

Technical Description

The Equipment Under Test (EUT) is a portable 2.4GHz Transmitter (controller) operating at the frequency range of 2412.2-2472.2MHz with 1 MHz channel spacing. The EUT is powered by 2*1.5V AA battery. And it is able to control the car to move forward/backward and leftward/rightward.

The brief circuit description is listed as below:

- 1) U1 acts as MCU and 2.4GHz RF Module Circuit (CW2401).**
- 2) Y1 is 12MHz crystal oscillator providing clock for U1.**

Antenna Type: Internal antenna

Antenna Gain: 0dBi

Nominal rated field strength: 94.0dB μ V/m at 3m

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

PROGRAMMABLE LOW POWER SYSTEM-ON-CHIP FOR 2.4GHz RF APPLICATIONS

GENERAL DESCRIPTION

CW2401 is an optimized radio System-on-Chip (SoC) device providing a complete RF system solution with a single device and a few discrete components. The CW2401 is designed to implement low cost wireless systems operating in the worldwide 2.4GHz Industrial, Scientific, and Medical (ISM) frequency band. (2.400GHz to 2.4835GHz) It integrates ultra-low power transceiver with an 8bit high performance, RISC architecture microcontroller device specifically designed for multiple I/O, mouse/keyboard appliance applications.

The advantages of low power consumption, I/O flexibility, timer functions, watchdog timer, power down, wake-up functions together with the optional peripherals such as EPROM, SRAM memory and RF transceiver provides the device with versatility for industrial control, consumer products, subsystem controllers, RF module control, etc.

A full choice of EOSC, IHRC and ILRC oscillator functions are provided including a fully integrated system oscillator which requires no external components for its implementation. The ability to operate and switch dynamically between a range of operating modes using different clock sources gives users the ability to optimize microcontroller operation and minimize power consumption.

The solution 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 100 meters connection range with up to 2Mbps air data rate.

Complete software and hardware technical support along with system emulator for problem tracing and debugging will be provided which will be significantly shortening the product development cycle. The CW2401 targets wireless consumer applications, it is also tailored for peripheral device such as wireless mice.

KEY FEATURES

RF SECTION

- High performance single chip 2.4GHz RF Transceiver
- GFSK Modulation
- Supports 250Kbps, 1Mbps and 2Mbps air data rates
- RF Range: up to 100m range
- Excellence link budget, enabling long range without external front-end

- Excellent anti-interference ability including co-channel interference and adjacent channel interference
- Programmable output power up to 2dBm
- Excellent receiver sensitivity (-92.8dBm at 250Kbps, -86.5dBm at 1Mbps)
- Supports 33mm wired antenna
- Suitable for systems targeting compliance with worldwide RF regulations

LAYOUT

- Low BOM cost, only requires few external components
- Pin out suitable for single layer PCB applications
- 16pin SOP package (10 General Purpose IO pins)
- Reference design available, reduced time to market

MICROCONTROLLER

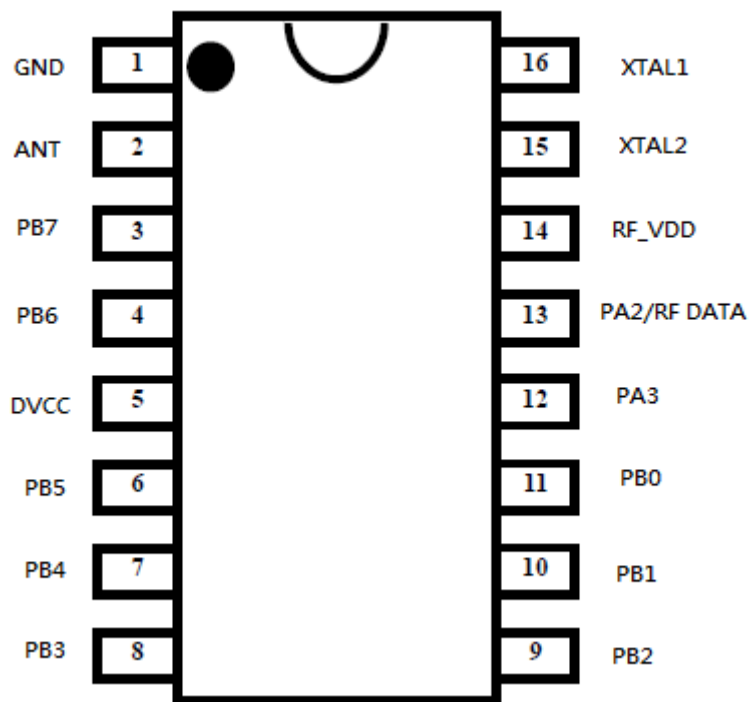
- High performance and low power 8051 microcontroller core
- 42 powerful instructions
- All instructions executed in one or two machine cycles
- Supports 3 different oscillator circuits including External Oscillator (EOSC), Internal High Frequency RC Oscillator(IHRC), and Internal Low Frequency RC Oscillator(ILRC)
- 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

