

☐ Product System (PS)



S4CWM-19-BB255-C-C2

Product Specification

Version: 0.4
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1. INTRODUCTION

S4CWM19 is a Bluetooth/WLAN device includes, PCB with 2x BT/WLAN SoC CYW89570 with periphery and three FPC antennas. PCB and antennas are mounted inside of a plastic cover. The device is powered by 3,3V and 1,8V voltages. Mechanical interface to main board is a 50 pins edge connector.

Wi-Fi and Bluetooth (BT) 5.2 are integrated into the used SoC of Infineon®CYW89570.

CYW89570 is Tri-Band capable (2,4/5GHz) and supports MIMO. Supporting a MIMO configuration in 5GHz band. All Bluetooth 5.0/5.1/5.2 optional features are supported, including LE-Audio. the System-on-Chip (SoC) implements advanced features including MU-MIMO, OFDMA.

The device provides host interfaces for the Wi-Fi radios (PCIe) and Bluetooth radio (2x UART, 1x PCM) and integrates an Antenna Detection mechanism on each individual antenna, which allows simple and easy detection of whether any of the three antennas is disconnected.

The device is installed in vehicles by vehicle manufacturers.

1.1 Support features

WLAN

802.11 a/b/g/n/ac/ax

Antenna configuration:

- Two antennas each supporting Bluetooth and WLAN 5GHz (MIMO),
- One antenna supports only WLAN 2,4 GHz (SISO)

Host interface: PCIe

Bluetooth

Device supports Bluetooth 5.2 standard. Host Controller Interface is UART up to 3 Mbit/s and Audio Interface for Hands Free Profile is PCM.

1.2 Power consumption

- Operation mode: 1100mA @3.3V
- Peak current drawn during device initialization: 1550mA @3.3V

2. SPECIFICATION

2.1 Hardware Requirement

2.1.1 Block Diagram

The variant supports BT, WLAN 2G4 SISO and WLAN 5G MIMO. The variant requires three antennas configuration and use combine Bluetooth antenna.

2.1.2 System Interface

The form factor of S4CWM19 device is a 50 pins edge connector. The pinout of S4CWM19 is shown in Figure 2-1.

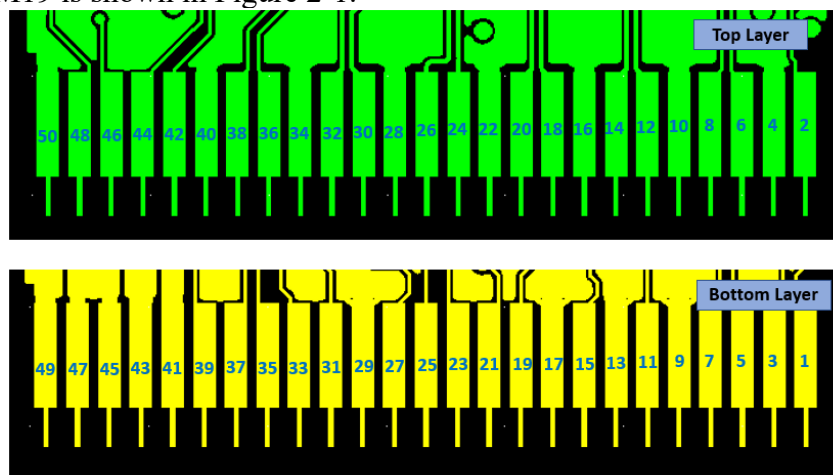


Figure 2-1 System Interface

2.1.3 Electrical Characteristics

Absolute maximum ratings

Symbol	Parameter	Min.	Max.	Units
VCC_VIO	Power supply voltage with respect to VSS	0	2.2	V
VCC_3V3	Power supply voltage with respect to VSS	0	4.5	V
Tstg	Storage Temperature	-50	95	°C
Ta	Ambient Temperature	-40	85	°C

Recommended operating conditions

Symbol	Parameter	Min.	Typ.	Max	Units
VCC_VIO	Digital I/O power supply	1.62	1.8	1.98	V
		2.97	3.3	3.63	V
VCC_3V3	Main power supply	3.15	3.3	3.45	V

