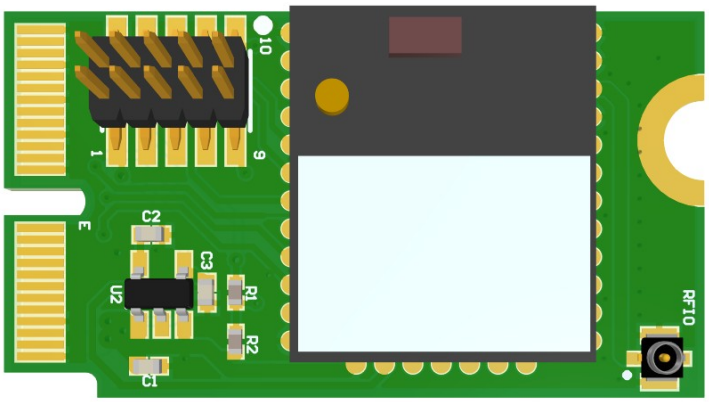
Data Sheet

ZBC-M2-1630 card M.2 1630 E-Key

ZBC-M2-1630



ZigBee®/ Bluetooth® Card based on the Silabs EFR32MG21 Series 2 Multiprotocol SoC in M.2 1630 E-Key Form Factor

The ZBC card is based on a Silabs MGM210P module adopting the M.2 1630 E-Key form factor. Based on the EFR32MG21 SoC, it enables ZigBee®, Thread®, Bluetooth® and multi-protocol connectivity (ZigBee + Bluetooth 5.1) while delivering best-in-class RF range and performance, enhanced security, low active current consumption, and a temperature rating suited for operating in demanding environmental conditions.

Key Features

- 32-bit ARM Cortex®-M33 with DSP instruction and floating point unit for efficient signal processing
- Hardware Cryptographic Acceleration with DPA countermeasures1 for AES128/256, SHA-1, SHA-2 (up to 256-bit), ECC (up to 256-bit), ECDSA, and ECDH
- Ultra-low power consumption
- Super slim profile and compact size
- Robust mounting and interfaces
- Broad usage spectrum through standard M.2 1630 E-Key
- UART interface
- TX power up to +20 dBm

Application Areas

- Internet of Things (IoT) and Industrial Internet of Things (IIoT) Applications
- Connected lighting
- Building automation and security
- Machine to Machine (M2M)
- Smart City
- Home-, Building-, Industrial Monitoring and Control

