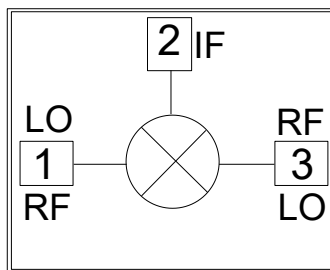


**性能特点**

- 变频损耗: 8.5dB
- L0至RF隔离: 46dB
- L0至IF隔离: 28dB
- 无源双平衡拓扑结构
- 宽IF带宽: DC~9GHz
- 芯片尺寸: 1.180\*1.450mm

**典型应用**

- 点对点通信
- 仪器仪表
- 5G通信

**功能框图**

**概述**

SIM276是一款通用型双平衡MMIC混频器,采用GaAs工艺制造。该器件在宽频带范围内具有出色的转换损耗、卓越的隔离和杂散抑制。可用作频率6GHz至27GHz的上变频器或下变频器。

**电性能表 (T<sub>a</sub>=+25°C, IF=100MHz, LO=+15dBm 配置A,下变频)**

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	6~27			GHz
	IF端口	DC~9			GHz
本振功率范围		11		16	dBm
变频损耗	P <sub>in</sub> =0dBm		8.5		dB
RF回波损耗	P <sub>in</sub> =0dBm		10		dB
输入IP3	P <sub>in</sub> =0dBm/ tone, Δf=1MHz		21		dBm
输入IP2	P <sub>in</sub> =0dBm		60		dBm
输入P1dB			11		dBm
杂散	2L0-2RF		72		dBc
	3L0-3RF		66		dBc
	2IF+1L0 <sup>①</sup>		70		dBc
隔离度	RF到IF端口		34		dB
	L0到RF端口		46		dB
	L0到IF端口		28		dB

附注①: 2IF+1L0为上变频杂散指标

电性能表 (T<sub>a</sub>=+25°C, IF=100MHz, LO=+13dBm 配置B, 下变频)

参数名称	描述	最小值	典型值	最大值	单位
频率范围	RF、LO端口	7~26			GHz
	IF端口	DC~9			GHz
本振功率范围		9		14	dBm
变频损耗	Pin=0dBm		11		dB
RF回波损耗	Pin=0dBm		10		dB
输入IP3	Pin=0dBm/tone, Δf=1MHz		24		dBm
输入IP2	Pin=0dBm		58		dBm
输入P1dB			13		dBm
杂散	2LO-2RF		72		dBc
	3LO-3RF		65		dBc
	2IF+1LO <sup>①</sup>		69		dBc
隔离度	RF到IF端口		28		dB
	LO到RF端口		46		dB
	LO到IF端口		34		dB

附注①: 2IF+1LO为上变频杂散指标

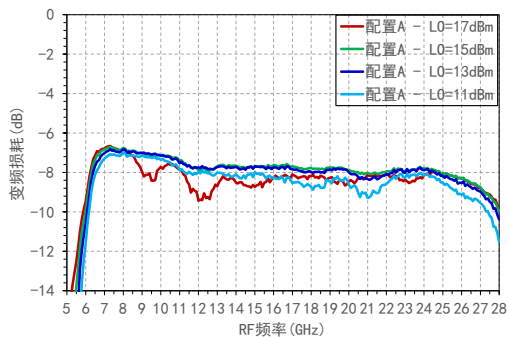
### 砷化镓双平衡混频器



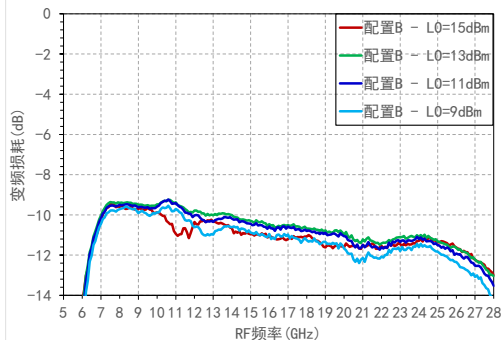
SIM276应用时可通过配置 A/B 两种不同方式来实现最佳杂散抑制。如果需要较优的变频增益(转换损耗)则选择配置A(端口1作为RF输入或输出, 端口3作为LO输入)。如果您需要较低的LO驱动功率, 则选择配置B(端口1作为 LO输入, 端口3作为RF输入或输出)。

