



CYPRESS
ENVIROSYSTEMS

Part Number: WiFi3309701
Ultra Low-Power 802.11b Transceiver
Module
OEM User Manual

FCC ID: W3I-WIFI3309701
IC: 8266A-WIFI3309701

Revision 02
March 12, 2009

Copyrights

Copyright 2009 by Cypress Envirosystems. All rights reserved. The information in this document is subject to change without notice. While reasonable precautions have been taken, Cypress assumes no responsibility for any errors that may appear in this document. No part of this document may be copied or reproduced in any form or by any means without the prior written consent of Cypress.

Disclaimer

CYPRESS MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARD TO THIS MATERIAL, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Cypress reserves the right to make changes without further notice to the materials described herein. Cypress does not assume any liability arising out of the application or use of any product described herein. Cypress does not authorize its products for use in mission or safety critical systems or where a malfunction or failure may reasonably be expected to result in significant injury to the user. The inclusion of 'Cypress' product in mission or safety critical system applications implies that the manufacturer assumes all risk of such use and in doing so indemnifies Cypress against all charges. In no event is Cypress liable to anyone for any indirect, special or consequential damages.

ELECTRICAL PERFORMANCE

Absolute Maximum Ratings

Parameters	Symbol	Min.	Typical	Max.	Units
Storage Temp	T_{ST}	-55		+125	°C
Supply Voltage	V_{RTC}, V_{bat}	-0.5		4.0	V

Operating Conditions

Parameters	Symbol	Min.	Typical	Max.	Units
Extended Temp	T_A	-40		+85	°C
Supply Voltage	V_{RTC}, V_{bat}	1.2		3.6	V
Supply Current			60		mA
Sleep Current			7.2		mA
Deep Sleep			110		uA
Standby Current			5		uA

Power Consumption

Parameters	Voltage	Current	Power	Units
Standby (RTC only)	1.2	1.17uA	1.4	uW
	1.5	1.34uA	2.01	
	2.4	3.79uA	9.1	
	2.2	4.7uA	15.5	
	3.6	5.0uA	18	
Deep Sleep	1.8	130uA*	.260**	mW
	3.3	20uA*	.060	
Processor Sleep	1.8	7.2mA	13	mW
WLAN CPU 22MHz running from Flash	1.8	21.5mA	38.8	mW
APP CPU running from FLASH** 11MHz 22MHz 44MHz	1.8	13.4mA	26.8	mW
		17.2mA	34.4	
		22.8mA	45.6	
APP CPU running from RAM** 11MHz 22MHz 44MHz	1.8	10.1mA	20.2	mW
		13.3mA	26.7	
		21.2mA	42.4	
Both CPUs running from FLASH	1.8	31.1mA	62.2	mW
Listen Mode	1.8	150mA	300	mW
	3.3	100uA	.300	
Receive Mode	1.8	144mA	289	mW
	3.3	100uA	.300	
Transmit Mode (internal PA = 9dBm)** External PA = 20dBm**	1.8	152mA	304	mW
	3.3	90mA	330	
Program Flash	1.8	152mA	304	mW
	3.3	200mA	733	
<p>Notes:</p> <p>* Accounts for 1.8V $I_q=20uA$ typ and 3.3V $I_q=20uA$ typ.</p> <p>** Accounts for 90% switching efficiency of the 1.8V switcher.</p>				

I/O DC Specifications

Parameters	Symbol	Min.	Typical	Max.	Units
Logical Output High	V_{OH}	$V_{dd}-0.4$		V_{dd}	V
Logical Output Low	V_{OL}	0		0.4	V
Logical Input High	V_{IH}	$0.8*V_{dd}$			V
Logical Input Low	V_{IL}			$0.25*V_{dd}$	V

Notes: $V_{dd}=V_{dd-IO}= 1.8V$ or $3.3V$ typical depending on device programming jumpers. See power supply section for voltage variability.

Power Supply Specifications

Parameters	Symbol	Min.	Typical	Max.	Units
3.3V Power Supply	$V_{3.3}$	3.0	3.3	3.63	V
Supply Current Source	$I_{3.3}$			800	mA
3.3V Quiescent Current	$I_{q,3.3}$		20	30	uA
1.8V Power supply	$V_{1.8}$	1.62	1.8	1.98	V
Supply Current Source	$I_{1.8}$			600	mA
1.8V Quiescent Current	$I_{q,1.8}$		20	30	uA
3.3V RF Supply	$V_{3.3RF}$	3.0	3.3	3.63	V
1.8V RF Supply	$V_{1.8RF}$	1.62	1.8	1.98	V

Notes:

Radio Parameters

Parameters	Min.	Typical	Max.	Units	Notes
RF Frequency					
Bit Rate					
External Power Amplifier					
Output power (rms)		20	21	dBm	Modulated single, balanced 100 ohm
GS PA Module Output					
Output power (rms)		10	12	dBm	
Receiver Specifications					
2.4GHz band RF input return loss			-10	dB	
Receiver Sensitivity, front end losses not included		-90 -92		dBm	2Mbps QPSK 8% PER 1Mbps QPSK 8% PER

