

Technical Description

The Equipment Under Test (EUT) is a 2.4GHz Pure Transmitter Controller for RC car operated at 2410.2, 2420.2 and 2460.2MHz only. The EUT is powered by 2 X 1.5V AAA batteries. After switch on the EUT and RC Car, the RC Car can be controlled to move forward, backward, turn right/left by the controller.

The brief circuit description is listed as below:

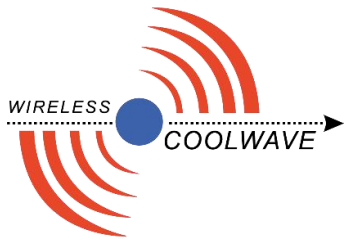
- 1) U6 acts as 2.4GHz RF Module Circuit (CWMDP03_2).**
- 2) X1 is 16MHz Crystal Oscillator for U6.**

Antenna Type: Internal antenna

Antenna Gain: 0dBi

Nominal rated field strength: 83.2dB μ V/m at 3m

Maximum allowed field strength of production tolerance: +/- 3dB



CWMDP03_3

2.4GHz RF Transceiver

Product brief

General Description

CWMDP03_3 is a cost effective, high performance 2.4GHz RF transceiver module which is designed based on CW2401 System-on-Chip. (SoC) The SoC integrates ultra-low power transceiver with an 8bit high performance, RISC architecture microcontroller. The CWMDP03_3 is designed dedicated for R/C car to implement low cost wireless systems operating in the worldwide 2.4GHz Industrial, Scientific, and Medical (ISM) frequency band. (2.400GHz to 2.4835GHz)

The CWMDP03_3 is intended to drastically reduce the time to market and the Bill of Materials (BOM) cost of wireless designs while providing excellent robustness and up to 50 meters connection range with 250Kbps air data rate. CWMDP03_3 features cost effective 33mm wired antenna, powerful 3-channel frequency hopping, excellent anti-interference ability and no pairing is needed which makes CWMDP03_3 becoming the best solution for R/C related applications.

The CWMDP03_3 targets wireless consumer applications especially for remote toy. It can be programmed as transmitter or receiver module with the same PCBA. The CWMDP03_3 can be widely applied in various wireless connections, it's compliant with the specifications regulated and required by FCC and CE.

Key Feature

RF

- High performance single chip 2.4GHz RF Transceiver
- GFSK Modulation
- 250Kbps air data rates
- RF Range: up to 50m range
- Frequency hopping
- Excellence link budget, enabling long range without external front-end
- Excellent anti-interference ability including co-channel interference and adjacent channel interference

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RF

- *0dBm transmit output power; programmable up to 2dBm*
- *Excellent receiver sensitivity (-89dBm @2Mbps; -92dBm @250Kbps)*
- *33mm wired antenna supported*
- *Suitable for systems targeting compliance with worldwide RF regulations*

Microcontroller

- *42 powerful instructions*
- *All instructions executed in one or two machine cycles*
- *Supports 3 different oscillator circuits including External Oscillator (EOSC), Internal High Frequency RC Oscillator(IHRC), and Internal Low Frequency RC Oscillator(ILRC)*
- *Superior AES security co-processor*
- *Low Voltage Reset function (LVR) with level at 3V, 2.75V, 2.5V, 2.2V, 2.0V, 1.8V*
- *1KB ROM*
- *10 GPIO pins*
- *Watchdog Timer function*
- *Hardware Comparator function*
- *All I/O pins have falling and rising edge wake-up function*
- *Power-on-Reset function*
- *Supported both Power-up Timer (PWRT) and Oscillator Start-up Timer (OST) functions*
- *Supported Power Saving (Sleep) mode*

