

模块参数

参数名称	参数值	备注
模块型号	AD8310-差分	
模块类型	射频对数检波器	
模块供电电压	DC5V	
模块供电电流	9mA	
输入信号形式	差分	
输入电压范围	-100dBm -- +15dBm	
输入频率范围	DC-400MHz	
输入阻抗	50欧	
输出电压范围	0.34V-2.7V	以实测值为准，不同模块之间有差异
输入信号特点	输入耦合	可为连续正弦波或者脉冲，脉冲测量需要修改电路，模块默认为连续均值检波。
输出电流	2mA (max)	输出为电压信号，一般不带电流。
模块动态范围	优于95dB	
模块重量	17.5g	
模块保护	无	无反接保护，无限流保护
模块重量	17.5g	
模块规格	43*38*14mm	长*宽*高-PCB尺寸
模块屏蔽	无屏蔽盖	
模块发热因素		供电电压过大损坏芯片或者模块有损坏
模块工作温度	-40℃--+85℃	工业级
模块特点		模块简约小巧，接口简单，带有供电指示。
应用范围		RSSI, 发射功率控制，脉冲检测等
模块接口类型		SMA信号输入输出，5.08-2PIN电源座

3

模块描述

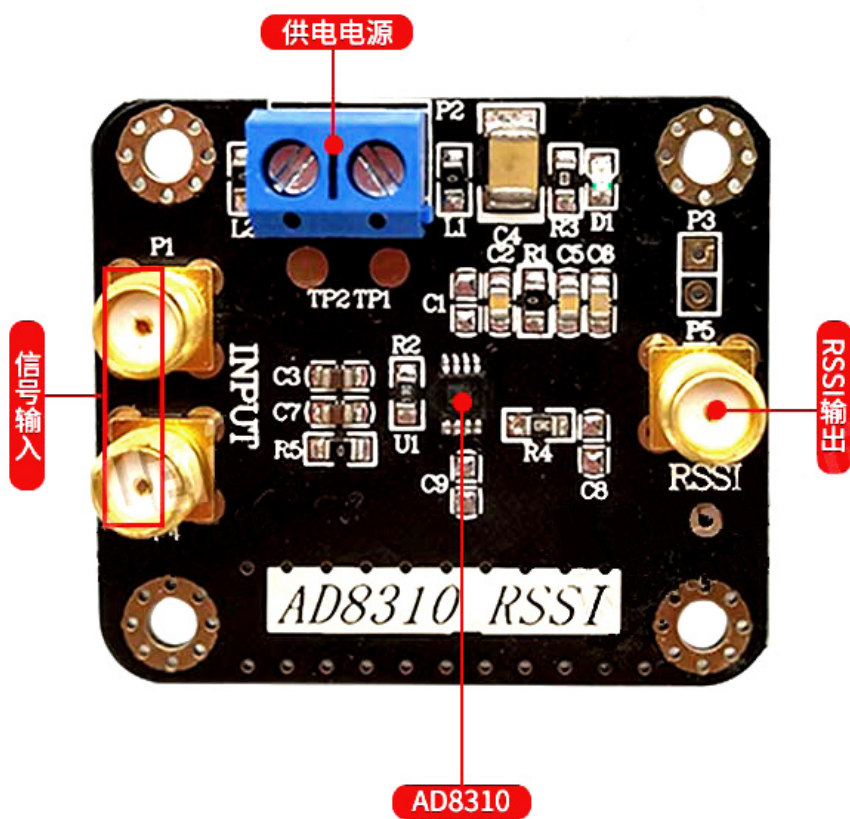
AD8310是一款超快响应、功能多样的对数放大器,它是一款基于渐进压缩(逐次压缩)技术的

400MHz完整单芯片解调对数放大器,在频率最高为100MHz时可提供95dB(± 3 dB法则一致性)和90dB(± 1 dB紧误差界限)的动态范围。

AD8310是要求较高的精密中频信号测量应用的理想之选,该对数放大器通过以dB等效形式检测并压缩中频信号,使测量工作轻松自如。AD8310具有极快的15ns响应时间,可以检测10MHz以上的ASK调制波形。它提供了低成本、小体积、低功耗、高精度和稳定性、动态范围、包括音频到超高频的频率范围、快速响应时间和良好的负载驱动能力的独特组合,使得该产品在许多需要将信号减少到分等效的应用中非常有用。

