

***WLAN* Module**

**IEEE802.11b/g/n**

**Model Name: WYSAGBUX7**

**Users Manual**

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**Document constituent list**

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## Rev. record

16-Nov-2009> Ver.1.0: Newly Issued

10-Dec-2009> Ver.1.1: 11n Draft -> 11n, Add note (g) on Page 3,  
Add Pin Descriptions (HD-BA-A) on Page 11.

16-Dec-2009> Ver.1.2: Correct the error on Page 12.

28-Jan.-2010> Ver.1.3: Add Tx Power condition "Average Power " on Page 6 and 7.

03-Mar.-2010> Ver.1.4: Add Mexico "Cofetel ID" on page 13.

26-Mar.-2010> Ver.1.5: Add Taiwan "NCC ID" on page 13.

20-Apr.-2011> Ver.1.6: Add USB2.0 Specification on page5.

Change Indication Label size and design on page 10.

13-Dec.-2011> Ver.1.7 Change FCC/IC Regulatory Information

Control No. HD-AG-A	(1/1)	Control name General Items
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## Scope

This specification (“Specification”) applies to the hybrid IC “WYSAGBUX7” for use WLAN Module (“Product”).

1. Model name: WYSAGBUX7
2. Brand name : **brother**
3. Manufacture: BROTHER INDUSTRIES, LTD.
4. Function: Radio frequency transfer Module. (**IEEE802.11b/g/n** standard conformity)
5. Application: Printer
6. Structure: Hybrid IC loaded with silicon monolithic and GaAs semiconductor
7. Ability of lead free mounting at customer's assembly (Heat resistance of this Product) : Yes  
Containment of hazardous substance in this Product  
\*This product conforms to RoHS Directive (2002/95/EC).
8. Outline: 6-pin Connector
9. Marking: Model name, Brand name, Type Approval number, MAC address, Lot number
10. Features:

-**IEEE802.11b/g/n** standard conformity

Transmit speed: 11n(20MHz) 6.5/7.2/13/14.4/19.5/21.7/26/28.9/39/43.3/52/57.8/58.5/65/72.2Mbps  
11g 54/48/36/24/18/12/9/6Mbps 11b 11/5.5/2/1 Mbps

Modulation: 11g/n (OFDM): BPSK, QPSK, 16QAM, 64QAM 11b (DSSS): BPSK, QPSK, CCK

Channel Number: 1 to 11 channels

Interface: USB2.0

OSC (30MHz), Pattern Antenna (Monopole antenna), Connector

11. Security: WEP (64/128bit), TKIP (WPA), AES (WPA2)

12. Packing: Packaging method: Tray

## 13. Notes:

- a. Any question arising from this Specification shall be solved through mutual discussion by the parties hereof.
- b. This Product is not designed for radiation durable and should not be used under the circumstance of radiation.
- c. The operating conditions of this Product are as shown in this Specification.
- d. This Product mentioned in this Specification is manufactured for use in Printer.  
This Product shall not be used in any special equipment (such as medical equipment, space equipment, air craft, disaster prevention equipment), where higher safety and reliability are duly required. Also, evaluation of the safety function of this Product even for use in general electronics equipment shall be thoroughly made and when necessary, a protective circuit shall be added at design stage, all at the customer's sole risk.
- e. Communication between this Product and others might not be established nor maintained depending upon radio environment or operating conditions of this Product and other **ISM band** at 2.4GHz products.
- f. This Product operates in the unlicensed ISM band at 2.4GHz. In case this Product is used around the other wireless devices which operate in same frequency band of this Product, there is a possibility that interference occurs between this Product and such other devices. If such interference occurs, please stop the operation of other devices or relocate this Product before using this Product or do not use this Product around the other wireless devices.
- g. Please note that this users manual should not be provided to end-users.

