

Table of contents

1. Overview.....	1
2. Characteristics	1
3. application Scenario.....	1
4. Packaging information.....	2
4.1 Pin diagram.....	2
4.2 Pin Description.....	2
5. Limit parameters.....	2
5.1 Limit value.....	3
5.2 Recommended value.....	3
6. Electrical parameters.....	3
7. Typical application diagram.....	4
7.1 Application Circuit.....	4
7.2 Device parameters.....	4
8. Package Diagram and Dimensions.....	5
8.1 Package Diagram.....	5
8.2 Package size.....	5

1. Overview

VG590 is a special integrated circuit for superheterodyne reception. It is a single-chip solution for ASK/OOK (ON-OFF Keyed) wireless reception. This chip realizes data input and data output. It integrates a low-noise amplifier, mixer, frequency synthesizer PLL, intermediate frequency amplifier, bandpass filter, peak detection circuit, low-pass filter and comparator. The application circuit of this chip is simple and only a few components are needed to realize the wireless signal reception function.

The chip demodulates the received RF signal and outputs a CMOS level data signal, achieving "data in, data out". The chip's operating voltage is 2.8~5.5V, and the current consumption is 5.2mA (433.92MHz) at 5V. The typical sensitivity can reach up to -115dBm. The maximum data rate is 10Kbit/s, and the operating temperature range is -30°C to +85°C.

This chip solution is mainly suitable for systems that require simple structure and small scale in industrial and consumer fields.

2. Characteristics

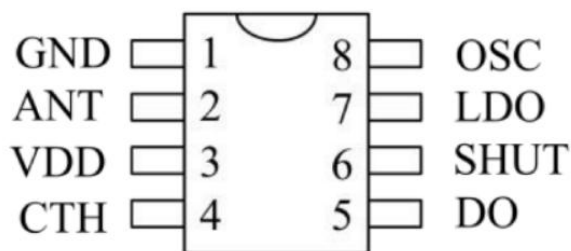
- ◆ Integrated OOK wireless receiving chip
- ◆ Working speed can reach 10Kbit/s
- ◆ Operating frequency 300MHz~450MHz
- ◆ 2.8~5.5V power supply
- ◆ Low power consumption, high sensitivity
- ◆ Good stability no debugging required
- ◆ Data in, data out

3. Application

- ◆ Alarm and security systems
- ◆ Home automation control
- ◆ Automatic test system
- ◆ Vehicle security system
- ◆ Remote control device
- ◆ Industrial control
- ◆ Short range wireless communication

4. Packaging information

4.1 Pin diagram



4.2 Pin Description

Pin number	Pin number	Functional Description	I/O
1	GND	land	I
2	ANT	RF Input	I
3	VDD	power supply	I
4	CTH	Data Limit	I
5	DO	Data Output	O
6	SHUT	Enable	I
7	LDO	LDO Output	O
8	OSC	Crystal Oscillator	I

5 Absolute Maximum Ratings (Unless otherwise specified: Tamb=25° C)

5.1 Limit values

symbol	parameter	Parameter range	unit
VDD	Supply voltage	-0.3~6.5	V
TA	Work Environment	-30~+85	°C
TSTG	Storage temperature	-60~+150	°C
TLES	Soldering temperature	260(10s)	°C
TJMAX	Maximum junction temperature	150	°C
ESD	Human body model ESD	>4000	V

5.2 Recommended value

symbol	parameter	Parameter range	unit
VDD	Supply voltage	2.8~5.5	V
TA	Work Environment	-30~+85	℃

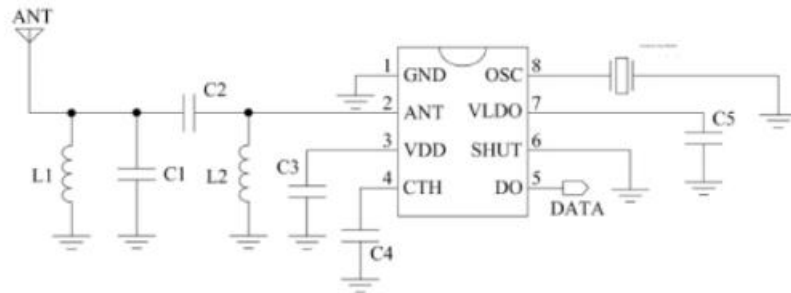
6. Electrical parameters

If no special instructions are given, the default values are VDD=5V, TA=25℃, and input and output are 50Ω matched.

