

## GENERAL DESCRIPTION

>> F2M03GX / GXA are Free2move's top of the line embedded Bluetooth™ v2.0+EDR modules with exceptional wireless transmission characteristics. They provide a fully Bluetooth™ compliant device for data and voice communications. With a transmit power of up to +19dBm and a receiver sensibility of down to -92dBm the F2M03GX / GXA are suitable for the most demanding applications. Developers can easily implement a wireless solution into their product even with limited knowledge in Bluetooth™ and RF. The modules are fully Bluetooth™ v2.0+EDR qualified and are certified according to CE and FCC, which give fast and easy Plug-and-Go implementation and short time to market.

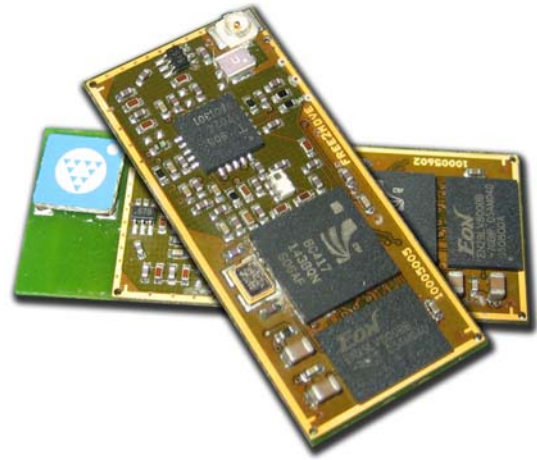
>> The F2M03GXA comes with an on board highly efficient omni-directional antenna that simplifies the integration for a developers Bluetooth™ solution.

>> The F2M03GX has an U.FL-connector, which gives the possibility to use many external antenna alternatives to provide a flexibility of size, performance and designs.

>> F2M03GX / GXA have by default the exceedingly reliable and powerful easy-to-use Wireless UART firmware implementing the Bluetooth™ Serial Port Profile (SPP). All information sent to the serial interface is transmitted transparently via Bluetooth™ to the connected remote device. F2M03GX / GXA are also available with Headset, Hands Free or HCI firmware. Optional firmwares are: DUN, AGP, OBEX, HID or HCRP.

## APPLICATIONS

- >> Industrial and domestic appliances
- >> Cable replacement
- >> Medical systems
- >> Automotive applications
- >> Stand-alone sensors
- >> Embedded systems
- >> Cordless headsets
- >> Computer peripherals (Mice, Keyboard, USB dongles, etc.)
- >> Handheld, laptop and desktop computers
- >> Mobile phones



## KEY FEATURES

- >> Fully qualified end product with Bluetooth™ v2.0+EDR, CE and FCC
- >> Two antenna options:
  - > Integrated high output antenna (F2M03GXA)
  - > U.FL-connector for external antenna (F2M03GX)
- >> Transmit power up to +19dBm
- >> Range: up to 350m (line of sight)
- >> Piconet and Scatternet capability, support for up to 7 slaves
- >> Require only few external components
- >> Industrial temperature range -40°C to +85°C
- >> Enhanced Data Rate (EDR) compliant with v2.0.E.2 of specification for both 2Mbps and 3Mbps modulation modes
- >> USB v2.0 compliant
- >> Serial interface up to 4Mbps
- >> Extensive digital and analog I/O interface
- >> PCM interface for up to 3 simultaneous voice channels
- >> Support for custom applications
- >> Large external memory for custom applications
- >> Supports many Bluetooth™ profiles
- >> Support for 802.11b/g Co-Existence
- >> Lead Free and RoHS compliant

## TECHNICAL DETAILS

### HARDWARE

- >> Bluetooth™ Class 1 radio
  - > Nominal transmit power: +17/19dBm (GX / GXA)
  - > Nominal sensitivity: -92dBm
  - > Frequency: 2.4GHz ISM band
  - > Chipset: CSR BC4-EXT
- >> Integrated high output antenna or U.FL connector
- >> External 8Mbit Flash for complete system solution
- >> 10 digital and 2x8bit analog I/O
- >> UART or USB host processor interface
- >> Optional I<sup>2</sup>C compatible interface
- >> Full speed USB v1.1 interface supports OHCI and UHCI host interfaces. Compliant with USB v2.0
- >> Serial interface of up to 4Mbps
- >> 13-bit PCM interface for Audio applications
- >> Operating temperature: -40°C to +85°C
- >> Physical size (LxWxH) [mm]:
  - > F2M03GX 33x15.2x2.1
  - > F2M03GXA 40x15.2x2.0
- >> Weight:
  - > F2M03GX: 1.5g
  - > F2M03GXA 1.7g
- >> Supply voltage: regulated 2.2-4.2 VDC

### CONTACT INFORMATION

- >> Please find your local distributor below or visit [www.free2move.net](http://www.free2move.net) to find a distributor in your country for further information about our products.

