

FUJITSU, years of experience Wireless Solutions



>> FUJITSU Components' Wireless Solutions

Introduction

FUJITSU Components wireless product portfolio consists of a wide and constantly growing range of modules, devices and solutions, developed to make IoT in many markets an easy technology to integrate.

The module product line contains a wide range of Bluetooth[®] modules. The well-known family of Bluetooth version 2.1 + EDR modules which includes iOS compatible modules. The growing family of Bluetooth low energy modules - Version 4.1, 4.2 and 5 compliant - are amongst the smallest and best performing modules in the market.

The range of FUJITSU Beacons is expanded with the implementation of sensors, powered by alternative energy sources and adding solution software.

The introduction of 'FUJITSU IoT Connectivity solutions' is setting the standard by the ideal combination of our hardware products and the best software solutions in the market: A wide area MESH network with a de-centralized radio protocol that allows connected devices to

make all decisions locally and co-operatively. A software stack that makes the interface from almost any sensor to our radio technologies. And the easiest connection from IoT devices to the cloud.

Imagine all the possibilities...



More information

For questions or information, please refer to your supplier or contact your local FUJITSU Office. For contact information, see the last page of this document, or visit:

http://www.fujitsu.com/components/

Index

Wireless Modules

Bluetooth version 2.1+EDR modules	Page 2
Bluetooth version 4.1 low energy modules	Page 3
Bluetooth version 4.1 low energy modules (Embedded profile)	Page 4
Bluetooth version 4.2 low energy modules	Page 5
LPWAN module	Page 6

Wireless Devices

Beacons introduction	Page 7
Beacons	Page 8 - 9

Solutions

FUJITSU IoT Connectivity Solutions	
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>> Bluetooth version 2.1+EDR modules

Easy control and communication

The FUJITSU Components' Bluetooth modules contain the complete upper layer protocol stack (L2CAP, RFCOMM, SDP) and the GAP and SPP profiles. Communication and control can be easily established by using as many as 200 simple text base commands and events covered by the firmware. The crystal and 8Mbit Flash memory are integrated into the module, but offer nevertheless a small and compact design. The FUJITSU Components' Bluetooth modules are available in four versions, offering antenna options, a 40-pin PCB connectors and a 10-pin FPC/ FCC connector.

In response to the rapid development of iOS devices and software applications, FUJITSU Components has developed Bluetooth modules that are compliant with the iAP and iAP2 profiles, necessary for communication with the iPhone[®], iPod[®] and iPad[®]. The modules with and without antenna make the FUJITSU Bluetooth iOS modules easy to integrate.

* To purchase these Bluetooth iOS modules it is required to join the MFi license program provided by Apple[®]. The CP-chip (Authentication Coprocessor chip) is required for iOS communication and needs to be purchased from Apple[®].

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Partnumber	MBH7BTZ39(A)	MBH7BTZ40	MBH7BTZ42(A)	MBH7BTZ43
Used IC	CSR BC4-Ext.	CSR BC4-Ext.	CSR BC4-Ext.	CSR BC4-Ext.
Туре	Bluetooth Ver.2.1+EDR Class 2	Bluetooth Ver.2.1+EDR Class 2	Bluetooth Ver.2.1+EDR Class 2	Bluetooth Ver.2.1+EDR Class 2
Profile	SPP, GAP embedded (A: iAP and iAP2)	SPP, GAP embedded	SPP, GAP embedded (A: iAP and iAP2)	SPP, GAP embedded
Size	12.4x9.4x1.5mm	31x15x2.5mm	17.6x10.6x1.9mm	22.5x10.6x2.3mm
Operating Temperature	-40 to +85 °C	-25 to 85 °C	-40 to +85 °C	-40 to 85 °C
Attachment	SMD	Connector	SMD	Connector
Antenna	No	Yes	Yes	Yes
Host I/F	UART	UART	UART	UART
Qualification/ Certification	QDID, Radio Act Japan	QDID, FCC/IC/CE/Radio Act Japan	QDID, FCC/IC/CE/Radio Act Japan	QDID, FCC/IC/CE/Radio Act Japan

>> Bluetooth version 4.1 low energy modules

Easy-to-integrate modules

The FUJITSU wireless modules conform with the Bluetooth Core Specification version 4.1. This Bluetooth technology contains a low energy feature enabling a substantial reduction of power consumption. The modules are available with 256kB Flash memory and up to 32kB RAM for profile and application development.