parameter	symbol	Test conditions	Minimum	Typical Value	Maximum	unit
Power Characteristics						
power supply	VDD		2.8	5	5.5	V
Junction temperature	T		-40	25	125	℃
Working current	I _{SS}	f _{rx} =315MHz		4.2		mA
		f _{rx} 433.92MHz		5.2		
Shutdown current	I _{SHUT}				0.5	uA
Frequency characteristics						
Input sensitivity (dBm)	V _{in}	f _{rx} =433.92MHz 1kbps BER=10 ⁻²		-115		dBm
		f _{rx} =315 MHz 1kbps BER=10 ⁻²		-115		
Image Rejection Ratio				30		dB
IF center frequency	f _{IF}	f _{rx} -433.92MHz		1240		KHz
		f _{rx} =315 MHz		890		
IF bandwidth	f _{BW}	f _{rx} -433.92MHz		500		KHz
		f _{rx} =315 MHz		400		
Maximum input intensity				0		dBm
Crystal Oscillator Characteristics						
Crystal frequency		f _{rx} -433.92MHz		13.52127		MHz
		f _{rx} =315 MHz		9.81563		
Output Characteristics						
CMOS/TTL High level output	V _{OH}			0.8		VDD
CMOS/TTL Low level output	V _{OL}				0.2	VDD

7. Typical application diagram

7.1 Application Circuit



7.2 Device Parameters

Typical parameters when working at 315MHz

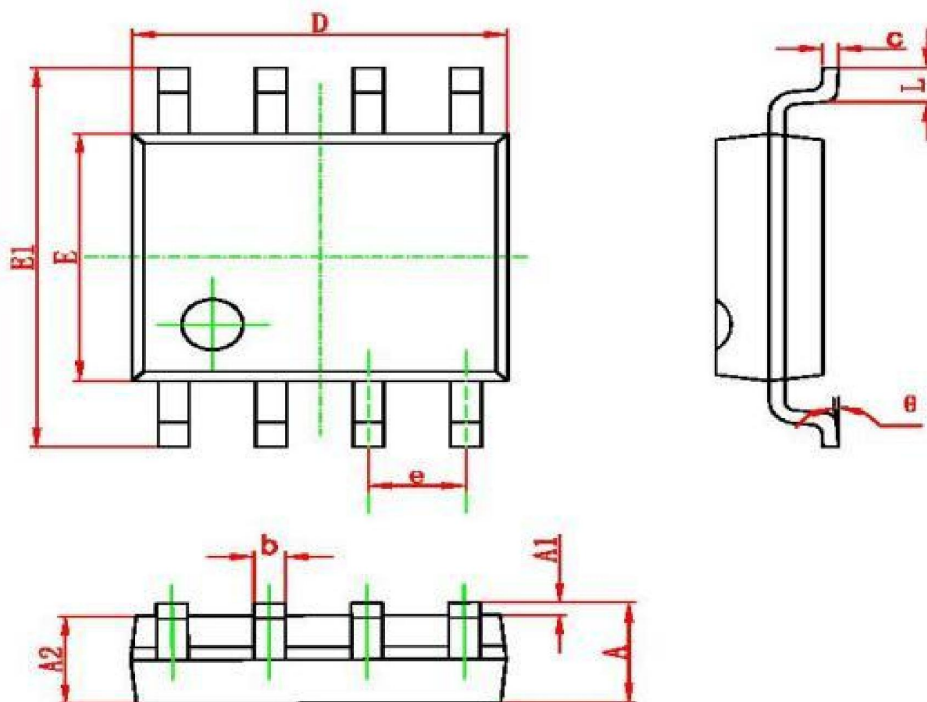
Device name	value	Remark
L1	39nH	
L2	68nH	
C1	6.8pF	
C2	1.5pF	
C3	100nF+10uF	
crystal oscillator	9.81563MHz	
C4	100nF	
C5	100nF or floating	

Typical parameters when working at 433.92MHz

Device name	value	Remark
L1	24nH	
L2	39nH	
C1	5.6pF	
C2	1.5pF	
C3	100nF+10uF	
crystal oscillator	13.52127MHz	
C4	100nF	
C5	100nF or floating	

8.Package Diagram and Dimensions

8.1Package Diagram



8.2Package size

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
C	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
E	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
H	0.250(TYP)		0.01(TYP)	