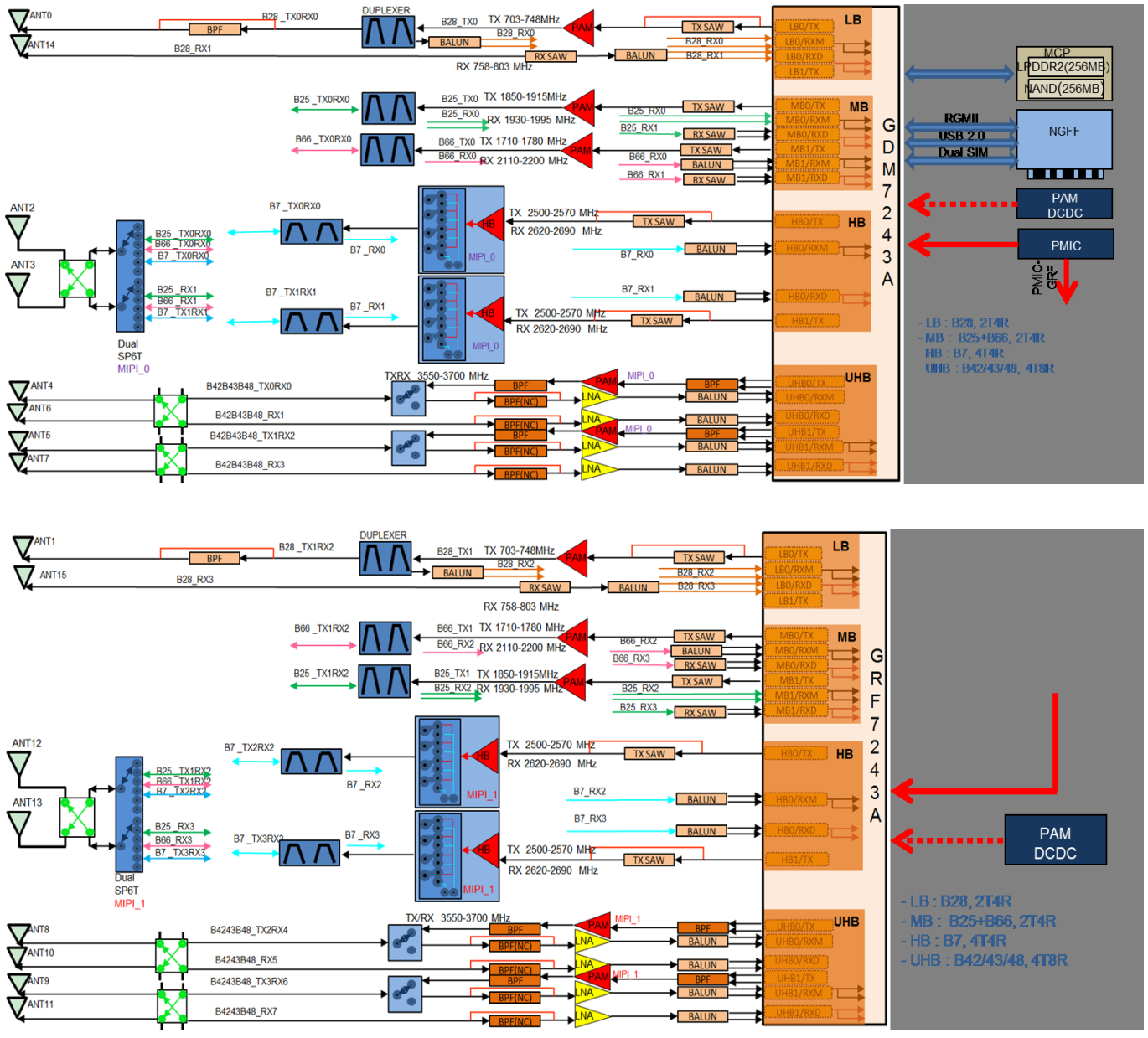
AIRCREEK_V2.5
2019.10.15

BLOCK DIAGRAM



FEATURE

1. FORM FACTOR
 - NGFF module

2. RF
 - LB : B28, 2T4R
 - MB : B25+B66, 2T4R
 - HB : B7, 4T4R
 - UHB : 【B42/43】/48, 4T8R

3. CA combination
Inter-band CA
 - (B28) + (B25/B66) + (B7) + (B42/43/48)

Intra-band CA
 - CA_B25 (DL-2CA, UL-1CA)
 - CA_B66 (DL-2CA, UL-1CA)
 - CA_B28 (DL-2CA, UL-1CA)
 - CA_B7 (DL-2CA, UL-1CA)
 - CA_B42 (DL-2CA,3CA, UL-1CA,2CA)
 - CA_B43 (DL-2CA, UL-1CA)
 - CA_B48 (DL-2CA,3CA)

4. SYSTEM
 - USB2.0 for debugging
 - Dual SIM
 - RGMII
 - 1PPS
 - Temperature detection for baseband
 - Security mode

PAGE

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HISTORY

Version 1.2 of a tagret schematic	
Each Decimal fraction of the version	Revison Description
Units	1. An error or alternation related to new devices and debugging points 2. PCB revision is mandatory.
Tenths	1. A changes of devices' values after optimizing or debugging circuits