FUJITSU Bluetooth version 4.1 low energy modules provide robust wireless communication with any Bluetooth compliant device.

The modules have a compact size and are among the smallest on the market with a maximum number of GPIO pins.



	39	USOL AA		USOL AA	
Partnumber	MBH7BLZ01-109029	MBH7BLZ02-109031	MBH7BLZ01A-109008	MBH7BLZ02A-109009	MBH7BLZ07-109033
Used IC	Nordic Semiconductor nRF51822 rev.3 16kB RAM, 256kB Flash	Nordic Semiconductor nRF51822 rev.3 16kB RAM, 256kB Flash	Nordic Semiconductor nRF51822 rev.3 32kB RAM, 256kB Flash	Nordic Semiconductor nRF51822 rev.3 32kB RAM, 256kB Flash	Nordic Semiconductor nRF51822 16kB RAM, 256kB Flash
Туре	Bluetooth Ver.4.1 low energy (single mode)	Bluetooth Ver.4.1 low energy (single mode)			
SoftDevice	S110 v 8.0.0 embed- ded	S110 v 8.0.0 embed- ded	S120 v 2.0.0 embed- ded	S120 v 2.0.0 embed- ded	S110 v 8.0.0 embed- ded
Size	10.5x9.2x1.6mm	15.7x9.8x2.0mm	10.5x9.2x1.6mm	15.7x9.8x2.0mm	11.5x7.9x1.7mm
Operating Temperature	-40 to +85 °C	-40 to +85 °C	-25 to +85 °C	-25 to +85 °C	-40 to +85 °C
Attachment	SMD	SMD	SMD	SMD	SMD
Antenna	No	Yes	No	Yes	Yes
Host I/F	UART, SPI, 12C, GPIO	UART, SPI, I2C, GPIO			
Number of GPIO's	31	31	31	31	22
Qualification/ Certification	QDID, Radio Act Japan	QDID, FCC/IC/CE/Radio Act Japan	QDID, Radio Act Japan	QDID, FCC/IC/CE/Radio Act Japan	QDID, FCC/IC/CE/Radio Act Japan

>> Bluetooth version 4.1 low energy modules

FUJITSU also offers embedded profile modules

The embedded FUJITSU Components Data Communication is a unique data transmission profile developed by Fujitsu Components. The FDC profile is a SPP (serial port profile) like interface which allows data to transmit with the host system and can be controlled by simple text based commands (via UART). Modules are available as peripheral versions or a switchable version which can be peripheral and central.

With more than 100 commands and continuous additions, FDC allows for quick product to market and reduction of development resources. FDC is ideally suited for sensing, monitoring, and wearable applications.

FUJITSU FDC embedded Bluetooth version 4.1 low energy modules provide robust wireless communication with any Bluetooth compliant device. The modules are easy to integrate because of the UART communication and are compact in size.













Partnumber	MBH7BLZ01-xxxxxx	MBH7BLZ02-109058	MBH7BLZ01A-xxxxxx	MBH7BLZ02A-109059	MBH7BLZ07-109060
Used IC	Nordic Semiconductor nRF51822 rev.3	Nordic Semiconductor nRF51822 rev.3	Nordic Semiconductor nRF51822 rev.3	Nordic Semiconductor nRF51822 rev.3	Nordic Semiconductor nRF51822
Туре	Bluetooth Ver.4.1 low energy (single mode)				
FUJITSU unique data transmission profile	Peripheral type embeded	Peripheral type embeded	Central/Peripheral type embeded	Central/Peripheral type embeded	Peripheral type embeded
Size	10.5x9.2x1.6mm	15.7x9.8x2.0mm	10.5x9.2x1.6mm	15.7x9.8x2.0mm	11.5x7.9x1.7mm
Operating Temperature	-40 to +85 °C	-40 to +85 °C	-25 to +85 °C	-25 to +85 °C	-40 to +85 °C
Attachment	SMD	SMD	SMD	SMD	SMD
Antenna	No	Yes	No	Yes	Yes
Host I/F	UART	UART	UART	UART	UART
Qualification/ Certification	QDID, Radio Act Japan	QDID, FCC/IC/CE/Radio Act Japan	QDID, Radio Act Japan	QDID, FCC/IC/CE/Radio Act Japan	QDID, FCC/IC/CE/Radio Act Japan

>> Bluetooth version 4.2 low energy module

New FUJITSU Bluetooth low energy module

This is the first of a new range of Bluetooth modules which conform to the Bluetooth Core Specification Version 4.2 and already have Bluetooth 5 features like the High Throughput and Advertising extensions. Nordic Semiconductor SoC forms the basis of this very powerful module that is unique in power consumption and antenna characteristics.

