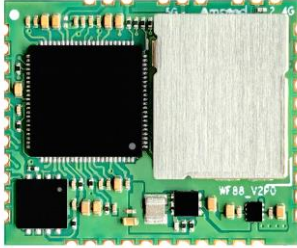


Wi-Fi Mesh Module
WF88

Amp'ed RF Technology, Inc.

WF88 Product Specification



Description

Amp'ed RF Tech presents the WF88 Wi-Fi dual band, 2.4/5GHz IoT module. The WF88 is a small footprint low cost RF module, supporting IPV6 and Mesh networking 300m range line-of-sight. Intended to help customers shorten product development cycles and reduce cost, this module is ready to go. Typical applications include:

- Remote metering
- IoT applications
- Mesh networks
- Smart home control
- Industrial control

Features

Hardware

- Wi-Fi: ACC1340
- Linux CPU
- WF88-EX: 24mm x 20mm
- SDIO/ethernet/USB/I2C

WLAN

- 802.11a/b/g/n
- Dual Band: 2.4/5GHz
- Output Power, +21dBm
- IPV6
- Mesh networking
- Security: WPA3
- OTA/OTAP support

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1. Hardware Specifications

General Conditions 25°C

1.1. Recommended Operating Conditions

Rating	Min	Typical	Max	Unit
Operating Temperature Range	-20	-	70	°C
Supply Voltage VDD	3.0	3.3	3.6	Volts
Supply Voltage VDD_PA	3.0	3.3	3.6	Volts
Signal Pin Voltage	-	3.3	-	Volts
RF Frequency for 2.4G	2400	-	2483.5	MHz
RF Frequency for 5G	5150	-	5850	MHz

1.2. Absolute Maximum Ratings

Rating	Min	Typical	Max	Unit
Storage temperature range	-40	-	+80	°C
Supply Voltage VDD	-0.3	-	+4.8	Volts
Supply Voltage VDD_PA	-0.3	-	+4.8	Volts
I/O pin voltage VIO	-0.3	-	+4.8	Volts
RF input power	-	-	-5	dBm

1.3. I/O Operating Conditions

Symbol	Parameter	Min	Max	Unit
V _{IL}	Low-Level Input Voltage	-	1.2	Volts
V _{IH}	High-Level Input Voltage	2.2	-	Volts
V _{OL}	Low-Level Output Voltage	-	0.2	Volts
V _{OH}	High-Level Output Voltage	2.95	-	Volts
I _{OL}	Low –Level Output Current	-	4.0	mA
I _{OH}	High-Level Output Current	-	4.0	mA

1.4. Current Consumption

VDD=3.3V VDD_AP=3.3V	Avg	Unit
Standby	2	mA
Active	140	mA
I _{peak} : system maximum peak current draw	300	mA

1.5. Selected RF Characteristics

Parameters	Conditions	Typical	Unit
Antenna load		50	ohm
Wi-Fi Receiver 5GHz 11n			
Sensitivity	BPSK 6.5Mbps@PER<10%,Nss=1	-91	dBm
Sensitivity	QPSK 13Mbps@PER<10%, Nss=1	-88	dBm
Sensitivity	16QAM 26MbpsPER<10%,Nss=1	-83	dBm
Sensitivity	64QAM 65MbpsPER<10%,Nss=1	-72.5	dBm
Wi-Fi Transmitter 5GHz, 11n			
Output Power	802.11n MCS-1	21	dBm

1.6. Pin Assignment

1.6.1 WF88-EX

Assignment	Type	Pin	Description
GND		1	
VDD		2	Supply in 3.3V
USB_DP	I/O	3	USB
USB_DM	I/O	4	USB
BOOT	I/O	5	
UART0_RTS	I/O	6	UART RTS
UART0_CTS	I/O	7	UART CTS
UART0_TXD	I/O	8	UART TXD
UART0_RXD	I/O	9	UART RXD
UART1_RXD	I/O	10	UART RXD, debug serial port

UART1_TXD	I/O	11	UART TXD, debug serial port
GMAC_TXEN	I/O	12	
GMAC_TXD1	I/O	13	
GMAC_TXD0	I/O	14	
GMAC_PHY_CLK	I/O	15	
GMAC_TXCLK	I/O	16	
GMAC_RXD1	I/O	17	
GMAC_RXD0	I/O	18	
GMAC_CRS_DV	I/O	19	
GMAC_MDC	I/O	20	
GMAC_MDIO	I/O	21	
GPIO0	I/O	22	
GPIO1	I/O	23	
GMAC_RST_N/PWM1/GPIO2	I/O	24	PWM
PWM2/GPIO3	I/O	25	PWM
I2C_SCK/GPIO4	I/O	26	I2C clock
I2C_SDA/GPIO5	I/O	27	I2C data
GPIO6	I/O	28	GPIO
GPIO7	I/O	29	GPIO
RESET		30	
LPCLK_1V8		31	Low power clock input
VDD_PA		32	Supply in 3.3V
GND		33	
GND		34	
2.4G_ANT	RF	35	RF port
GND		36	
GND		37	
5G_ANT	RF	38	RF port
GND		39	
1V8_OUT		40	
ADC_VREF		41	Voltage reference input, 0.9~1.8V.
ADC_IN		42	Analog input

