

YF109

32 Bit Microcontroller with Built-in 2.4G

Product Specification

YUFAN MICRO

1. General Description

The YF109 microcontroller utilizes a high-performance 32-bit ARM® Cortex®-M0+ core, offering a wide voltage operating range. With up to 32Kbytes of flash memory and 4Kbytes of SRAM, it achieves a maximum operating frequency of 32MHz. The chip integrates various communication peripherals, including I2C, SPI, and USART, as well as a 12-bit ADC, five 16-bit timers, and two comparators.

In addition, the YF109 microcontroller features an embedded 2.4GHz wireless transceiver module. Operating within the 2.400GHz to 2.483GHz ISM frequency band, it can reach a maximum transmit power of 8dBm. In open environments, its transmission range can reach 120+ meters, while its receiver receiver adopts a low intermediate frequency structure with a sensitivity of up to -86dBm. This module achieves high integration and requires a minimum of only two capacitors and a crystal oscillator as external components.

Operating across a temperature range of -40°C to 85°C and a voltage range of 1.7V to 5.5V (2.4GHz operation from 2V to 3.6V), the YF109 microcontroller provides low-power modes, including sleep and stop, catering to diverse low-power applications.

The YF109 microcontroller is suitable for various applications, including controllers, wireless handheld devices, smart homes, IoT systems, remote-controlled toys, wireless industrial control devices and etc.

1.1 Features

- **Core**

32-bit ARM Cortex-M0+ core

- **Memory**

16 to 32Kbytes of flash memory

2 to 4Kbytes of SRAM

- **Low Power**

Current in STOP mode: <4.5uA (VDD=1V)

Wake-up time from STOP mode: <3.5μs

- **System**

Supports HSI, HSE, LSI clocks

Maximum clock frequency: up to 24/32MHz

Wide operating voltage range: 1.7V to 5.5V

Operating temperature range: -40°C to 85°C / -40°C to 105°C

- **Peripherals**

Up to 18 GPIOs

1x I2C, 1x SPI, 2x USART, 4x 16-bit GPTimer, RTC

1x ADTimer (Three-phase BLDC/PMSM control module)

1x LPTimer, internal temperature sensor

1x 12-bit ADC (10 channels), 2x COMP

1.2 2.4G Wireless Module

- **Low power consumption**

Operating current in transmission mode (0dBm): 16mA

Operating current in receiving mode: 14mA

Sleep current: 1.5uA

- **High integration**

Only requires 2 capacitors and one crystal oscillator for peripheral components

- **Low cost**

Supports 16MHz crystal oscillator with ± 60 ppm accuracy

Supports double-sided PCB design

Supports SOP8 package option

Supports SPI interface communication

Can be used with microstrip antennas on PCB

- **High performance**

Receiver sensitivity in 1Mbps mode: -86dBm

Maximum transmission power in 1Mbps mode for special applications: 8dBm, achieving a transmission distance of over 120 meters in open areas

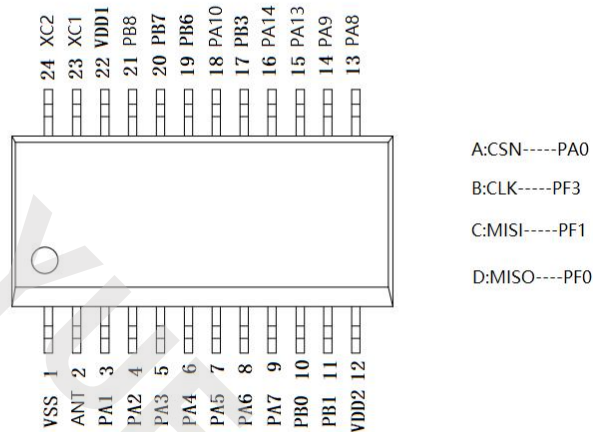
Excellent interference resistance with high adjacent channel suppression in the receiver filter

- **Built-in auto re-transmission and auto_ack functionality.**

- **Supports 4-wire SPI interface, with a maximum speed of up to 8Mbps.**

2. Pin Assignment

YF109 SSOP24



2.1 Pin Description

Pin Name		Description
1:GND		Negative Power Supply
2:		2.4G ANT
3: PA1	I/O	SPI1_SCK ADC_IN1 COMP1_INP USART1_RTS USART2_RTS EVENTOUT SPI1_MOSI USART2_RX TIM1_CH4 TIM1_CH2N

		MCO
4: PA2	I/O	SPI1_MOSI ADC_IN2 COMP2_INM USART1_TX USART2_TX COMP2_OUT SPI1_SCK TIM3_CH1 I2C_SDA
5:PA3	I/O	USART1_RX ADC_IN3 COMP2_INP USART2_RX EVENTOUT SPI1_MOSI TIM1_CH1 I2C_SCL
6: PA4	I/O	SPI1_NSS ADC_IN4 USART1_CK TIM14_CH1 USART2_CK ENENTOUT RTC_OUT TIM3_CH3 USART2_TX
7: PA5	I/O	SPI1_SCK ADC_IN5 LPTIM_ETR EVENTOUT TIM3_CH2 USART2_RX MCO
8: PA6	I/O	SPI1_MISO ADC_IN6 TIM3_CH1 TIM1_BKIN TIM16_CH1 EVENTOUT COMP1_OUT USART1_CK RTC_OUT
9: PA7	I/O	SPI1_MOSI ADC_IN7 TIM3_CH2 TIM1_CH1N TIM14_CH1 TIM17_CH1 EVENTOUT COMP2_OUT USART1_TX USART2_TX I2C_SDA SPI1_MISO

10: PB0	I/O	SPI1_NSS ADC_IN8 TIM3_CH3 TIM1_CH2N EVENTOUT COMP1_OUT
11: PB1	I/O	TIM14_CH1 ADC_IN9 COMP1_INM TIM3_CH4 TIM1_CH3N EVENTOUT
12: VDD		Positive Power Supply
13: PA8	I/O	USART1_CK IM1_CH1 USART2_CK MCO EVENTOUT USART1_RX USART2_RX SPI1_MOSI I2C_SCL
14: PA9	I/O	USART1_TX OSC32OUT TIM1_CH2 MCO I2C_SCL EVENTOUT I2C_SDA TIM1_BK SPI1_SCK USART1_RX
15: PA13(SWDIO)	I/O	SWDIO IR_OUT EVENTOUT SPI1_MISO TIM1_CH2 USART1_RX MCO
16: PA14(SWCLK)	I/O	SWCLK USART1_TX USART2_TX EVENTOUT MCO
17: PB3	I/O	SPI1_SCK COMP2_INM TIM1_CH2 USART1_RTS USART2_RTS EVENTOUT
18: PA10	I/O	USART1_RX OS32IN TIM1_CH3 TIM17_BKIN USART2_RX I2C_SDA

		EVENTOUT I2C_SCL SPI1_NSS USART1_TX IR_OUT
19: PB6	I/O	USART1_TX COMP2_INP TIM1_CH3 TIM16_CH1N USART2_TX I2C_SCL LPTIM_ETR EVENTOUT
20: PB7	I/O	USART1_RX COMP2_INM PVD_IN TIM17_CH1N USART2_RX I2C_SDA EVENTOUT
21: PB8	I/O	TIM16_CH1 COMP1_INP I2C1_SCL USART2_TX EVENTOUT USART1_TX I2C_SDA TIM17_CH1 IR_OUT
22:	-	2.4G VDD
23:		2.4G XC1
24:		2.4G XC2

3. Package Dimension

3.1 SSOP24 Dimension

