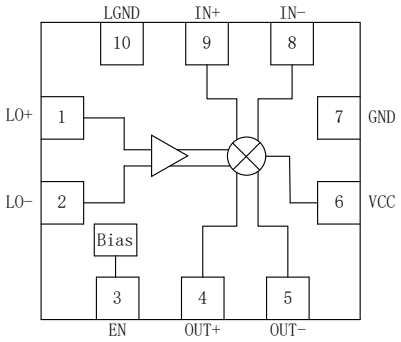
## 性能特点

- 宽带频率范围高达7GHz
- 上变频/下变频
- 变频增益：5.1dB@Fout=0.9GHz
- 功耗：132mW
- 封装尺寸：QFN 2*2 10L

## 典型应用

- 测试仪器
- 无线基础设施
- VHF和UHF混频器

## 功能框图




## 概述

SIM195SP2C是一款01MHz~7GHz宽带低功率有源双平衡混频器，该芯片具有体积小、低功耗、低噪声、应用灵活，全差分端口等特点。

## DC 电性能表

| 参数 | 描述 | 最小值 | 典型值 | 最大值 | 单位 |
|---|---|---|---|---|---|
| 工作电压 | VCC | 3 | 3.3 | 3.6 | V |
| 工作电流 | ICC | | 40 | | mA |

## AC 电性能表

| 参数 | 描述 | 最小值 | 典型值 | 最大值 | 单位 |
|---|---|---|---|---|---|
| 输入频率范围 | 外部匹配 | 0.01 | | 7 | GHz |
| 输出频率范围 | 外部匹配 | DC | | 7 | GHz |
| LO频率范围 | 外部匹配 | LF | | 9 | GHz |
| LO功率范围 | | -6 | | 6 | dBm |



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## 上变频电性能表（TA=25°C, Pin=-12dBm, PLO=0dBm, VCC=EN=3.3V）

| 参数指标 | 描述 | 最小值 | 典型值 | 最大值 | 单位 |
|---|---|---|---|---|---|
| 变频增益 | Fin=140MHz Fout=900MHz, HIGH LO | | 5.1 | | dB |
| | Fin=240MHz Fout=3.6GHz, LOW LO | | 1.2 | | dB |
| | Fin=900MHz Fout=5.8GHz LOW LO | | -0.8 | | dB |
| 回波损耗 | Fin=140M | | 26 | -- | dB |
| | FLO=1040M | | 18 | -- | dB |
| | Fout=900M | | 13 | -- | dB |
| | Fin=240M | | 25 | | dB |
| | FLO=3.36G | | 18 | | dB |
| | Fout=3.6G | | 19 | | dB |
| | Fin=900M | | 19 | | dB |
| | FLO=4.9G | | 20 | | dB |
| | Fout=5.8G | | 18.6 | | dB |
| 隔离度：IN-LO | Fin=140MHz, FLO=1040MHz, Fout=900MHz | | 58 | | dB |
| | Fin=240MHz, FLO=3.36GHz, Fout=3.6GHz | | 52 | | dB |
| | Fin=900MHz, FLO=4.9GHz, Fout=5.8GHz | | 42.5 | | dB |
| 隔离度：IN-OUT | Fin=140MHz, FLO=1040MHz, Fout=900MHz | | 63 | | dB |
| | Fin=240MHz, FLO=3.36GHz, Fout=3.6GHz | | 67 | | dB |
| | Fin=900MHz, FLO=4.9GHz, Fout=5.8GHz | | 58 | | dB |
| 隔离度：LO-IN | Fin=140MHz, FLO=1040MHz, Fout=900MHz | | 43 | | dB |
| | Fin=240MHz, FLO=3.36GHz, Fout=3.6GHz | | 41.3 | | dB |
| | Fin=900MHz, FLO=4.9GHz, Fout=5.8GHz | | 37.5 | | dB |
| 隔离度：LO-OUT | Fin=140MHz, FLO=1040MHz, Fout=900MHz | | 26 | | dB |
| | Fin=240MHz, FLO=3.36GHz, Fout=3.6GHz | | 30 | | dB |
| | Fin=900MHz, FLO=4.9GHz, Fout=5.8GHz | | 20 | | dB |
| 输入P1dB | Fin=140MHz, Fout=900MHz | | 4.7 | | dBm |
| | Fin=240MHz, Fout=3.6GHz | | 3.8 | | dBm |
| | Fin=900MHz, Fout=5.8GHz | | 3.9 | | dBm |
| 输入三阶交调点IIP3 | Fin=140MHz, FLO=1040MHz, Fout=900MHz | | 17.7 | | dBm |
| | Fin=240MHz, FLO=3.36GHz, Fout=3.6GHz | | 14 | | dBm |
| | Fin=900MHz, FLO=4.9GHz, Fout=5.8GHz | | 11.6 | | dBm |
| 输出三阶交调点OIP3 | Fin=140MHz, FLO=1040MHz, Fout=900MHz | | 22.8 | | dBm |
| | Fin=240MHz, FLO=3.36GHz, Fout=3.6GHz | | 15 | | dBm |
| | Fin=900MHz, FLO=4.9GHz, Fout=5.8GHz | | 10.7 | | dBm |
| 输入二阶交调点IIP2 | Fin=140MHz, Fout=900MHz | | 38.6 | | dBm |
| | Fin=240MHz, Fout=3.6GHz | | 35 | | dBm |
| | Fin=900MHz, Fout=5.8GHz | | 43 | | dBm |
| 噪声系数NF | Fin=140MHz, Fout=900MHz | | 9.4 | | dB |
| | Fin=240MHz, Fout=3.6GHz | | 14.2 | | dB |
| | Fin=900MHz, Fout=5.8GHz | | 16.4 | | dB |





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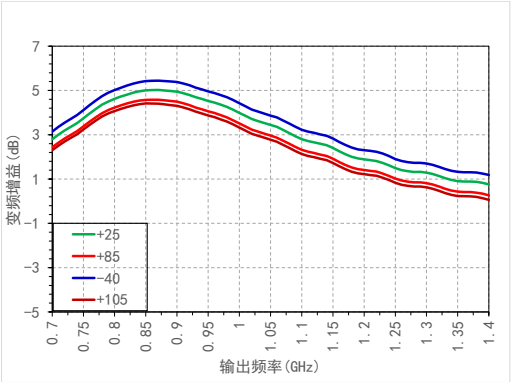
## 下变频电性能表（TA=25°C, Pin=-12dBm, PLO=0dBm, VCC=EN=3.3V）