Note:

1V8_OUT, it can only provide reference for ADC, when the user does not need other values of the ADC_VREF or more stable and accurate ADC_VREF. 1V8_OUT cannot power other circuits.

1.6.2 WF88M

Assignment	Type	Pin #	Description
GND		1	
VDD		2	Supply in 3.3V
I2C_SCK	O	3	I2C clock
I2C_SDA	I/O	4	I2C data line
BOOT	I	5	
UART0_RTS	I/O	6	UART RTS
UART0_CTS	I/O	7	UART CTS
UART0_TXD	I/O	8	UART TXD
UART0_RXD	I/O	9	UART RXD
NC		10-21	
GPIO0	I/O	22	
GPIO1	I/O	23	
GPIO2	I/O	24	
GPIO3	I/O	25	
GPIO4	I/O	26	
GPIO5	I/O	27	
GPIO6	I/O	28	
GPIO7	I/O	29	
RESET	I	30	
LPCLK_1V8	I	31	Low power clock input
VDD_PA		32	Supply in 3.3V
GND		33	
GND		34	

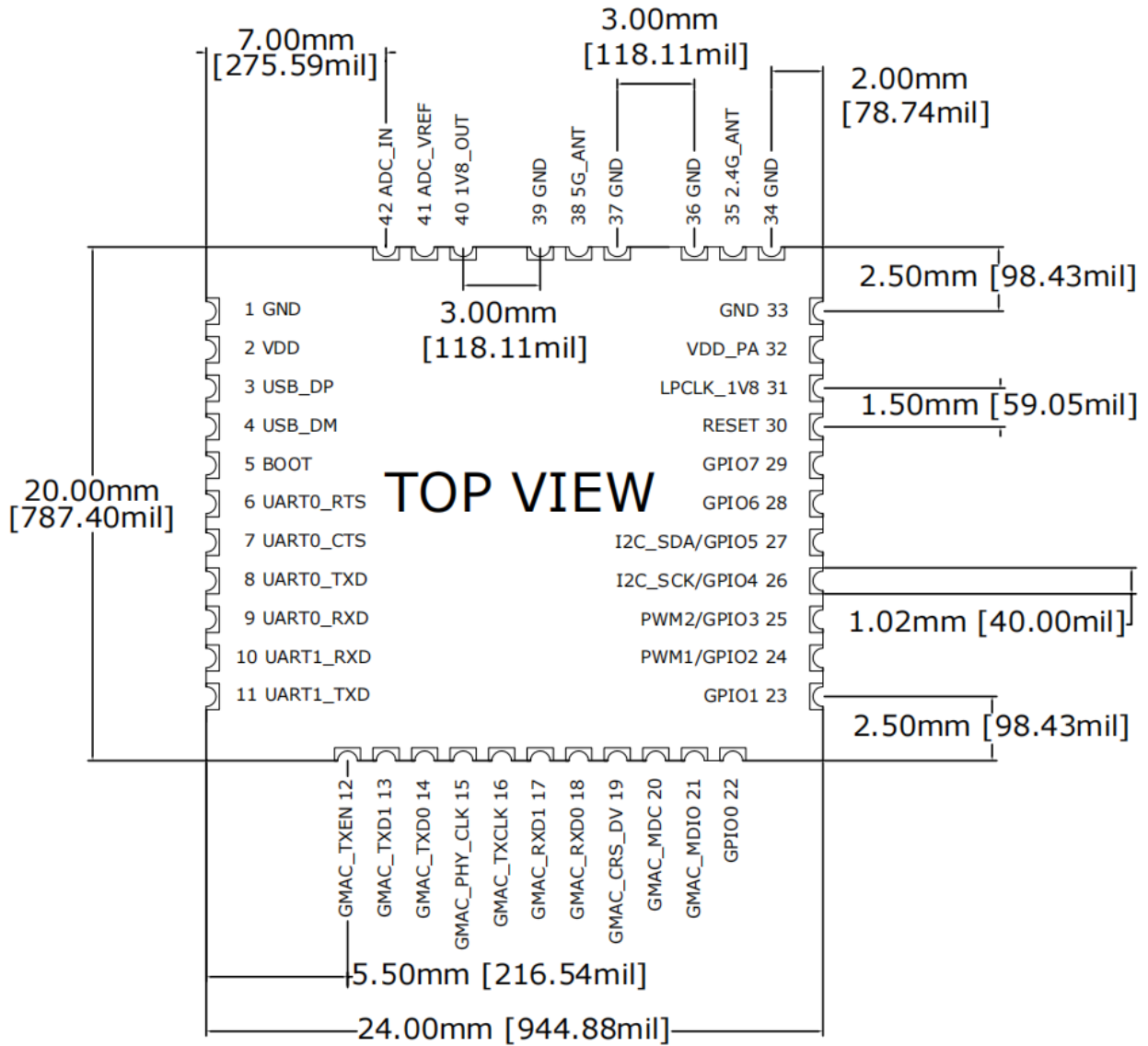
2.4G_ANT	RF	35	RF port
GND		36	
GND		37	
5G_ANT	RF	38	RF port
GND		39	
NC		40	
ADC_VREF		41	Voltage reference input
ADC_IN		42	Analog input

