

## Bluetooth Module : MB8811QA



[top]



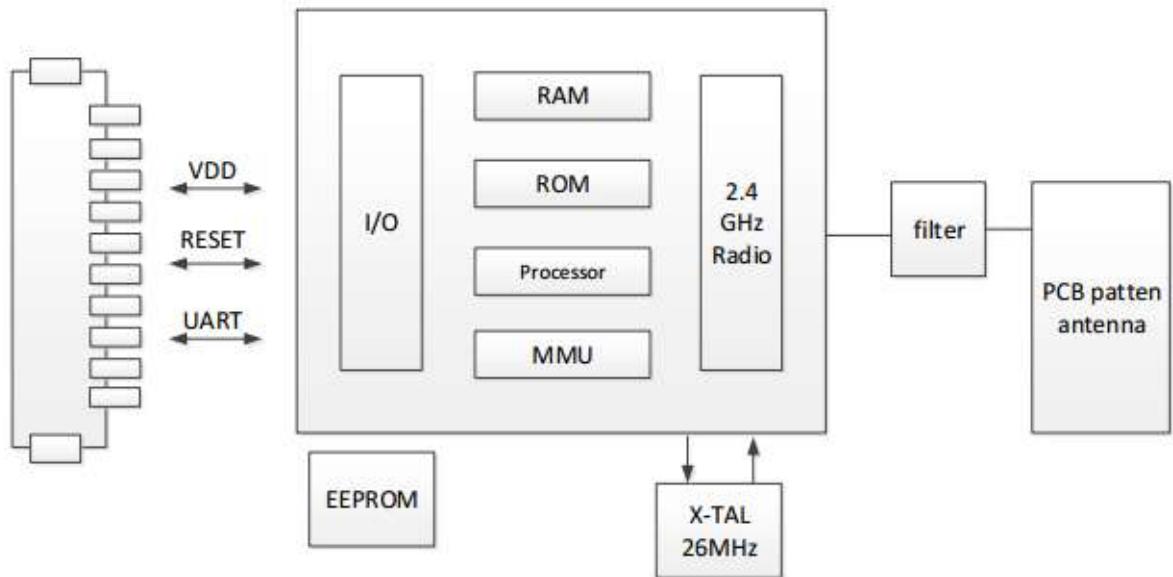
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This MB8811QAN Module is compatible with Bluetooth specification version 4.2. MB8811QA is a fully integrated RF, baseband controller etc.

## SPECIFICATION

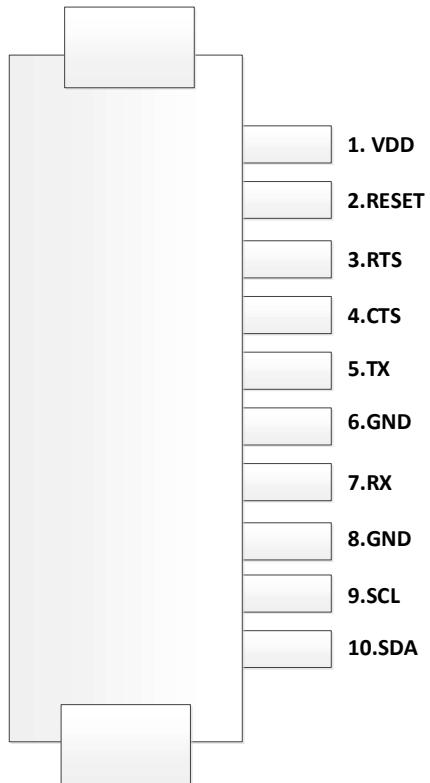
Main Chips	CSR8811A12
Standards	Bluetooth 4.2
Frequency Band	2402 ~ 2480 MHz
Tx Power	0.25 ~ 10mW (Bluetooth Power Class 1)
Rx Sensitivity	< -70dBm (BER 0.1%)
Distance	< 10m (open space)
Power Voltage	3.3V
Dimension	18.6 x 31.2 x 3.4 mm
Environmental Range	Operation temperature : -25 ~ +70 °C
Modulation mode	GFSK, 8DPSK
Communication method	FHSS