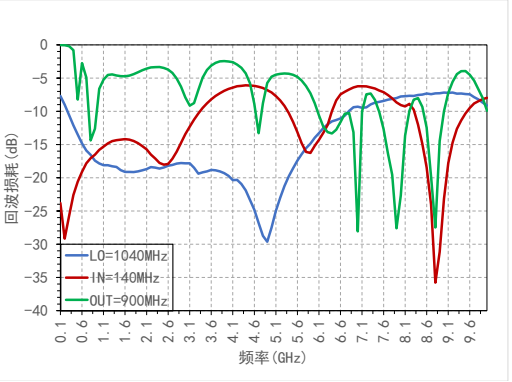
| 参数指标 | 描述 | 最小值 | 典型值 | 最大值 | 单位 |
|---|---|---|---|---|---|
| 变频增益 | Fin=0.9GHz Fout=0.14GHz, HIGH LO | | 4.7 | | dB |
| | Fin=3.5GHz Fout=0.456GHz, HIGH LO | | 3.3 | | dB |
| | Fin=5.8GHz Fout=0.8GHz, LOW LO | | 1.7 | | dB |
| 回波损耗 | 输入端Fin=0.9G | | 16 | | dB |
| | 本振端FLO=1.04G | | 21 | | dB |
| | 输出端Fout=0.14G | | 14 | | dB |
| | 输入端Fin=3.5G | | 24 | | dB |
| | 本振端FLO=3.956G | | 20 | | dB |
| | 输出端Fout=0.456G | | 13 | | dB |
| | 输入端Fin=5.8G | | 20 | | dB |
| | 本振端FLO=5.0G | | 35 | | dB |
| | 输出端Fout=0.8G | | 18 | | dB |
| 隔离度：IN-LO | Fin=0.9GHz, FLO=1.04GHz, Fout=0.14GHz | | 60 | | dB |
| | Fin=3.5GHz, FLO=3.956GHz, Fout=0.456GHz | | 43.7 | | dB |
| | Fin=5.8GHz, FLO=5.0GHz, Fout=0.8GHz | | 37 | | dB |
| 隔离度：IN-OUT | Fin=0.9GHz, FLO=1.04GHz, Fout=0.14GHz | | 56 | | dB |
| | Fin=3.5GHz, FLO=3.956GHz, Fout=0.456GHz | | 44 | | dB |
| | Fin=5.8GHz, FLO=5.0GHz, Fout=0.8GHz | | 44.5 | | dB |
| 隔离度：LO-IN | Fin=0.9GHz, FLO=1.04GHz, Fout=0.14GHz | | 44 | | dB |
| | Fin=3.5GHz, FLO=3.956GHz, Fout=0.456GHz | | 42 | | dB |
| | Fin=5.8GHz, FLO=5.0GHz, Fout=0.8GHz | | 37.5 | | dB |
| 隔离度：LO-OUT | Fin=0.9GHz, FLO=1.04GHz, Fout=0.14GHz | | 56 | | dB |
| | Fin=3.5GHz, FLO=3.956GHz, Fout=0.456GHz | | 44 | | dB |
| | Fin=5.8GHz, FLO=5.0GHz, Fout=0.8GHz | | 35.3 | | dB |
| 输入P1dB | Fin=0.9GHz, FLO=1.04GHz, Fout=0.14GHz | | 5.7 | | dBm |
| | Fin=3.5GHz, FLO=3.956GHz, Fout=0.456GHz | | 1.7 | | dBm |
| | Fin=5.8GHz, FLO=5.0GHz, Fout=0.8GHz | | 3.7 | | dBm |
| 输入三阶交调点IIP3 | Fin=0.9GHz, FLO=1.04GHz, Fout=0.14GHz | | 17 | | dBm |
| | Fin=3.5GHz, FLO=3.956GHz, Fout=0.456GHz | | 11.2 | | dBm |
| | Fin=5.8GHz, FLO=5.0GHz, Fout=0.8GHz | | 11.4 | | dBm |
| 输出三阶交调点OIP3 | Fin=0.9GHz, FLO=1.04GHz, Fout=0.14GHz | | 21.5 | | dBm |
| | Fin=3.5GHz, FLO=3.956GHz, Fout=0.456GHz | | 14.4 | | dBm |
| | Fin=5.8GHz, FLO=5.0GHz, Fout=0.8GHz | | 13.3 | | dBm |
| 输入二阶交调点IIP2 | Fin=0.9GHz, FLO=1.04GHz, Fout=0.14GHz | | 56 | | dBm |
| | Fin=3.5GHz, FLO=3.956GHz, Fout=0.456GHz | | 31.5 | | dBm |
| | Fin=5.8GHz, FLO=5.0GHz, Fout=0.8GHz | | 46.8 | | dBm |
| 噪声系数NF | Fin=0.9GHz, FLO=1.04GHz, Fout=0.14GHz | | 10 | | dB |
| | Fin=3.5GHz, FLO=3.956GHz, Fout=0.456GHz | | 13.6 | | dB |
| | Fin=5.8GHz, FLO=5.0GHz, Fout=0.8GHz | | 15.2 | | dB |

