CYF115H Datasheet

300M-450MHz ASK transmitter

FEATURES

- 12V High Voltage Supply
- Internal LDO Regulator
- 300MHz to 450MHz Frequency Range
- Data Rates up to 10kbps ASK
- Output Power to 17dBm on 50ohm load
- Low external part count
- SOT23-6 Package Type

APPLICATIONS

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

DESCRIPTION

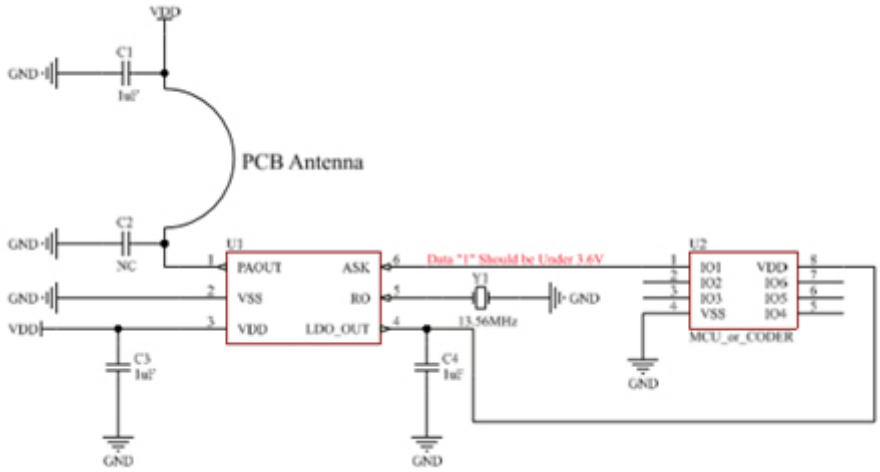
The CYF115H is a high voltage supply, high performance, internal 3V LDO regulator output, single chip ASK transmitter IC for remoter wireless applications in the 300 to 450MHz frequency band.

This transmitter IC is a true “data-in, antenna-out” monolithic device, in terms of power, the CYF115H is capable of delivering 17dBm into a 50ohm load (matched). In the terms of operating voltage, the CYF115H operates from 5V to 14V. In the terms of internal LDO regulator, the regulator can output 3V voltage supply for encode ICs or MCU, and up to 60mA load current with external 1uF capacitor when 12V input Voltage.

The CYF115H is easy to use, it requires a reference frequency (RF carrier frequency divide by 32 times) generated from a crystal without external capacitor. No external matching network components for PCB antenna application.

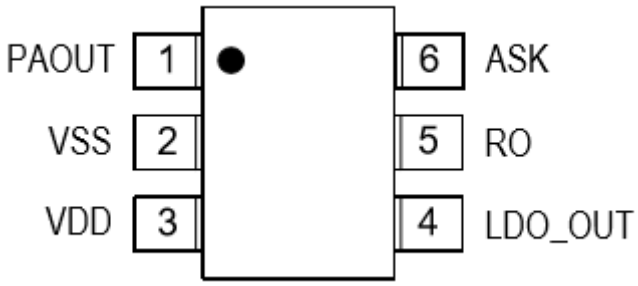
The CYF115H operates with ASK/OOK UHF receiver types from wide-band super-regenerative radios to narrow-band, high performance super-heterodyne receivers. The CYF115H’s maximum ASK data rate is 10kbps. The ASK data voltage should be under 3.6V.

TYPICAL APPLICATION



433.92MHz CYF115H Application Circuit

PIN CONFIGURATION



CYF115H SOPT23-6 Package

Pin	Name	Function
1	PAOUT	Power Output
2	VSS	Ground
3	VDD	High Voltage Power Supply
4	LDO_OUT	Internal LDO Voltage Output Supply for MCU or Coder
5	RO	Reference Oscillator
6	ASK	Code Data Input, Data "1" Should be Under 3.6V

ABSOLUTE MAXIMUM RATINGS

Supply Voltage ……..16V
Input Voltage ……..…7V
ESD Rating ……..….Note 1
Storage Temperature Range……-65℃ to 150℃
Junction Temperature ……150°C
Lead Temperature (soldering, 10sec.) ….. 260°C

OPERATING RATINGS

Supply Voltage ……..…5V to 14V
Input Voltage (Max.) ……..…3.6V
Ambient Temperature (TA) …….-40℃ to 85℃

ELECTRICAL CHARACTERISTICS

Unless otherwise noted, VDD = 12V, TA = 25℃, 1Kbps data rate 50% duty cycle, RL 50ohm load(matched).

