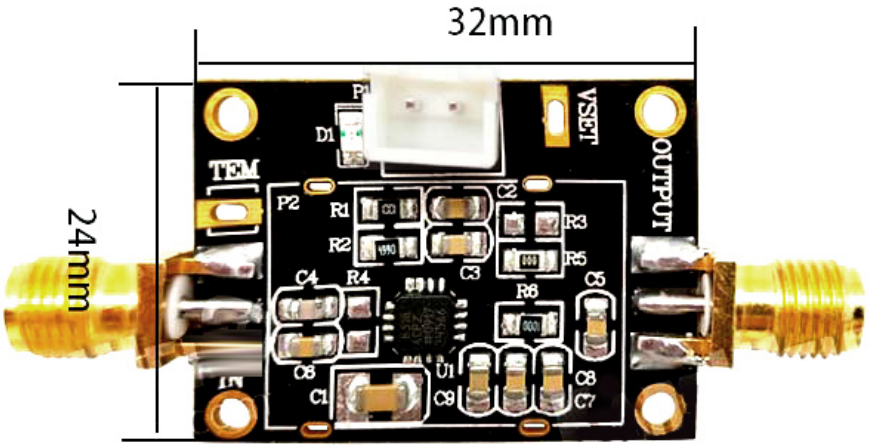
模块参数		
参数名称	参数值	备注
模块型号	AD8318	
模块类型	射频对数检波器	
模块供电电压	DC5V	
模块供电电流	80mA	
输入信号形式	单端	
输入电压范围	-65dBm -- +20dBm	
输入频率范围	1MHz-8GHz	由于仪器限制，3G以上参数未测
输入阻抗	50欧	
输出电压范围	0.5V-2.1V	以实测值为准，不同模块之间有差异
输入信号特点	输入耦合	可为连续正弦波或者脉冲，脉冲测量需要修改电路，模块默认为连续均值检波。
输出电流	2mA（max）	输出为电压信号，一般不带电流。
模块动态范围	优于70dB	
模块重量	10g	
模块保护	无	无反接保护，无限流保护
模块重量	10g	
模块规格	32*24*7mm	长*宽*高-PCB尺寸
模块屏蔽	有屏蔽盖	
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	-25℃--+75℃	工业级
模块特点		模块简约小巧，接口简单
应用范围		发射机功率测量，接收机强度测量等
模块接口类型		SMA信号输入输出，XH2.54防呆电源座

3 模块描述

AD8318输入范围典型值为60dB（re:50），误差小于者±1dB。AD8318的响应时间为10ns，能够检测45MHz以上的RF突发脉冲。在环境温度条件下，该器件具有很好的对数截距稳定性。该器件还提供斜率为2mV°C的温度传感器输出，用于其它系统监控。需5V单电源供电。耗用电流典型值为68mA。当器件禁用时，功耗降至<1.5mW。

AD8318可以配置成向功率放大器等VGA提供控制电压，或提供VOUT引脚的测量输出。因为输出可以用于控制器应用所以宽带噪声极低。在这种模式下，设定点控制电压作用于VSET引脚。经过RF放大器的反馈环路通过VOUT实现闭合，其输出将放大器的输出调节至与VSET相对应的幅度。AD8318可通过VOUT引脚提供0V至49输出，适合控制器应用。作为测量器件，OUT引脚在外部与VSET相连，以产生输出电压VOUT,它是RF输入信号振幅的线性dB函数。对数斜率标称值为-25mvdB，但可以通过将VOUT的反馈电压调整至VSET接口进行调整。用NH输入时，截距为20dBm（re:500CW输入）。这些参数非常稳定，不随电源电压和温度波动而变化