The Bluetooth version 4.2 low energy module has 512kB Flash memory and 64kB RAM available next to the 32- bit ARM® Cortex™-M4F CPU for profile and application development, with built-in 32.768kHz and 32MHz crystals. The embedded FUJITSU Component Data profile can be controlled by text-based commands for an easy integration in any application.





Partnumber	FWM7BLZ20-109062	FWM7BLZ20-109068
Used IC	Nordic Semiconductor nRF52832-QFAA, 64kB RAM, 512kB Flash	Nordic Semiconductor nRF52832-QFAA
Туре	Bluetooth Ver.4.2 low energy (single mode)	Bluetooth Ver.4.2 low energy (single mode)
SoftDevice	S132 embedded	-
FUJITSU unique data transmission profile	-	Central/Peripheral type embeded
Size	15.7x9.8x1.7mm	15.7x9.8x1.7mm
Size Operating Temperature	15.7x9.8x1.7mm -40 to +85 °C	15.7x9.8x1.7mm -40 to +85 ℃
Size Operating Temperature Attachment	15.7x9.8x1.7mm -40 to +85 °C SMD	15.7x9.8x1.7mm -40 to +85 °C SMD
Size Operating Temperature Attachment Antenna	15.7x9.8x1.7mm -40 to +85 °C SMD Yes	15.7x9.8x1.7mm -40 to +85 °C SMD Yes
Size Operating Temperature Attachment Antenna Host I/F	15.7x9.8x1.7mm -40 to +85 °C SMD Yes UART,SPI, I2C, GPIO	15.7x9.8x1.7mm -40 to +85 °C SMD Yes UART
Size Operating Temperature Attachment Antenna Host I/F Number of GPIO's	15.7x9.8x1.7mm -40 to +85 °C SMD Yes UART,SPI, I2C, GPIO 30	15.7x9.8x1.7mm -40 to +85 °C SMD Yes UART -



Vireless Modules >> LPWAN module

FUJITSU LPWAN module

This is the first of a new range of wireless modules for long range communication. The Low-Power Wide-Area Network module is designed for Long Range communication with a relatively low bit rate (up to 50kbps) and a low power consumption for battery powered applications.

With a LPWAN it is possible to build a private wireless network, but it can also be connected to a service or infrastructure offered by a third party. The Fujitsu modules conform to the LoRaWAN specification and are the first AS923 specification compliant modules on the Japanese market, but can also be set to a FSK type of communication which gives a High Rate mode of 300kbps for configuration purposes. And, as part of the Fujitsu IoT connectivity solutions, can be a communication device inside a scalable MESH network.

The Fujitsu LPWan module accelerates time-to-market and reduces development resource requirements. It is ideally suited for sensing, monitoring, and long life battery powered applications.



Partnumber	FWM7SLZ02A
Used IC	Semtech SX1276 and xxxxx MCU
Туре	LoRa / FSK
Size	22x50x4mm
Operating Temperature	-30 to +85 °C
Attachment	Stacking connector
Antenna	Built-in and RF-con- nector
Host I/F	2-wire UART
Data rate	Up to 11kbps (LoRa) Up to 50kbps (FSK) High rate FSK mode (300kbps) for config- uration
Qualification/ Certification	QDID, RED, FCC/IC, Radio Act Japan

Vireless Devices >> Beacons introduction

FUJITSU Components' Bluetooth beacons, let the app do the talking...

FUJITSU Components' Bluetooth beacons are based upon FUJITSU Components experience in the field of Wireless Modules. The Beacons are Bluetooth powered devices capable of providing location based information to mobile devices. Beacons are low energy transmitters that broadcast specific data which triggers an action on the installed application of a mobile device.

