AIROC™ Wi-Fi Cloud Connectivity Manager Module

Turnkey, secure solution for IoT applications

Description

The AIROC™ Wi-Fi 4 Cloud Connectivity Manager module bundles all the wireless, networking, cloud, and security know-how required to make first-time IoT projects a success into a turnkey, certified, hardware and firmware solution. The hardware leverages Infineon recognized leadership in the security industry to pair a pre-provisioned, secure MCU with the IoT industry's most reliable and widely shipped Wi-Fi. The AIROC™ Wi-Fi 4 Cloud Connectivity Manager module requires no customer programming or development with an SDK. The module arrives pre-programmed with tested and signed, secure Infineon® firmware. With support for over-the-air firmware updates, the module can be kept up to date with future connectivity and security optimizations. The firmware accelerates time-to-market and eliminates the IoT learning curve with a configurable, turnkey networking and cloud management offering that is easily integrated into customer systems with a simple command set.

Features

Cloud management

- Powered by AWS IoT express
- AWS over-the-air update support

Networking

- Full network stack offload from host: TCP/IP, TLS, DNS, HTTP, and MQTT
- Fully documented
- Command set for simple configuration from host processor

Wireless

- Built on industry-leading Infineon® Wi-Fi for long range, robust connectivity
- Wi-Fi 4 (802.11n)
- Up to 96Mbps PHY data rate
- Integrated antenna
- Soft AP or Bluetooth® LE onboarding to Wi-Fi access point

Security

- WPA3, WPA/WPA2 (personal)
- TLS 1.3
- Arm® platform security architecture level 2 certified
  - Secure enclave and secure boot
- Only operates with Infineon® signed firmware
- Current Cloud ID unique device ID for safe, convenient provisioning
- Ongoing security updates

Module

- Certified for US, Canada, EU, Japan, Taiwan, Australia, New Zealand
- On-module flash memory to store second FW image for safe over-the-air updates
- 36.0mm(L) x 18mm(W) x 2.8mm(H)
- LGA module, 146p

General features

- Turnkey solution requiring no development on module
- UART host interface
- Large integrated flash supports over-the-air firmware downloads
- -30°C to +85°C operating temperature

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1 Overview

1.1 Functional block diagram

The AIROC™ IFW56810 module with integrated antenna provides everything needed to connect a host processor to the cloud. Pre-certified for FCC, CE, Canada, Japan, Taiwan, Australia, and New Zealand, this module requires no extra RF or clocking circuitry. With just five host interface signals plus power and ground, connection to a host using an industry-standard UART is straightforward. IEEE 802.11n single band 2.4 GHz Wi-Fi performance is based on the industry's most widely deployed IoT technology from Infineon®. Bluetooth® LE onboarding to Wi-Fi networks is also supported.
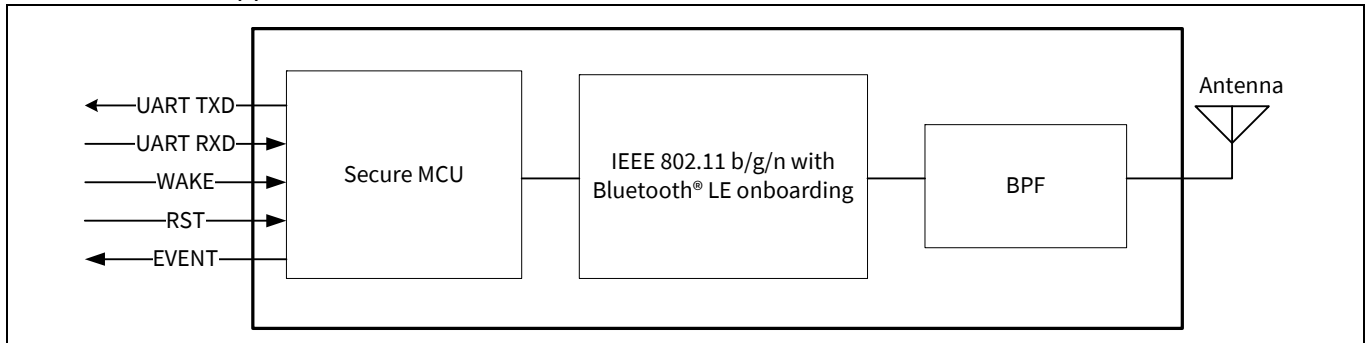