## 上变频测试曲线（Fin=0.14GHz，FLO=1.04GHz,Fout=0.9GHz,VCC=EN=3.3V,Pin=-12dBm,PLO=0dBm）

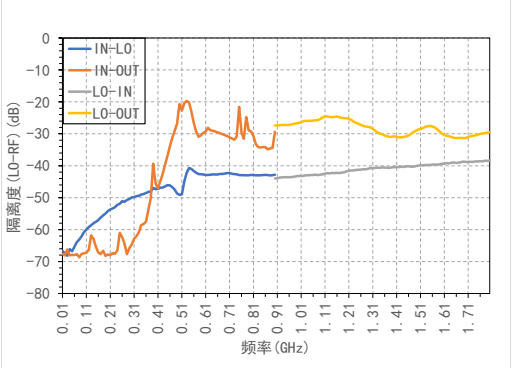
变频增益 VS 频率



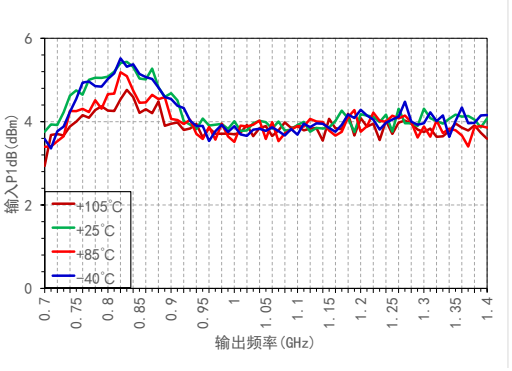

回波损耗 VS 温度



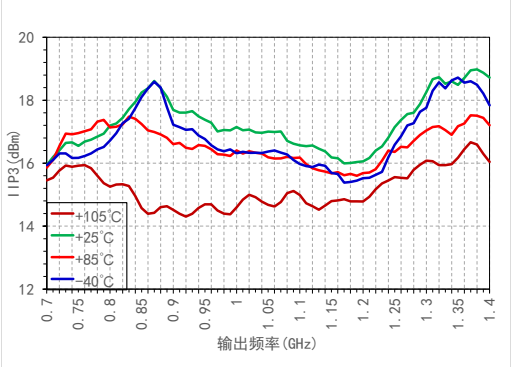

隔离度 VS 频率



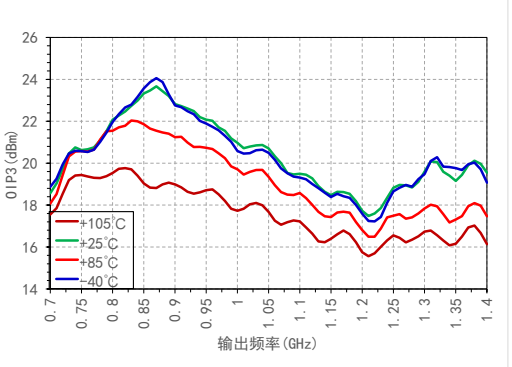

输入P1dB VS 频率




IIP3 VS 频率

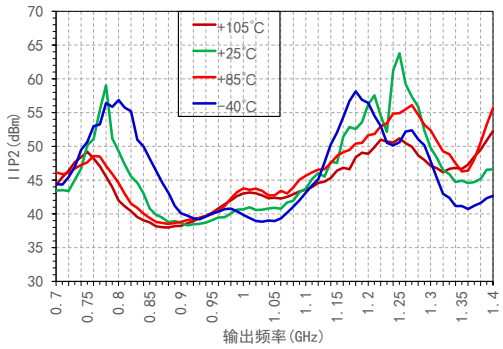



OIP3 VS 频率

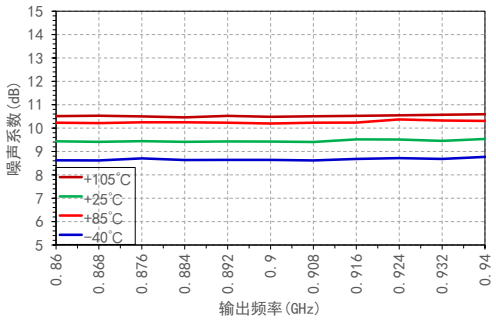


## 上变频测试曲线（A0：Fin=0.14GHz，FLO=1.04GHz,Fout=0.9GHz,VCC=EN=3.3V,Pin=-12dBm,PLO=0dBm）

IIP2 VS 频率

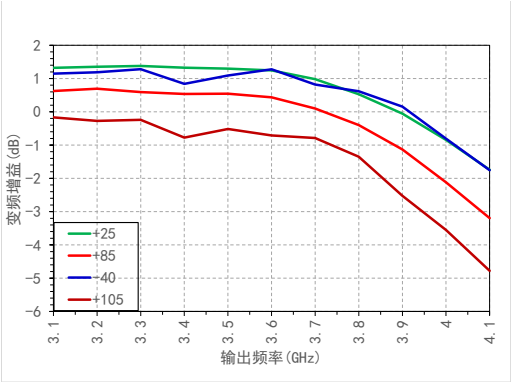



噪声系数 VS 频率

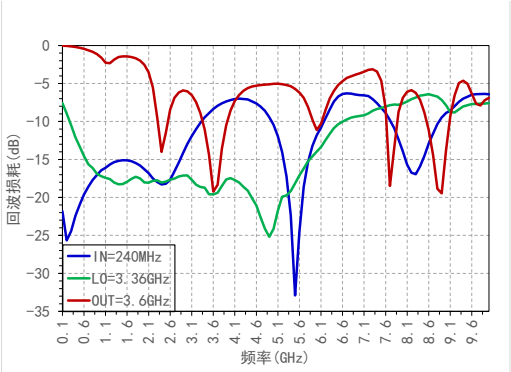



## 上变频测试曲线（A1：Fin=0.24GHz，FLO=3.36GHz,Fout=3.6GHz,VCC=EN=3.3V,Pin=-12dBm,PLO=0dBm）

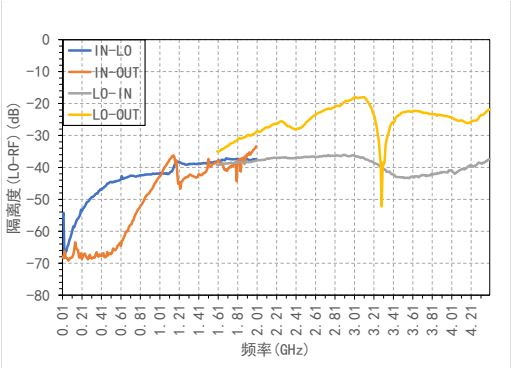
变频增益 VS 频率



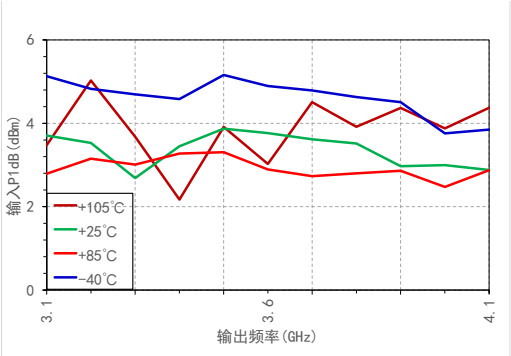

回波损耗 VS 频率）




隔离度 VS 频率

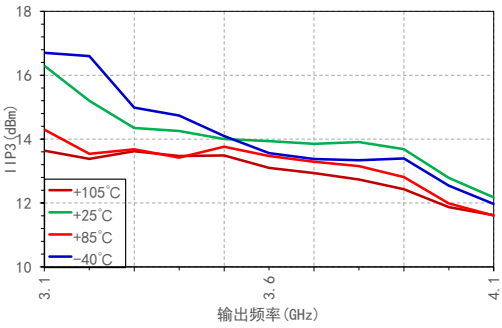



输入P1dB VS 频率

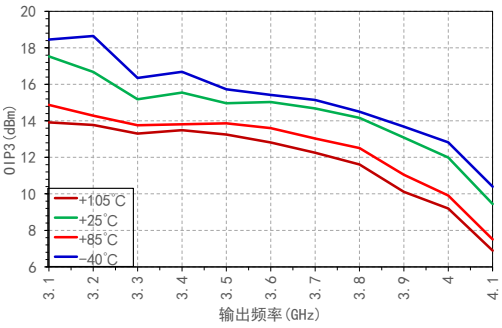


## 上变频测试曲线（A1：Fin=0.24GHz，FLO=3.36GHz,Fout=3.6GHz,VCC=EN=3.3V,Pin=-12dBm,PLO=0dBm）

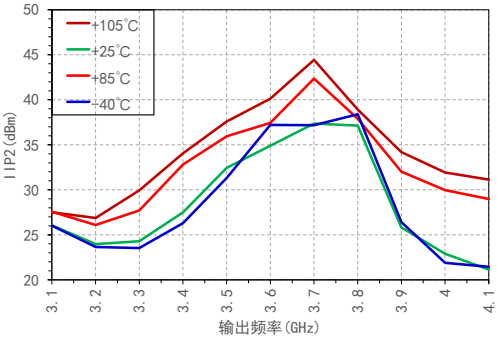
IIP3 VS 频率



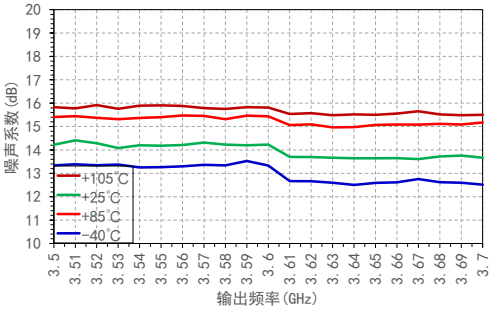

OIP3 VS 频率




IIP2 VS 频率

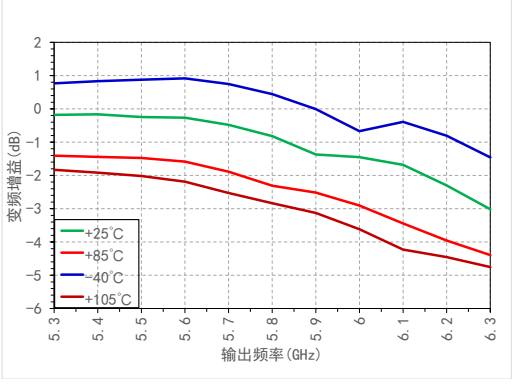



噪声系数 VS 频率

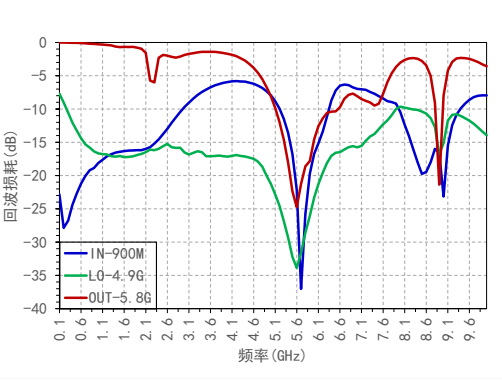



## 上变频测试曲线（A2：Fin=0.9GHz，FLO=4.9GHz,Fout=5.8GHz,VCC=EN=3.3V,Pin=-12dBm,PLO=0dBm）

变频增益 VS 频率




回波损耗 VS 频率





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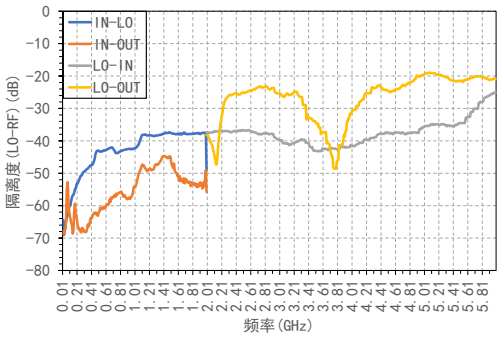
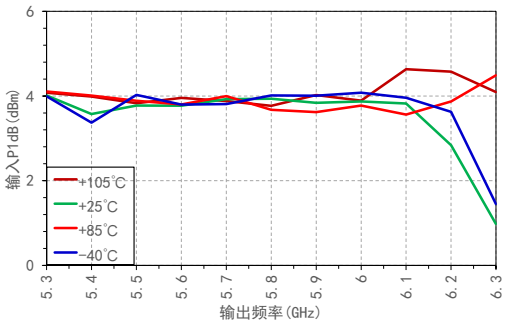
## 上变频测试曲线（A2：Fin=0.9GHz，FLO=4.9GHz,Fout=5.8GHz,VCC=EN=3.3V,Pin=-12dBm,PLO=0dBm）