下变频测试曲线 (IF=100MHz, LSB, 配置A/B, Pin=0dBm)

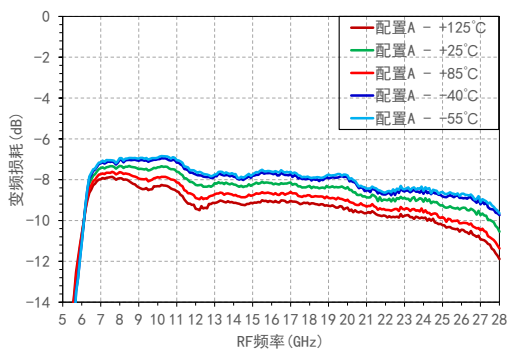
变频损耗 VS RF频率



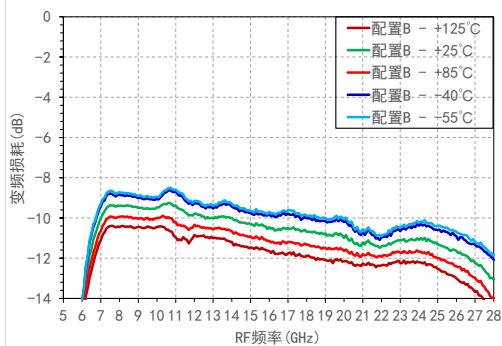
变频损耗 VS RF频率



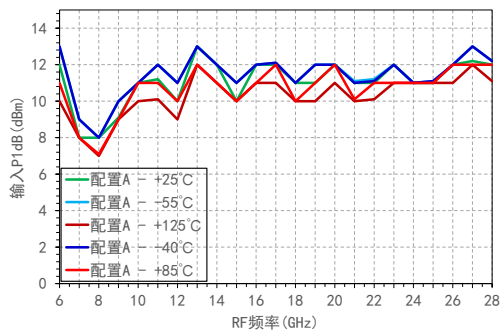
变频损耗 VS RF频率 (L0=15dBm)



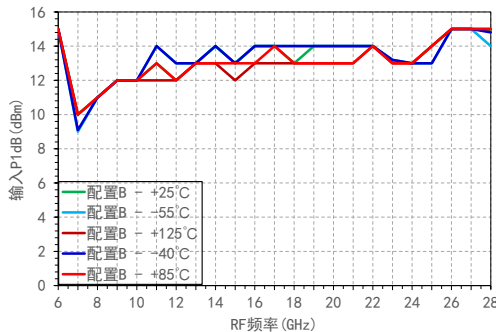
变频损耗 VS RF频率 (L0=13dBm)



输入P1dB VS RF频率 (L0=15dBm)



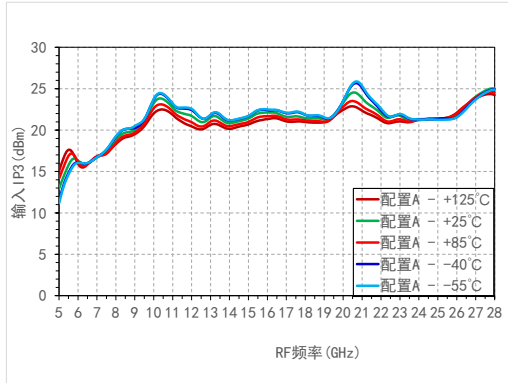
输入P1dB VS RF频率 (L0=13dBm)