5 模块尺寸图


32mm
24mm
TEM
IN
OUTPUT
VSET
P1
P2
D1
R1
R2
R3
R4
R5
R6
C1
C2
C3
C4
C5
C6
C7
C8
C9
U1

6 模块使用注意事项

（1）检波器模块最大输入功率为+20dBm。检波器动态范围85dB，有实测图可看出大于-5dBm开始出现非线性。

（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。

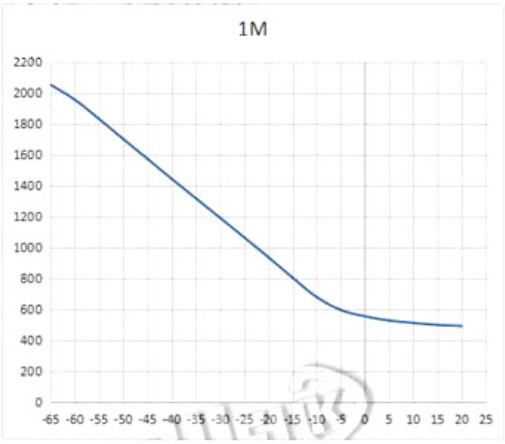
（3）模块为低功耗模块，供电电源不超过5.5V。

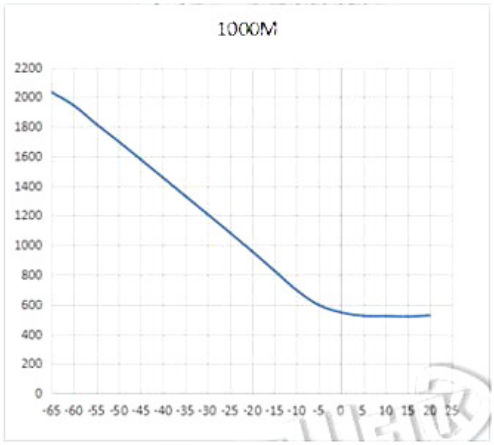
（4）由于模块是高精度器件，为了避免不必要的干扰，建议使用线性电源供电。

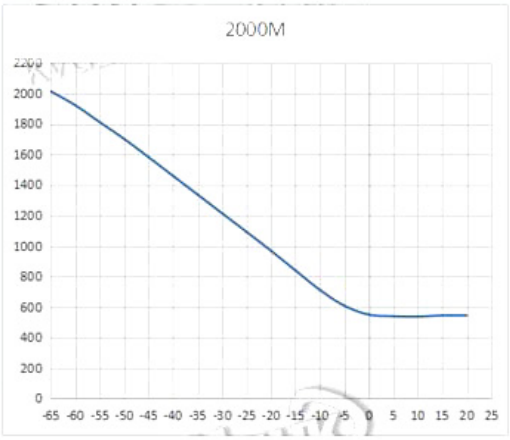
（5）输入信号建议使用SMA接口，接触不良或劣质的线材可能导致信号衰减或者噪声过大，使得测量不准确。

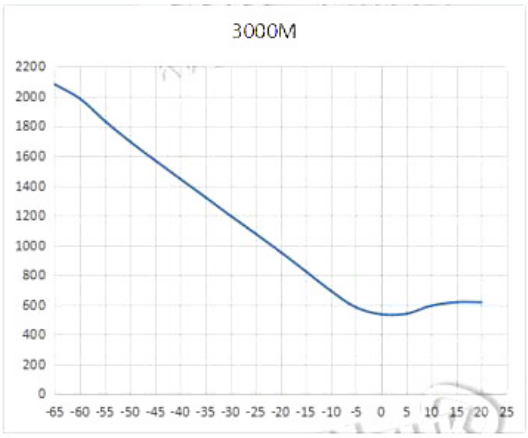
（6）检波器模块在不同频率下的响应和动态范围会差别，不同的模块之间也有差异，属于正常现象，并非模块问题

7 模块测试图









测试频率 MHz	输入功率 dBm	检波输出 /mV	测试频率 /MHz	输入功率 /dBm	检波输出 /mV	测试频率 MHz	输入功率 /dBm	检波输出 /mV
1	-65	2055	10	-65	2021	100	-65	2001
	-60	1958		-60	1916		-60	1916
	-55	1834		-55	1801		-55	1803
	-50	1704		-50	1683		-50	1688
	-45	1576		-45	1563		-45	1569
	-40	1447		-40	1441		-40	1444
	-35	1321		-35	1316		-35	1319
	-30	1195		-30	1193		-30	1196
	-25	1068		-25	1067		-25	1070
	-20	940		-20	939		-20	942
	-15	808		-15	806		-15	810
	-10	682		-10	681		-10	686
	-5	598		-5	596		-5	594
	0	557		0	554		0	545
	5	530		5	529		5	523
	10	514		10	508		10	508
	15	501		15	501		15	499
	20	494		20	595		20	494

