

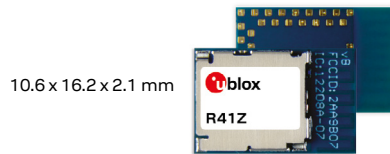
# R41Z module



## Stand-alone Bluetooth 4.2 low energy and 802.15.4 module

### Complete Bluetooth Low Energy v4.2 and 802.15.4 (Thread and Zigbee) solution

- Powerful & ultra-efficient 48MHz 32-bit Arm® Cortex®-M0+ CPU with 512kB Flash & 128kB SRAM
- High resolution 16-bit ADC
- Buck-boost DC-DC converter for operating voltage 0.9-4.2 V
- Certified for Europe, USA, Canada, Japan, Australia / New Zealand



### Product description

The R41Z module is an ultra-low-power, highly-integrated single-chip device that enables concurrent Bluetooth low energy and IEEE 802.15.4 (Thread and Zigbee) connectivity for portable, extremely low-power embedded systems. With an Arm® Cortex®-M0+ CPU, integrated 2.4 GHz transceiver, and an integrated antenna, the R41Z provides a complete RF solution allowing faster time to market with reduced development costs.

The R41Z module is based on the NXP KW41Z chip, and the module provides access to all its capabilities and peripherals. With the integrated buck-boost DC-DC converter, the module can be powered from only 0.9 V up to 4.2 V, thus supporting a wide range of batteries including single cell types. The module also includes a high-performance A/D converter at the MCU level, for sensor aggregation and other sophisticated applications.

	R41Z
<b>Grade</b>	
Automotive	
Professional	
Standard	•
<b>Radio</b>	
Chip inside	NXP KW41Z
Bluetooth qualification	v4.2
Bluetooth low energy	•
Thread / Zigbee	•
Bluetooth output power EIRP [dBm]	3
Max range [meters]	150
NFC	
Antenna type (see footnotes)	pcb
<b>Application software</b>	
Open CPU for embedded applications	•
<b>Interfaces</b>	
UART	◆
SPI	◆
I2C	◆
I2S	
USB	
PWM	◆
TSI	◆
GPIO pins	25
AD converters [number of bits]	16
<b>Features</b>	
MCU (see footnotes)	M0+
RAM [kB]	128
Flash [kB]	512
Simultaneous GATT server and client	◆
Throughput [Mbit/s]	
Maximum Bluetooth connections	2
Secure boot	
Bluetooth mesh	
FOTA	◆

pcb = Internal PCB antenna      ◆ = Feature enabled by HW. The actual support depends on the open CPU application SW.  
M0+ = 48 MHz Arm Cortex-M0+

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## Features

Bluetooth	v4.2 (Bluetooth low energy)
Range	150 m
Max. radiated output power	3 dBm
Conducted sensitivity	-95 dBm (1 Mbit/s) -100 dBm (125 Kbit/s)
Bluetooth address	Unique public Bluetooth address provided (on label)
Bluetooth operating modes	Simultaneous central and peripheral roles LE 1M PHY (1 Mbps) LE Data Length Extension
Antenna	Integrated PCB antenna
Development environment	MCUXpresso IDE and SDK Customers develop and embed their own application in the R41Z modules (open CPU concept)
Security	Secure Simple Pairing 128-bit AES encryption Bluetooth low energy secure connections

## Interfaces and peripherals\*

UART	1 block. 1200 baud to 1 M baud, parity, CTS and RTS support
SPI master	2 blocks. 125 kHz to 8 Mhz clock rates
SPI Slave	2 blocks. 125 kHz to 8 Mhz clock rates
I2C master/slave	2 blocks. 100 kHz to 400 kHz clock rates
ADC	4-ch single ended or 1-ch differential, 16-bit
DAC	1-channel, 12-bit
GP Comparator	8-ch, VCC and internal ref, 64 levels
Temp. Sensor	Internal, -40 °C to 85 °C
GPIO	25 - Input High: 0.7 x VCC; Input Low: 0.3 x VCC; pull-up/pull-down
Timers / PWM	2-ch to 8-ch, 16-bit with prescaler, watchdog

\* Not all simultaneously

## Package

Dimensions	10.6 x 16.2 x 2.1 mm
Weight	< 1.0 g
Mounting	Machine mountable Solder pins

## Environmental data, quality & reliability

Operating temperature	-40 °C to +85 °C
Storage temperature	-40 °C to +125 °C
Humidity	RH 5 – 90% non-condensing
RoHS	RoHS 3 compliant

## Electrical data

Power supply	1.7 VDC to 3.6 VDC
Power consumption in Bluetooth low energy mode	Active TX @ 0 dBm: 6.1 mA Very low power run, 137 µA Very low leakage stop 3, 1.8 µA Very low leakage stop 0, 182 nA

## Certifications and approvals

Type approvals	US (FCC); Canada (ISED); Europe (ETSI RED); Japan (MIC); Australia & New Zealand(RCM)
Health and safety	EN 62479, EN 60950-1, IEC 60950-1
Bluetooth qualification	v4.2 (Bluetooth low energy), Bluetooth RF PHY

## Support products

R41Z-Eval	Evaluation kit for R41Z with open CPU and internal PCB antenna
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## Product variants

R41Z	With PCB antenna, open CPU
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## Further information

For contact information, see [www.u-blox.com/contact-us](http://www.u-blox.com/contact-us).

For more product details and ordering information, see the [product data sheet](#).

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