Control No. HD-AM-A (1/1)	Control name Absolute maximum ratings
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### Absolute maximum ratings

Item	Symbol	Rating				Remark
		Min.	Typ.	Max.	Unit	
Supply voltage 1	VCC3V3	-0.3		4.1	V	
Storage temperature range	Tstg	-30		85	Degrees C	
Operation temperature range	Topr	-5	25	55	Degrees C	

### Recommendation operating range

Item	Symbol	Rating				Remark
		Min.	Typ.	Max.	Unit	
Supply voltage 1	VCC3V3	3.0	3.3	3.6	V	

Control No. HD-AE-A	(1/3)	Control name Electrical characteristics
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## DC Specifications

The Specification applies for Topr.= 25 degrees C, Supply voltage=Typical voltage

No.	Parameter	Condition	Symbol	Min.	Typ.	Max.	Unit	Remark
1	Operating Voltage 1		VCC3V3	-	3.3	-	V	
2	Peak Current1		Ip1	-	-	800	mA	
3	TX Current1	Burst Tx (11g/54Mbps)	TC1	-	145	371	mA	Duty 15.4%
4	RX Current1	Burst Rx (11g/54Mbps)	RC1	-	124	142	mA	
5	TX Current2	Burst Tx (11b/11Mbps)	TC2	-	236	446	mA	Duty49.2 %
6	RX Current2	Burst Rx (11b/11Mbps)	RC2	-	122	140	mA	
7	TX Current3	Burst Tx (11n/72.2Mbps)	TC3	-	140	343	mA	Duty13.6 %
6	RX Current3	Burst Rx (11n/72.2Mbps)	RC3	-	125	143	mA	

## USB2.0 Specifications

The Specification applies for Topr.=25 degrees C, Supply voltage=Typical voltage

No.	Parameter	Condition	Symbol	Min.	Typ.	Max.	Unit	Remark
1	D+ / D- Input low voltage	Full-Speed	VIL	0		0.8	V	
2	D+ / D- Input high voltage	Full-Speed	VIH	2.0		3.6	V	
3	D+ / D- Output low voltage	Full-Speed	VOL	0		0.3	V	
4	D+ / D- Output high voltage	Full-Speed	VOH	2.8		3.6	V	
5	D+ / D- Squelch Detection Threshold (differential)	High-Speed	VHSSQ			100	mV	Squelch detected
				150			mV	No squelch detected
6	D+ / D- Differential input Signaling levels	High-Speed	-	See Receiver Eye Diagram Template Section 7.1.2.2 of USB 2.0 Specifications.				
7	D+ / D- Output High Voltage	High-Speed	VHSOH	360		440	mV	
8	D+ / D- Output Low Voltage	High-Speed	VHSOL	-10		10	mV	

Control No. HD-AE-A	Control name Electrical characteristics
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### RF Specifications (WLAN 11n(Draft)/72.2Mbps, OFDM)

The Specification applies for Ta=25 degrees C, Supply voltage =Typical voltage

No.	Parameter	Condition	Symbol	Min	Typ	Max	Unit	Remark
1	RF frequency range		FREQ	2412		2462	MHz	
2	TX Power	w/o Ant Gain Average power	Po1	10	12	14	dBm	
3	Spectrum Mask	1 <sup>st</sup> Side Lobe	M1	-		-20	dBc	
		2 <sup>nd</sup> Side Lobe	M2	-		-28	dBc	
		3 <sup>rd</sup> Side Lobe	M3	-		-45	dBc	
4	Symbol clock tolerance		Fs	-25		25	ppm	
5	Frequency tolerance		Ft	-25		25	ppm	
6	EVM	rms	EVM	-		-28	dB	
7	TX Out of band spurious1	f<2387MHz, 2496.5MHz<f	TOS1	-		2.5	uW	
8	TX Out of band spurious2	2387MHz<f<2400MHz, 2483.5MHz<f<2496.5MHz	TOS2	-		25	uW	
9	Rx sensitivity	PER<10%	SEN		-70	-64	dBm	
10	Maximum Input Level	PER<10%	MIL	-20		-	dBm	
11	RX Out of band spurious1	f<1GHz	ROS1	-		4	nW	
12	RX Out of band spurious2	f>1GHz	ROS2	-		20	nW	