Figure 1-1   IFW56810 module

1.1.1 General features

Table 1-1   Module features

Features	Description
Product description	IEEE 802.11 b/g/n wireless LAN and Bluetooth® IoT module
Host interface	UART
Dimension	36.0mm(L) x 18mm(W) x 2.8mm(H)
Form factor	LGA module, 146p
Antenna	Internal PCB antenna
Weight	2.3g

1.1.2 Wi-Fi features

Table 1-2   Wi-Fi specification

Features	Description	Min	Typ	Max	Unit
WLAN standard	IEEE 802.11b/g/n, Wi-Fi compliant				
Frequency range	WLAN: 2.4 GHz band				
Modulation	DSSS DBPSK(1Mbps), DQPSK(2Mbps), CCK(11/5.5Mbps) OFDM BPSK(9/6Mbps), QPSK(18/12Mbps), DBPSK(1Mbps), DQPSK(2Mbps), CCK(11/5.5Mbps), 16-QAM(36/24Mbps), 64-QAM (72.2/54/48Mbps)				

Overview

Table 1-2   Wi-Fi specification

Features	Description	Min	Typ	Max	Unit
Output power (Board level limit)[*]	2.4G 11b (11Mbps) @EVM< 35%	17	19	21	dBm
	11g (54Mbps) @EVM< -25 dB	16	18	20	dBm
	11n (HT20 MCS7) @EVM< -27 dB	15.5	17.5	19.5	dBm
Receiver sensitivity	2.4G 11b (1Mbps)	-	-97	-93	dBm
	11g (6Mbps)	-	-91	-87	dBm
	11b (11Mbps)	-	-89	-85	dBm
	11g (54Mbps)	-	-76	-72	dBm
	11n (HT20 MCS0)	-	-91	-87	dBm
	11n (HT20 MCS7)	-	-73	-69	dBm
Data rate	802.11b: 1, 2, 5.5, 11Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps 802.11n: MCS0~7 HT20				
Security	• WPA™- and WPA2™- (Personal) support for powerful encryption and authentication • WPA3 • AES and TKIP acceleration hardware for faster data encryption and 802.11i compatibility • Cisco® compatible extension- (CCX, CCX 2.0, CCX 3.0, CCX 4.0, CCX5.0) certified • Wi-Fi protected setup (WPS) • WEP • WMM / WMM-SA • CKIP (software)				

1.1.3 Bluetooth® features

Table 1-3 **Bluetooth® specification**

Features	Description	Min	Typ	Max	Unit
Bluetooth® standard	Bluetooth® LE 5.2	-	-	-	-
Frequency range	2400~2483.5MHz	-	-	-	-
Modulation	GFSK	-	-	-	-
Output power	8dBm+/-3dBm (max settings)	-	-	-	-
Receiver sensitivity	GFSK	-	-91	-76	dBm

1.1.4 Operating conditions

Table 1-4 **Operating specification**

| Features	Description
Operating conditions	
Voltage	VBAT: 3.2V~4.8V (3.6V typical) VDD: 1.7V~3.6V
Operating temperature	-30°C to 85°C (optimal RF performance guarantee -30°C to 80°C)
Operating humidity	less than 85% R.H.
Storage temperature	-40°C to 90°C
Storage humidity	less than 60% R.H.
ESD protection	
Human body model	±1KV per MIL-STD-883H method 3015.8
Charged device model	±300V per JEDEC EIA/JESD22-C101E