500	-65	2012	1000	-65	2032	1500	-65	2013
	-60	1925		-60	1942		-60	1939
	-55	1812		-55	1818		-55	1848
	-50	1692		-50	1701		-50	1718
	-45	1571		-45	1579		-45	1594
	-40	1445		-40	1456		-40	1468
	-35	1320		-35	1333		-35	1344
	-30	1197		-30	1210		-30	1221
	-25	1071		-25	1086		-25	1098
	-20	944		-20	960		-20	974
	-15	814		-15	830		-15	845
	-10	690		-10	698		-10	717
	-5	594		-5	597		-5	609
	0	550		0	547		0	541
	5	526		5	524		5	534
	10	515		10	522		10	531
	15	513		15	519		15	527
	20	513		20	526		20	538

2000	-65	2015	2500	-65	2005	3000	-65	2082
	-60	1923		-60	1910		-60	1986
	-55	1812		-55	1806		-55	1835
	-50	1702		-50	1694		-50	1697
	-45	1582		-45	1573		-45	1570
	-40	1459		-40	1451		-40	1446
	-35	1337		-35	1329		-35	1323
	-30	1214		-30	1206		-30	1198
	-25	1092		-25	1084		-25	1077
	-20	968		-20	959		-20	953
	-15	839		-15	831		-15	824
	-10	711		-10	700		-10	693
	-5	607		-5	599		-5	582
	0	549		0	546		0	535
	5	538		5	541		5	538
	10	536		10	537		10	592
	15	543		15	544		15	616
	20	543		20	544		20	616

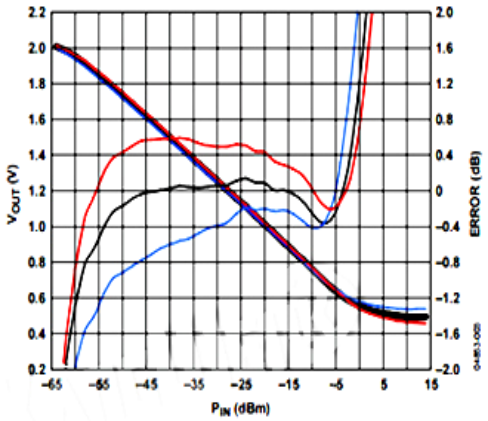


Figure 4. VOUT and Log Conformance vs. Input Amplitude at 900 MHz, Typical Device

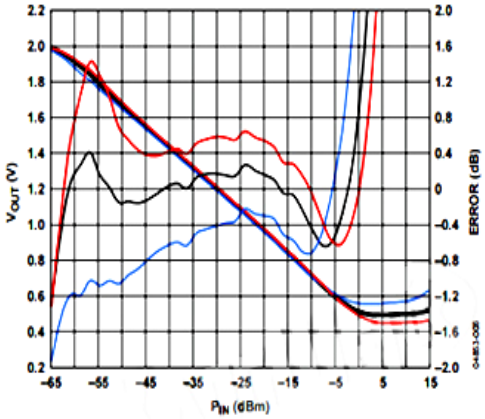


Figure 7. V_{OUT} and Log Conformance vs. Input Amplitude at 3.6 GHz, Typical Device, R_{TADJ} = 51 Ω

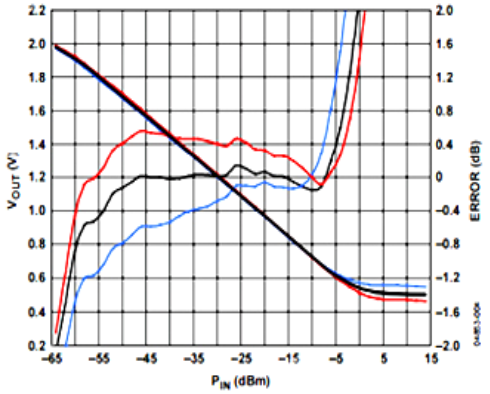


Figure 5. VOUT and Log Conformance vs. Input Amplitude at 1.9 GHz, Typical Device

