

# Product Comparison Charts 2013

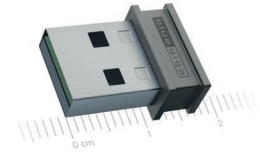


[www.bluegiga.com](http://www.bluegiga.com)



**Bluegiga BLE112**  
*Bluetooth Smart Module*

**Bluegiga BLED112**  
*Bluetooth Smart Dongle*



**Bluetooth**

Version	Bluetooth 4.0	Bluetooth 4.0
Single mode	Yes	Yes
Dual mode	-	-
Roles	slave/master	slave/master

**Radio**

TX power	+2-3 dBm	+2-3 dBm
RX sensitivity	-92 dBm	-92 dBm
Class	-	-
Range	up to 150m	up to 10-30m

**Antenna options**

Integrated chip	Yes	-
Integrated meander line	-	Yes
U.FL	MoQ 5000pcs	-
50ohm pin	MoQ 5000pcs	-

**Interfaces**

UART	2 (or SPI)	-
USB	2.0 device	2.0 device
SPI	2 (or UART)	-
I2C	1 (soft I2C)	-
PWM	4 (or timer)	-
GPIO	19 configurable (shared)	-
ADC	7 x 12 bit	-
Wake-up interrupt	Yes	-
Comparator	1	-
Timers	2x8-bit and 1x16-bit (or PWM)	-
Op-amp	Yes	-
Battery monitor	Yes	-
Temperature sensor	Yes	Yes
Debug	Yes	-
IR generation	Yes	-
PCM	-	-
I2S	-	-

**Microcontroller**

Architecture	8051	8051
RAM	8 kB	8 kB
Flash	128 kB	128 kB
EEPROM	-	-

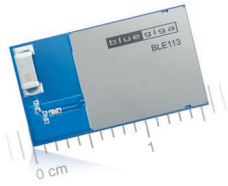


Bluegiga *Bluetooth*<sup>®</sup>  
Smart Modules

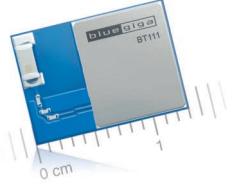


Bluegiga *Bluetooth*<sup>®</sup>  
Smart Ready Modules

**Bluegiga BLE113**  
*Bluetooth* Smart  
Module



**Bluegiga BT111**  
*Bluetooth* Smart Ready  
HCI Module



*Bluetooth* 4.0

Yes

-

slave/master

*Bluetooth* 4.0

-

Yes

master

0 dBm

-93 dBm

-

100+ m

+8 dBm

-89 dBm

1

100+ m

Yes

-

-

-

Yes

-

-

-

2 (or SPI)

-

2 (or UART)

1

4 (or timer)

23 configurable (shared)

7 x 12-bit

Yes

1

2x8-bit and 1x16-bit (or PWM)

Yes

Yes

Yes

Yes

Yes

-

-

-

2.0 device

-

-

-

6

-

-

-

-

-

-

-

Yes

-

Yes

Yes

8051

8 kB

128 kB

-

16-bit RISC (XAP2)

-

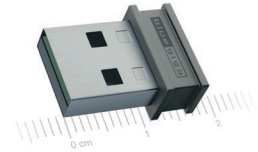
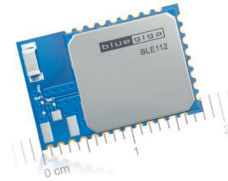
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64kB



## Bluegiga BLE112 Bluetooth Smart Module

## Bluegiga BLED112 Bluetooth Smart Dongle



### Current consumption

TX peak	27 mA	N/A
RX peak	19.6 mA	N/A
Sleep (timer active)	1 uA	N/A
Sleep (external wake-up)	0.5 uA	N/A

### Operating voltage

Operating voltage	2.0 - 3.6V	5V
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### Bluetooth stack software

Integrated <i>Bluetooth</i> stack	Yes	Yes
ATT	Yes	Yes
GATT	Yes	Yes
GAP	Yes	Yes
L2CAP	Yes	Yes
Security manager	Yes	Yes
Host API	BGAPI™ protocol	BGAPI™ protocol
Connections	up to 8	up to 8
HCI	-	-
IP licensing	Yes	Yes

### Supported profiles

GAP	Yes	Yes
Manufacturer service	Yes	Yes
Battery service	Yes	Yes
Proximity profile	Yes	Yes
HR profile	Yes	Yes
Temperature profile	Yes	Yes

