



CY900T Datasheet

450M-1000MHz RF transmitter



GENERAL DESCRIPTION

The CY900T is a high performance, easy to use, single chip ASK transmitter IC for remoter wireless applications in the 450 to 1000MHz frequency band.

This transmitter IC is a true “data-in, antenna-out” monolithic device. In terms of power, the CY900T is capable of delivering +10dBm into a 50Ω load. This power level enables a small form factor transmitter (lossy antenna) such as a key fob transmitter to operate near the maximum limit of transmission regulations. In terms of operating voltage, the CY900T operates from 2.5V to 3.6V.

The CY900T is easy to use, it requires a reference frequency (RF carrier frequency divide by 64 times) generated from a crystal with a few additional external parts to create a complete versatile transmitter.

The CY900T operates with ASK/OOK UHF receiver types from wide-band super-regenerative radios to narrow-band, high performance super-heterodyne receivers. The CY900T’s maximum ASK data rate is 10kbps (Manchester Encoding).

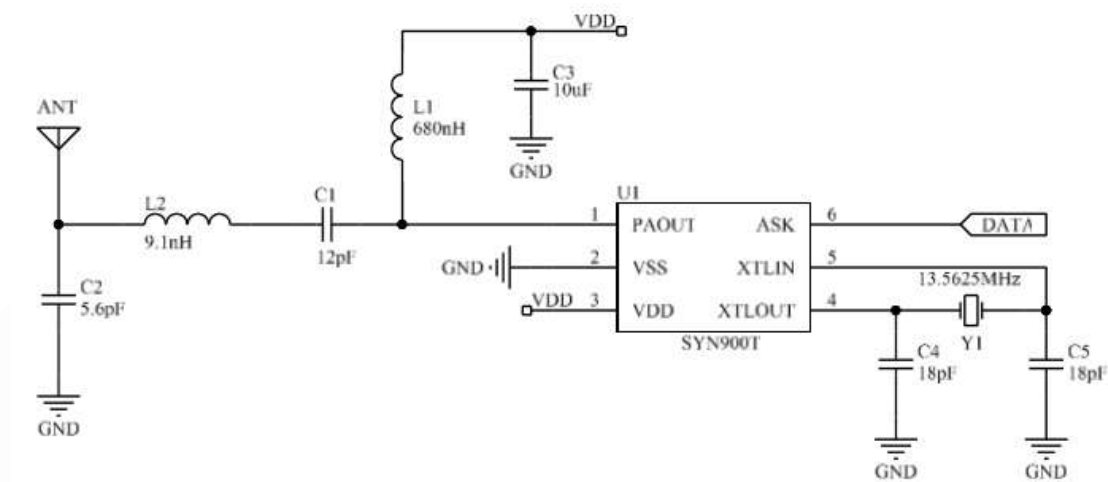
FEATURES

- Complete UHF transmitter
- 450MHz to 1000MHz Frequency Range
- Data Rates up to 10kbps ASK
- Output Power to 10dBm on 50ohm load
- Low external part count
- Operate with Crystals or Ceramic Resonators
- SOT23-6 Package Type

APPLICATIONS

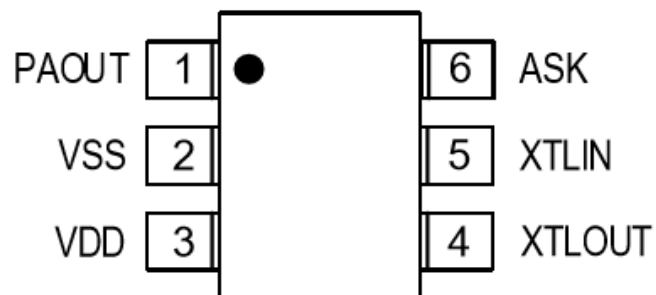
- Fan Controllers
- Remote Power Switches
- Multi-Media Remote Control
- Remote Sensor Data Links
- Infrared Transmitter Replacement

TYPICAL APPLICATION



868MHz CY900T Application Circuit

PIN CONFIGURATION



CY900T SOT23-6 Package



PIN DESCRIPTION

Pin	Pin Name	Pin Function
1	PAOUT	Power Output
2	VSS	Ground
3	VDD	Power Supply.
4	XTLOUT	Crystal Out (Output): Reference oscillator output connection.
5	XTLIN	Crystal In (Input): Reference oscillator output connection.
6	ASK	Code Data Input.

ABSOLUTE MAXIMUM RATINGS

Supply Voltage	+5V
Input Voltage	+5V
Voltage on PAOUT	7.2V
Storage Temperature Range	-65°C to +150°C
Lead Temperature (soldering, 10sec.)	+260°C
ESD Rating	Note 1

OPERATING RATINGS

Supply Voltage	+2.5V to +3.6V
Input Voltage (Max.)	3.6V
Ambient Temperature(T_A)	-40°C to +85°C

ELECTRICAL CHARACTERISTICS

Unless otherwise noted, VDD = 3V, T_A = 25 °C, 1Kbps data rate 50% duty cycle, RL 50ohm load(matched).

