

# Wi-Fi 5 & Bluetooth 5.0 Module

## Ultra-compact LCC Package

FCS950U is a high-performance 2.4 GHz and 5 GHz Wi-Fi 5 and Bluetooth Low Energy (BLE) module featuring 1T1R in LCC package. It can be used to establish WLAN and Bluetooth connections. Designed with a reliable SDIO 3.0 interface to provide WLAN capability, it also provides an integrated PA with advanced architecture enhancement to achieve satisfying receiver sensitivity in noisy home scenarios. With an ultra-compact size of 12.0 mm × 12.0 mm × 2.15 mm, FCS950U optimizes the size and cost for end-products.

FCS950U supports WEP, WPA, WPA2, WPA3-Personal and WPA3-Enhanced Open, and both single and multiple channel concurrency. Compliant with Bluetooth 5.0, FCS950U provides the concurrent operation of Classic Bluetooth and BLE, supporting LE 2 Mbps, LE Advertise Extension, Long Range, AoD Rx Direction Finding, BLE Mesh, multiple piconets and up to 8 concurrent BLE links.

Surface-mount Technology (SMT) makes FCS950U an ideal solution for durable and rugged designs. The low profile and small size of LCC package ensure that it can be easily embedded into size-constrained applications and provide reliable connectivity with these applications. The advanced package and the laser-engraved label with better heat dissipation and indelible markings allow for large-scale automated manufacturing which has strict requirements on cost and efficiency. FCS950U can meet Wi-Fi & Bluetooth application design requirements in fields including industry, POS and printing.



## Key Features

- ✓ Dual-band 2.4 GHz and 5 GHz Wi-Fi and BLE
- ✓ SDIO 3.0 interface that features higher data transmission rate and lower power consumption
- ✓ Faster time-to-market: simple design minimizes design-in time and development efforts
- ✓ Wide operating temperature range: -40 °C to +85 °C



Ultra-compact Size



LCC Package



IEEE 802.11 a/b/g/n/ac



SDIO Interface



Operating Temperature Range: -40 °C to +85 °C



BLE (Bluetooth 5.0)

Wi-Fi & Bluetooth Module	FCS950U
WLAN Protocol	IEEE 802.11a/b/g/n/ac
Wi-Fi Frequency Band	2.4 GHz/ 5 GHz
Wi-Fi Antenna	1 × 1
Wi-Fi Modulation Mode	DSSS, DBPSK, DQPSK, CCK, BPSK, QPSK, 16QAM, 64QAM, 256QAM
2.4 GHz Channel Bandwidth	20/ 40 MHz
5 GHz Channel Bandwidth	20/ 40/ 80 MHz
Encryption Mode	WPA3
Wi-Fi Operating Mode	AP/STA
Bluetooth Protocol	Bluetooth 5.0
Dimensions	12.0 mm × 12.0 mm × 2.15 mm
Weight	0.55 g
Temperature Range	
Operating Temperature Range	-40 °C to +85 °C
Data Rate (Max.)	
802.11a	54 Mbps
802.11b	11 Mbps
802.11g	54 Mbps
802.11n	150 Mbps
802.11ac	433 Mbps
Interfaces	
SDIO 3.0	× 1 (for Wi-Fi)
PCM	× 1 (for Bluetooth)
UART	× 1 (for Bluetooth)
Wi-Fi/Bluetooth Antenna Interface	× 1
Electrical Features	
Power Supply Voltage	VBAT: 3.2–3.4 V, Typ. 3.3V
Power Consumption	Max. current at Tx mode: 210 mA @ VBAT
Certification	
Regulatory	Europe: CE America: FCC Canada: IC Brazil: Anatel China: SRRC Australia/New Zealand: RCM
Wi-Fi Performance	<b>Maximum Peak Output Power(Conducted)</b>
2.4 GHz	2414-2462 MHz(802.11b/g/n ht20) 2422-24522 MHz(802.11n ht40)
	23.54 dBm

## Wi-Fi & Bluetooth Module

### Wi-Fi Performance

#### Maximum Average Output Power(Conducted)

Band1:	
5180-5240 MHz(802.11a/n ht20/ac vht20)	
5190-5230 MHz(802.11n ht40/ac vht40)	
5210 MHz(802.11ac vht80)	
Band2:	
5260-5320 MHz (802.11a/n ht20/ac vht20)	16.57 dBm in 5150-5250 MHz Band
5270-5310 MHz(802.11n ht40/ac vht40)	
5290 MHz(802.11ac vht80)	16.86 dBm in 5250-5350 MHz Band
5 GHz	
Band3:	
5500-5720 MHz (802.11a/n ht20/ac vht20)	17.15 dBm in 5470-5725 MHz Band
5510-5710 MHz(802.11n ht40/ac vht40)	
5530-5690MHz(802.11ac vht80)	17.18 dBm in 57250-5850 MHz Band
Band4:	
5745-5825 MHz (802.11a/n ht20/ac vht20)	
5755-5795 MHz(802.11n ht40/ac vht40)	
5775 MHz(802.11ac vht80)	

### Bluetooth Performance

#### Maximum Peak Output Power(Conducted)

BR	9.15 dBm
EDR ( $\pi/4$ -DQPSK)	10.79 dBm
EDR (8-DPSK)	11.08 dBm
BLE	6.58 dBm

Ordering Code	Antenna	DBS	Coexistence with Cellular Module	Development Board (Only for Debugging)
FCS950UABMD	One Wi-Fi/Bluetooth Antenna	-	-	FCS950UABM2

## Integration instructions for host product manufacturers according to KDB 996369

### D03 OEM

#### Manual v01r01

##### 2.2 List of applicable FCC rules

CFR 47 FCC PART 15 SUBPART C&E has been investigated. It is applicable to the modular.

##### 2.3 Specific operational use conditions

This module is stand-alone modular. If the end product will involve the Multiple simultaneously transmitting condition or different operational conditions for a stand-alone modular transmitter in a host, host manufacturer have to consult with module manufacturer for the installation method in end system.

##### 2.4 Limited module procedures

Not applicable

##### 2.5 Trace antenna designs

Not applicable

##### 2.6 RF exposure considerations

To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum distance of 20cm from your body.

##### 2.7 Antennas

This radio transmitter FCC ID: **2AM6U-FCS950U** has been approved by Federal Communications Commission to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Antenna Manufacturer	Antenna Chain	Antenna type	Input impedance (Ohm)	Maximum antenna gain
ZHONGTIAN XUN	1	FPC	50	2.39 dBi/2.4-2.5GHz (WIFI/BT Ant)

##### 2.8 Label and compliance information

The final end product must be labeled in a visible area with the following " Contains FCC ID: **2AM6U-FCS950U** "

##### 2.9 Information on test modes and additional testing requirements

Host manufacturer is strongly recommended to confirm compliance with FCC requirements for the transmitter when the module is installed in the host.

##### 2.10 Additional testing, Part 15 Subpart B disclaimer

Host manufacturer is responsible for compliance of the host system with module installed with all other applicable requirements for the system such as Part 15 B

FCC Warning:

Any Changes expressly or modifications not approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the

equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment .

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This equipment should be installed and operated with minimum distance 20cm between the radiator &you body.