

RENESAS Bluetooth Low Energy (LE) Product Portfolio

LE MCU Line Up	<u>RX23W</u>	<u>RA4W1</u>	<u>RE01B</u>	<u>RL78/G1D</u>	<u>RYZ012x1</u>
Product Type	IC / Module	IC	IC	IC / Module	Module
Product Overview	The RX23W provides system control for devices and wireless communication on a single chip.	The RA4W1 also features a rich set of peripheral features, making it ideal for wireless applications that use a HMI.	The RE01B is suitable for many different battery-driven IoT applications due to its ultra-low power and high-speed operation.	The RL78/G1D enable reliable Bluetooth LE connections with current consumption levels among the lowest in the industry.	The RYZ012x1 is Pre-defined serial interface for easy system creation.

RF Properties »

Bluetooth LE	Core Spec Version	5.0	5.0	5.0	5.0	5.0
LE Functions	LE Data Packet Length Extension	●	●	●	-	●
	LE Secure Connections	●	●	●	-	-
	LE 2M PHY	●	●	●	-	-
	LE Long Range	●	●	●	-	-
	LE Advertising Extensions	●	●	●	-	-
	Channel Selection Algorithm #2	●	●	●	-	-
	High Duty Cycle NC Advertising	●	●	●	-	-
	Maximum Number of Connections	7	7	7	8	1
RF Peak Current	Tx (0dBm)	4.3mA	4.5mA	4.3mA	4.3mA	4.8mA
	Rx (1Mbps)	3.0mA	3.3mA	3.0mA	3.5mA	5.3mA
Rx Sensitivity	2Mbps	-92dBm	-92dBm	-92dBm	-	-
	1Mbps	-95dBm	-95dBm	-95dBm	-90dBm	-96dBm
	500kbps	-100dBm	-100dBm	-100dBm	-	-
	125kbps	-105dBm	-105dBm	-105dBm	-	-
Output Power		+4dBm	+4dBm	+4dBm	0dBm	+10dBm
External Parts (Minimum Config)	Matching Circuit	0	0	0	0	-
	Capacity for Xtal	0	0	0	3	-

Device »

IC	Product Model Name	<u>R5F523Wxxxx</u>	<u>R7FA4W1AD2CNG</u>	<u>R7F0E01BD2DNB</u>	<u>R5F11Axxxx</u>	-
	Size	A: 5.5 x 5.5mm B: 7.0 x 7.0mm	7 x 7mm	8 x 8mm	6 x 6mm	-
	Pin Pitch	A: 0.5mm B: 0.4mm	0.4mm	0.4mm	0.4mm	-
	Package	A: 85pin BGA B: 56pin QFN	56pin QFN	64pin QFN	48pin QFN	-
Module	Product Model Name	<u>R5F523W8xDLN</u>	-	-	<u>RY7011A0000DZ00</u>	<u>RYZ012x100FZ00</u>
	Antenna Type	Pattern	-	-	Pattern	Chip / External
	Size	6.1 x 9.5mm	-	-	8.95 x 13.35mm	12.0 x 12.0mm
	Pin Pitch	0.5mm	-	-	0.85mm	1.40mm
	Package	83pin LGA	-	-	42pin LGA	26pin LGA
Radio Regulation: Conformity Standard »						
	Technical Conformity Mark (MIC/JPN)	●	-	-	●	●
	FCC Certification (FCC/USA)	●	-	-	●	●
	FCC Certification (ISED/CAN)	●	-	-	●	●
	CE Marking (/EU· EFTA)	●	-	-	●	●
	CCC Certification (SRRC/CHN)	-	-	-	-	-
	KC Mark (RRA/KOR)	-	-	-	-	-

MCU »

