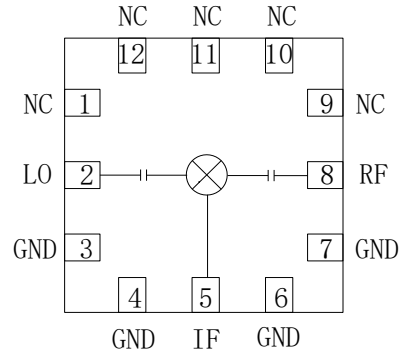


性能特点

- 变频损耗: 8dB
- L0至RF隔离: 55dB
- L0至IF隔离: 44dB
- 无源双平衡拓扑结构
- 频率范围: 0.5~2GHz
- 封装尺寸: 3*3 QFN 12L

典型应用

- 点对点通信
- 仪器仪表
- 5G通信

功能框图

概述

SIM273SP3B是一款通用型无源双平衡混频器,采用GaAs工艺制造。该器件为无源器件,无需偏置、外部元件或匹配电路。可用作频率0.5GHz至2GHz的上变频器或下变频器。

电性能表 ($T_A=+25^{\circ}\text{C}$, $L0=+13\text{dBm}$)

参数名称	描述	最小值	典型值	最大值	单位
频率范围	RF、L0端口	0.5~2.0			GHz
	IF端口	DC~1.0			GHz
本振输入功率范围		11		19	dBm
回波损耗	RF端口		8		dB
	IF端口		13		dB
隔离度	RF到IF端口		17		dB
	L0到RF端口		55		dB
	L0到IF端口		44		dB

下变频电性能表 ($T_A=+25^{\circ}\text{C}$, $IF=100\text{MHz}$, $L0=+13\text{dBm}$ LSB)

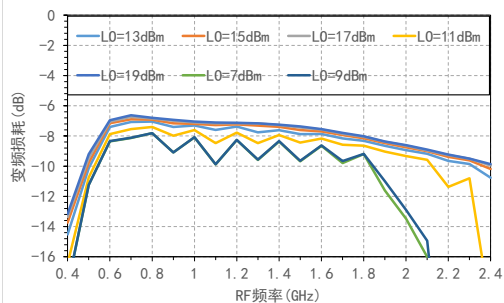
参数名称	描述	最小值	典型值	最大值	单位
变频损耗	$P_{in}=-10\text{dBm}$		8		dB
输入IP3	$P_{in}=5\text{dBm}/\text{tone}$, $\Delta f=1\text{MHz}$		19		dBm
输入IP2	$P_{in}=5\text{dBm}/\text{tone}$, $\Delta f=1\text{MHz}$		60		dBm
输入P1dB	IP1dB		12		dBm
杂散	2L0-2RF		67		dB
	3L0-3RF		70		dB

上变频电性能表 ($T_A=+25^{\circ}\text{C}$, $IF=100\text{MHz}$, $L0=+13\text{dBm}$ LSB)

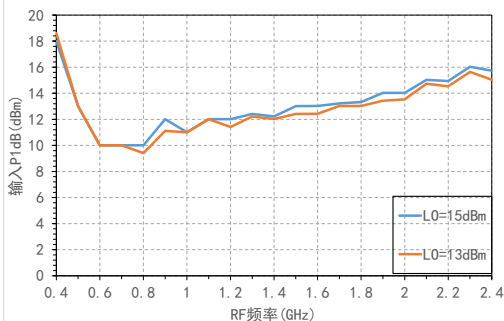
参数名称	描述	最小值	典型值	最大值	单位
变频损耗	$P_{in}=-10\text{dBm}$		7.5		dB
输入IP3	$P_{in}=5\text{dBm}/\text{tone}$, $\Delta f=1\text{MHz}$		17.5		dBm
输入IP2	$P_{in}=5\text{dBm}/\text{tone}$, $\Delta f=1\text{MHz}$		47		dBm
输入P1dB	IP1dB		12.5		dBm
杂散	2L0-2IF		64		dB
	3L0-3IF		62		dB

下变频测试曲线 (IF=0.1GHz, LSB)

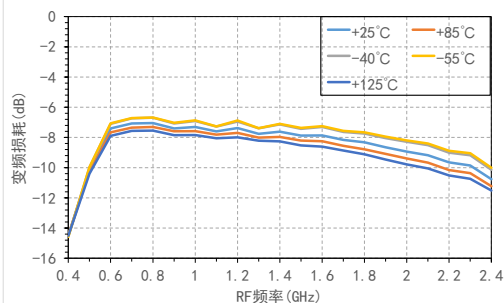
变频损耗 VS RF频率@本振功率 (Pin=-10dBm)



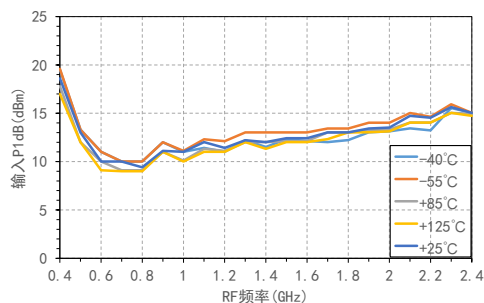
输入P1dB VS RF频率@本振功率



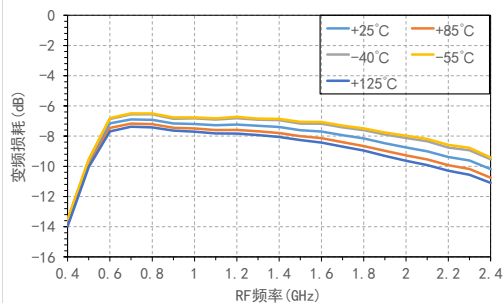
变频损耗 VS RF频率 @温度 (LO=13dBm, Pin=-10dBm)



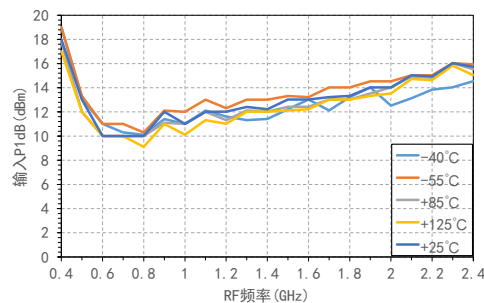
输入P1dB VS RF频率@温度 (LO=13dBm)



变频损耗 VS RF频率 @温度 (LO=15dBm, Pin=-10dBm)

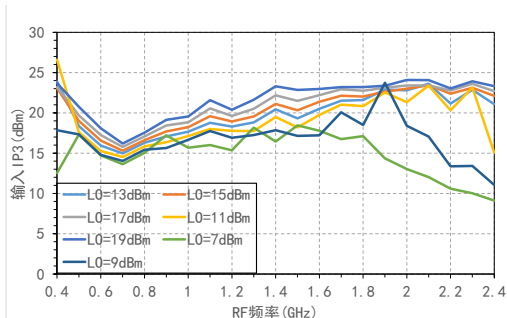


输入P1dB VS RF频率@温度 (LO=15dBm)

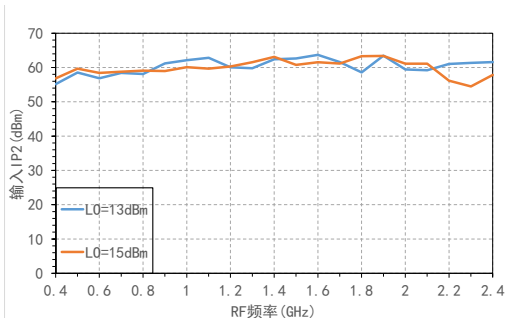


下变频测试曲线 (IF=0.1GHz, LSB)

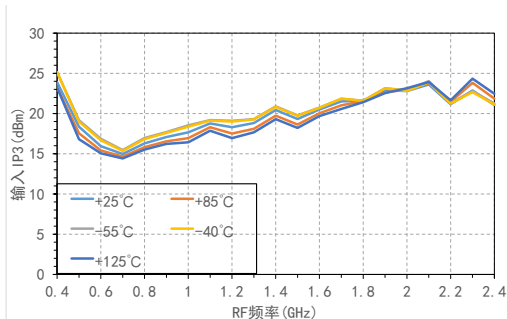
输入 IP3 VS RF 频率@本振功率 (Pin=5dBm)



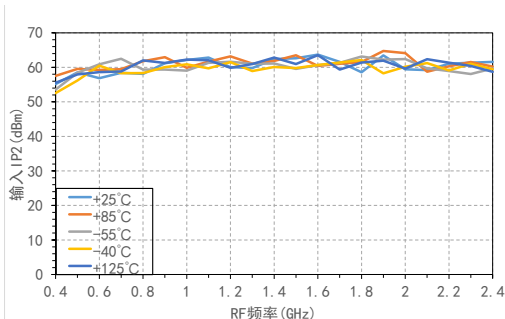
输入 IP2 VS RF 频率@本振功率 (Pin=5dBm)



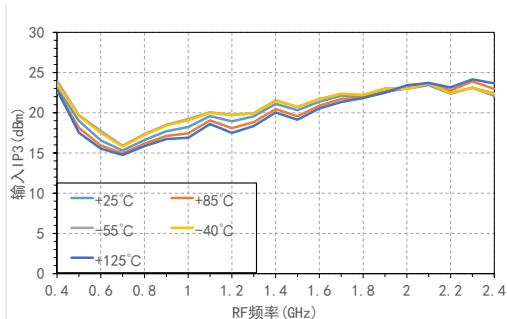
输入 IP3 VS RF 频率@温度 (LO=13dBm, Pin=5dBm)



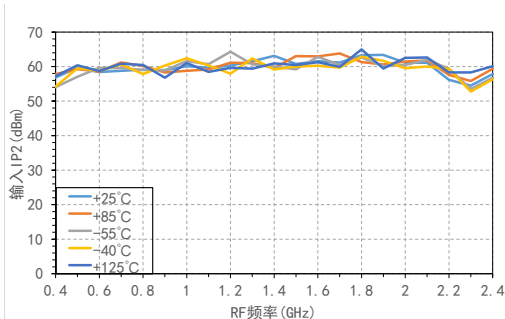
输入 IP2 VS RF 频率@温度 (LO=13dBm, Pin=5dBm)



输入 IP3 VS RF 频率@温度 (LO=15dBm, Pin=5dBm)



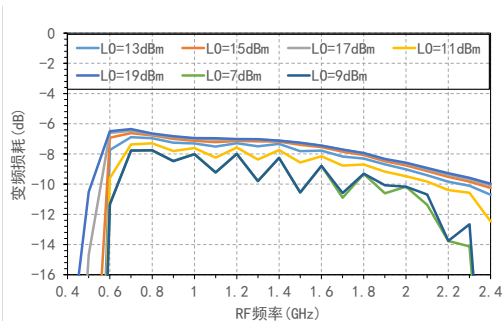
输入 IP2 VS RF 频率@温度 (LO=15dBm, Pin=5dBm)



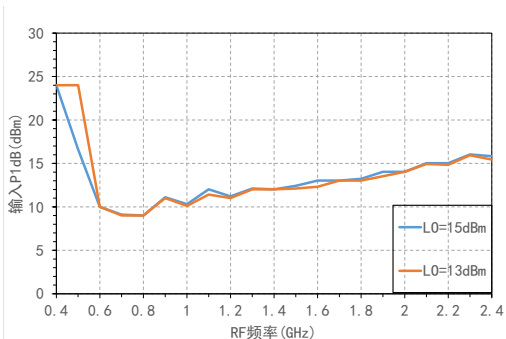
SIM
混频器系列

下变频测试曲线 (IF=0.1GHz,USB)

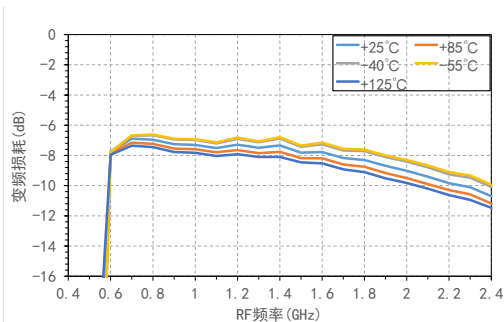
变频损耗 VS RF频率@本振功率 (Pin=-10dBm)



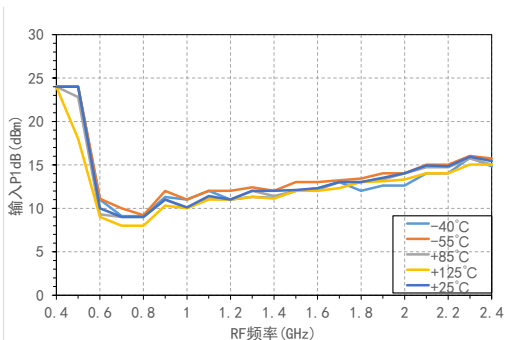
输入P1dB VS RF频率@本振功率



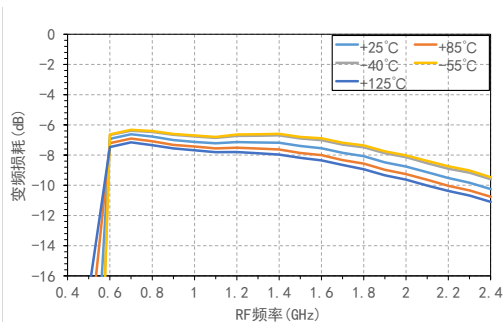
变频损耗 VS RF频率 @温度 (LO=13dBm, Pin=-10dBm)



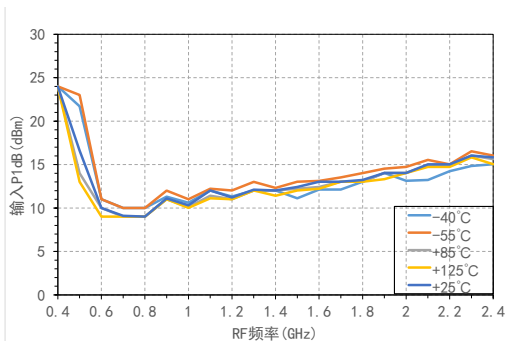
输入P1dB VS RF频率@温度 (LO=13dBm)



变频损耗 VS RF频率 @温度 (LO=15dBm, Pin=-10dBm)

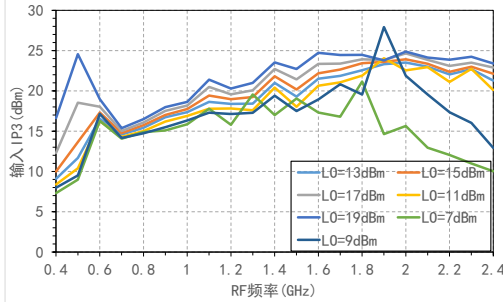


输入P1dB VS RF频率@温度 (LO=15dBm)

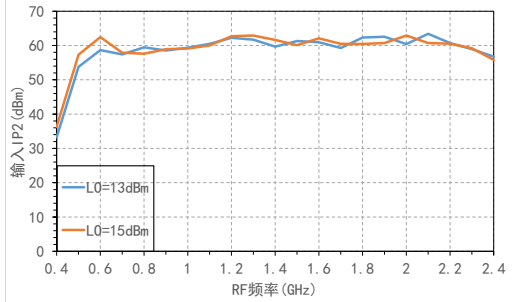


下变频测试曲线 (IF=0.1GHz,USB)

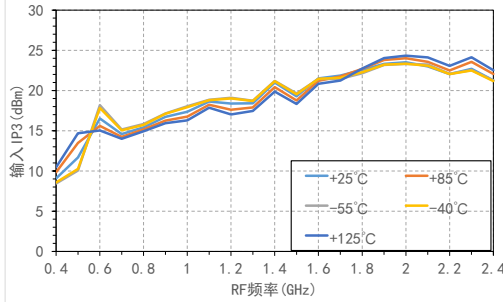
输入IP3 VS RF频率@本振功率 (Pin=5dBm)



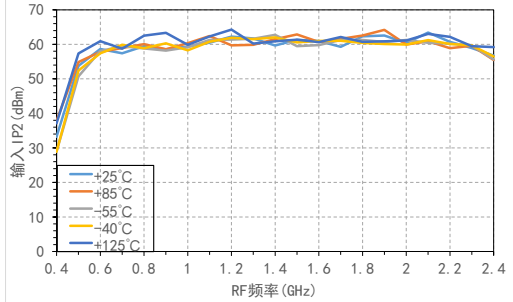
输入IP2 VS RF频率@本振功率 (Pin=5dBm)



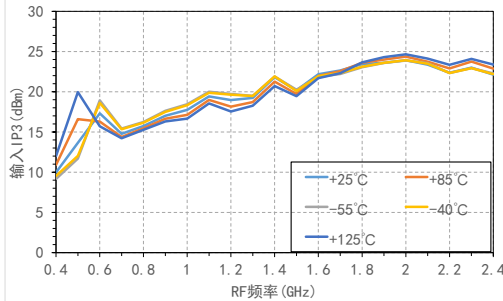
输入IP3 VS RF频率@温度 (LO=13dBm, Pin=5dBm)



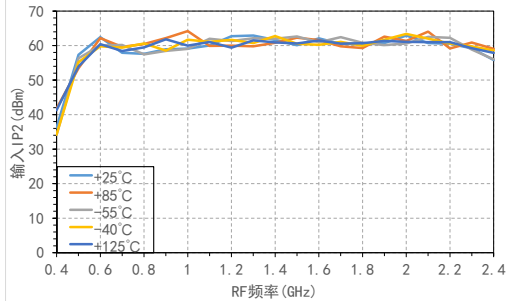
输入IP2 VS RF频率@温度 (LO=13dBm, Pin=5dBm)



输入IP3 VS RF频率@温度 (LO=15dBm, Pin=5dBm)

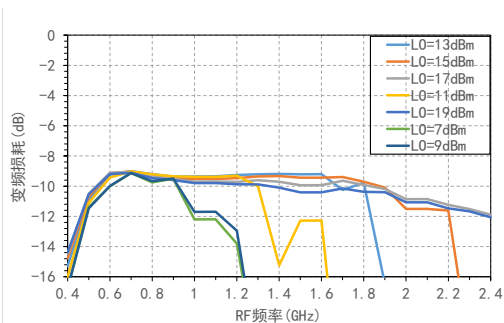


输入IP2 VS RF频率@温度 (LO=15dBm, Pin=5dBm)

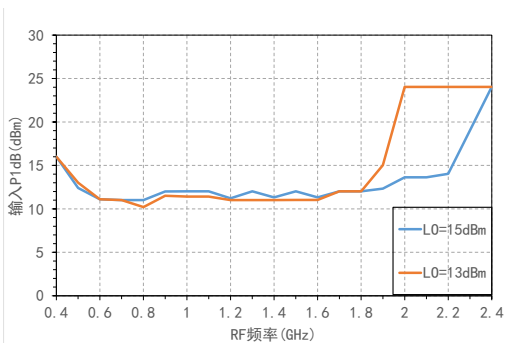


下变频测试曲线 (IF=1GHz,LSB)

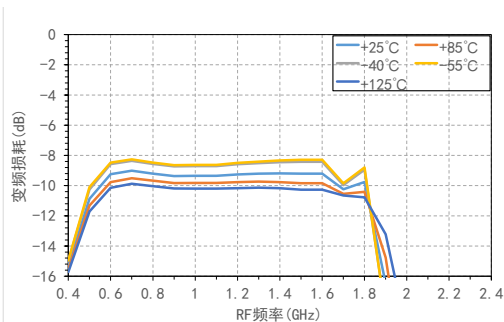
变频损耗 VS RF频率@本振功率 (Pin=-10dBm)



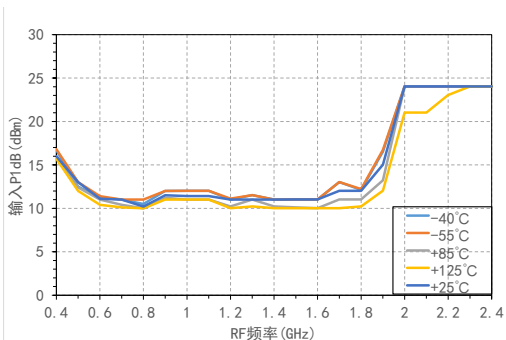
输入P1dB VS RF频率@本振功率



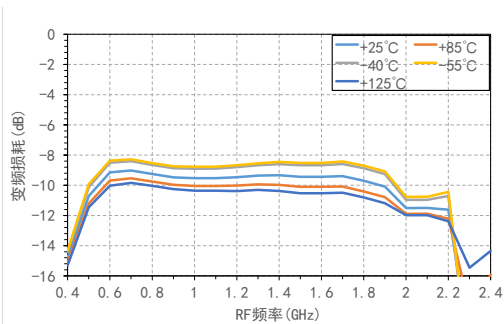
变频损耗 VS RF频率 @温度 (LO=13dBm, Pin=-10dBm)



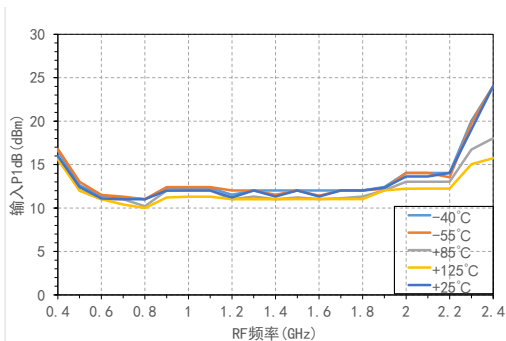
输入P1dB VS RF频率@温度 (LO=13dBm)



变频损耗 VS RF频率 @温度 (LO=15dBm, Pin=-10dBm)

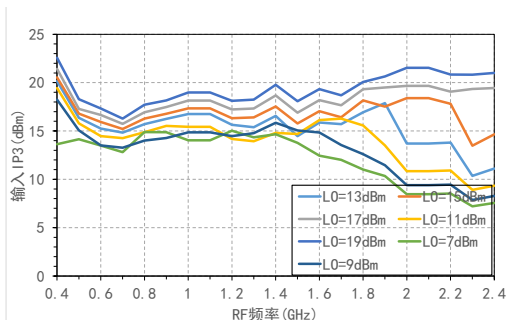


输入P1dB VS RF频率@温度 (LO=15dBm)

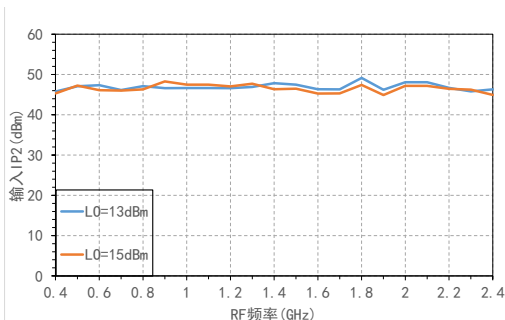


下变频测试曲线 (IF=1GHz,LSB)

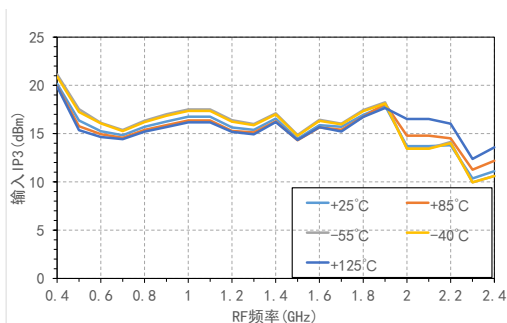
输入IP3 VS RF频率@温度 (Pin=5dBm)



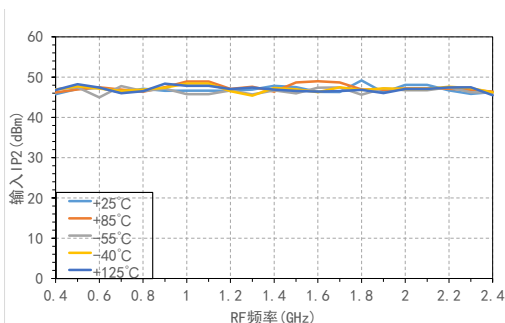
输入IP2 VS RF频率@温度 (Pin=5dBm)



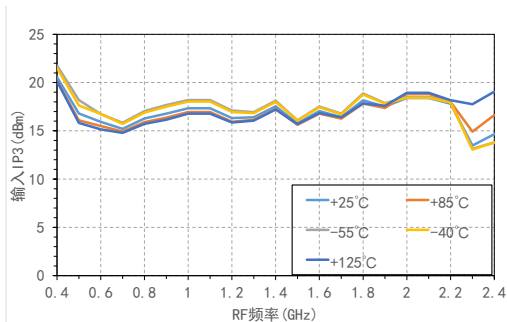
输入IP3 VS RF频率@温度 (L0=13dBm, Pin=5dBm)



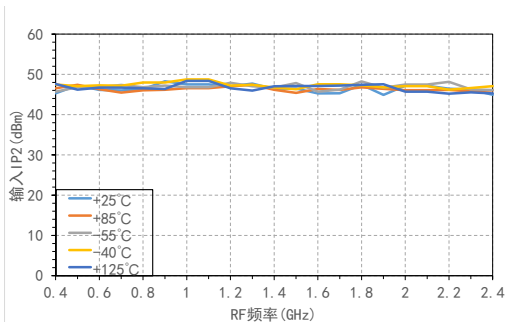
输入IP2 VS RF频率@温度 (L0=13dBm, Pin=5dBm)



输入IP3 VS RF频率@温度 (L0=15dBm, Pin=5dBm)



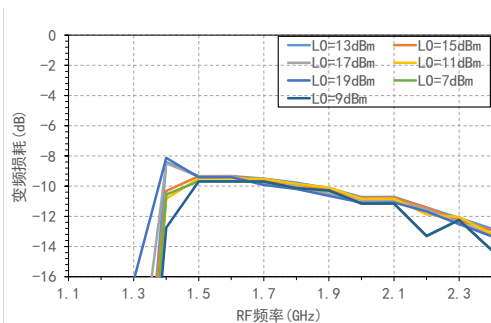
输入IP2 VS RF频率@温度 (L0=15dBm, Pin=5dBm)



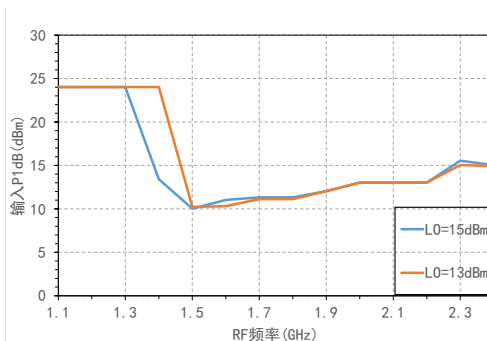
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下变频测试曲线 (IF=1GHz,USB)

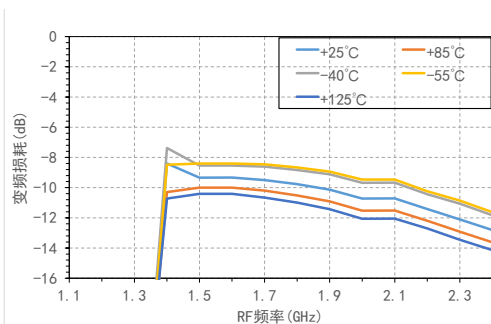
变频损耗 VS RF频率@本振功率 (Pin=-10dBm)



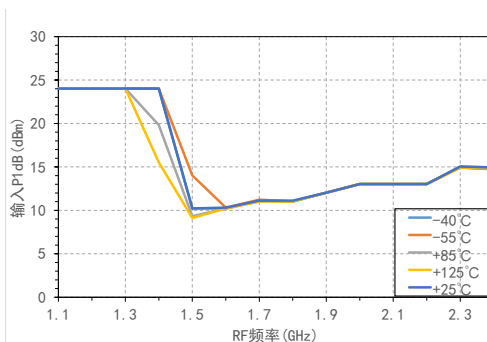
输入P1dB VS RF频率@本振功率



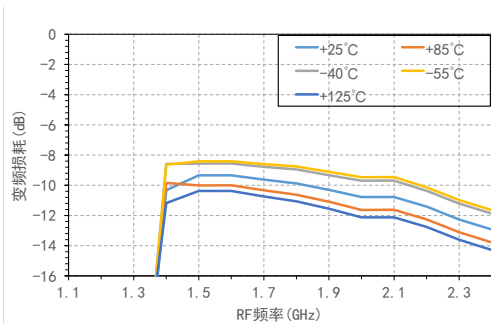
变频损耗 VS RF频率 @温度 (LO=13dBm, Pin=-10dBm)



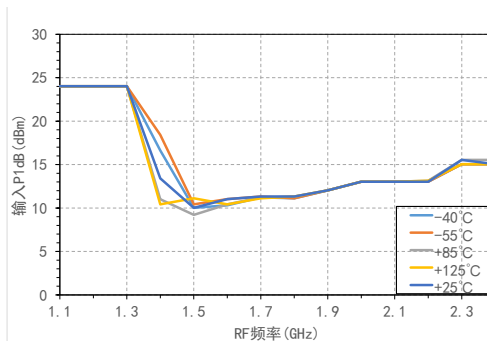
输入P1dB VS RF频率@温度 (LO=13dBm)



变频损耗 VS RF频率 @温度 (LO=15dBm, Pin=-10dBm)

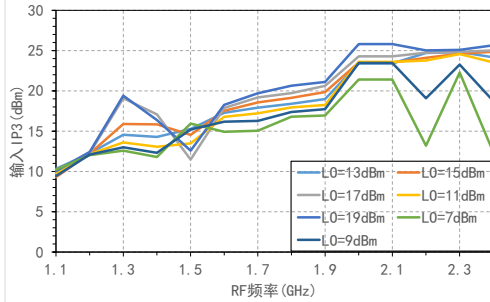


输入P1dB VS RF频率@温度 (LO=15dBm)

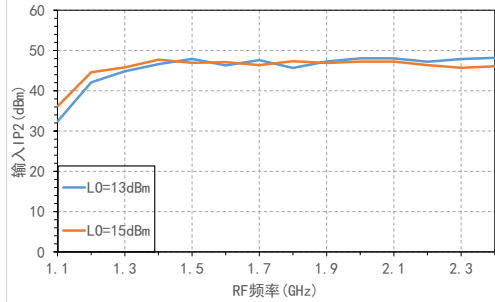


下变频测试曲线 (IF=1GHz,USB)

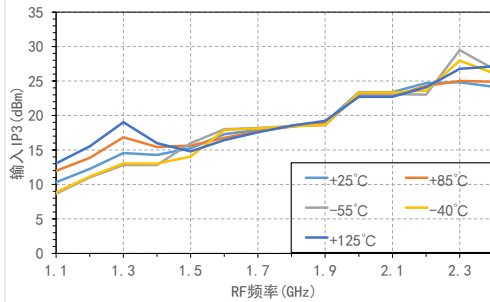
输入IP3 VS RF频率@本振功率(Pin=5dBm)



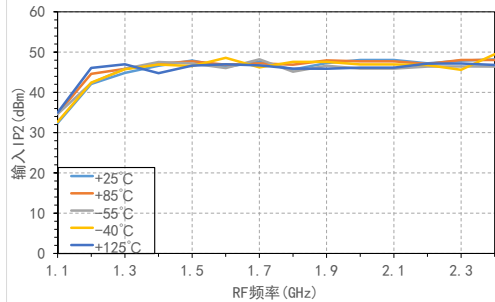
输入IP2 VS RF频率@本振功率(Pin=5dBm)



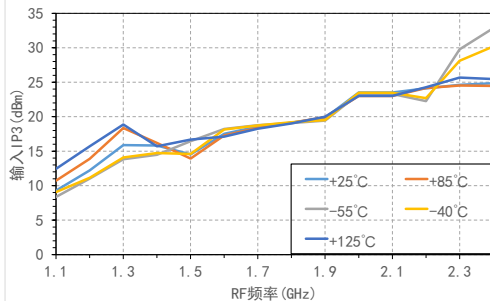
输入IP3 VS RF频率@温度(L0=13dBm, Pin=5dBm)



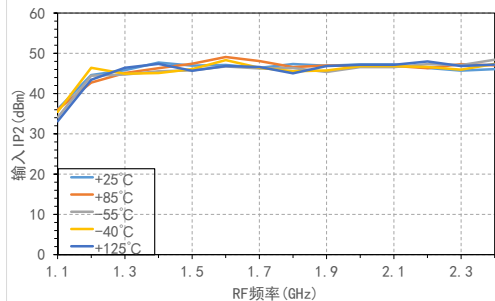
输入IP2 VS RF频率@温度(L0=13dBm, Pin=5dBm)



输入IP3 VS RF频率@温度(L0=15dBm, Pin=5dBm)

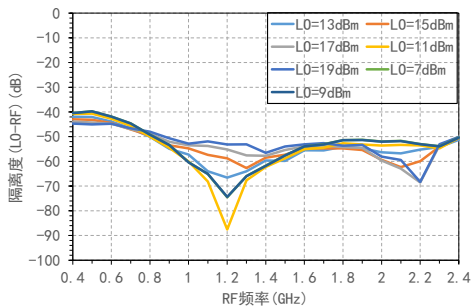


输入IP2 VS RF频率@温度(L0=15dBm, Pin=5dBm)

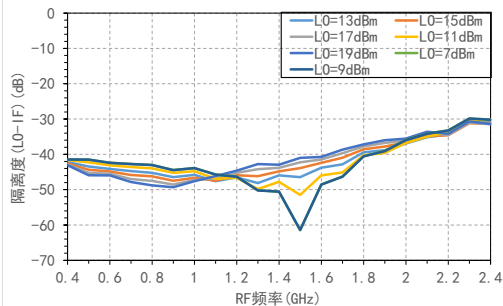


下变频测试曲线 (Pin=-10dBm)

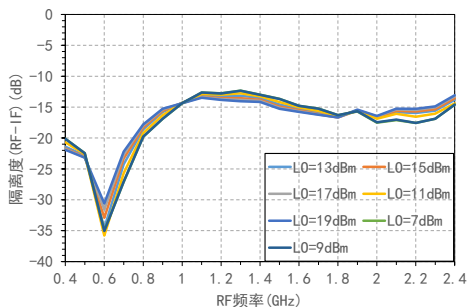
L0-RF 隔离度 VS RF 频率@本振功率



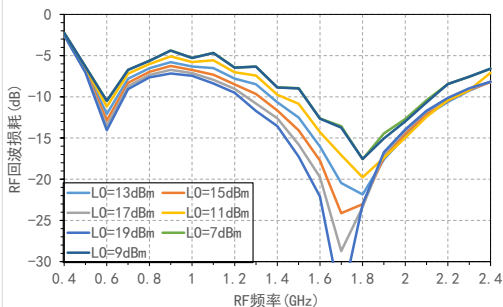
L0-IF 隔离度 VS RF 频率@本振功率



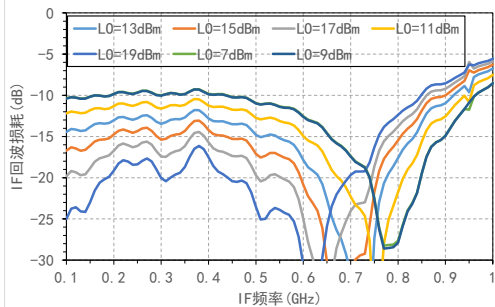
RF-IF 隔离度 VS RF 频率@本振功率



RF 回波损耗 VS RF 频率@本振功率



IF 回波损耗 VS RF 频率@本振功率



上下变频杂散表 (Pin=-10dBm)

下变频

		M*L0					
		0	1	2	3	4	5
M*RF	0	/	11.94	25.08	18.77	42.22	12.25
	1	26.80	0.00	33.77	24.34	33.43	50.56
	2	57.82	49.14	65.07	62.68	64.88	60.60
	3	64.93	60.35	64.40	67.23	68.29	69.86
	4	61.04	70.85	63.50	72.90	62.99	64.88
	5	60.13	62.81	70.19	59.99	65.56	49.21
	RF=0.6GHz&-10dBm; L0=0.7GHz&+15dBm						

下变频

		M*L0					
		0	1	2	3	4	5
M*RF	0	/	12.56	28.72	17.64	52.11	30.11
	1	5.61	0.00	36.22	40.27	31.80	47.48
	2	55.37	61.63	63.29	67.29	65.85	64.11
	3	58.08	56.84	60.75	66.03	59.69	62.91
	4	60.34	62.40	60.64	61.52	65.54	68.93
	5	74.13	69.58	60.19	70.55	64.59	69.17
	RF=1.3GHz&-10dBm; L0=1.4GHz&+15dBm						

下变频

		M*L0					
		0	1	2	3	4	5
M*RF	0	/	4.00	31.30	28.45	50.72	21.37
	1	7.81	0.00	34.23	43.91	38.53	44.54
	2	60.11	76.84	74.2	74.65	84.98	78.89
	3	89.41	74.22	78.12	79.22	74.69	79.91
	4	76.52	83.88	77.18	77.78	93.51	77.54
	5	92.60	80.57	86.88	80.56	83.23	85.54
	RF=1.9GHz&-10dBm; L0=2GHz&+15dBm						

上变频

		M*L0					
		0	1	2	3	4	5
M*IF	-5	66.71	79.34	84.15	52.97	67.95	58.03
	-4	76.73	70.88	51.12	64.98	54.94	71.94
	-3	71.13	71.16	63.60	52.15	71.95	59.06
	-2	81.54	66.16	62.29	74.54	57.52	61.35
	-1	24.24	0.84	18.45	12.36	40.66	26.20
	0	/	11.53	14.70	32.74	31.40	15.71
	1	24.23	0.00	28.96	15.32	37.84	25.41
	2	90.31	94.97	52.78	70.00	58.18	64.47
	3	72.80	51.16	65.08	54.48	70.26	60.57
	4	74.13	62.94	52.30	70.46	58.20	74.64
	5	64.90	61.58	71.74	57.42	62.40	62.07
	IF=0.1GHz&-10dBm; L0=0.7GHz&+15dBm						

上变频

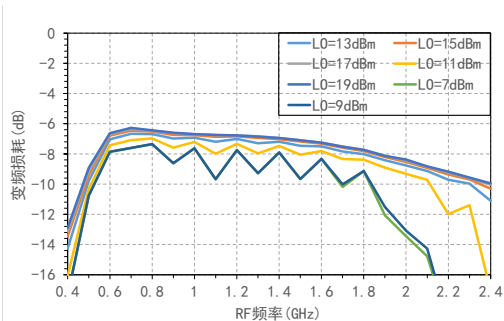
		M*L0					
		0	1	2	3	4	5
M*IF	-5	82.96	82.63	76.93	85.56	78.01	85.34
	-4	91.36	86.30	84.15	83.73	90.09	76.21
	-3	76.79	58.62	78.91	61.93	98.66	71.09
	-2	82.78	62.44	73.76	72.27	82.88	66.79
	-1	23.37	-0.07	23.49	24.79	50.56	23.66
	0	/	21.32	28.52	25.57	45.07	21.51
	1	23.38	0.00	29.51	24.87	50.57	22.81
	2	89.19	61.23	76.63	70.82	84.86	59.93
	3	84.40	51.02	73.68	63.81	81.14	64.66
	4	84.21	85.91	79.44	80.80	87.67	85.66
	5	87.72	85.84	76.89	88.26	84.47	85.02
	IF=0.1GHz&-10dBm; L0=1.4GHz&+15dBm						

上变频

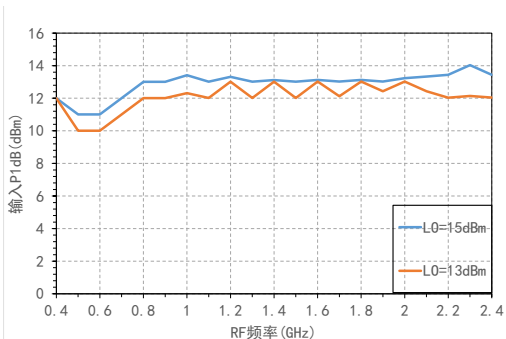
		M*L0					
		0	1	2	3	4	5
M*IF	-5	83.48	82.85	84.96	84.60	84.08	77.58
	-4	82.55	80.81	79.00	78.64	85.65	92.41
	-3	83.98	52.80	85.84	82.94	91.97	86.23
	-2	85.64	60.48	65.31	88.54	56.74	57.85
	-1	20.87	-0.63	45.19	31.10	52.18	28.47
	0	/	19.62	17.53	28.07	21.06	30.38
	1	20.86	0.00	48.13	28.38	53.48	29.58
	2	95.66	65.63	63.30	69.18	58.61	62.59
	3	90.04	51.84	81.09	67.77	91.66	78.34
	4	86.39	75.33	74.19	82.93	80.94	79.14
	5	93.60	78.07	79.88	85.84	74.79	74.12
	IF=0.1GHz&-10dBm; L0=2GHz&+15dBm						

上变频测试曲线 (IF=0.1GHz, LSB)

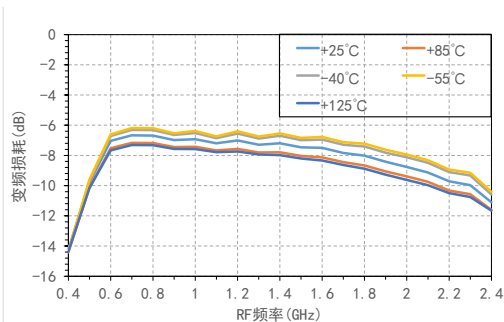
变频损耗 VS RF频率@本振功率 (Pin=-10dBm)



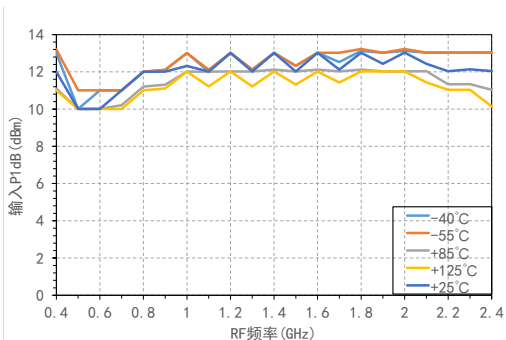
输入P1dB VS RF频率@本振功率



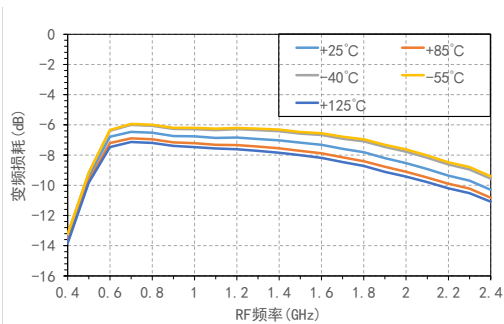
变频损耗 VS RF频率 @温度 (LO=13dBm, Pin=-10dBm)



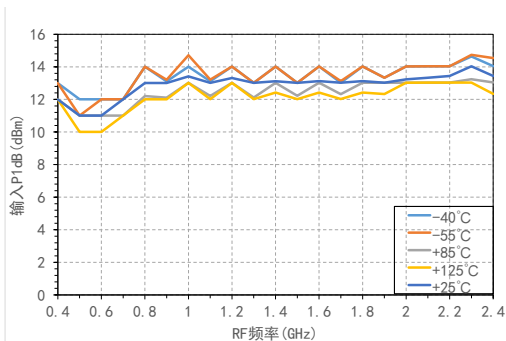
输入P1dB VS RF频率@温度 (LO=13dBm)



变频损耗 VS RF频率 @温度 (LO=15dBm, Pin=-10dBm)

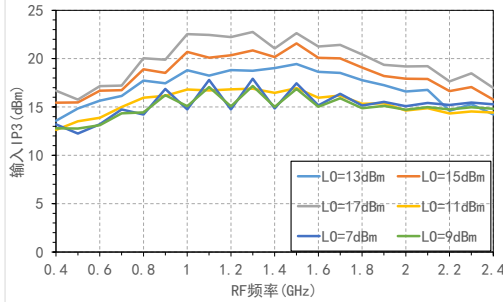


输入P1dB VS RF频率@温度 (LO=15dBm)

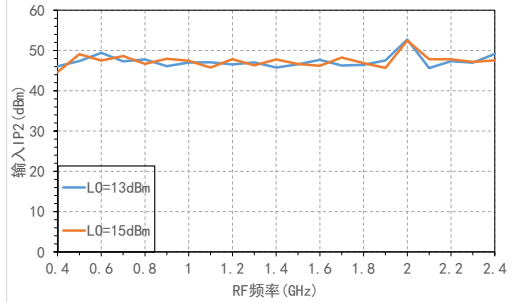


上变频测试曲线 (IF=0.1GHz, LSB)

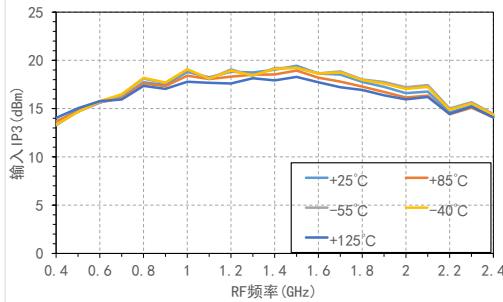
输入IP3 VS RF频率@本振功率(Pin=5dBm)



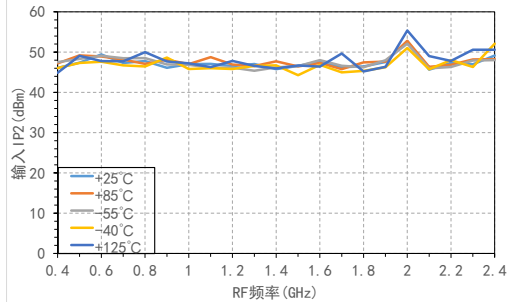
输入IP2 VS RF频率@本振功率(Pin=5dBm)



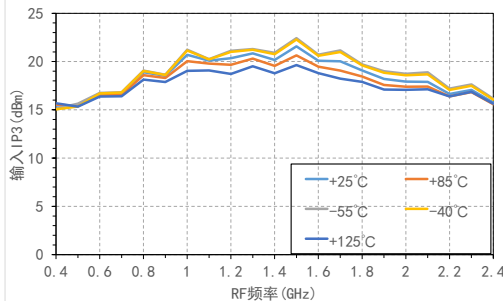
输入IP3 VS RF频率@温度(L0=13dBm, Pin=5dBm)



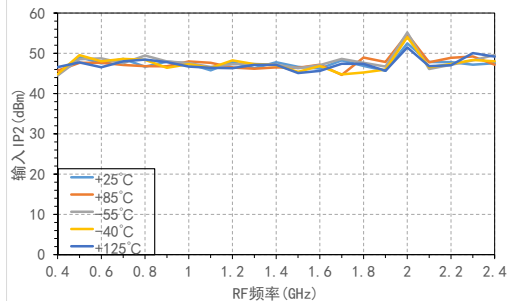
输入IP2 VS RF频率@温度(L0=13dBm, Pin=5dBm)



输入IP3 VS RF频率@温度(L0=15dBm, Pin=5dBm)

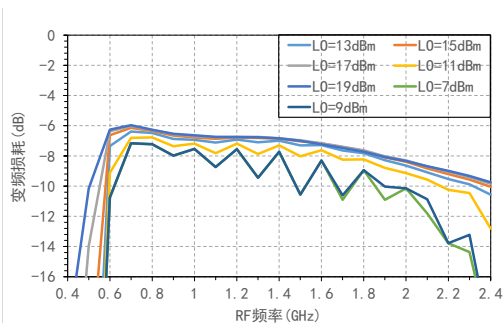


输入IP2 VS RF频率@温度(L0=15dBm, Pin=5dBm)

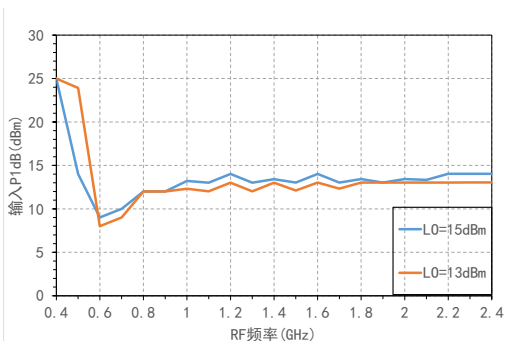


上变频测试曲线 (IF=0.1GHz, USB)

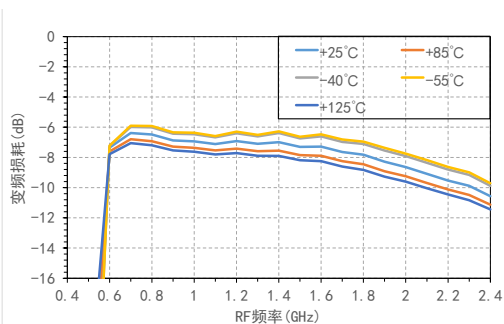
变频损耗 VS RF频率@本振功率 (Pin=-10dBm)



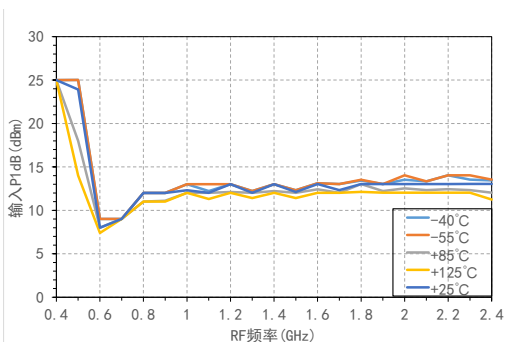
输入P1dB VS RF频率@本振功率



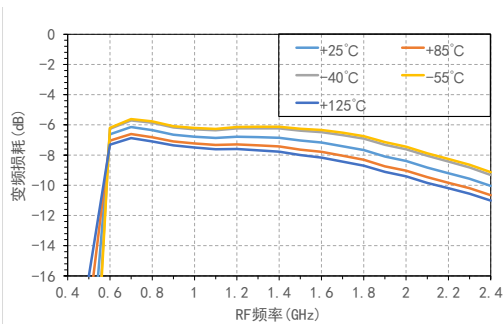
变频损耗 VS RF频率 @温度 (LO=13dBm, Pin=-10dBm)



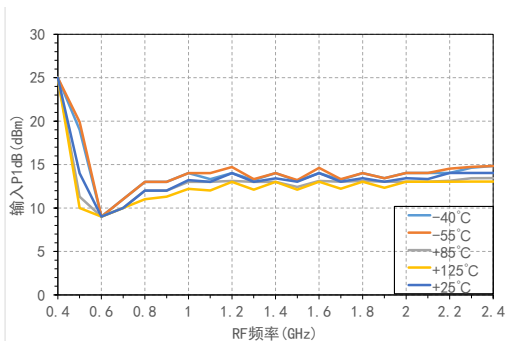
输入P1dB VS RF频率@温度 (LO=13dBm)



变频损耗 VS RF频率 @温度 (LO=15dBm, Pin=-10dBm)

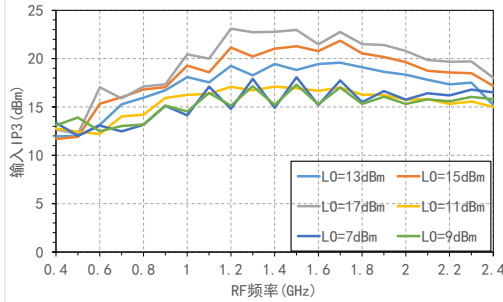


输入P1dB VS RF频率@温度 (LO=15dBm)

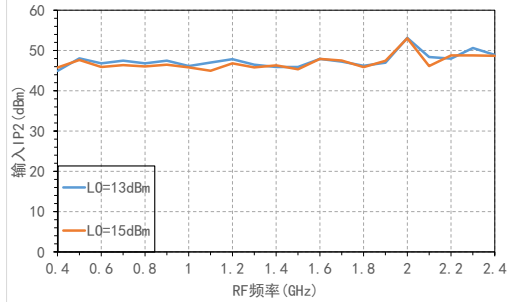


上变频测试曲线 (IF=0.1GHz, USB)

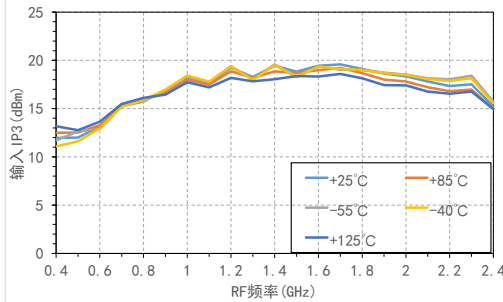
输入IP3 VS RF频率@本振功率(Pin=5dBm)



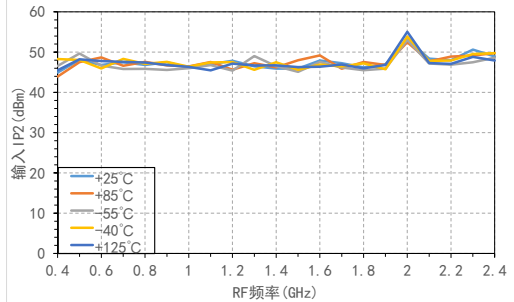
输入IP2 VS RF频率@本振功率(Pin=5dBm)



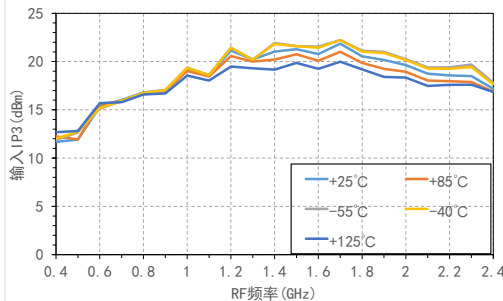
输入IP3 VS RF频率@温度(L0=13dBm, Pin=5dBm)



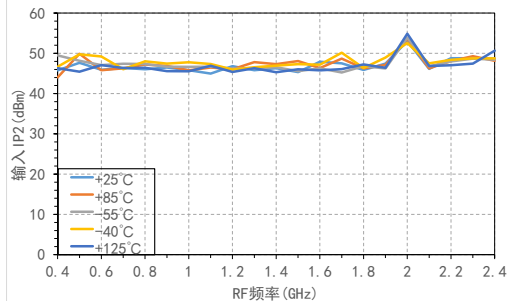
输入IP2 VS RF频率@温度(L0=13dBm, Pin=5dBm)



输入IP3 VS RF频率@温度(L0=15dBm, Pin=5dBm)

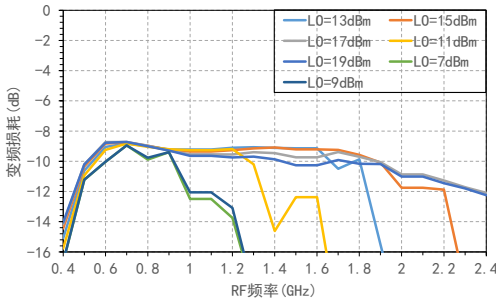


输入IP2 VS RF频率@温度(L0=15dBm, Pin=5dBm)

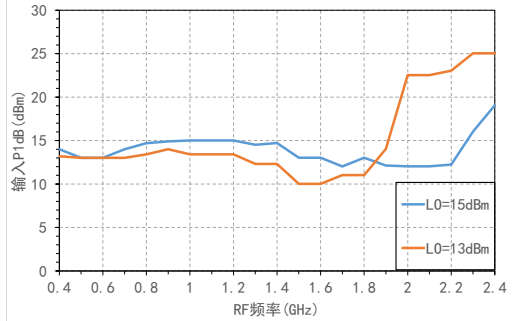


上变频测试曲线 (IF=1GHz, LSB)

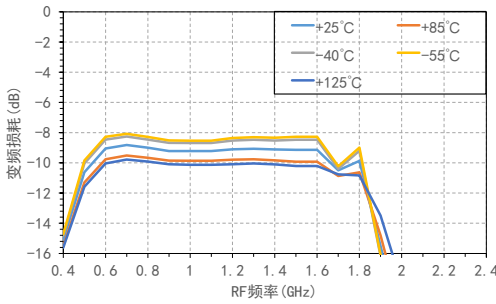
变频损耗 VS RF频率@本振功率 (Pin=-10dBm)



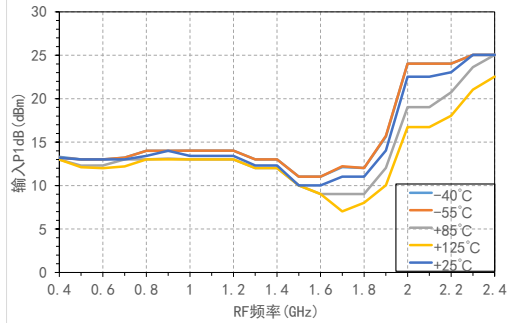
输入P1dB VS RF频率@本振功率



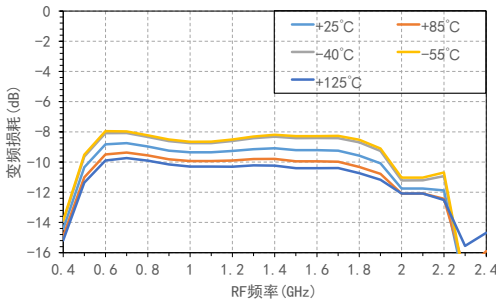
变频损耗 VS RF频率 @温度 (LO=13dBm, Pin=-10dBm)



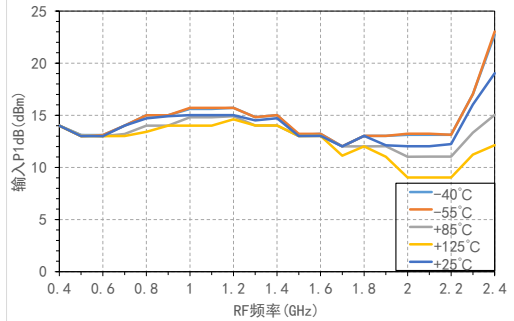
输入P1dB VS RF频率@温度 (LO=13dBm)



变频损耗 VS RF频率 @温度 (LO=15dBm, Pin=-10dBm)

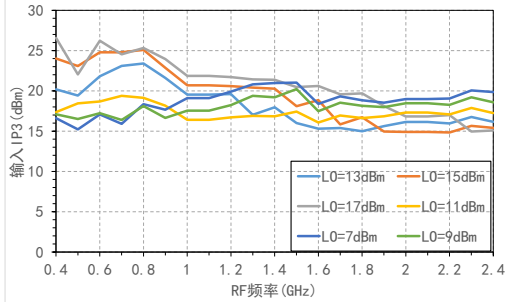


输入P1dB VS RF频率@温度 (LO=15dBm)

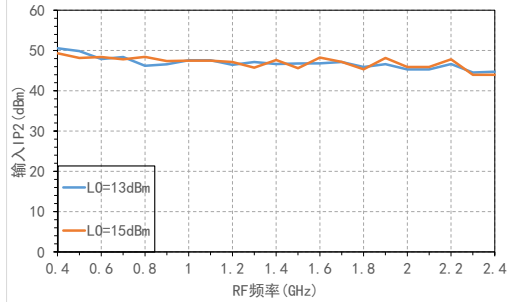


上变频测试曲线 (IF=1GHz, LSB)

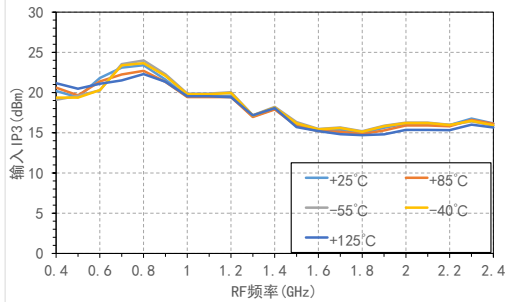
输入IP3 VS RF频率@本振功率 (Pin=5dBm)



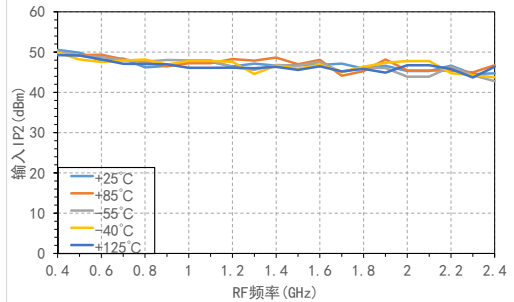
输入IP2 VS RF频率@本振功率 (Pin=5dBm)



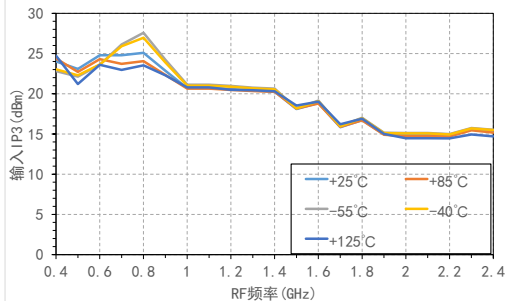
输入IP3 VS RF频率@温度 (LO=13dBm, Pin=5dBm)



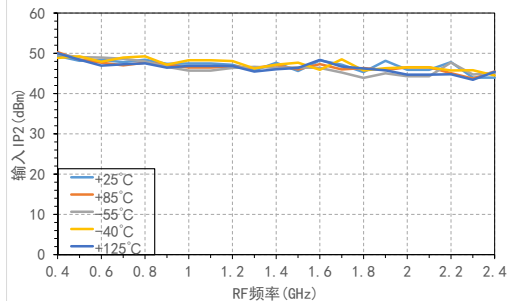
输入IP2 VS RF频率@温度 (LO=13dBm, Pin=5dBm)



输入IP3 VS RF频率@温度 (LO=15dBm, Pin=5dBm)

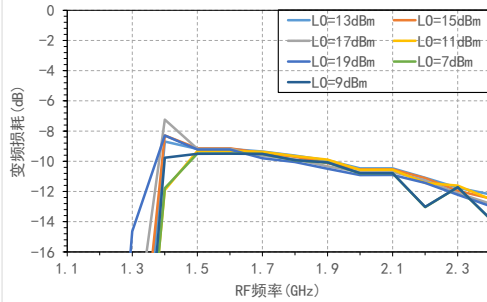


输入IP2 VS RF频率@温度 (LO=15dBm, Pin=5dBm)

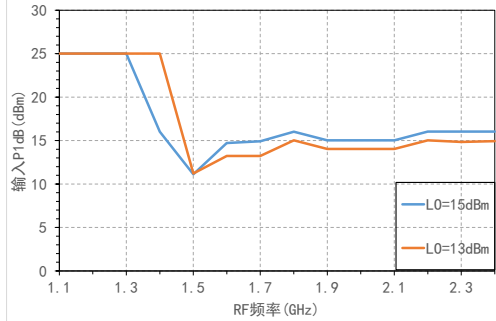


上变频测试曲线 (IF=1GHz, USB)

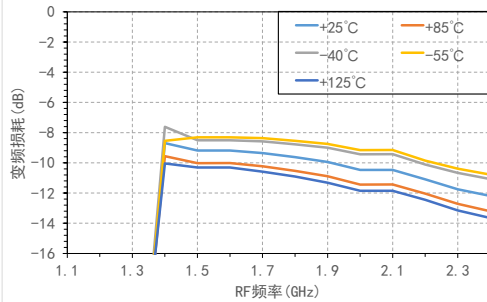
变频损耗 VS RF频率@本振功率 (Pin=-10dBm)



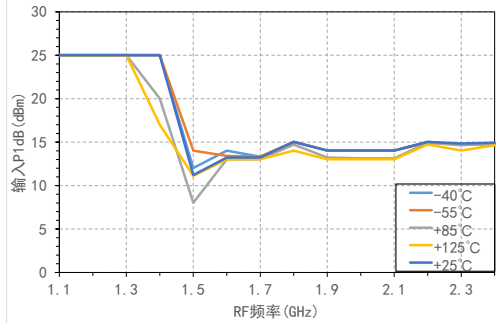
输入P1dB VS RF频率@本振功率



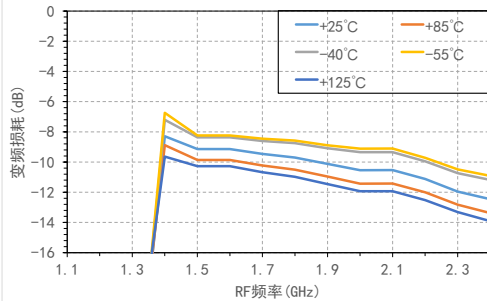
变频损耗 VS RF频率 @温度 (LO=13dBm, Pin=-10dBm)



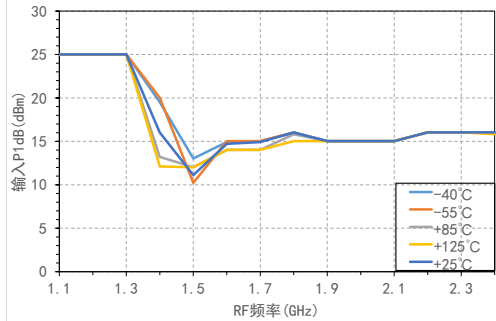
输入P1dB VS RF频率@温度 (LO=13dBm)



变频损耗 VS RF频率 @温度 (LO=15dBm, Pin=-10dBm)

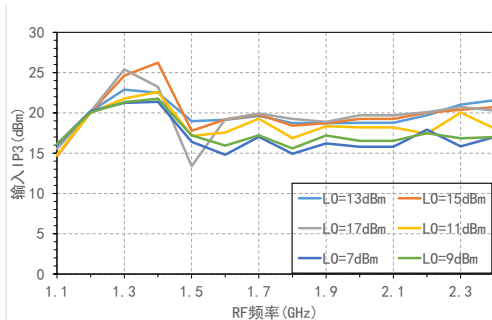


输入P1dB VS RF频率@温度 (LO=15dBm)

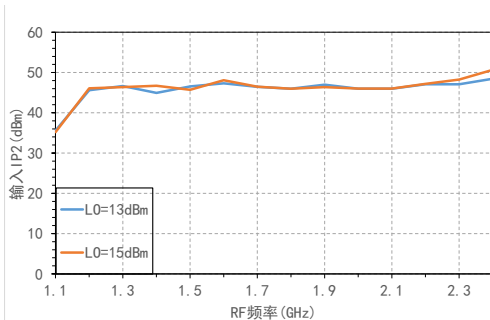


上变频测试曲线 (IF=1GHz, USB)

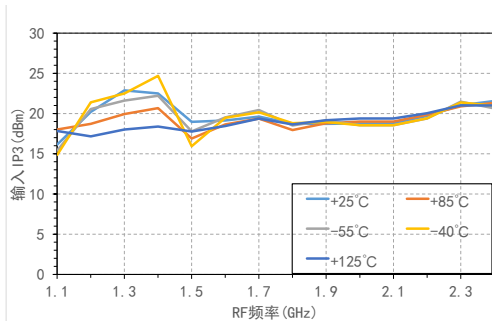
输入IP3 VS RF频率@本振功率(Pin=5dBm)



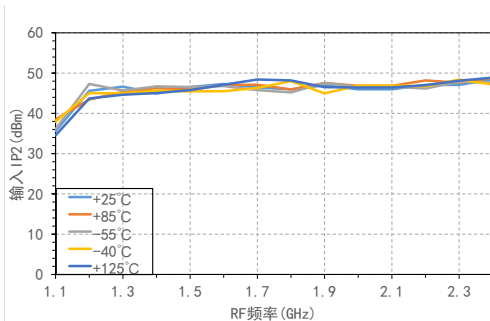
输入IP2 VS RF频率@本振功率(Pin=5dBm)



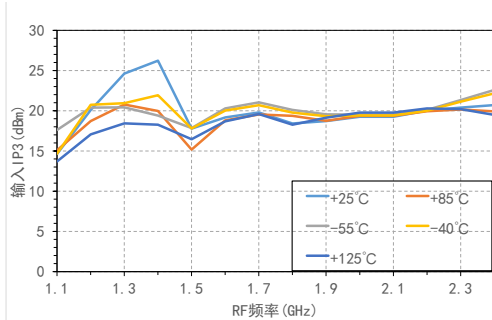
输入IP3 VS RF频率@温度(L0=13dBm, Pin=5dBm)



