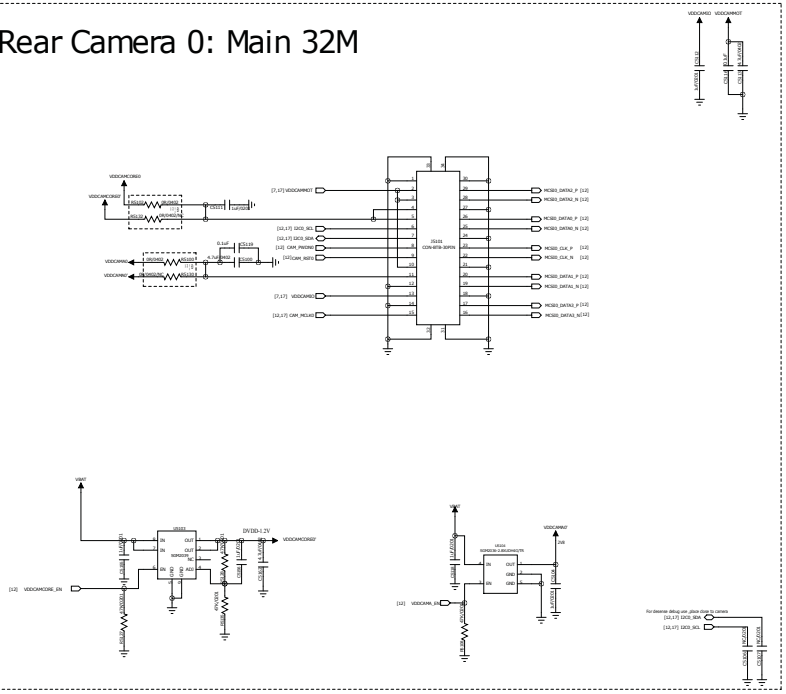
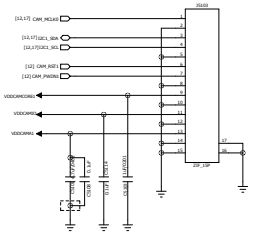
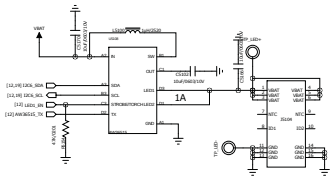
# Rear Camera 0: Main 32M



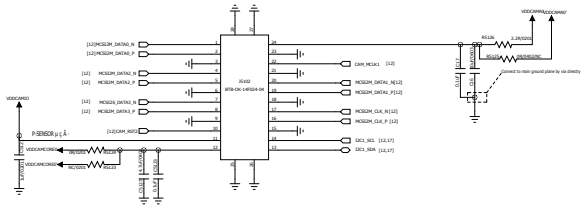

# Rear Camera : 8M



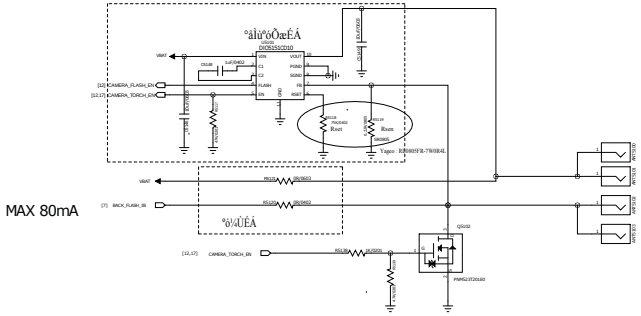

# LED




# Front Camera 2:16M




# Back FLASH LED

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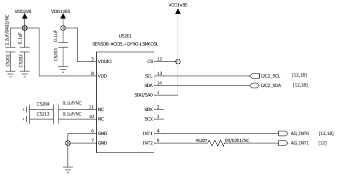
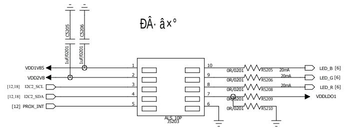
# Accelerometer:

