

Technical Description of the Circuit:

The circuit is a RF thermometer & hygrometer transmitter part, the MCU TM8712 will measure the temperature & relative humidity and code the data. Afterward, the data is transferred to the RF circuit by the IC PT4450 which includes a SAW oscillator 434MHz. One-shot circuit every 3 minutes when the data pin output HIGH level to the oscillator, the oscillator is turned on and output 434MHz RF signal, when the data pin output LOW level to the oscillator, the oscillator is turned off, and this ON & OFF process modulate the code data into 434MHz with ON OFF KEYING.. L4, C8, L3, C7, L2 and C2 for antenna matching network.

PT4450 SAW-based ASK/OOK Transmitter IC

Advance Information

Princeton Technology Corp. reserves the right to change the product described in this datasheet. All information contained in this datasheet is subject to change without prior notice. Princeton Technology Corp. assumes no responsibility for the use of any circuits shown in this datasheet.

Description

The PT4450 is a high performance 315/433 MHz ASK/OOK transmitter for the Remote Keyless Entry (RKE) systems. The chip consists of a SAW oscillator, a power amplifier (PA), and an one-shot circuit to control the SAW oscillator.

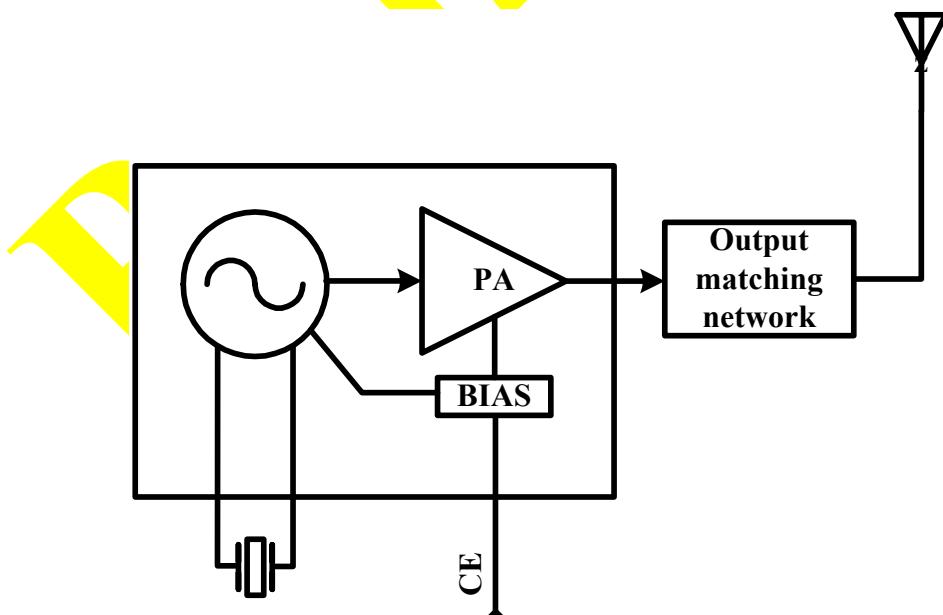
Features

- ◆ Supply voltage: 2.2V to 3.6V
- ◆ Frequency range: 250MHz to 500MHz, depend on the external SAW resonator.
- ◆ Output power and consumption current: 10dBm/10mA@3V@433MHz in CW output
- ◆ Harmonics: -50dBc
- ◆ RF power on/off ratio: 50dB(TBD)
- ◆ Data rate: 10Kbps maximum
- ◆ SOT26 package

Applications

- ◆ Wireless mouse
- ◆ Video sender remote controller
- ◆ Car alarm and home security system

Block Diagram





Pin Descriptions

Number	Name	I/O	Description
1	OSCOUT	OUT	SAW resonator output
2	VSS	PWR	Ground connection
3	PAOUT	OUT	Power amplifier output
4	CE	IN	Chip enable
5	VDD	PWR	Power supply connection
6	OSCIN	IN	SAW resonator input

Preliminary

Absolute Maximum Ratings

$V_{SS} = 0$ V

Parameter	Symbol	Rating	Unit
Supply voltage	V_{CC}	$V_{SS} - 0.5$ to $V_{SS} + 8.0$	V
Operating temperature range	T_{OPR}	-40 to 85	°C
Storage temperature range	T_{STG}	-55 to 150	°C
Soldering temperature range	T_{SLD}	255	°C
Soldering time range	t_{SLD}	10	s

Recommended Operating Conditions

$V_{SS} = 0$ V

Parameter	Symbol	Value			Unit
		min.	typ.	max.	
Supply voltage range	V_{CC}	2.2	3.0	3.6	V
RF input frequency	f_{RFIN}	250		500	MHz
Operating temperature	T_A	-10	25	60	°C

Electrical Characteristics

Nominal conditions: $V_{DD} = 3.0$ V, $V_{SS} = 0$ V, CE = “high”, Temp= 27 °C, $f_{RF} = 433$ MHz

Parameter	Symbol	Condition	Value			Unit
			min.	typ.	max.	
Power Supply						
Supply voltage	V_{DD}		2.2	3.0	3.6	V
Consumption dc current	I_{DD}	CW transmission		10		mA
Total dc current (stand-by mode)	$I_{standby}$	CE = low			1.0	μ A
Frequency range	f_{RF}		250		500	MHz
Power amplifier output power	P_{out}	CW transmission		+10		dBm
Data rate	$DATA_{rate}$			1	10	KHz
Start-up time	T_{ON}				100	μ s
Operating ambient temperature	$T_{AMBIENT}$		-40		+85	°C
Power Amplifier						
Output power	P_{out}	$V_{DD}=2.2V$ to $3.6V$		10		dBm
Consumption current	I_{DD}	CW transmission		8		mA
RF power on/off ratio	P_{EXT}			TBD		dB
Harmonics	P_{HARM}	$2x/3x f_{RF}$		-50		dBc

Application Circuit

- ◆ Power amplifier will be switched ON/OFF with the CE signal
- ◆ An one-shot circuit is implemented to control the SAW oscillator. When the CE stay in High, SAW oscillator will be turn ON. When CE is toggled in High/Low(negative edge trigger), SAW resonator will keep ON for an one-shot period