### Software development

On-board application support	Yes	Yes
BGScript™	Yes	Yes
Profile toolkit™	Yes	Yes
BGLib™ (Host C library)	Yes	Yes
Software development service	Yes	Yes
SDK/IDE	Bluegiga SDK	Bluegiga SDK

### Certifications

Certifications	<i>Bluetooth</i> , CE, FCC, IC, Korea and Japan	<i>Bluetooth</i> , CE, FCC, IC, Korea and Japan
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### Dimensions

Dimensions (W x L x H)	12 x 18 x 2.3 mm	17 x 12 x 6.5 mm
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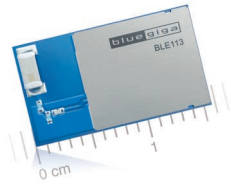


Bluegiga *Bluetooth*®  
Smart Modules

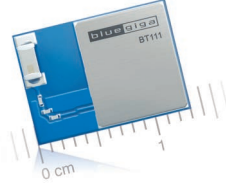


Bluegiga *Bluetooth*®  
Smart Ready Modules

**Bluegiga BLE113**  
*Bluetooth* Smart Module



**Bluegiga BT111**  
*Bluetooth* Smart Ready  
HCI Module



18.2 mA	70 mA
17.9 mA	52 mA
1 uA	-
0.5 uA	370uA

2.0 - 3.6V	2.3 - 5.7V
------------	------------

Yes	No
Yes	-
Yes	-
Yes	-
Yes	-
Yes	-
BGAPI™ protocol	HCI
up to 8	7 x <i>Bluetooth</i> classic, 5 x <i>Bluetooth</i> LE
-	HCI over USB
Yes	-

Yes	Yes*
Yes	Yes*
Yes	Yes*
Yes	Yes*
Yes	Yes*
Yes	Yes*

Yes	No
Yes	No
Yes	No
Yes	Stack dependent
Yes	No
Bluegiga SDK	Stack dependent

<i>Bluetooth</i> , CE, FCC, IC, Korea and Japan	<i>Bluetooth</i> , CE, FCC, IC, Korea and Japan
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9.15 x 15.75 x 1.9 mm	9.3 x 13.05 x 2.3 mm
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Bluegiga Bluetooth®  
Classic Modules

## Bluegiga WT12 Bluetooth Class 2 Module



## Bluegiga WT11i Bluetooth Class 1 Module



### Bluetooth

Version	Bluetooth 2.1 + EDR	Bluetooth 2.1 + EDR
Bluetooth low energy support	-	-
BR/EDR support	Yes	Yes

### Radio

Typical TX power	+3 dBm	+17 dBm
Typical RX sensitivity	-83 dBm	-85 dBm
Class	2	1
Typical range	30-50m	200-400m

### Antenna options

Integrated chip	Yes	Yes
U.FL	-	Yes
50ohm pin	MoQ (5000pcs)	-

### Interfaces

UART	1	1
USB	2.0 device	2.0 device
GPIO	6 configurable	6 configurable
AIO	-	1 x 8-bit
Debug (SPI)	1	1

### Audio interfaces

PCM	1	1
I2S	-	-
SPDIF	-	-
Analogue	-	-

### Microcontroller

Architecture	16-bit RISC (XAP2)	16-bit RISC (XAP2)
RAM	48 kB	48 kB
Flash	8 Mbit	8 Mbit
DSP	-	-

### Operating voltage

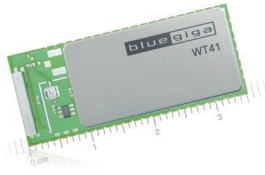
Operating voltage	2.7 - 3.6V	2.7 - 3.6V
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### Copper plated edges

Copper plated edges	No	Yes
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Bluegiga WT41  
Long Range  
Bluetooth Module



