

User Manual

Project Name	IEEE802.11 b/g/n Module
FOXCONN Part No.	T77H505.00



COMPANY CONFIDENTIAL Content

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1. Introduction

The T77H505.00 802.11b/g/n module provides wireless modem functionality utilizing direct sequence spread spectrum and OFDM/CCK technology. This module is based on Broadcom BCM43143KMLG solution that is integrated 2.4GHz IEEE802.11 b/g/n (MAC/PHY/Radio), 2.4GHz power amplifier (PA) and integrated T/R switch, power management unit (PMU), and SDIO 2.0 interface.

1.1 Scope

The wireless LAN is compliant to IEEE 802.11b and IEEE 802.11g and IEEE 802.11n standard. The data rate of 802.11b is up to 11Mbps and fallback rates of 5.5, 2, 1Mbps. The data rate of 802.11g is up to 54Mbps and fallback rates of 48,36,24,18,12,9, 6Mbps. The data rate of 802.11n HT20 with 800ns GI is up to 65Mbps and fallback rates of 58.5, 52, 39, 26, 19.5, 13, 6.5Mbps; the data rate of 802.11n HT20 with 400ns GI is up to 72.2Mbps and fallback rates of 65, 57.8, 43.3, 28.9, 21.7, 14.4, 7.2Mbps. The data rate of 802.11n HT40 with 800ns GI is up to 135Mbps and fallback rates of 121.5, 108, 81, 54, 40.5, 27, 13.5Mbps. The data rate of 802.11n HT40 with 400ns GI is up to 150Mbps and fallback rates of 135, 120, 90, 60, 45, 30, 15Mbps.

1.2 Function

- IEEE802.11b/g/n (1X1) based on Broadcom 43143 solutions.
- SDIO v2.0 (50MHz, 4-bit and 1-bit) host Interfaces.
- The module with a 3.3V +/- 10% supply powers from host.
- One 2.4GHz PCB printing antennas.
- Uses BCM43143 integrated OTP memory instead of external EEPROM.
- RoHS and Green Compliant.

1.3 Electrical Characteristics

Parameter	Minimum	Typical	Maximum	Units
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Frequency Range		2.4	~	2.5	GHz
Current Consumption		-	-	600	mA
Input Supply Voltage	Recommended Operating voltage	3.14	3.3	3.47	V
Current Consumption	TX CCK 11Mbps 17dBm	-	227.2	-	mA
	TX OFDM 54Mbps 13dBm	-	162.7	-	mA
	TX HT20 MCS7 12dBm	-	212.8	-	mA
	TX HT40 MCS7 12dBm	TBD	TBD	TBD	mA
	Rx HT20	-	78.4	-	mA
TX Output Power	CCK	15	17	19	dBm
	OFDM BPSK	11	13	15	dBm
	OFDM QPSK	11	13	15	dBm
	OFDM 16QAM	11	13	15	dBm
	OFDM 64QAM	11	13	15	dBm
	MCS0~7	10	12	14	dBm
Storage Temperature		-30	-	85	°C
Storage Humidity		0	-	90	%
ESD Level	HBM	-	1K		V
	MM	-	200		V

1.4 SDIO 2.0 Characteristics

The SDIO interface supports all of the SDIO version 2.0 modes:

- 1- bit SDIO-SPI mode (25Mbps)
- 1- bit SDIO-SD mode (25Mbps)
- 4- bit SDIO-SD default speed mode (100Mbps)
- 4- bit SDIO-SD high-speed mode (200Mbps)

2. WIFI ALLIANCE CONFORMANCE

The Module is certified by the Wi-Fi Alliance. The Module and standard PC driver passes the Wi-Fi System Interoperability Test Plan including the following:

A. IEEE 802.11-2007 Standard for LAN/MAN

Specific requirements Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications

B. IEEE P802.11n-2009 Standard for Information Technology

Telecommunications and information exchange between systems - Local and metropolitan area networks – Specific requirements - Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications Amendment 5: Enhancements for Higher Throughput

C. Supported Security

- WPA™ and WPA2™ (Personal) support for powerful encryption and authentication
- AES and TKIP acceleration hardware for faster data encryption
- Secure Easy setup for simple Wi-Fi setup and WPA2/WPA security configuration

3. Hardware Specification

Parameter	Typical	Units
Operating frequency range	2400 ~ 2500	MHz
Antenna gain (max)	2.46	dBi

4. Product Requirements

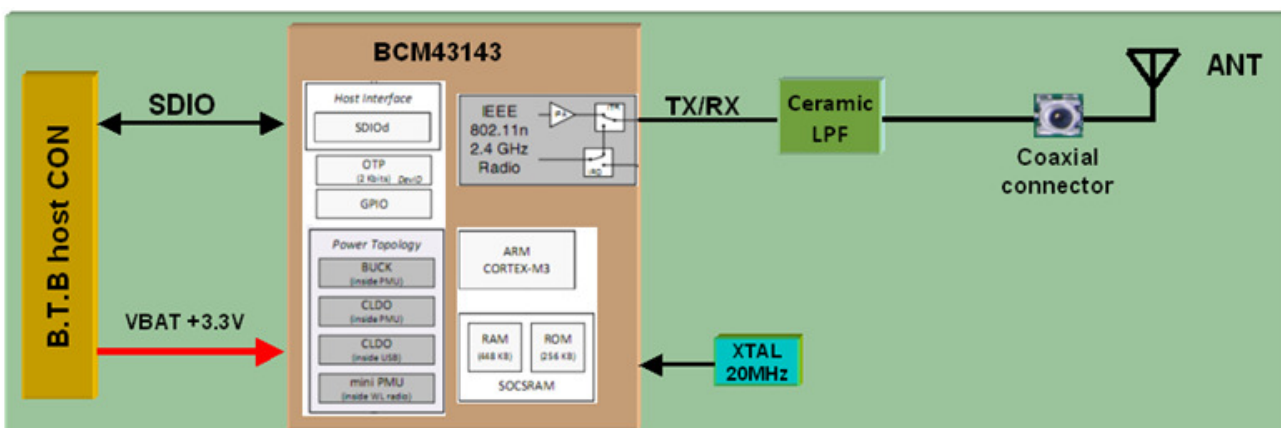
4.1 Hardware Requirements

Form factor	32mmx23mm module with 8-pin B.T.B connector
Host Interface	SDIO2.0 interface
PCB	4-layer design
Antenna connector	RF switch connector

4.2 Hardware Architecture

The T77H505.00 802.11b/g/n module provides wireless modem functionality utilizing direct sequence spread spectrum and OFDM/CCK technology. This module is based on Broadcom BCM43143KMLG solution that is integrated 2.4GHz IEEE802.11 b/g/n (MAC/PHY/Radio), 2.4GHz power amplifier (PA) and integrated T/R switch, power management unit (PMU), and SDIO 2.0 interface.

The functional block diagram is shown as below.



5. Environmental Requirements

Operating Temperature Conditions

The product shall be capable of continuous reliable operation when operating in ambient temperature of -5 °C to 60 °C.

Non-Operating Temperature Conditions

Neither subassemblies shall be damaged nor shall the operational performance be degraded when restored to the operating temperature when exposed to storage temperature in the range of -20 °C to +85 °C.

Operating Humidity Conditions

The product shall be capable of continuous reliable operation when subjected to relative humidity in the range of 0% and 90% non-condensing.

Non-Operating Humidity conditions

The product shall not be damaged nor shall the performance be degraded after exposure to relative humidity.

6. Test Operating Instructions Info

Please refer to another file named "Test SOP for T77H505.00 projects".



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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.

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



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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 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: B3QT77H505". 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

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