Your distributor:



### FIRMWARE

- >> Default: Wireless UART compliant with the Serial Port Profile (SPP) with an easy to use command interface
- >> Standard: HCI for USB-interface, Headset or Hands Free
- >> Optional: DUN, AGP, OBEX, HID or HCRP

### CLASSIFICATIONS

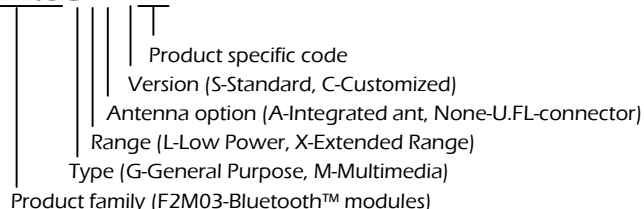
- >> Bluetooth™ v2.0+EDR
- >> Lead free and RoHS compliant
- >> CE and FCC

### EVALUATION KITS AND RELATED PRODUCTS

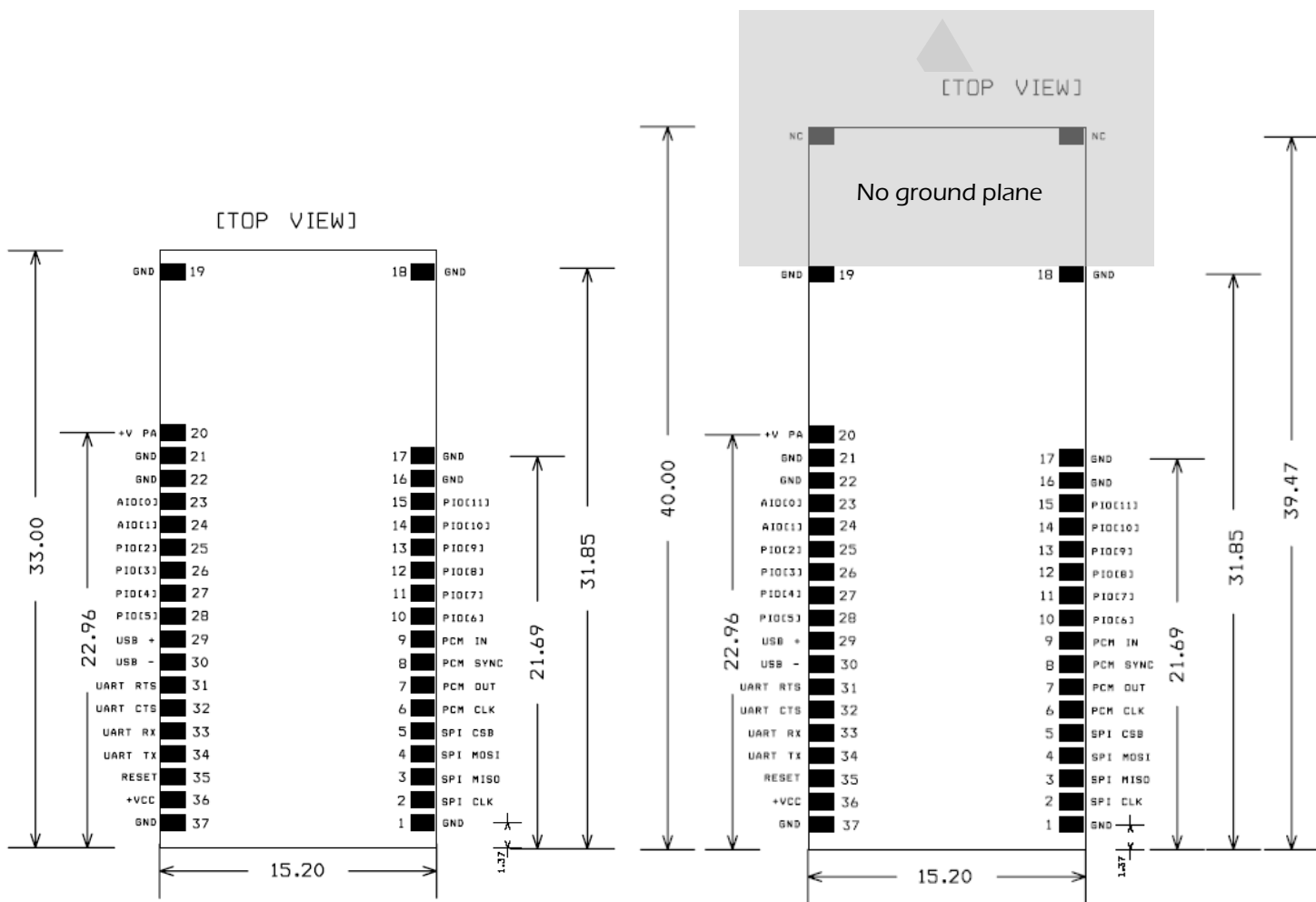
- >> Evaluation kit:
  - > F2M03GX: F2M03GX-KIT-YY
  - > F2M03GXA: F2M03GXA-KIT-YY
  - YY- Product code (01-Single Kit, 02-Dual Kit)
- >> Related products:
  - > F2M03GLA Low power module with antenna.
  - > F2M03MLA Multimedia low power module with ant.
  - > F2M03MX Multimedia extended range module.

