CMOSTEK

CMT2180B

312 - 480 MHz Flash Based OOK Transmitting Wireless MCU

MCU Features

- 1 k x 14 b rewritable program storage space (16 bytes/page)
- 256 x 8 b data EEPROM (16 bytes/page)
- 64 x 8 b SRAM
- 8-layer hardware stack x 10 bits
- Support of online debugging
- Support of in-system programming (ICSP)
- Support of data EEPROM programming in application
- 5 general purpose IOs
- One Timer 0 with 8-bit prescaler
- One Timer 2 with 8-bit prescaler
- WDT with 7-bit prescaler (the overflow frequency is about 16 - 2048 ms)
- Support of power up delay counter (PWRT)
- Support of low power mode SLEEP
- 4 wake-up sources: INT, port change interrupt, WDT and write operation completion
- Built-in high speed 16 MHz RC oscillator
- Built-in low speed 32 kHz RC oscillator
- Port change interrupt: PA0 - PA5
- Program space protection
- Clock operating frequency (Fsys) up to 16 MHz
  - 2.0 – 3.6 V: Fsys being up to 8 MHz
  - 2.7 – 3.6 V: Fsys being up to 16 MHz

RF Features

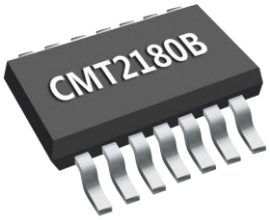
- Frequency range: 312 - 480 MHz
- Modulation mode: OOK
- Data rate: 0.5 - 40.0 kbps
- Output power: + 13 dBm
- Operating current: 17.5 mA @ +13 dBm, 433.92 MHz with continuous *1* transmitting

System Features

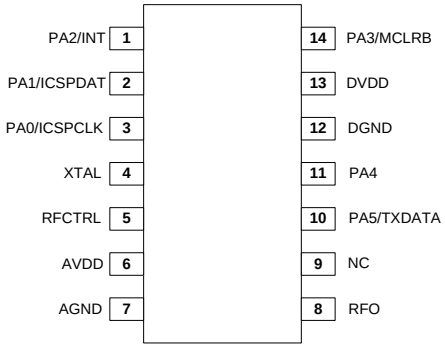
- Supply voltage：2.0 ~ 3.6 V
- Operating temperature: -4 0 ~ + 85 ℃
- SOP14 packaging

Application

- Wireless weather forecasting system
- Wireless lighting control system
- Consumer remote control



SOP14



CMT2180B PIN Assignment

Description

Embedded with 8-bit RISC core, the CMT2180B is an OOK based transmitting wireless MCU with low power and low cost, applying to 312 - 480 MHz band wireless applications. Empowered by a 1 k x 14 b rewritable program space, a high-efficiency and ultra-low power transmitter, along with the supports of up to 5 general-purpose IOs, online debug, and ultra-low power sleep mode, the chip is ideal for a variety of consumer remote control applications. With an operating temperature range of - 40 ~ 85 ℃ and a power supply voltage of 2.0 ~ 3.6 V, it consumes only a current of 17.5 mA while delivering +13 dBm power at 433.92 MHz. The CMT2180B co-working with CMOSTEK's NextGenRF™ series receivers offers an ideal solution for ultra-low power RF applications.

Typical Application

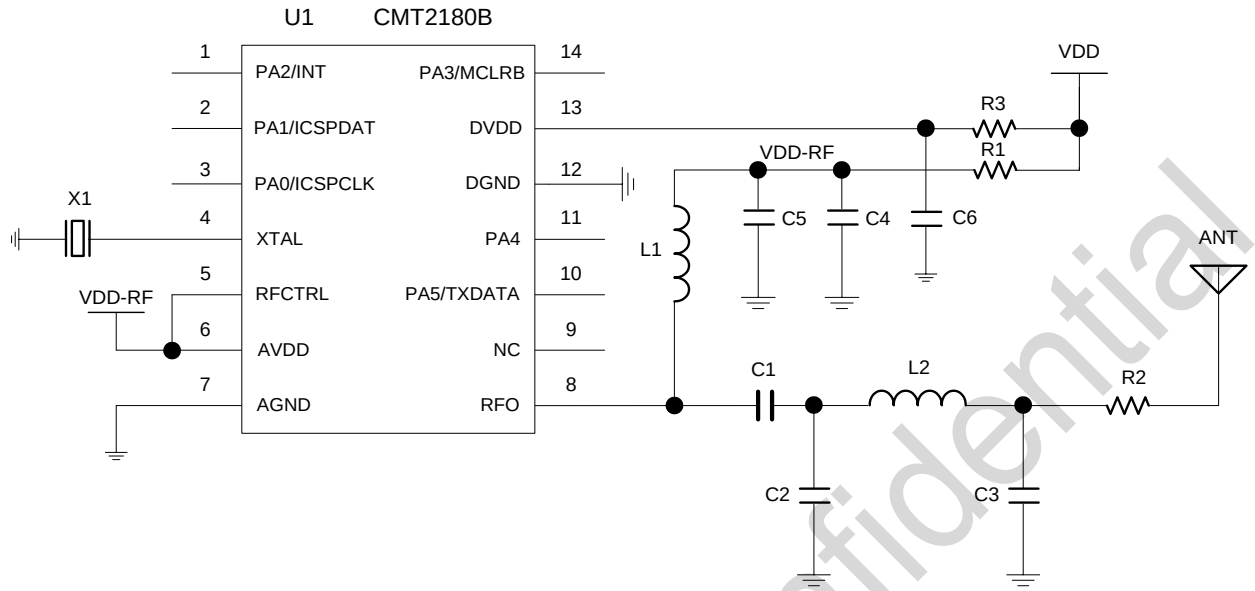


Figure 1. CMT2180B Typical Application Schematic (low-cost matching network)

