

## Technical Description

The Equipment Under Test (EUT) is a 2.4GHz Car operating from 2408.2-2464.2MHz with 1MHz channel spacing for RC Controller. The EUT is powered by 4\*1.5V AA batteries. After switch on the EUT and paired with RC Controller, the EUT can be controlled to move forward, backward, turn left/right by Controller.

**The brief circuit description is listed as below:**

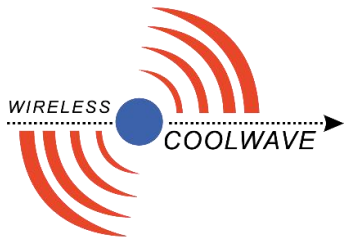
- 1) **U0 acts as MCU (N588J120).**
- 2) **U1A 2.4GHz RF Module Circuit (CWMDP03-2).**
- 3) **16MHz crystal oscillator providing clock for U1A.**
- 4) **U3 and U5 act as Motor Driver (DW10845).**
- 5) **U1 acts as Voltage Regulator.**

**Antenna Type: Internal antenna**

**Antenna Gain: 0dBi**

**Nominal rated field strength: 82.3dB $\mu$ V/m at 3m**

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



# CWMDP03\_2

## 2.4GHz RF Transceiver

### Product brief

#### General Description



*CWMDP03\_2 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\_2 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\_2 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\_2 features cost effective 33mm wired antenna, powerful 3-channel frequency hopping, excellent anti-interference ability and no pairing is needed which makes CWMDP03\_2 becoming the best solution for R/C related applications.*

*The CWMDP03\_2 targets wireless consumer applications especially for remote toy. It can be programmed as transmitter or receiver module with the same PCBA. The CWMDP03\_2 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*

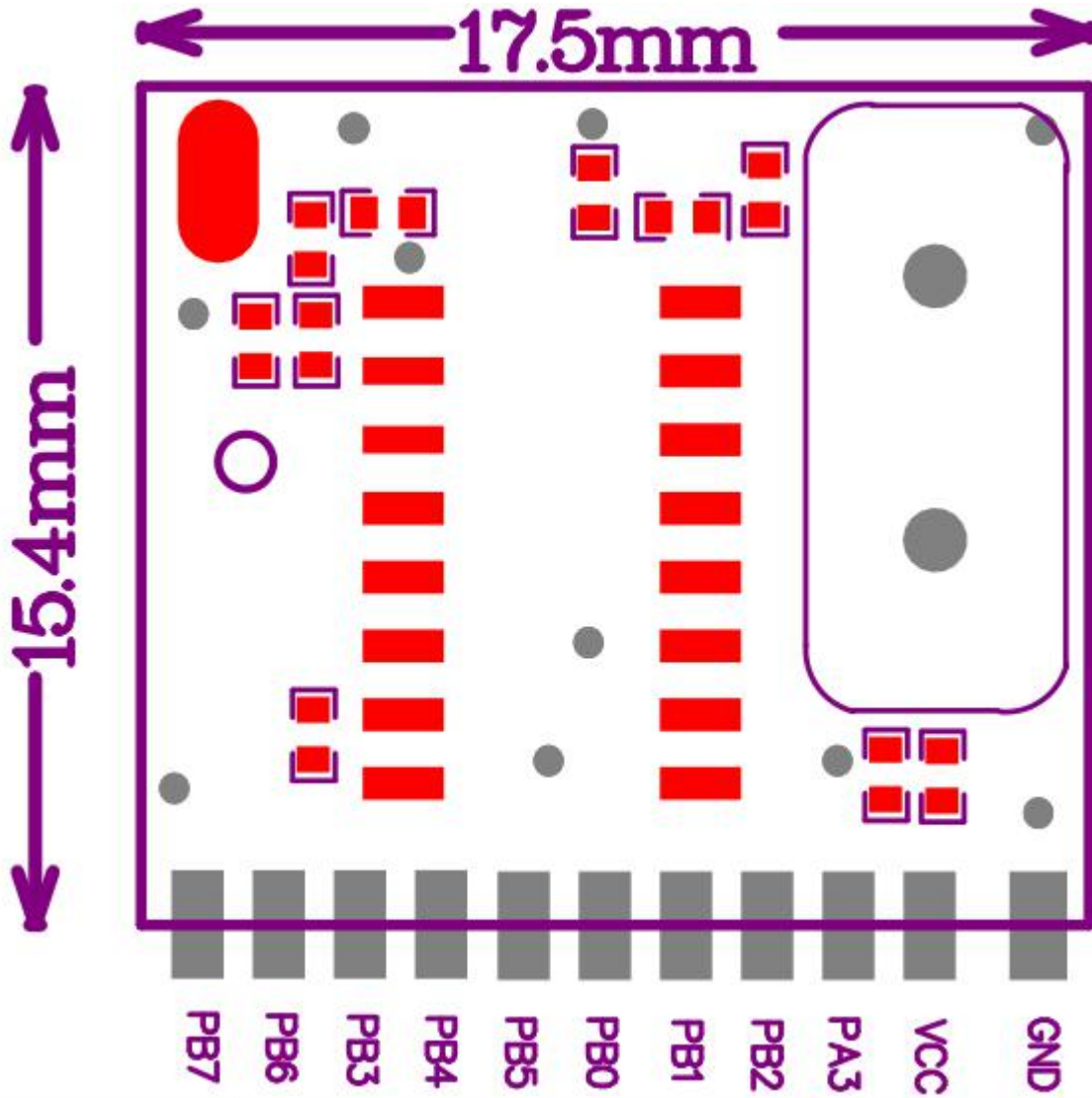
## Applications

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


 Technical

<b>Item</b>	<b>Parameter</b>	<b>Min.</b>	<b>Typ.</b>	<b>Max.</b>	<b>Unit</b>
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

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	input high control module to TX carrier mode	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	N/A
6	PB0	LED for TEST mode:high	N/A
7	PB5	N/A	IN_1
8	PB4	N/A	IN_2
9	PB3	N/A	reset low activate
10	PB6	N/A	IN_3
11	PB7	N/A	IN_4

IN 1 IN2 IN3 IN4 高有效，当4个输入都为0时，2.5秒会进入休眠。

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

## VERSION HISTORY

Date	version	Description
22/9/2016	V0.2	Preliminary version
23/11/2016	V0.3	Update pin dimension

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