SHORT RANGE

EMMY-W1 series

Standard | Professional | Automotive

Host-based multiradio modules with Wi-Fi and Bluetooth®

The most robust and comprehensive modules with Wi-Fi and Bluetooth® coexistence

- Automotive and professional grades
- Dual-band Wi-Fi with IEEE 802.11ac
- Dual-mode Bluetooth v4.2 with BR/EDR and Bluetooth low energy
- Simultaneous client and micro access point operation for up to 10 clients
- Integrated LTE filter

EMMY-W1
13.8 x 19.8 x 2.5 mm

Product description

EMMY-W1 is an ultra-compact multiradio module providing Wi-Fi 802.11ac, Bluetooth BR/EDR, and Bluetooth low energy with an extended temperature range from -40 °C to +85 °C offered in automotive and professional grades. It is designed for both simultaneous and independent operations of:

- Wi-Fi IEEE 802.11ac and a/b/g/n
- Dual-mode Bluetooth v4.2

EMMY-W1 is an SMD component that can easily be integrated into the application. Together with a host and the free-of-charge driver, it provides a complete wireless modem solution. The module is connected to the host processor through SDIO and High-Speed UART interfaces. EMMY-W1 is radio type approved for Europe, US, Canada, Japan, South Korea, and Australia/New Zealand.

Key features

- Wi-Fi Standards IEEE 802.11a/b/g/n/ac
- Support of Wi-Fi direct mode
- IEEE 802.11 PHY data rates of up to 433 Mbps
- Suitable for HD video streaming
- Concurrent multiradio connections
- Wireless Apple CarPlay, Android Auto, Baidu CarLife support
- Hardware encryption engine for 128-bit AES
- WAPI support
- Bluetooth v4.2 with Bluetooth low energy & Bluetooth BR/EDR
- PCM interface for audio
- Climatic, mechanical, and operating life qualification tests according to ISO 16750-4
- AEC-Q100 compliant radio chipset

Product selector

Model	Radio								Interfaces			Power	Connectors	Features				Grade		
	Wi-Fi 2.4 GHz channels 1-13	Wi-Fi 5 GHz channels 36-165	Wi-Fi IEEE 802.11 version	Bluetooth® qualification	Bluetooth profiles	Max output power at antenna pin	Antenna type	LTE filter	High-speed UART	SDIO 3.0	PCM (Bluetooth audio)	Power supply: 3.0-3.6 V	Solder pins	Micro Access Point [max stations]	AES hardware support	RF parameters in OTP memory	MAC addresses in OTP memory	Standard	Professional	Automotive
EMMY-W161	•	•	a/b/g/n/ac	v4.2	H	18 dBm	1p	•	•	•	•	•	•	10	•	•	•			
EMMY-W163	•	•	a/b/g/n/ac	v4.2	H	18 dBm	2p		•	•	•	•	•	10	•	•	•			
EMMY-W165	•	•	a/b/g/n/ac	v4.2	H	18dBm	1p		•	•	•	•	•	10	•	•	•			

H = HCI

1p = One pin for combined external antenna for Bluetooth and Wi-Fi
2p = Two pins for separate external antennas for Bluetooth and Wi-Fi

Standard
Professional
Automotive

Features

Wi-Fi standards	IEEE 802.11a/b/g/n/ac IEEE 802.11d/e/h/i/k*/r/v*/w
Wi-Fi transfer rates	IEEE 802.11n/ac: max. 433 Mbps (80 MHz channel) max. 200 Mbps (40 MHz channel) max. 86 Mbps (20 MHz channel) IEEE 802.11g: 54,48,36,24,18,12,9,6 Mbps IEEE 802.11b: 11, 5.5, 2, 1 Mbps
Wi-Fi channels	2.4 GHz: 1-13 5 GHz: 36-165 (U-NII band 1, 2, 2e, 3)
Bluetooth	v4.2 (Bluetooth low energy and Bluetooth BR/EDR)
Antennas	EMMY-W161 & EMMY-W165: 1 combined antenna pin for Bluetooth and Wi-Fi antennas EMMY-W163: 2 separate antenna pins for Bluetooth and Wi-Fi antennas
LTE filter	Integrated BAW filter (EMMY-W161 only)
Output power	Wi-Fi IEEE 802.11b: 18 dBm Wi-Fi IEEE 802.11a/g/n/ac: 16 dBm Bluetooth BR: 10 dBm Bluetooth EDR: 8 dBm

* Not currently supported by firmware

Software features

RF parameters	Available in on-board OTP memory
MAC addresses	Available in on-board OTP memory
Security	WEP64/128 WPA (TKIP, AES) WPA2 (CCMP, AES) WAPI 128-bit AES hardware support
Wi-Fi operational modes	Station (STA): Infrastructure & Direct mode µAP: Supports up to 10 stations Simultaneous STA and µAP Simultaneous dual-band (2.4/5 GHz) Wi-Fi direct One single firmware for Wi-Fi STA, µAP and Bluetooth
Driver support	Free of charge drivers for Linux and Android Third party drivers for QNX
Wi-Fi / Bluetooth coexistence	Internal TDM mechanism

Interfaces

Wi-Fi	SDIO 3.0 (4-bit, up to 150 MHz clock)
Bluetooth	SDIO 3.0 (4-bit), High-speed UART
Bluetooth audio	PCM

Package

Dimensions	13.8 x 19.8 x 2.5 mm
Mounting	Solder pins (LGA)

Environmental data, quality & reliability

Operating temperature –40 °C to +85 °C

Automotive qualification according to ISO 16750-4

AEC-Q100 compliant radio chipset

Electrical data

RF power supply	3.0-3.6 VDC
I/O power supply	3.3 VDC or 1.8 VDC

Certifications and approvals

Europe (ETSI RED)

US (FCC CFR 47 part 15 unlicensed modular transmitter approval)

Canada (IC RSS), Australia/New Zealand (ACMA)*,

Japan (MIC)*, South Korea (KCC)*

* See the Data Sheet for details

Support products

The EMMY-W1 evaluation kits include an evaluation board with full access to the module interfaces. The board includes antennas for Wi-Fi and Bluetooth. It also includes U.FL connectors for connecting external Wi-Fi and Bluetooth antennas. The kit has a standard SDIO connector for host communication.

EVK-EMMY-W161	Evaluation kit for EMMY-W161, EMMY-W161-A, EMMY-W165 and EMMY-W165-A
EVK-EMMY-W163	Evaluation kit for EMMY-W163 and EMMY-W163-A

Product variants

EMMY-W161	Professional grade module with 1 combined antenna pin for Wi-Fi and Bluetooth; integrated LTE filter
EMMY-W163	Professional grade module with 2 separate antenna pins for Wi-Fi and Bluetooth (no LTE filter)
EMMY-W165	Professional grade module with 1 combined antenna pin for Wi-Fi and Bluetooth (no LTE filter)
EMMY-W161-A	Automotive grade module with 1 combined antenna pin for Wi-Fi and Bluetooth; integrated LTE filter
EMMY-W163-A	Automotive grade module with 2 separate antenna pins for Wi-Fi and Bluetooth (no LTE filter)
EMMY-W165-A	Automotive grade module with 1 combined antenna pin for Wi-Fi and Bluetooth (no LTE filter)

Further information

For contact information, see www.u-blox.com/contact-us.

For more product details and ordering information, see the product data sheet.