### RF Specifications (WLAN 11g/54Mbps, OFDM)

The Specification applies for Ta=25 degrees C, Supply voltage=Typical voltage

No.	Parameter	Condition	Symbol	Min	Typ	Max	Unit	Remark
1	RF frequency range		FREQ	2412		2462	MHz	
2	TX Power	w/o Ant Gain Average Power	Po1	11	13	15	dBm	
3	Spectrum Mask	1 <sup>st</sup> Side Lobe	M1	-		-20	dBc	
		2 <sup>nd</sup> Side Lobe	M2	-		-28	dBc	
		3 <sup>rd</sup> Side Lobe	M3	-		-40	dBc	
4	Symbol clock tolerance		Fs	-25		25	ppm	
5	Frequency tolerance		Ft	-25		25	ppm	
6	EVM	rms	EVM	-		-25	dB	
7	TX Out of band spurious1	f<2387MHz, 2496.5MHz<f	TOS1	-		2.5	uW	
8	TX Out of band spurious2	2387MHz<f<2400MHz, 2483.5MHz<f<2496.5MHz	TOS2	-		25	uW	
9	Rx sensitivity	PER<10%	SEN		-73	-65	dBm	
10	Maximum Input Level	PER<10%	MIL	-20		-	dBm	
11	RX Out of band spurious1	f<1GHz	ROS1	-		4	nW	
12	RX Out of band spurious2	f>1GHz	ROS2	-		20	nW	

Control No. HD-AE-A	(3/3)	Control name Electrical characteristics
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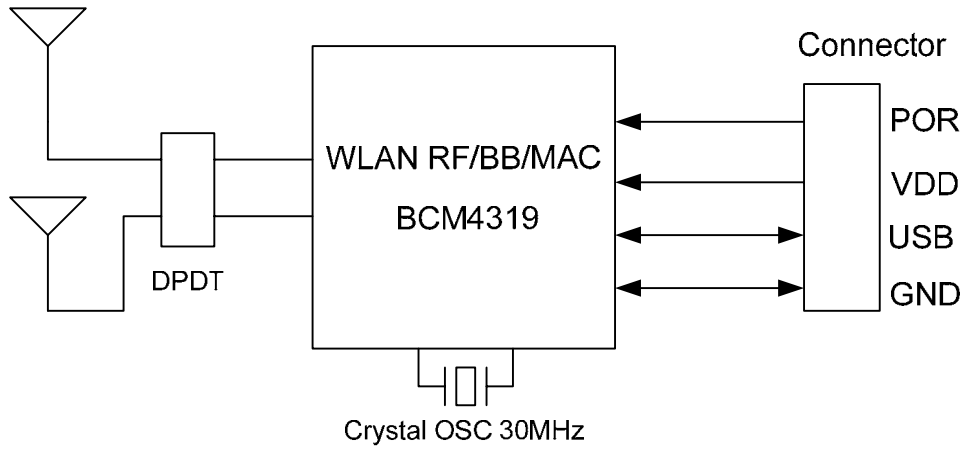
**RF Specifications (WLAN 11b/11Mbps, CCK)**

The Specification applies for Ta=25 degrees C, Supply voltage=Typical voltage

No.	Parameter	Condition	Symbol	Min	Typ	Max	Unit	Remark
1	RF frequency range		FREQ	2412		2462	MHz	
2	TX Power	w/o Ant Gain Average Power	Po1	15	17	19	dBm	
3	Spectrum Mask	1 <sup>st</sup> Side Lobe	M1	-		-30	dBc	
		2 <sup>nd</sup> Side Lobe	M2	-		-50	dBc	
4	Power up-down rump	Power up	TU	-		2	us	
		Power down	TD	-		2	us	
5	Frequency tolerance		Ft	-25		25	ppm	
6	EVM	Peak	EVM	-		35	%	
7	TX Out of band spurious1	f<2387MHz, 2496.5MHz<f	TOS1	-		2.5	uW	
8	TX Out of band spurious2	2387MHz<f<2400MHz, 2483.5MHz<f<2496.5MHz	TOS2	-		25	uW	
9	Rx sensitivity	PER<8%	SEN		-86	-76	dBm	
10	Maximum Input Level	PER<8%	MIL	-10		-	dBm	
11	RX Out of band spurious1	f<1GHz	ROS1	-		4	nW	
12	RX Out of band spurious2	f>1GHz	ROS2	-		20	nW	

Control No. HD-MC-A	(1/1)	Control name Circuit Schematic
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## Block Diagram

