BCM94343WWCD2_1: BCM4343W WLBGA + STM32F412

Preliminary schematic, subject to changes

Page 1 - Revision and Notes
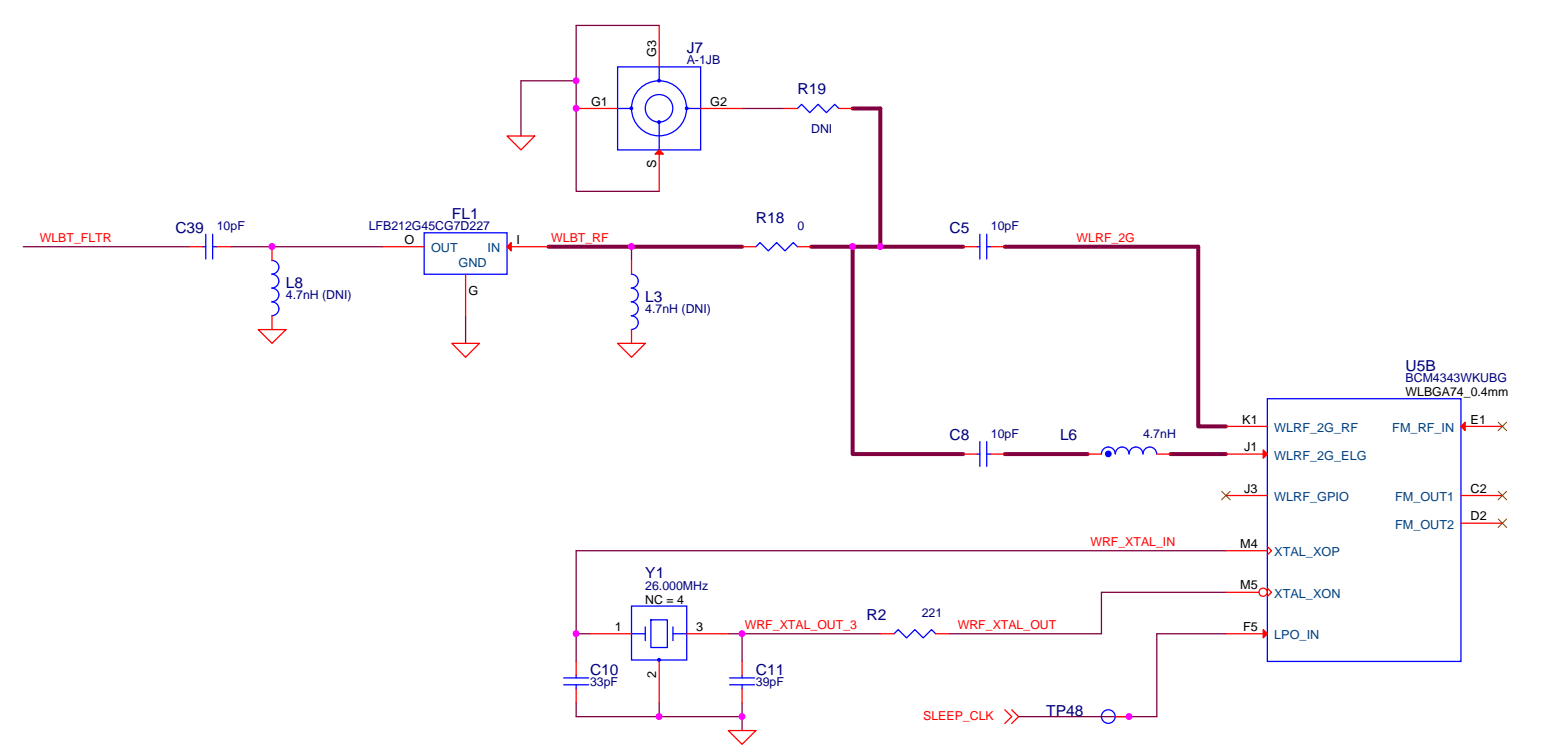
Page 2 - BCM4343W WLBGA Section

Page 3 - STM32F412 Section

BOM ITEMS

PCB

PCB NUMBER: 200-130058-0010
PCB NAME: BCM94343WWCD2_1

ASSEMBLY INSTRUCTIONS

SHIELD

SIP Shield: 210-128955-0010

ZH1
210-128955-0010

Broadcom Corporation

5300 California Avenue
Irvine, CA 92617
Phone: (949) 926-5000

BROADCOM.