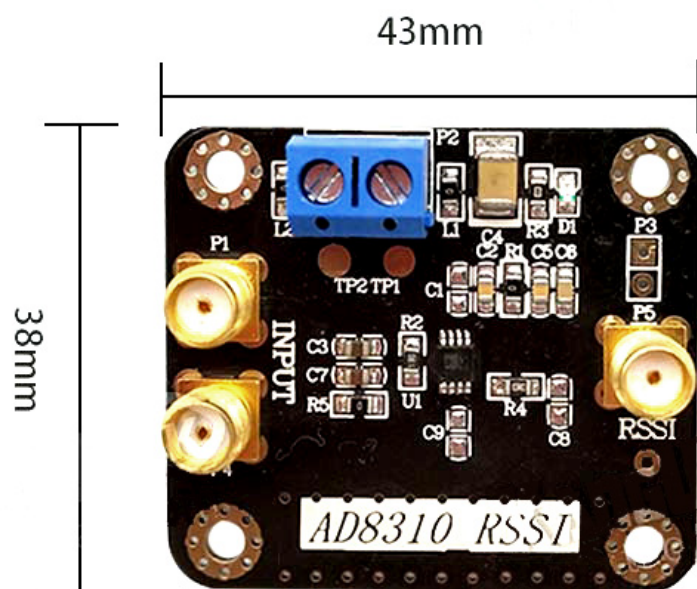
4

模块接口图



5

模块尺寸图



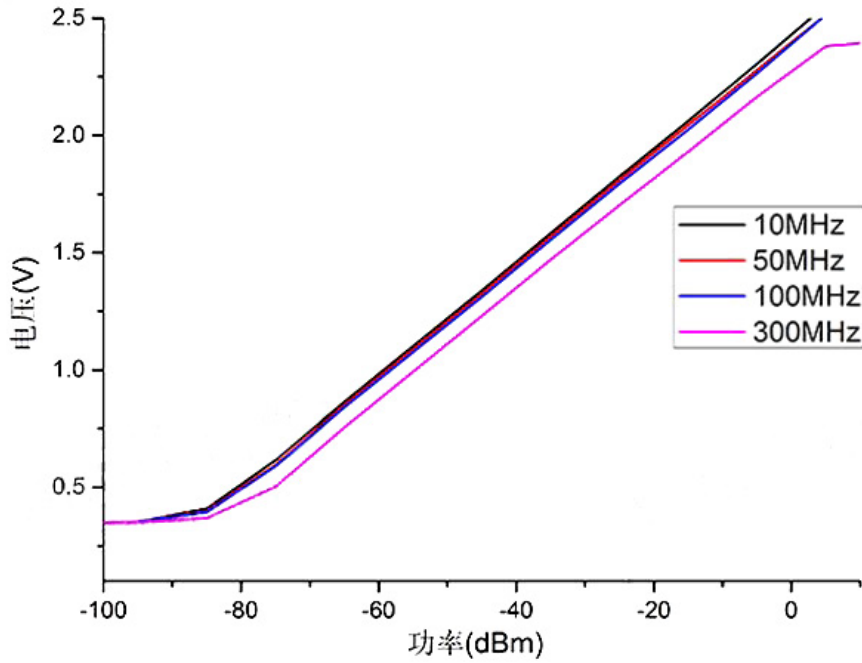
6

模块使用注意事项

- (1) 检波器模块最大输入功率为+15dBm，检波器动态范围115dB。
- (2) 模块无反接、无限流保护，使用模块时一定要注意不要反接，否则容易损坏芯片或模块。
- (3) 模块为低功耗模块，供电电源不超过5.5V。
- (4) 由于模块是高精度器件，为了避免不必要的干扰，建议使用线性电源供电。
- (5) 输入信号建议使用SMA接口，接触不良或劣质的线材可能导致信号衰减或者噪声过大，使得测量不准确。
- (6) 检波器模块在不同频率下的响应和动态范围会差别，不同的模块之间也有差异，属于正常现象，并非模块问题

7

模块测试图



AD8310 带宽DL-400MHz 95dB				
电压 (V)	频率 (MHz)			
功率 (dBm)	10	50	100	300
15	2.7310	2.6780	2.6270	2.4070
5	2.5550	2.5150	2.5140	2.3790
-5	2.3050	2.2800	2.2650	2.1650
-15	2.0607	2.0429	2.0251	1.9307
-25	1.8253	1.8098	1.7942	1.7027
-35	1.5829	1.5689	1.5549	1.4704
-45	1.3383	1.3247	1.3107	1.2301
-55	1.1024	1.0890	1.0761	0.9927
-65	0.8639	0.8499	0.8402	0.7537
-75	0.6159	0.5964	0.5893	0.5016
-85	0.4084	0.4000	0.3935	0.3684
-95	0.3526	0.3538	0.3527	0.3493
-100	0.3499	0.3480	0.3483	0.3496

8

常见问题解答

Q: 测量脉冲功率是无反应? 输出是一条直线。

A: 模块默认功能为功率检波, 不能检测脉冲或者瞬时功率大小, 需要将C1电容换为小电容值才能检测脉冲和瞬时功率, 一般对瞬时要求越高, 可将C1电容去掉。

Q: 买了2个模块, 同一检测条件输出电压有差异, 是正常现象么?