Revision	Author/Date (YYYY/MM/DD)	Revision Contents
V1.0	Foxconn-Allen 2018/04/02	1. Initial draft.
	GCT 2018/07/26	1. Matching point was updated. B5 - TX0 : C423(8.2nH), C250(47pF), C612(2.2nH), C614(3.3nH) - TX1 : C273(47pF), C633(1.2nH) B20 - TX0 : C251(2.2nH), C623(3.3nH) - TX1 : C287(2.4nH), C642(47pF), C639(2.7nH) - RX0 : C424(DNI), C237(6.8nH), C236(6.8nH) - RX1 : L52(DNI), C464(6.2nH), C462(6.2nH) B1 - TX0 :C197(1.5nH), C184(1.5nH), C246(1pF), C370(8.2nH) - RX0 : L20(4.7nH), C191(8.2pF), C192(8.2pF) - RX1 : C323(1.8nH), C320(1.8nH), C330(1.8nH), L49(0.5pF) - RX2 : C563(1nH), C562(1nH), L95(0.5pF), L156(DNI) - RX3 : C554(1.2nH), L94(1pF) B3 - TX0 : C200(1.5nH), C185(2nH), C367(4.7nH), C372(4pF) - TX1 : C202(1.5nH), L88(4.7nH), C193(1.2nH), C436(1nH) - RX0 : L81(DNI), L22(1pF), L23(DNI), C277(1.2nH), C278(1.2nH) - RX1 : L51(1pF), C322(3.3nH), C332(3.3nH), L50(0.5pF) - RX2 : L92(DNI), C552(4.7pF), C553(4.7pF), L91(1pF) - RX3 : C547(2.7nH), C548(2.7nH) B7 - TX1 : C651(1.5nH), C653(1.8nH), C266(12pF) - TX2 : C402(3.9pF), C404(12nH) - TX3 : C450(1.0nH), C451(0.5pF), C687(1.0nH), L166(1.8nH), C452(8.2nH) - RX0 : C684(DNI) - RX1 : C702(1.0pF) - RX2 : L164(2.2nH) - RX3 : L166(1.8nH), C452(8.2nH), C720(1.0pF) 2. RX PLL bypass cap was changed 10uF to 22uF. - GDM : C86, C87 - GRF : C534, C535 B38 - TX1 : C222(2.0nH), C167(1.2nH), C647(1.2nH) - TX2 : C628(1.5nH), C567(1.2nH), C171(1.8nH) - TX3 : C407(1.2nH), C169(2.4nH) - RX0 : L99(DNI), C295,C294(1.5pF), C527(5.1pF) - RX1 : L102(1.0pF), C298,C296(0R), C544(3.0nH), C539(1.0nH) - RX2 : L135(12nH), C329,C317(1.0pF), L136(10nH), C559(1.8nH) - RX3 : L139(0.5pF), C400,C401(0R), L140(0.5pF), C564(3.6nH) B40 - Tx0 : C252(39pF) - TX1 : C265(1.5nH) - TX2 : C408(1.5nH) - TX3 : C444(1.2nH), C442(2.2nH), L121(2.4nH), C445(1.2nH) B41 - TX1 : C224(1.0nH), C173(3.3pF) - TX2 : C395(1.0nH) - TX3 : C410(1.0nH), C175(1.8nH) B42 - ANT5 : C832(2.2pF) - TX0 : C350(2pF), C361(47pF) - RX0 : C583(47pF) - RX1 : C584(47pF) - RX2 : C780(2.7nH), C771(47pF), C763(47pF), C766(47pF), L76(DNI) - RX3 : C773(47pF) - RX4 : C607(47pF), C605(2nH), C606(2nH), L75(DNI) - RX5 : C608(47pF) - RX6 : C802(3nH), C795(47pF), C792(2nH), C793(2nH), L112(DNI) - RX7 : C804(47pF)
	GCT 2018/12/21	1. Schematics changed and add parts of ANT0&1 ANT0 - U254(LPF), C897(NC), C895(NC), C896(47pF) ANT1 - U255(LPF), C900(NC), C899(NC), C898(47pF)
	FOXCONN 2019/02/01	1. Add band 4 to replace band 3 and component change below - TXRX0 :U88(SAFFB1G73KA0F0AR), U83(SAYEY1G73CA0F0A) - RX1 : U37(SAFFB2G14FA0F0A) - TX1RX2 : U78(SAYEY1G73CA0F0A), U96(SAFFB1G73KA0F0AR) - RX3 : U40(SAFFB2G14FA0F0A)
	FOXCONN 2019/05/06	1. Add band 28 to replace band 5 and component change below 2. Add band 28 to replace band 20 and component change below. 3. Add band 25 to replace band 1 and component change below. 4. Add band 66 to replace band 4 and component change below band28 U27,U29 (SKY77772) PA U76,U75(SAYRH725MBC0B0A) DUPLEXER U73,U77(SAYRH725MBC0B0A) TX SAW U112,U91 (SAFFB780MAA0F0AR1X) RX SAW U264,U265,U92,U109 (HHM17147A1) BALUN band25 U28,U30(SKY77762) PA U74,U100(SAYPE1G88BA1G0A) DUPLEXER U36,U68,U256,U257(SAFFB1G96FB1F0AR1X) RX SAW U70,U71(SAFFB1G88KC1F0AR1X) TX SAW band66 U78,U83(SAYRH1G74BA1F0A) DUPLEXER U259,U262(SAFFB2G15AA0F0A) RX SAW U88,U98(SAFFB1G74AB0F0A) TX SAW U37,U40,U258,U263(HHM17147A1) balun - BAND28_RX1 C241(47pF) L161(18nH) L213(18nH) C976(47pF) BAND28_TX0RX0 C238(47pF) C612(47pF) C613(18nH) C973(47pF) BAND28_RX3 C304(47pF) L85(18nH) C459(18nH) BAND28_TX1RX2 C624(18nH) C251(47pF) C231(47pF) C623(47pF) L84(18nH) C405(47pF) - B25TX0RX0 C197(10pF) L77(6.8nH) L196(2nH) C184(10pF) C368(10pF) C913(1nH) L78(27nH) B25RX1 C323(10pF) L198(27nH) B25TX1RX2 C233(10pF) L97(6.8nH) L200(2nH) C190(10pF) C518(10pF) C916(1nH) L105(27nH) BAND25_RX3 C554(10pF) L202(27nH) - B66TX0RX0 C200(10pF) L80(10pF) C185(0ohm) C371(10pF) C920(4.7nH) C919(10pF) L212(6.8nH) B66RX1 C324(10pF) C334(3.6nH) C923(3.6nH) C922(10pF) B66TX1RX2 C202(10pF) L88(3.6nH) L203(6.8nH) C193(0ohm) C436(10pF) C926(4.7nH) C925(10pF) C552(8.2nH) C553(8.2nH) C461(4.7nH) L158(10pF) B66RX3 C487(10pF) L492(3.6nH) C930(3.6nH) C928(10pF) L90(1pF) - B7TX0RX0 C619 C276 C617 C352 C528 C289 C529 10pF B7TX1RX1 C651 C336 C647 C356 C540 C292 C544 10pF B7TX2RX2 C602 C628 C387 C678 C561 C313 C561 10pF B7TX3RX3 C685 C681 C674 C441 C695 C344 C564 10pF - B48TX0RX0 C325 C577 C361 C350 C281 C726 C703 C825 C379 C583 C303 10pF B48RX1 C828 C584 C337 10pF B48TX1RX2 C341 C727 C383 C283 C734 C737 C491 C771 C312 C832 10pF B48RX3 C835 C773 C772 10pF B48TX2RX4 C448 C600 C510 C306 C746 C709 C839 C394 C607 C308 10pF B48RX5 C841 C608 C499 10pF B48TX3RX6 C345 C745 C432 C307 C743 C740 C844 C494 C795 C319 10pF B48RX7 C846 C804 C803 10pF C822 C819 C260 C216 C215 C259 C757 C761 C258 C214 C257 C213 10pF
	FOXCONN 2019/07/20	band28 TX0 C614 C612 U73 DNI C950 3.3nH C949 0ohm TX1 C625 C623 U77 DNI C958 100pF C957 47pF band66 TX0 L80 C185 2.0nH C200 1.5nH TX1 L185 1.2nH C193 2.0nH C202 1.5nH band7 B7 TX1 C266 C342 9pF B7 TX2 C402 C418 9pF C422 C451 DNI B7 TX3 C450 C454 9pF
	FOXCONN 2019/10/15	band28 TX0 C613 R377 C952 C951 DNI C950 100pF C949 47pF L159 20nH U254 C896 C255 47pF TX1 C624 R339 C954 C953 DNI L84 20nH U255 C898 C256 47pF band7 B7 TX0 C253 C338 9pF