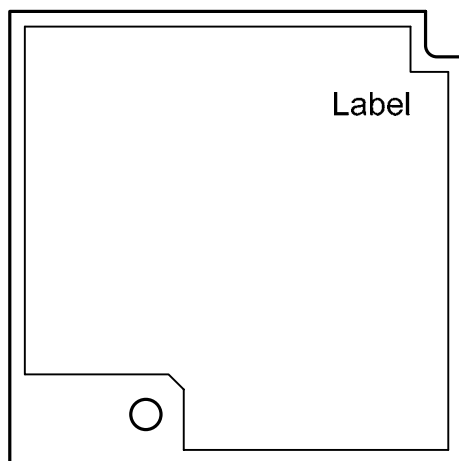
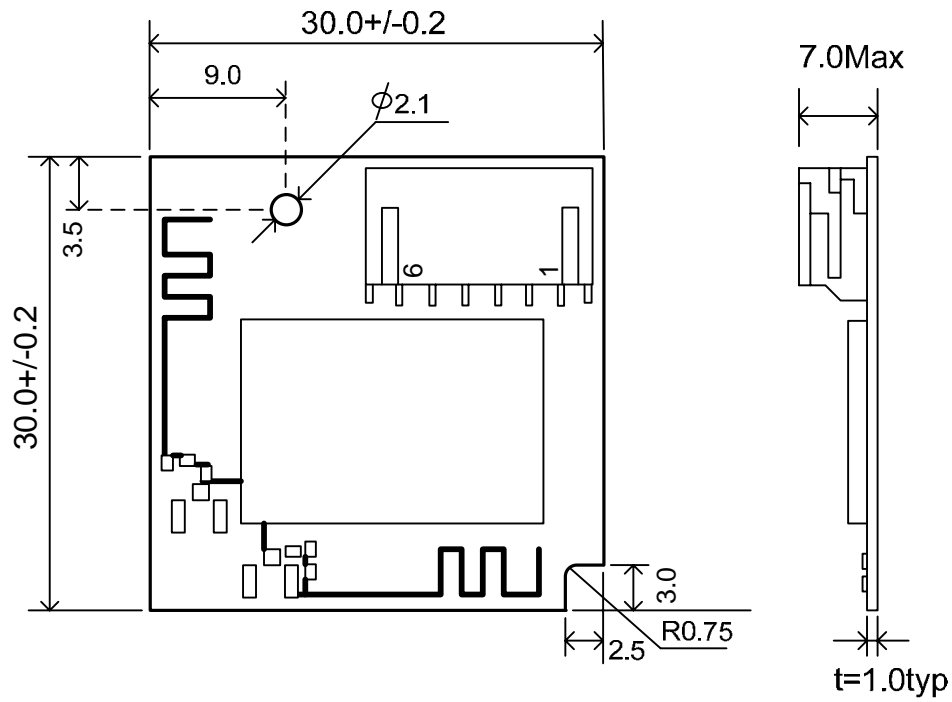




Control No. HD-AD-A	(1/1)	Control name Outline/Appearance
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## OUTLINE

