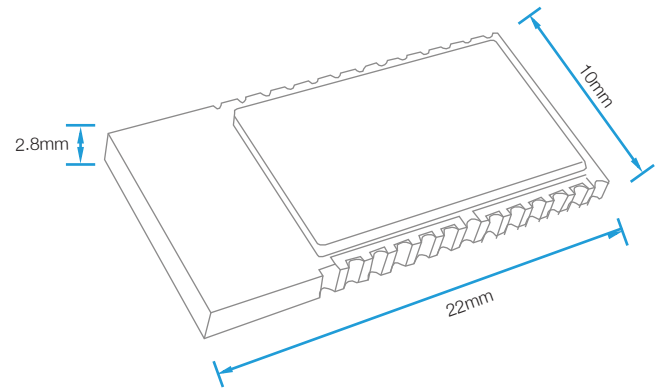
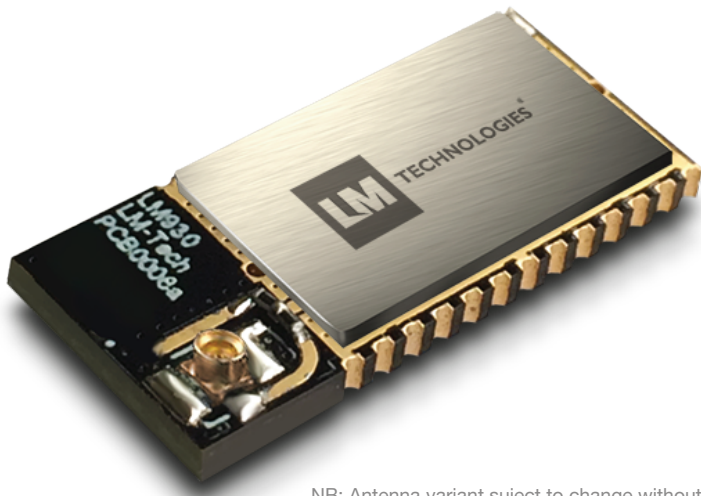




# LM930 Bluetooth BLE 4.1 Smart Module

## UART Class 1 with UFL Receptical

Product LM930  
 Part No 930-0633  
 Revised 04/MAY/2016



NB: Antenna variant subject to change without notice.

### Features

- 128KB memory: 64KB RAM and 64KB ROM
- Bluetooth® v4.1 specification
- 9dBm Bluetooth low energy maximum transmit output power
- Support for Bluetooth v4.1 specification host stack including ATT, GATT, SMP, L2CAP, GAP
- RSSI monitoring for proximity applications
- <900nA current consumption in dormant mode
- Low Power 32kHz and 16MHz crystal
- Switch-mode power supply
- Programmable general purpose PIO controller
- Wake-up interrupt and watchdog timer
- 12 digital PIOs
- 3 analogue AIOs
- UART
- 4 PWM modules
- 10-bit ADC

### Overview

The LM930 is a highly power efficient stand alone module, combining both the host micro controller and Bluetooth radio into a single package. You can connect your peripheral sensors and devices directly to the LM930 and use it to host your application code, thus eliminating the need for an extra MCU. Furthermore LM offer a range of available Bluetooth Smart profile templates which we can customise to your specification and can offer applications such as iBeacon to be pre-installed.

For production, LM can provide modules with your firmware and settings preloaded, simplifying your manufacturing and testing process. The LM930 comes with a U.FL/IPEX connector for attaching an antenna. With a battery added to the LM930 and placed into a housing, this module can also act as an iBeacon device awaiting instruction/ data, or to pass on instruction/data automatically when in range of other BLE enabled devices.

LM has been creating long distance Bluetooth Modules and Adapters for over 10 years, with our experience we have developed a new Long Range BLE Module, utilising an antenna with superior performance comparable to common IC or meander alternatives, ideally suited for distances up to 500m and beyond.



