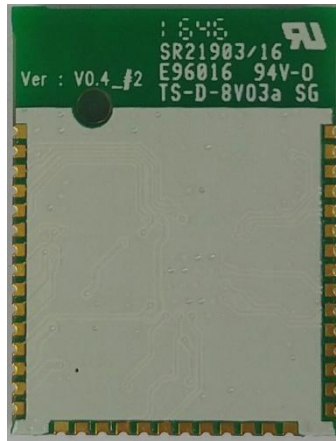


1. Module : WB1NP7



[Top]



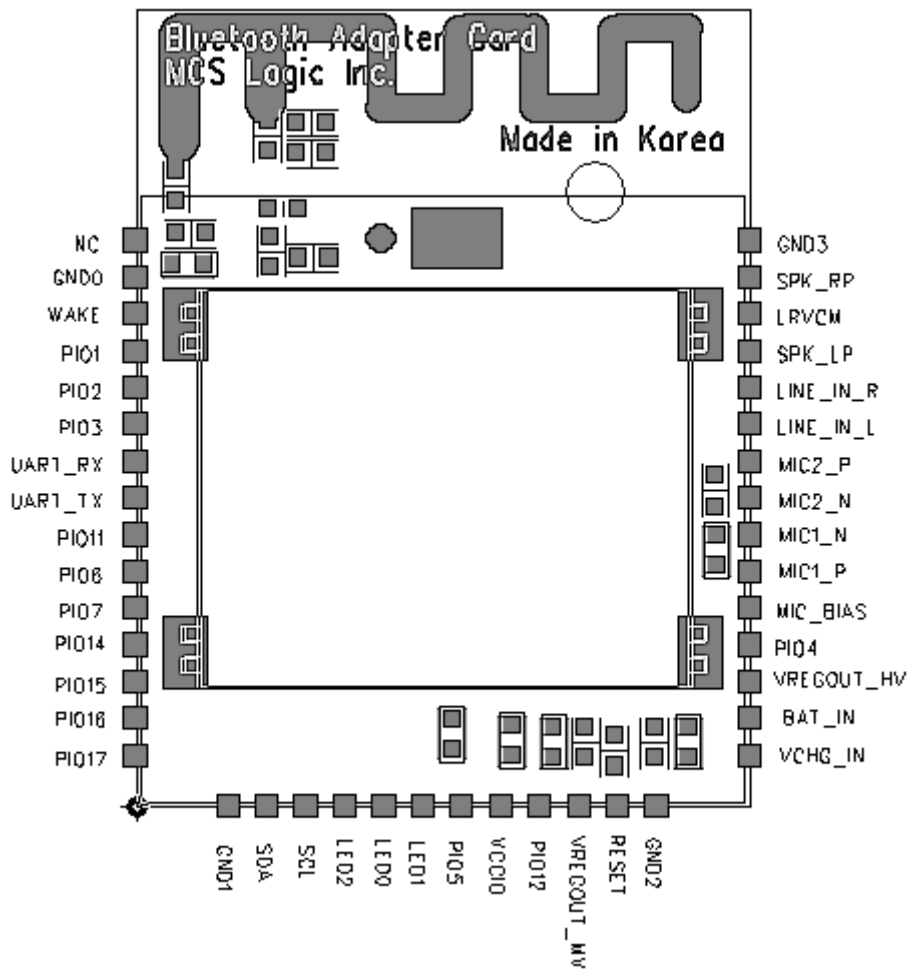
[Bottom]

This WB1NP7 Module can be easily designed into any embedded system for Bluetooth Spec 4.2 feature. It is based on Airoha's AB1520 with specific interface design to meet LG Electronics's needs.

2. Module Specification

Chips	AB1520
Bluetooth Spec	Bluetooth 4.2
Frequency Band	2402 ~ 2480 MHz
Tx Power	0.25 ~ 2.5mW (Bluetooth Power Class I)
Rx Sensitivity	< -70dBm (BER 0.1%)
Distance	< 100m (Open Space)
Power Voltage	3.7V
Dimension	20mm x 26mm x 3.1 mm
Environmental Range	Operation temperature -10 ~ 50°C
Modulation	GFSK, 8DPSK, $\pi/4$ -DQPSK
Communication Method	FHSS