Bluegiga WT32  
Bluetooth Audio Module



Bluegiga WT21  
Bluetooth HCI Module



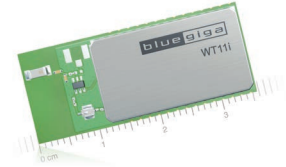
Bluetooth 2.1 + EDR	Bluetooth 2.1 + EDR	Bluetooth 2.1 + EDR
-	-	-
Yes	Yes	Yes
+19 dBm	+7 dBm	+7 dBm
-93 dBm	-88 dBm	-88 dBm
1	1.5	1.5
500-1000m	30-60m	100-200m
Yes	Yes	Yes
Yes	Yes (W.FL)	-
MoQ (5000pcs)	MoQ (5000pcs)	MoQ (5000pcs)
1	1	1
2.0 device	2.0 device	-
6 configurable	10 configurable	7
1 x 8-bit	2 x 10-bit	1
1	1	1
1	1	1
-	1	1
-	1	-
-	2 inputs/outputs	-
16-bit RISC (XAP2)	16-bit RISC (XAP2)	16-bit RISC (XAP2)
48 kB	48 kB	48 kB
8 Mbit	8 Mbit	-
-	Kalimba DSP	-
2.7 - 3.6V	1.8 - 3.6V	1.8 - 3.6V
Yes	Yes	Yes



Bluegiga WT12  
Bluetooth Class 2  
Module



Bluegiga WT11i  
Bluetooth Class 1  
Module



**Bluetooth stack features**

Version	2.1 + EDR / 3.0	2.1 + EDR / 3.0
Integrated Bluetooth stack	Yes	Yes
Security Simple Pairing	Yes	Yes
Connections	1-7	1-7
Host API	ASCII commands / HCI	ASCII commands / HCI
HCI interface	UART/USB	UART/USB

**Supported profiles**

SPP	Yes	Yes
OBEX OPP	Yes	Yes
OBEX FTP	Yes	Yes
DUN	Yes	Yes
HID	Yes	Yes
A2DP	-	-
AVRCP	Yes	Yes
HFP v.1.6	Yes	Yes
HSP	Yes	Yes
PBAP	Yes	Yes
HDP	Yes	Yes
MAP	Yes	Yes
DI	Yes	Yes
Apple iAP support	Yes	Yes
Over-the-Air configuration*	Yes	Yes
BGIO*	Yes	Yes

**Software development**

On-board applications	Yes	Yes
Software development service	Yes	Yes
SDK/IDE	CSR BlueLab	CSR BlueLab

**Certifications**

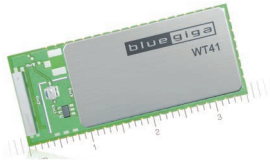
Bluetooth	Yes	Yes
CE	Yes	Yes
FCC	Yes	Yes
IC	Yes	Yes
South-Korea	Yes	Yes
Japan	Yes	Yes
NCC (Taiwan)	-	-

**Dimensions**

Dimensions (W x L x H)	14 x 25.6 x 2.4 mm	14.5 x 35.8 x 2.6 mm
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**Bluegiga WT41**  
Long Range  
*Bluetooth* Module



**Bluegiga WT32**  
*Bluetooth* Audio Module



**Bluegiga WT21**  
*Bluetooth* HCI Module



2.1 + EDR / 3.0	2.1 + EDR / 3.0	Stack dependent
Yes	Yes	HCI only
Yes	Yes	Stack dependent
1-7	1-7	1-7
ASCII commands / HCI	ASCII commands	HCI
UART/USB	-	UART/SDIO/CSPI

Yes	Yes	Stack dependent
Yes	Yes	Stack dependent
Yes	Yes	Stack dependent
Yes	Yes	Stack dependent
Yes	Yes	Stack dependent
-	Yes	Stack dependent
Yes	Yes	Stack dependent
Yes	Yes	Stack dependent
Yes	Yes	Stack dependent
Yes	Yes	Stack dependent
Yes	-	Stack dependent
Yes	Yes	Stack dependent
Yes	Yes	Stack dependent
Yes	Yes	Stack dependent
Yes	Yes	Stack dependent
Yes	Yes	Stack dependent

Yes	Yes	-
Yes	Yes	-
CSR BlueLab	CSR BlueLab	-

Yes	Yes	Yes
Yes	Yes	Yes
Yes	Yes	Yes
Yes	Yes	Yes
-	-	-
Yes	Yes	-
Yes (for WT41-E)	-	-

14 x 35 x 5.65 mm	15.9 x 23.9 x 2.5 mm	11.6 x 17.1 x 2.5 mm
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## Key Features