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### Packaging

930-0633 M SMT PROG BT4.1 300Kbps UART SPI I2C 1.2-4.4V 9.3dB UFL TRAY

930-0635 MOD SMT PROG BT4.1 300Kbps UART SPI I2C 1.2-4.4V 9 T&R

### Application Templates Included

- Alert Tag
- Automotive Keyfob
- Beacon
- Blood Pressure Sensor
- Cycling Speed and Cadence Sensor
- Environment Sensor
- Glucose Sensor
- Health Thermometer
- Hearth Rate Sensor
- Keyboard
- Multifunction Steering Wheel
- Mouse
- Running Speed and Cadence Sensor
- Security Tag
- Serial Communication
- Time Client
- Temperature and Pressure
- Weight Scale

### General Specification

Chipset	CSR 1012
Class	BLE Smart Class 1
Speed / Bandwidth	Up to 1Mbps (0.27Mbps throughput)
Range	0m - 500m estimated with 2Dbi Antenna
Interface	UART ( I <sup>2</sup> C + SPI for peripherals )
Standard Bluetooth	4.1
Frequency	2.400 to 2.4835 GHz
Hopping	Adaptive/sec 2MHz channel space
Profiles Supported	BLE Smart App's Only
Firmware	Fully programmable (Onboard stack)
Rx Sensitivity	-92 dBm typical
Tx Output Power	9 dBm ± 2dB
Current Consumption	TX 25mA, RX 23mA
Antenna Gain	Max 2 dBi
Power Supply	1.8-3.6 VBATT and 1.2-3.6 VDD PAD
Weight	9g approx
Operating Temperature	-30°C to 85°C
Storage Temperature	-40°C to +85°C
Dimensions	22mm x 10mm x 2.8mm



# LM930 Bluetooth BLE 4.1 Smart Module

## UART Class 1 with UFL Receptical

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### Pin Assignments

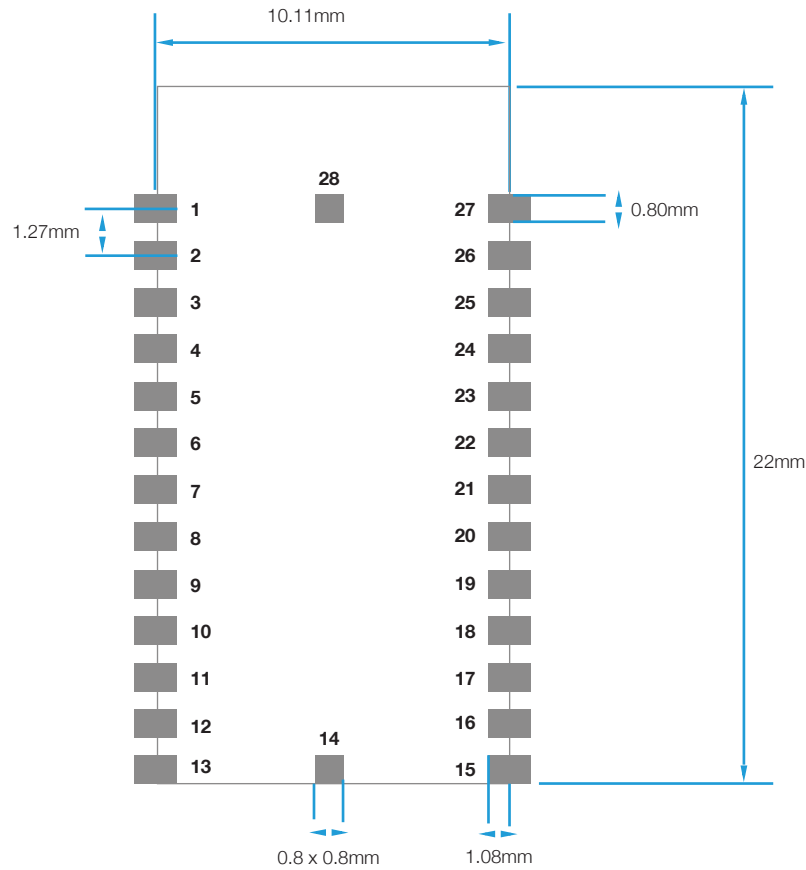
Pin	Name	Type	Description
1	GND	Ground	Common Ground
2	GND	Ground	Common Ground
3	GND	Ground	Common Ground
4	AIO2	I/O	Programmable Input Output
5	AIO1	I/O	Programmable Input Output
6	AIO0	I/O	Programmable Input Output
7	GND	Ground	Common Ground
8	IO0	I/O	UART TX
9	IO1	I/O	UART RX
10	IO3	I/O	Programmable Input Output
11	IO4	I/O	Programmable Input Output
12	IO5	I/O	DEBUG_CLK
13	GND	Ground	Common Ground
14	GND	Ground	Common Ground
15	GND	Ground	Common Ground
16	PADS	Power	Positive supply for all digital I/O Ports
17	VBATT	Power	Module input supply, 3.3V DC
18	IO6	I/O	DEBUG_CS#
19	IO7	I/O	DEBUG_MOSI
20	IO8	I/O	DEBUG_MISO
21	GND	Ground	Common Ground
22	IO9	I/O	Programmable Input Output
23	IO10	I/O	Programmable Input Output
24	IO11	I/O	Programmable Input Output
25	SPIPION	Input	High to enable the SPI debug interface
26	WAKE	Input	Wake from Hibernate
27	GND	Ground	Common Ground
28	GND	Ground	Common Ground