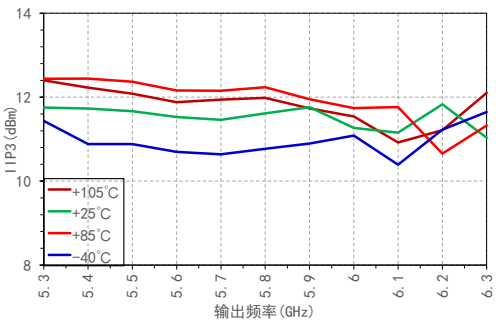
隔离度 VS 频率



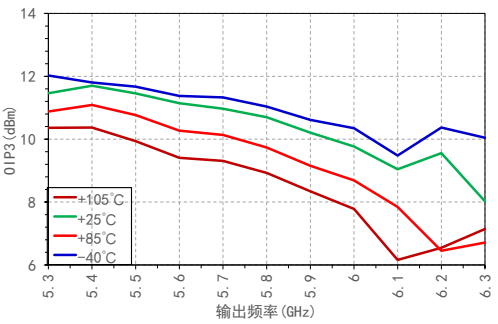

输入P1dB VS 频率



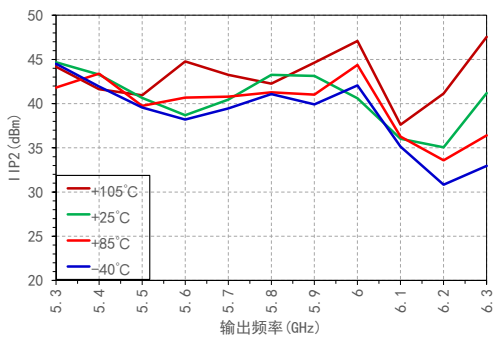

IIP3 VS 频率



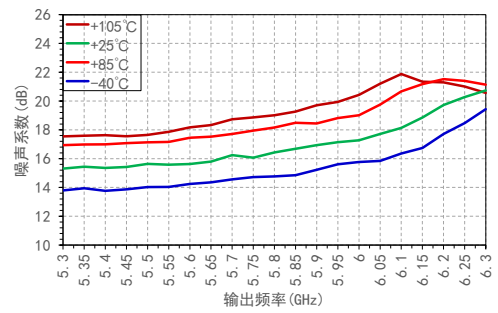

OIP3 VS 频率




IIP2 VS 频率

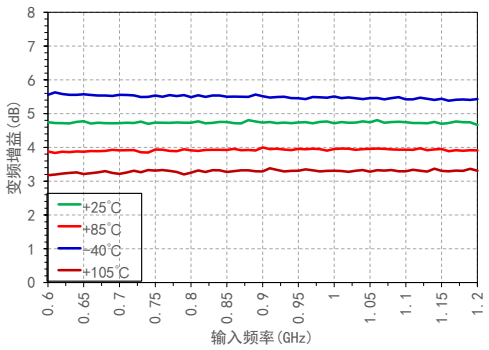



噪声系数 VS 频率

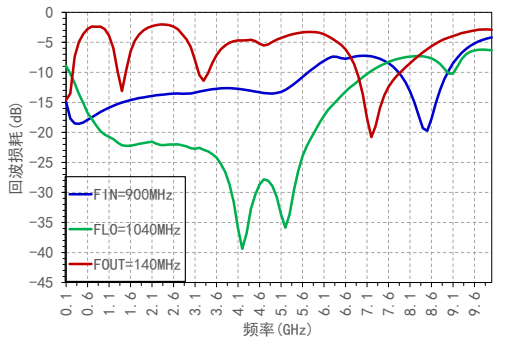


## 下变频测试曲线（B0：Fin=0.9GHz，FLO=1.04GHz,Fout=0.14GHz,VCC=EN=3.3V,Pin=-12dBm,PLO=0dBm）

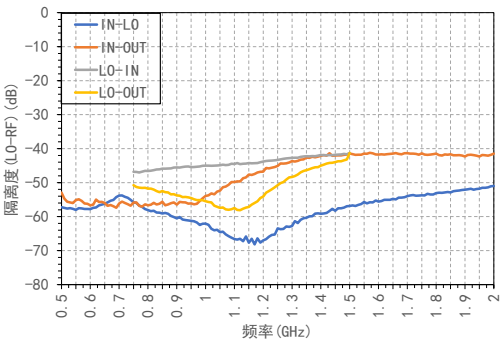
变频增益 VS 频率



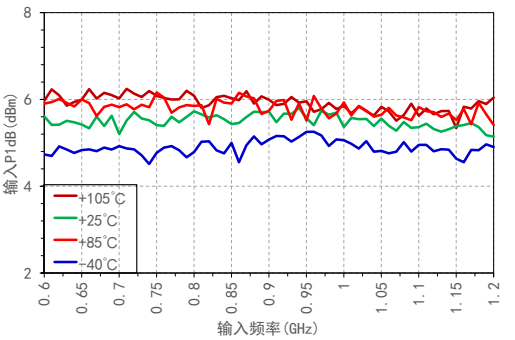

回波损耗 VS 频率



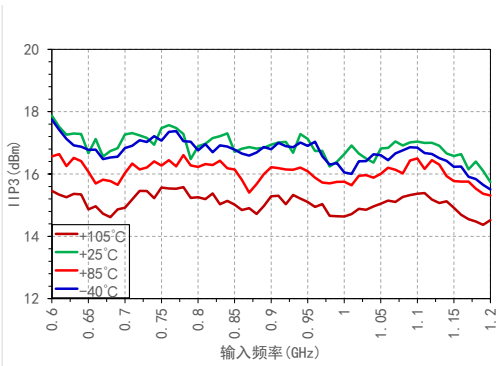

隔离度 VS 频率



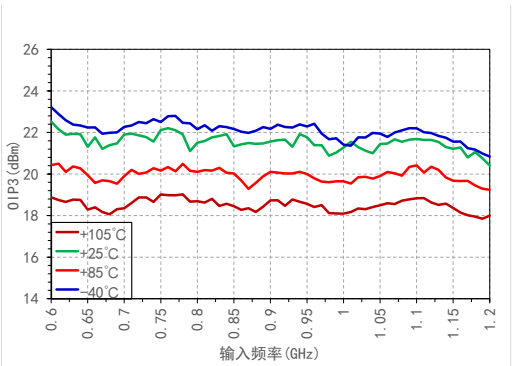

输入P1dB VS 频率




IIP3 VS 频率




OIP3 VS 频率





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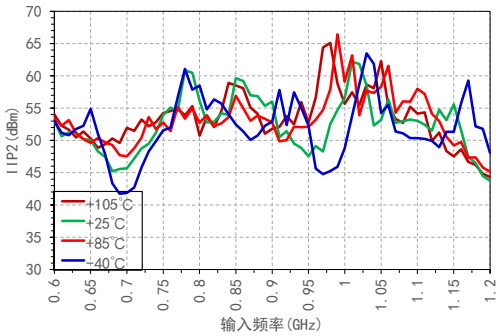
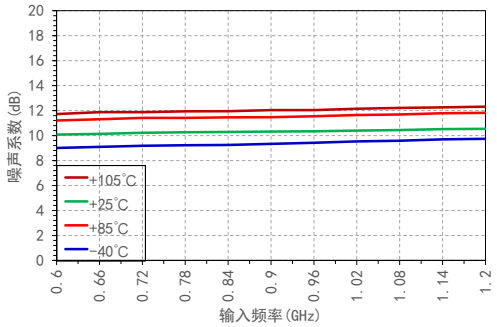
## 下变频测试曲线（B0：Fin=0.9GHz，FLO=1.04GHz，Fout=0.14GHz，VCC=EN=3.3V，Pin=-12dBm，PLO=0dBm）