Applications

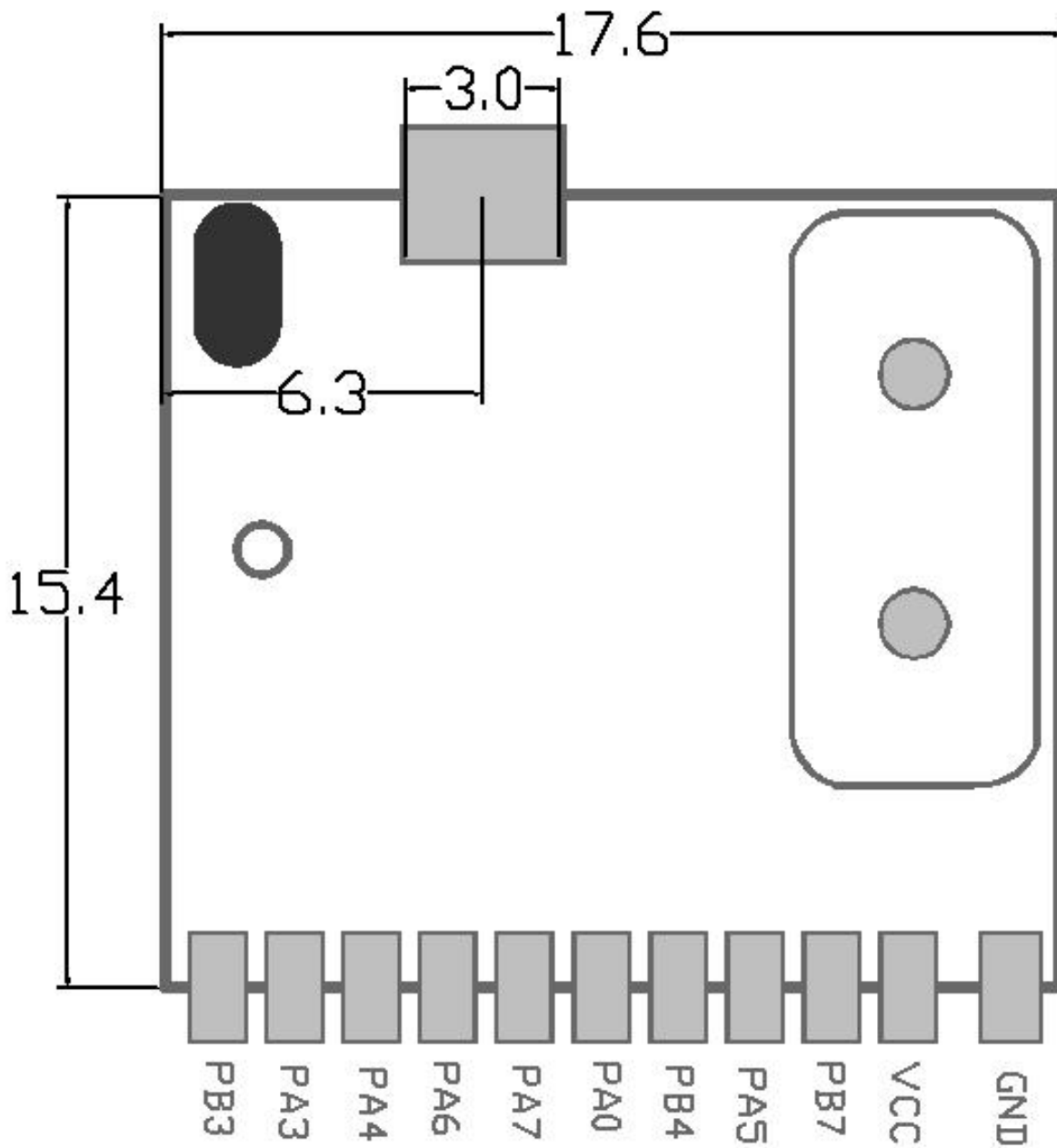
- *R/C cars*
- *Proprietary 2.4GHz Systems*
- *Wireless Keyboards and Mice*
- *Remote Toys*
- *Wireless Sensing Network*
- *Wireless Gamepads*
- *Wireless Data Access and Collection*


 Technical

Item	Parameter	Min.	Typ.	Max.	Unit
1.1	Voltage	2.3	3.3	3.6	V
1.2	Operating Temperature	-40	+20	+85	°C
2	Power Down Current	2.5	5	10	uA
3	Normal RF Condition				
3.1	Operating Frequency	2402		2483	MHz
3.2	Air Data Rates		250		Kbps
4	Transmitter				
4.1	Output Power	-40	0	2	dBm
4.2	Modulation 20dB Bandwidth (2Mbps)		2.5		MHz
4.3	Current at 0dBm output power	16	20	23	mA
5	Receiver				
5.1	Current (1Mbps)	15	20	23	mA
5.2	Sensitivity (250Kbps)		-92		dBm
6	IO				
6.1	Voltage IN_High (VIH)	0.8		1.2	V
6.2	Voltage IN_Low (VIL)	0		0.8	V
6.3	Capacitor_IN (C_IN)			10	pF
6.4	Input Leakage (I_LEAK_IN)	2.5	5	10	uA
7	Other Parameter				
7.1	Crystal Frequency		16		MHz
7.2	Remote Distance		30	50	meters
8	Antenna				
	33mm long (O.D 1.3mm)		1		dBi

CWMDP03_3 2.4GHz RF Transceiver

Dimensions and Pin



transmitter

PIN	sympo	Test mode	Normal mode
1	GND	Ground	Ground
2	VCC	module supply voltage input	module supply voltage input
3	PA3	LED for TEST mode:high	N/A
4	PB2	input low control module to TEST mode	input high control module to normal mode
5	PB1	input high control module to TX carrier mode	IN_1
6	PB0		N/A
7	PB5	N/A	IN_3
8	PB4	Step key for TEST mode by low activate	IN_2
9	PB3	N/A	N/A
10	PB6	N/A	IN_4
11	PB7	N/A	IN_5

TX if PB1 PB4 PB5 PB6 PB7 = 11111; then goto Sleep after about 5s

receiver

PIN	sympo	Test mode	Normal mode
1	GND	Ground	Ground
2	VCC	module supply voltage input	module supply voltage input
3	PA3	LED for TEST mode:high	N/A
4	PB2	input low control module to TEST mode	input high control module to normal mode
5	PB1	Step key for TEST mode by low activate	OUT_1
6	PB0	input low control module to TX carrier mode	N/A
7	PB5	N/A	OUT_3
8	PB4	N/A	OUT_2
9	PB3	N/A	N/A
10	PB6	N/A	OUT_4
11	PB7	N/A	OUT_5

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