2 Pin map
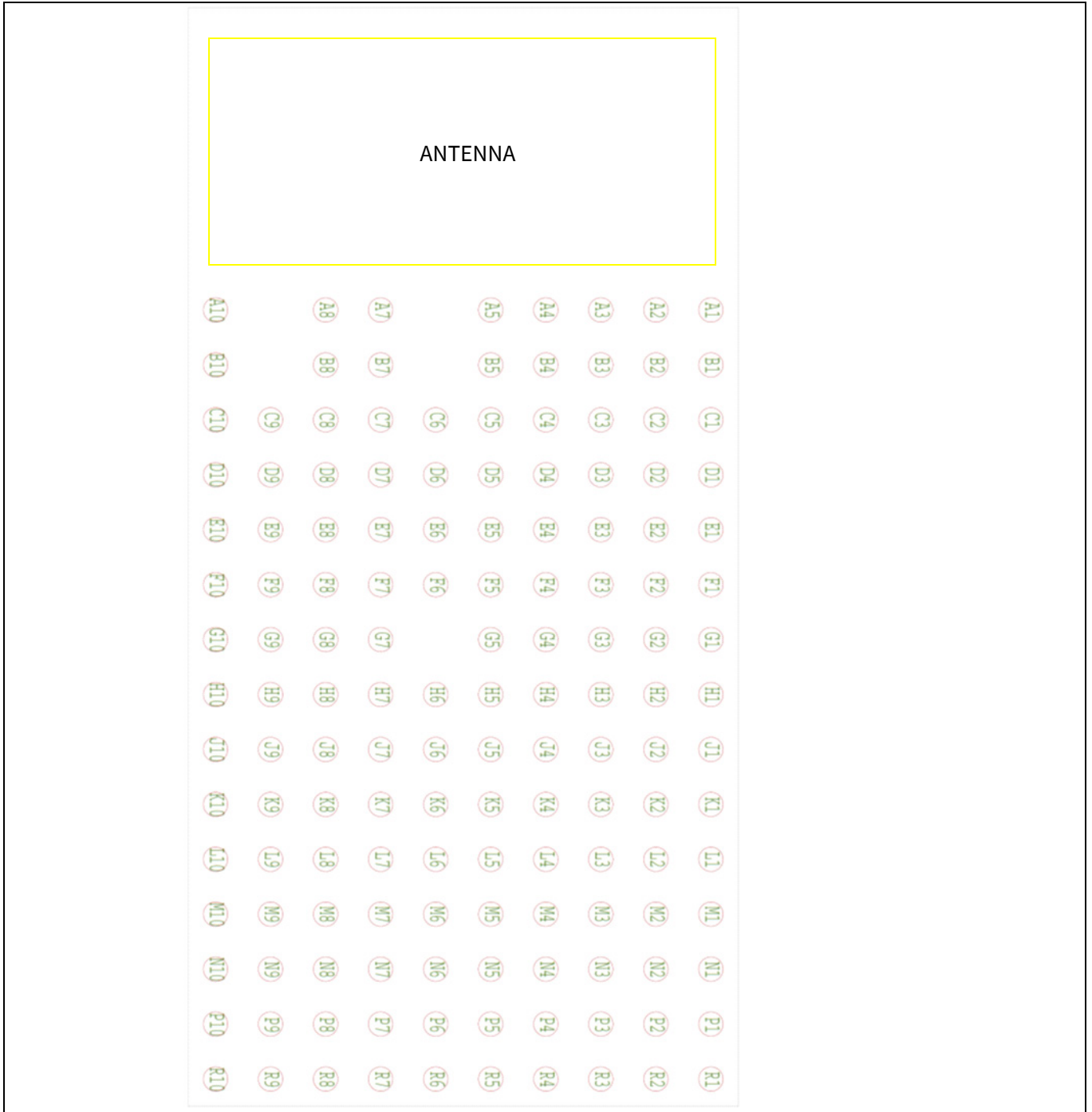
Figure 2-1   Top view pin map

3 Pin table

Table 3-1 **Pin table**

Pin No	Definition	Basic description	Voltage	Type
G3	Reserved	Reserved for debug use only	VDDIO_WL	I/O
D3	Reserved	Reserved for debug use only	VDDIO_WL	I
E3	Reserved	Reserved for debug use only	VDDIO_WL	O
F3	Reserved	Reserved for debug use only	VDDIO_WL	I/O
D5	Reserved	Reserved for debug use only	VDDIO_WL	I
B1	Reserved	Reserved for debug use only	VDDIO_WL	I
D2	Reserved	Reserved for debug use only	VDDIO_WL	O
C2	Reserved	Reserved for debug use only	VDDIO_WL	I
B2	Reserved	Reserved for debug use only	VDDIO_WL	O
N5	Reserved	Reserved for debug use only	-	I
N4	Reserved	Reserved for debug use only	-	O
A1	GND_A1	Ground	-	GND
A10	GND_A10	Ground	-	GND
A2	GND_A2	Ground	-	GND
A3	GND_A3	Ground	-	GND
A4	GND_A4	Ground	-	GND
A5	GND_A5	Ground	-	GND
A7	GND_A7	Ground	-	GND
A8	GND_A8	Ground	-	GND
B10	GND_B10	Ground	-	GND
B3	GND_B3	Ground	-	GND
B7	GND_B7	Ground	-	GND
B8	GND_B8	Ground	-	GND
C10	GND_C10	Ground	-	GND
C3	GND_C3	Ground	-	GND
C6	GND_C6	Ground	-	GND