A: 模块之间存在个体差异, 详情实测图为典型数据, 具体参数以实测为准。

Q: 可以做快速检波或者解调吗? 单端和差分模块有什么区别?

A: 在去掉C1电容的情况下可以做快速检波或者解调。只是接口不一样, 差分的模块能支持差分输入。



Fast, Voltage-Out, DC to 440 MHz, 95 dB Logarithmic Amplifier

AD8310

FEATURES

Multistage demodulating logarithmic amplifier

Voltage output, rise time <15 ns

High current capacity: 25 mA into grounded R_L

95 dB dynamic range: -91 dBV to +4 dBV

Single supply of 2.7 V min at 8 mA typ

DC to 440 MHz operation, ± 0.4 dB linearity

Slope of +24 mV/dB, intercept of -108 dBV

Highly stable scaling over temperature

Fully differential dc-coupled signal path

100 ns power-up time, 1 mA sleep current

APPLICATIONS

Conversion of signal level to decibel form

Transmitter antenna power measurement

Receiver signal strength indication (RSSI)

Low cost radar and sonar signal processing

Network and spectrum analyzers

Signal-level determination down to 20 Hz

True-decibel ac mode for multimeters

GENERAL DESCRIPTION

The AD8310 is a complete, dc to 440 MHz demodulating logarithmic amplifier (log amp) with a very fast voltage mode output, capable of driving up to 25 mA into a grounded load in under 15 ns. It uses the progressive compression (successive detection) technique to provide a dynamic range of up to 95 dB to ± 3 dB law conformance or 90 dB to a ± 1 dB error bound up to 100 MHz. It is extremely stable and easy to use, requiring no significant external components. A single-supply voltage of 2.7 V to 5.5 V at 8 mA is needed, corresponding to a power consumption of only 24 mW at 3 V. A fast-acting CMOS-compatible enable pin is provided.

Each of the six cascaded amplifier/limiter cells has a small-signal gain of 14.3 dB, with a -3 dB bandwidth of 900 MHz. A total of nine detector cells are used to provide a dynamic range that extends from -91 dBV (where 0 dBV is defined as the amplitude of a 1 V rms sine wave), an amplitude of about ± 40 μ V, up to +4 dBV (or ± 2.2 V). The demodulated output is accurately scaled, with a log slope of 24 mV/dB and an intercept of -108 dBV. The scaling parameters are supply- and temperature-independent.

FUNCTIONAL BLOCK DIAGRAM

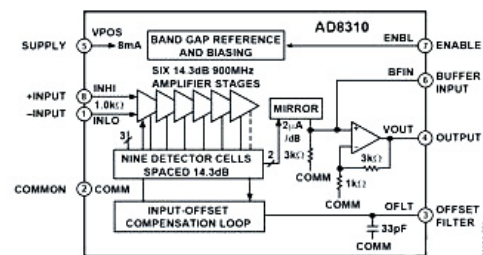


Figure 1.

The fully differential input offers a moderately high impedance (1 k Ω in parallel with about 1 pF). A simple network can match the input to 50 Ω and provide a power sensitivity of -78 dBm to +17 dBm. The logarithmic linearity is typically within ± 0.4 dB up to 100 MHz over the central portion of the range, but it is somewhat greater at 440 MHz. There is no minimum frequency limit; the AD8310 can be used down to low audio frequencies. Special filtering features are provided to support this wide range.

The output voltage runs from a noise-limited lower boundary of 400 mV to an upper limit within 200 mV of the supply voltage for light loads. The slope and intercept can be readily altered using external resistors. The output is tolerant of a wide variety of load conditions and is stable with capacitive loads of 100 pF.

The AD8310 provides a unique combination of low cost, small size, low power consumption, high accuracy and stability, high dynamic range, a frequency range encompassing audio to UHF, fast response time, and good load-driving capabilities, making this product useful in numerous applications that require the reduction of a signal to its decibel equivalent.

The AD8310 is available in the industrial temperature range of -40°C to +85°C in an 8-lead MSOP package.

Rev. F
Information furnished by Analog Devices is believed to be accurate and reliable. However, no responsibility is assumed by Analog Devices for its use, nor for any infringements of patents or other rights of third parties that may result from its use. Specifications subject to change without notice. No license is granted by implication or otherwise under any patent or patent rights of Analog Devices. Trademarks and registered trademarks are the property of their respective owners.

One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106, U.S.A.
Tel: 781.329.4700 www.analog.com
Fax: 781.461.3113 ©2005–2010 Analog Devices, Inc. All rights reserved.