2. Module Drawing

2.1. WF88-EX

Size: 24 mm x 20 mm x 2.8 mm

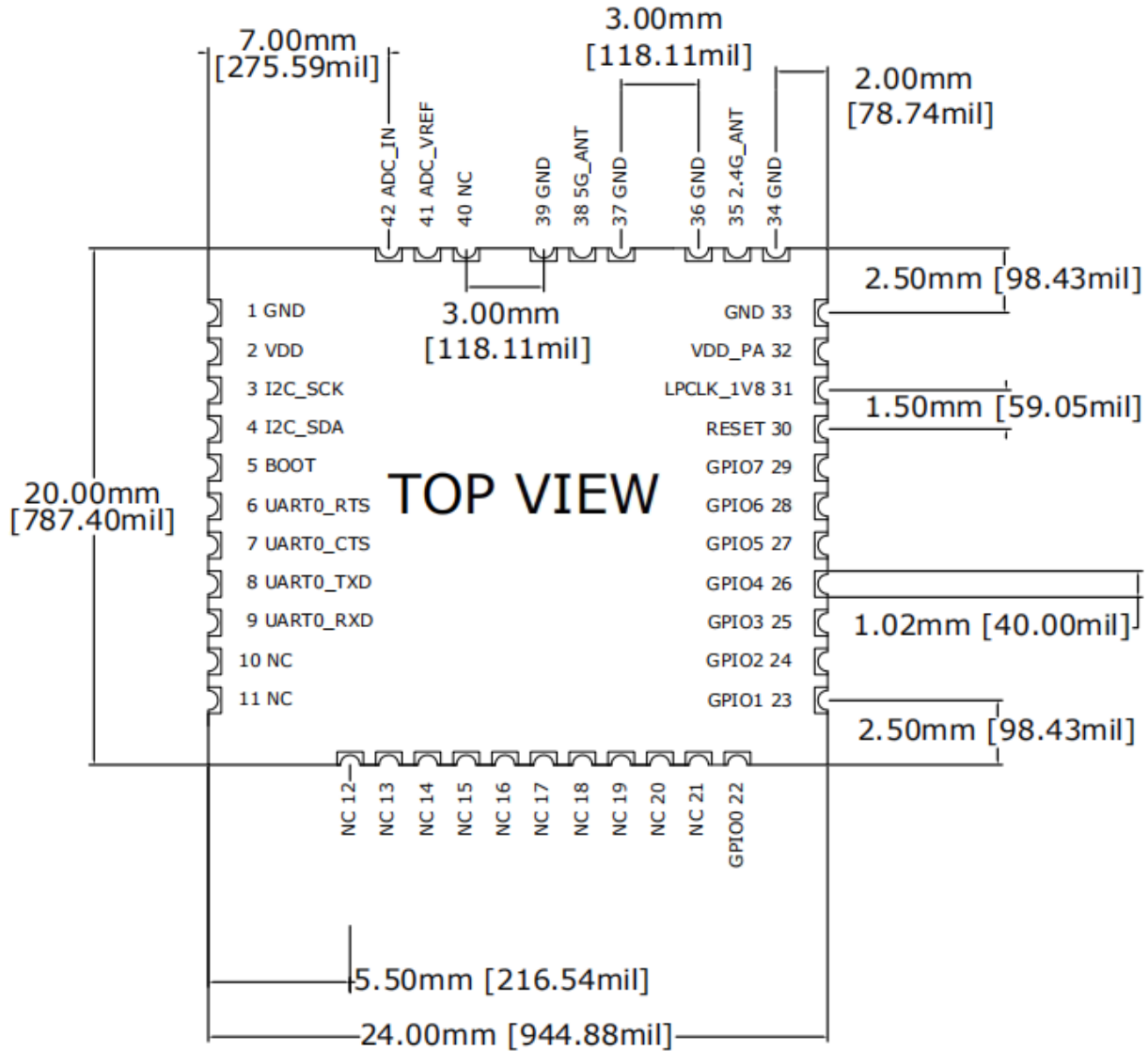
Top view



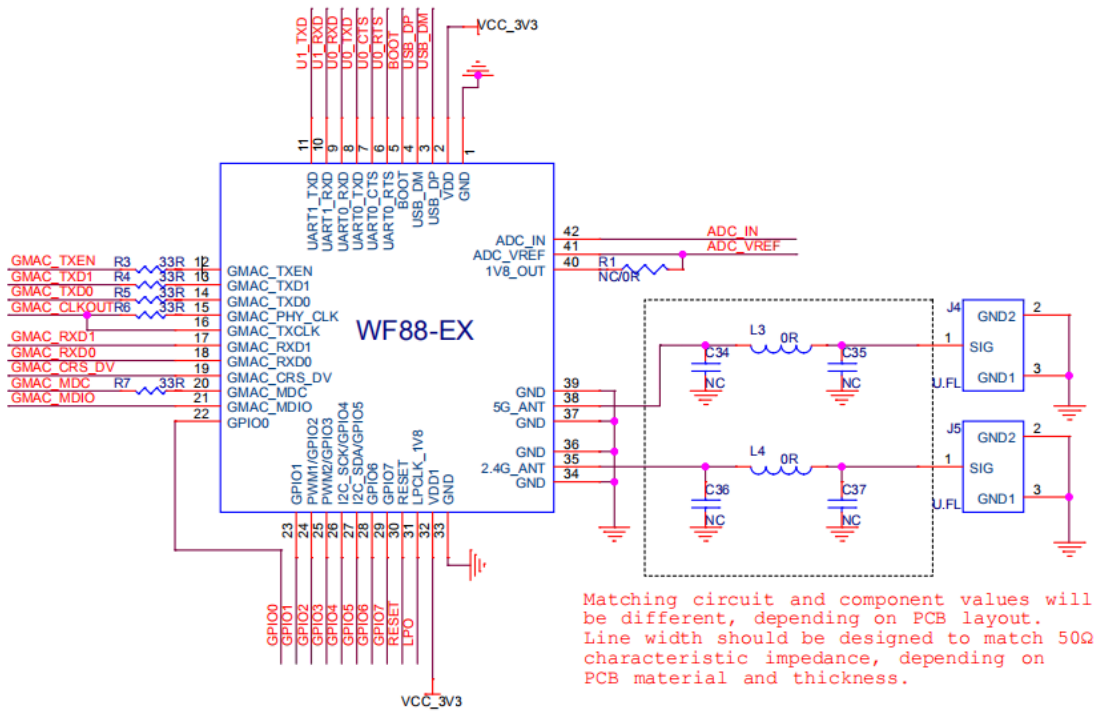
2.2. WF88-M

Size: 24 mm x 20 mm x 2.8 mm

Top view

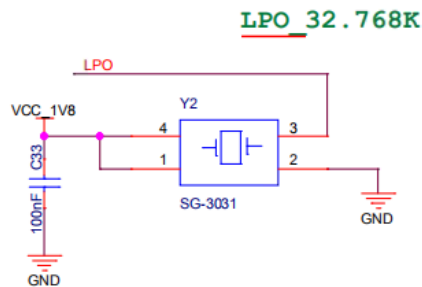
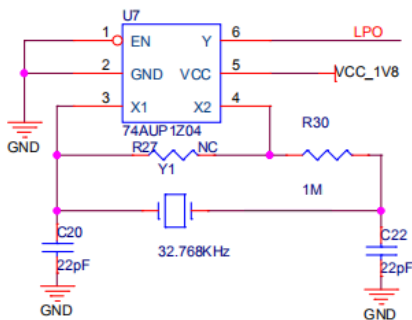


3. Reference Design Circuits



ADC:

- When using an external reference voltage, do not connect 1V8_OUT.
- If there is no external reference voltage, connect ADC_VREF and 1V8_OUT.



4. Ordering Information

Part Name	Description
WF88-A	Wi-Fi module, dual band, with U.FL antenna connectors (No longer available)
WF88-EX	Wi-Fi module, dual band, with external antenna ports
WF88-M	Wi-Fi module, dual band, with external antenna ports , embedded MCU

5. Revision History

Date	Revision	Description
3/24/2023	1.0	Initial release
5/25/2023	1.1	Add console password
3/28/2024	2.0	Updated module pinout and size. Added new part number options