IIP2 VS 频率

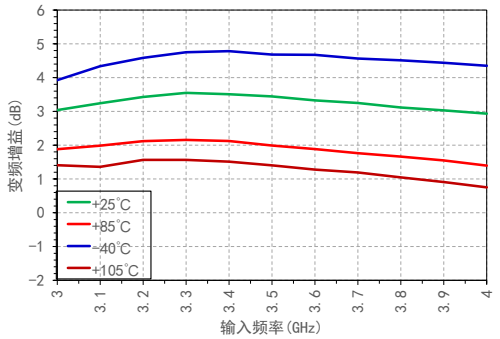



噪声系数 VS 频率

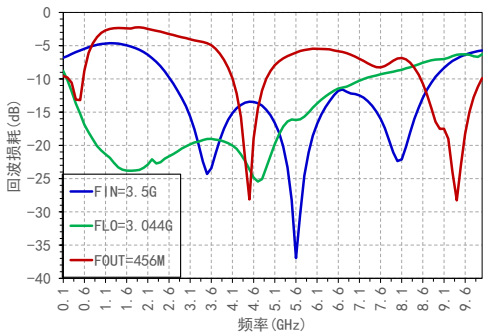



## 下变频测试曲线（B1：Fin=3.5GHz，FLO=3.956GHz，Fout=0.456GHz，VCC=EN=3.3V，Pin=-12dBm，PLO=0dBm）

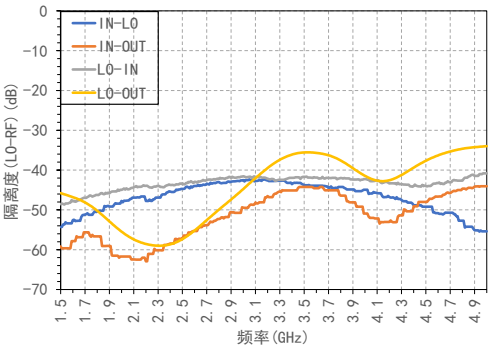
变频增益 VS 频率



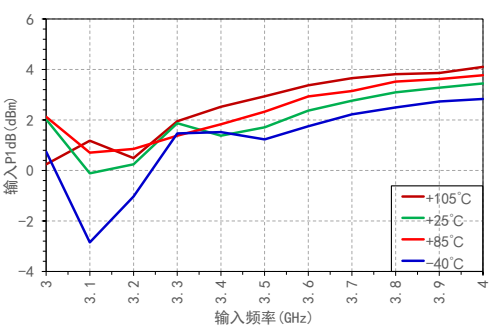

回波损耗 VS 频率




隔离度 VS 频率

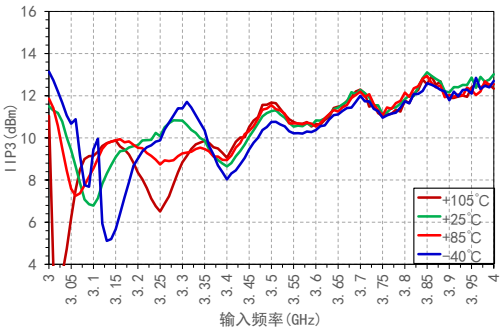



输入P1dB VS 频率

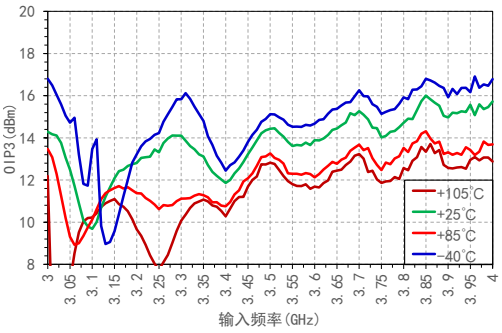


## 下变频测试曲线（B1：Fin=3.5GHz，FLO=3.956GHz，Fout=0.456GHz，VCC=EN=3.3V，Pin=-12dBm，PLO=0dBm）

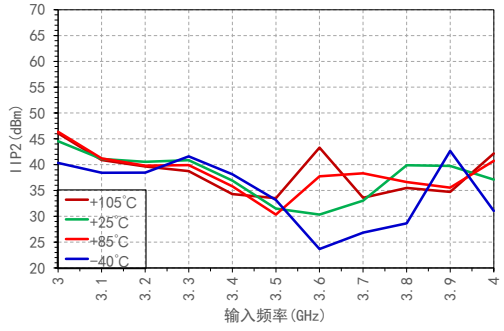
IIP3 VS 频率



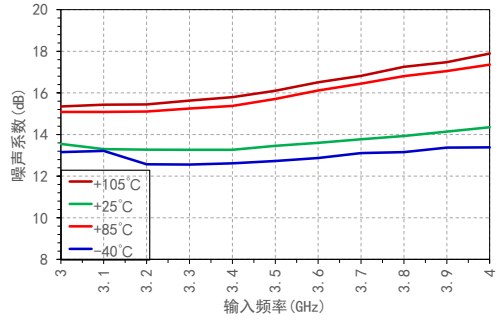

OIP3 VS 频率




IIP2 VS 频率

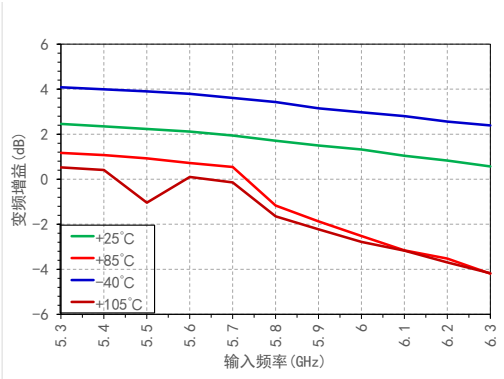



噪声系数 VS 频率

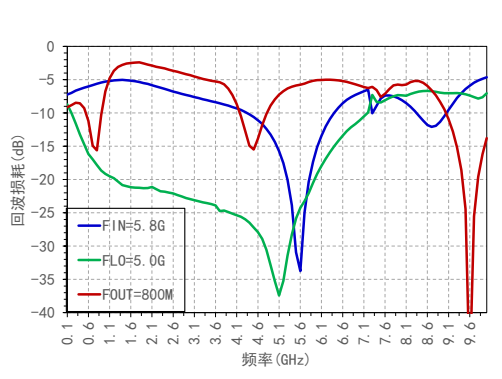



## 下变频测试曲线（B2：Fin=5.8GHz，FLO=5.0GHz，Fout=0.8GHz，VCC=EN=3.3V，Pin=-12dBm，PLO=0dBm）

变频增益 VS 频率




回波损耗 VS 频率





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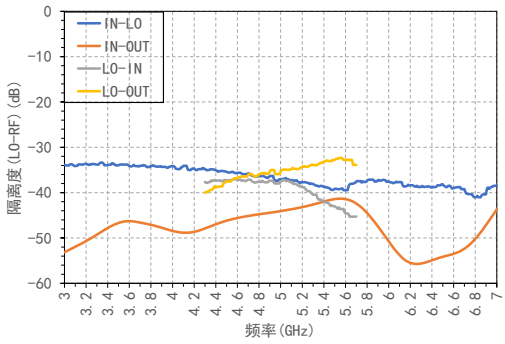
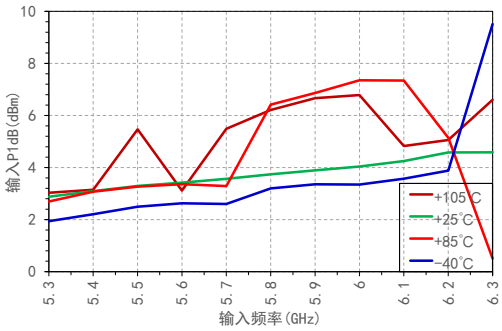
## 下变频测试曲线（B2：Fin=5.8GHz，FLO=5.0GHz,Fout=0.8GHz,VCC=EN=3.3V,Pin=-12dBm,PLO=0dBm）