Unit: mm



# WYSAGBUX7

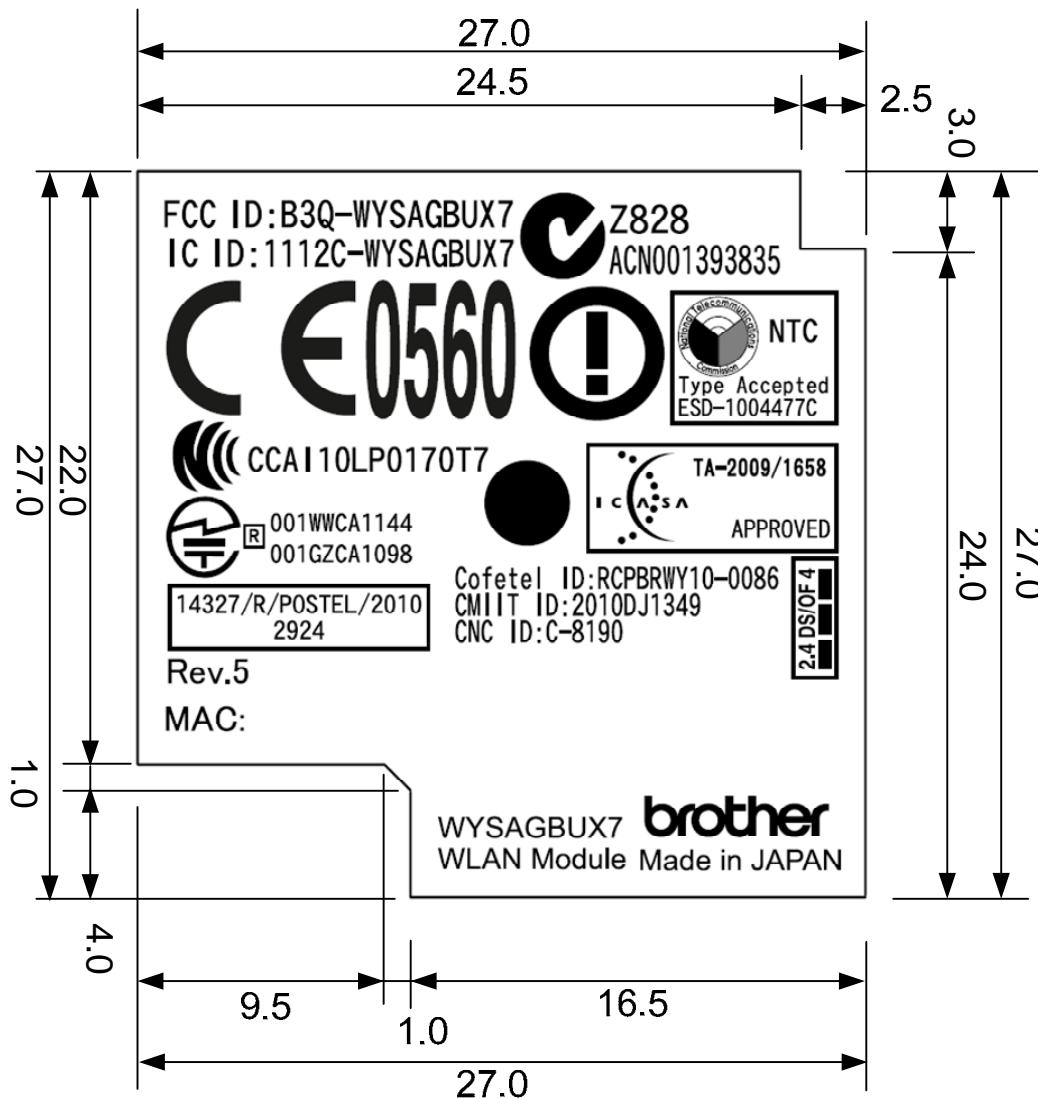
FCC 13-Dec.-2011 Ver.1.7  
Confidential



Control No. HD-AD-B	(1/1)	Control name Outline/Appearance
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Indication label (example)