Our beacons have unique features, for example: multiple broadcast options, secured by the use of two switches. The FUJITSU Components' Bluetooth beacons are Eddystone[™] (UID, TLM, EID or URL), iBeacon[™] or proprietary compliant. Beacons enable pro-active communication with the audience and are used in a wide field of applications such as: in-shop promotion, museums, festivals, exhibitions and many more...

How does it work?

A beacon transmits a package of data without having the need to be connected (unlike classic Bluetooth). This data package can contain information like the identification of a group the beacons relate to. With the additional the sub group, individual ID and transmitting power and for example an URL.

A standard application example is the use of beacons in shop environments. By transmitting a data package like the iBeacon™ standard (UUID, Major, Minor, Tx power) or using the Google Eddystone™ standards for transmitting an ID or URL.

By using the standards the beacon transmits a data package at a certain interval (example: every 100ms). This package is received by a mobile device and can trigger an installed app, open a Web browser or visit a web link. The data package contains information which can be converted/translated in a specific action from the installed app. This could display a discount coupon, sale items, new items etc.



Wireless Devices >> Beacons

Solar Beacon

Partnumber	FWM8BLZ04-109072
Description	FUJITSU Data Communication for Beacon profile embedded
Туре	Bluetooth v5.0 low energy compliant iBeacon, Eddystone and proprietary beacon standards supported
Size / weight	90x60x5.6mm casing
Features	IP65 (water and dust proof, outside use) NFC for direct connection
Power supply	Photovoltaic cell
Qualification	FCC/IC/RED/Radio ACT Japan, QDID



Веасоп



Partnumber	FWM8BLZ02A-109042
Description	FUJITSU Data Communication for Beacon profile embedded
Туре	Bluetooth v4.1 low energy iBeacon, Eddystone and proprietary beacon standards supported
Size / weight	40x31x12mm casing, 10 gram excl. cell battery
Operating Conditions	-30 to +60 °C @ +20 to +80%RH (No condensation)
Power supply	CR2450 coin cell
Qualification	FCC/IC/RED/Radio ACT Japan, QDID

Sensor Beacon

Partnumber	FWM8BLZ02A-109047
Description	FUJITSU Data Communication for Beacon profile embedded
Туре	Bluetooth v4.1 low energy iBeacon, Eddystone and proprietary beacon standards supported
Size / weight	40x31x12mm casing, 10 gram excl. Cell battery
Operating Conditions	-30 to +60 °C @ +20 to +80%RH (No condensation)
Features	Acceleration sensor: Detectable range:±16G, Accuracy ±3% Temperature sensor: Detectable range:-30 to +60 °C, Accuracy ±0.3 deg C
Power supply	CR2450 coin cell
Qualification	FCC/IC/RED/Radio ACT Japan, QDID



Wireless Devices >> Beacons

Sensor Beacon with data log

Partnumber	FWM8BLZ02A-109069
Description	FUJITSU Data Communication for Beacon profile embedded
Туре	Bluetooth v4.1 low energy iBeacon, Eddystone and proprietary beacon standards supported
Size / weight	40x31x12mm casing, 10gram, excl. cell
Operating Conditions	-30 to +60 °C @ 20 to 80%RH (No condensation)
Features	Acceleration sensor: Detectable range:±16G, Accuracy ±3% Temperature sensor: Detectable range:-30 to +60 °C, Accuracy ±0.3 deg C 32kB Non volatile Memory; 4000 x 8-byte data, about 68 hrs. at 1 min. interval, about 42 days at 15 min. interval
Power supply	CR2450 coin cell
Qualification	FCC/IC/RED/Radio ACT Japan, QDID



Sensor Beacon with enmo IoT enabled



Partnumber	FWM8BLZ02A-ENMO
Description	FUJITSU Data Communication profile embedded with enmo IoT.over.Beacon platform support
Туре	Bluetooth v4.1 low energy iBeacon, Eddystone and proprietary beacon standards supported
Size / weight	40x31x12mm casing, 10 gram excl. Cell battery
Operating Conditions	-30 to +60 C @ +20 to +80%RH (No condensation)
Features	Acceleration sensor: Detectable range:±16G, Accuracy ±3% Temperature sensor: Detectable range:-30 to +60 °C, Accuracy ±0.3 deg C
Power supply	CR2450 coin cell
Qualification	FCC/IC/RED/Radio ACT Japan, QDID

>> FUJITSU IoT Connectivity Solutions

IoT seems to be the magic word in all industries and all markets.

