

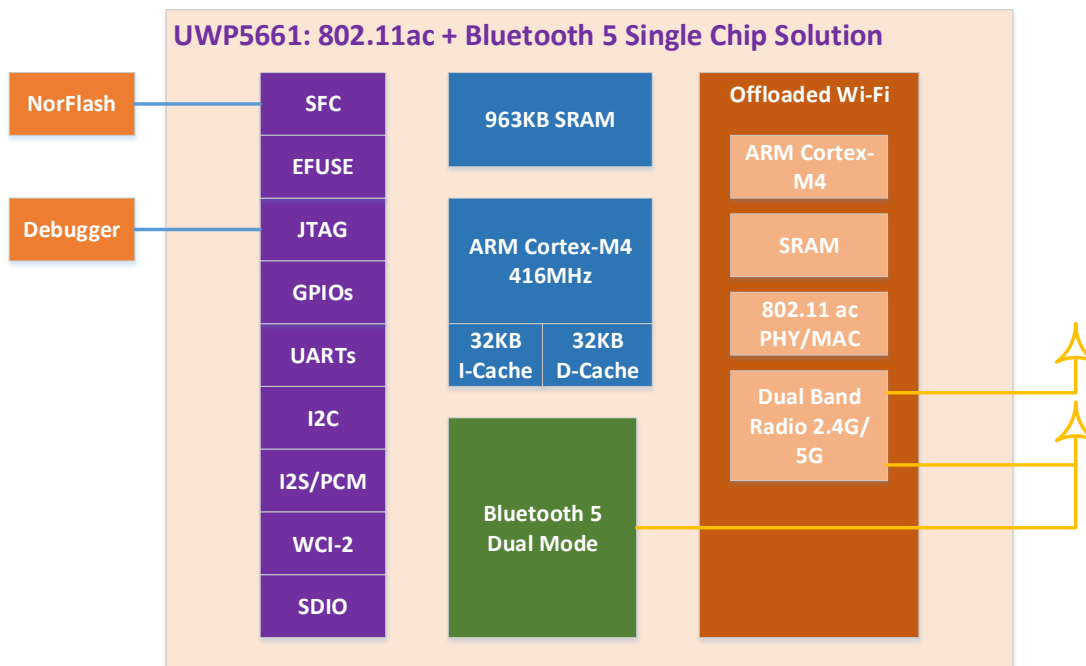
Product Overview

UWP5661 is a highly integrated 2-in-1 connectivity single chip which offers the lowest RBOM in the industry for smart home, IoT, industrial control and automotive applications.

This chip includes 2.4GHz and 5GHz WLAN IEEE802.11 a/b/g/n/ac 2x2 MU-MIMO 20/40/80 MHz VHT R2 MAC/PHY/Radio, Bluetooth 5 with supporting high power mode, mesh, direction finding and long range. Additionally, this radio-on-chip integrates power amplifiers, receive low noise amplifiers and RF TR switch.

This chip includes two ARM Cortex-M4 processors. One is used for offloaded Wi-Fi software and Bluetooth controller. The other is used for application processor.

UWP5661 also supports interface including SFC, JTAG, I2S, UART and I2C.



Features

Microcontroller subsystem

- 416MHz ARM® Cortex®-M4 for user application customization and development
- 256MHz ARM® Cortex®-M4 and internal SRAM for embedded Wi-Fi and Bluetooth
- 1 system timer, 1 common timer and 3 general purpose timers
- Hardware DFS from 26MHz to 416MHz
- Development support: SWD, JTAG

Memory

- 963KB internal SRAM in application processor and 208MHz maximum frequency
- 32KB I-Cache and 32KB D-Cache in application process
- 412KB available SRAM for user application
- Supports to up to 32MB external nor flash and 104MHz maximum frequency
- 14 DMA channels

Wi-Fi

- IEEE802.11 b/g/n/ac (2.4GHz/5GHz, 1x1/2x1)
- Supports MU-MIMO
- Supports 20MHz, 40MHz and 80MHz bandwidth
- Support Wi-Fi security WEP/WPA2
- Support STA, Soft AP, P2P
- Support STA and Soft AP concurrency
- Support Social Wi-Fi (Neighbor Awareness Network)
- Support Fine Timing Measurement (RTT) for Wi-Fi location and Time Sync
- Integrated PA, LNA and RF TR switch
- Optional external 5GHz LNA and PA support
- Support EasyConnect, EasyMesh and Data Element WFA standards

Bluetooth

- Bluetooth 5
- Bluetooth classic and LowEnergy dual mode concurrent operation
- Support BLE 2Mbps, LE advertise extension, long range
- Support BLE mesh networking
- Support multiple Piconets and up to 16 concurrent links
- Integrated packet loss concealment (PLC) with wide-band speech processing up to 16 kHz sampling rate
- Angle of departure (AoD) and In-door positioning system (IPS) to enable location based services
- Support Bluetooth high power mode up to 18 dBm Tx power
- Rich set of Bluetooth profiles, SCO, eSCO, A2DP, HID, etc.