BCM94343WWCD2_1

Size	DWG NO	Rev
Custom	824-130058-0010	02

Scale	Deval Dave	Sheet 1 of 3

WLAN: BCM4343W WLBGA

Stuffing option for Skyworks vs. JRC (Footprint Compatible):

Install R54:
Position AC (Default) for SKYA21038-679LF
Position BC for NJG1801K75

Install C2:
0.001uF for SKYA21038
10pF for NJG1801K75

INSTALL POSITION A

ANT2
ANT-BCM943235UE

ANT1
ANT-BCM943235UE-MIR

MM8430-2610B — J1
MM8430-2610B — J2

C1 1.8nH
L1 4.7nH (DNI)
L2 1.8pF
C6 1.8nH
L4 4.7nH (DNI)
L5 1.8pF

C41 0.2pF (DNI)
C3 10pF
C4 10pF
C40 0.2pF (DNI)
C42 0.2pF (DNI)
C2 1000pF
C34 4.7pF

R54

U1 SKYA21038-679LF SON6H_0.35mm
OUT1 VDD
OUT2 IN
GND   VCTL

ANT_A
ANT_B

WL_GPIO_3   VOUT_3P3
WLBT_FLTR
WL_GPIO_1

J7 A-1JB
G3 G1 G2 S
R19 DNI

FL1 LFB212G45CG7D227
OUT IN GND

C39 10pF
L8 4.7nH (DNI)
WLBT_RF
R18 0
C5 10pF
WLRF_2G
L3 4.7nH (DNI)

C8 10pF
L6 4.7nH

U5B BCM4343WKUBG WLBGA74_0.4mm
K1 WLRF_2G_RF   FM_RF_IN E1
J1 WLRF_2G_ELG
J3 WLRF_GPIO   FM_OUT1   C2
                 FM_OUT2   D2
M4 XTAL_XOP
M5 XTAL_XON
F5 LPO_IN

