

FMA Integrated WiFi Module P/N 7712066000

## Manual and Spec

### Reference Documents

- FN-LINK F23BUUM13-W2 module product specification
- Fender FMA Wi-Fi schematic

### Description

The Fender FMA Wi-Fi board is used to provide wireless connectivity, Wi-Fi and Bluetooth, for the family of Fender Modular Architecture (FMA) products.

### Circuit Description

Referring to the block diagram, there are three main sections of the circuit:

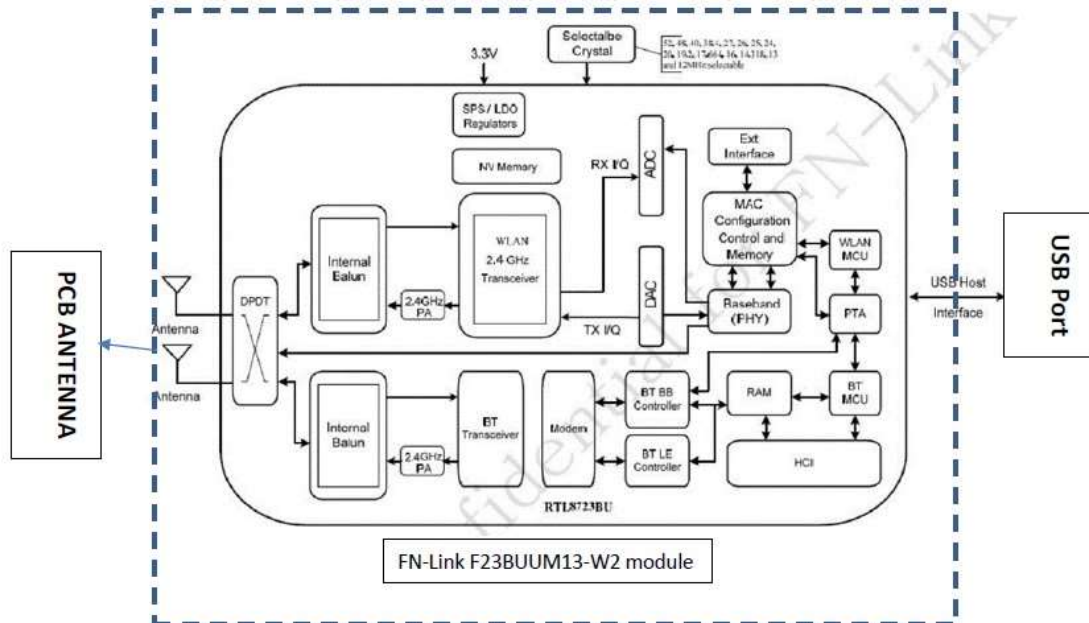
- FN-Link F23BUUM13-W2 module
- USB port
- PCB "F" Antenna

Communication with the FN-Link module is accomplished through a USB 2.0 port connected through a signal path that ultimately goes to the system host processor. The Wi-Fi and Bluetooth radio circuitry is contained on the FN-Link module. There is no antenna on the module so the radio output from the module connects to an F-Type PCB antenna on the PCBA. The FN-Link module operates from a 3.3V supply sourced through the USB cable. The VBUS conductor on the USB cable supplies the 3.3V instead of the typical 5V VBUS. Damage to the FN-Link module will occur if the module is connected to a 5V USB VBUS supply.

### FN-Link Module installation and Use

The FN-Link module is soldered to the PCBA. Pads on the PCBA make contact to the 3.3V supply, USB port and antenna. All communication between the host processor and the module is accomplished through the modules USB port. A description of specific commands for Bluetooth and Wi-Fi driver development is beyond the scope of this document and can be found in documentation from Realtek for the RTL8723BU Wi-Fi+BT chip or elsewhere.

## Block Diagram



Fender FMA WIFI Block Diagram

### USB Connector

The pinout for the USB connector follows the standard for micro-B USB except the VBUS power is reduced to 3.3V. The connector pinout is below:

Pin	Signal	Description
1	+3.3V	Power
2	USB_DN	USB data signal
3	USB_DP	USB data signal
4	-	No connection
5	GND	GND

### FN-Link Module

The FN-LINK F23BUUM13-W2 module takes care of all wireless communication. The host processor communicates to the module through a USB port. The wireless module is supports a number of IEEE standards including IEEE 802.11b, IEEE 802.11g, IEEE 802.11n, IEEE 802.11d, IEEE 802.11e, IEEE 802.11h and IEEE 802.11i. The module also supports Bluetooth specs including Bluetooth 3.0 and Bluetooth 4.0 Dual mode. For a complete list of supported wireless standards please refer to the product specification for the FN-Link F23BUUM13-W2 module.