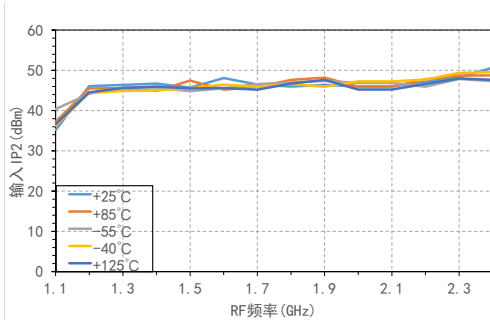
输入IP2 VS RF频率@温度(L0=13dBm, Pin=5dBm)



输入IP3 VS RF频率@温度(L0=15dBm, Pin=5dBm)



输入IP2 VS RF频率@温度(L0=15dBm, Pin=5dBm)



SIM
混
频
器
系
列

绝对最大额定值

RF/LO输入功率	24dBm
IF输入功率	24dBm
存储温度	-65°C~+150°C
工作温度	-40°C~+85°C
ESD (HBM)	Class 1A
ESD (CDM)	Class C3

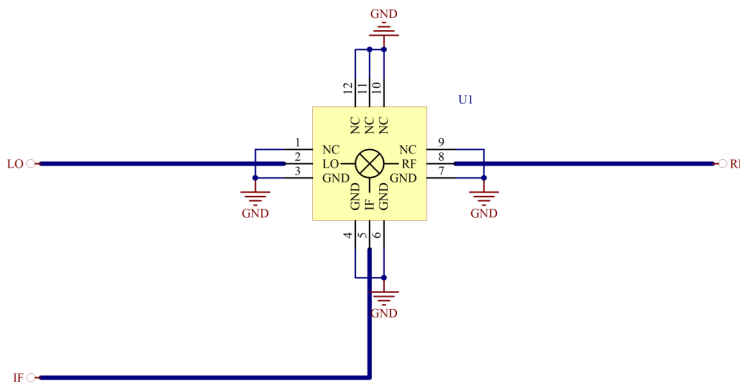
注意事项

型号	封装材料	焊盘镀层	MSL等级 ^[1]	封装标识 ^[2]	环保要求
SIM273SP3B	绿色树脂化合物	NiPdAu	MSL 3	S273 XXXXX	符合RoHS

[1] 最高回流焊温度260°C

[2] XXXXX为批号

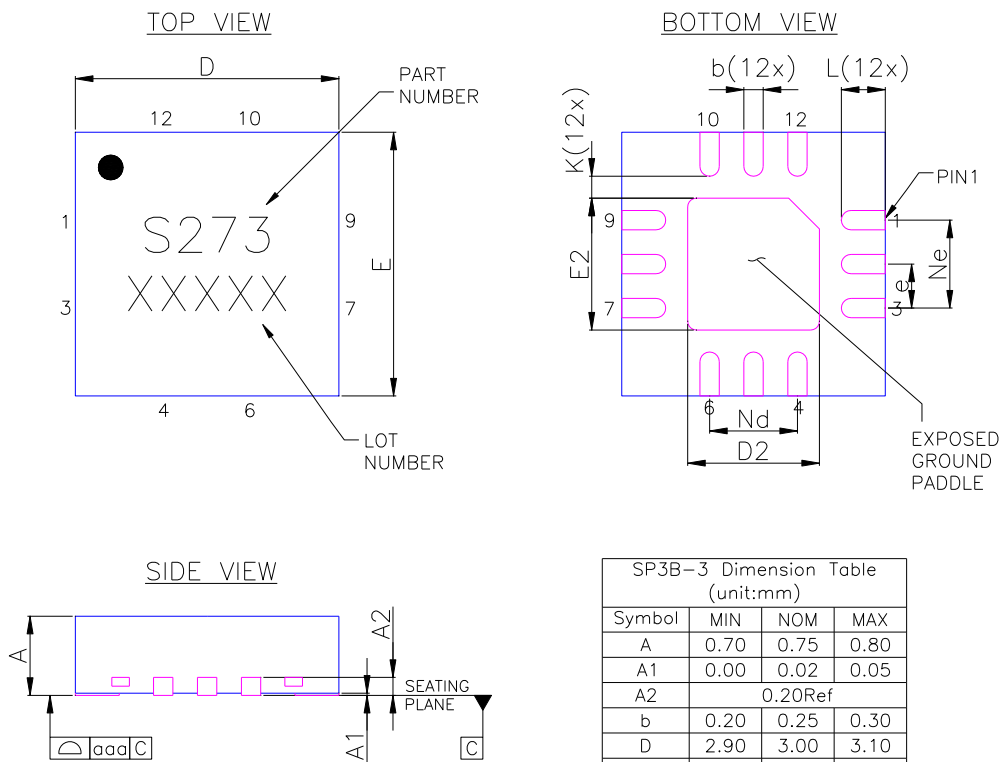
典型应用图



引脚定义

引脚编号	功能符号	功能描述
3; 4; 6; 7	GND	射频地, 封装Exposed Paddle也为RF&DC射频地。
2	L0	本振端口, 交流耦合外端匹配50Ω, 内部有隔直电容。
5	IF	中频端口, 直流耦合外端匹配50Ω, 内部无隔直电容。
8	RF	射频端口, 交流耦合外端匹配50Ω, 内部有隔直电容。
1; 9-12	NC	内部无连接。

封装外形图

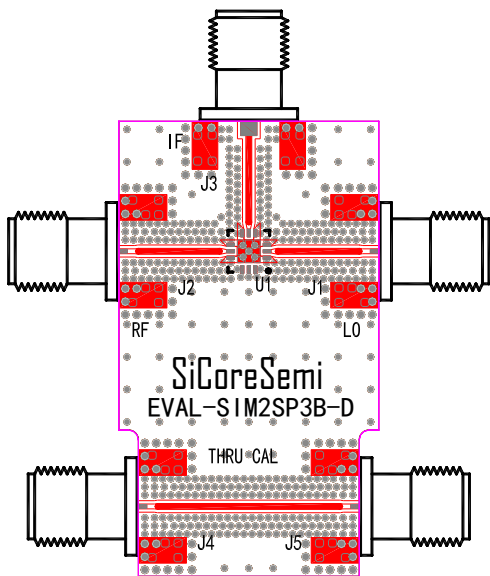
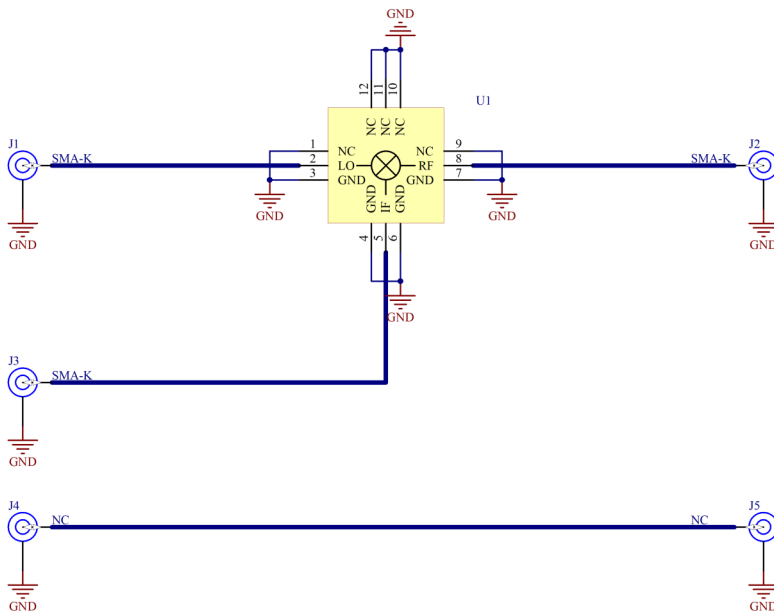


Symbol	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
A2	0.20Ref		
b	0.20	0.25	0.30
D	2.90	3.00	3.10
D2	1.45	1.50	1.55
e	0.50BSC		
Ne	1.00BSC		
Nd	1.00BSC		
E	2.90	3.00	3.10
E2	1.45	1.50	1.55
K	0.20	---	---
L	0.35	0.40	0.45
aaa	0.08		

说明:

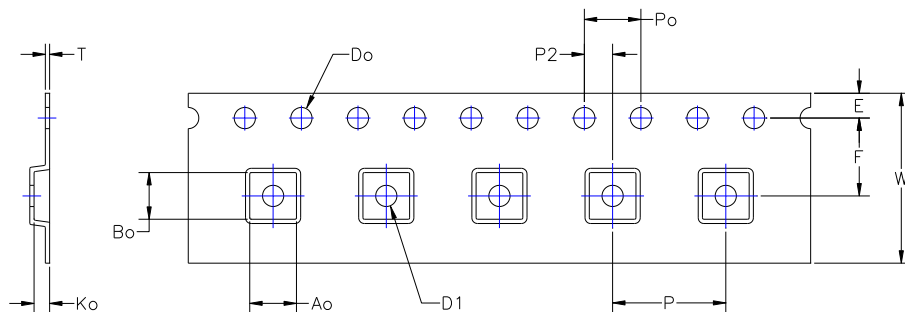
1. 单位: mm
2. 引线框架材料: 铜合金
3. 封装表面翘曲: ≤0.05mm
4. 所有接地引脚请连接PCB射频地

评估板电路图

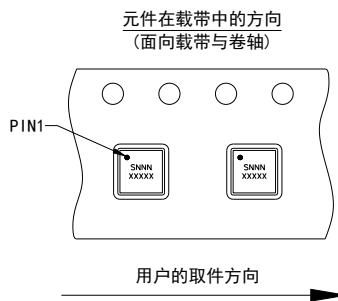


Designator	Description
J1, J2, J3	SMA-K PCB 连接器
U1	SIM273SP3B
J1, J2, J3 推荐使用南京傲文 D550B12E01-023型SMA-K连接器	
NC表示为未使用端口或器件不焊接。 芯片NC端口外部可连接到GND。	

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	∅1.50 MIN
Ao	3.30 +/- 0.10
Bo	3.30 +/- 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



- 说明:
1. 单位: mm
 2. 材料: 防静电聚丙烯
 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. 干燥环境储存。

