

SIA2420 2.4GHz Wireless Module

Product Description

The SIA2420 combines an industry-standard 802.15.4 radio with WIA-Mesh Protocol to enable low-power wireless sensors and actuators with highly reliable wireless mesh networking. The SIA2420 is tailored for use in battery- and line-powered wireless devices for applications that demand proven performance, scalability, and reliability.

The SIA2420 uses the IEEE standard 802.15.4 radio, which operates in the global license-free 2.4GHz band. The SIA2420 offers a range of up to 500 meters outdoors, while advanced power management techniques keep power consumption down to as low as 30 μ A in a typical network deployment. The combination of extremely high reliability and low power consumption enables applications that require very low installation cost and low-maintenance, long-term deployments.

The standard serial and discrete input/output (I/O) interfaces of the SIA2420 give it flexibility to be used in a wide variety of different applications, from industrial process control to security, to lighting. When integrated into a product, the SIA2420 acts like a network interface card—it takes a data packet and makes sure that it successfully traverses the network. By isolating the wireless mesh networking protocols from the user, the SIA2420 simplify the development process and reduce development risk.

Key Features

- IEEE standard 802.15.4 radio, global 2.4 GHz license-free band
- High reliability, >99.9% typical network reliability
- Direct-sequence spread spectrum (DSSS) for additional interference rejection
- Mesh networking for built-in redundancy
- High integration level, power amplifier (PA) and low noise amplifier (LNA)

integrated

- Down to 30μA typical power consumption
- - 95dBm receiver sensitivity
- Outdoor range > 500 m typical

Normal Operating Conditions

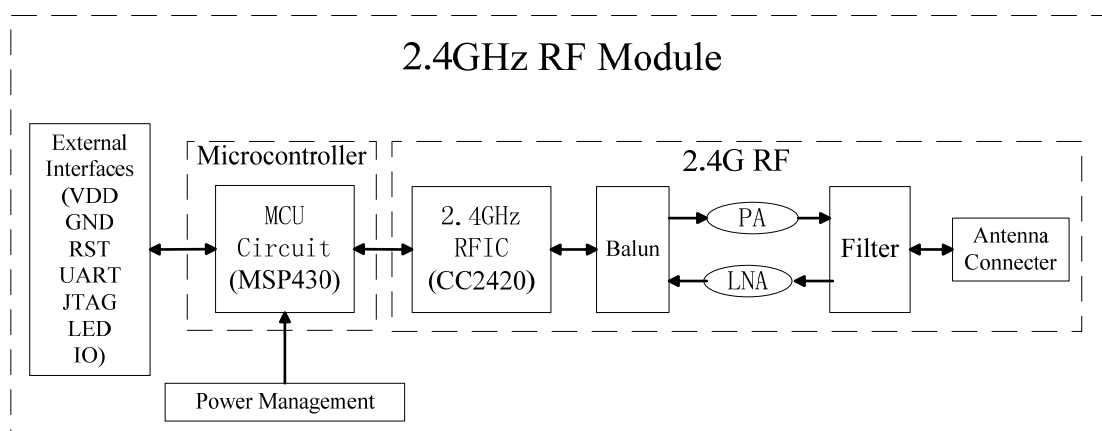
Parameter	Min	Typ	Max	Units	Comments
Operational supply voltage range	2.8		3.3	V	(between Vcc and GND)
Peak current			120	mA	Vcc=3.3V, 25°C
Transmit current		100	120	mA	Vcc=3.0V, 25°C
Receive Current		35	40	mA	Vcc=3.0V, 25°C
Sleep Current	10	15	25	uA	Vcc=3.0V, 25°C
Storage and operating temperatures	-40		+85	°C	
Operating humidity	10		90	%RH	

Detailed Radio Specifications

Parameter	Min	Typ	Max	Units	Comments
Operating frequency	2.400		2.4835	GHz	
Number of channels		16			
Channel separation		5		MHz	
Occupied channel bandwidth		2.7		MHz	At-20dBc
Modulation					IEEE 802.15.4 DSSS
Raw data rate		250		kbps	
Receiver sensitivity	-92	-95	-98	dBm	At 1% PER, Vcc=3.3V, 25°C

Output power, EIRP				18dBm		V _{cc} =3.3V, 25°C,(+3dBi antenna)
Range	Outdoor			500	m	25°C, 50% RH, 1.5 meters above ground, +3dBi
	Indoor			200	m	omni-directional antenna

Operational Description



SIA2420 integrates a low noise amplifier (LNA) and a power amplifier (PA).

The received RF signal is filtered and passed by a T/R switch to the LNA. The LNA amplifies the RF signal. The amplified signal is passed to a balun by another T/R switch, and then fed to the RF transceiver CC2420.

The transmitted RF signal from CC2420 is converted by the balun and passed to the PA. The converted RF signal is then amplified, filtered and fed to the antenna.