Communication interfaces

- 1x SDIO 3.0 slave
- 1x I2C
- 1x I2S/PCM
- 1x 4-wires UART and 2x 2-wires UART
- 14x GPIOs

- 1x SFC for QSPI nor flash, up to 32MB and maximum 104MHz frequency

Power management

- Power input
 - VDD: 3.3V
 - VDDIO: 1.8V
- Ambient temperature from -40°C to 85°C

Clock source:

- Supports Standard 26/38.4 MHz crystal and reference clock input
- Supports internal 32KHz RC

Package

- 204 Balls BGA package (6.9mm x 6.9mm, 0.4 mm pitch)

RF Performance

Wi-Fi

11ac 2x2	UWP5661
2.4 GHz 20 MHz BW Tx Power (dBm)	20 CCK / 18.5 OFDM
5 GHz 20 MHz BW Tx Power (dBm)	16
5 GHz 80 MHz BW Tx Power (dBm)	15
2.4 GHz 20 MHz BW Sensitivity (dBm)	-97.5 @ 1 Mbps -89 @ 11 Mbps -78 @ 54 Mbps -75.5 @ MCS 7
5 GHz 20 MHz BW Sensitivity (dBm)	- 76.5 @ MCS7 -72.5 @ MCS 9
5 GHz 80 MHz BW Sensitivity (dBm)	- 70.5 @ MCS 7 -65 @ MCS 9

Bluetooth

	UWP5660/5661
Compliance	BT / BLE 5.1
Typical Tx Power (dBm)	10

High Power Mode (dBm)	18
GFSK Sensitivity @ BER = 0.1 % (dBm)	-95.3
Pi/4-DQPSK Sensitivity @ BER = 0.1 % (dBm)	-95.2
8DPSK Sensitivity @ BER = 0.1 % (dBm)	-89.3
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8DPSK Sensitivity @ BER = 0.1 % (dBm)	-89.3

Target Applications

- Smart home IoT applications
- IoT gateway
- Smart repeater
- Industrial control
- Automotive applications
- Wi-Fi Speaker
- Storytelling

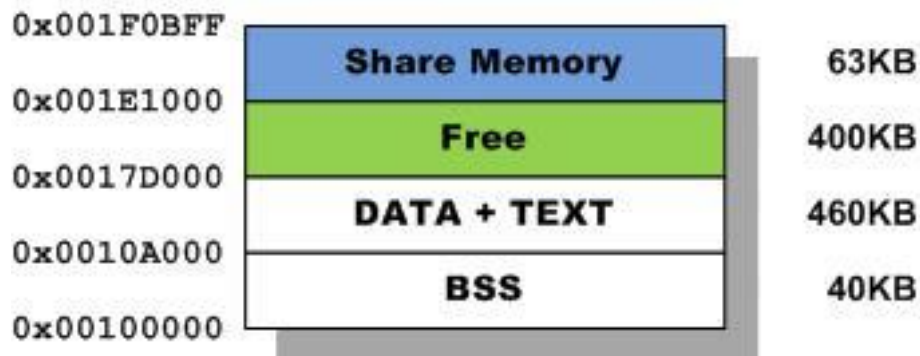
Programming Guides

Supported RTOS

- Zephyr

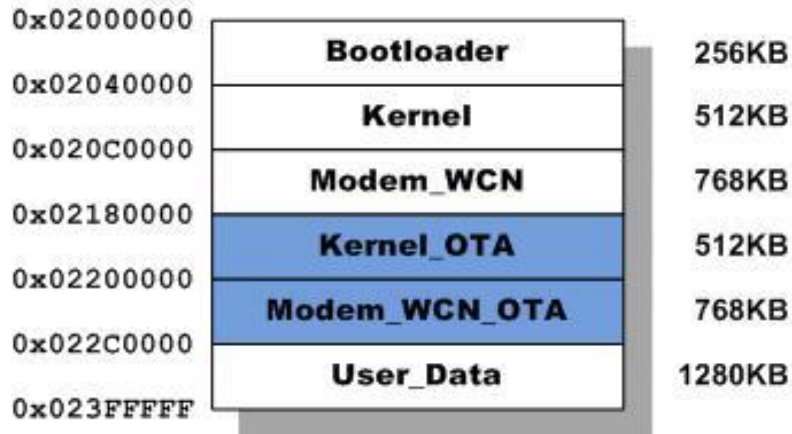
Memory layout

Among all 963KB, 500KB is used by OS. 63KB is used by share memory. And the rest is for the users, which is about 400KB.



Flash layout

The default flash layout is shown below, which is comprised of bootloader, kernel, BT/Wi-Fi modem binary, user data and two OTA partitions.



Interrupts

The top interrupts are shown below.

NVIC[]	INTC[36:0]	Name
0		FIQ
1		IRQ
20	18	AON
35	33	UART0
40	38	WDG

The sub-interrupts on AON are shown below.

AON INT No.	Name
10	GPIO
12	AON_UART