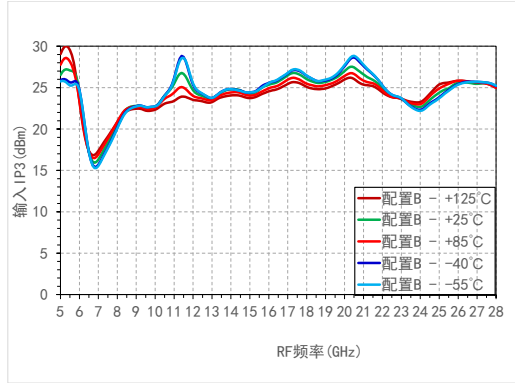
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下变频测试曲线 (IF=100MHz, LSB, 配置A/B, Pin=0dBm)

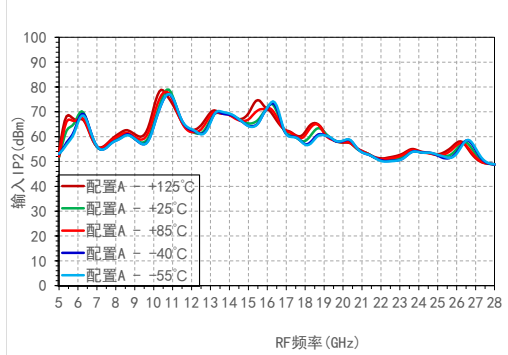
输入IP3 VS RF频率 (L0=15dBm)



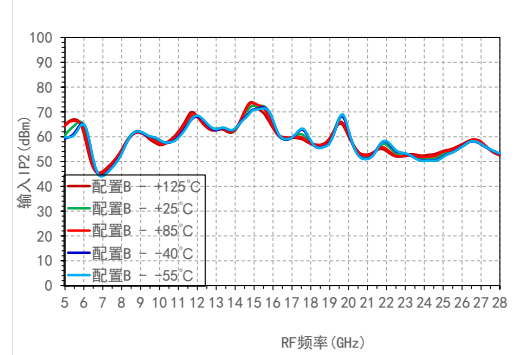
输入IP3 VS RF频率 (L0=13dBm)



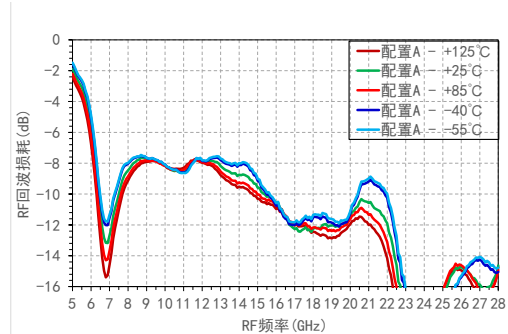
输入IP2 VS RF频率 (L0=15dBm)



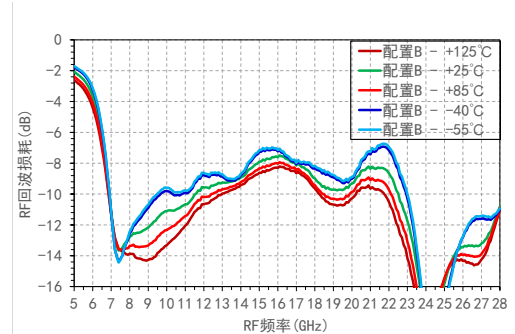
输入IP2 VS RF频率 (L0=13dBm)



RF 回波损耗 VS RF频率 (L0=15dBm)

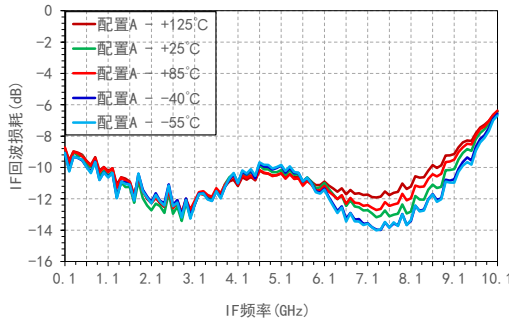


RF 回波损耗 VS RF频率 (L0=13dBm)

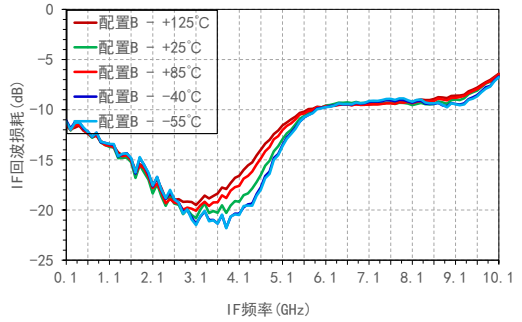


下变频测试曲线 (IF=100MHz, LSB, 配置A/B, Pin=-10dBm)

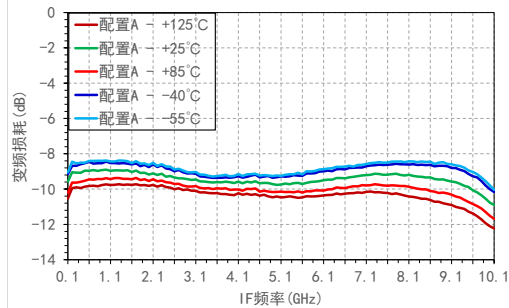
IF回波损耗 VS IF频率 (L0=15dBm)



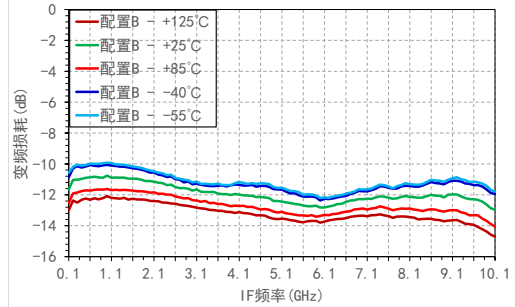
IF回波损耗 VS IF频率 (L0=13dBm)



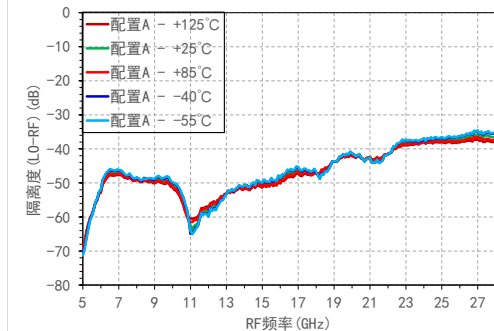
变频损耗 VS IF频率 (L0=15dBm, L0=25GHz)



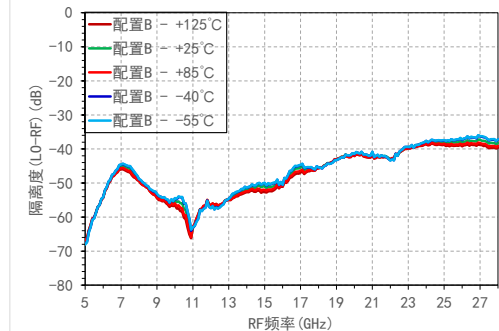
变频损耗 VS IF频率 (L0=13dBm, L0=25GHz)



L0-RF隔离度 VS 射频频率 (L0=15dBm)

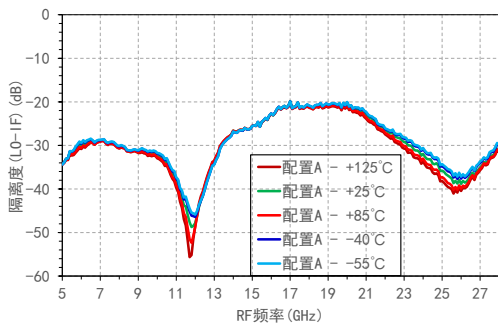


L0-RF隔离度 VS 射频频率 (L0=13dBm)