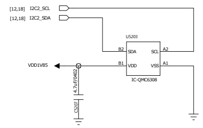



T5210 For ICM20600 FSYNC
R5216 not NF for ICM20600 when FSYNC not connected
R5216 NF for LSM6DSL/BMI160
R5215&R5214 NF for BMI160& ICM20600
C5213 NF for LSM6DSL/BMI160
C5213 not NF for ICM20600

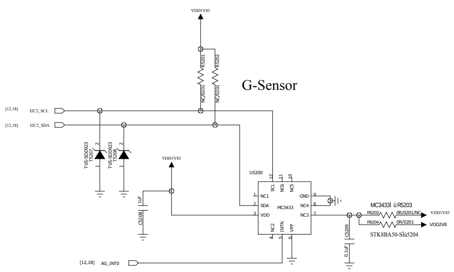
# ALS & PROX



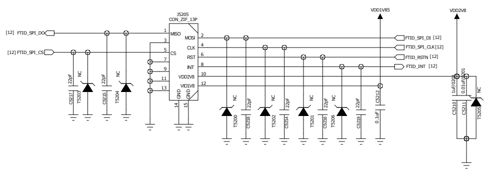

# Magnetic Sensor:




# G Sensor




# FingerPrint ID

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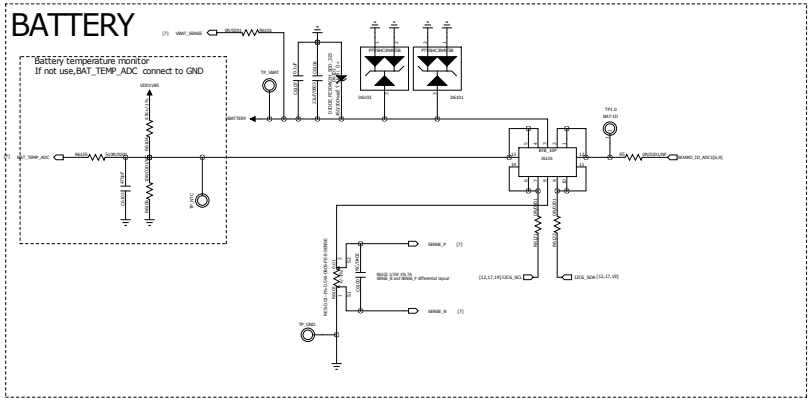
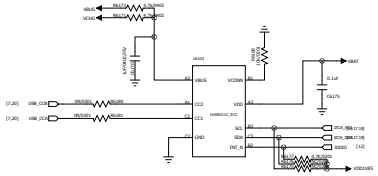
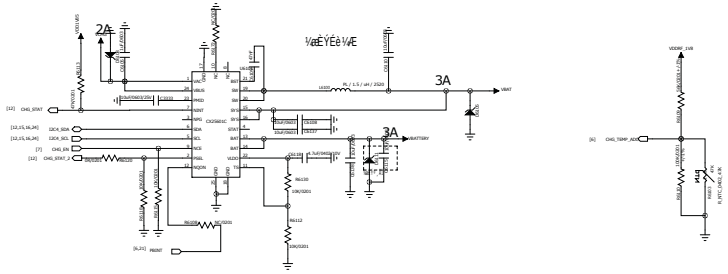
# BATTERY




# CC1/CC2_logic



# CHARGE

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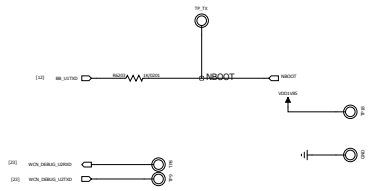
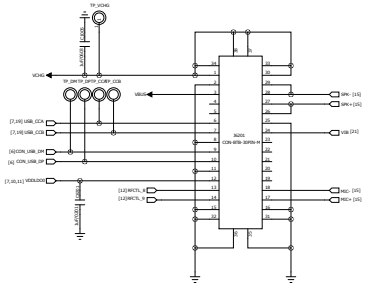
# Test Points




# USB Connector

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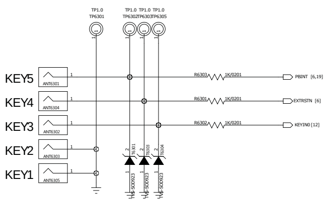
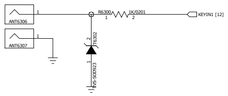
# Volume Key + POWER KEY