- A fully embedded *Bluetooth* stack with:
  - Thirteen integrated *Bluetooth* profiles
  - Apple iAP over *Bluetooth* support
  - Two Bluegiga proprietary profiles
- *Bluetooth* 3.0 compliant
  - Secure Simple pairing support
  - Seven simultaneous connections
  - 600kbps data rate
- Supported *Bluetooth* profiles:
  - Serial Port Profile (SPP) : DevA and DevB
  - *Bluetooth* Health Device Profile (HDP) : Sink and source modes
  - Dial-up Networking Profile (DUN) : Terminal emulation
  - Object Push Profile (OPP) : OPP server and client
  - File Transfer Profile (FTP) : FTP client
  - Human Interface Device (HID) : HID device
  - Advanced Audio Distribution Profile (A2DP) : Sink and source modes
  - A/V Remote Control Profile (AVRCP) : AVRCP controller and target
  - Hands-Free Profile (HFP) v. 1.6 : HPF and HFP-AG modes
  - Headset profile v. 1.2 (HSP) : HSP and HSP-AG modes
  - Phone Book Access Profile (PBAP) : PBAP client
  - Message Access Profile (MAP) : Client
  - Device Identification Profile (DI)
- Proprietary profiles
  - Apple iAP profile
  - Bluegiga proprietary IO Profile (BGIO)
  - Bluegiga proprietary OTA (Over-the-Air configuration profile)
- *Bluetooth* qualified

## Description

iWRAP is an embedded *Bluetooth* stack for Bluegiga's *Bluetooth* classic modules (WT32, WT12, WT11i, WT41). It exposes a powerful yet easy-to-use command interface to manage *Bluetooth* operations. iWRAP hides the complexity of *Bluetooth* protocol stack and profiles from the end user. iWRAP can be used for almost anything from simple data or audio applications to more complex use cases where interaction with several *Bluetooth* enabled devices are needed - or even multi-profile environments for simultaneous audio and data connections.

The fifth generation iWRAP™ *Bluetooth* stack is targeted at Bluegiga's *Bluetooth* classic modules. By enhancing the compatibility with Apple's iOS devices, the iWRAP5 adds new industry leading features, such as Apple iAP support and Hands-Free Profile v. 1.6 with Wide Band Speech codec. In addition, the iWRAP5 software offers Continua 1.5 support for the Health Device Profile, advanced HID support and more than twenty other new features and improvements for supporting the *Bluetooth* ecosystem.

## Benefits

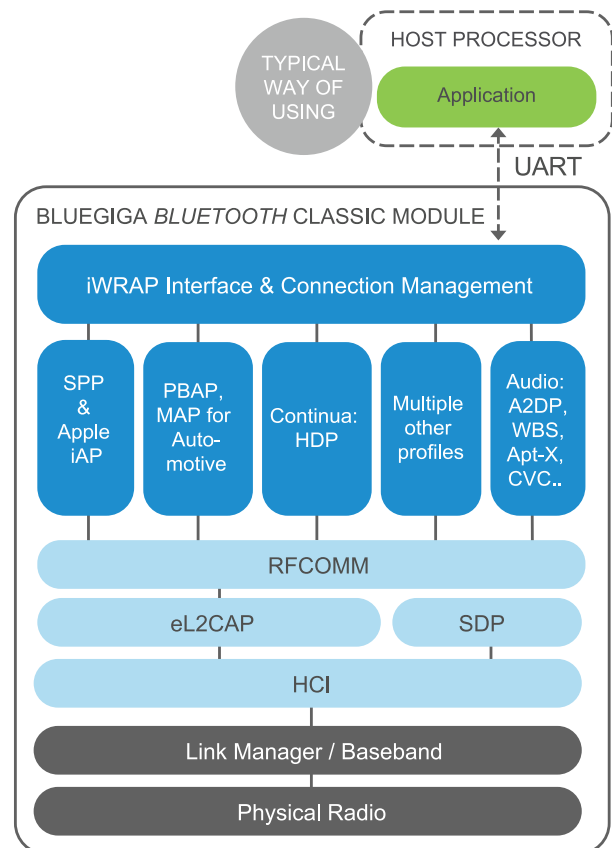
- A simple ASCII based command and response API
  - Easy to learn how to use
  - Fast application development
  - Low resource requirements for the host
- A wide range of *Bluetooth* profiles
  - Enables complex use cases
- Customizable by Bluegiga Technologies
  - Possible to add new features and profiles
  - Offers product differentiation at low risk
  - No *Bluetooth* development skills or tools needed
- On the field upgradable
- *Bluetooth* qualified
  - Proven interoperability

### 3rd party extensions for iWRAP

- CSR's Clear Voice Capture (CVC) - Echo cancellation and noise reduction algorithm
- aptX audio codec - Nearly lossless quality audio over *Bluetooth A2DP*
- aptX low latency - Low latency A2DP audio with aptX quality
- Other 3rd party softwares also available. Please contact Bluegiga for more information.