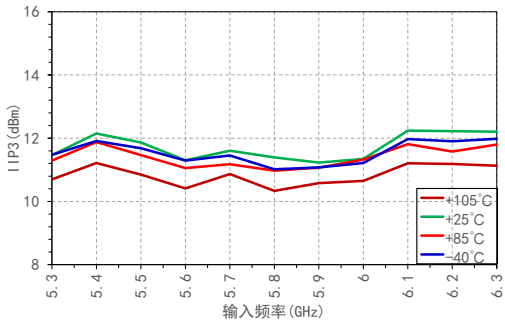
隔离度 VS 频率



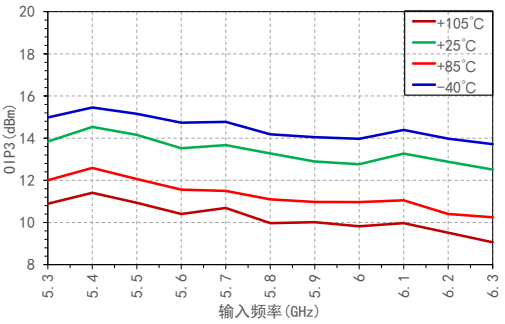

输入P1dB VS 频率



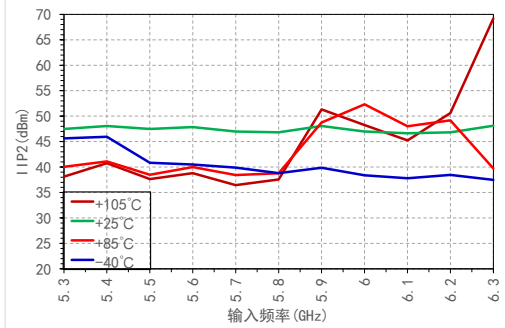

IIP3 VS 频率



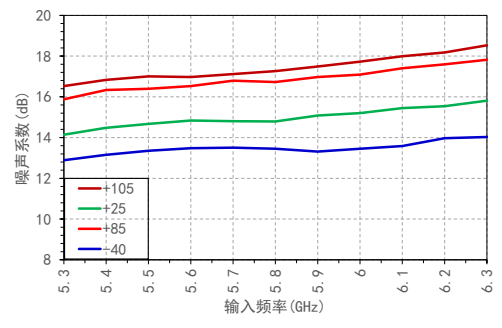

OIP3 VS 频率




IIP2 VS 频率



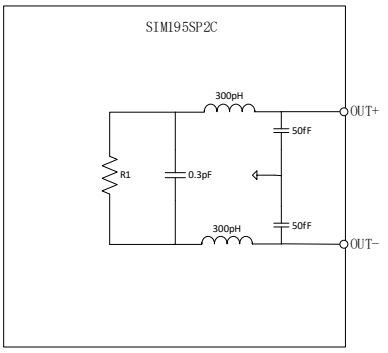

噪声系数 VS 频率



## 绝对最大额定值

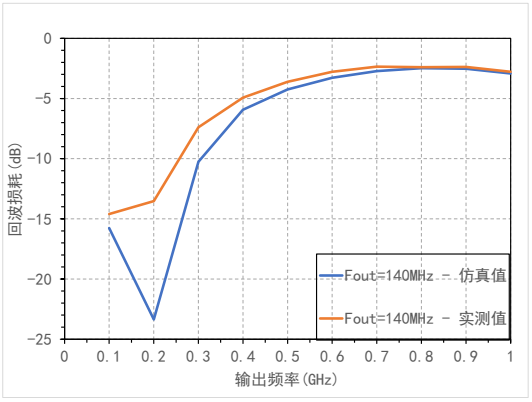
| | |
|---|---|
| 工作电压(VCC, OUT+, OUT-) | 4V |
| EN电压 | -0.3V to VCC+0.3V |
| LO+,LO-输入功率 | +10dBm |
| IN+,IN-输入功率 | +15dBm |
| 工作温度 | -40℃ to 105℃ |
| 贮存温度 | -65℃ to 150℃ |
| ESD(HBM) | Class 1C |
| ESD(CDM) | Class C3 |

## 输出端口阻抗图




## 阻抗测试曲线

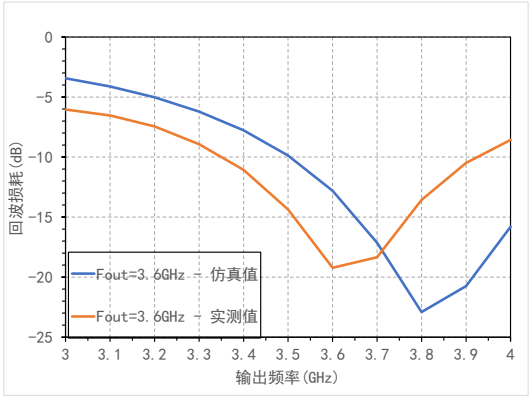
EVAL-SIM195SP52C-B0, $f_{IN}$=900MHz, $F_{LO}$=1040MHz, $f_{OUT}$=140MHz



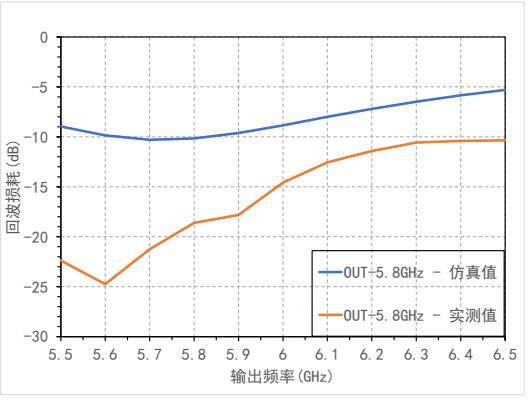

其中R1如下表：

| 频率 | R1 |
|---|---|
| 0.1GHz | 710Ω |
| 0.2GHz | 705Ω |
| 0.35GHz | 692Ω |
| 0.5GHz | 674Ω |
| 0.9GHz | 610Ω |
| 1.5GHz | 516Ω |
| 3.5GHz | 365Ω |
| 5.8GHz | 315Ω |
| 7GHz | 300Ω |

