User Manual

WF-RF915

FCC ID:2AEQB-WXFLW001

IC:23187-WXFLW001

1 Description

The WF-RF915 SOC RF module contains a 32-but ARM® Cortex®-M4 core with 32 kB ram and 256 kB flash running at 38.4 Mhz. The built in 915Mhz @ 7.4dBm radio has the capability to transmit over long distances using little power.

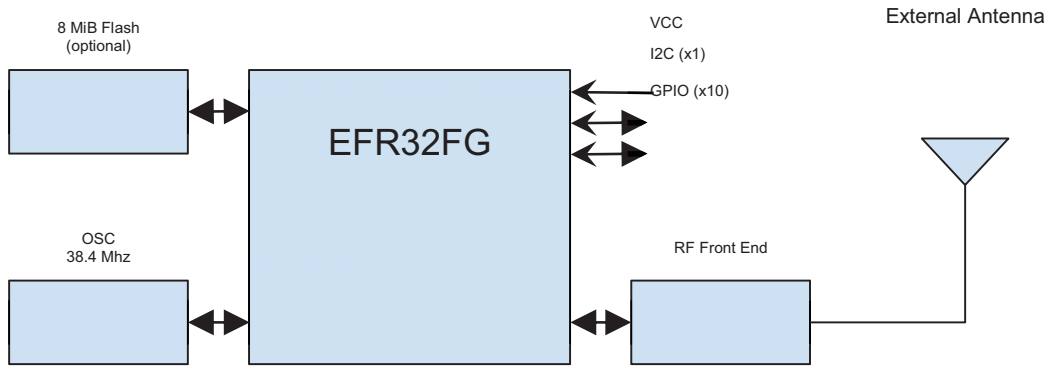
2 Application

Smart Weatherstation Control and Communications.

3 Features

- 32-bit ARM® Cortex®-M4 core
- Autonomous Hardware Crypto Accelerator and Random Number Generator
- Integrated balun for 7.4 dBm transmit power

4 Block Diagram



5 Pin Description

5.1 Pin Map

Pin No.	Signal Name	Type	Pin Name	Description
1	Ground	SIG	-	Ground
2	NC	-	-	
3	I2C_SDA	IO	PD15	I2C #0 SDA
4	I2C_SCL	IO	PD14	I2C #0 SDC
5	Port A0	IO	PA0	GPIO 1
6	Port A1	IO	PA1	GPIO 2
7	Port B11	IO	PB11	GPIO 3
8	Port B12	IO	PB12	GPIO 4
9	Port B13	IO	PB13	GPIO 5
10	Ground	SIG	-	Ground
11	Ground	SIG	-	Ground
12	VCC 3.3	SIG	-	Power Supply 3.3v
13	Port C11	IO	PC11	GPIO 6
14	Port F0	IO	PF0	GPIO 7
15	Port F1	IO	PF1	GPIO 8
16	Port F2	IO	PF2	GPIO 9
17	Port F3	IO	PF3	GPIO 10
18	RESET	IO	NRST	RESET_N
19	NC	-	-	
20	Ground	SIG	-	Ground

6 Electrical Specification

6.1 Absolute Maximum Ratings

Stresses above those listed below may cause permanent damage to the device. This is a stress rating only and functional operation of the devices at those or any other conditions above those indicated in the operation listings of this specification is not implied. Exposure to maximum rating conditions for extended periods may affect device reliability.

Table 6.0

Parameter	Min	Typ	Max	Unit
Storage Temperature Range	-50	-	150	℃
External main supply voltage	0	-	3.8	V
External main supply voltage ramp rate	-	-	1	V / µs
Voltage on any 5V tolerant GPIO pin[1]	-0.3	-	Min of 5.25 and IOVDD + 2	V
Voltage on non-5V tolerant GPIO pins	-0.3	-	IOVDD + 0.3	V
Voltage on HFXO pins	-0.3	-	1.4	V
Voltage differential between RF pins (2G4RF_IOP - 2G4RF_ION)	-50	-	50	mV
Absolute Voltage on RF pins 2G4RF_IOP and 2G4RF_ION	-0.3	-	3.3	V
Voltage differential between RF pins (SUBGRF_IP - SUBGRF_IN)	-50	-	50	mV
Absolute Voltage on RF pins SUBGRF_IP, SUBGRF_IN, SUBGRF_OP, and SUBGRF_ON	-0.3	-	3.3	V
Total current into VDD power lines (source)	-	-	200	mA
Total current into VSS ground lines (sink)	-	-	200	mA
Current per I/O pin (sink)	-	-	50	mA
Current per I/O pin (source)	-	-	50	mA
Current for all I/O pins (sink)	-	-	200	mA

Current for all I/O pins (source)	-	-	200	mA
Voltage difference between AVDD and VREGVDD	-	-	0.3	V
Junction Temperature	-40	-	105	℃

Note:
1. When a GPIO pin is routed to the analog module through the APORT, the maximum voltage = IOVDD.