### Target applications

- **Cable replacement:** Support for *Bluetooth Serial Port Profile*
- **Medical and healthcare:** Support for *Bluetooth Health Device Profile*
- **Hands-Free audio:** Hands-Free and Headset profile support. Optional echo cancellation and noise reduction algorithms available
- **Stereo audio:** High quality audio streaming via A2DP, mobile phone calls via Hands-Free profile, phone book management, Internet access via dial-up networking. Optional echo cancellation and audio improvement algorithms available
- **Apple accessories** : Support for iAP over *Bluetooth* profile
- **Human Interface Devices** : Support for HID mouse, keyboard, etc. emulation
- **Industrial:** Single and multipoint operation. Several optimizations for latency, low power modes, GPIO and AIO replacement
- Various consumer applications



iWRAP 3.0.0  
build 165
iWRAP 4.0.0  
build 317
iWRAP 4.0.0  
build 317
iWRAP 5.0.1  
build 620  
*Generic*

Ordering code	AI3	AI4	AI4	AI5
<b>Supported hardware</b>				
WT32	Yes	-	Yes	-
WT41	Yes	Yes	-	Yes
WT11i	Yes	Yes	-	Yes
WT12	Yes	Yes	-	Yes
<b>Bluetooth stack features</b>				
Version	2.1 + EDR	2.1 + EDR	2.1 + EDR	3.0
Security Simple Pairing	Yes	Yes	Yes	Yes
Max connections	7	7	7	7
Host API	ASCII commands	ASCII commands	ASCII commands	ASCII commands
Host interfaces	UART	UART	UART	UART
Encryption	56-bits	56-bits	56-bits	56/128-bits
<b>Supported profiles</b>				
SPP	Yes	Yes	Yes	Yes
OBEX OPP	Yes	Yes	Yes	Yes
OBEX FTP <sup>(2)</sup>	-	Yes	Yes	Yes
DUN <sup>(3)</sup>	Yes	Yes	Yes	Yes
HID <sup>(4)</sup>	Yes	Yes	Yes	Yes
A2DP	Yes	-	Yes	-
HFP	Yes	Yes	Yes	Yes
HSP	Yes	Yes	Yes	Yes
AVRCP	Yes	-	Yes	-
PBAP <sup>(5)</sup>	-	Yes	Yes	Yes
HDP	-	-	-	Yes
DI	Yes	Yes	Yes	Yes
MAP <sup>(7)</sup>	-	-	-	Yes
Apple iAP support <sup>(6)</sup>	-	-	-	-
Over-the-Air configuration <sup>(*)</sup>	Yes	Yes	Yes	Yes
BGIO <sup>(*)</sup>	Yes	Yes	Yes	Yes
<b>IEEE agents (for HDP)</b>				
Blood pressure monitor	-	-	-	Yes
Blood glucose	-	-	-	Yes
Weight scale	-	-	-	Yes
Pulse oximeter	-	-	-	Yes
Thermometer	-	-	-	Yes
<b>Audio features</b>				
CVC echo cancellation	-	-	-	-
aptX audio codec	-	-	-	-
mSBC (Wide-Band Speech)	-	-	-	-
<b>Bluetooth qualification</b>				
QDID	B014328	B016540	B016540	B019486

1) OPP server only

2) FTP client only

3) DUN terminal only

4) HID device only

5) PBAP client only

6) Delivered only to Apple MFi licensees. Please contact [support@bluegiga.com](mailto:support@bluegiga.com)

7) MAP client only

\*) Bluegiga proprietary profiles

For any other firmware version contact : [sales@bluegiga.com](mailto:sales@bluegiga.com)