RF Output

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
P_{OUT}	Output Power	$f_{TX} = 868\text{MHz}$	10			dBm



Reference Oscillator

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
f_{OSC}	Frequency	$f_{TX} = 868\text{MHz}$		13.5625		MHz
C_{XTL}	Pin Capacitance			2		pF
C_{EXT}	External Capacitance	See Schematic C4, C5		18		pF

ASK Modulation

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
		$f_{TX} = 868\text{MHz}$		<1000		kHz
	Data Rate				10	kbps

Digital / Control Section

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
T_{START}	Output Blanking	VDD from 0V to 3V		500		μsec
V_{IH}	Digital Input ASK Pin	High (V_{IH})	$0.8 \times V_{DD}$			V
V_{IL}		Low (V_{IL})			$0.2 \times V_{DD}$	V
I_{IH}	Digital Input Leakage Current ASK Pin	High (V_{IH})		0.05		μA
I_{IL}		Low (V_{IL})			0.05	μA
UVLO	Under Voltage Lock Out			1.6		V

Power Supply

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
I_{ON}	Supply Current	$f_{TX} = 868\text{MHz}$, $P_{out} = +12\text{dBm}$		23		mA

Note 1: Device is ESD sensitive. Use appropriate ESD precautions. Exceeding the absolute maximum rating may damage the device.

BLOCK DIAGRAM

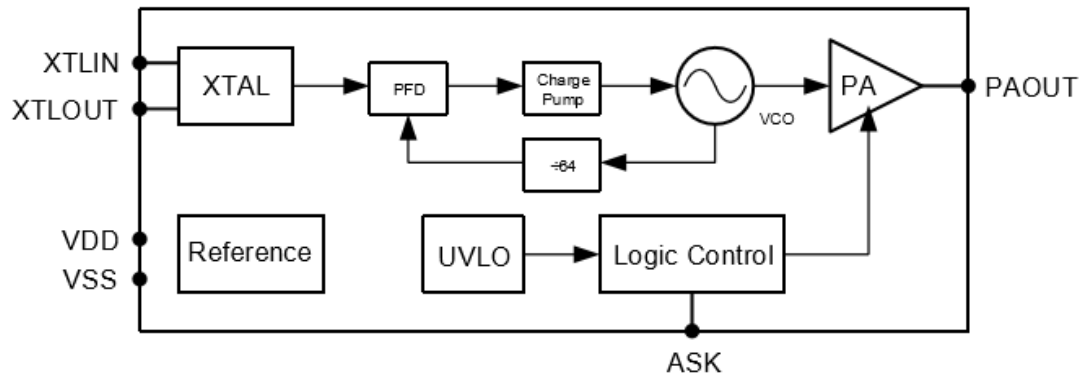


Figure 1 Simplified Block Diagram

FUNCTIONAL DESCRIPTION

Figure 1 Simplified Block Diagram that illustrates the basic structure of the CY900T. It is composed of five modules; Crystal oscillator, PLL, PA, Reference, UVLO and Logic Control.

Crystal Oscillator

The reference oscillator circuit configuration for ASK operation. The reference oscillator is capable of driving crystals with ESR range from 20Ω to 300Ω.

PLL

The PLL is to provide a stable carrier frequency for transmission. It is a “divide by 64” phase locked loop oscillator.

Power Amplifier

The PA serves two purposes: To buffer the VCO from external elements. To amplify the phase locked signal. The power amplifier can produce +10dBm at 3V on 50ohm.

Reference

The reference provides the internal stable voltage and current.



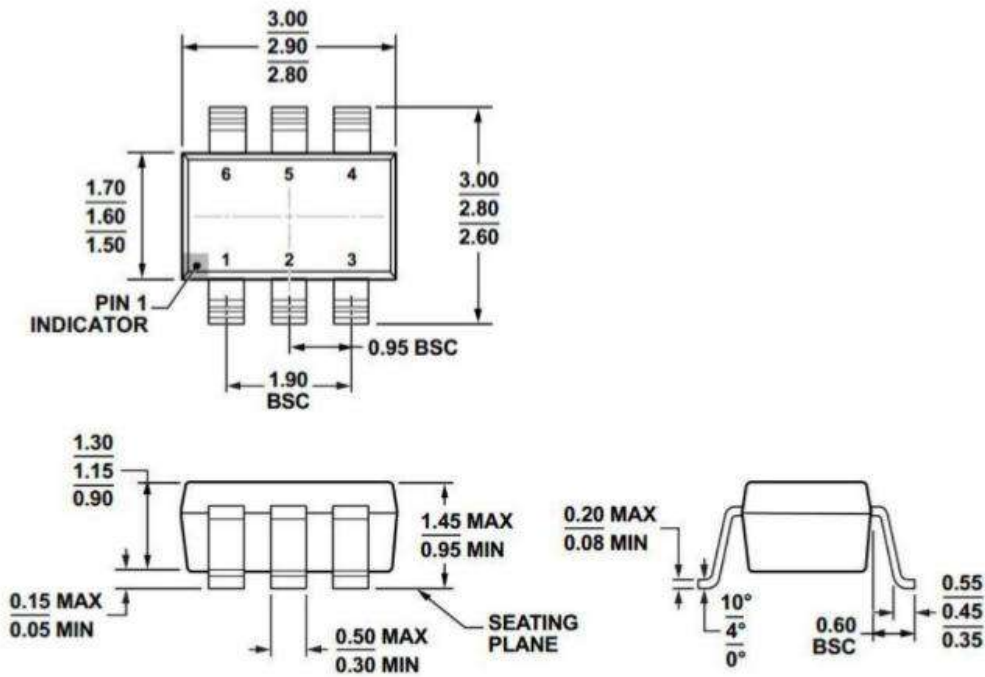
Under Voltage Detect

The block senses operating voltage. If the operating voltage falls below the setting voltage, this block will send a signal to disable the PA.

Logic Control

The logic control gates the ASK data. It only allows transmission when lock, amplitude and under voltage detect conditions are valid.

PACKAGE DESCRIPTION



SOT23-6 Package Outline Dimensions shown in millimeters