300 – 480 MHz OOK Receiver with Decoder and 1 PWM Output

Features

- Embedded EEPROM
  - Very Easy Development with RFPDK
  - All Features Programmable
- Frequency Range: 300 to 480 MHz
- Symbol Rate: 0.1 to 40 ksps
- Sensitivity: -114 dBm at 1 ksps, 0.1% BER
- 3-wire SPI Interface for EEPROM Programming
- Stand-Alone, No External MCU Control Required
- Configurable Duty-Cycle Receive Mode
- 1 PWM Control Output
- Low Power Consumption: 3.8 mA
- Low Standby Current：520 uA
- Support 1920, 1527 and 2262 Decoding Formats
- ID Study, Factory Code Supported
- RoHS Compliant
- 16-pin QFN 3x3 Package

Descriptions

The CMT2251A is a true single-chip, ultra low power and high performance device that consists of an OOK RF receiver, a data decoder and 1 PWM output pin for various 300 to 480 MHz wireless applications. The device integrates a data decoder that is not only compatible with the most common used packet format of 1527 and 2262, but also a more efficient, flexible and powerful format of 1920 designed by CMOSTEK. The device delivers sensitivity up to -114 dBm while consuming only 3.8 mA current when it is always on. An embedded EEPROM allows the frequency, symbol rate and other features to be programmed into the device using the CMOSTEK USB Programmer and the RFPDK. Alternatively, in stock products of 315/433.92 MHz are available for immediate demands with no need of EEPROM programming. When pairing the device to CMOSTEK transmitter, the synchronization ID can be programmed into both of the transmitter and receiver during the manufacturing phase, or studied by the receiver from the transmitter remotely by end customers. The CMT2251A is part of the CMOSTEK NextGenRF^{TM} family, together with CMT215x transmitters, they enable ultra low cost, low power consumption RF links.
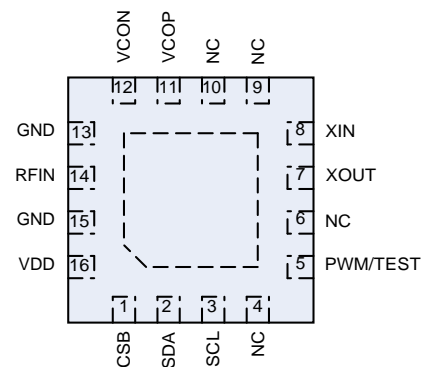
Applications

- Smart LED Control (PWM)
- Low-Cost Consumer Electronics Applications
- Remote Control
- Fan Controller
- Wireless Controller with PWM Interface
- Home Security and Alarm
- Garage and Gate Openers
- Home and Building Automation
- Industrial Monitoring and Controls
- Sensor Networks

Ordering Information

Part Number	Frequency	Package	MOQ
CMT2251A-EQR	Random	QFN16	5,000 pcs
CMT2251A-EQR3	315.00 MHz	QFN16	5,000 pcs
CMT2251A-EQR4	433.92 MHz	QFN16	5,000 pcs

QFN16 (3x3)