EVAL-SIM195SP52C-A1, $f_{IN}$=240MHz, $F_{LO}$=3.36GHz, $f_{OUT}$=3.6GHz




EVAL-SIM195SP52C-A2, $f_{IN}$=900MHz, $F_{LO}$=4.9GHz, $f_{OUT}$=5.8GHz




以上曲线图分别以输出0.14GHz，3.6GHz，5.8GHz为例，模型配合实际的外围元器件的S参数进行输出端口的回波损耗仿真和实测。





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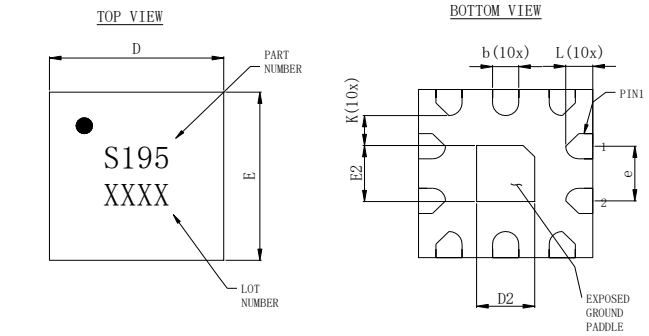
## 封装信息

| 型号 | 封装材料 | 焊盘镀层 | MSL等级[1] | 封装标识[2] | 环保要求 |
|---|---|---|---|---|---|
| SIM195SP2C | 绿色树脂化合物 | NiPdAu | MSL 3 | S195<br>XXXXX | 符合RoHS |

[1] 最高回流焊温度260℃

[2] XXXXX为批号

## 封装外形图



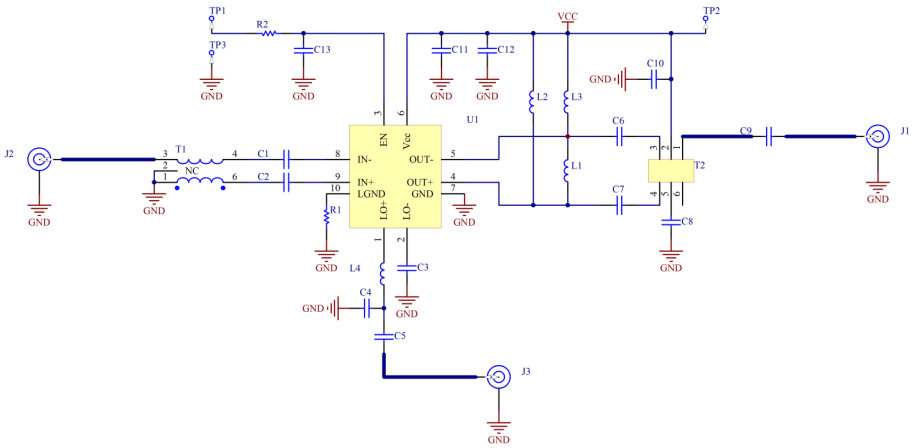

| SP2C Dimension Table (unit:mm) | | | |
|---|---|---|---|
| Symbol | MIN | NOM | MAX |
| A | 0.70 | 0.75 | 0.80 |
| A1 | 0.00 | 0.02 | 0.05 |
| A2 | | 0.20Ref | |
| b | 0.20 | 0.25 | 0.30 |
| D | 1.90 | 2.00 | 2.10 |
| D2 | 0.45 | 0.50 | 0.55 |
| e | | 0.50BSC | |
| E | 1.90 | 2.00 | 2.10 |
| E2 | 0.45 | 0.50 | 0.55 |
| K | 0.20 | --- | --- |
| L | 0.25 | 0.30 | 0.35 |
| aaa | | 0.08 | |

说明：
1. 单位：mm
2. 引线框架材料：铜合金
3. 封装表面翘曲：≤0.05mm
4. 所有接地引脚请连接PCB射频地

## 引脚定义

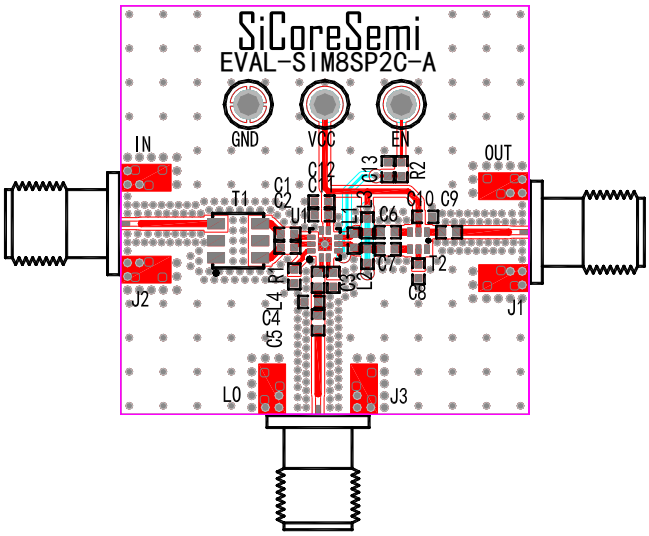
| 引脚编号 | 功能符号 | 功能描述 |
|---|---|---|
| 1;2 | LO+;LO- | 差分LO输入，输入阻抗约为差分100欧姆，实现了宽带匹配，也可以通过外部匹配实现窄带匹配。单端输入使用时，将另外一端通过电容进行良好接地。且内部电路提供直流偏置，因此需要外部隔直 |
| 3 | EN | 该引脚上施加电压大于1V时芯片开始工作，小于0.5V将禁用芯片。开启电压不应超过VCC电压0.3V |
| 4;5 | OUT+;OUT- | 差分输出。需要外部匹配转换成单端，并且需要提供到VCC的低电阻直流路径，用于给混频器提供输出直流，典型直流电流为每个引脚18mA |
| 6 | VCC | 电源范围为 2.7V至 3.6V。该引脚应由靠近IC的10nF电容进行旁路。推荐设计布板时使用低阻抗电源层。典型电流为4mA |
| 7 | GND | 射频地，封装底部Exposed Padlle也为射频地 |
| 8;9 | IN-;IN+ | 差分输入，差分驱动时可以获得最佳性能。单端使用时，需要将另外一端通过电容接地，内部电路提供了直流偏置，因此需要外部隔直 |
| 10 | LGND | 输入放大器直流地回路 |