## Block Diagram

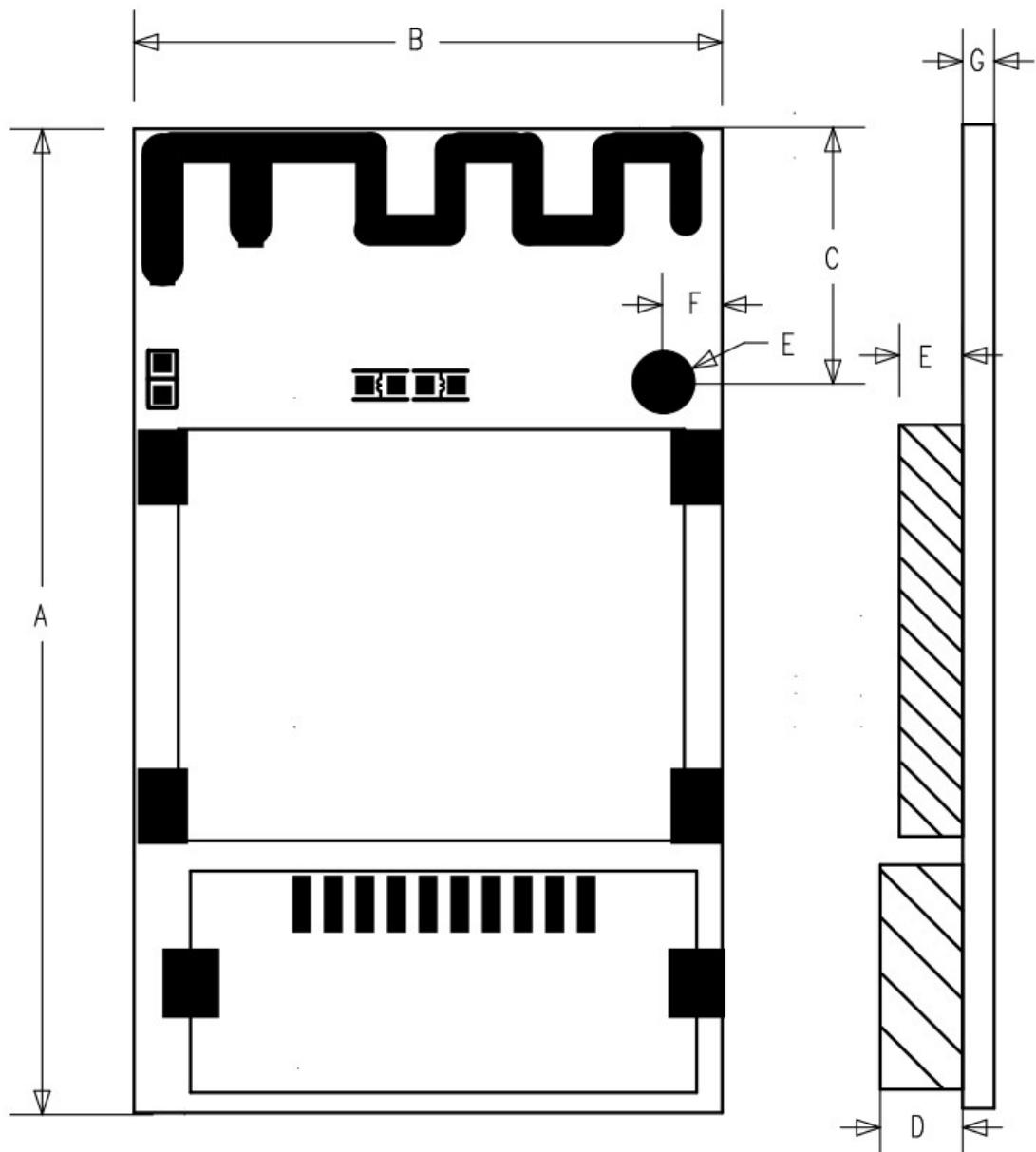


## Pin define(TOP PIN MAP)

No	Pin Name	I/O	Description
1	VDD	I	Positive Input for the internal regulator (3.0 ~ 3.6V)
2	RESET	I	Reset if low. Input debounced so must be low for >5ms to cause a reset
3	RTS	O	Bluetooth UART Request to Send. Active-low request.
4	CTS	I	Bluetooth UART Clear to Send.Active-low clear.
5	TX	O	Bluetooth UART Serial Output.
6	GND	-	Ground.
7	RX	I	Bluetooth UART Serial Input.
8	GND	-	Ground.
9	SCL	O	I2C interface Clock
10	SDA	I/O	I2C interface DATA



## Dimension



## TOP View

Mark	Dimension	Mark	Dimension	Mark	Dimension
A	$31.60 \pm 0.3$	D	$2.60 \pm 0.2$	G	$1.0 \pm 0.2$
B	$18.60 \pm 0.3$	E	$2.0 \pm 0.2$		
C	$8.0 \pm 0.2$	F	$1.8 \pm 0.2$		

(Unit : mm)

## Electrical Characteristics

Conditions : VDD = 3.3V, Ta = 25 °C, unless otherwise noted.

