

MB8811C1B is a Bluetooth Stereo module which can be used to design Bluetooth speakers. Besides, MB8811C1B can be as a direct connection to any Bluetooth mobile phone when designed into speakers and stereo headphones.

Host Controller Interface

- UART

This is a standard Universal Asynchronous Receiver Transmitter (UART) interface for communicating with Host.

principle of operation with Microcontroller

The microcontroller (like BX8805), interrupt controller and event timer run the Bluetooth software stack and control the radio and host interfaces. A 32 bit ARM based microcontroller is used for low power consumption and efficient use of memory. This MCU contain full Bluetooth software stack.

EEPROM

It contain basic information for address, name and RF information so that Microcontroller read and set value for corresponding block.

Audio Interface

Although MB8811C1B contain PCM interface for Audio, it does not decode audio directly, all encoded audio streaming would be decoded at Microcontroller.

Clock Input and Generation

The reference clock for the system is generated from a TCXO or crystal input 26MHz. All internal reference clocks are generated using a phase locked loop, which is locked to the external reference frequency.

Radio

Common TX/RX terminal simplifies external matching; eliminates external antenna switch.

BIST minimises production test time. No external trimming is required in production

Full RF reference designs available

Bluetooth 4.0 Specification compliant

Bluetooth Software Stacks

CSR's Bluetooth Protocol Stack runs on the on-chip and MCU in a variety of configurations:

- Standard HCI (UART or USB)
- Fully embedded RFCOMM
- Customised builds with embedded application code

Power

For Class 1 Bluetooth applications, the regulator used to derive 3.3V from VBAT.

How to design of the power regulation

There is a regulator on the motherboard to provide the 3.3V for MB8811C1B's power regulation .



Bluetooth 4.0 Smart Device Module (MB8811C1)

1. General Description

MB8811C1 is a fully integrated Bluetooth module. It is based on CSR's Bluecore 8811 chip with specific interface design to meet LG Electronics's needs.

MB8811C1 is compatible with Bluetooth specification version 4.0. It integrates RF, Baseband controller, etc., a completed Bluetooth subsystem.

Features :

- Operation Range (Class I)
- Fully Compatible with Bluetooth Specification 4.0
- Dual-mode Bluetooth / Bluetooth low energy
- Operating Temperature Range : -10°C ~ 70°C
- Operating VDD Range : 3.0 V ~ 3.6V
- Interface : UART
- Internal Antenna
- RoHS Compliant

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	$\Delta F_{1\text{avg}}$	140	-	175	KHz
	$\Delta F_{2\text{max}}$	115	-	-	KHz
	$\Delta F_{2\text{avg}} / \Delta F_{1\text{avg}}$	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	$f_1 - f_2 = 5\text{ MHz}$, $P_{\text{wanted}} = -64\text{ dBm}$	-39	-	-	dBm

7. 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	-10	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 _{IL} Input Voltage Low	-0.4	0.8	V
V _{IH} Input Voltage High	0.7*VDD	VDD+0.4	V
V _{OL} Output Voltage Low	-	0.2	V
V _{OH} Output Voltage High	VDD-0.2	-	V

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.

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 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 Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This transmitter module must not be co-located or operating in conjunction with any other antenna or transmitter. This End equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

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IMPORTANT NOTE:

In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling

The final end product must be labelled in a visible area with the following:

"Contains FCC ID: API-MB8811VMA".

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Manual Information to the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

Canada Statement

This device complies with Industry Canada's licence-exempt RSSs. 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.

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;

(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Caution Exposure:

This device meets the exemption from the routine evaluation limits in section 2.5 of RSS102 and users can obtain Canadian information on RF exposure and compliance.

Le dispositif répond à l'exemption des limites d'évaluation de routine dans la section 2.5 de RSS102 et les utilisateurs peuvent obtenir des renseignements canadiens sur l'exposition aux RF et le respect.

The final end product must be labelled in a visible area with the following:

The Industry Canada certification label of a module shall be clearly visible at all times when installed in the host device, otherwise the host device must be labelled to display the Industry Canada certification number of the module, preceded by the words "Contains transmitter module", or the word "Contains", or similar wording expressing the same meaning, as follows:

"Contains transmitter module IC: 6132A-MB8811VMA"

This End equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

Cet équipement devrait être installé et actionné avec une distance minimum de 20 centimètres entre le radiateur et votre corps.

The end user manual shall include all required regulatory information/warning as show in this manual.