性能特点

- 频率范围: 25~32GHz
- 小信号增益：20.5 dB
- P_1dB 输出功率: 21.6 dBm
- Psat 输出功率: 23 dBm
- Bias: Vd = 5 V , Id = 200 mA
- 芯片尺寸: 4.0mm×4.0mm× 0.75mm

产品简介

ZRA1162Q 是一款 Ka 波段功率放大器，采用 GaAs 工艺制造。其工作频率覆盖范围 25~32GHz，小信号增益为 20.5dB，饱和输出功率 23dBm。

应用领域

- 点对点无线电
- Ka 频段 VSAT

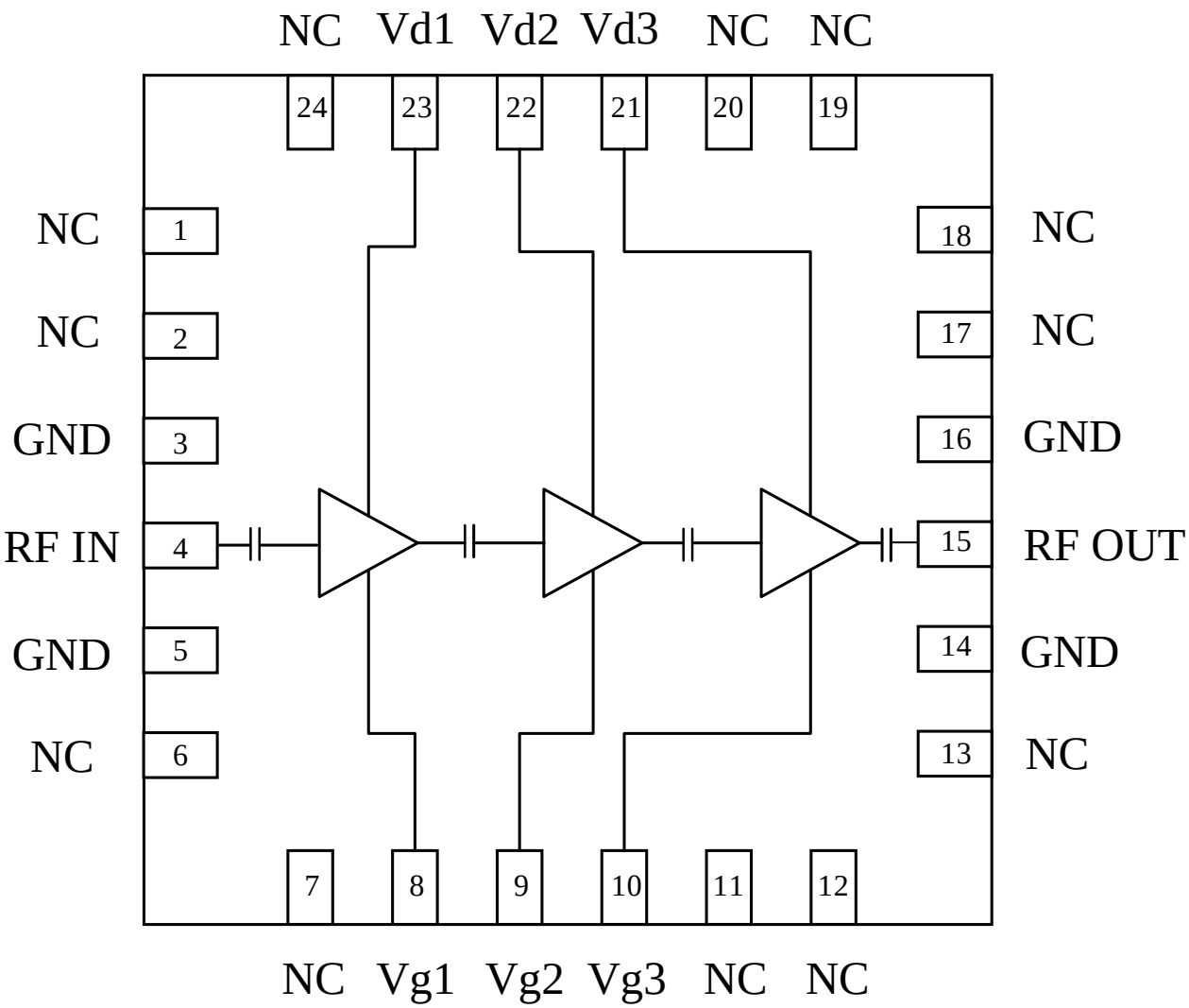


Figure 1. Functional Block Diagram

目录

1. 性能参数

1.1.电参数

除非状态特殊说明，所有参数均在 Vd = 5V, Idq = 200mA, T_A = 25°C 条件下测试得出。

参数名称	最小值	典型值	最大值	单位
Frequency Range	25		32	GHz
Gain	17.8	20.5	22	dB
Input Return Loss		11		dB
Output Return Loss		13.5		dB
Output P1dB (CW,reference to small signal gain@max gain point)	21.6	21.6	22.4	dBm
Saturated Output Power(P_{sat}) (CW,reference to small signal gain@max gain point)	22.2	23	23.4	dBm
PAE		32.5		%
OIP3(POUT/Tone = 17.5dBm, 5MHz tonespacing)		28.5		dBm
Gain Temperature Coefficient		TBD		dB/°C
Power Temperature Coefficient		TBD		dB/°C