4. Pin Define



Symbol	Description
I	CMOS input
O	Output

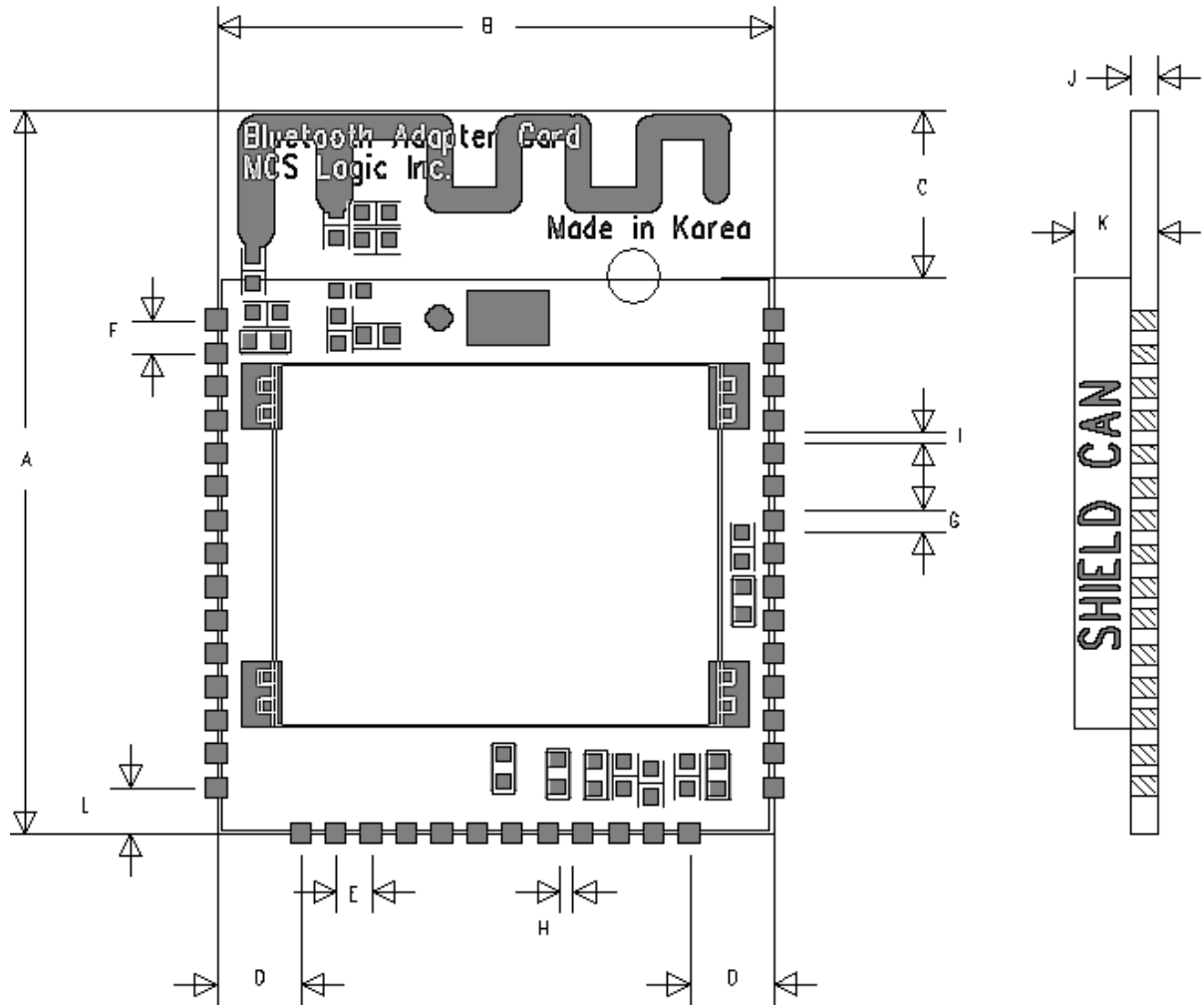
No	Pin Name	I/O	Description
1	NC		NOT CONNECTION
2	GND	I	GND CONNECTION FOR INTERNAL DIGITAL CIRCUITRY AND PADS
3	WAKE	I	Input Pin with pull up
4	PIO1	I	Input only
5	PIO2	I	Input only

6	PIO3	I/O	I2S_SDI2, Alternative function PIO[3]
7	UART_RX	I	UART DATA IN
8	UART_TX	O	UART DATA OUT
9	PIO11	I/O	AIO and I2S_SDI, Alternative function PIO[11]
10	PIO6	I/O	I2S_MCLK, Alternative function PIO[6]
11	PIO7	I/O	I2S_SCK, Alternative function PIO[7]
12	PIO14	I/O	I2S_WS, Alternative function PIO[14]
13	PIO15	I/O	I2S_SDO, Alternative function PIO[15]
14	PIO16	I/O	I2S_MCLK2, Alternative function PIO[16]
15	PIO17	I/O	I2S_SCK2, Alternative function PIO[17]
16	GND	I	GND CONNECTION FOR INTERNAL DIGITAL CIRCUITRY AND PADS
17	SDA	I/O	I2C DATA LINE
18	SCL	I/O	I2C CLOCK LINE
19	LED2	O	LED DRIVER (OPEN DRAIN)
20	LED0	O	LED DRIVER (OPEN DRAIN)
21	LED1	O	LED DRIVER (OPEN DRAIN)
22	PIO5	I	I2S_SDO2, Alternative function PIO[5]
23	VCCIO	I	1.7~3.6V SUPPLY INPUT FOR PIO
24	PIO12	I/O	AIO, Alternative function PIO[17]
25	VREGOUT_MV	O	LDO OUT(1V8)
26	RESET	I	GLOBAL RESET, ACTIVE HIGH
27	GND	I	GND CONNECTION FOR INTERNAL DIGITAL CIRCUITRY AND PADS
28	VCHG_IN	I	VCC FOR CHARGER
29	BAT_IN	I	Battery input P
30	VREGOUT_HV	O	LDO OUT(3V3)
31	PIO4	O	I2S_WS2, Alternative function PIO[4]
32	MIC_BIAS	A	MICROPHONE 1 Bias
33	MIC1_P	A	MICROPHONE 1 P-path

