



Description

STX57A is one OOK/ASK transmitter for remote control application. The circuit is mainly intended for the ISM (Industrial, Scientific and Medical) band 315/433MHz.

STX57A integrates most circuit components on-chip and only requires a few external components to work normally. The STX57A consists of an integrated phase-locked loop (PLL) ,a MCU, and an on-chip regulator.

The STX57A is designed for remote wireless control systems. It is available in SOP-16 package and working over the extended temperature range (-40 to +85°C).

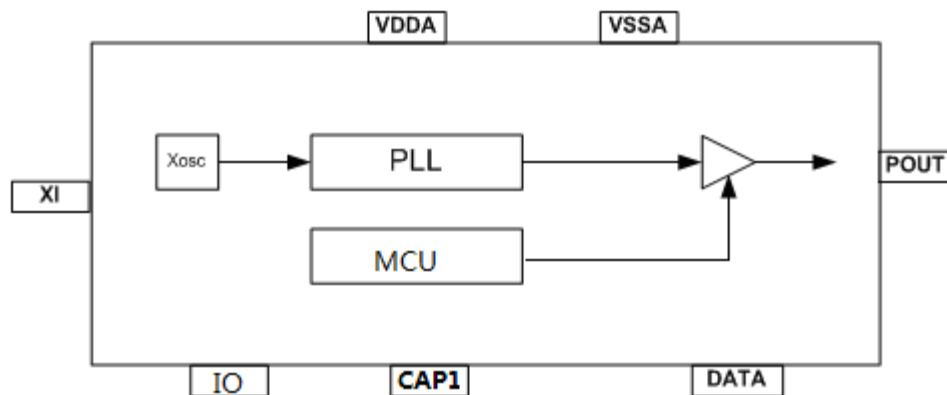
Features

- Working frequency range: 200MHz-500MHz.
- Tunable output power : 10dBm @ 3V with 50 ohm load, typ.
- Larger than 60dB on-off ratio for OOK/ASK modulation
- Low supply voltage: 2.2V-5.5V for 315/433MHz.
- SOP-16 package

Applications

- Remote Keyless Entry (RKE)
- Remote Control, Garage door and gate openers
- AMR-Automatic Meter Reading
- Wireless alarm and security system.
- 315/433MHz ISM band system

Block Diagram





Pin Configuration

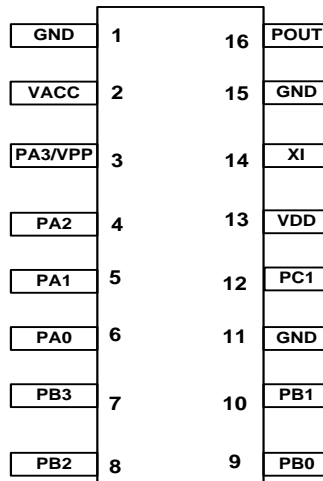


Table 1. Pin Description

Pin	Symbol	I/O	Description
1	GND	I/O	Ground.
2	VACC	I/O	LDO Power for RF part, connected ext bypass cap
3	PA3/VPP	I	PA3 is an input pin only, with pull up resistor 150K. Level-change-wakeup function is provided. PA3 is shared with RSTB pin by option. RSTB shared pin function isn't provided on TR4P131AF
4	PA2	I/O	PA2 are programmable I/O ports, with pull up resistor 150K ohm. Level-change-wakeup function is provided.
5	PA1	I/O	PA1 are programmable I/O ports, with pull up resistor 150K ohm. Level-change-wakeup function is provided.
6	PA0	I/O	PA0 are programmable I/O ports, with pull up resistor 150K ohm. Level-change-wakeup function is provided.
7	PB3	I/O	PB3 are programmable I/O ports, with pull up resistor 150Kohm. Level-change-wakeup function is provided.
8	PB2(TD)	I/O	PB2 are programmable I/O ports, with pull up resistor 150Kohm. Level-change-wakeup function is provided. TX transmitted data, DATA="1", transmit signal from PIN3; DATA="0", no signal out from PIN 3. When data change from "1" to "0", chip automatically shut down about 100ms. FOR TEST.