RF Output

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
Pout	Output Power	fRX = 315MHz		18		dBm
		fRX = 433.92MHz		16		dBm

Reference Oscillator

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
fosc	Frequency	fRX = 315MHz	9.84375			MHz
		fRX = 433.92MHz	13.56			MHz
	Input Range		0.2		1.5	V_{PP}
Ioscsc	Source Current	V(RO) = 0V		5		μA

ASK Modulation

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
	Occupied Bandwidth	@315MHz		<700		kHz
		@433.92MHz		<1000		kHz
	Data Rate				10	Kbps

Power Supply

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
ICN	Supply Current @ VDD = 12V	fRX = 315MHz, Pout = +14dBm		24		mA
		fRX = 433.92MHz, Pout = +14dBm		24		mA

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

BLOCK DIAGRAM

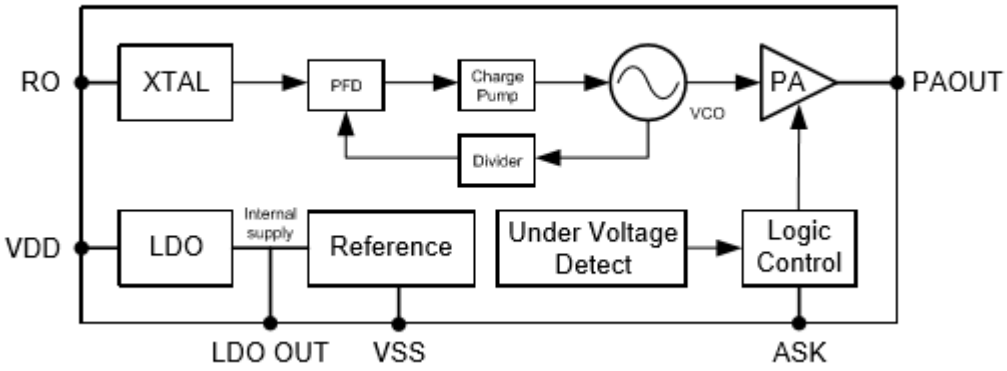


Figure 1 Simplified Block Diagram

FUNCTIONAL DESCRIPTION

Figure 1 Simplified Block Diagram that illustrates the basic structure of the CYF115H. It is composed of five modules; Crystal oscillator, PLL, PA, LDO, Reference, Under Voltage Detect and Logic Control.

Crystal Oscillator

The reference oscillator is crystal-based Pierce configuration, designed to accept crystals with frequency from 9.375MHz to 14.0625MHz.

PLL

The PLL is to provide a stable carrier frequency for transmission. It is a “divide by 32” 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 +17dBm at 12V on 50ohm.

LDO Regulator

The LDO outputs 3V voltage for internal modules and external ICs.

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.

PCB LAYOUT

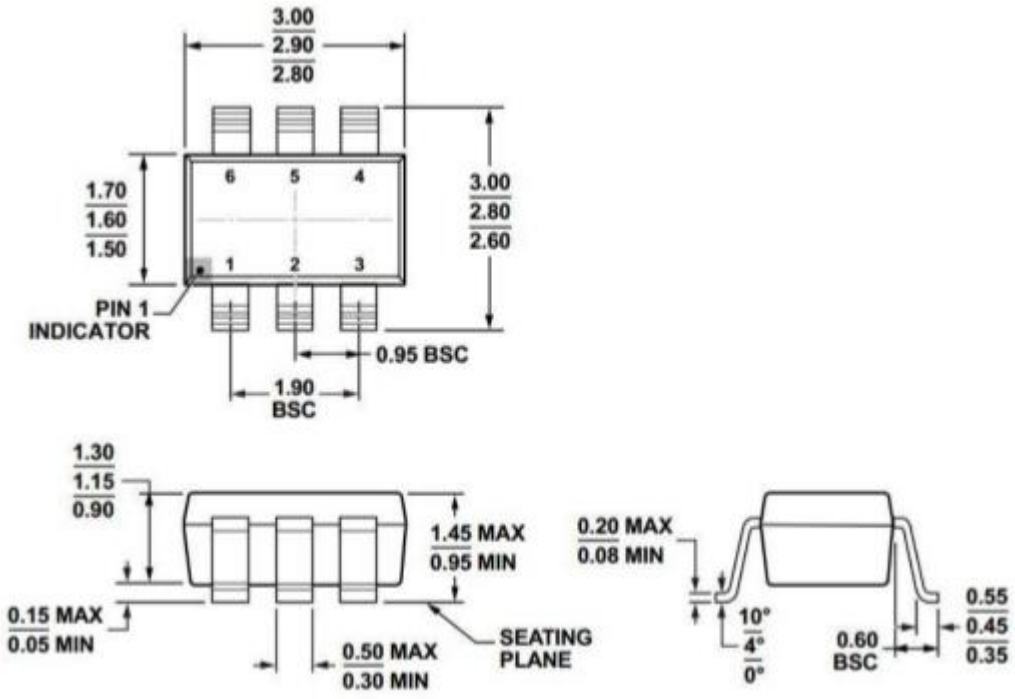
Layout Issues

For PCB antenna application, PCB layout is a primary concern for achieving optimum performance and consistent manufacturing results, so PCB trace length should be short to minimize parasitic inductance (25.4mm ~ 20nH), wide traces and a ground plane under the signal traces is recommended.

Antenna Layout

No ground plane should be under the antenna trace, capacitance C2 normally don't need.
Recommended for 433.92MHz application:
1. PCB antenna trace length is 45±5mm.
2. PCB antenna trace width is 1mm. Recommended for 315MHz application: 1. PCB antenna trace length is 54±5mm. 2. PCB antenna trace width is 1mm.

PACKAGE DESCRIPTION



SOT23-6 Package Outline Dimensions shown in millimeters