1.2.允许最大参数范围

参数名称	参数值 / 范围	单位
Drain Voltage (Vd)	+6.5	V
Gate Voltage Range (Vg)	-2 to 0	V
Drain Current (Id)	300	mA
Power Dissipation (PDISS)	1.8	W
RF Input Power,CW, 50Ω,T = 25ºC	+10	dBm
Junction Temperature	175	ºC
Soldering Temperature (30s, max.)	260	ºC
Storage Temperature	-65 to 150	ºC

以上参数仅表示应力范围，并不意味在这些条件下的功能操作。芯片在以上所列参数范围外工作可能造成芯片永久性损坏。

1.3.ESD 等级

参数名称	参数值	等级
Human Body Model (HBM)	±250V	Class-1A

1.4.推荐工作条件

Vd(V)	Id(mA)
+3.5 ~ +6	200

2. 典型性能特点

除非状态特殊说明，所有参数均在 Vd = 5V，Idq = 200mA，T_A = 25°C 条件下测试得出。

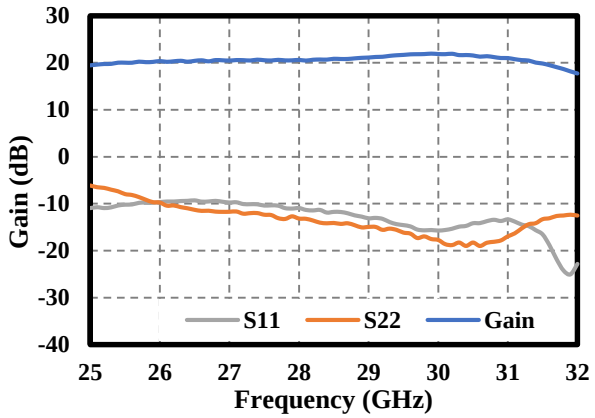


Figure 2. Gain & Return Loss

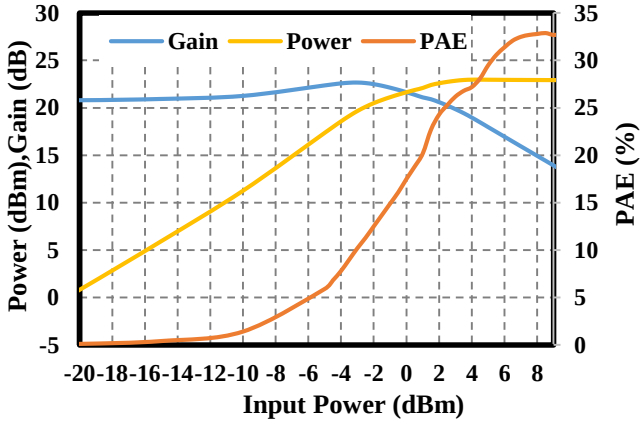


Figure 3. Power, Gain, PAE vs. InputPower @ 28 GHz

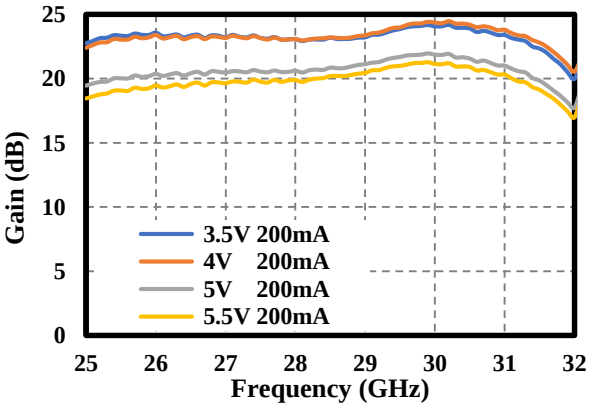


Figure 4. Gain vs. Vd

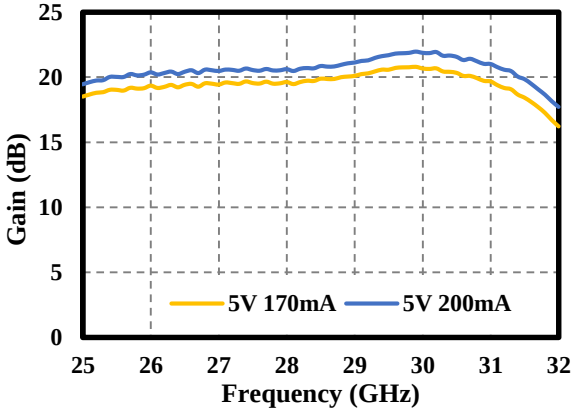


Figure 5. Gain vs. Id

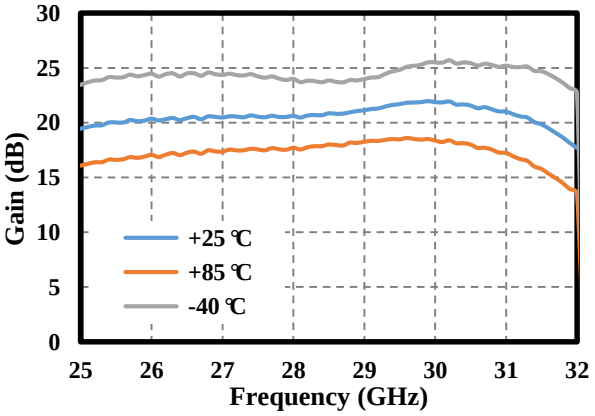


Figure 6. Gain vs. Temp

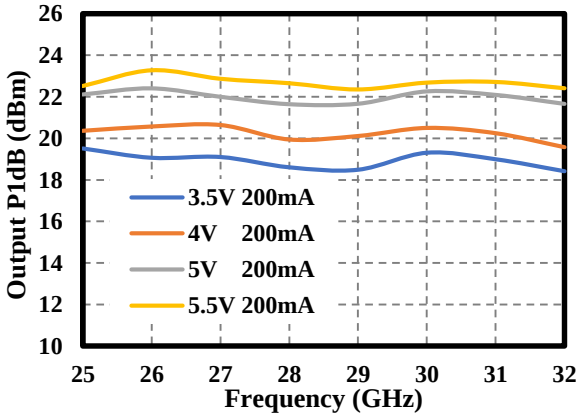


Figure 7. P1dB vs. Vd