<b>iWRAP 5.0.1 build 620 Generic</b>	<b>iWRAP 5.0.1 build 621 Audio Source</b>	<b>iWRAP 5.0.1 build 619 iAP</b>	<b>iWRAP 5.0.1 build 619 iAP</b>	<b>iWRAP 5.0.1 build 623 aptX®</b>	<b>iWRAP 5.0.1 build 624 aptX® Source</b>	<b>iWRAP 5.0.1 build 622 CVC5</b>
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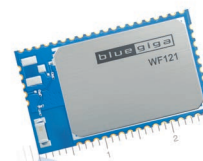
AI5	AI5S	AI5IAP	AI5IAP	AI5-APT X	AI5S-APT X	CVC
Yes	Yes	-	Yes	Yes	Yes	Yes
-	-	Yes	-	-	-	-
-	-	Yes	-	-	-	-
-	-	Yes	-	-	-	-
3.0	3.0	3.0	3.0	3.0	3.0	3.0
Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	6	7	6	6	6	6
ASCII commands UART 56/128-bits	ASCII commands UART 56/128-bits	ASCII commands UART 56/128-bits	ASCII commands UART 56/128-bits	ASCII commands UART 56/128-bits	ASCII commands UART 56/128-bits	ASCII commands UART 56/128-bits
Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yes	-	Yes	Yes	Yes	-	Yes
A2DP sink	A2DP source	-	A2DP sink	A2DP sink	A2DP source	A2DP sink
Hands-free	Hands-free AG	Hands-free	Hands-free	Hands-free	Hands-free AG	Hands-free
Headset	Headset AG	Headset	Headset	Headset	Headset AG	Headset
Yes	Yes	-	Yes	Yes	Yes	Yes
Yes	-	Yes	Yes	Yes	-	Yes
-	-	Yes	-	-	-	-
Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yes	-	Yes	Yes	Yes	-	Yes
-	-	Yes	Yes	-	-	-
Yes	-	Yes	-	-	-	-
Yes	-	Yes	-	-	-	-
-	-	Yes	-	-	-	-
-	-	Yes	-	-	-	-
-	-	Yes	-	-	-	-
-	-	Yes	-	-	-	-
-	-	-	-	-	-	Yes
-	-	-	-	Yes	Yes	-
Yes	Yes	-	Yes	Yes	Yes	-
B019486	B019486	B019486	B019486	B019486	B019486	B019486



## Bluegiga WF111 Wi-Fi Module



## Bluegiga WF121 Wi-Fi Module



### Wi-Fi features

Version	802.11 b/g/n	802.11 b/g/n
Frequency	2.4GHz	2.4GHz
Max. symbol rate	72.2Mbps	72.2Mbps
Soft AP mode	Yes (8 clients)	-
Wi-Fi direct	Option	-

### Radio performance

Typical TX power	+17 dBm	+17 dBm
Typical RX sensitivity	-97 dBm	-97 dBm
Typical range	300-500m	300-500m

### Antenna options

Integrated chip	Yes	Yes
U.FL	Yes	Yes
50ohm pin	Check availability	Check availability

### Host interfaces

SDIO	Yes	No
CSPI	Yes	No
UART	No	Yes
USB	No	Yes
SPI	No	Yes

### Peripheral interfaces

SPI	-	up to 2*
UART	-	up to 4*
USB	-	1xOTG*
Ethernet MAC	-	1
I2C	-	up to 2*
GPIO	6	up to 38*
AIO	-	up to 10*

### Microcontroller

Architecture	-	MIPS 4K
MHz	-	80 Mhz
RAM	-	128 kB (64 kB free)
Flash	-	512 kB (256 kB free)

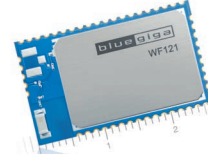
### Avg. current consumption

TX (17dBm, 802.11g)	192 mA	170 mA
RX	88 mA	170 mA
Sleep	70 uA	62 uA

\*) Check software availability

### Bluegiga WF111 Wi-Fi Module

### Bluegiga WF121 Wi-Fi Module



#### Operating voltage

Operating voltage	1.8V and 3.3V	2.7V - 3.6V
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#### Copper plated edges

	Yes	Yes
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#### TCP/IP stack features

Integrated TCP/IP stack	-	Yes
DHCP	-	Yes
DNS	-	Yes
TCP client	-	Yes
UDP client	-	Yes
TCP server	-	Yes
UDP server	-	Yes
ICMP server	-	Yes

#### Host API

BGAPI™ binary protocol	-	Yes
BGLib™ host library	-	Yes

#### OS drivers

Linux	Yes	Not needed
Windows	Check with Bluegiga	Not needed
Android	Yes	Not needed

#### Software development

On-board applications	-	Yes
BGScript™ support	-	Yes
Native C development	-	Check with Bluegiga
Software development service	-	Yes
SDK	-	Bluegiga SDK