Pin table

Table 3-1   Pin table

Pin No	Definition	Basic description	Voltage	Type
C7	GND_C7	Ground	-	GND
C8	GND_C8	Ground	-	GND
C9	GND_C9	Ground	-	GND
D1	GND_D1	Ground	-	GND
D7	GND_D7	Ground	-	GND
D8	GND_D8	Ground	-	GND
D9	GND_D9	Ground	-	GND
E2	GND_E2	Ground	-	GND
E5	GND_E5	Ground	-	GND
F2	GND_F2	Ground	-	GND
F6	GND_F6	Ground	-	GND
F9	GND_F9	Ground	-	GND
G1	GND_G1	Ground	-	GND
G2	GND_G2	Ground	-	GND
G7	GND_G7	Ground	-	GND
H10	GND_H10	Ground	-	GND
H3	GND_H3	Ground	-	GND
H8	GND_H8	Ground	-	GND
J8	GND_J8	Ground	-	GND
J9	GND_J9	Ground	-	GND
K2	GND_K2	Ground	-	GND
K4	GND_K4	Ground	-	GND
K5	GND_K5	Ground	-	GND
K8	GND_K8	Ground	-	GND
L1	GND_L1	Ground	-	GND
L5	GND_L5	Ground	-	GND
L7	GND_L7	Ground	-	GND

Pin table

Table 3-1   Pin table

Pin No	Definition	Basic description	Voltage	Type
N3	GND_N3	Ground	-	GND
P3	GND_P3	Ground	-	GND
P6	GND_P6	Ground	-	GND
P8	GND_P8	Ground	-	GND
R9	GND_R9	Ground	-	GND
K6	P0_2	UART_RX	VBACKUP	I/O
J7	P0_3	UART_TX	VBACKUP	I/O
K7	Reserved	Reserved for debug use only	VBACKUP	I/O
J6	P0_5	Reserved for debug use only	VBACKUP	I/O
M2	P1_0	EVENT	VDDD	I/O
M3	P1_1	WAKE	VDDD	I/O
K3	Reserved	Reserved for debug use only	VDDD	I/O
L3	Reserved	Reserved for debug use only	VDDD	I/O
L2	Reserved	Reserved for debug use only	VDDD	I/O
J3	Reserved	Reserved for debug use only	VDDD	I/O
R7	Reserved	Reserved for debug use only	VDDA	I/O
R6	Reserved	Reserved for debug use only	VDDA	I/O
P7	Reserved	Reserved for debug use only	VDDA	I/O
L6	Reserved	Reserved for debug use only	VDDA	I/O
N7	Reserved	Reserved for debug use only	VDDA	I/O
M7	Reserved	Reserved for debug use only	VDDA	I/O
M6	Reserved	Reserved for debug use only	VDDA	I/O
R4	Reserved	Reserved for debug use only	VDDD	I/O
L4	Reserved	Reserved for debug use only	VDDD	I/O
R5	Reserved	Reserved for debug use only	VDDD	I/O
N6	Reserved	Reserved for debug use only	VDDD	I/O
M4	Reserved	Reserved for debug use only	VDDD	I/O

Pin table

Table 3-1   **Pin table**

Pin No	Definition	Basic description	Voltage	Type
P4	Reserved	Reserved for debug use only	VDDD	I/O
P5	Reserved	Reserved for debug use only	VDDD	I/O
M5	Reserved	Reserved for debug use only	VDDD	I/O
R2	Reserved	Reserved for debug use only	VDDD	I/O
R1	Reserved	Reserved for debug use only	VDDD	I/O
N1	Reserved	Reserved for debug use only	VDDD	I/O
P1	Reserved	Reserved for debug use only	VDDD	I/O
P2	Reserved	Reserved for debug use only	VDDD	I/O
N2	Reserved	Reserved for debug use only	VDDD	I/O
C4	Reserved	Reserved for debug use only	VDDD	I/O
F4	Reserved	Reserved for debug use only	VDDD	I/O
E4	Reserved	Reserved for debug use only	VDDD	I/O
F5	Reserved	Reserved for debug use only	VDDD	I/O
D4	Reserved	Reserved for debug use only	VDDD	I/O
B5	Reserved	Reserved for debug use only	VDDD	I/O
B4	Reserved	Reserved for debug use only	VDDD	I/O
C5	Reserved	Reserved for debug use only	VDDD	I/O
F7	Reserved	Reserved for debug use only	VDDD	I/O
E7	Reserved	Reserved for debug use only	VDDD	I/O
E8	Reserved	Reserved for debug use only	VDDD	I/O
G8	Reserved	Reserved for debug use only	VDDD	I/O
F8	Reserved	Reserved for debug use only	VDDD	I/O
E9	Reserved	Reserved for debug use only	VDDD	I/O
E10	Reserved	Reserved for debug use only	VDDD	I/O
D10	Reserved	Reserved for debug use only	VDDD	I/O
F10	Reserved	Reserved for debug use only	VDDD	I/O
H9	Reserved	Reserved for debug use only	VDDD	I/O