2.1.6 Antenna Diagnosis parameters

Antenna connection status	Diagnostic result (pin27 voltage)
Antenna not connect well (all ports open)	3.23V
Partially contact (one or two of the antenna ports contact well)	1.61V
Antenna contact well (all ports contact well)	1.08V

2.2 RF Subsystem Requirement

2.2.1 Radio Specification 802.11b/g/n/ac/ax WLAN (2G4 band)

Features	Description
WLAN standard	IEEE 802.11 b/g/n/ax Wi-Fi compliant
Frequency Band	2.4000 – 2.472GHz (2.4 GHz ISM Band)
Number of Channel	CH1~CH13($f=2412+n*5\text{MHz}$, $n=0, \dots, 12$)
Modulation	802.11b: DBPSK, DQPSK, CCK
	802.11g/n: BPSK, QPSK, 16QAM, 64QAM
	802.11 ac: BPSK, QPSK, 16QAM, 64QAM, 256QAM
	802.11ax: BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM

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Operation temperature	-40°C ~ 85°C
VCC	3V3 +/- 5%
Carrier Frequency Accuracy	+/- 18PPM

Conducted output power for WLAN 2.4G band at 25°C

Standard	Packet	EVM	Min.	Typ.	Max.	Units
IEEE 802.11b	11M bps	-9.1dB	13.5	15	-	dBm
IEEE 802.11g	54M bps	-25dB	14.5	16	-	dBm
IEEE 802.11n	MCS7 HT 20	-27dB	13.5	15	-	dBm
IEEE 802.11ax	HE MU 20	-35dB	10.5	12	-	dBm

Conducted sensitivity for WLAN 2.4G band at 25°C

Standard	Packet	Min.	Typ.	Max.	Units
IEEE 802.11b	11M bps	-	-84	-82.5	dBm
IEEE 802.11g	54M bps	-	-71	-69.5	dBm
IEEE 802.11n	MCS7 HT 20	-	-70	-68.5	dBm
IEEE 802.11ax	HE MU 20	-	-58	-56.5	dBm

2.2.2 Radio Specification 802.11a/n/ac/ax WLAN (5G band)

Features	Description
WLAN standard	IEEE 802.11a/n/ac/ax Wi-Fi compliant
Frequency Band	5150-5250 (UNII-1) 5725-5850 (UNII-3)
Number of Channel	Please see the 5G band frequency table
Modulation	802.11 a/n: BPSK, QPSK, 16QAM, 64QAM
	802.11 ac: BPSK, QPSK, 16QAM, 64QAM, 256QAM
	802.11ax: BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM
Operation temperature	-40°C ~ 85°C
VCC	3V3 +/- 5%
Carrier Frequency Accuracy	+/- 18PPM

Conducted output power for WLAN 5G band at 25°C

Standard	Packet	EVM	Min.	Typ.	Max.	Units
IEEE 802.11a	OFDM-54	-25dB	13.5	15	-	dBm
IEEE 802.11n	MCS7 HT 20	-27dB	13.5	15	-	dBm
IEEE 802.11n	MCS7 HT 40	-27dB	12.5	14	-	dBm
IEEE 802.11ac	MCS8 VHT 20	-30dB	12.5	14	-	dBm
IEEE 802.11ac	MCS9 VHT 80	-32dB	11.5	13	-	dBm

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IEEE 802.11ax	HE_MU 20	-35dB	9.5	11	-	dBm
IEEE 802.11ax	HE_MU 40	-35dB	8.5	10	-	dBm
IEEE 802.11ax	HE_MU 80	-35dB	7.5	9	-	dBm

Conducted sensitivity for WLAN 5G band at 25°C

Standard	Packet	Min.	Typ.	Max.	Units
IEEE 802.11a	MCS7 HT 20	-	-69	-67.5	dBm
IEEE 802.11n	MCS7 HT 20	-	-67	-65.5	dBm
IEEE 802.11n	MCS7 HT 40	-	-64	-62.5	dBm
IEEE 802.11ac	MCS8 VHT 20	-	-63	-61.5	dBm
IEEE 802.11ac	MCS9 VHT 80	-	-55	-53.5	dBm
IEEE 802.11ax	HE_MU 20	-	-55	-53.5	dBm
IEEE 802.11ax	HE_MU 40	-	-52	-50.5	dBm
IEEE 802.11ax	HE_MU 80	-	-50	-48.5	dBm