34	MIC1_N	A	MICROPHONE 1 N-path
35	NC	-	
36	NC	-	
37	LINE_IN_L	A	LINE IN L-path
38	LINE_IN_R	A	LINE IN R-path
39	SPK_LP	A	SPEAKER OUTPUT LP
40	LRVCM	A	SPEAKER OUTPUT LRVCM
41	SPK_RP	A	SPEAKER OUTPUT LP
42	GND	I	GND CONNECTION FOR INTERNAL DIGITAL CIRCUITRY AND PADS

5. Mechanical Dimension

TOP View



Mark	Dimension	Mark	Dimension	Mark	Dimension	Mark	Dimension
A	26.0±0.3	D	3.01±0.05	G	0.8±0.2	J	1±0.1
B	20.0±0.5	E	1.27±0.2	H	0.5±0.2	K	3±0.3
C	6.0±0.3	F	1.20±0.3	I	0.4±0.1	L	1.65±0.2

(Unit : mm)

6. Electrical Characteristics

Conditions : BAT_P = 4.2V, Ta = 25 °C, unless otherwise noted.

Absolute Maximum Ratings

Parameter	Min	Max	Unit
Power Supply Voltage : BAT_P	-0.3V	4.4V	DCV
I/O Supply Voltage : VCCIO	-0.3V	3.6V	DCV
Storage Temperature	-40	85	°C

Recommended Operating Conditions

Parameter	Min	Max	Unit
Power Supply Voltage	3.34V	4.2V	DCV
Operation Temperature	0	60	°C

Current consumption

Parameter	Condition	Avg	Peak	Unit
Inquiry and Page scan, Time interval	-	7		mA
ACL data transfer	Master	20		mA

Input/Output Characteristics

Parameter	Min	Max	Unit
V _{IL} Input Voltage Low	0	0.3*VCCIO	V
V _{IH} Input Voltage High	0.7*VCCIO	VCCIO+0.4	V
V _{OL} Output Voltage Low	-	0.4	V
V _{OH} Output Voltage High	VCCIO-0.4	-	V

General Performance

Parameter	Condition	Min	Type	Max	Unit
Frequency Range		2402		2480	MHz

Transmitter Performance					
Parameter	Condition	Min	Type	Max	Unit
Transmit Power		-6	0	7	dBm
Power density		-	-	20	dBm
20dB bandwidth				1000	KHz
Adjacent channel power	±2%	-	-	-20	dBm
	±3%	-	-	-40	dBm
	±4%	-	-	-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	-40	-	40	KHz
Carrier Frequency Drift	DH5 packet	-25		25	KHz

Receiver Performance					
Parameter	Condition	Min	Type	Max	Unit
Sensitivity 0.1% BER	Single slot (DH1 packet)	-70	-	-	dBm
Sensitivity 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 MHz, Pwanted=-64 dBm	-39	-	-	dBm

FCC WARNING 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, and (2) this device must accept any interference received, including interference that may cause undesired operation

Any changes or modifications (including the antennas) to this device that are not expressly approved by the manufacturer may void the user's authority to operate the equipment.

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.

Modifications not expressly approved by the manufacturer could void your authority to operate the equipment under FCC rules.

FCC RF Radiation Exposure Statement

This equipment complies with FCC RF Radiation exposure limits set forth for an uncontrolled environment. This device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter.

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

Information for OEM integrator

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 manual of the end product.

The user manual which is provided by OEM integrators for end users must include the following information in a prominent location.

“To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.” Label for end product must include “Contains FCC ID: BEJ-WB1NP7, IC: 2703H-WB1NP7” or "A RF transmitter inside, FCC ID: BEJ-WB1NP7, IC: 2703H-WB1NP7".

IC WARNING STATEMENT

This device complies with Industry Canada 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.

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'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This equipment complies with IC RF Radiation exposure limits set forth for an uncontrolled environment. This device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter.

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

Cet équipement est conforme aux limites établies par Industrie Canada en matière d'exposition aux radiofréquences dans un environnement non contrôlé. Cet appareil et son antenne ne doivent pas être colocalisés ou fonctionner en conjonction avec tout autre antenne ou émetteur.

Cet équipement doit être installé et utilisé avec une distance minimale de 20cm entre le radiateur et votre corps.