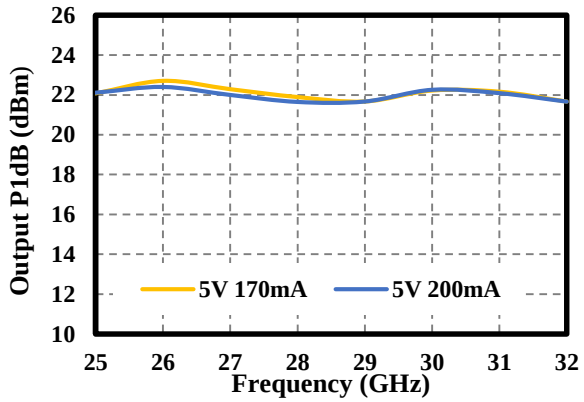


Figure 8. P1dB vs. Id

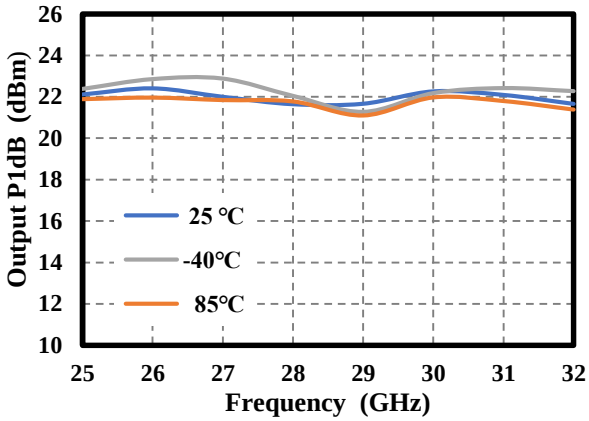


Figure 9. P1dB vs. Temp

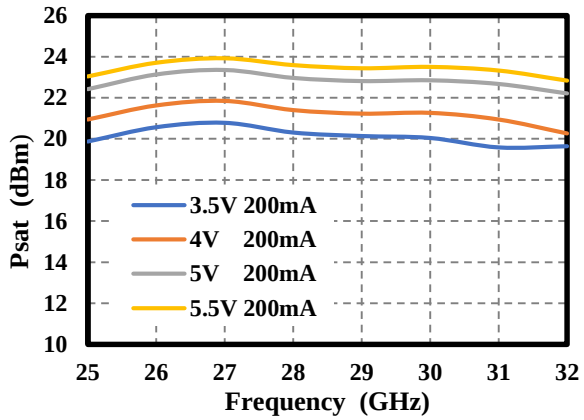


Figure 10. Psat vs. Vd

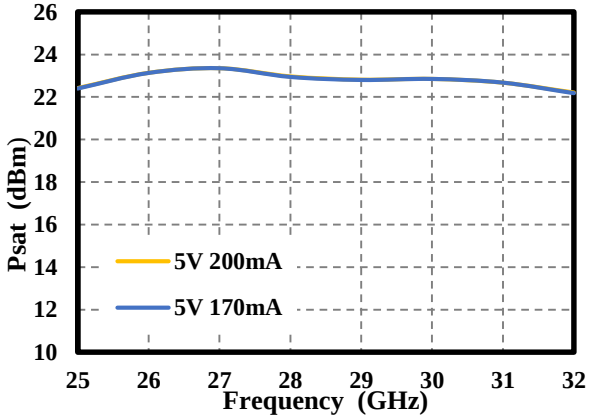


Figure 11. Psat vs. Id

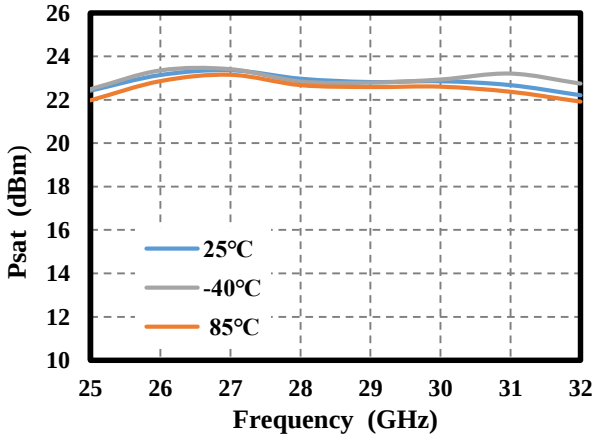


Figure 12. Psat vs. Temp

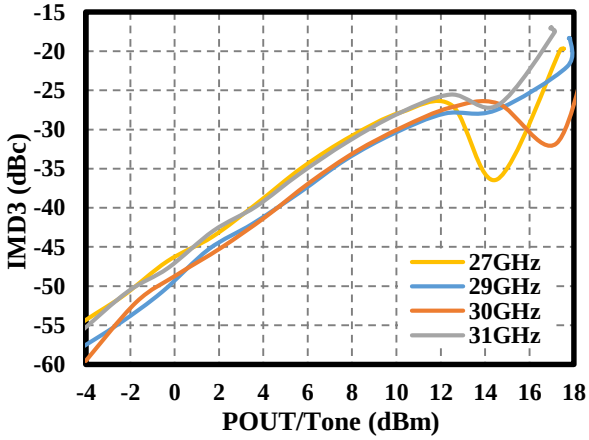


Figure 13. IMD3 vs. Pout/Tone

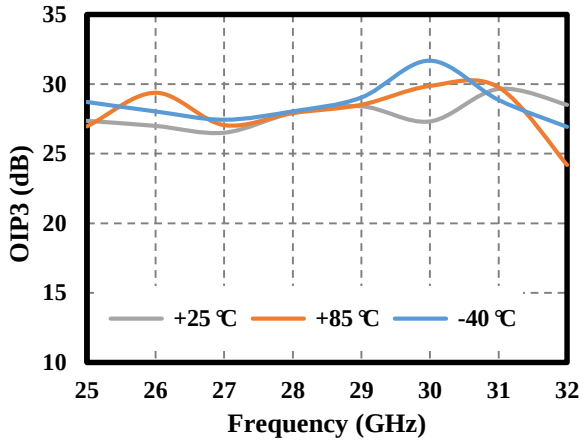


Figure 14. OIP3 vs. Temp
(Pout/Tone = 16dBm)

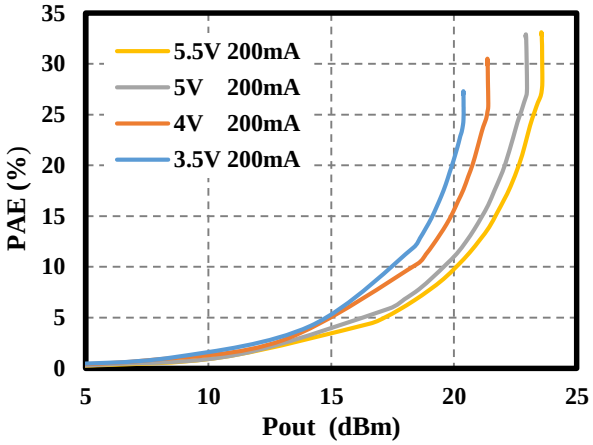


Figure 15. PAE vs. Pout @ 28GHz

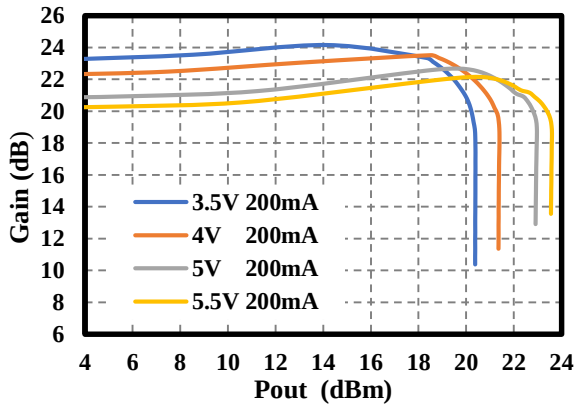


Figure 16. Gain vs. Pout @ 28GHz

3. 管脚信息

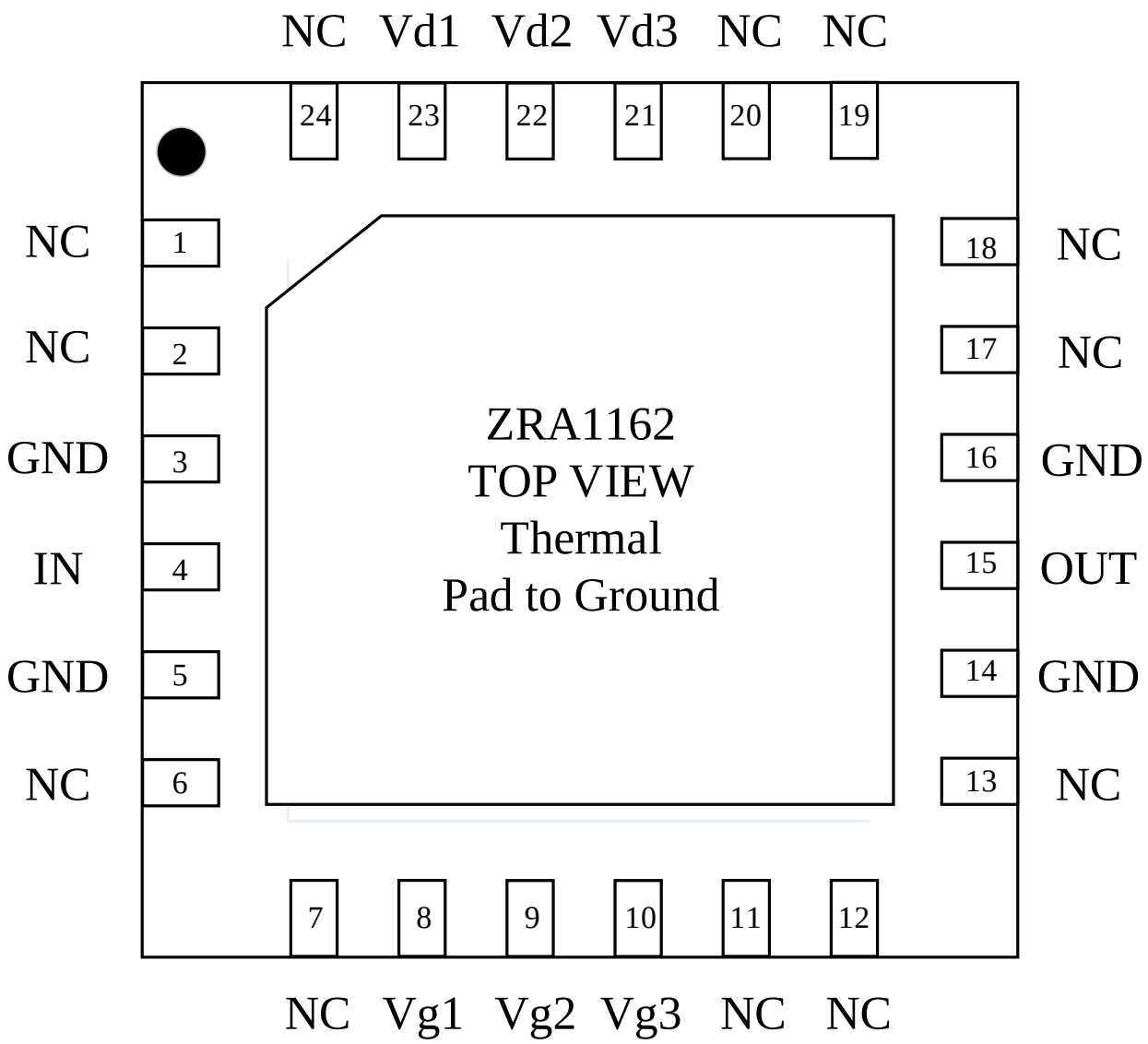


Figure 17. 管脚信息

Table1 管脚描述

管脚号	管脚名	描述
4	RF IN	射频信号输入端口
15	RF OUT	射频信号输出端口
8,9,10	Vg1,Vg2,Vg3	放大器的栅极电源输入
21,22,23	Vd3, Vd2,Vd1	放大器的漏极电源输入
3,5,14,16	GND	接地
1,2,6,7,11,12,13,17,18,19 ,20,24	N/C	不连接或接地

4. 典型应用电路

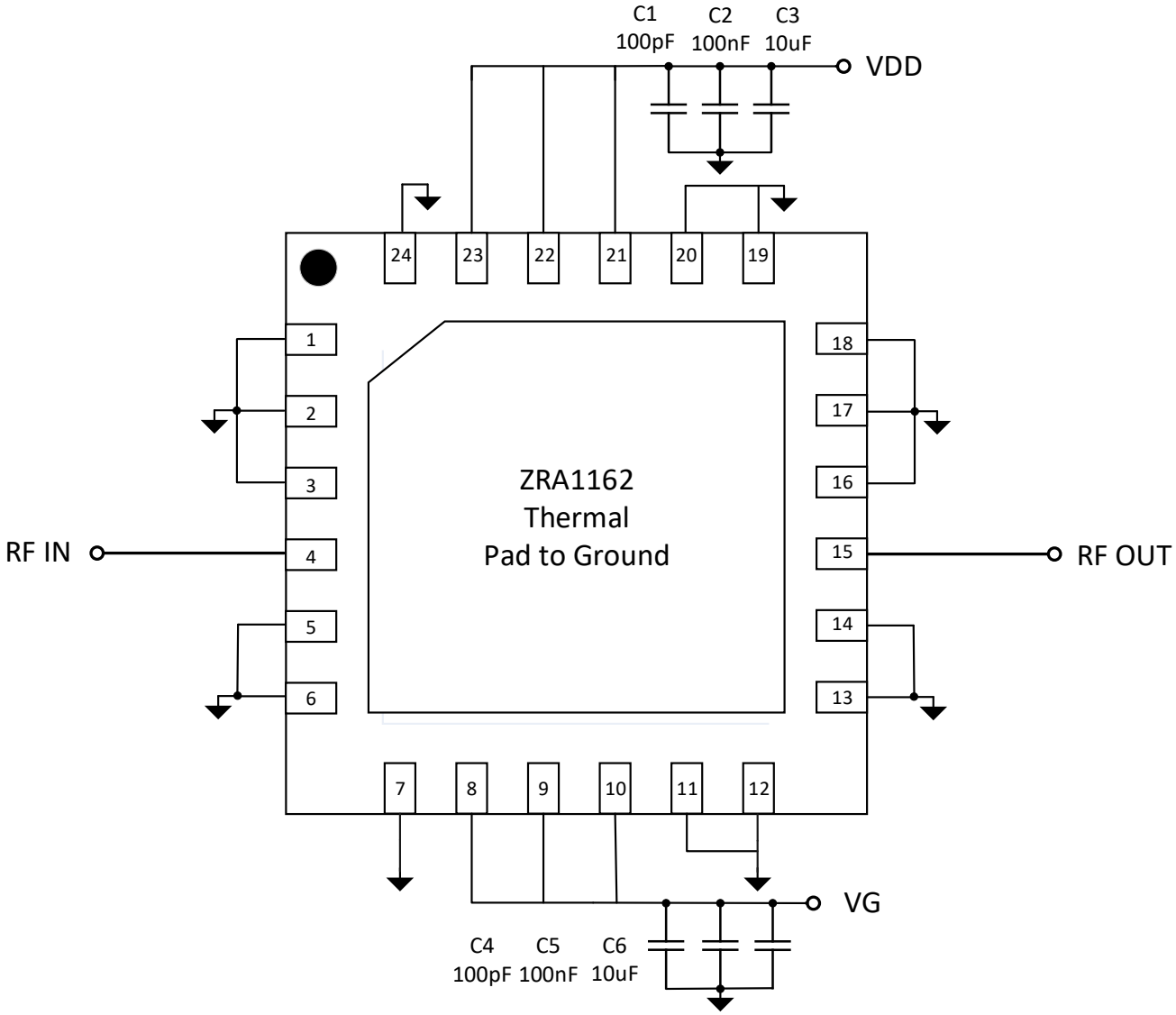


Figure 18. 应用电路图

注意：Vg 和 Vd 电源上的 10uF 电容必须放置，并且尽量靠近芯片。

Table2 物料清单

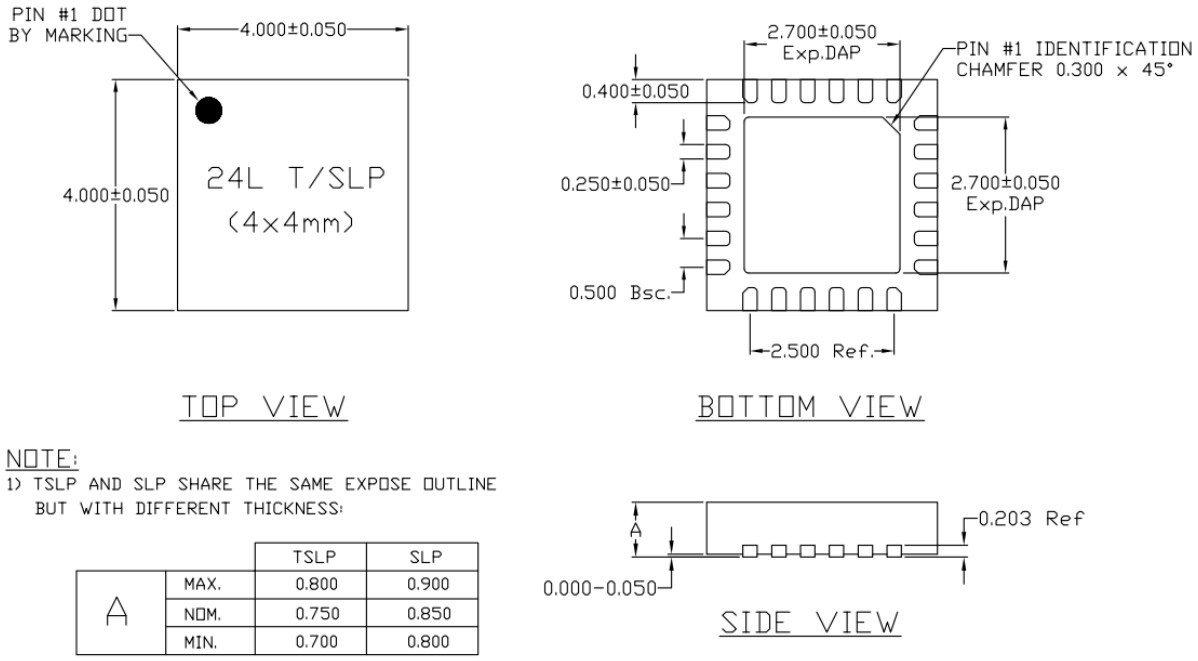
Component	P/N	Supplier	Value	Size
C2,C5	CC0402KRX7R7BB104	YAGEO	100nF	0402C
C4,C1	CC0402JRNPO9BN101	YAGEO	100pF	0402C
C3, C6	CC0603KRX5R6BB106	YAGEO	10uF	0603C

5. 丝印图解

第一行:知融科技公司标识
第二行:芯片型号
第三行:公司内部编码

Figure 19. 芯片丝印描述

6. 外形尺寸



		TSLP	SLP
A	MAX.	0.800	0.900
	NOM.	0.750	0.850
	MIN.	0.700	0.800

Figure 20. 外形尺寸

7. 评估板照片

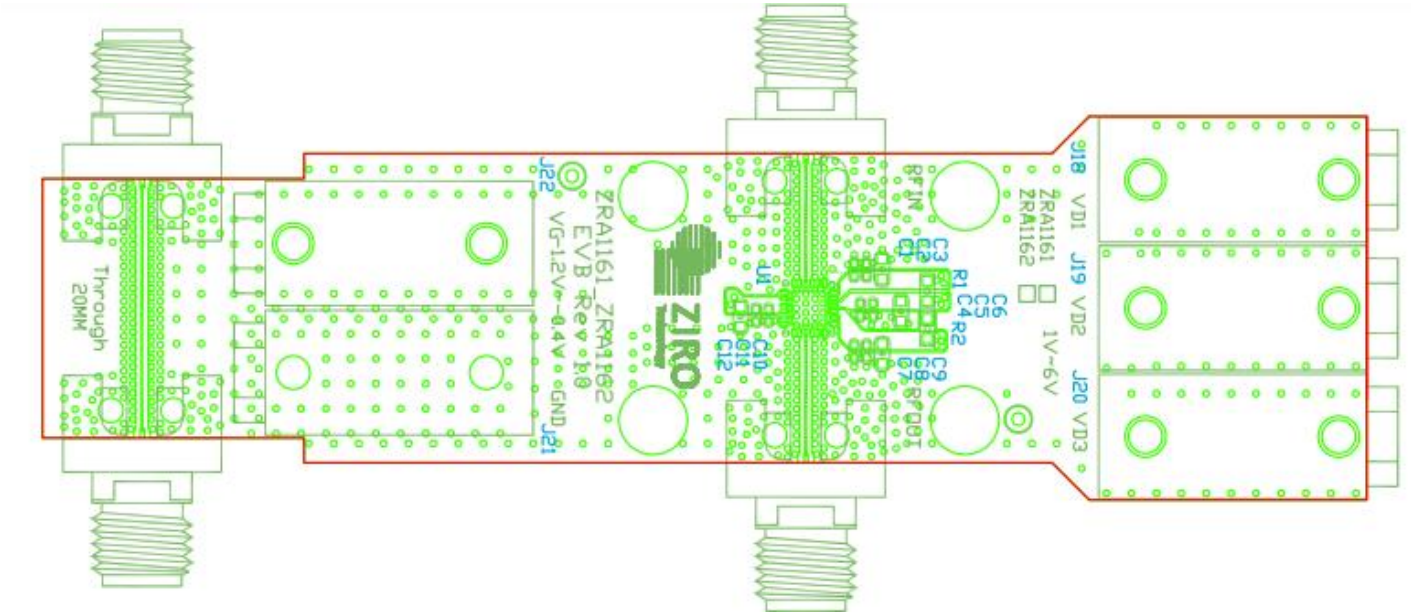
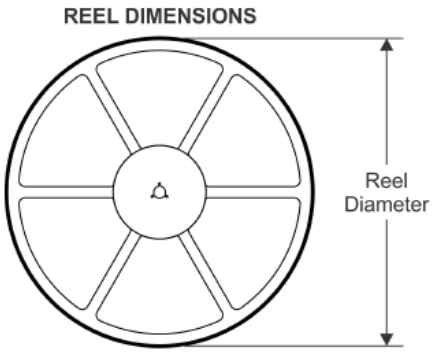