### PRODUCT CODES

F2M03GXA-YYZ



## PIN OUT



Pin out for **F2M03GX** (left) and **F2M03GXA** (right)

>> The module uses bottom pads for soldering optimized for an automatic solder line. It is also possible to solder the module manually by using hot air soldering. For manual soldering solder pads may in some situation be made slightly larger to allow easier heating process.

>> To achieve good RF performance for the antenna (F2M03GXA) it is advisable to place a ground plane beneath that part of the module where the antenna is not mounted. Except from the ground plane it is preferable that there are as few components and other material as possible nearby the antenna. Free air is the best surrounding for the antenna.

- > Grey area at the F2M03GXA should be transparent, thus no ground plane.
- > When using multilayer PCB, through plating is necessary.

>> General:

- > Pad size: 0.8x1.2
- > Pitch: 1.27
- > All dimensions are in [mm]



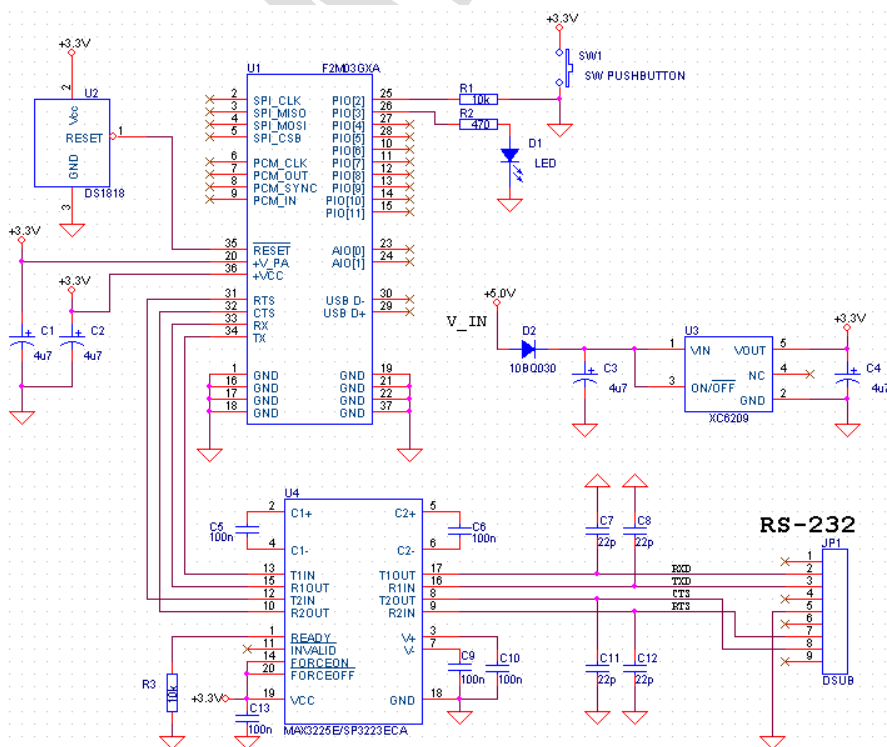
## TYPICAL APPLICATION SCHEMATIC

- >> A typical application schematic for the Wireless UART firmware is shown in the figure below.
- >> The module must be provided with a clean power from a LDO with fast transient response. The XC6209B332 from TOREX is a good choice.
- >> All capacitors in the schematic are ceramic and must be mounted as close as possible to its respectively IC.
- >> The module must start up with a reset. It is preferred to do this with a reset-circuit such as the DS1818 from Dallas-semiconductor or alternately using an I/O from a microcontroller\*. Reset cannot be done using a R-C network.

## LAYOUT GUIDELINES

- >> All GND pads must be connected directly to a flooded ground-plane. If more then one ground layer is used then make a good connection between them using many via holes. VCC and V\_PA should be connected to the LDO using a wide trace.
- >> For more application information see available application notes or contact Free2move's support team: [support@free2move.se](mailto:support@free2move.se)

\* It is important to have a pull-down (1.8k) from the microcontroller's output to the reset input of the module to ensure proper reset throughout the initialization of the microcontroller during power on.



Typical application schematic for the F2M03GX / GXA modules using the WU-firmware