**LM930 Bluetooth BLE 4.1 Smart Module**  
 UART Class 1 with UFL Receptical

Product LM930  
 Part No 930-0633

**Pin Outs**



## **FCC Warning**

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: Any changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

## **FCC Radiation Exposure Statement:**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance.

**Note 1:** This module certified that complies with RF exposure requirement under mobile or fixed condition, this module is to be installed only in mobile or fixed applications.

A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimeter separation requirement.

A fixed device is defined as a device is physically secured at one location and is not able to be easily moved to another location.

**Note 2:** Any modifications made to the module will void the Grant of Certification, this module is limited to OEM installation only and must not be sold to end-users, end-user has no manual instructions to remove or install the device, only software or operating procedure shall be placed in the end-user operating manual of final products.

**Note 3:** The device must not transmit simultaneously with any other antenna or transmitter.

**Note 4:** To ensure compliance with all non-transmitter functions the host manufacturer is responsible for ensuring compliance with the module(s) installed and fully operational. For example, if a host was previously authorized as an unintentional radiator under the Declaration of Conformity procedure without a transmitter certified module and a module is added, the host manufacturer is responsible for ensuring that after the module is installed and operational the host continues to be compliant with the Part 15B unintentional radiator requirements. Since this may depend on the details of how the module is integrated with the host, LM Technologies Ltd. shall provide guidance to the host manufacturer for compliance with the Part 15B requirements.

**Note 5:** FCC ID label on the final system must be labeled with “Contains FCC ID: VVX-LM930-XXXX” or “Contains transmitter module FCC ID: VVX-LM930-XXXX”.

The transmitter module must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the host product. LM Technologies Ltd. is responsible for the compliance of the module in all final hosts.

## IC WARNING

This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions:

- (1) This device may not cause interference; and
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

*This radio transmitter (IC: 10531A-LM930XXXX) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.*

No.	Antenna Type	Gain	Impedance
1	External uniqueness Antenna	2dBi	50ohm

## **IC Radiation Exposure Statement:**

This device and its antenna(s) must not be co-located with any other transmitters except in accordance with IC multi-transmitter product procedures. Referring to the multi-transmitter policy, multiple-transmitter(s) and module(s) can be operated simultaneously without reassessment permissive change.

Cet appareil et son antenne (s) ne doit pas être co-localisés ou fonctionner en association avec une autre antenne ou transmetteur.

This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20cm de distance entre la source de rayonnement et votre corps.

This module is limited to OEM installation only and must not be sold to end-users, end-user has no manual instructions to remove or install the device, only software or operating procedure shall be placed in the end-user operating manual of final products. Additional testing and certification may be necessary when multiple modules are used.

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

The final end product must be labeled in a visible area with the following " Contains IC: 10531A-LM930XXXX".