CPU	Core	32-bit RXv2	Cortex-M4	Cortex-M0+	16-bit RL78-S2	Proprietary 32-bit MCU
	Clock	54MHz	48MHz	64MHz	32MHz	48MHz
	Code Flash	384 / 512KB	512KB	1.5MB	128 / 192 / 256KB	-
	Data Flash	8KB	8KB	8KB	8KB	-
	RAM	64KB	96KB	256KB	12 / 16 / 20KB	-
Supply Voltage Range		1.8 ~ 3.6V	1.8 ~ 3.6V	1.8 ~ 3.6V	1.6 ~ 3.6V	1.8 ~ 3.6V
Operating Temperature		-40 ~ +85°C	-40 ~ +85°C	-40 ~ +85°C	-40 ~ +85°C	-40 ~ +85°C
Energy Harvest				●	●	
Security	AES	128/256	128/256	128/256	128(Bluetooth's)	-
	TRNG	●	●	●	-	-

RENESAS Bluetooth Low Energy (LE) Product Portfolio

LE MCU Line Up		RX23W	RA4W1	RE01B	RL78/G1D	RYZ012x1
	Access Management	●	●	●	-	-
	Unique ID	●	●	●	-	-
	Memory Protection Unit	●	●	●	-	-
Peripherals	USB2.0 FS	1	1	-	-	-
	I2C	1	2	1	1+(Simple: 2)	-
	SCI	4	6	2	2	1(UART)
	SPI	1	2	1	-	1
	CAN	1	1	-	-	-
	SDHI	1	-	-	-	-
	SSI	1	-	-	-	-
	ADC	14	8	7	8	-
	DAC	2	3	-	-	-
	Touch Interface	12	11	-	-	-

Solution »

Hardware & Kit	Evaluation Board	RTK5RX23W0C00000BJ	RTK7EKA4W1S00000BJ	EB-RE01B (Tessera)	RTK0EN0001D01001BZ	-
	Module Evaluation Board	RTK5RX23W0C01000BJ	-	-	RM-110-RFB-2	RTKYZ012A1B00000BE
	RSSK	RTK5523W8xS00000BJ	-	-	-	-
	Experience Kit	-	-	-	IoT Experience Kit: RTK5RLG140C00000BJ+RTKYRLG1D0B00000BJ	EK-RA4M2+ RTKYZ012A1B00000BE
Protocol Stack (Bluetooth Qualified)	Core Stack	●	●	●	●	●
	Bluetooth Mesh	●	●	-	-	-
	Profiles / Services	23 / 31	23 / 31	23 / 31	-	-
	Beacon Stack	-	-	●	●	-
Sample Programs	ANCS	●	●	-	-	-
	AMS	-	●	-	-	-
	OTA	●	-	●	●	-
	High-Speed Communication	●	●	-	-	-
	Virtual UART	-	-	-	●	-
	Host MCU	-	-	-	●	-
	HID	-	-	-	●	-
	Beacon	●	-	●	●	-
	Sensor	●	-	-	●	-
	Multirole	●	-	-	-	-
Mesh / Multi hop	●	●	-	●	-	
Custom Profile	●	●	●	●	●	
Development Environment	Integrated Development Environment (IDE)	e ² studio / IAR Embedded Workbench for Renesas RX	e ² studio / IAR Embedded Workbench for Arm/ Keil Microcontroller Development Kit	e ² studio / IAR Embedded Workbench for Arm	e ² studio / CS+ / IAR Embedded Workbench for Renesas RL78	-
	Emulator	E1 / E2	E2 / SEGGER J-Link / IAR I-Jet	E2 / SEGGER J-Link / IAR I-Jet	E1 / E2 Lite	-
	Compiler	CC-RX / IAR	GCC / IAR / Arm	GCC / IAR	CS+ for CC / CS+ for CA,CX / IAR	-
	Flash Memory Write	Renesas Flash Programmer	Renesas Flash Programmer	Renesas Flash Programmer	Renesas Flash Programmer	-
	Assistance (GUI) Tool	QE for BLE	QE for BLE	QE for BLE	QE for BLE	QE for BLE
	RTOS support	FreeRTOS	FreeRTOS / Azure RTOS	-	RWKE (Task Scheduler)	-
Windows Applications	BTTS	●	●	●	-	-
	GUI Tool	-	-	-	●	-
	Windows 10 Bluetooth LE App	●	●	●	●	●
Smartphone Applications	GATTBrowser	●	●	●	●	●
	TryBT	●	●	●	-	●