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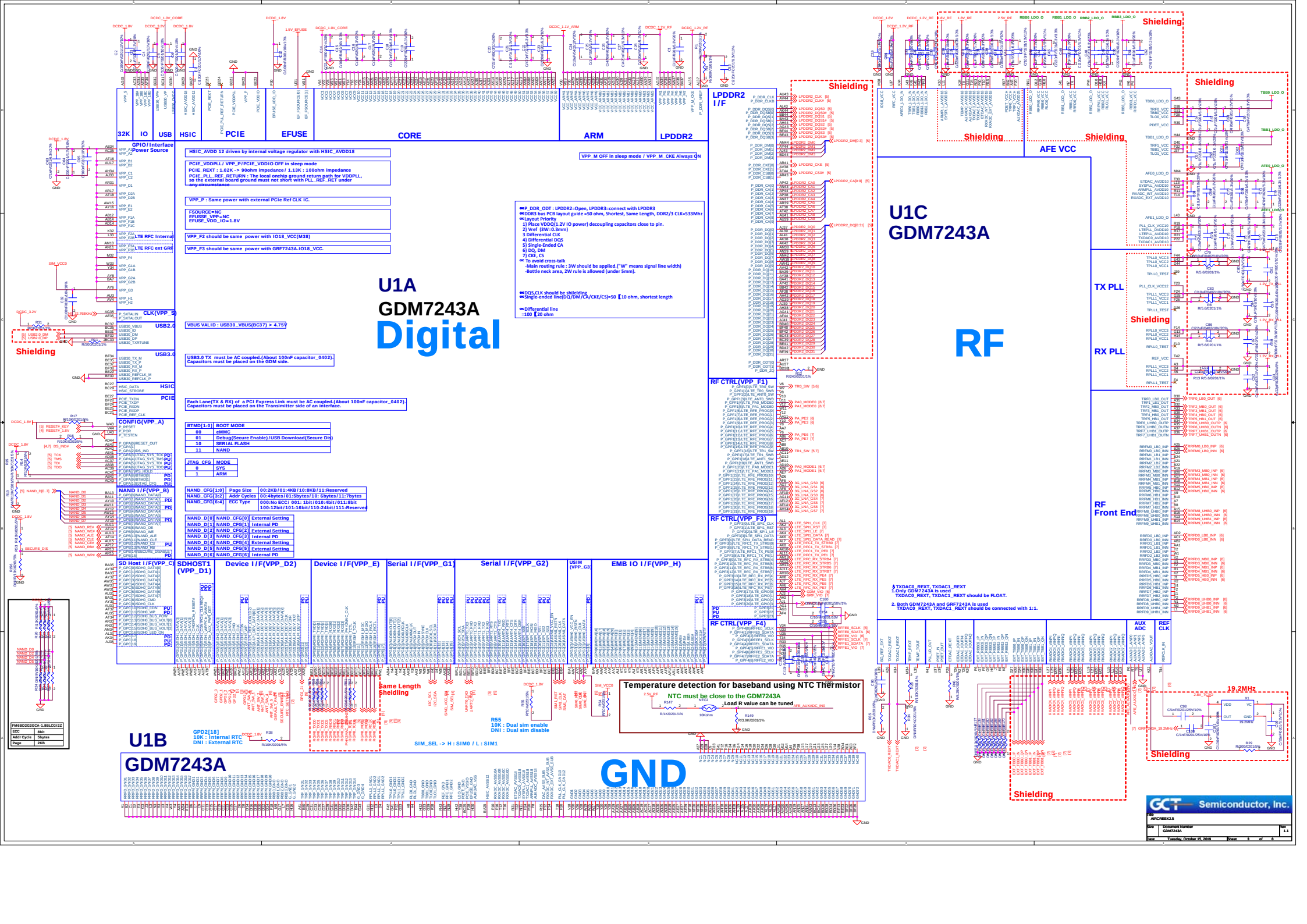
U1A
GDM7243A
Digital
U1C
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RF
U1B
GDM7243A
GND
32K
IO
USB
HSIC
PCIE
EFUSE
CORE
ARM
LPDDR2
LPDDR2 I/F
GPIO/Interface Power Source
CLK(VPP_S)
USB2.0
USB3.0
HSIC
PCIE
CONFIG(VPP_A)
NAND I/F(VPP_B)
SD Host I/F(VPP_C)
SDHOST1 (VPP_D1)
Device I/F(VPP_D2)
Device I/F(VPP_E)
Serial I/F(VPP_G1)
Serial I/F(VPP_G2)
USIM (VPP_G3)
EMB IO I/F(VPP_H)
RF CTRL(VPP_F1)
RF CTRL(VPP_F3)
RF CTRL(VPP_F4)
AFE VCC
TX PLL
RX PLL
RF Front End
AUX ADC
REF CLK
Shielding
Temperature detection for baseband using NTC Thermistor
NTC must be close to the GDM7243A
Load R value can be tuned
Same Length Shielding
SIM_SEL -> H : SIM0 / L : SIM1
R55
10K : Dual sim enable
DNI : Dual sim disable
GPD2[18]
10K : Internal RTC
DNI : External RTC
19.2MHz
Semiconductor, Inc.
AIRCREEK2.5
GDM7243A
Tuesday, October 15, 2019