9	PB0	I/O	PB0 is a programmable I/O port, with pull up resistor 150K ohm. Level-change-wakeup function is provided.
10	PB1	I/O	PC0 is a programmable I /O port, with pull up resistor 150K ohm. Level-change-wakeup function is provided.
11	GND	I/O	Ground.
12	PC1	I/O	PC1 is an input pin only, with pull up resistor 150k ohm and levelchange-wakeup.
13	VDD	I/O	Vdd for whol chip
14	XI	I/O	Input terminal of local oscillation signal. It is connected to the crystal or driven by an external clock.
15	GND	I/O	Ground.
16	POUT	I/O	Transmitted RF output

**Electrical Specifications****Table 2. Absolute Maximum Rating**

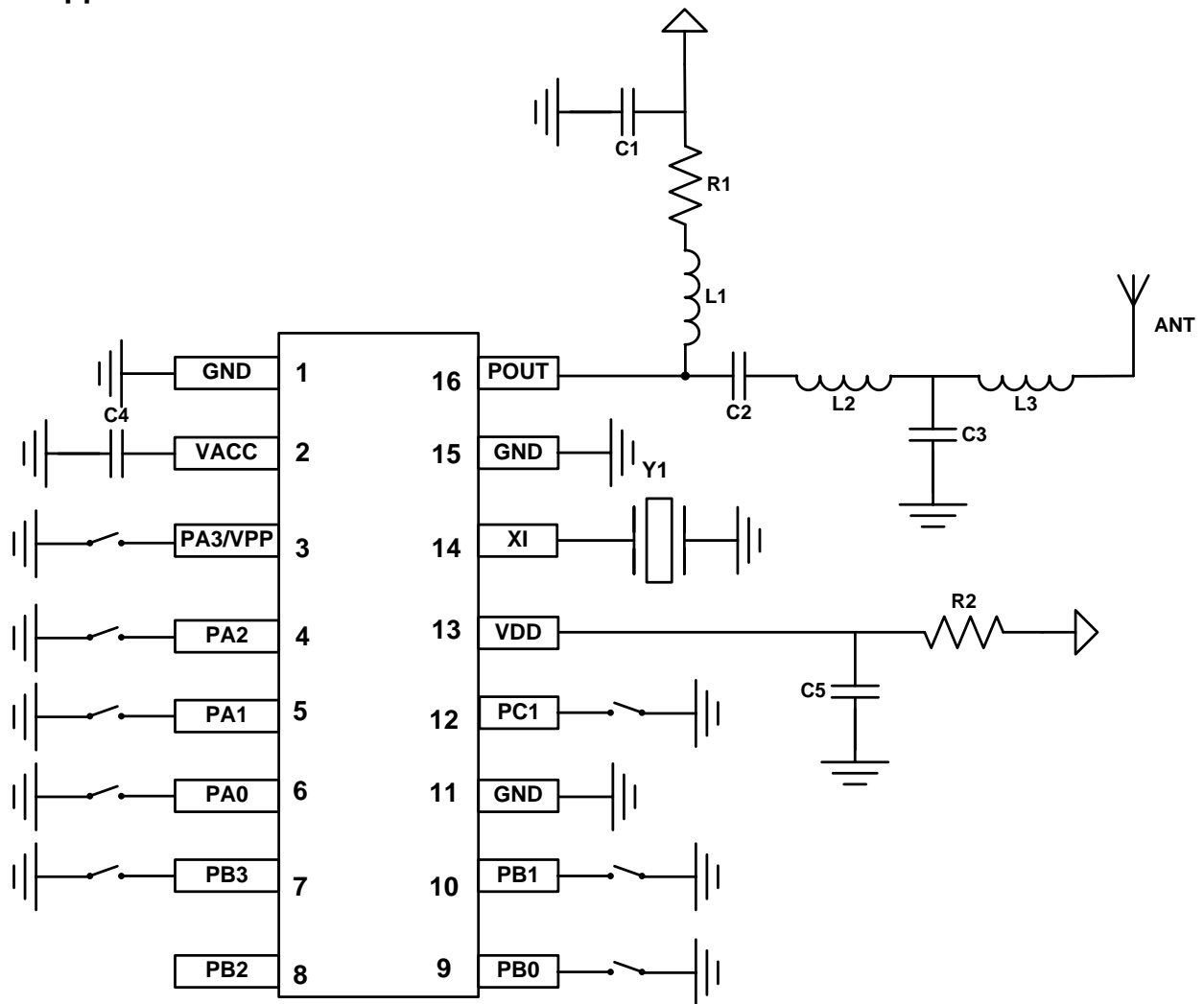
Item	Rating
Supply Voltage, VDD	+ 5.6V
Inputs and Clock Outputs	- 0.5V to + 5.6V
Storage Temperature	- 65 to + 150 oC
Soldering Temperature	+ 260 oC

Table 3. Electrical Specifications

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Supply Voltage	V _{DD}	150MHz-500MHz	2.2	3.0	3.3	V
Supply Current	I _{DD}	F _{out} =434MHz, 10dBm, 3V		15		mA
RF Power On/Off Ratio	Pratio			60		dB
Transmitted Power	P _{out}	Fin=315MHz, with 50 Ω load		10		dBm
		Fin=434MHz, with 50 Ω load		10		dBm
Data Rate		OOK/ASK mode			10	Kbps
OSCI operating Frequency	F _{OSC}		9	10	20	MHz
Operating Temperature	T _a		-40	27	85	°C
Leakage Current	I _{SB}	Power down mode			1	uA



Typical Application Circuit I —315/433MHz Transmitter





Functional Description

Crystal Oscillator (Pin 16)

The crystal oscillator circuit consists of a colpitt oscillator. Pin 16 can drive one off-chip 9MHz-30MHz crystal without external capacitors required. The driving capacitors are integrated on Chip.