Y1 26.000MHz NC = 4
WRF_XTAL_IN
WRF_XTAL_OUT_3   R2 221   WRF_XTAL_OUT
C10 33pF
C11 39pF
SLEEP_CLK   TP48

To use 3-Wire COEX:
Install J8
Install R53, R56, R57

J8 PBC03SAAN
1 WL_GPIO_2
2 WL_GPIO_3
3 WL_GPIO_4

Default: J8 is DNI

To use JTAG: Install R4

R4 10K (DNI)
VDD_3V3_SIP   WL_HOST_WAKE
WL_GPIO_1

U5A BCM4343WKUBG WLBGA74_0.4mm
WL_SDIO_CLK   M7 SDIO_CLK
WL_SDIO_CMD   L6 SDIO_CMD
WL_SDIO_DAT0 K6 SDIO_DATA_0
WL_SDIO_DAT1 H7 SDIO_DATA_1
WL_SDIO_DAT2 L7 SDIO_DATA_2
WL_SDIO_DAT3 J7 SDIO_DATA_3
              M6 CLK_REQ
WL_HOST_WAKE J6 GPIO_0
WL_GPIO_1 R52 0 TP59 H6 GPIO_1
WL_GPIO_2 R53 0 TP60 L5 GPIO_2
WL_GPIO_3 R56 0 TP61 K4 GPIO_3
WL_GPIO_4 R57 0 TP62 K5 GPIO_4
              H5 BT_GPIO_5
              G5 BT_GPIO_4
              F4 BT_GPIO_3
C1 BT_HOST_WAKE   BT_HOST_WAKE
B1 BT_DEV_WAKE   BT_DEV_WAKE
A5 BT_PCM_CLK   BT_PCM_CLK
B5 BT_PCM_SYNC   BT_PCM_SYNC
C4 BT_PCM_IN   BT_PCM_IN
B4 BT_PCM_OUT   BT_PCM_OUT
A4 BT_I2S_CLK
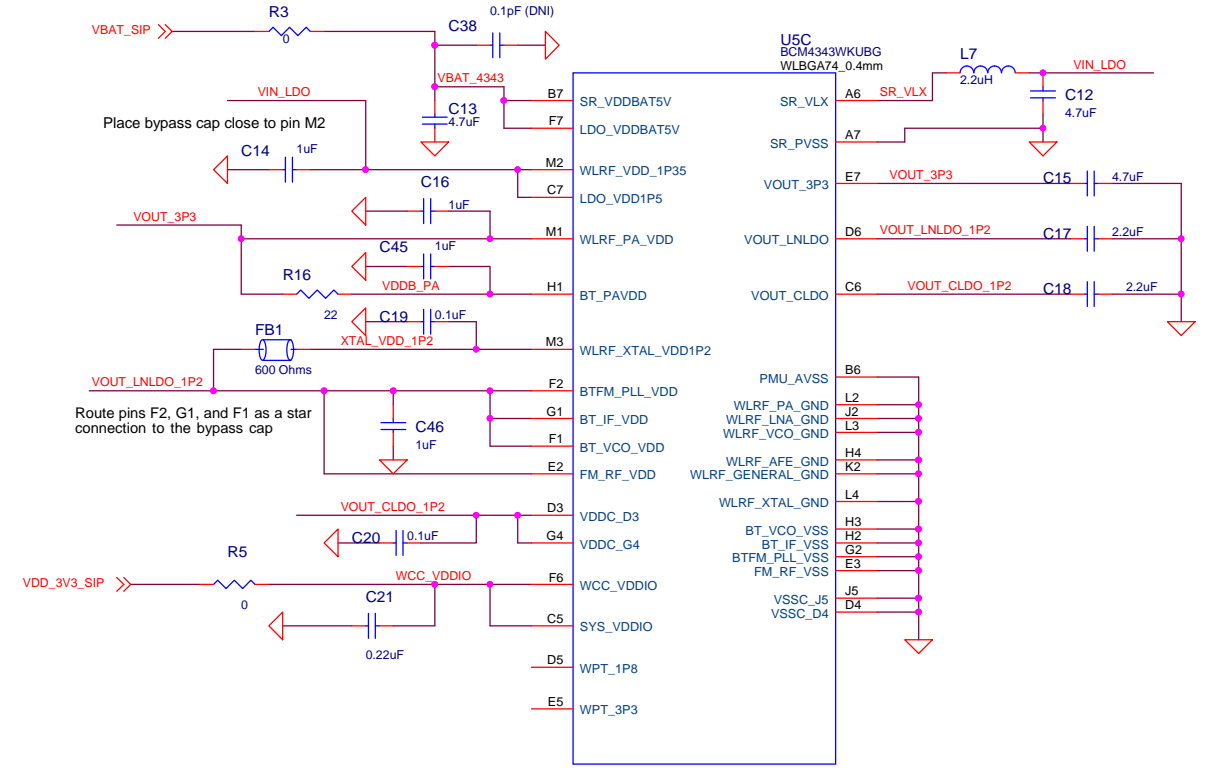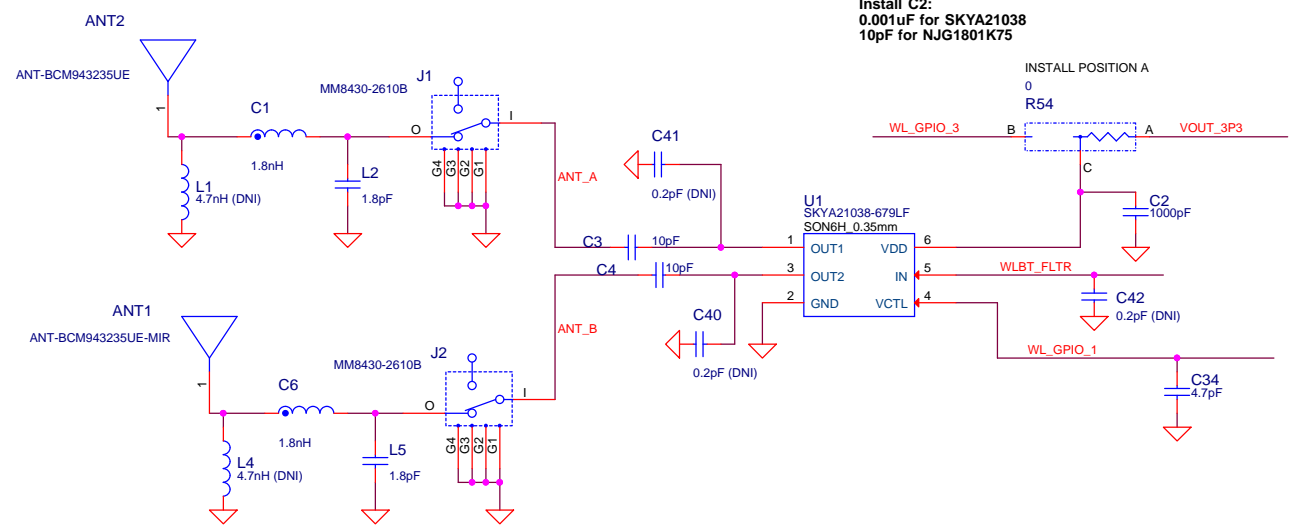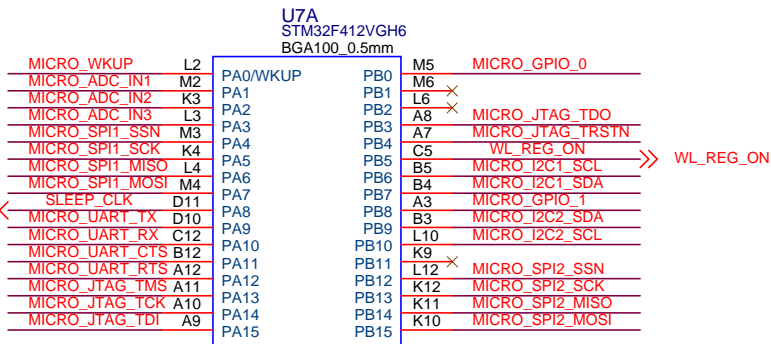A3 BT_I2S_WS
B3 BT_I2S_DO
B2 BT_UART_CTS_L   BT_UART_CTS_L
C3 BT_UART_RTS_L   BT_UART_RTS_L
A1 BT_UART_RXD   BT_UART_RXD
A2 BT_UART_TXD   BT_UART_TXD