Note: The WLAN 5G conducted power should be set to comply with Homologation

2.2.3 Radio Specification 802.11 Bluetooth

Features	Description
Frequency Band	2.4 GHz ISM Band
Number of selectable Sub channels	79 channels ($f=2402+k$ MHz, $k=0, \dots, 78$)
Modulation	FHSS GFSK, $\pi/4$ -DQPSK, 8DPSK
Supported rates	1, 2, 3 Mbps
Power Class	Class 1.5
Output Power	3dBm (Typical)
Output Power (LE)	3dBm (Typical)
Sensitivity (BDR)	1Mbps: -84dBm @ 0.1% BER 2Mbps: -84dBm @ 0.01% BER 3Mbps: -81dBm @ 0.01% BER
Sensitivity (BLE)	-82dBm @ 30.8% BER

Note: The Bluetooth conducted power should be set to comply with Homologation

2.3 Mechanical Requirement

2.3.1 Form Factor

A 38.12*81mm PCBA device, with periphery and three FPC antennas.

PCB and antennas are mounted inside of a plastic cover.

Mechanical interface to main board is a 50 pins edge connector.

2.3.2 PCBA Dimension

Description	Layer	Surface Finish	Min. line width/space Inner Layer (um)	Min. line width/space Outer Layer (um)	Min. Mech. Drill (um)	Mech. Drill Q'ty	PCB Size (mm)	Chamfer (card edge connector)
PCB_WIFI	6	OSP+GOLD Plating	100/100	90/100	150	290	38.12 x 81 x 1.6	No

2.3.3 Weight

40.2g(Typ.) include PCBA and mechanical housing, antenna.

3. MAINTAINABILITY & QUALITY

3.1 Maintainability

Device cannot be reworked.

Qisda will analyze failures and update report to customer by 8D format.

3.2 Quality Target

The quality target for the delivered quality (0 Km-line failures) is < 25ppm.

Quality target is complaint rate at delivery < 25ppm.

4. ENVIRONMENTAL REQUIREMENTS

4.1 Operating and Storage Requirements

4.1.1 Temperature

Operating: - 40 to 85 °C

Storage: - 50 to 95 °C

4.1.2 Shelf Life

When stored in a non-condensing atmospheric environment of < 40°C/90% RH. (ESD bag), It is one year.

5. Packing REQUIREMENTS

5.1 The devices are placed in the ESD bag

The packing of S4CWM-11 has been verified that it can resist +-8KV static electricity when placed in the ESD bag (Test for top & bottom side, 8 test points).



5.2 Device has been unpacked from the ESD bag

If aluminum bag has been opened, the antistatic ability will be limited.

The antistatic ability of the device is as follows

Contact discharge test in unpowered handling mode:

- (1) +/- 8 KV for the antenna pins
- (2) +/- 2 KV for all the other pins

6. Device LASER MARKING

6.1 2D Barcode Definition

5J.64T01.004 - 2D Barcode Definition								
Content	634	xxxxxxxx	02	01	04168953	LICHRG#	YYYYMMDD,	KD PC#
Digits	3 digits	9 digits	2 digits	2 digits	8 digits+1	7 digits	8 digits+1	6 digits
Description	Qisda supplier Code	Harman Serial No.	EC Level	Harman Device No.	Harman P/N	Fixed Specified Key	Supplier Production Date,	Fixed Specified Key
S4CWM19,	KD_SN#	5J64T01004	S16,	MAC-ADR#	xxxxxxxxxxxx,	BLUE-TOOTH#	xxxxxxxxxxxx,	
6 digits+1	6 digits	10 digits	3 digits+1	8 digits	12 digits+1	11 digits	12 digits+1	
Qisda Internal Project No.	Fixed Specified Key	Qisda Internal Part No.	Qisda PCB Version No.	Fixed Specified Key	WiFi MAC,	Fixed Specified Key	BT MAC,	

Each S4CWM19 device needs to write 4 set of MAC addresses (WIFI & BT MAC) in the OTP. Hide the second set of WIFI / BT MAC addresses, the value of the second set of WIFI MAC addresses is incremented by 1 of the first set of WIFI MAC addresses.