PMIC

U2 G5851B81U

PWRON, PWRHOLD, ENDLO=Over Min 1.4V
PWRON internal PU=200Kohm

POWER SEQUENCER

LDO2~LDO7

Vcc Min=2.6V
Vcc operating=2.8~5.5V

RTCOUT=3.0V

* GPD2[18] (INT PD)
[0] External RTC
- X-tal EXT CAP
[1] Internal RTC - not used Hibernation
- XIN=PD100K / XOUT=DNI

32KHz OSC

OSC_32K level=DCDC4

I2C I/F

SWREG1 1.1V,2A
SWREG2 1.2V,2A
SWREG3 3.2V,2A
SWREG4 1.8V,2A

LDO

1.8V,300mA LDO1
2.8V,300mA LDO2
2.5V,300mA LDO3
2.8V,300mA LDO4
2.5V,300mA LDO5
1.2V,300mA LDO6
1.2V,300mA LDO7

Vcc for LDO1~5
Vcc for LDO6,7

Shielding
Shielding

SIM CARD I/F

SIM_VCC0 Load Switch

LDO5 is default 2.5V when PMIC is ON.

TON : 300us(Typ)

U249 TPS22915BYFPR

PAM DCDC (BOOST, 3A)

If MAIN_VCC is below 3.3V, please use DCDC for boosting PAM VCC as avove 3.6V.

Peak Current Limit

ILIM0	ILIM1	
H	L	= 1.8A
L	H	= 3.0A
H	H	= 5.2A

G5177ARE1U

VOUT=VREF*(1+R1/R2)
VREF typical is 1.23V

PAM DCDC (BOOST, 3A)

If MAIN_VCC is below 3.3V, please use DCDC for boosting PAM VCC as avove 3.6V.