### Absolute Maximum Ratings

Parameter	Min	Max	Unit
Power Supply Voltage : VDD	-0.4V	3.6V	DCV
Storage Temperature	-40	85	°C

### Recommended Operating Conditions

Parameter	Min	Max	Unit
Power Supply Voltage	3.0V	3.6V	DCV
Operation Temperature	-25	70	°C

### Current consumption

Parameter	Connection Type	Avg	Peak	Unit
Page scan, Time interval = 1.28s	-	2		mA
Inquiry and Page scan, Time interval = 1.28s	-	2	3	mA
ACL No data transfer	Master	10		mA
ACL data transfer	Master	32		mA

### Input/Output Characteristics

Parameter	Min	Max	Unit
V <sub>IL</sub> Input Voltage Low	-0.4	0.8	V
V <sub>IH</sub> Input Voltage High	0.7*VDD	VDD+0.4	V
V <sub>OL</sub> Output Voltage Low	-	0.2	V
V <sub>OH</sub> Output Voltage High	VDD-0.2	-	V

General Performance					
Parameter	Condition	Min	Typ	Max	Unit
Frequency Range	Normal	2402	-	2480	MHz

Transmitter Performance					
Parameter	Condition	Min	Typ	Max	Unit
Transmit Power	Normal	-6	0	8	dBm
Power density	Normal	-	-	20	dBm
20dB bandwidth	Normal			1000	KHz
Adjacent channel power ( $F_0 = 2441\text{MHz}$ )	$F=F_0 \pm 2\text{MHz}$	-	-	-20	dBm
	$F=F_0 \pm 3\text{MHz}$	-	-	-40	dBm
	$F=F_0 \pm 4\text{MHz}$	-	-	-40	dBm
Out-band Spurious Emission	30MHz ~ 1GHz	-	-	-36	dBm
	1GHz ~ 12.75GHz	-	-	-30	dBm
	1.8GHz ~ 1.9GHz	-	-	-47	dBm
	5.1GHz ~ 5.3GHz	-	-	-47	dBm
Modulation Characteristic	$\Delta F1_{avg}$	140	-	175	KHz
	$\Delta F2_{max}$	115	-	-	KHz
	$\Delta F2_{avg} / \Delta F1_{avg}$	80	-	-	%
Initial Carrier Frequency Tolerance	DH1 packet	-75	-	75	KHz
Carrier Frequency Drift	DH5 packet	-25		25	KHz

Receiver Performance					
Parameter	Condition	Min	Type	Max	Unit
Sensitivity at 0.1% BER	Single slot (DH1 packet)	-	-	-70	dBm
Sensitivity at 0.1% BER	Multi slot (DH5 packet)	-	-	-70	dBm
Maximum received signal at 0.1% BER		-20	-	-	dBm
Maximum level of intermodulation interferers	$f1-f2 = 5\text{ MHz}$ , Pwanted= -64 dBm	-39	-	-	dBm

## FCC Statement

FCC Part 15C 15.247, 15E 15.407 is applied to the modular transmitter.

### Federal Communication Commission Interference Statement

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 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.

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.

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

This device and its antenna(s) must not be co-located or operation in conjunction with any other antenna or transmitter.

**IMPORTANT NOTE:****FCC Radiation Exposure Statement:**

This equipment complies with FCC 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.

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

**USERS MANUAL OF THE END PRODUCT:**

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 FCC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied. The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product. 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. If the device is small or for such use that it is not practicable to place the statement on the product, then additional FCC part 15.19 statement is required to be available in the users manual: This device complies with Part 15 of 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.

**LABEL OF THE END PRODUCT:**

The final end product must be labeled in a visible area with the following " Contains FCC ID: MBBMB8811QA". If the device is small or for such use that it is not practicable to place the statement on the product, then the following FCC part 15.19 statement has to also be available on the label: This device complies with Part 15 of 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.

## IC Statement

This Class B digital apparatus complies with Canadian ICES-003.

This device complies with Industry Canada license-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.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du 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 tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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

This device and its antenna(s) must not be co-located or operation in conjunction with any other antenna or transmitter.

The device could automatically discontinue transmission in case of absence of information to transmit, or operational failure. Note that this is not intended to prohibit transmission of control or signaling information or the use of repetitive codes where required by the technology.

### IMPORTANT NOTE:

#### IC Radiation Exposure Statement

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

## **USERS MANUAL OF THE END PRODUCT:**

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. If the device is small or for such use that it is not practicable to place the statement on the product, then following IC statement is required to be available in the users manual: IC statement is required to be available in the users manual: This device complies with Industry Canada license-exempt RSS standard(s). This Class B digital apparatus complies with Canadian ICES-003. 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.

## **LABEL OF THE END PRODUCT:**

The final end product must be labeled in a visible area with the following  
" Contains IC : 11657A-MB8811QA"

## **Transmit Antenna Notice**

This radio transmitter [IC: 11657A-MB8811QA ] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Antenna list ( type, maximum gain(dBi) )

Model	Type	Maximum gain (dBi)
HWI-BTP-MB8811QAN	PCB Pattern	1.193