With some spin off abbreviations like IIoT, Industry 4.0, and more. What the market requires is to improve connectivity, efficiency, scalability, creating time and cost savings. For some, IoT is all about cost saving thanks to predictive maintenance, improved safety, and other operational efficiencies. For others, it is localization of assets and their condition. The challenge is to make IoT easy to integrate as electronics on pcb level, as complete IoT devices or as complete IoT connectivity solution in a network.

Fujitsu co-creates with various partners to enable secure, scalable and flexible IoT solutions.

The high-quality Fujitsu modules and (sensor) beacons are only hardware. With Fujitsu IoT Connectivity we offer easy- to-use, customizable and safe solutions for various IoT application areas, such as Lighting, Smart metering, Asset management and Sensors for industrial automation and smart building.



The Fujitsu IoT Connectivity Solutions

With the wireless modules, the (sensor) beacons and various partners, Fujitsu offers a one-stop shop for a variety of solutions and markets. Whether for indoor navigation, asset tracking or even asset management. Utilizing MESH networks for lighting, sensors, smart city and more. Fujitsu IoT connectivity brings everything together and can customize the best solutions for individual markets.

De-centralized MESH networks

With partner Wirepas, Fujitsu has co-created a reliable, optimized, scalable intelligent MESH network on the Fujitsu wireless hardware. Through enabling this IoT connectivity MESH network on the wireless modules and beacons Fujitsu creates a complete solution based on any markets specific requirement.

Sensors to IoT connectivity

Cratus technology inc. has developed a strong solution to connect hundreds of combinations of sensors and store and transmit their data. Fujitsu uses this intelligens to visualize data on mobile devices and augmented reality headsets and brings it to modules and beacons to integrate it in a customized combination of solutions.

>> FUJITSU IoT Connectivity Solutions

Easy IoT to Cloud connectivity

Enmo Technologies has solved a major limitation of Bluetooth IoT. When retrieving sensor data from an IoT device it requires discovery & pairing. The Advertising mode in Bluetooth, does not require Discovery & Pairing. The Advertising mode doesn't have a provision to pass a big payload, which is the entire purpose of IoT: passing a payload from the IoT device to the phone. Enmo has extended the Advertising mode eliminating the need for Discover and Pairing, additionally allowing the passing of large payloads (tens of thousands of Bytes). We call this technology IoT.Over.Beacon™. Fujitsu has applied enmo's IoT.Over.Beacon™ technology to the Sensor Beacon and modules. Together with the complete Smartphone Apps, IoT deployments can be developed and launched in minutes through the enmo Platform.

"In the constant evolving and growing world of IoT, upgradable solutions are key to a successful design. This is exactly what Fujitsu brings to the market, in co-operation with various solution partners."

Dennis van Doorn Marketing Manager Wireless Solutions Fujitsu Components Europe B.V.









Fujitsu IoT Connectivity Beacon To The Cloud

Soutions >> FUJITSU IoT Connectivity Solutions



Applications

Fujitsu Components' IoT Connectivity Solutions are developed for professional IoT applications, whatever the scale. Applications include Sensors, Asset Management, Smart Metering and Lighting, all of which have very diverse requirements on range, throughput, latency and energy consumption. The solution provides flexibility, fit-for-purpose and, if needed, customization on all these parameters and the hardware too.



Sensors

For a reliable connection with real-time visibility in a highly scalable network. Control and optimize environmental conditions intelligently.



Asset Management

For tracking the locations of various assets. Rolling cages, boxes and crates in distributions centers, beds and instruments in hospitals and other valuable corporate assets.



Smart Metering

For connecting an unlimited number of metering points together in a highly scalable network.



Lighting

For intelligent lighting of Smart City or Smart Buildings enabled with Fujitsu's IoT Connectivity Solutions.

Notes

Thank you for making notes!

For questions or information, please refer to your supplier or contact your local Fujitsu Office. For contact information, see the last page of this document, or http://www.fujitsu.com/components/

FUjitsu

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