Two keys Reset :EXTRSTN+PBINT

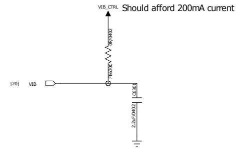


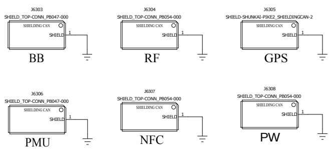

spport two keys 7S reset ,also support single key 7S reset with UMP510G

Two keys :EXTRSTN+PBINT

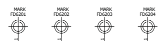
# VIBRATOR




# SHIELDING




# MARK POINT

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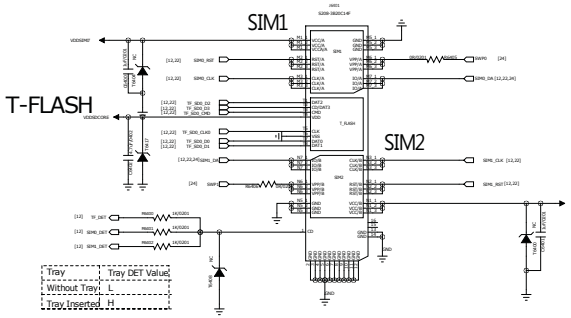
# NO NFC

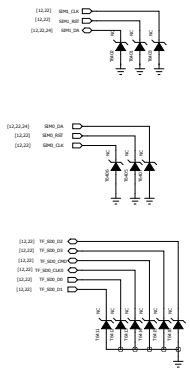
# SIM0 & SIM1 & T_Flash

| | R7301 | R7310 | R6404 | R6407 | R6405 | R6406 |
|---|---|---|---|---|---|---|
| with NFC | OR | OR | NF | NF | OR | OR |
| No NFC | NF | NF | OR | OR | NF | NF |

## micro/nano sim1+ nano sim2+Tcard




| Tray | Tray DET Value |
|---|---|
| Without Tray | L |
| Tray Inserted | H |




Reserve 0402 CAP for ESD defense and test point

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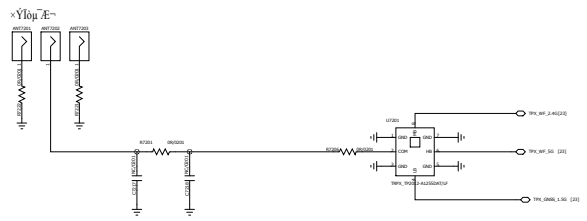
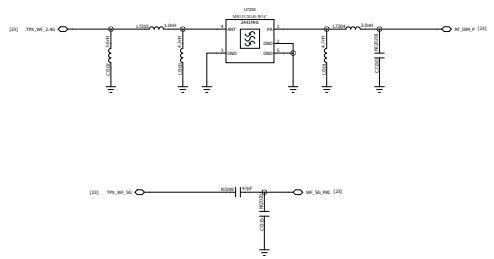
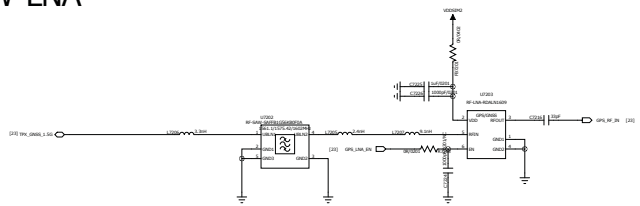
# WIFI&BT ANT