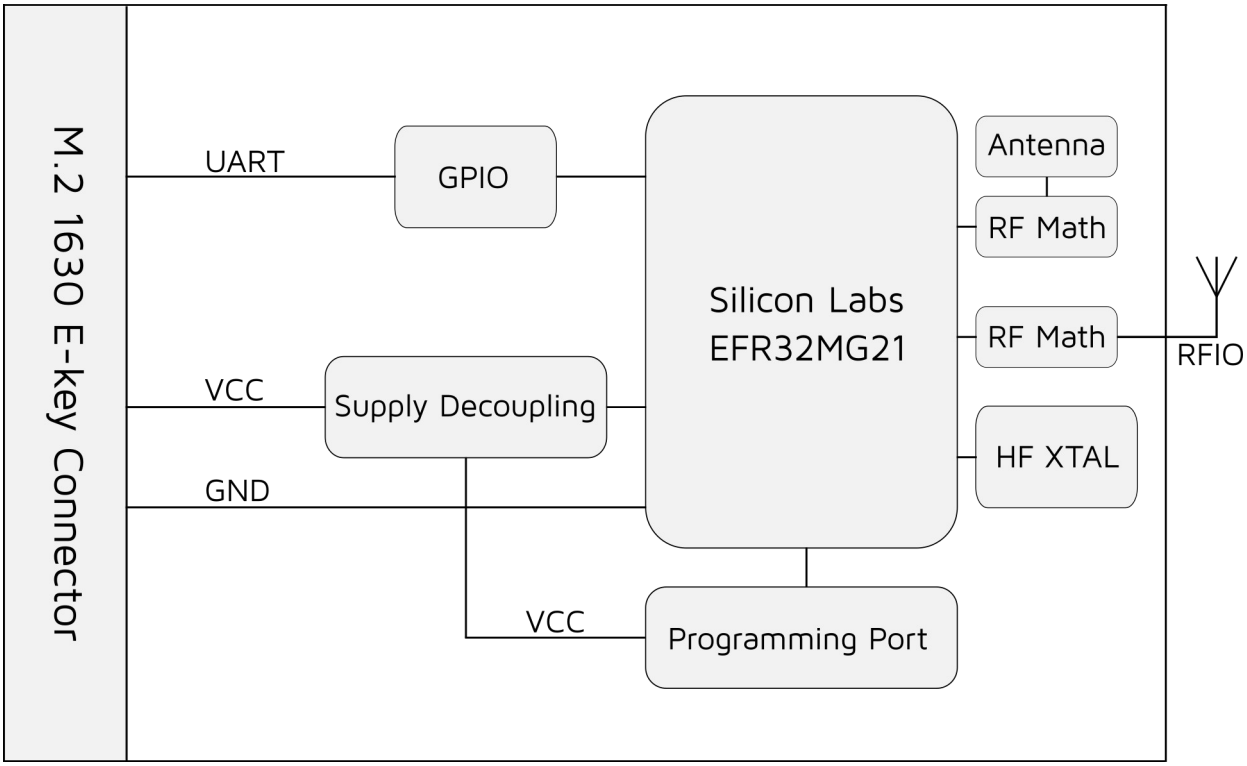
Specifications

Category	Feature	Description
General Radio	Multi-protocol (ZigBee + Bluetooth 5.1)	EFR32MG21 SoC, 2.4 GHz radio
	Wireless System-on-Chip	32-bit ARM Cortex®-M33 with DSP instruction and floating point unit for efficient signal processing 1024 kB flash program memory 96 kB RAM data memory Embedded Trace Macrocell (ETM) for advanced debugging
	Security	Secure Boot with Root of Trust and Secure Loader (RTSL) Hardware Cryptographic Acceleration with DPA countermeasures1 for AES128/256, SHA-1, SHA-2 (up to 256-bit), ECC (up to 256-bit), ECDSA, and ECDH True Random Number Generator (TRNG) compliant with NIST SP800-90 and AIS-31 ARM® TrustZone® Secure Debug Interface lock/unlock
Connectors	Connector Type	M.2 1630 E-Key
	External Antenna	MHF4 connector with 50 Ω impedance
Host Interface		UART
Power	Input Voltage	1.71 to 3.8 V
	Consumption	9.4 mA RX current at 250 kbps O-QPSK DSSS 9.3 mA RX current at 1 Mbps GFSK 34.1 mA TX current at 10 dBm (MGM210Px22) 50.9 µA/MHz in Active Mode (EM0) 5.1 µA EM2 DeepSleep current (RTCC running from LFXO, Bluetooth Stack not running) 8.5 µA EM2 DeepSleep current (RTCC running from LFXO, Bluetooth Stack running)
RF	Frequency Range	2.4 GHz
	Sensitivity	03.9 dBm sensitivity (1% PER) at 250 kbps O-QPSK DSSS -104.5 dBm sensitivity (0.1% BER) at 125 kbps GFSK -100.1 dBm sensitivity (0.1% BER) at 500 kbps GFSK -97.0 dBm sensitivity (0.1% BER) at 1 Mbps GFSK -94.1 dBm sensitivity (0.1% BER) at 2 Mbps GFSK
	Max. TX Power	Up to +20 dBm
Antenna	Built-in and external	By default the internal chip antenna is enabled, the external antenna requires a special firmware variant.
Operating Conditions	Temperature (operating)	-40 to +125 °C

Category	Feature	Description
	Humidity	10% ~ 90% RH Non-condensing
Physical Properties	Dimensions WxHxD	30 x 16.5 x 3.2 mm
	Weight	4 g
Regulatory	Certifications	Pending: CE
	Materials	RoHS, REACH
Warranty		12 months for B2B customers 24 months for B2C customers

Block Diagram

The ZigBee card is a highly-integrated, high-performance system with all the hardware components needed to enable 2.4 GHz wireless connectivity and support robust networking capabilities via multiple protocols.



Interfaces

M.2 1630 Connector

The card is compliant with the M.2 1630 E-key specification and can thus be used in any compatible host system. Some reserved pins are used and others re-purposed as shown in the following table.

Pin #	Symbol	Type	Description
1	GND	power	
2	VCC	power	

Pin #	Symbol	Type	Description
3	NC	-	
4	VCC	power	
5	NC	-	
6	NC	-	
7	GND	power	
8	NC	-	
9	NC	-	
10	NC	-	
11	NC	-	
12	NC	-	
13	NC	-	
14	NC	-	
15	NC	-	
16	NC	-	
17	NC	-	
18	GND	power	
19	NC	-	
20	NC	-	
21	NC	-	
22	TX	output	Main UART transmit
23	NC	-	
32	RX	input	Main UART receive
33	GND	power	
34	RTS	input	Main UART request to send
35	NC	-	
36	CTS	output	Main UART clear to send
37	NC	-	
38	NC	-	
39	GND	power	
40	NC	-	
41	NC	-	
42	NC	-	
43	NC	-	
44	NC	-	
45	GND	power	
46	NC	-	
47	NC	-	
48	NC	-	

Pin #	Symbol	Type	Description
49	NC	-	
50	NC	-	
51	GND	power	
52	RESET		
53	NC	-	
54	NC	-	
55	NC	-	
56	NC	-	
57	GND	power	

NC = Not Connected
VCC = 1.71 to 3.8 V=Power Supply
GND = Ground

RF IO Port

The RF IO port is a W.FL type connector for the connection to the antenna. Usually a 'pigtail' cable with a W.FL to SMA or N-Type connector is used for this.
Built around the EFR32MG21 Wireless Gecko SoC, the card includes, both, a built-in antenna and a 50 Ω-matched RF port for an external antenna.

Product Family Portfolio

Part Number	Description	Availability
zbc-m2-1630	ZigBee card an based on the EFR32MG21 SoC, design in M.2 1630 E-Key	available

Ordering Information

All n-fuse products can be ordered directly through the n-fuse website.
You can also contact a sales representative via devices-sales@n-fuse.co for volume ordering.

Version 28.11.2020