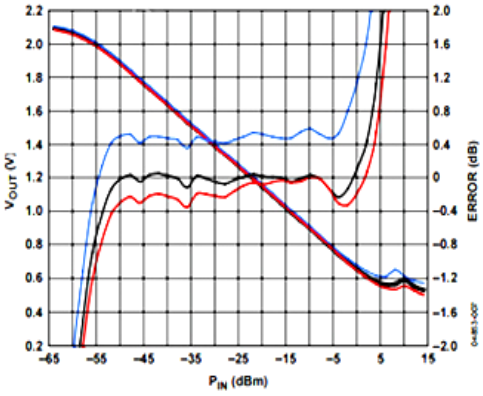


Figure 8. VOUT and Log Conformance vs. Input Amplitude at 5.8 GHz, Typical Device, R_{TADJ} = 1000 Ω

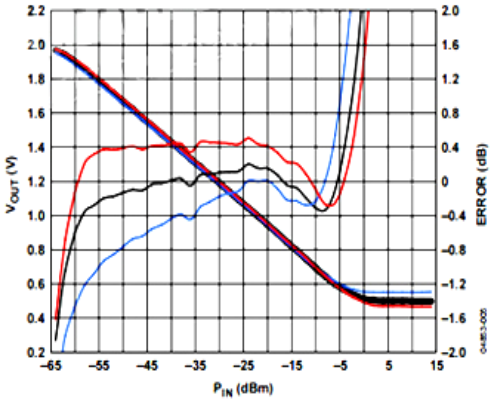


Figure 6. V_{OUT} and Log Conformance vs. Input Amplitude at 2.2 GHz, Typical Device

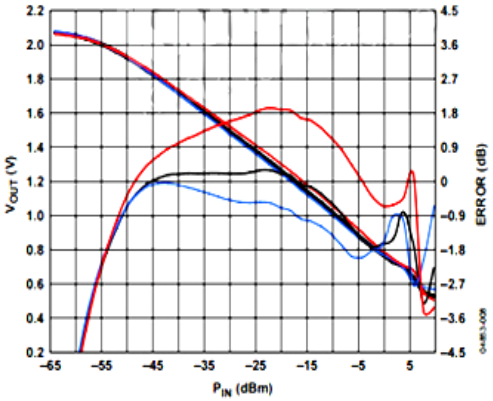


Figure 9. V_{OUT} and Log Conformance vs. Input Amplitude at 8 GHz, Typical Device

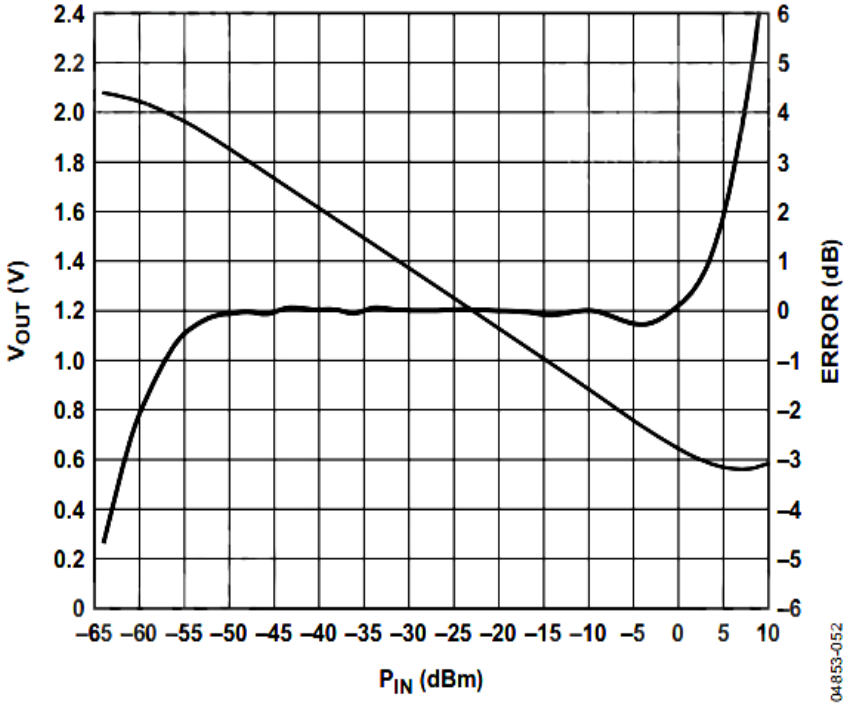


Figure 2. Typical Logarithmic Response and Error vs. Input Amplitude at 5.8 GHz

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C7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，那么C7电容就要够小。