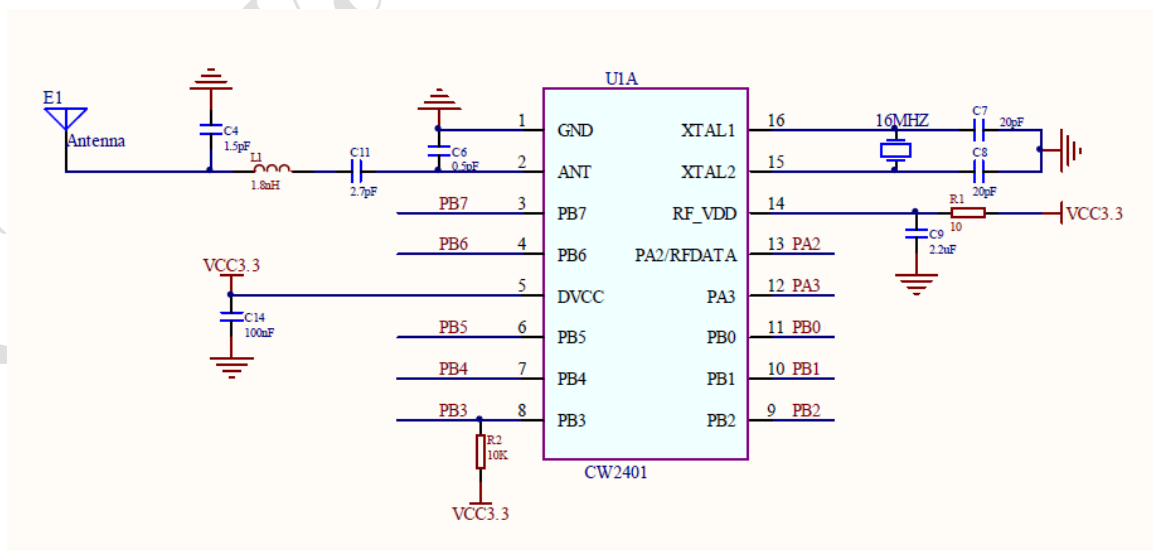
- Proprietary 2.4-GHz Systems
- Wireless Keyboards and Mice
- Remote Controls
- Remote Toys
- Wireless Sensing Network
- Wireless Gamepads
- Wireless Data Access and Collection
- Wireless Long Range Monitoring System

- Container Tracking
- Home Automation
- Automatic Meter Readers
- Personal Health and Entertainment