The crystal driver stage can also take input clock as input clock buffer. The crystal oscillator frequency is determined as follows

$$f_{osc} = f_{vco} / 32$$

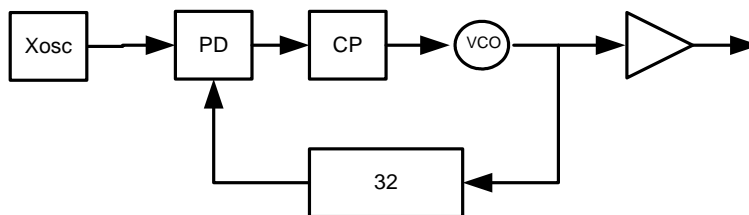
Where F_{vco} is VCO oscillation frequency. 32 is PLL divider value. Below table lists the required Crystal frequency. The suggested crystal ESR must be less than 50Ω .

Transmitting Frequency (MHz)	Crystal Frequency (MHz)	Note
315	9.844	
340	10.625	
390	12.188	
433.92	13.56	

PLL Block

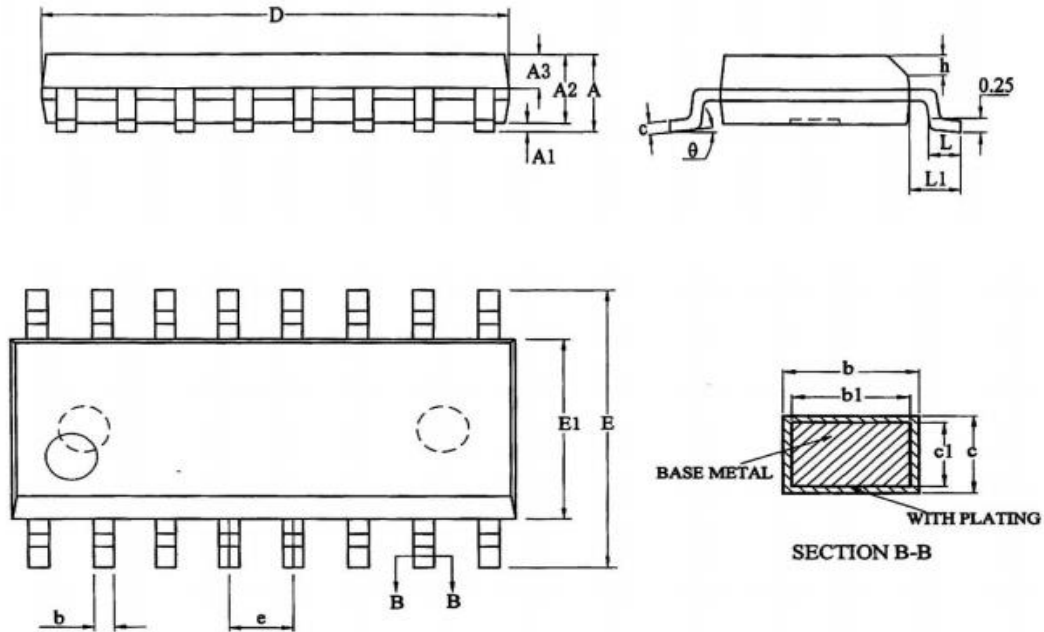
The PLL consists of phase-frequency detector (PFD), charge pump, loop filter, voltage-controlled oscillator (VCO), and divider (32). The PFD compares two signals and produces an error signal which is proportional to the two signal phase difference. The error signal is used to control the VCO to run fast or slow.

The VCO oscillation frequency range is tunable between 200MHz-450MHz.





Package Information SOP-16



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
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
b1	0.38	0.41	0.43
c	0.21	—	0.26
c1	0.19	0.20	0.21
D	9.70	9.90	10.10
E	5.80	6.00	6.20
E1	3.70	3.90	4.10
e	1.27BSC		
h	0.25	—	0.50
L	0.50	—	0.80
L1	1.05BSC		
theta	0	—	8°