

RUBY-W2 series

Host-based flexible automotive modules



Standard



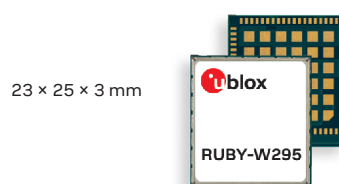
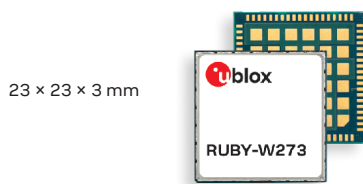
Professional



Automotive

Automotive grade 2 modules featuring tri-band Wi-Fi 7 and dual-mode Bluetooth 5.4

- High-performance for in-vehicle infotainment
- Telematics applications with simultaneous use cases
- Multi-link operation (MLO):
 - Dual Band Simultaneous (DBS) Wi-Fi 7 (RUBY-W273)
 - High Band Simultaneous (HBS) Wi-Fi 7 (RUBY-W295)
- 2x2 Multi-User Multiple-Input Multiple-Output (MU-MIMO)
- Bluetooth 5.4 and dual RF



Product description

RUBY-W2 automotive host-based modules are designed, built, and tested to meet the high reliability and quality requirements of applications in advanced in-vehicle infotainment and telematics use cases requiring high throughput (in-car hotspots), display (e.g. Apple CarPlay) and video streaming for multiple clients.

The modules deliver data speeds up to 5.8 Gbit/s (PHY) in IEEE 802.11be technology in High Band Simultaneous Mode (HBS): 2x2 at 5 GHz + 2x2 at 6 GHz. The modules can operate as access point, station, in P2P connections, or combinations of these.

RUBY-W2 supports dual-mode Bluetooth 5.4 BR/EDR and LE features, such as high data rates, extended advertising, long range, and the use of isochronous channels for LE Audio, fully simultaneously to Wi-Fi operation. The modules work with host processors running a Linux or Android operating system connected through various interfaces. RUBY-W2 modules are based on the automotive-qualified Qualcomm QCA6797AQ or QCA6787AQ chipsets. They undergo automotive qualification according to u-blox qualification policy based on AEC-Q104 and are manufactured in line with ISO/TS 16949.

Key features

- Dual Band Simultaneous (DBS) up to 2.4 GHz 2x2 40MHz + 5 GHz 2x2 160 MHz / 6 GHz 2x2 160 MHz
- High Band Simultaneous (HBS) up to 5 GHz/6 GHz 2x2 160 MHz + 5 GHz/6 GHz 2x2 160 MHz on RUBY-W295
- Wi-Fi 20, 40, 80, 160, and 320 MHz channels*
- Multi-role operation: AP, STA, P2P
- Security: WPA2/3; AES/CCMP, AES/GCMP and WAPI encryption; Secure boot
- Bluetooth dual RF: Simultaneous Bluetooth connection and Bluetooth scan/discovery
- Bluetooth LE physical layer (PHY) data rates up to 2 Mbit/s
- Bluetooth long range
- Advertising extension, high duty cycle directed advertising
- All standard pairing, authentication, link key, and encryption operation

*320 MHz only supported in 6 GHz single band mode, and only supported on RUBY-W29x

	RUBY-W273	RUBY-W295
Grade		
Automotive	•	•
Professional		
Standard		
Radio		
Chip inside: Qualcomm	QCA6787AQ	QCA6797AQ
Bluetooth qualification	v5.4	
Bluetooth profiles	HCI	
Bluetooth BR/EDR	•	•
Bluetooth Low Energy	•	•
Wi-Fi IEEE 802.11 standards	Wi-Fi 7 (802.11 a/b/g/n/ac/ax/be)	
Wi-Fi 2.4 / 5 / 6 [GHz]	2.4, 5 and 6	
Simultaneous bands in Wi-Fi multi-link operation (MLO)	2.4 and 5/6 GHz (DBS)	Any two bands 2.4, 5, or 6 GHz (incl. HBS)
Max Wi-Fi channel bandwidth [MHz]	160	320*
Wi-Fi output power conducted [dBm]	TBD	TBD
Co-existence filters	Optional LTE/5G/CV2X	
OS support		
Android / Linux drivers (from Qualcomm)	•	•
Interfaces		
High-speed UART (for Bluetooth only)	1	1
PCM / I2S (Bluetooth audio)	1	1
PCIe Gen3 (for Wi-Fi only)	1	1
Features		
Maximum Bluetooth connections	20	20
Bluetooth LE long range (coded PHY)	•	•
LE Audio	•	•
Bluetooth dual RF	•	•
Snapdragon Sound™ Technology Suite	•	•
Micro Access Point [max connects]	64	64
Wi-Fi direct	•	•
WPA2 / WPA3	•	•
RF parameters in OTP memory	•	•
Secure boot	•	•