PIN ASSIGNMENT



APPLICATION CIRCUIT



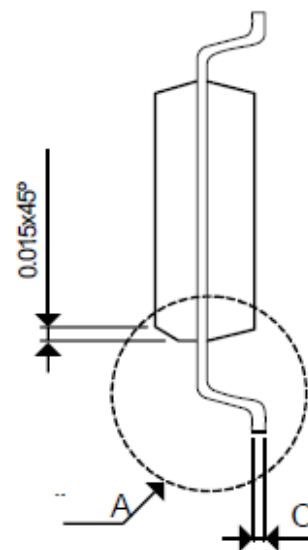
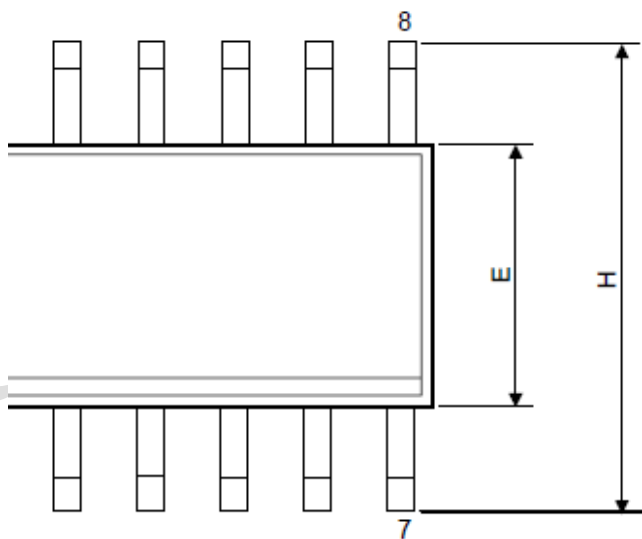
PIN DEFINITIONS

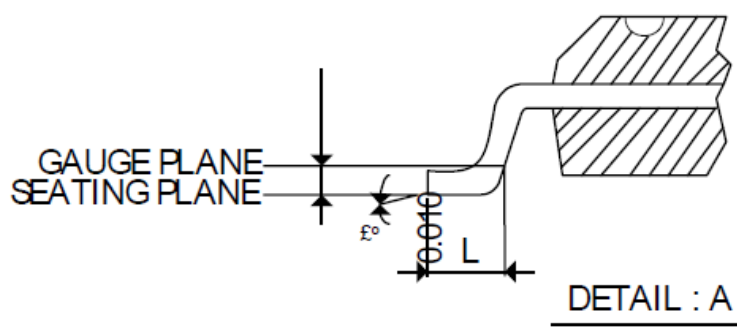
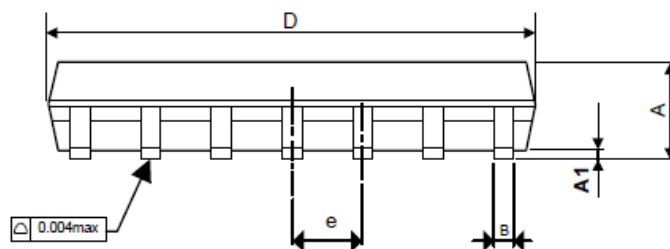
Pin Name	Description
PA2/PA3	Each pin can be configured as an Input/Output, pull high resistor; system can be awoken (from sleep mode) by configuration option
PB0~PB7	- Each pin can be configured as an Input/Output, pull high resistor - Counter PWM output - Positive input for hardware comparator
XTAL1/XTAL2	External 16MHz oscillator for RF, tolerance of the oscillator will be defined based on air data rates: 250Kbps ± 20 ppm; 1Mbps ± 40 ppm
ANT	RF Input/Output
RF_VDD	Power supply for RF
GND	Ground for both MCU and RF
DVCC	Power supply for MCU

ABSOLUTE MAXIMUM RATINGS

- Supply voltage (for MCU and RF): +2.2 ~ +3.6V
- Input voltage: -0.3 ~ VDD +0.3V
- Operating Temperature: -20 ~ +70°C
- Storage Temperature: -40 ~ +125°C

PACKAGE INFORMATION





Symbols	Dimension In Inches		
	Min	Nom	Max
A	0.058	0.064	0.068
A1	0.004	-	0.010
B	0.013	0.016	0.020
C	0.0075	0.008	0.0098
D	0.336	0.341	0.344
E	0.150	0.154	0.157
e	-	0.050	-
H	0.228	0.236	0.244
L	0.015	0.025	0.050
θ°	0°	-	8°

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