CMOSTEK

CMT2189B

240 - 960 MHz FLASH Based OOK Transmitting Wireless MCU

MCU Features

- PIC16 compatible instruction set
- Up to 16 MHz clock operating frequency
- 2T or 4T instruction cycle
- 8-layer hardware stack x 11 bit
- 2 k x 14 b rewritable program storage space (16 bytes/page)
- 256 x 8 b data EEPROM (16 bytes/page)
- 128 x 8 b SRAM
- Support of online debug
- Support of ICSP programming
- Support of data EEPROM programming in application
- 8 general 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
- Multiple wakeup sources: INT, port change interrupt, WDT, data EEPROM write operation completion, etc.
- Built-in high speed 16 MHz RC oscillator
- Built-in low speed 32 kHz RC oscillator
- Port change interrupt: RA0 - RA7
- Program space protection

RF Features

- Frequency range: 240 - 960 MHz
- Modulation mode: OOK
- Data rate: 1.0 - 40.0 kbps
- Output power: + 13 dBm
- Operating current: 17.5 mA @+13dBm, 433.92 MHz with continuous *1* transmitting

System Features

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

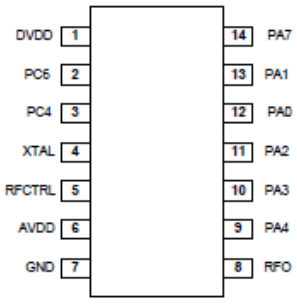
Application

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

Description

Embedded with 8-bit RISC core, the CMT2189B is an OOK based transmitting wireless MCU with low power and low cost, applying to 240 - 960 MHz band wireless applications. Empowered by a 2 k x 14 b rewritable program space, a high-efficiency and ultra-low power transmitter, along with the supports of up to 8 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 CMT2189B co-working with CMOSTEK's NextGenRF™ series receivers offers an ideal solution for ultra-low power RF applications..

SOP14



CMT2189B PIN Arrangement

Typical Application

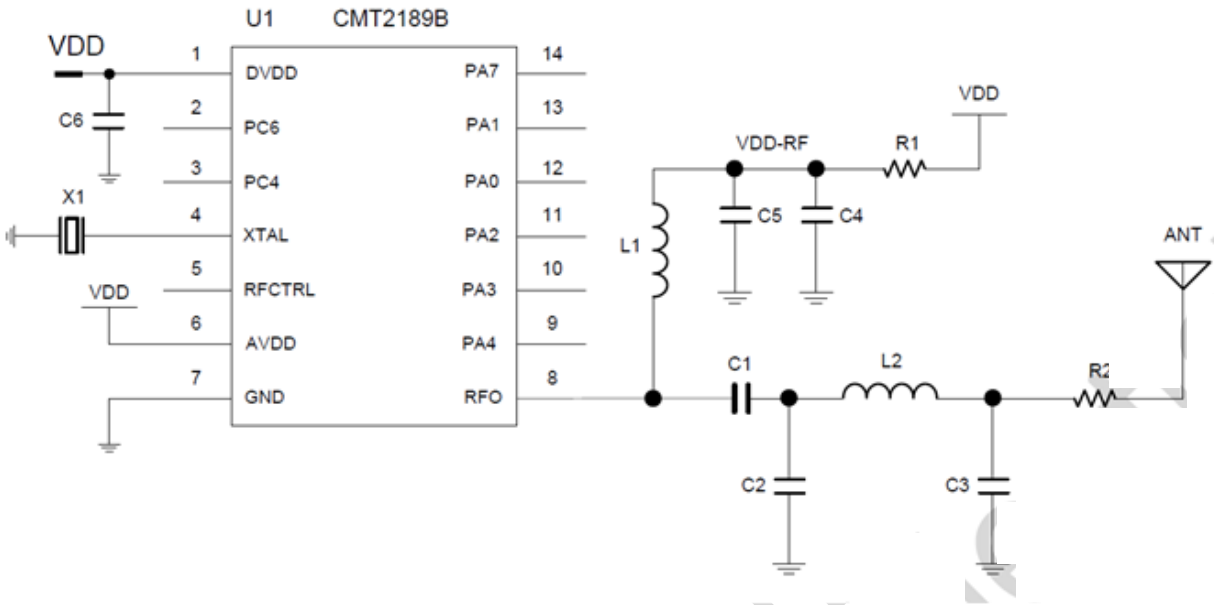


Figure 1. CMT2189B typical Application Schematic (low cost matching network)