G6 WL_REG_ON   BT_REG_ON TP53 WL_REG_ON
E6 BT_REG_ON   TP50 BT_REG_ON

R20 10K (DNI)
VDD_3V3_SIP

TP54 BT_HOST_WAKE
TP55 BT_DEV_WAKE

SDIO INTERFACE

R3
VBAT_SIP
C38 0.1pF (DNI)
VBAT_4343

VIN_LDO
C13 4.7uF
Place bypass cap close to pin M2
C14 1uF

U5C BCM4343WKUBG WLBGA74_0.4mm
B7 SR_VDDBAT5V   SR_VLX   A6 SR_VLX   L7 2.2uH VIN_LDO
F7 LDO_VDDBAT5V   SR_PVSS   A7   C12 4.7uF
M2 WLRF_VDD_1P35 VOUT_3P3 E7 VOUT_3P3 C15 4.7uF
C7 LDO_VDD1P5   VOUT_LNLDO D6 VOUT_LNLDO_1P2 C17 2.2uF
M1 WLRF_PA_VDD   VOUT_CLDO C6 VOUT_CLDO_1P2   C18 2.2uF
H1 BT_PAVDD
M3 WLRF_XTAL_VDD1P2
F2 BTFM_PLL_VDD   PMU_AVSS B6
G1 BT_IF_VDD   WLRF_PA_GND L2 J2 L3
F1 BT_VCO_VDD   WLRF_LNA_GND
E2 FM_RF_VDD   WLRF_VCO_GND
                  WLRF_AFE_GND H4 K2
                  WLRF_GENERAL_GND L4
D3 VDDC_D3   WLRF_XTAL_GND
G4 VDDC_G4   BT_VCO_VSS H3 H2
F6 WCC_VDDIO   BT_IF_VSS   G2
C5 SYS_VDDIO   BTFM_PLL_VSS E3
D5 WPT_1P8   FM_RF_VSS
E5 WPT_3P3   VSSC_J5   J5
                  VSSC_D4   D4

C16 1uF
VOUT_3P3
C45 1uF
VDDB_PA
R16
C19 0.1uF
XTAL_VDD_1P2
FB1 600 Ohms
VOUT_LNLDO_1P2
Route pins F2, G1, and F1 as a star connection to the bypass cap
C46 1uF
VOUT_CLDO_1P2
C20 0.1uF
R5
VDD_3V3_SIP 0
C21 0.22uF
WCC_VDDIO

RF Shield Clip Landing Pads

J5 CLIP-RFI-SMT
J6 CLIP-RFI-SMT
J3 CLIP-RFI-SMT
J4 CLIP-RFI-SMT

U7A
STM32F412VGH6
BGA100_0.5mm

MICRO_WKUP	L2	PA0/WKUP	
MICRO_ADC_IN1	M2	PA1	PB0	M5	MICRO_GPIO_0
MICRO_ADC_IN2	K3	PA2	PB1	M6	
MICRO_ADC_IN3	L3	PA3	PB2	L6	
MICRO_SPI1_SSN	M3	PA4	PB3	A8	MICRO_JTAG_TDO
MICRO_SPI1_SCK	K4	PA5	PB4	A7	MICRO_JTAG_TRSTN
MICRO_SPI1_MISO	L4	PA6	PB5	C5	WL_REG_ON
MICRO_SPI1_MOSI	M4	PA7	PB6	B5	MICRO_I2C1_SCL
SLEEP_CLK	D11	PA8	PB7	B4	MICRO_I2C1_SDA
MICRO_UART_TX	D10	PA9	PB8	A3	MICRO_GPIO_1
MICRO_UART_RX	C12	PA10	PB9	B3	MICRO_I2C2_SDA
MICRO_UART_CTS	B12	PA11	PB10	L10	MICRO_I2C2_SCL
MICRO_UART_RTS	A12	PA12	PB11	K9	
MICRO_JTAG_TMS	A11	PA13	PB12	L12	MICRO_SPI2_SSN
MICRO_JTAG_TCK	A10	PA14	PB13	K12	MICRO_SPI2_SCK
MICRO_JTAG_TDI	A9	PA15	PB14	K11	MICRO_SPI2_MISO
			PB15	K10	MICRO_SPI2_MOSI