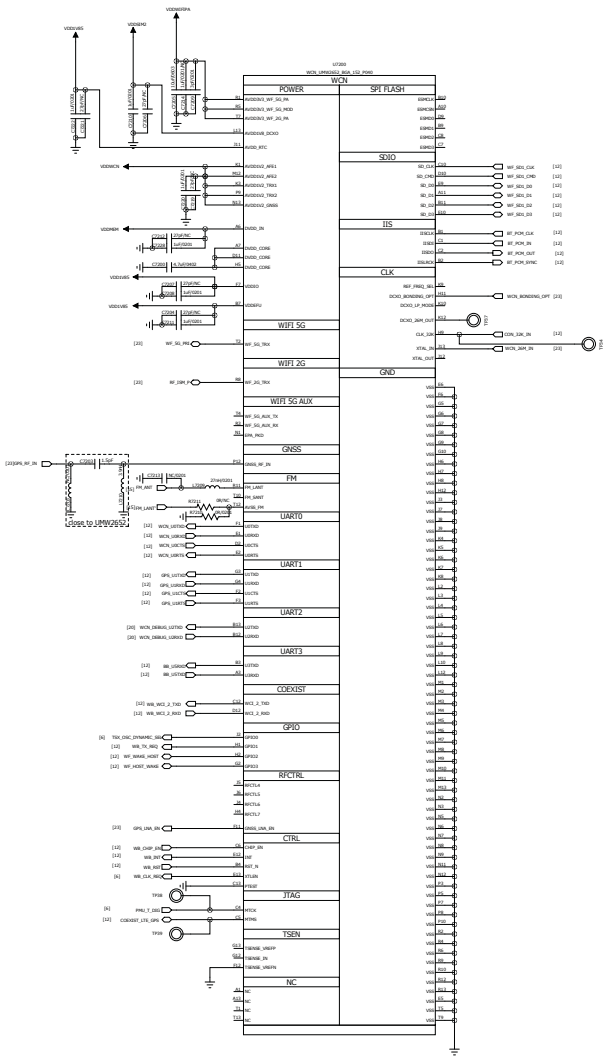

# WIFI/BT SAW




# GNSS SAW LNA



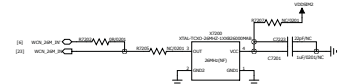

# WCN




# Strapping Pin

| BONDING_OPT | |
|---|---|
| 0 | buffer mode |
| 1 | XO mode |

| | R7202 | R7205 | X7200 | R7207 | C7223 | C7201 |
|---|---|---|---|---|---|---|
| --> TSX (PMU) Only for UMS512 | 0R | NF | NF | NF | NF | NF |
| TCXO(´ WCN( © for UMS312 | NF | 0R | TCXO | 0R | 22pF | 1uF |

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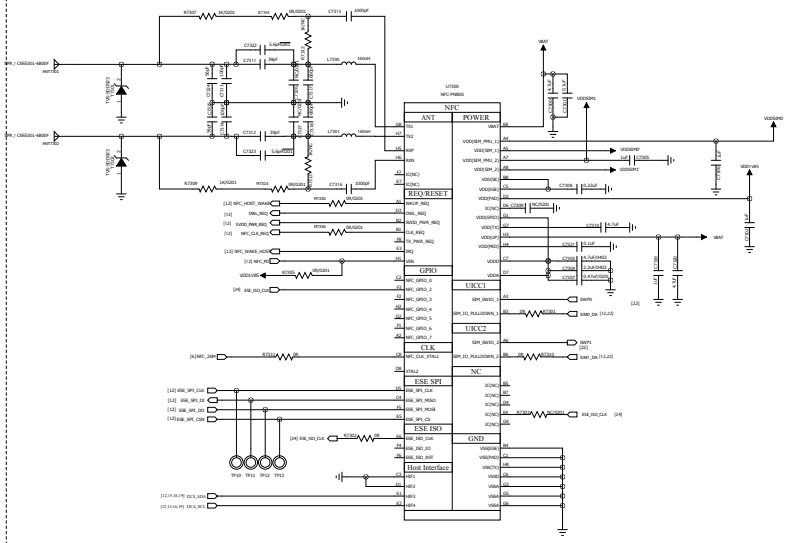
# NFC

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|---|---|---|---|
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| CHECKED: <Checked By> | DATE(S): <Checked Date> | TITLE: <Title> | |
| QUALITY CONTROL: <QC By> | DATE(S): <QC Date> | CODE: <Code> | SIZE: A0 |
| RELEASED: <Released By> | DATE(S): <Release Date> | DRAWING NO: <Drawing Number> | REV: <Revision> |
| | | SCALE: <Scale> | SHEET: 24 24 |