Table 1. Typical Application BOM (low-cost matching network)

Label	Description	Component Value @ 315 MHz	Component Value @ 433.92 MHz	Unit	Supplier
U1	CMT2180B, 312 - 480 MHz Flash based OOK transmitting wireless MCU	-	-	-	CMOSTEK
X1	± 20 ppm, SMD32 * 25 mm, crystal	26.25	26.2982	MHz	EPSON
L1	± 10%, 0603 multilayer chip inductor	220	180	nH	Sunlord
L2	± 10%, 0603 multilayer chip inductor	33	27	nH	Sunlord
C1	± 0.25 pF, 0603 NP0, 50 V	82	68	pF	-
C2	± 0.25 pF, 0603 NP0, 50 V	2	NC	pF	-
C3	± 0.25 pF, 0603 NP0, 50 V	NC	2.2	pF	-
C4	± 20%, 0603, NP0, 50 V	470		pF	-
C5	± 20%, 0603, X7R, 25 V	0.1		uF	-
C6	± 20%, 0603, X7R, 25 V	1		uF	-
R1	-	10		Ω	-
R2	-	10		Ω	-
R3	-	0 / 10		Ω	-

Table 2. CMT2180B Pin Description

Pin #	Pin Name	I/O	Description
1	PA2	IO	GPIO with programmable pull-up and level change triggered interrupt
	INT	I	External interrupt input
2	PA1	IO	GPIO with programmable pull-up and level change triggered interrupt
	ICSPDAT	I	Serial port data signal for debug and programming mode (Fmax = 6 MHz)
3	PA0	IO	GPIO with programmable pull-up and level change triggered interrupt
	ICSPLCK	I	Serial port clock signal for debug and programming mode (Fmax = 6 MHz)
4	XTAL	I	Crystal oscillator pin, connecting a crystal with the corresponding frequency value and a capacitance of 15 pF to GND
5	RFCTRL	I	Connect to AVDD
6	AVDD	I	2 - 3.6 V analog power-input pin
7	AGND	I	Analog ground
8	RFO	O	RF output pin
9	NC	-	No connection
10	PA5/TXDATA	IO	It is the PA5 port of the MCU core and data transmission pin at the same time. ▪ The software needs to configure PA5 as output mode. ▪ Trigger the transmission mode on the rising edge. Transmit data after the triggering according to the data stream. ▪ Continue outputting low level for 20 ms then exit the transmission mode. ▪ Keep outputting low in the normal low power status.
11	PA4	IO	GPIO with programmable pull-up and level change triggered interrupt
12	DGND	I	Digital ground
13	DVDD	I	2 - 3.6 V digital power-input pin
14	PA3	I	Input pin with level change triggered interrupt, no internal pull-up
	MCLRB	I	External reset input. When the function is configured, the chip turns on the pull-up automatically.

Notes:

1. MCU core programming interface: ICSPLCK, ICSPDAT, DVDD and DGND.

Packaging Information

The packaging information of the CMT2180B is shown in the below figure.

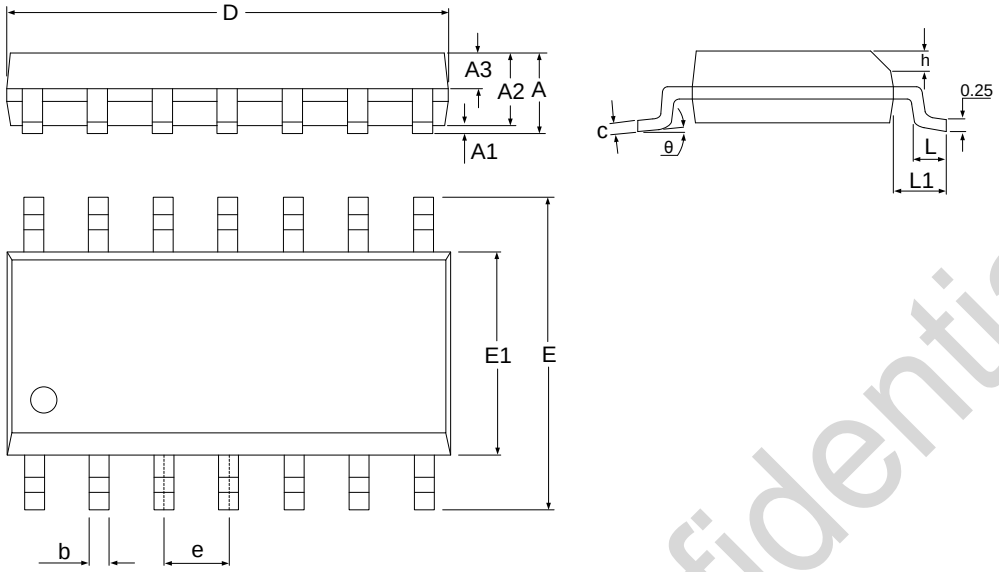


Figure 2. SOP14 Packaging

Table 3. SOP14 Packaging Scale

Symbol	Scale (mm)		
	Min.	Typ.	Min.
A	-	-	1.75
A1	0.05	-	0.225
A2	1.30	1.40	1.50
A3	0.60	0.65	0.70
b	0.39	-	0.48
c	0.21	-	0.26
D	8.45	8.65	8.85
E	5.80	6.00	6.20
E1	3.70	3.90	4.10
e	1.27 BSC		
h	0.25	-	0.50
L	0.50	-	0.80
L1	1.05 BSC		
θ	0	-	8°

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