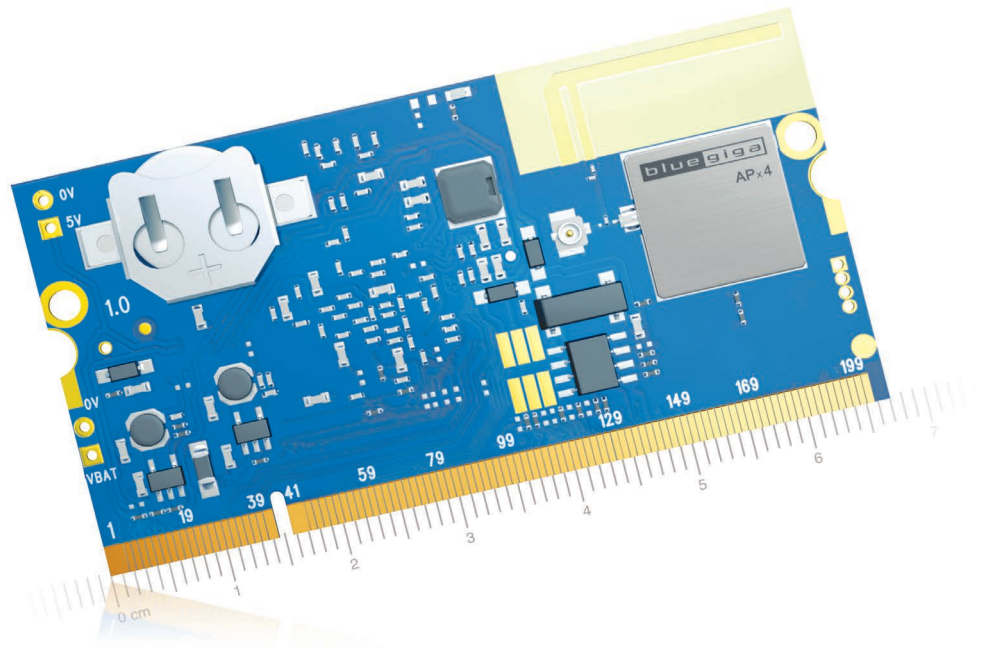
#### Certifications

CE	Yes	Yes
FCC	Yes	Yes
IC	Yes	Yes
South Korea	Yes	No
Japan	Yes	No

#### Dimensions

Dimensions (W x L x H)	12.0 x 19.0 x 2.1 mm	15.4 x 26.2 x 2.1 mm
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# APx4 Wireless System-on-Module™



Bluegiga APx4  
Software

## Key Features

- APx4 is a computing platform:
  - 450MHz ARM9 core (Freescale i.MX28)
  - 64Mb RAM
  - 128Mb Flash
  - Real Time Clock
  - Linux operating system
  - SO-DIMM form factor
- A connectivity platform:
  - *Bluetooth* 4.0 dual-mode radio
  - 2.4GHz 802.11 b/g/n radio
  - Wi-Fi Access Point mode
  - 10/100 Ethernet
  - USB 2.0 High Speed
- With many extension options:
  - Up to 800 x 480 resistive touch screen
  - MMC/SDIO
  - Multiple SPI, UART and I2C
  - I2S
  - PWM, GPIO and AIO
- Linux operating system: Based on the Yocto Project(TM), Thousands of open source software packets available
- Dimensions: 67 x 35 x 6 mm
- *Bluetooth*, CE, FCC and IC qualified

## Description

The Bluegiga APx4 is smaller than a credit-card, low power wireless system-on-module that includes the latest wireless connectivity standards: Wi-Fi and *Bluetooth* Smart Ready. The APx4 is based on carefully engineered RF, Wi-Fi and *Bluetooth* co-existence. The core of the product is ARM9 processor that runs an embedded Linux operating system based on the Yocto Project(TM). In addition to the integrated ARM processor, the wireless connectivity technologies and the Linux operating system; the APx4 also includes carefully optimized drivers, such as the 802.11, *Bluetooth* 4.0 stacks and Continua v. 1.5 manager. This combination provides an ideal platform for designing a multi-radio wireless gateway that enables fast time-to-market and minimum R&D risks.

The Bluegiga APx4 is an ideal product for applications that require wireless or wired connectivity technologies and the processing power of an ARM processor, such as health and fitness gateways, building and home automation gateways, M2M, point-of-sale and industrial connectivity.

## Applications

Used for professional applications that require a high extendability platform with fully qualified end-to-end connectivity and co-existence with Wi-Fi, *Bluetooth* Smart and *Bluetooth* Classic. For example, health gateways, M2M connectivity, fitness gateways, home and building automation, point-of-sale gateways, people and asset tracking.