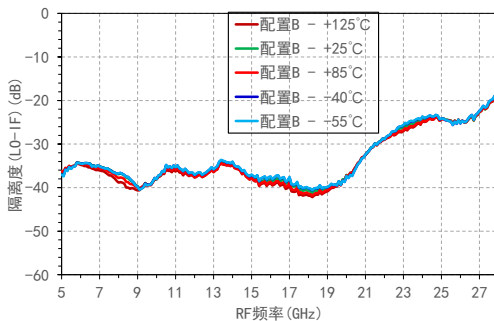


下变频测试曲线 (IF=100MHz, LSB, 配置A/B, Pin=-10dBm)

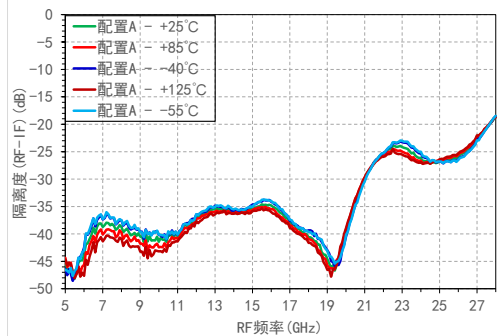
L0-IF隔离度 VS 射频频率 (L0=15dBm)



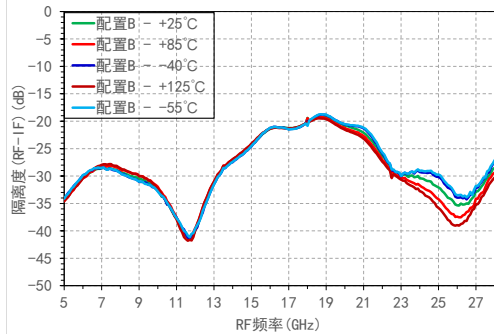
L0-IF隔离度 VS 射频频率 (L0=13dBm)



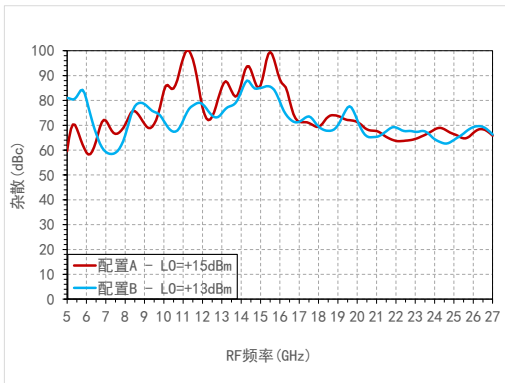
RF-IF隔离度 VS 射频频率 (L0=15dBm)



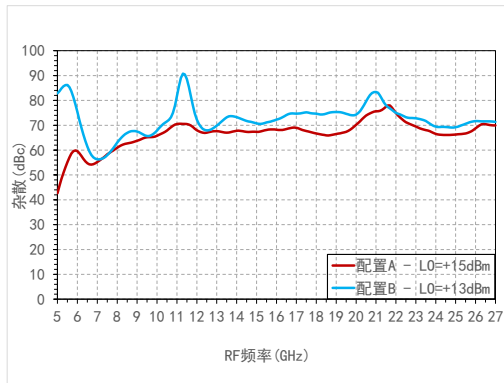
RF-IF隔离度 VS 射频频率 (L0=13dBm)



2L0-2RF 杂散 VS RF频率



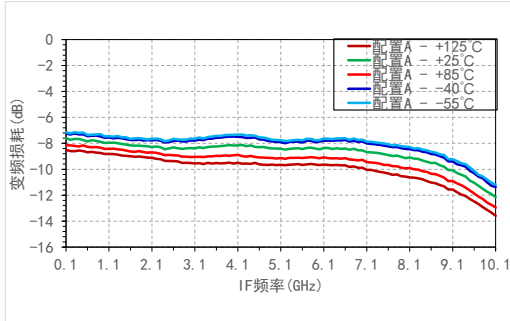
3L0-3RF 杂散 VS RF频率



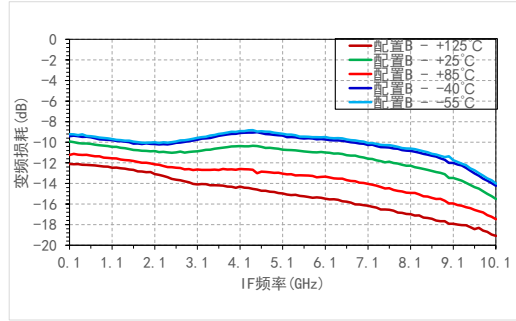
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下变频杂散表

变频损耗 VS IF频率 (L0=15dBm, L0=9GHz)



变频损耗 VS IF频率 (L0=13dBm, L0=9GHz)



下变频杂散表

配置A

		M*L0					
		0	1	2	3	4	5
M*RF	0	/	-0.69	19.35	12.03	24.79	11.94
	1	30.55	0.00	34.79	42.49	36.02	31.90
	2	81.51	51.74	69.50	49.14	79.31	51.87
	3	82.14	81.88	74.91	57.61	74.03	80.55
	4	78.59	90.40	78.82	85.89	89.57	80.21
	5	83.75	90.84	91.41	81.40	91.12	88.31

RF=8GHz&-10dBm; L0=8.1GHz&+15dBm

配置B

		M*L0					
		0	1	2	3	4	5
M*RF	0	/	3.19	28.97	14.64	21.95	10.02
	1	20.05	0.00	38.08	36.90	36.11	28.47
	2	65.90	56.96	63.83	70.73	94.37	58.76
	3	81.95	89.76	81.36	64.33	96.58	72.74
	4	81.83	77.04	87.32	89.39	88.13	92.75
	5	79.82	62.28	81.73	81.55	79.15	97.00

RF=8GHz&-10dBm; L0=8.1GHz&+15dBm

配置A

		M*L0					
		0	1	2	3	4	5
M*RF	0	/	-9.20	14.78	22.26	/	/
	1	29.27	0.00	50.61	20.60	38.23	/
	2	75.21	65.87	76.97	66.77	80.18	66.85
	3	72.46	78.37	84.80	71.00	88.56	74.16
	4	/	66.72	80.24	90.37	87.28	83.60
	5	/	/	78.24	88.50	96.69	86.68

RF=16GHz&-10dBm; L0=16.1GHz&+15dBm

配置B

		M*L0					
		0	1	2	3	4	5
M*RF	0	/	4.40	9.70	5.18	/	/
	1	13.05	0.00	48.74	16.72	53.61	/
	2	63.41	80.67	90.28	74.09	70.89	57.00
	3	78.05	73.39	92.49	80.75	75.18	84.70
	4	/	62.08	77.79	73.81	88.66	78.28
	5	/	/	70.27	75.51	82.93	84.95

RF=16GHz&-10dBm; L0=16.1GHz&+15dBm

配置A

		M*L0					
		0	1	2	3	4	5
M*RF	0	/	-0.05	10.43	/	/	/
	1	15.74	0.00	36.66	23.73	/	/
	2	67.12	62.03	66.59	57.54	75.23	/
	3	/	62.32	70.95	67.97	84.17	76.69
	4	/	/	71.15	89.65	84.72	73.68
	5	/	/	/	66.78	77.50	98.61

RF=24GHz&-10dBm; L0=24.1GHz&+15dBm

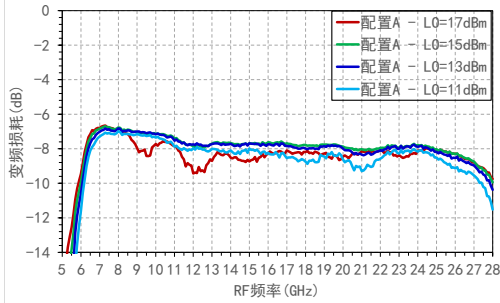
配置B

		M*L0					
		0	1	2	3	4	5
M*RF	0	/	-10.5	5.63	/	/	/
	1	22.79	0.00	38.51	22.18	/	/
	2	72.55	56.80	59.90	56.01	67.90	/
	3	/	61.16	86.48	70.28	75.74	74.41
	4	/	/	60.94	85.22	90.12	79.84
	5	/	/	/	61.36	86.22	84.01

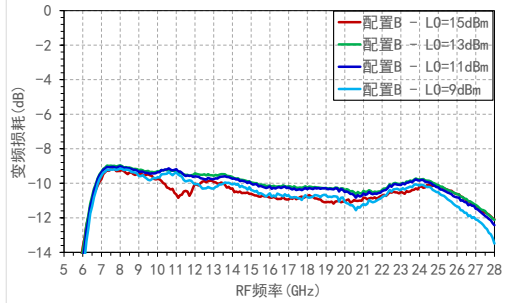
RF=24GHz&-10dBm; L0=24.1GHz&+15dBm

上变频测试曲线 (IF=100MHz,配置A/B,LSB, Pin=0dBm)

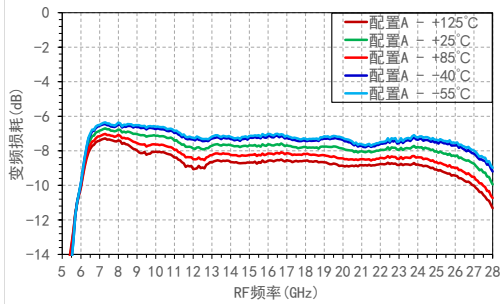
变频损耗 VS RF频率



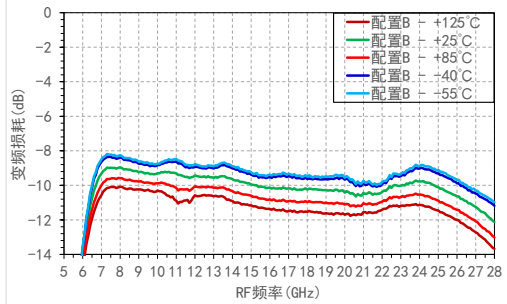
变频损耗 VS RF频率



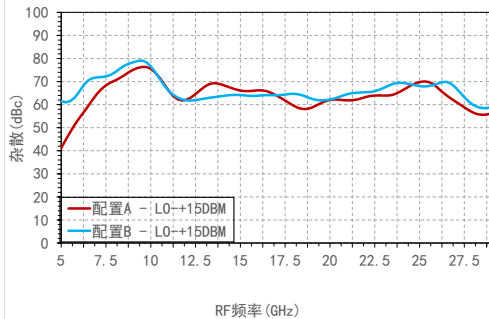
变频损耗 VS RF频率 (L0=15dBm)



变频损耗 VS RF频率 (L0=13dBm)



2IF+1LO杂散 VS RF频率



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## 上变频杂散表

**配置A**

		M*L0					
		0	1	2	3	4	5
M*IF	-5	96.08	91.22	107.26	99.85	101.72	97.90
	-4	93.42	105.90	87.02	81.96	104.68	95.19
	-3	102.59	66.70	84.99	65.87	81.49	78.53
	-2	88.66	65.30	64.05	80.20	66.82	64.90
	-1	66.01	-0.40	32.83	10.72	27.18	30.34
	0	/	14.01	2.49	24.70	21.45	28.76
	1	65.87	0.00	35.97	11.06	26.73	30.93
	2	109.07	66.82	64.06	106.18	66.06	62.41
	3	107.05	65.54	90.19	66.18	84.44	94.11
	4	105.64	106.75	105.69	88.45	83.55	72.93
	5	89.68	87.58	81.12	83.63	79.91	73.01