Figure 21. Evaluation Board

Table3 Suggested Stacking

TOP	Copper	0.035mm
Dielectric	RO3003	0.127mm
GND	Copper	0.018mm
Dielectric	pp	0.1mm
SIG	Copper	0.018mm
Dielectric	FR4	1.25mm
BOTTOM	Copper	0.035mm

8. 卷带包装信息



A0	Dimension designed to accommodate the component width
B0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thichness
W	Overall width of the carrier tape
P	Pitch between successive cavith centers

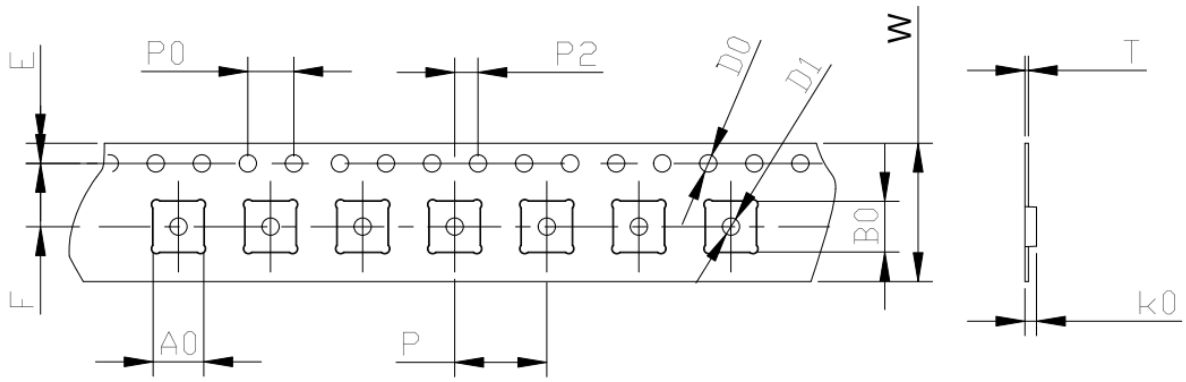


Figure 22. Packaging Information

Table4 卷带尺寸信息

Reel Diameter (mm)	W mm	A0 mm	B0 mm	K0 mm	E mm	F mm	P mm	P0 mm	P2 mm	D0 mm	D1 mm	T mm
180	12.0	4.40	4.40	1.20	1.75	5.50	8.00	4.00	2.00	1.50	1.50	0.30

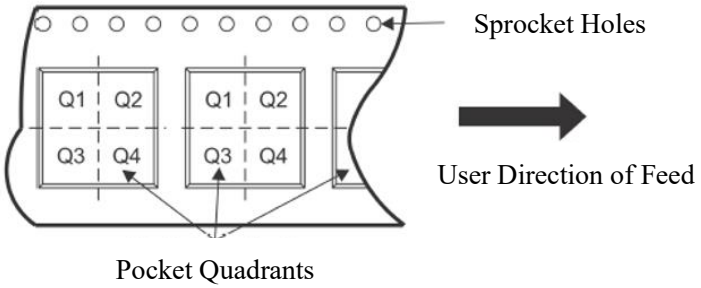


Figure 23. Quadrant Assignments for Pin1 Orientation in Tape

Table5 订购信息

Part Number	Package Type	Quantity/Reel (pcs)	Reel Diameter mm	MSL Rating	Temperature Range	Pin1 Quadrant
ZRA1162QRA	QFN-24	250	180	2	-40℃ to +85℃	Q2
ZRA1162QRB	QFN-24	1000	180	2	-40℃ to +85℃	Q2
ZRA1162QRC	QFN-24	3000	330	2	-40℃ to +85℃	Q2

9. 历史版本

Revision	Description	Modifier	Date
Rev.0.1	初始发布	YDS	2024.2.23
Rev.0.2	新增高低温数据	YDS	2024.3.26