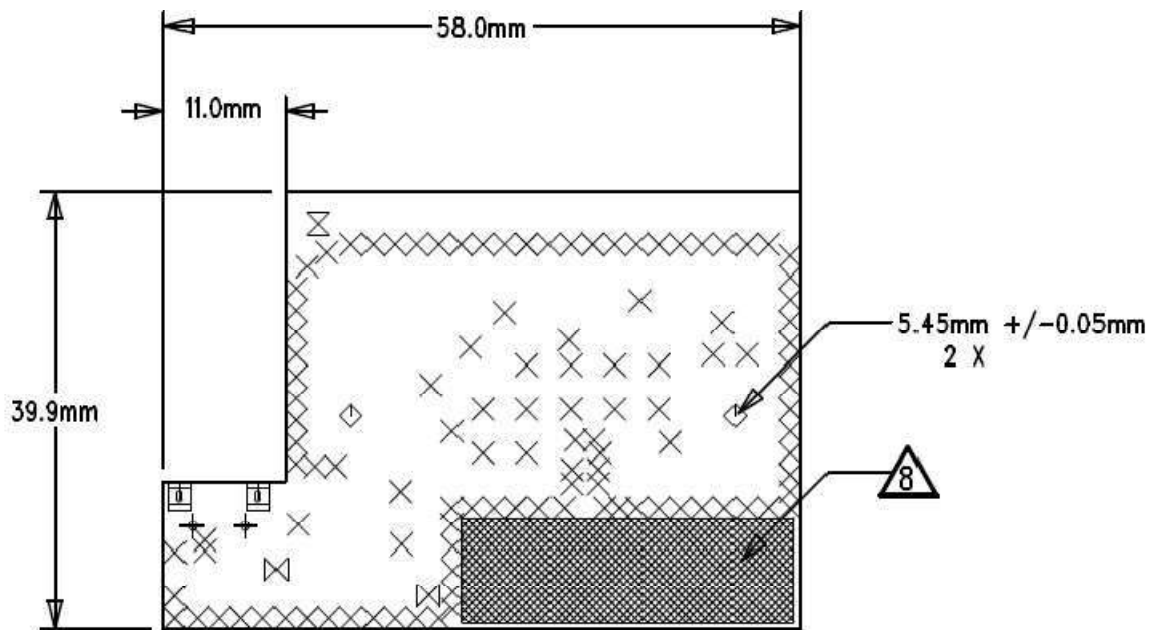
### Antenna

An F-type PCB antenna is located on the PCB to support the 2.4GHz signal from the FN-Link module.

### Power Consumption

Operating Voltage	3.3VDC +/- 9%
WiFi mode current	200mA (TX/RX continuous mode) 2.1 mA (idle power saving) 0.1mA (Idle or RF disable mode)
BT	15mA (SCO HV3) 0.9mA (Inquiry and Page Scan) 7.5mA (ACL no traffic)

### Board Dimensions



**FCC Statement:**

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. (2) This device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

**WARNING:** Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

**LABEL OF THE END PRODUCT:**

The final end product must be labelled in a visible area with the following "Contains TX FCC ID: XQW-FMAPR5133". If the size of the end product is smaller than 8x10cm, then additional FCC part 15.19 statement is required to be available in the users' manual: 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.

**RF Exposure**

This device has been evaluated and shown compliant with the FCC RF Exposure limits under fixed exposure conditions (antennas are greater than 20cm from a person's body) when installed in certain specific OEM configurations.

This modular complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. Due to missing shielding the module is strictly limited to integration by the Grantee himself or his dedicated OEM integrator under control of the Grantee. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

**IMPORTANT NOTE:**

This device is intended only for OEM integrators under the following conditions:

(1) According to FCC Part 15 Subpart C Section 15.212, the radio elements of the modular transmitter must have their own shielding. However, due to there is no shielding for this WIFI/BT module, this module is granted as a Limited Modular Approval.

(2) This module has been designed to operate with PCBA antenna having a maximum gain of 1.0 dBi.

(3) Integration is typically strictly restricted to Grantee himself or dedicated OEM integrators under control of the Grantee.

The module will be responsible to satisfy SAR/RF Exposure requirements, when the module integrated into any (portable, mobile, fixed) host device.

This module is intended for OEM integrator only and the OEM integrators and instructed to ensure that the end user has no manual instructions to remove or install the device. The OEM integrator is still responsible for the FCC compliance requirement of the end product, which integrates this module.

The module has no shielding and tested stand alone. This module is tested and approved as Limited modular approval with stand alone configuration, any OEM incorporated this radio module into any system are require additional testing and evaluation.

The module is only certified with the installed antenna. Any change of the antenna will void the certification.

**IC Notice:**

This device complies with Canada Industry licence-exempt RSS standard(s). 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.

**Avis d'Industrie Canada**

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 le brouillage radioélectrique subi même si le brouillage est susceptible d'en compromettre le fonctionnement. mauvais fonctionnement de l'appareil.

**Radiation Exposure Statement:**

This equipment complies with IC 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.

**Déclaration d'exposition aux radiations:**

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 20 cm de distance entre la source de rayonnement et votre corps.

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 fonctionnement en association avec une autre antenne ou transmetteur. This module is intended for OEM integrator.

The OEM integrator is still responsible for the IC compliance requirement of the end product, which integrates this module.

In the users manual of the end product, the end user has to be informed to keep at least 20cm separation with the antenna while this end product is installed and operated. The end user has to be informed that the IC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied. The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment. 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.

The final end product must be labeled in a visible area with the following " Contains TX IC : 8690A-FMAPR5133 ".



This radio transmitter (identify the device by certification number, or model number if Category II) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated.

Le présent émetteur radio (identifier le dispositif par son numéro de certification ou son numéro de modèle s'il fait partie du matériel de catégorie I) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne.