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<p style="text-align: center;">User Manual Bluetooth Module</p>

Part Name	Bluetooth Module
Doc. Rev.	0.0
Foxconn P/N.	J20H070

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1. Introduction

Project Name: Bluetooth module

Project Number: J20H070

This document provides information for designing and using the Broadcom Bluetooth module with BCM20705 solution. It is a confidential document of Foxconn.

The J20H070 Bluetooth module provides Bluetooth 3.0 compliant wireless modem function. This module is based on BCM20705 solution which is integrated 2.4GHz transceiver and manufactured using the industry's most advanced 65nm CMOS low-power process.

1.1 Major Components

- **Broadcom BCM20705**
- **Serial Flash Memory**

1.2 Features

- ◆ **Bluetooth 3.0 Compliant**
- ◆ **UART Interface.**
- ◆ **Module is powered by the host with a 3.3V +/- 10% supply.**
- ◆ **One PCB printed antennas.**
- ◆ **4 layers through hole PCB design with halogen free FR4 material**

1.3 Application Scope

The BT Module is compliant to Bluetooth 3.0 standard:

Frequency range: 2400MHz~ 2483.5MHz

Carrier Spacing: 1.0MHz

Duplexing: TDD

Modulation: FHSS , GFSK, pi/4-DQPSK, 8DPSK

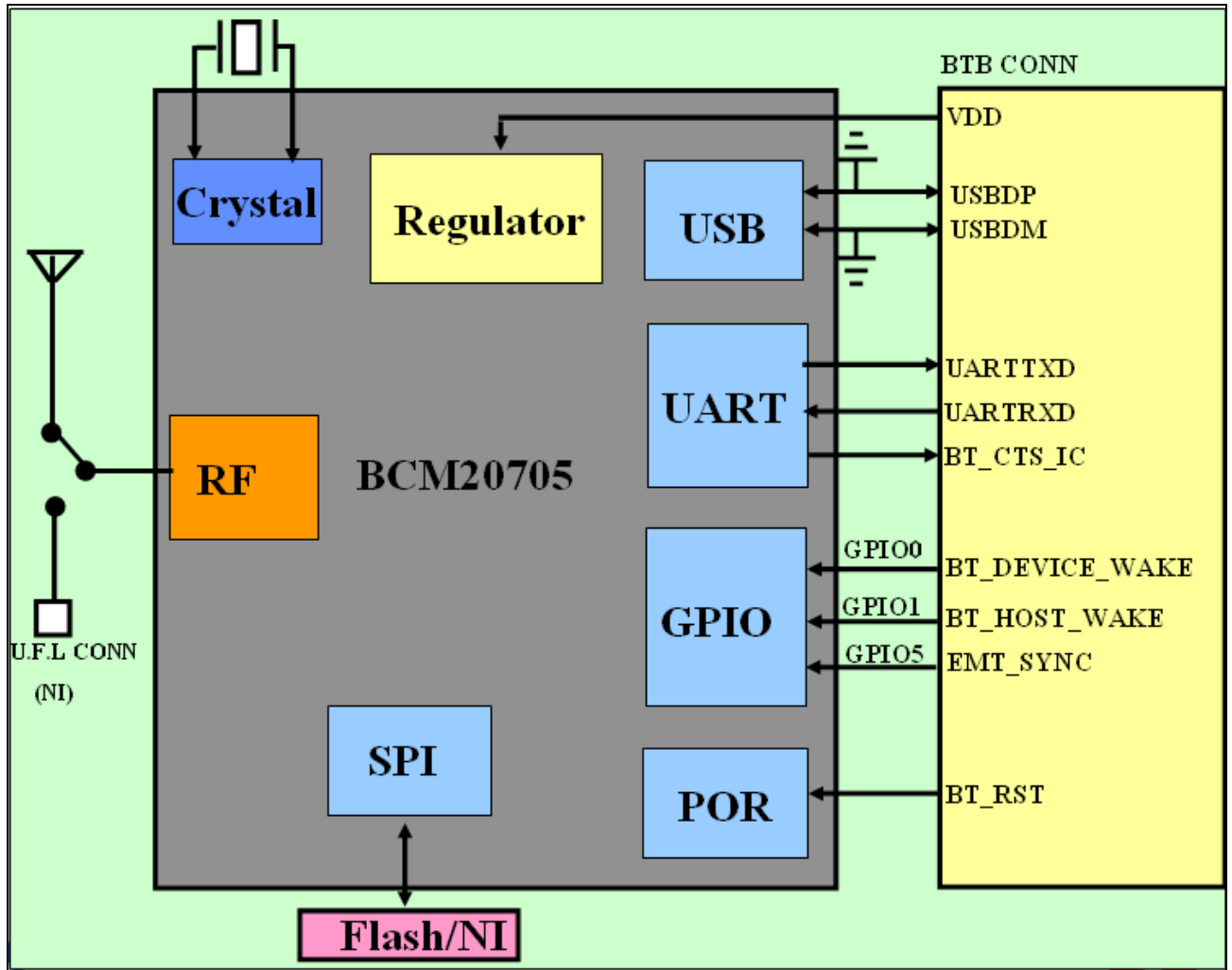
Symbol Rate: 1Mbps (GFSK), 2Mbps (pi/4-DQPSK), 8DPSK

This module is designed with BTB connector and UART Interface, and it is installed as a client device in TV platform.

2. Hardware Overview

2.1 Block Diagram

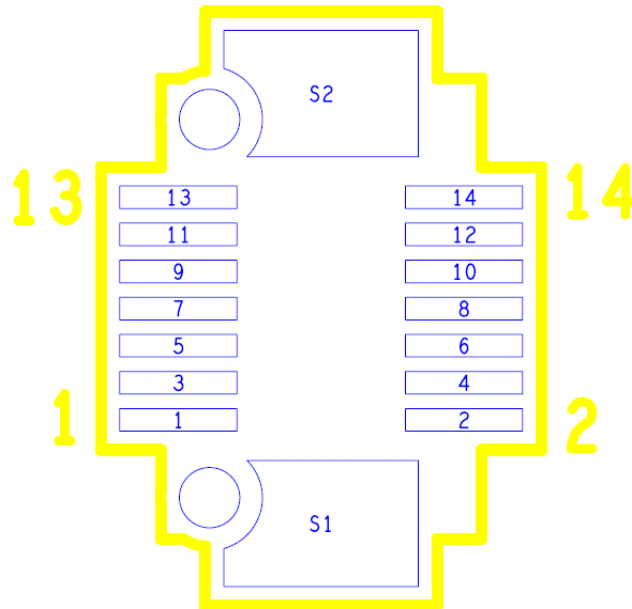
The general HW architecture is shown below Figure:



Module Block Diagram

2.2 Interface and Connector

Pin definition:



Pin Number	Symbol Name	Status	Pin definition
1	GND	P	Ground
2	BT_RST	I	Reset pin
3	HUSBDP	I/O	USB positive data
4	UARTTXD	O	UART Transmit signal
5	HUSBDM	I/O	USB negative data
6	UARTRXD	I	UART Receive signal
7	GND	P	Ground
8	BT_DEVICE_WAKE	I	-
9	GND	P	Ground
10	BT_HOST_WAKE	I	-
11	GND	P	Ground
12	EMT_SYNC	I	-
13	BT_CTS_IC	O	-
14	VDD_3P3	P	+3.3V power input
S1	GND	P	Ground
S2	GND	P	Ground

3. Product Specification

3.1 RF Specification

Bluetooth 3.0

Items	Contents			
	Min.	Typ.	Max.	Unit
- TX Characteristics -				
1. Power Levels				
BT Output Power (Basic Data Rate)	-6	1.5	4	dBm
2. Initial Carrier Frequency Tolerance				
Average Offset	-75	6	75	kHz
3. Carrier Drift				
Drift Rate				
DH1	-20	-4	20	kHz/50us
DH3	-20	-4	20	kHz/50us
DH5	-20	-5	20	kHz/50us
Average Drift				
DH1	-25	-1	25	kHz
DH3	-40	0	40	kHz
DH5	-40	0	40	kHz
4. Modulation Characteristic				
F1avg	140	150	175	kHz
F2max	115	140		kHz
F1/F2 Ratio	0.8	0.96		
5. EDR Relative Transmit Power				
2Mbps: P[DQPSK]-P[GFSK]	-4	0.25	1	dB
3Mbps: P[8DPSK]-P[GFSK]	-4	0.25	1	dB
6. EDR Carrier Frequency Stability and Modulation Accuracy				
2Mbps: $\pi/4$ DQPSK				
Initial Frequency Error: ω_i	-75	-3	75	kHz
Frequency Error: ω_0	-10	-2	10	kHz
Block Frequency Error: $\omega_i + \omega_0$	-75	-5	75	kHz
RMS DEVM	-	0.05	0.2	
Peak DEVM	-	0.12	0.35	
99% DEVM (% Symbols ≤ 0.3)	99%	100%		
3Mbps: 8DPSK				
Initial Frequency Error: ω_i	-75	-9	75	kHz
Frequency Error: ω_0	-10	-1.5	10	kHz
Block Frequency Error: $\omega_i + \omega_0$	-75	-10	75	kHz
RMS DEVM	-	0.05	0.13	

Peak DEVM	-	0.13	0.25	
99% DEVM (% Symbols <=0.13)	99%	100%		

Items	Contents			
Specification	BT3.0			
Frequency range	2.4GHz~2.4835GHz			
Data rate	1Mbps, 2Mbps, 3Mbps			
- RX Characteristics -	Min.	Typ.	Max.	Unit
1. Minimum Input Level Sensitivity				
GFSK (1Mbps)	-	-90	-83	dBm
$\pi/4$ DQPSK (2Mbps)	-	-90	-83	dBm
8DPSK (3Mbps)	-	-85	-77	dBm
2. Maximum Input Level				
GFSK (1Mbps)	-20	0		dBm
$\pi/4$ DQPSK (2Mbps)	-20	-14		dBm
8DPSK (3Mbps)	-20	-14		dBm

3.2 Electrical Specification

3.2.1 Recommended operating rating

Element	Symbol	Min	Typ	Max	Unit
DC supply voltage	UV+	3.0	3.3	3.6	(V)

3.2.2 DC Characteristics

Symbol	Parameter	Min	Typ	Max	Unit
STBY3.3V	Supply voltage	3.0	3.3	3.6	(V)
	Tx Current	--	40	50	(mA)
	Rx Current	--	26	32	(mA)
	Standby Current		5	7	(mA)

3.2.3 ESD Information

Mode	Level	Unit
HBM	+/-1500	V
MM	+/-200	V



Industry Canada statement:

This device complies with RSS-210 of the Industry Canada 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.

Ce dispositif est conforme à la norme CNR-210 d'Industrie Canada applicable aux appareils radio exempts de licence. Son fonctionnement est sujet aux deux conditions suivantes: (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

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 is intended only for OEM integrators under the following conditions:

(For module device use)

- 1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
 - 2) The transmitter module may not be co-located with any other transmitter or antenna.
- As long as 2 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

Cet appareil est conçu uniquement pour les intégrateurs OEM dans les conditions suivantes: (Pour utilisation de dispositif module)

- 1) L'antenne doit être installée de telle sorte qu'une distance de 20 cm est respectée entre l'antenne et les utilisateurs, et
 - 2) Le module émetteur peut ne pas être coimplanté avec un autre émetteur ou antenne.
- Tant que les 2 conditions ci-dessus sont remplies, des essais supplémentaires sur l'émetteur ne seront pas nécessaires. Toutefois, l'intégrateur OEM est toujours responsable des essais sur son produit final pour toutes exigences de conformité supplémentaires requis pour ce module installé.

IMPORTANT NOTE:



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In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the Canada authorization is no longer considered valid and the IC 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 Canada authorization.

NOTE IMPORTANTE:

Dans le cas où ces conditions ne peuvent être satisfaites (par exemple pour certaines configurations d'ordinateur portable ou de certaines co-localisation avec un autre émetteur), l'autorisation du Canada n'est plus considéré comme valide et l'ID IC ne peut pas être utilisé sur le produit final. Dans ces circonstances, l'intégrateur OEM sera chargé de réévaluer le produit final (y compris l'émetteur) et l'obtention d'une autorisation distincte au Canada.

End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains IC: 2878D-J20H070".

Plaque signalétique du produit final

Ce module émetteur est autorisé uniquement pour une utilisation dans un dispositif où l'antenne peut être installée de telle sorte qu'une distance de 20cm peut être maintenue entre l'antenne et les utilisateurs. Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante: "Contient des IC: 2878D- J20H070".

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.

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

Manuel d'information à l'utilisateur final

L'intégrateur OEM doit être conscient de ne pas fournir des informations à l'utilisateur final quant à la façon d'installer ou de supprimer ce module RF dans le manuel de l'utilisateur du produit final qui intègre ce module.

Le manuel de l'utilisateur final doit inclure toutes les informations réglementaires requises et avertissements comme indiqué dans ce manuel.



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Federal Communication Commission Interference 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.

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 transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

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

- 1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
- 2) The transmitter module may not be co-located with any other transmitter or antenna.



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As long as 2 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed

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 reevaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains FCC ID: MCLJ20H070". The grantee's FCC ID can be used only when all FCC compliance requirements are met.

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.

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

CE statement:

Declare under our own responsibility that the product J20H066 to which this declaration refers conforms with the relevant standards according to the regulation in Article 3.1.a, 3.1.b and 3.2 of the R&TTE Directive

1999/5/EEC of the European Community

Applied Standards:

- ETSI EN 300 328 V1.7.1
- ETSI EN 301 489-1
- ETSI EN 301 489-17

- ETSI EN 62479
- IEC/EN 60950-1

National Authorities were informed according to Article 6.4 of Frequency Notification.
Special Requirements are considered. The product is labeled with CE Marking.



Any unauthorized modification of the product voids this declaration.

This product can be used in the following countries

AT	BE	CY	CZ
DK	EE	FI	FR
DE	GR	HU	IE
IT	LV	LT	LU
MT	NL	PL	PT
SK	SI	ES	SE
GB	IS	LI	NO
CH	BG	RO	TR

For Taiwan 警語：(電信管制射頻器材使用)

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:  XXXyyyLPDzzzz-x (NCC ID) 」字樣