SLEEP_CLK →
WL_REG_ON

To use SPI2 between BCM4343W and STM32F412:
Install R11, R12, R13, R14 and R15.
(R15 is used to select SPI mode for BCM4343W)

| WL_SDIO_DAT0 | R11 | 0 (DNI) | MICRO_SPI2_MISO | (SPI_DO) |
WL_SDIO_DAT3	R12	0 (DNI)	MICRO_SPI2_SSN	(SPI_CS)
WL_SDIO_CLK	R13	0 (DNI)	MICRO_SPI2_SCK	(SPI_CLK)
WL_SDIO_CMD	R14	0 (DNI)	MICRO_SPI2_MOSI	(SPI_DI)
WL_SDIO_DAT2	R15	0 (DNI)	GND	
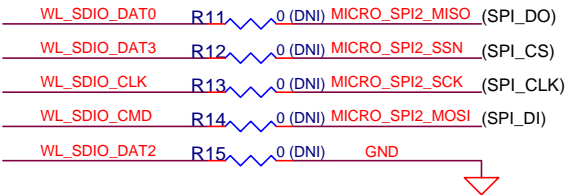
To use WLAN JTAG, Install R4

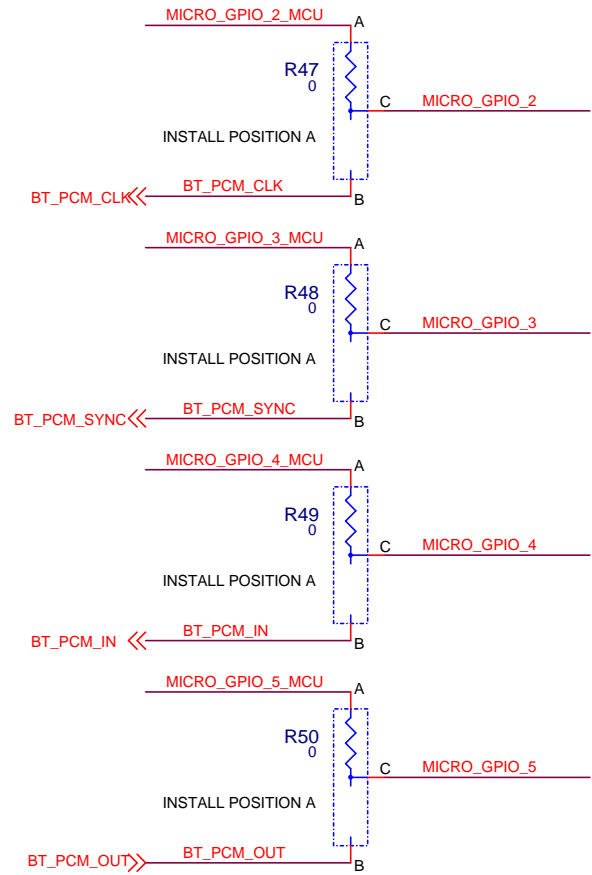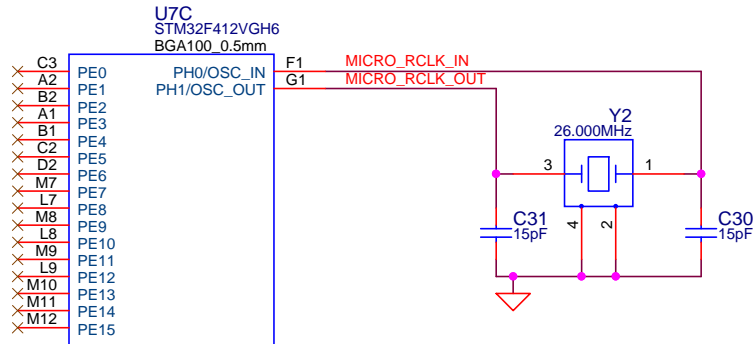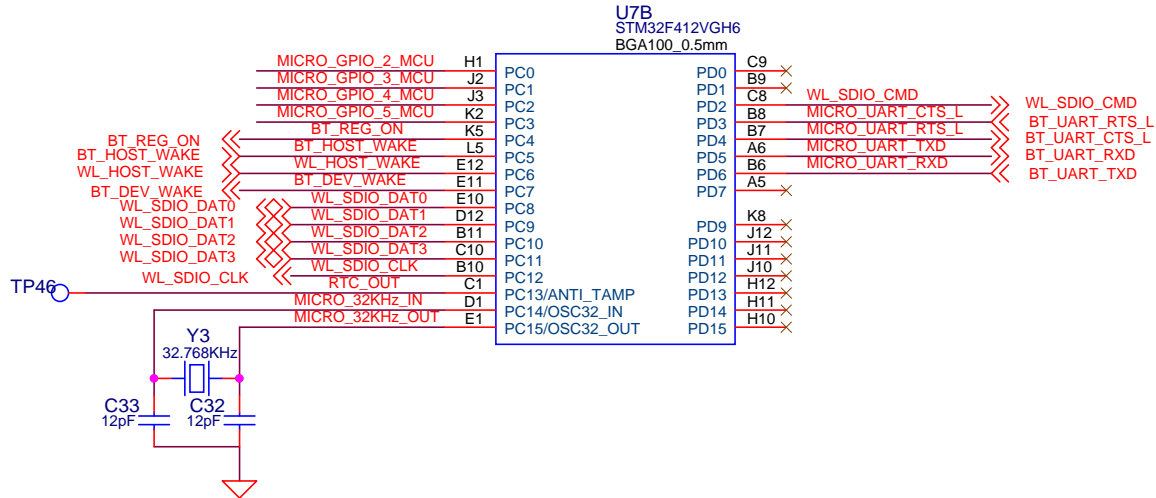| WL_SDIO_DAT1 | R21 | 0 (DNI) | WL_JTAG_TDI |
| WL_SDIO_DAT2 | R22 | 0 (DNI) | WL_JTAG_TDO |
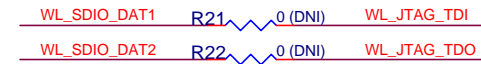
To use GPIO Signals to STM32F412, Install Position AC.
To use BT PCM Signals directly to BCM4343W, Install Position BC (Default).
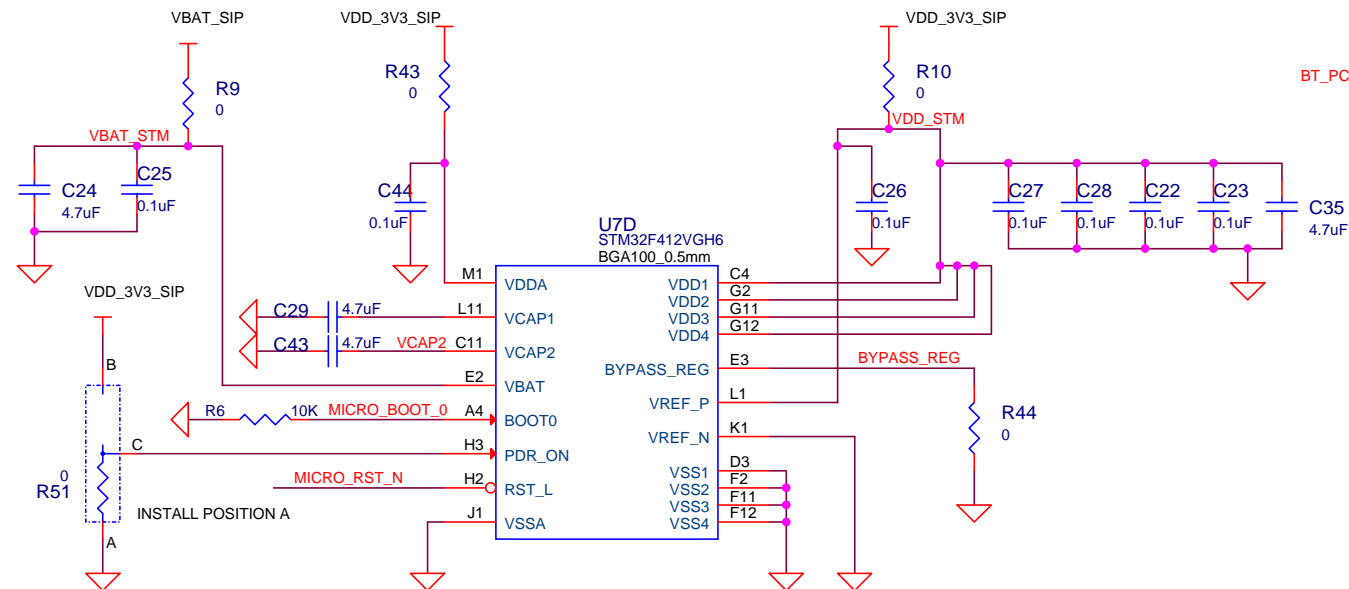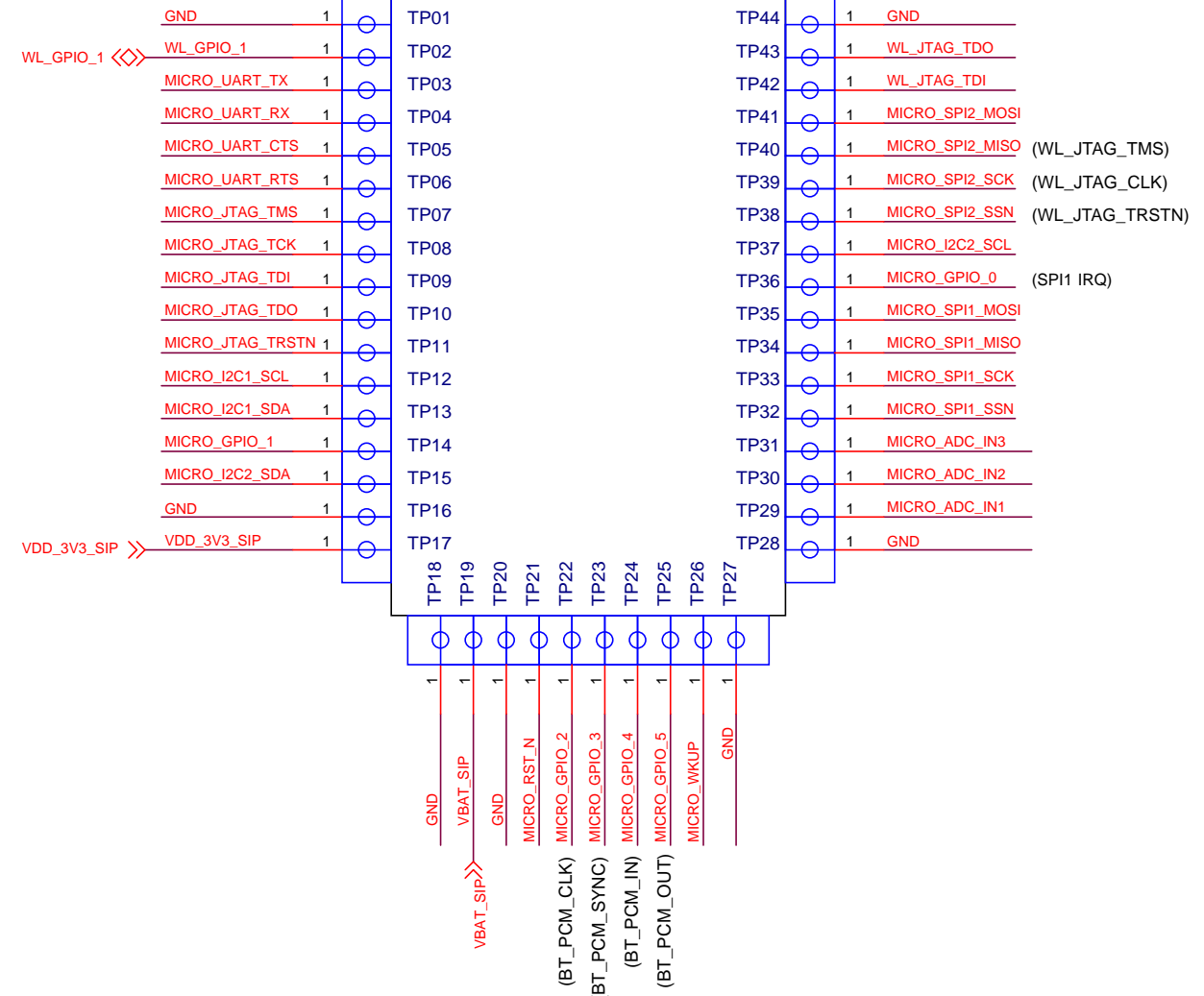
SDIO / SPI Interface Options:

SDIO	STM32F412 Pin Number	STM32F412 Port/Pin	BCM4343W Pin Number	Function
	B10	PC12	<---> M7	SDIO_CLK
	C8	PD2	<---> L6	SDIO_CMD
	E10	PC8	<---> K6	SDIO_DATA_0
	D12	PC9	<---> H7	SDIO_DATA_1
	B11	PC10	<---> L7	SDIO_DATA_2
	C10	PC11	<---> J7	SDIO_DATA_3

SPI	STM32F412 Pin Number	STM32F412 Port/Pin	BCM4343W Pin Number	Function
	K12	PB13	<---> M7	SPI_CLK
	K10	PB15	<---> L6	SPI_MOSI
	K11	PB14	<---> K6	SPI_MISO
	C10	PC11	<---> J7	SPI_CS
	D12	PC9	<---> H7	SPI_IRQ

Note: Only one set of communication lines are required to be connected between the microcontroller and wlan device (either SDIO or SPI).
Please select one set based on the table above.
It is NOT necessary to connect both SPI and SDIO.

U7B
STM32F412VGH6
BGA100_0.5mm

MICRO_GPIO_2_MCU	H1	PC0	PD0	C9	
MICRO_GPIO_3_MCU	J2	PC1	PD1	B9	
MICRO_GPIO_4_MCU	J3	PC2	PD2	C8	WL_SDIO_CMD
MICRO_GPIO_5_MCU	K2	PC3	PD3	B8	MICRO_UART_CTS_L
BT_REG_ON	K5	PC4	PD4	B7	MICRO_UART_RTS_L
BT_HOST_WAKE	L5	PC5	PD5	A6	MICRO_UART_TXD
WL_HOST_WAKE	E12	PC6	PD6	B6	MICRO_UART_RXD
BT_DEV_WAKE	E11	PC7	PD7	A5	
WL_SDIO_DAT0	E10	PC8	PD9	K8	
WL_SDIO_DAT1	D12	PC9	PD10	J12	
WL_SDIO_DAT2	B11	PC10	PD11	J11	
WL_SDIO_DAT3	C10	PC11	PD12	J10	
WL_SDIO_CLK	B10	PC12	PD13	H12	
RTC_OUT	C1	PC13/ANTI_TAMP	PD14	H11	
MICRO_32KHz_IN	D1	PC14/OSC32_IN	PD15	H10	
MICRO_32KHz_OUT	E1	PC15/OSC32_OUT			