RUBY-W2 series



Features

Chip inside	RUBY-W273: Qualcomm QCA6787AQ RUBY-W295: Qualcomm QCA6797AQ
Wi-Fi standards	Wi-Fi 7 IEEE 802.11 a/b/g/n/ac/ax/be IEEE 802.11 d/e/h/i/k/r/u/v/w/ai/mc
Wi-Fi channels	2.4 GHz: 1-13 5 GHz: 36-165 6 GHz: 1-233
Bluetooth	v5.4 (Bluetooth Low Energy and Bluetooth with EDR) Class 1 and 2 transmission Bluetooth Low Energy long range Power management, LE Audio
Output power (indicative)	Wi-Fi IEEE 802.11b: TBD Wi-Fi IEEE 802.11a/g: TBD Wi-Fi IEEE 802.11n/ac/ax: TBD Bluetooth BR/EDR: TBD Bluetooth LE: TBD
RX sensitivity (indicative)	Wi-Fi 6 2.4 GHz: TBD Wi-Fi 6 5 GHz: TBD Wi-Fi 6 6 GHz: TBD Bluetooth BR/EDR: TBD Bluetooth LE: TBD
Security	Full AES hardware encryption Secure boot
Antenna	RUBY-W273: Pin 1: 2.4 GHz and 5/6 GHz Wi-Fi (DBS) Pin 2: 2.4 GHz and 5/6 GHz Wi-Fi (DBS) Pin 3: Bluetooth RUBY-W295: Pin 1: any two bands 2.4, 5, or 6 GHz (incl. HBS) Pin 2: any two bands 2.4, 5, or 6 GHz (incl. HBS) Pin 3: Bluetooth

Software features

RF parameters	Available in on-board OTP memory
MAC addresses	Available in on-board OTP memory
Security	WPA2 (CCMP, AES) WPA3 WAPI
Wi-Fi operational	Station, access point, Wi-Fi direct, or any combination of these
Driver support	Linux and Android

Electrical data

Power supply	3.3 V / 1.9 V / 1.8 V / 1.35 V / 0.95 V
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Package

Dimensions	RUBY-W273: 23 x 23 x 3 mm RUBY-W295: 23 x 25 x 3 mm
Mounting	Solder pins (LGA), 112 pins including central pads for ground and power

Environmental data, quality & reliability

Operating temperature	-40 °C to +105 °C
Storage temperature	TBD
Moisture sensitivity level	3
RoHS and REACH compliance	
Automotive qualification according to u-blox Qualification Policy based on AEC-Q104	

Interfaces

Wi-Fi	PCIe Gen 3
Bluetooth	High-speed UART, 4-wire
Bluetooth audio	PCM and I2S
Coexistence	WSI-2 (2-wire) for LTE radio coexistence I/Os for 5G NR coexistence I/Os for LTE-LAA coexistence
Other interfaces	GPIOs

Certifications and approvals

Type approvals	Europe (RED), US (FCC), Canada (ISED), Great Britain (UKCA), Japan (Giteki) Other certifications will be considered upon request
Bluetooth qualification	v5.4 (Bluetooth BR/EDR and Bluetooth Low Energy)

Support products

EVK-RUBY-W273-00C	Evaluation kit for RUBY-W273 modules
EVK-RUBY-W295-00C	Evaluation kit for RUBY-W295 modules

Product variants

RUBY-W273-05A	3 antenna pins, 105 °C, MLO/DBS, automotive grade 2, eFEM
RUBY-W295-05A	3 antenna pins, 105 °C, MLO/HBS, automotive grade 2, eFEM

Further information

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

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

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