Notes:

ADC Parameters

Parameters	Min.	Typical	Max.	Units	Notes
ADC Resolution		10		bits	
ADC Sample Freq			32	kHz	
ADC Offset Error	-10		10	mV	
ADC Gain Error	-10		10	mV	
Supply Current		400	800	uA	1.8V supply
Input Resistance	1			MΩ	
Bandgap (V_{ref})	1.159	1.22	1.281	V	

Notes:

User Guide Information

Electronic device manufacturers using Cypress Envirosystems modular approval are required to place the below text in their product user's guide in accompaniment with other regulatory information. The text may be disbursed according to language or geographic regions if desired, but the exact text shown below must be maintained.

§ 15.19 Labeling Requirements:

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.

**When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (a) of this section on it, the information required by this paragraph shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed. However, the FCC identifier or the unique identifier, as appropriate, must be displayed on the device.

§15.21 Statement - for all intentional and unintentional radiators.

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

§15.105 Statement (for digital devices)

For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

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 to 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.*

Note: Changes or modifications not expressly approved by the manufacturer responsible for compliance could void the user's authority to operate the 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.

RF Exposure info:

This equipment complies with the FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

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

The antennas used for this transmitter must be installed to provide a separation distance of at least 20cm from all persons and must not be located or operating in conjunction with any other antenna or transmitter.

Antenna Support:

Up to 7.4dBi Omni tested under FCC part 15.247 rules.

Certified with:

- NKG SF-245WR (7.4dBi)
- Centurion NanoBlue-FL04 (2.0dBi)

Co-location of Additional Transmitters

Digital Electronic Devices manufacturers using this MA grant should refer to Appendix B (FCC Grant #) for end-products using two or more co-located RF transmitters. This grant states:

"This modular transmitter is approved for use in Digital Electronic Devices and may operate in conjunction with other mobile and portable transmitters in the same device; provided, the other mobile and portable transmitters have satisfied the appropriate RF exposure requirements contained in the FCC rules. The grantee must also provide Digital Electronic Device integrators, or end users if marketed directly to end users, with installation and operating instructions for satisfying RF exposure requirements. The Grantee must inform second manufacturers/installers that in order for this module to be operated in any configuration other than that permitted in the preceding sentences, a separate FCC equipment authorization must be obtained for each device into which this module is installed."

This modular approval is granted provided Digital Electronic Devices manufacturers assume responsibility for ensuring that other transmitters operating in conjunction with the WiFi3309701 comply with RF exposure requirements associated with their use. The use of one or more additional RF transmitters will require review by the FCC and may require end-product recertification, including the WiFi3309701 to ensure emissions compliance and RF safety. It is the sole responsibility of the Digital Electronic Device manufacturer to obtain end-product regulatory compliance for configurations including two or more RF transmitters.

Product Labeling Requirements

FCC product labeling requirements stipulate an FCC label, including specific text, be placed on the device containing the WiFi3309701 module. The product label must include the following text and must be affixed to the exterior of the OEM's product.

“Contains FCC ID: W3I-WIFI3309701”

Industry Canadian Regulatory Approval

Industry Canada regulatory approval typically conforms to the FCC in terms of emission levels and other regulatory requirements. It is the position of the Industry Canada agency that the OEM primarily responsibility for ensuring end product compliance. Cypress Envirosystems as grantee and supplier of the module maintains responsibility for the Modular Approved design.

Product Labeling Requirements

Industry Canada product labeling requirements stipulate that specific text be placed on the device containing the WiFi3309701 module. The product label must include the following text and must be affixed to the exterior of the OEM's product. The same information must be included in the product user manual.

“Contains IC: 8266A-WIFI3309701”

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Europe

Regulatory Marking

The equipment shall be marked, where applicable, in accordance with CEPT/ERC Recommendation 70-03 or Directive 1999/5/EC, whichever is applicable. Where this is not applicable, the equipment shall be marked in accordance with the National Regulatory requirements.

CE Marking

The equipment shall be marked in a visible place. This marking shall be legible and durable.

In cases where the devices are too small to carry legible marking, it is sufficient to provide the relevant information in the user's manual and on the product packaging.

DECLARATION OF CONFORMITY

Cypress Envirosystems
198 Champion Court
San Jose, CA 95134
USA

declare under our sole responsibility that the product(s)

WiFi3309701

to which this declaration relate(s) is in conformance with the following standards:

ETSI EN 300 328-2: 2001-12 (Article 3.2 of R&TTE Directive)
ETSI EN 301 489-1 (2000-08)
ETSI EN 301 489-17 (Article 3.1(b) of R&TTE Directive)

following the provisions of the 73/23/EEC and 89/336/EEC Directives.