Peak Current Limit

ILIM0	ILIM1	
H	L	= 1.8A
L	H	= 3.0A
H	H	= 5.2A

G5177ARE1U

VOUT=VREF*(1+R1/R2)
VREF typical is 1.23V

DCDC_1.0V_CORE

G5719CRC1U

Secure_enable POWER

TLV73315PDQNR

AVDD18 POWER

OFF in sleep mode

RT9078-18GQZ
M-DFN-1X1-4AS

Shielding

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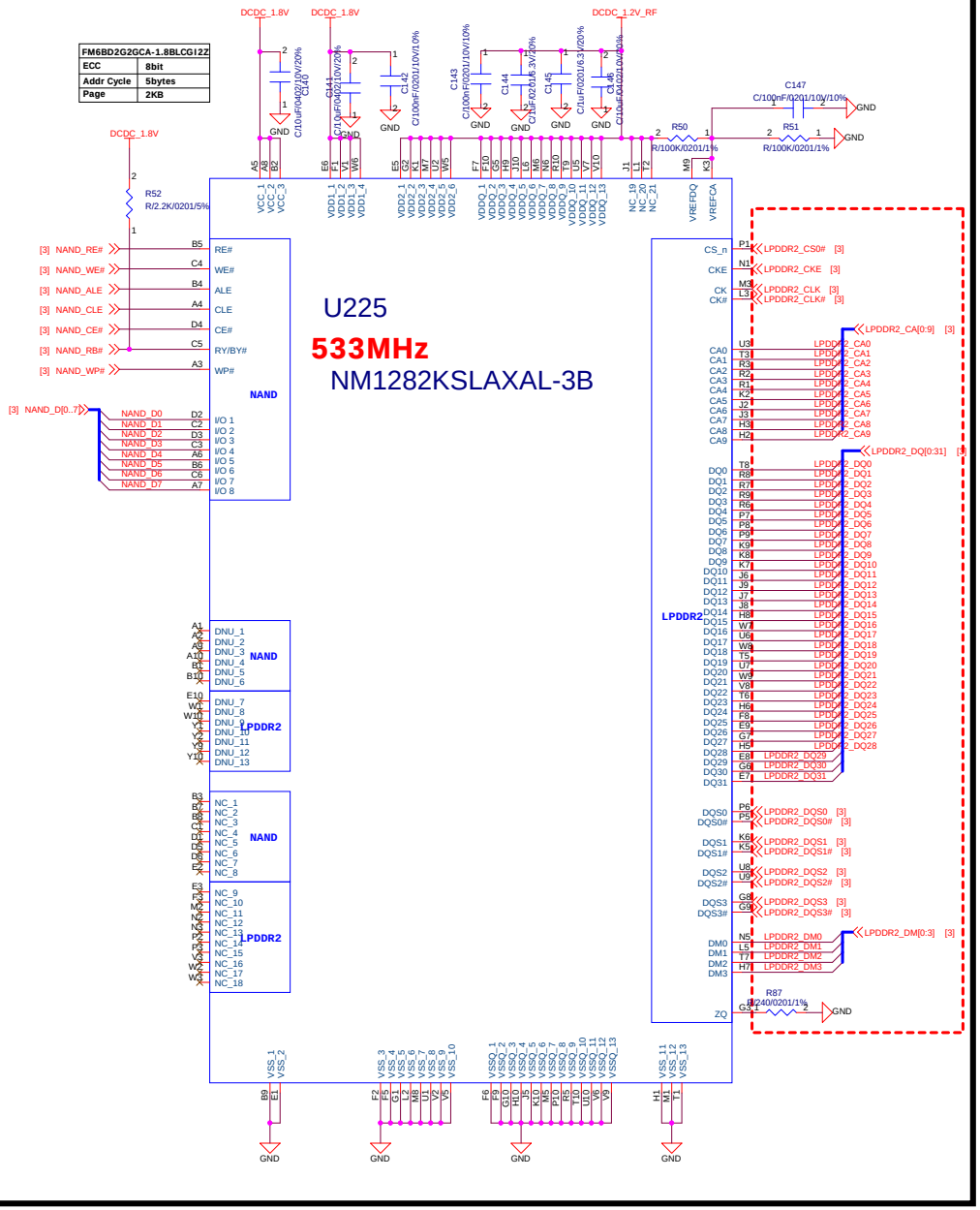
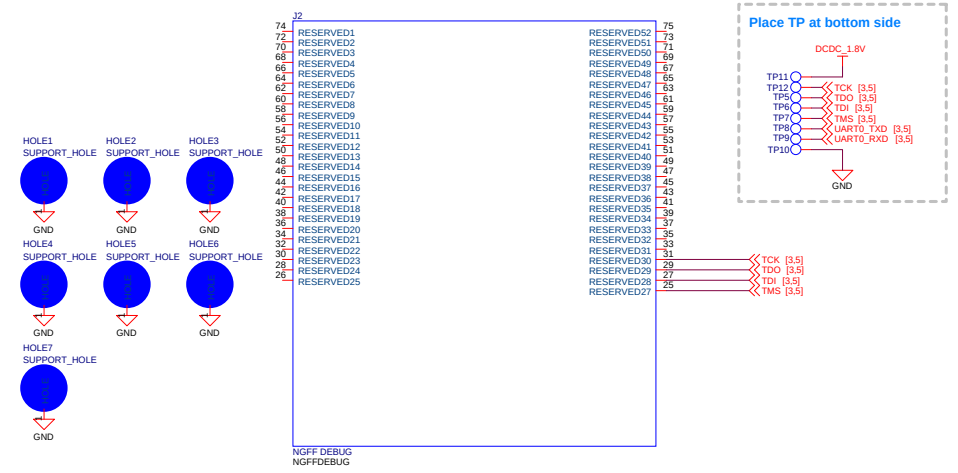
MCP(NAND 2Gb + LPDDR2 2Gb)