Pin table

Table 3-1   Pin table

Pin No	Definition	Basic description	Voltage	Type
G9	Reserved	Reserved for debug use only	VDDD	I/O
G10	Reserved	Reserved for debug use only	VDDD	I/O
J10	Reserved	Reserved for debug use only	VDDD	I/O
K9	Reserved	Reserved for debug use only	VDDD	I/O
L8	Reserved	Reserved for debug use only	VDDD	I/O
K10	Reserved	Reserved for debug use only	VDDD	I/O
L9	Reserved	Reserved for debug use only	VDDD	I/O
M8	Reserved	Reserved for debug use only	VDDD	I/O
L10	Reserved	Reserved for debug use only	VDDD	I/O
M9	Reserved	Reserved for debug use only	VDDD	I/O
P9	Reserved	Reserved for debug use only	VDDA	I/O
N9	Reserved	Reserved for debug use only	VDDA	I/O
M10	Reserved	Reserved for debug use only	VDDA	I/O
N8	Reserved	Reserved for debug use only	VDDA	I/O
P10	Reserved	Reserved for debug use only	VDDA	I/O
N10	Reserved	Reserved for debug use only	VDDA	I/O
R10	Reserved	Reserved for debug use only	VDDA	I/O
H4	Reserved	Reserved for debug use only	-	Floating
G5	Reserved	Reserved for debug use only	-	Floating
H5	Reserved	Reserved for debug use only	-	Floating
G4	Reserved	Reserved for debug use only	-	Floating
H7	Reserved	Reserved for debug use only	-	Floating
H6	Reserved	Reserved for debug use only	-	Floating
J4	Reserved	Reserved for debug use only	3.3V	I/O
J5	Reserved	Reserved for debug use only	3.3V	I/O

Pin table

Table 3-1   Pin table

Pin No	Definition	Basic description	Voltage	Type
M1	VBACKUP	VBACKUP is the supply to the backup domain. The backup domain includes the 32-kHz WCO, RTC, and backup registers. It can generate a wake-up interrupt to the chip via the RTC timers or an external input. It can also generate an output to wakeup external circuitry. It is connected to VDDD when not used as a separate battery backup domain. VBACKUP provides the supply for port 0. min. is 1.4 V in backup mode	-	PWR
K1	VDD_NS	Power supply for PSoC™ 64 Buck regulator	VDDD	PWR
H2	VDD_USB	Power supply for PSoC™ 64 USB	3.3V	PWR
R8	VDDA	Power supply for PSoC™ 64 P9,P10 (analog peripherals)	1.7~3.6V	PWR
R3	VDDD	Power supply for PSoC 64™ P1,P5,P6,P7,P8,P11,P12,XRES.	1.7~3.6V	PWR
H1	VDDIO_WL	Power supply for CYW43439 digital I/O. Connect it to VDDIOR.	VDDIOR	PWR
J1	VDDIOR	Power supply for PSoC™ 64 P2, P3, P4. Connect it to VDDIO_WL	1.8V	PWR
D6	Reserved	Reserved for debug use only	VDDIO_WL	I/O
E6	Reserved	Reserved for debug use only	VDDIO_WL	I/O
C1	Reserved	Reserved for debug use only	VDDIO_WL	I
F1	WLAN_VBAT	Main power supply for CYW43439	3.2~4.8V	PWR
E1	WLAN_VBAT	Main power supply for CYW43439	3.2~4.8V	PWR
J2	XRES_L	External reset I/O pin (pulled up by a 4.7K ohms resistor internally)	VDDD	I

4 Ordering information

Table 4-1   Ordering information

Part number	Form factor	Features
IFW56810-00	LGA module, 146P	AWS IoT, trace antenna

Revision history

Document version	Date of release	Description of changes
**	2021-11-19	Initial release

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