## Technical data

### Processor

Model	Freescall i.MX28
Clock speed	454Mhz
Core	ARM926EJ-S

### Memory

Flash	128MB
RAM	64MB

### Bluetooth

Version	Bluetooth 4.0 (Smart Ready)
TX power	+9 dBm
RX sensitivity	-89 dBm
BR/EDR connections	7
LE connections	5
Antenna	Integrated or U.FL

### Peripheral interfaces

UART	Up to 4 ports, 2 with flow control Baud rates up to 3.25Mbps
USB High Speed Host	Up to 2
SPI	Yes
Ethernet	Yes, 10/100Base-TX PHY integrated
SD/SDIO/MMC	Yes
I <sup>2</sup> C	Up to 2
Debug interface	JTAG, Debug UART
GPIO	Up to 60
PWM	Up to 7
Audio interface	I <sup>2</sup> S
Display	Yes
Resistive touch screen	Yes

### Software

Operating system	Linux (Yocto based)
Driver support	Complete (all peripherals listed above)
Number of software packages	Over 1800
Bluetooth stack	Bluetooth 4.0 stack - Serial Port Profile (SPP) - Health Device Profile (HDP) - Generic Attribute Profile (GATT)
Additional applications	BlueConnector (Bluetooth to IP routing) Continua compliant IEEE 11073 eHealth stack Extendable web configuration interface

### Certifications

Bluetooth, CE, FCC and IC

### IEEE 802.11

802.11 versions	802.11 b/g/n
TX power	+17 dBm
RX sensitivity	- 92 dBm
Access Point mode	Soft AP up to 8 clients
Antenna	Integrated or U.FL

### Power supply and management

Power supply	5V
Peak consumption	1900 mW
Sleep consumption	230 mW

# Long Range *Bluetooth* Access Point 3241™



## Key Features

- Excellent *Bluetooth* radio performance
  - +20 dBm transmit power
  - -90 dBm receiver sensitivity
- Maximum line-of-sight range 1000m
- *Bluetooth* 2.1 + EDR compliant
- 10/100Mbps Ethernet interface
- USB host port for optional accessories
- Built-in application interfaces for medical and TCP/IP networking
- Centralized remote management system with Bluegiga Solution Manager
- Supported *Bluetooth* profiles: SPP, OBEX OPP, OBEX FTP, PAN, LAN Access, DI and HDP
- Embedded Linux operating system
- Software development kit
- Dimensions: 90 x 59 x 30 mm
- *Bluetooth*, CE, FCC and IC qualified

## Description

The Long Range *Bluetooth* Access Point 3241 is an ideal solution for demanding connectivity applications, where extreme performance and robustness is needed, especially for applications where different *Bluetooth* devices need to be wirelessly connected to the Internet. The *Bluetooth* radio performance is taken to the extreme and AP3241 can reach line-of-sight range up to 1000 meters. With typical class 2 *Bluetooth* devices, the improved sensitivity increases the range up to 80 meters— allowing three to four times longer range than normally. The built-in USB port allows the use of optional accessories, such as Wi-Fi, 3G modems or extra memory. The AP3241 has built-in applications, such as eHealth and it offers the standardized *Bluetooth* Health Device Profile and Continua based IEEE 11073-20601 manager. The data can be relayed to various back-end services, such as Google Health.

## Benefits

- Line of sight range up to 1000 meters
- Built-in USB for Wi-Fi, 3G or extra memory

## Applications

Connectivity, eHealth, point-of-sales, digital pen, and M2M.

## Technical data

### Bluetooth

Version	Bluetooth 2.1 + EDR
Bluetooth Smart support	-
BR/EDR support	Yes
Connections	7

### Radio

Typical TX power	+19 dBm
Typical RX sensitivity	-93 dBm
Class	1
Typical range	500–1000m

### Antenna options

Internal	Yes
SMA	No

### Interfaces

Ethernet	Yes
USB host	Yes
GPIO	-
SIM	-
MicroSD	-

### Other connectivity

802.11 b/g	-
3G	-

### Processor

Architecture	ARM9
RAM	200Mhz

### Memory

RAM	32MB
Flash	16MB

### Certifications

CE	Yes
FCC	Yes
IC	Yes
Bluetooth	Yes

### Operating system

Linux

### Operating voltage

9–24V

### Operating temperature

0 to 60°C 0 to 60°C

### Dimensions

W x L x H 90 x 59 x 30 mm

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