Q：买了3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？

A:在去掉C7电容的情况下可以做快速检波或者解调。

9

芯片简介

ANALOG DEVICES

1 MHz to 8 GHz, 70 dB Logarithmic Detector/Controller

Data Sheet **AD8318**

FEATURES

Wide bandwidth: 1 MHz to 8 GHz
High accuracy: ±1.0 dB over 55 dB range (f < 5.8 GHz)
Stability over temperature: ±0.5 dB
Low noise measurement/controller output (VOUT)
Pulse response time: 10 ns/12 ns (fall/rise)
Integrated temperature sensor
Small footprint LFCSP
Power-down feature: <1.5 mW at 5 V
Single-supply operation: 5 V at 68 mA
Fabricated using high speed SiGe process

APPLICATIONS

RF transmitter PA setpoint control and level monitoring
RSSI measurement in base stations, WLAN, WiMAX, and radars

FUNCTIONAL BLOCK DIAGRAM

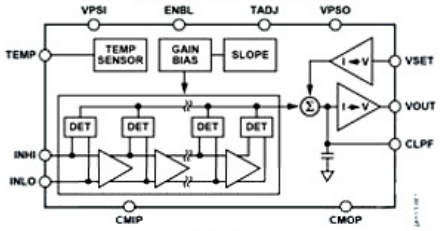


Figure 1.

GENERAL DESCRIPTION

The AD8318 is a demodulating logarithmic amplifier, capable of accurately converting an RF input signal to a corresponding decibel-scaled output voltage. It employs the progressive compression technique over a cascaded amplifier chain, each stage of which is equipped with a detector cell. The device is used in measurement or controller mode. The AD8318 maintains accurate log conformance for signals of 1 MHz to 6 GHz and provides useful operation to 8 GHz. The input range is typically 60 dB (referenced to 50 Ω) with error less than ±1 dB. The AD8318 has a 10 ns response time that enables RF burst detection to beyond 45 MHz. The device provides unprecedented logarithmic intercept stability vs. ambient temperature conditions. A 2 mV/°C slope temperature sensor output is also provided for additional system monitoring. A single supply of 5 V is required. Current consumption is typically 68 mA. Power consumption decreases to <1.5 mW when the device is disabled.

The AD8318 can be configured to provide a control voltage to a VGA, such as a power amplifier or a measurement output, from Pin VOUT. Because the output can be used for controller applications, wideband noise is minimal.

In this mode, the setpoint control voltage is applied to VSET. The feedback loop through an RF amplifier is closed via VOUT, the output of which regulates the amplifier output to a magnitude corresponding to VSET. The AD8318 provides 0 V to 4.9 V output capability at the VOUT pin, suitable for controller applications. As a measurement device, Pin VOUT is externally connected to VSET to produce an output voltage, V_{OUT}, which is a decreasing linear-in-dB function of the RF input signal amplitude.

The logarithmic slope is nominally −25 mV/dB but can be adjusted by scaling the feedback voltage from VOUT to the VSET interface. The intercept is 20 dBm (referenced to 50 Ω, CW input) using the INHI input. These parameters are very stable against supply and temperature variations.

The AD8318 is fabricated on a SiGe bipolar IC process and is available in a 4 mm × 4 mm, 16-lead LFCSP for the operating temperature range of −40°C to +85°C.

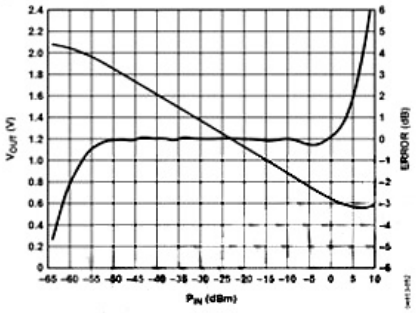


Figure 2. Typical Logarithmic Response and Error vs. Input Amplitude at 5.8 GHz

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