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

Label	Description	Component Value @ 315 MHz	Component Value @ 433.92 MHz	Unit	Supplier
U1	CMT2189B, 240-960 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 LQG18
L2	± 10%, 0603 multilayer chip inductor	33	27	nH	Sunlord LQG18
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	0.1		uF	-
R1	-	10		Ω	-
R2	-	10		Ω	-

Table 2. CMT2189B Pin Description

Pin #	Pin Name	I/O	Description
1	DVDD	I	2 - 3.6 V digital power supply input pin.
2, 3	PC6, PC4	IO	Port C I/O.
4	XTAL	I	Crystal input pin, connecting the crystal (with the corresponding frequency value and load capacitance of 15 pF) to GND.
5	RFCTRL	IO	RF serial port function with internal pull-up resistor. Pull down the pin through PC port or PA port to enable the function.
6	AVDD	I	2 - 3.6 V analog power supply input pin.
7	GND	I	Chip ground.
8	RFO	O	RF output pin.
9-11	PA4- PA2	IO	GPIO with IOC and WPU. It can configure pull-up resistor.
12	PA0	IO	GPIO with IOC and WPU. It can configure pull-up resistor.
	ICSPLCK	I	Clock signal for debug and programming series port (F_{max} = 6 MHz).
13	PA1	IO	GPIO with IOC and WPU. It can configure pull-up resistor.
	ICSPDAT	I	Data signal for debug and programming series port (F_{max} = 6 MHz).
14	PA7	IO	GPIO with IOC and WPU. It can configure pull-up resistor.

Notes:

1. MCU programming interface: ICSPLCK, ICSPDAT, VDD-MCU and GND.
2. IOC = Interrupt On Change. WPU = Weak Pull Up.

Packaging Information

The packaging information of the CMT2189B is shown in the below figure.

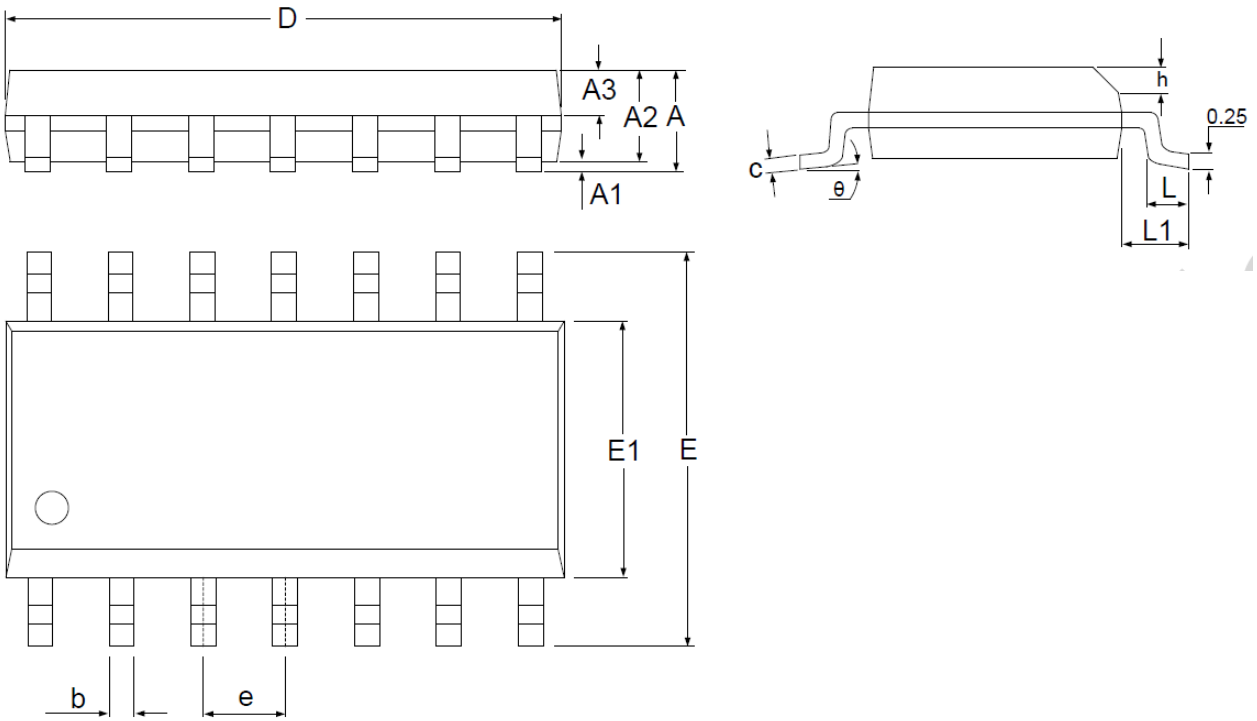


Figure 2. SOP14 Packaging

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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