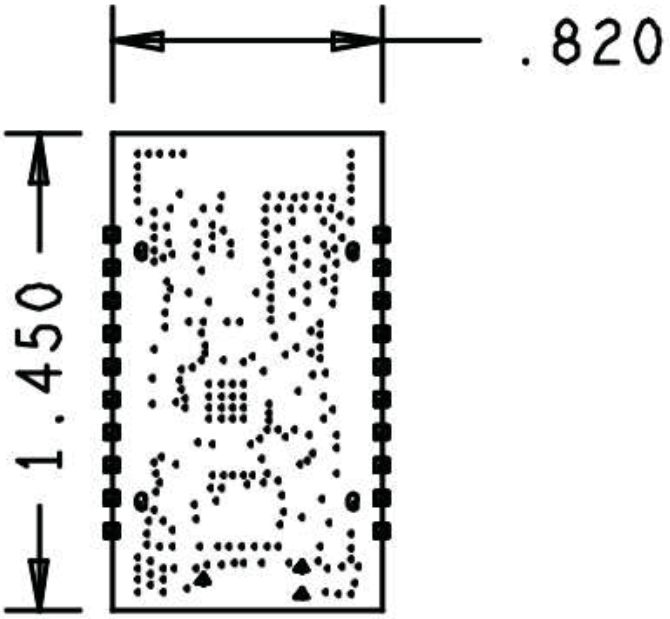
6.2 General Operating Conditions

Parameter	Test Condition	Min	Typ	Max	Unit
Operating temperature range	-G temperature grade, Ambient Temperature	-40	25	85	℃
AVDD Supply voltage1		1.85	3.3	3.8	V
VREGVDD Operating supply voltage[1 2]	DCDC not in use. DVDD externally shorted to VREGVDD	2.4	3.3	3.8	V
VREGVDD Current	DCDC in bypass	-	-	200	mA
RFVDD Operating supply voltage		1.62	-	VREGVDD	V
DVDD Operating supply voltage		1.62	-	VREGVDD	V
PAVDD Operating supply voltage		1.62	-	VREGVDD	V
IOVDD Operating supply voltage		1.62	-	VREGVDD	V
Difference between AVDD and VREGVDD, ABS(AVDD- VREGVDD)		-	-	0.1	V
HFCLK frequency	0 wait-states (MODE = WS0) [3]	-	-	26	MHz
	1 wait-states (MODE = WS1) [3]	-	-	40	MHz

Note:
1. VREGVDD must be tied to AVDD. Both VREGVDD and AVDD minimum voltages must be satisfied for the part to operate.
2. The minimum voltage required in bypass mode is calculated using RBYP from the DCDC specification table. Requirements for other loads can be calculated as VDVDD_min+ILOAD * RBYP_max 3. In MSC_READCTRL register

7 Mechanical Specification

7.1 Mechanical Size



8 Reflow Profile

Recommended reflow profile is JEDEC/IPC J-STD-020 specification.

9 Antenna Options

The default antenna option is a dipole antenna soldered directly to module.

10 Handling and Storage

The WXFLW001 module contain electronic components that are sensitive to ESD. Proper handling procedures must be used in order to prevent damage to the module.

The module should not be subjected to excessive mechanical shock.

Table of Contents

FCC 15.19

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.

FCC Compliance Statement

Any changes or modifications not expressly approved by the party responsible for compliance could void your 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.

RF exposure statements
1. This Transmitter must not be co‑located or operating in conjunction with any other antenna or transmitter.
2. This equipment complies with 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 or nearby persons.

Canadian Compliance Statement

This device complies with Industry Canada license-exempt RSSs. 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;
2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, meme si le brouillage est susceptible d'en compromettre le fonctionnement.

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.

Labelling Requirements for the Host device
The host device shall be properly labelled to identify the modules within the host device. The certification label of the module shall be clearly visible at all times when installed in the host device, otherwise the host device must be labelled to display the FCC ID and IC of the module, preceded by the words "Contains transmitter module", or the word "Contains", or similar wording expressing the same meaning, as follows:
Contains FCC ID: 2AEQB-WXFLW001
Contains IC: 23187-WXFLW001

Exigences d'étiquetage pour le périphérique hôte Le périphérique hôte doit être correctement étiqueté pour identifier les modules dans le périphérique hôte. L'étiquette de certification du module doit être clairement visible à tout moment lorsqu'elle est installée dans le dispositif hôte, sinon le périphérique hôte doit être étiqueté pour afficher l'ID FCC et le circuit intégré du module, précédés des mots «Contient le module émetteur» ou le mot «Contient», ou un libellé similaire exprimant le même sens, comme suit:
Contient l'ID FCC: 2AEQB-WXFLW001
Contient l'IC: 23187-WXFLW001