M.2 Socket2 PCIe Based WWLAN Module Pinout

M.2 Socket2 Debug



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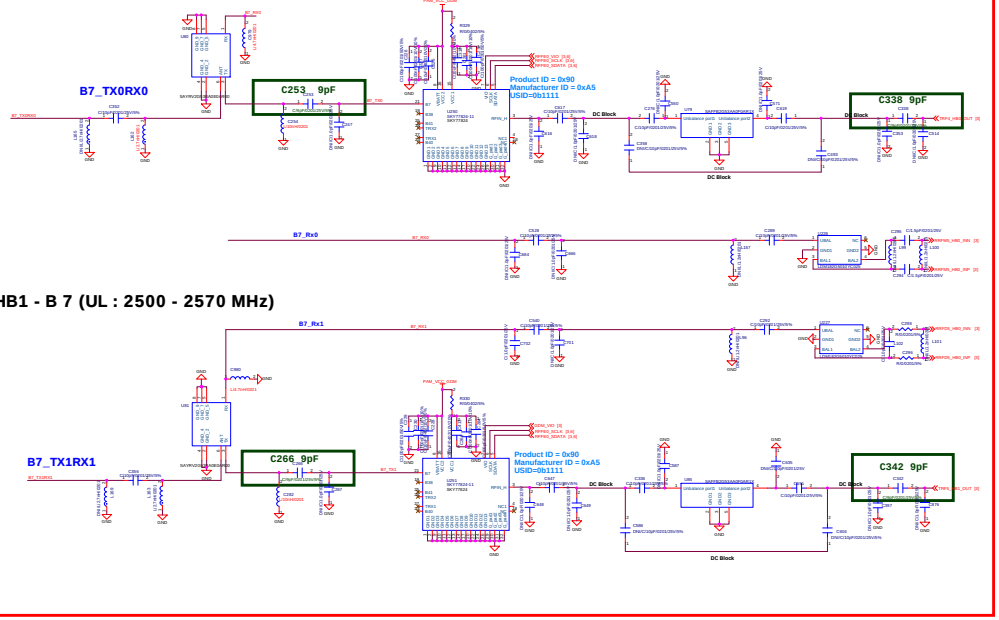
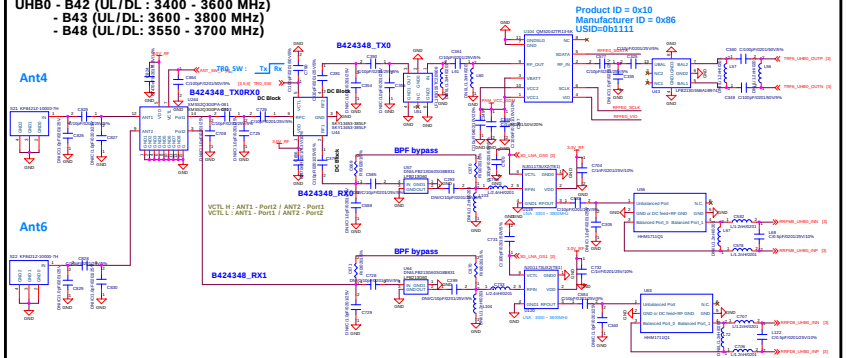
GDM7243A HB0 - B 7 (UL : 2500-2570 MHz, DL : 2620-2690 MHz)

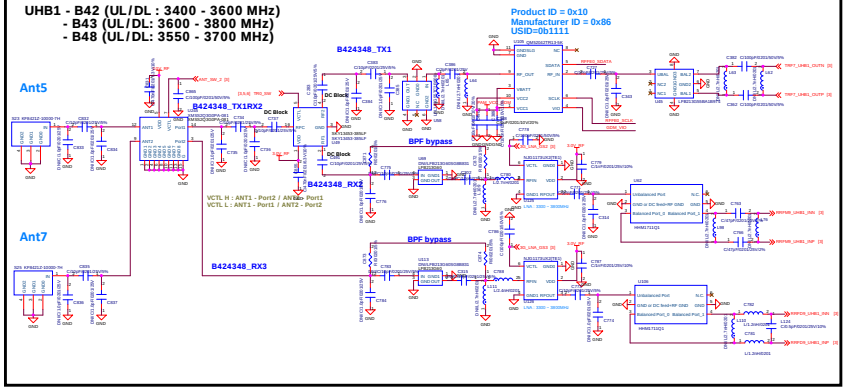


HB1 - B 7 (UL : 2500 - 2570 MHz)

