



RFWORLD

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无线模块 (WM24L01S)

用户指南



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1:简介

WM24L01S 射频模块,基于 Nordic nRF24L01 2.4G 数字无线收发一体FSK芯片,设计人员可以把整个无线模块作为一个嵌入式的元件,从而不需要考虑无线的模拟部分:例如阻抗匹配.



频率:2.4G
最大速率: 2M
RF 输出功率: +2dBm
接受灵敏度 : -82dBm
编程接口: SPI 数字接口
最大功耗 : 13MA
最大距离 : 20 米
天线 : PCB 板天线
尺寸 : 1.2*1.79*0.3cm

应用范围: 无线鼠标, 无线键盘, 2.4G 遥控, 有源电子标签, 无线玩具

2.管脚配置

Pin	Symbol	Function
1	VCC	Power Supply (+3.3V DC)
2	GND	Ground
3	CE	Chip Enable Activates RX or TX mode
4	CSN	SPI Chip Select
5	SCK	SPI Clock
6	MOSI	SPI Data In
7	MISO	SPI Data Out
8	IRQ	Interrupt Input



3. 操作范围

Symbol	Parameter (condition)	Notes	Min.	Typ.	Max.	Units
VDD	Supply voltage		1.9	3.0	3.6	V
VDD	Supply voltage if input signals >3.6V		2.7	3.0	3.3	V
TEMP	Operating Temperature		-40	+27	+85	°C

4. 电子参数

4.1 Power consumption

Symbol	Parameter (condition)	Notes	Min.	Typ.	Max.	Units
	Idle modes					
I _{VDD_PD}	Supply current in power down			900		nA
I _{VDD_ST1}	Supply current in standby-I mode	a		22		μA
I _{VDD_ST2}	Supply current in standby-II mode			320		μA
I _{VDD_SU}	Average current during 1.5ms crystal oscillator startup			285		μA
	Transmit					
I _{VDD_TX0}	Supply current @ 0dBm output power	b		11.3		mA
I _{VDD_TX6}	Supply current @ -6dBm output power	b		9.0		mA
I _{VDD_TX12}	Supply current @ -12dBm output power	b		7.5		mA
I _{VDD_TX18}	Supply current @ -18dBm output power	b		7.0		mA
I _{VDD_AVG}	Average Supply current @ -6dBm output power, Enhanced ShockBurst™	c		0.12		mA
I _{VDD_TXS}	Average current during TX settling	d		8.0		mA
	Receive					
I _{VDD_2M}	Supply current 2Mbps			12.3		mA
I _{VDD_LC}	Supply current 2Mbps LNA low current			11.5		mA
I _{VDD_1M}	Supply current 1Mbps			11.8		mA
I _{VDD_LC}	Supply current 1Mbps LNA low current			11.1		mA
I _{VDD_RXS}	Average current during RX settling	e		8.4		mA



4.2 General RF Condition

Symbol	Parameter (condition)	Notes	Min.	Typ.	Max.	Units
f_{OP}	Operating frequency	a	2400		2525	MHz
PLL_{res}	PLL Programming resolution			1		MHz
f_{XTAL}	Crystal frequency			16		MHz
Δf_{1M}	Frequency deviation @ 1Mbps			± 160		kHz
Δf_{2M}	Frequency deviation @ 2Mbps			± 320		kHz
R_{GFSK}	Air Data rate	b	1000		2000	kbps
$F_{CHANNEL\ 1M}$	Non-overlapping channel spacing @ 1Mbps	c		1		MHz
$F_{CHANNEL\ 2M}$	Non-overlapping channel spacing @ 2Mbps	c		2		MHz

4.3 Transmit operation

Symbol	Parameter (condition)	Notes	Min.	Typ.	Max.	Units
P_{RF}	Maximum Output Power	a		0	+4	dBm
P_{RFC}	RF Power Control Range		16	18	20	dB
P_{RFCR}	RF Power Accuracy				± 4	dB
P_{BW2}	20dB Bandwidth for Modulated Carrier (2Mbps)			1800	2000	kHz
P_{BW1}	20dB Bandwidth for Modulated Carrier (1Mbps)			900	1000	kHz
P_{RF1}	1 st Adjacent Channel Transmit Power 2MHz				-20	dBm
P_{RF2}	2 nd Adjacent Channel Transmit Power 4MHz				-50	dBm

4.4 Receiver operation



Symbol	Parameter (condition)	Notes	Min.	Typ.	Max.	Units
RX _{max}	Maximum received signal at <0.1% BER			0		dBm
RX _{SENS}	Sensitivity (0.1%BER) @2Mbps			-82		dBm
RX _{SENS}	Sensitivity at (0.1%BER) @1Mbps			-85		dBm
RX selectivity according to ETSI EN 300 440-1 V1.3.1 (2001-09) page 27						
C/I _{CO}	C/I Co-channel (@2Mbps)	a		7		dB
C/I _{1ST}	1 st Adjacent Channel Selectivity C/I 2MHz			1		dB
C/I _{2ND}	2 nd Adjacent Channel Selectivity C/I 4MHz			-21		dB
C/I _{3RD}	3 rd Adjacent Channel Selectivity C/I 6MHz			-27		dB
C/I _{CO}	C/I Co-channel (@1Mbps)	b		9		dB
C/I _{1ST}	1 st Adjacent Channel Selectivity C/I 1MHz			8		dB
C/I _{2ND}	2 nd Adjacent Channel Selectivity C/I 2MHz			-22		dB
C/I _{3RD}	3 rd Adjacent Channel Selectivity C/I 3MHz			-30		dB
RX selectivity with nRF24L01 equal modulation on interfering signal						
C/I _{CO}	C/I Co-channel (@2Mbps) (Modulated carrier)	a		11		dB
C/I _{1ST}	1 st Adjacent Channel Selectivity C/I 2MHz			4		dB
C/I _{2ND}	2 nd Adjacent Channel Selectivity C/I 4MHz			-20		dB
C/I _{3RD}	3 rd Adjacent Channel Selectivity C/I 6MHz			-27		dB
C/I _{CO}	C/I Co-channel (@1Mbps)	b		12		dB
C/I _{1ST}	1 st Adjacent Channel Selectivity C/I 1MHz			8		dB
C/I _{2ND}	2 nd Adjacent Channel Selectivity C/I 2MHz			-21		dB
C/I _{3RD}	3 rd Adjacent Channel Selectivity C/I 3MHz			-30		dB



5. 尺寸