BT_REG_ON, BT_HOST_WAKE, WL_HOST_WAKE, BT_DEV_WAKE

WL_SDIO_CMD
BT_UART_RTS_L
BT_UART_CTS_L
BT_UART_RXD
BT_UART_TXD

TP46

Y3 32.768KHz
C33 12pF   C32 12pF

U7C
STM32F412VGH6
BGA100_0.5mm

C3	PE0	PH0/OSC_IN	F1	MICRO_RCLK_IN
A2	PE1	PH1/OSC_OUT	G1	MICRO_RCLK_OUT
B2	PE2			
A1	PE3			
B1	PE4			
C2	PE5			
D2	PE6			
M7	PE7			
L7	PE8			
M8	PE9			
L8	PE10			
M9	PE11			
L9	PE12			
M10	PE13			
M11	PE14			
M12	PE15			

Y2 26.000MHz
C31 15pF   C30 15pF

Module Pinout

GND	1	TP01
WL_GPIO_1	1	TP02
MICRO_UART_TX	1	TP03
MICRO_UART_RX	1	TP04
MICRO_UART_CTS	1	TP05
MICRO_UART_RTS	1	TP06
MICRO_JTAG_TMS	1	TP07
MICRO_JTAG_TCK	1	TP08
MICRO_JTAG_TDI	1	TP09
MICRO_JTAG_TDO	1	TP10
MICRO_JTAG_TRSTN	1	TP11
MICRO_I2C1_SCL	1	TP12
MICRO_I2C1_SDA	1	TP13
MICRO_GPIO_1	1	TP14
MICRO_I2C2_SDA	1	TP15
GND	1	TP16
VDD_3V3_SIP	1	TP17

TP44	1	GND
TP43	1	WL_JTAG_TDO
TP42	1	WL_JTAG_TDI
TP41	1	MICRO_SPI2_MOSI
TP40	1	MICRO_SPI2_MISO	(WL_JTAG_TMS)
TP39	1	MICRO_SPI2_SCK	(WL_JTAG_CLK)
TP38	1	MICRO_SPI2_SSN	(WL_JTAG_TRSTN)
TP37	1	MICRO_I2C2_SCL
TP36	1	MICRO_GPIO_0	(SPI1 IRQ)
TP35	1	MICRO_SPI1_MOSI
TP34	1	MICRO_SPI1_MISO
TP33	1	MICRO_SPI1_SCK
TP32	1	MICRO_SPI1_SSN
TP31	1	MICRO_ADC_IN3
TP30	1	MICRO_ADC_IN2
TP29	1	MICRO_ADC_IN1
TP28	1	GND

TP18 TP19 TP20 TP21 TP22 TP23 TP24 TP25 TP26 TP27

GND / VBAT_SIP / GND / MICRO_RST_N / MICRO_GPIO_2 / MICRO_GPIO_3 / MICRO_GPIO_4 / MICRO_GPIO_5 / MICRO_WKUP / GND

VBAT_SIP
(BT_PCM_CLK) (BT_PCM_SYNC) (BT_PCM_IN) (BT_PCM_OUT)

MICRO_GPIO_2_MCU   R47 0   INSTALL POSITION A   BT_PCM_CLK   MICRO_GPIO_2
MICRO_GPIO_3_MCU   R48 0   INSTALL POSITION A   BT_PCM_SYNC   MICRO_GPIO_3
MICRO_GPIO_4_MCU   R49 0   INSTALL POSITION A   BT_PCM_IN   MICRO_GPIO_4
MICRO_GPIO_5_MCU   R50 0   INSTALL POSITION A   BT_PCM_OUT   MICRO_GPIO_5

U7D
STM32F412VGH6
BGA100_0.5mm

M1	VDDA	VDD1	C4	
L11	VCAP1	VDD2	G2	
C11	VCAP2	VDD3	G11	
E2	VBAT	VDD4	G12	
A4	BOOT0	BYPASS_REG	E3	BYPASS_REG
H3	PDR_ON	VREF_P	L1	
H2	RST_L	VREF_N	K1	
J1	VSSA	VSS1	D3	
		VSS2	F2	
		VSS3	F11	
		VSS4	F12	

VBAT_SIP   R9 0   VBAT_STM   C24 4.7uF   C25 0.1uF
VDD_3V3_SIP   R43 0   C44 0.1uF
VDD_3V3_SIP   R10 0   VDD_STM   C26 0.1uF   C27 0.1uF   C28 0.1uF   C22 0.1uF   C23 0.1uF   C35 4.7uF
C29 4.7uF   C43 4.7uF   VCAP2
R6 10K   MICRO_BOOT_0
R51 0   INSTALL POSITION A
MICRO_RST_N
R44 0