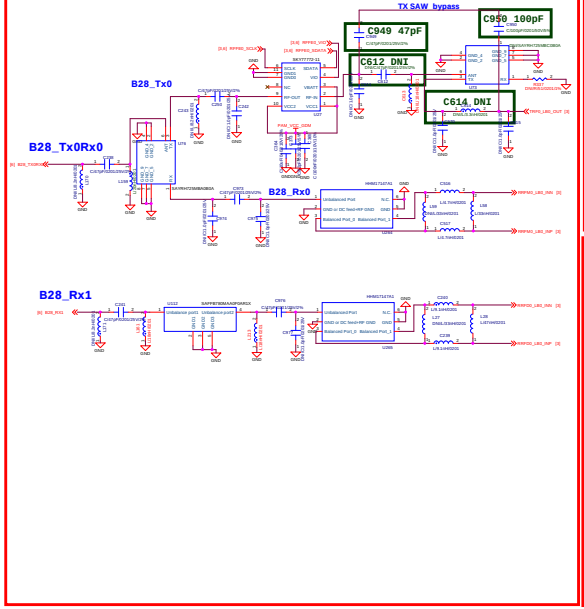
UHB0 - B42 (UL/DL : 3400 - 3600 MHz) - B43 (UL/DL: 3600 - 3800 MHz) - B48 (UL/DL: 3550 - 3700 MHz)



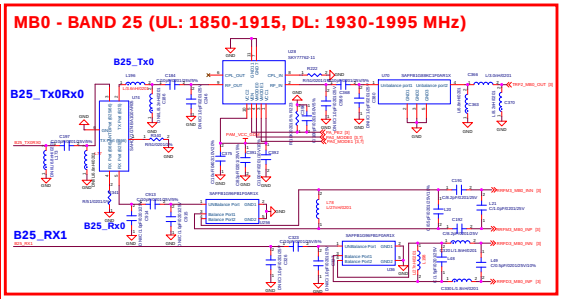
UHB1 - B42 (UL/DL : 3400 - 3600 MHz) - B43 (UL/DL: 3600 - 3800 MHz) - B48 (UL/DL: 3550 - 3700 MHz)



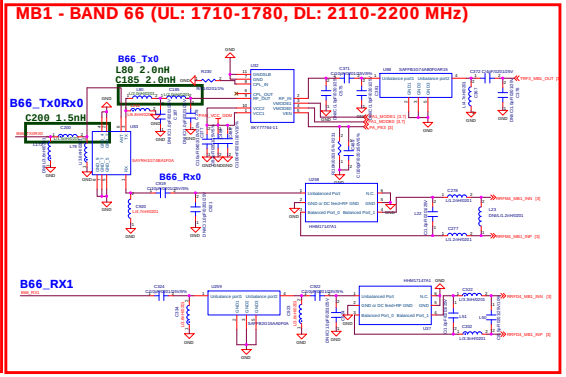
LB0 - BAND 28 (UL: 703-748, DL: 758-803 MHz)



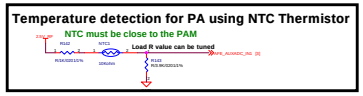
MB0 - BAND 25 (UL: 1850-1915, DL: 1930-1995 MHz)

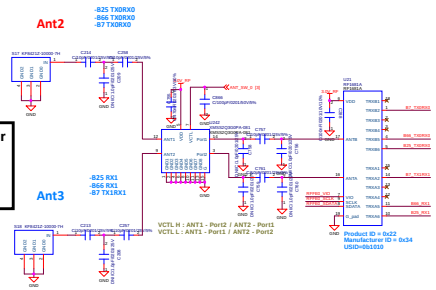


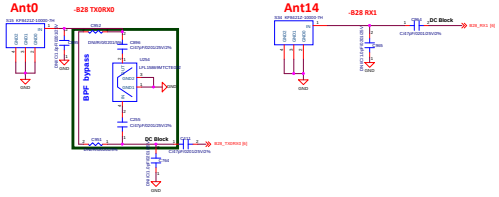
MB1 - BAND 66 (UL: 1710-1780, DL: 2110-2200 MHz)