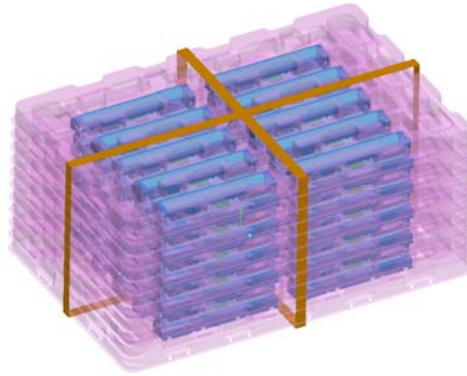
For example:

Example of 2D Barcode:

634000000145020104044065,MAC-ADR#1CE192B502B1,BLUE-TOOTH#1CE192B502B3,

7. PACKING DRAWING

ESD Dissipative PET Tray (520*340*25.8mm),
10 products per tray. 10+1 layers of trays per carton. 100pcs products/carton.



8. PACKING LABEL DRAWING

9.1 Attention Label Drawing (4E.G3503.002 size:55*55mm)



9.2 Warning message



9.3 Model Define Rule

5J.64T01.0XX (HARMAN)		
Item	Content	Remark
Reel ID	X code (R/A/B/C) + Year + Month + SN A = bag C = Carton	SN is from 0001 ~ 9999
P/O No		Defined by Customer, will be Changed for each shipment
Lot No	L + Year + Month + SN	(a) SN is from 0001 ~ 9999. Ex: L2021120001
Model No	S4CWM19	Qisda Model No.
Harman P/N	4168953	Defined by Harman
Part No	5J.64T01.004	Qisda Part No.
General Desc.	MOD QIS BT/WLAN S4CWM-19-BB255-C-C2	
Quantity	XXX pcs for each bag XXX pcs for each Carton	Quantity depends on real shipment quantity
EC Level	EC-XX	Started at 01
MSL	NA	

9. HANDLING

HANDLE WITH CARE, DO NOT DROP.

10. SAFETY WARNING

Federal Communications Commission (FCC) Statement

15.105(b)

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

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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.

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.

15.21

You are cautioned that changes or modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.

FCC RF Radiation Exposure Statement:

1. This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
2. This equipment complies with RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated, keeping the radiator at least 20cm or more away from the person's body.

For ISCED

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference, and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. l'appareil ne doit pas produire de brouillage, et
2. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Caution: Exposure to Radio Frequency Radiation

1. To comply with the Canadian RF exposure compliance requirements, this device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter.
2. To comply with RSS 102 RF exposure compliance requirements, this equipment should be installed and operated, keeping the radiator at least 20cm or more away from the person's body.

Attention: exposition au rayonnement radiofréquence

1. Pour se conformer aux exigences de conformité RF canadienne l'exposition, cet appareil et son antenne ne doivent pas être co-localisés ou fonctionnant en conjonction avec une autre antenne ou transmetteur.
2. Pour se conformer aux exigences de conformité CNR 102 RF exposition, cet équipement doit être installé et utilisé en maintenant le radiateur à au moins 20cm ou plus du corps de la personne.

For CE

Operation in 5150~5350MHz is restricted to indoor use only.

This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body.

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For NCC

此裝置於取得認證後將依規定於裝置本體標示審驗合格標籤，並要求平台廠商於平台上標示

『內含發射器模組： CCXXxxLPyyyZzW』

根據 NCC LP0002 低功率射頻器材技術規範_章節 3.8.2：

取得審驗證明之低功率射頻器材，非經核准，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

低功率射頻器材之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。

前述合法通信，指依電信管理法規定作業之無線電通信。

低功率射頻器材須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

應避免影響附近雷達系統之操作。