Unit: mm



Material: PET / Label color: White

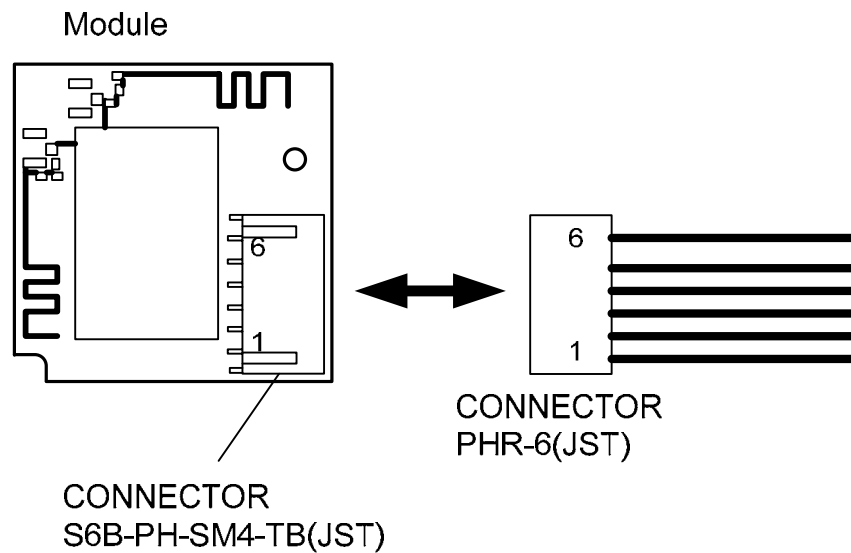
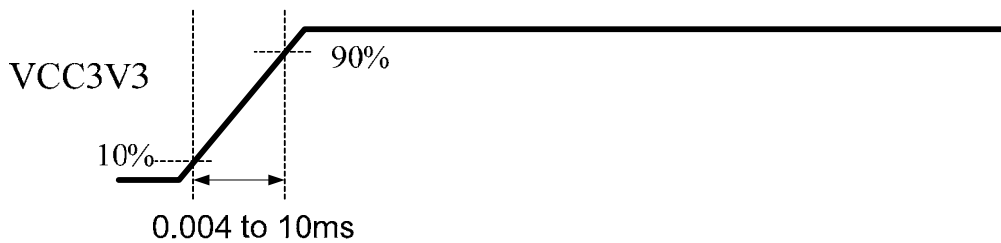
Control No. HD-BA-A	(1/1)	Control name Pin Descriptions
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## Pin Descriptions

Connector Number

No.	Pin Name	I/O	Type	Description
1	POR	Input	RESET	Power On Reset
2	VCC3V3	Input	Power	DC 3.3V
3	D+	Input/Output	USB	USB D+ Signal
4	D-	Input/Output	USB	USB D- Signal
5	GND	Input/Output	GND	Ground
6	GND	Input/Output	GND	Ground

### Power ON Timing



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## FCC Regulatory Information

**CAUTION:** This product is certified as a Portable device under specified conditions.

When you install this product, please use it within the specification range of this product to comply with SAR requirements.

For further information, please contact us.

For other conditions, this equipment must be installed and operated in accordance with provided instructions and the antenna(s) 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. End-users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

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.

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

### Notice

- At the installation of our WLAN Module (Model No.: WYSAGBUX7) into the device, following information should be provided with end-user under the responsibility of the manufacture who integrates it into their device.

The following sentence has to be displayed on the outside of the device in which the module is installed:

"Contains Transmitter Module FCC ID: B3Q-WYSAGBUX7 / IC ID: 1112C-WYSAGBUX7", or  
"Contains FCC ID: B3Q-WYSAGBUX7 / IC ID: 1112C-WYSAGBUX7"

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## Canada Regulatory Information

**CAUTION:** This product is certified as a Portable device under specified conditions.

When you install this product, please use it within the specification range of this product to comply with SAR requirements.

For further information, please contact us.

For other conditions, this equipment must be installed and operated in accordance with provided instructions and the antenna(s) 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. End-users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

**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.

**L'utilisation de ce dispositif est autorisée seulement aux conditions suivantes :**

- (1) il ne doit pas produire de brouillage et
- (2) l'utilisateur du dispositif doit être prêt à accepter tout brouillage radioélectrique reçu, même si ce brouillage est susceptible de compromettre le fonctionnement du dispositif.

## NCC Regulatory information

經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前項合法通信，指依電信法規定作業之無線電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

### Note:

1. 本模組於取得認證後將依規定於模組本體標示審驗合格標籤
2. 系統廠商應於平台上標示「本產品內含射頻模組: CCAI10LP0170T7(NCC ID)」字樣

## Mexico Regulatory Information

Please read this manual before this Module is used.

Model name : WYSAGBUX7  
Brand name : brother  
Cofetel ID: RCPBRWY10-0086

**CAUTION:** This device should be used in separation distance of at least 20 centimeters maintained between transmitter's radiating structure and the body of the user or nearby persons.

Specifications: Vcc 3.3V, RF frequency 2.4GHz, Current 800mA (Maximum), RF Output 50.2mW

Cto.Nemesio Diez Riega No.8 M2 L4 P.I.CerrilloII Estado de Mèxico 52000  
Brother International de Mèxico, S.A. de C.V.  
Telephone : 55-8503-8742  
Fax : 55-8503-8720