## 评估板原理图(上变频)

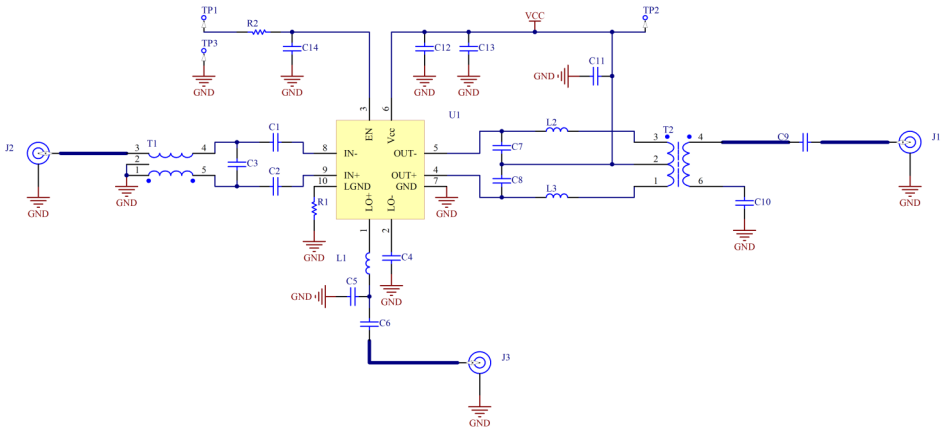



| Designator | Value | Size | Manufacturer Part Number |
|---|---|---|---|
| C1, C2, C3, C8, C9, C10 | 1nF | 0402 | Murata GRM Series |
| C5, C11, C13 | 100pF | 0402 | Murata GRM Series |
| C12 | 4.7uF | 0402 | Murata GRM Series |
| C4 | NC | 0402 | |
| R1 | 0Ω | 0402 | |
| R2 | 100Ω | 0402 | |
| T1 | Balun 1:1 (4.5MHz - 3000MHz) | AT224-1 | Mini-Circuits TC1-1-13M+ |
| J1, J2, J3 | SMA-K PCB 连接器 | | 傲文 D550B12E01-023 |
| TP1, TP2, TP3 | DC测试端子 | | Keystone 5005 |
| U1 | SIM195SP2C | | SiCore Semi SIM195SP2C |
| **EVAL-SIM195SP2C-A0, $f_{IN}$ = 140MHz, $f_{LO}$ = 1040MHz, $f_{OUT}$ = 900MHz** | | | |
| C6, C7, | 1.8pF | 0402 | Murata GJM Series |
| L1 | NC | 0402 | |
| L2, L3 | 15nH | 0402 | Murata GJM Series |
| L4 | 1.3nH | 0402 | Murata LQW Series |
| T2 | Balun 4:1 (800MHz - 2.6GHz) | 0805 | Anaren BD0826J50200AHF |
| **EVAL-SIM195SP2C-A1, $f_{IN}$ = 240MHz, $f_{LO}$ = 3.36GHz, $f_{OUT}$ = 3.6GHz** | | | |
| C6, C7, | 1pF | 0402 | Murata GJM Series |
| L1 | 5.8nH | 0402 | Murata LQW Series |
| L2, L3 | 4.7nH | 0402 | Murata GJM Series |
| L4 | 1.3nH | 0402 | Murata LQW Series |
| T2 | Balun 4:1 (3.3GHz - 4.2GHz) | 0805 | Mini-Circuits NCS4-442+ |
| **EVAL-SIM195SP2C-A2, $f_{IN}$ = 900MHz, $f_{LO}$ = 4.9GHz, $f_{OUT}$ = 5.8GHz** | | | |
| C6, C7, | 1pF | 0402 | Murata GJM Series |
| L1 | 1.5nH | 0402 | Murata LQW Series |
| L2, L3 | 6.2nH | 0402 | Murata GJM Series |
| L4 | 0Ω | 0402 | |
| T2 | Balun 4:1 (4.5GHz - 6GHz) | 0805 | Mini-Circuits NCS4-63+ |

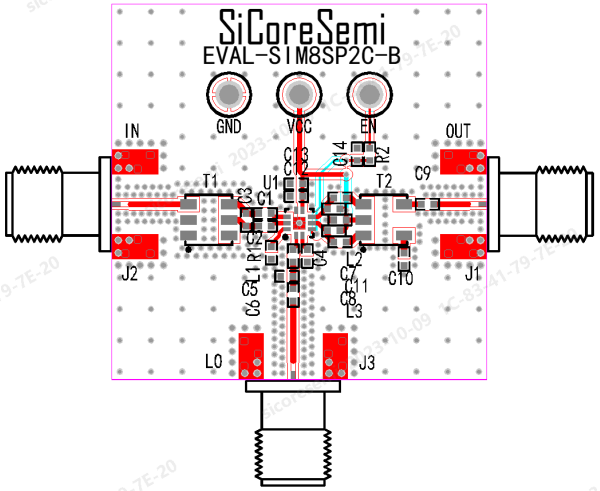
## 评估板电路图(上变频)




## 评估板原理图(下变频)

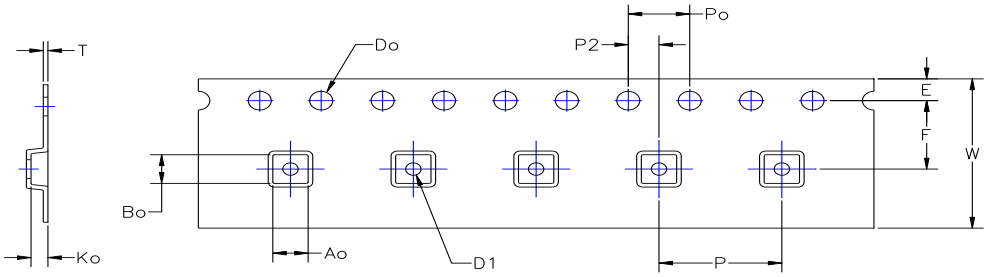


## 评估板电路图(下变频)



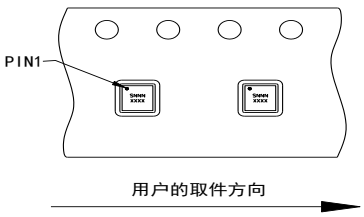

| Designator | Value | Size | Manufacturer Part Number |
|---|---|---|---|
| C4, C9, C10 | 1nF | 0402 | Murata GRM Series |
| C11, C12, C14 | 100pF | 0402 | Murata GRM Series |
| C13 | 4.7uF | 0402 | Murata GRM Series |
| C6 | 10nF | 0402 | Murata GRM Series |
| C5 | 3pF | 0402 | Murata GJM Series |
| C3 | NC | 0402 | |
| L1 | 10nH | 0402 | Murata LQW Series |
| R1 | 0Ω | 0402 | |
| R2 | 100Ω | 0402 | |
| T1 | Balun 1:1 (10MHz - 8000MHz) | DB1627-1 | Mini-Circuits TCM1-83X+ |
| J1, J2, J3 | SMA-K PCB 连接器 | | 傲文 D550B12E01-023 |
| TP1, TP2, TP3 | DC测试端子 | | Keystone 5005 |
| U1 | SIM195SP2C | | SiCore Semi SIM195SP2C |
| **EVAL-SIM195SP2C-B0, $f_{IN}$ = 900MHz, $f_{LO}$ = 1040MHz, $f_{OUT}$ = 140MHz** | | | |
| C1, C2 | 100pF | 0402 | Murata GRM Series |
| C7, C8 | 1.5pF | 0402 | Murata GJM Series |
| L2, L3 | 180nH | 0402 | Murata LQW Series |
| T2 | Balun 8:1 (2MHz - 500MHz) | AT224-1 | Mini-Circuits TC8-1+ |
| **EVAL-SIM195SP2C-B1, $f_{IN}$ = 3.5GHz, $f_{LO}$ = 3.044GHz, $f_{OUT}$ = 456MHz** | | | |
| C1, C2 | 1.5pF | 0402 | Murata GJM Series |
| C7, C8 | 1pF | 0402 | Murata GJM Series |
| L2, L3 | 56nH | 0402 | Murata LQW Series |
| T2 | Balun 4:1 (10MHz - 1900MHz) | DB714 | Mini-Circuits TCM4-19 |
| **EVAL-SIM195SP2C-B2, $f_{IN}$ = 5.8GHz, $f_{LO}$ = 4.9GHz, $f_{OUT}$ = 800MHz** | | | |
| C1, C2 | 1pF | 0402 | Murata GJM Series |
| C7, C8 | 0.3pF | 0402 | Murata GJM Series |
| L2, L3 | 33nH | 0402 | Murata LQW Series |
| T2 | Balun 4:1 (10MHz - 1900MHz) | DB714 | Mini-Circuits TCM4-19 |

## 包装信息




| DIMENSION | SPEC |
|---|---|
| W | 12.00 +/−0.30 |
| Do | ⌀1.50 +0.10/−0.00 |
| Po | 4.00 +/−0.10 |
| E | 1.75 +/−0.10 |
| D1 | ⌀1.00 MIN |
| Ao | 2.30 +/−0.10 |
| Bo | 2.30 +/−0.10 |
| P | 8.00 +/−0.10 |
| P2 | 2.00 +/−0.10 |
| Ko | 1.10 +/−0.10 |
| T | 0.30 +/−0.05 |
| F | 5.50 +/−0.05 |

元件在载带中的方向
（面向载带与卷轴）




说明：
1. 单位：mm
2. 材料：防静电聚炳乙烯
3. 颜色：黑色
4. 10个定位孔中心间距(P0)累积公差±0.2

## 注意事项

1. 禁止试图用湿化学方法清洁芯片表面。
2. 本品属于静电敏感器件，储存和使用时注意防静电。
3. 干燥、氮气环境储存。