CMT2251A Top View
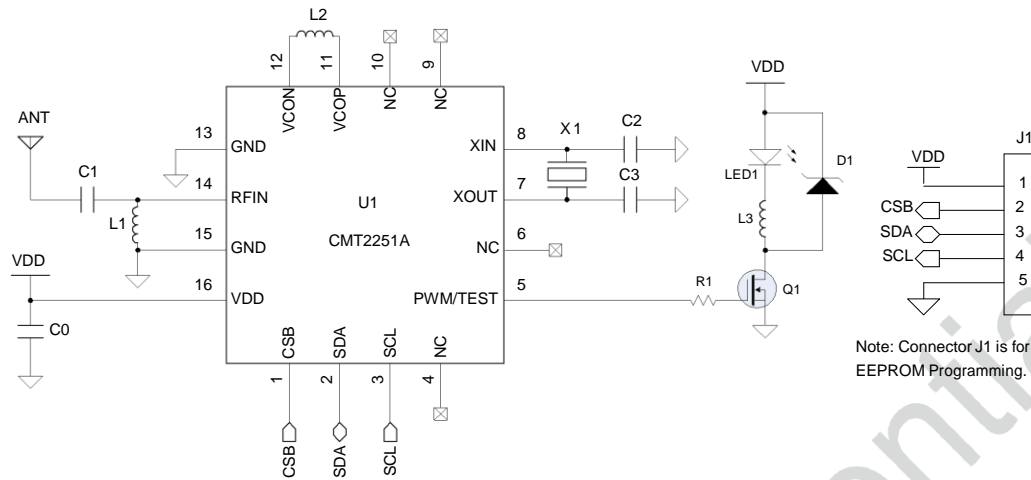
Typical Application

Figure 1. CMT2251A Typical Application Schematic

Table 1. BOM of Typical Application

Designator	Descriptions	Value		Unit	Manufacturer
		315 MHz	433.92 MHz		
U1	CMT2251A, 300 – 480 MHz OOK receiver with decoder and 1 PWM output	-		-	CMOSTEK
L1	±5%, 0603 multi-layer chip inductor	39	27	nH	Murata LQG18
L2	±5%, 0603 multi-layer chip inductor	33	22	nH	Murata LQG18
C1	±0.25 pF, 0402 NP0, 50 V	4.3	3.3	pF	Murata GRM15
C0	±20%, 0402 X7R, 25 V	0.1		uF	Murata GRM15
C2, C3	±5%, 0402 NP0, 50 V	15		pF	Murata GRM15
X1	±20 ppm, SMD32*25 mm, crystal	26		MHz	EPSON
LED1	SMD 5050, orange LED	0.25		W	-
R1	±5%, 0402 chip resistor	1.0		kΩ	-
D1	MBR0520, SOD123 Schottky diode	0.5		A	-
L3	SMD Φ=6mm, power inductor	68		uH	-
Q1	SOT23, SI2312 20-V N-channel MOSFET	-		-	Vishay

Table 2. CMT2251A Pin Descriptions

Pin Number	Name	I/O	Descriptions
1	CSB	I	3-wire SPI chip select input for EEPROM programming
2	SDA	IO	3-wire SPI data input and output for EEPROM programming
3	SCL	I	3-wire SPI clock input for EEPROM programming
4, 6, 9, 10	NC	-	Not connected, leave floating
5	PWM/TEST	O	PWM control output Receiving data output for production test purpose
7	XOUT	O	Crystal oscillator output
8	XIN	I	Crystal oscillator input or external reference clock input

Pin Number	Name	I/O	Descriptions
11	VCOP	IO	VCO tank, connected to an external inductor
12	VCON		
13, 15	GND	I	Ground
14	RFIN	I	RF signal input to the LNA
16	VDD	I	Power supply input

Package Outline
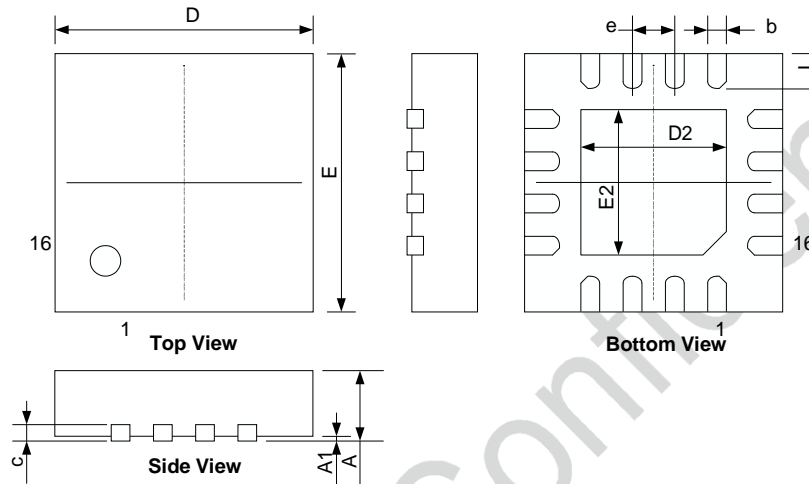
Figure 3. 16-Pin QFN 3x3 Package

Table 3. 16-Pin QFN 3x3 Package Dimensions

Symbol	Size (millimeters)	
	Min	Max
A	0.7	0.8
A1	-	0.05
b	0.18	0.30
c	0.18	0.25
D	2.90	3.10
D2	1.55	1.75
e	0.50 BSC	
E	2.90	3.10
E2	1.55	1.75
L	0.35	0.45

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