Temperature detection for PA using NTC Thermistor







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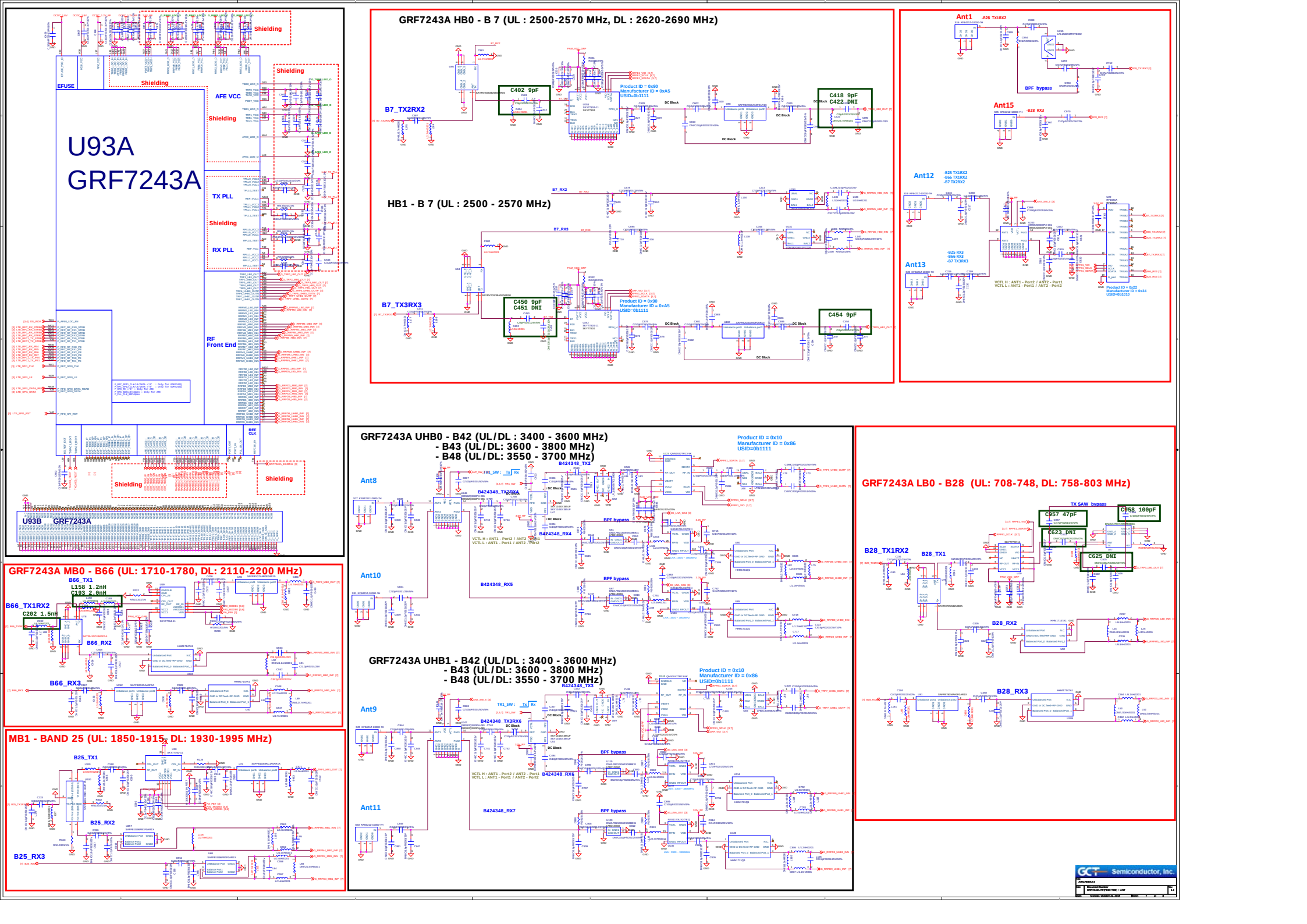
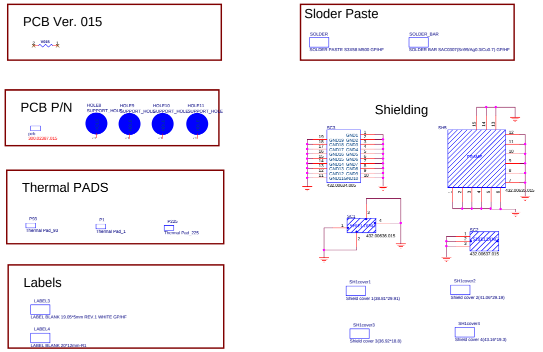

U93A
GRF7243A
Shielding
EFUSE
AFE VCC
TX PLL
RX PLL
RF Front End
REF CLK
U93B GRF7243A
GRF7243A HB0 - B 7 (UL : 2500-2570 MHz, DL : 2620-2690 MHz)
B7_TX2RX2
C402 9pF
C418 9pF
C422_DNI
Product ID = 0x90
Manufacturer ID = 0xA5
USID=0b1111
DC Block
HB1 - B 7 (UL : 2500 - 2570 MHz)
B7_TX3RX3
C450 9pF
C451 DNI
C454 9pF
Ant1
B28 TX1RX2
BPF bypass
Ant15
B28 RX3
Ant12
B25 TX1RX2
B66 TX1RX2
B7 TX2RX2
Ant13
B25 RX3
B66 RX3
B7 TX3RX3
VCTL H : ANT1 - Port2 / ANT2 - Port1
VCTL L : ANT1 - Port1 / ANT2 - Port2
Product ID = 0x22
Manufacturer ID = 0x34
USID=0b1010
GRF7243A UHB0 - B42 (UL/DL : 3400 - 3600 MHz)
- B43 (UL/DL: 3600 - 3800 MHz)
- B48 (UL/DL: 3550 - 3700 MHz)
Product ID = 0x10
Manufacturer ID = 0x86
USID=0b1111
B424348_TX2
B424348_TX2RX4
B424348_RX4
B424348_RX5
Ant8
Ant10
BPF bypass
GRF7243A LB0 - B28 (UL: 708-748, DL: 758-803 MHz)
TX SAW bypass
C958 100pF
C957 47pF
C623_DNI
C625_DNI
B28_TX1RX2
B28_TX1
B28_RX2
B28_RX3
GRF7243A MB0 - B66 (UL: 1710-1780, DL: 2110-2200 MHz)
B66_TX1
L158 1.2nH
C193 2.0nH
B66_TX1RX2
C202 1.5nH
B66_RX2
B66_RX3
GRF7243A UHB1 - B42 (UL/DL : 3400 - 3600 MHz)
- B43 (UL/DL: 3600 - 3800 MHz)
- B48 (UL/DL: 3550 - 3700 MHz)
Product ID = 0x10
Manufacturer ID = 0x86
USID=0b1111
B424348_TX3
B424348_TX3RX6
B424348_RX6
B424348_RX7
Ant9
Ant11
BPF bypass
MB1 - BAND 25 (UL: 1850-1915, DL: 1930-1995 MHz)
B25_TX1
B25_RX2
B25_RX3
GCT Semiconductor, Inc.



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