**IF=0.1GHz~-10dBm; L0=8.1GHz+15dBm**

**配置B**

		M*L0					
		0	1	2	3	4	5
M*IF	-5	106.64	109.60	86.58	78.17	77.28	76.39
	-4	109.45	95.55	83.78	78.06	81.08	75.87
	-3	109.22	72.45	80.93	100.40	99.15	91.61
	-2	91.27	69.08	71.32	101.21	67.87	82.28
	-1	68.36	-0.61	34.76	10.31	47.03	34.60
	0	/	11.69	14.98	22.15	21.25	22.88
	1	68.22	0.00	30.71	10.68	46.58	34.97
	2	103.99	66.26	71.75	73.10	70.86	88.21
	3	100.53	73.91	101.35	82.04	94.87	73.84
	4	110.72	79.03	104.05	99.88	97.79	82.66
	5	108.38	83.29	99.55	85.56	92.70	70.87

**IF=0.1GHz~-10dBm; L0=8.1GHz+15dBm**

**配置A**

		M*L0					
		0	1	2	3	4	5
M*IF	-5	90.44	92.17	81.63	76.56	/	/
	-4	105.83	84.41	83.21	89.09	/	/
	-3	93.64	75.43	80.69	74.55	/	/
	-2	111.43	70.25	82.92	60.12	/	/
	-1	64.87	-0.18	21.85	21.23	/	/
	0	/	10.12	21.27	14.22	/	/
	1	65.22	0.00	21.06	22.73	/	/
	2	108.39	67.95	87.85	61.36	/	/
	3	115.84	72.59	93.08	76.03	/	/
	4	86.60	87.98	102.84	69.77	/	/
	5	92.44	91.12	95.58	72.27	/	/

**IF=0.1GHz~-10dBm; L0=16.1GHz+15dBm**

**配置B**

		M*L0					
		0	1	2	3	4	5
M*IF	-5	95.24	100.50	77.09	67.37	/	/
	-4	88.24	81.89	81.89	71.42	/	/
	-3	91.37	75.35	75.59	88.70	/	/
	-2	108.43	65.82	59.31	63.51	/	/
	-1	69.01	-0.26	50.75	14.28	/	/
	0	/	8.28	8.57	17.19	/	/
	1	69.31	0.00	51.14	15.51	/	/
	2	113.65	66.36	61.52	60.85	/	/
	3	83.49	69.06	99.61	70.07	/	/
	4	98.27	102.09	81.14	96.12	/	/
	5	93.36	84.11	74.05	74.11	/	/

**IF=0.1GHz~-10dBm; L0=16.1GHz+15dBm**

**配置A**

		M*L0					
		0	1	2	3	4	5
M*IF	-5	91.48	106.03	80.18	/	/	/
	-4	92.93	80.18	80.80	/	/	/
	-3	93.93	70.82	73.53	/	/	/
	-2	113.53	70.04	61.74	/	/	/
	-1	64.68	0.07	27.15	/	/	/
	0	/	0.89	5.94	/	/	/
	1	65.13	0.00	30.38	/	/	/
	2	111.90	69.66	64.36	/	/	/
	3	111.94	68.20	70.43	/	/	/
	4	100.80	101.88	77.01	/	/	/
	5	113.84	101.80	70.15	/	/	/

**IF=0.1GHz~-10dBm; L0=24.1GHz+15dBm**

**配置B**

		M*L0					
		0	1	2	3	4	5
M*IF	-5	97.81	80.74	89.81	/	/	/
	-4	103.17	96.24	75.47	/	/	/
	-3	108.35	71.03	93.09	/	/	/
	-2	109.16	66.60	59.27	/	/	/
	-1	68.80	0.12	37.06	/	/	/
	0	/	-0.75	-2.59	/	/	/
	1	68.80	0.00	36.59	/	/	/
	2	106.32	68.79	60.08	/	/	/
	3	107.30	74.96	70.63	/	/	/
	4	91.45	86.71	90.76	/	/	/
	5	109.36	79.82	67.94	/	/	/

**IF=0.1GHz~-10dBm; L0=24.1GHz+15dBm**


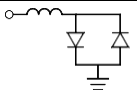

**绝对最大额定值**

RF/LO输入功率	25dBm@25°C
存储温度	-65°C~+150°C
工作温度	-55°C~+85°C
ESD_HBM	TBD

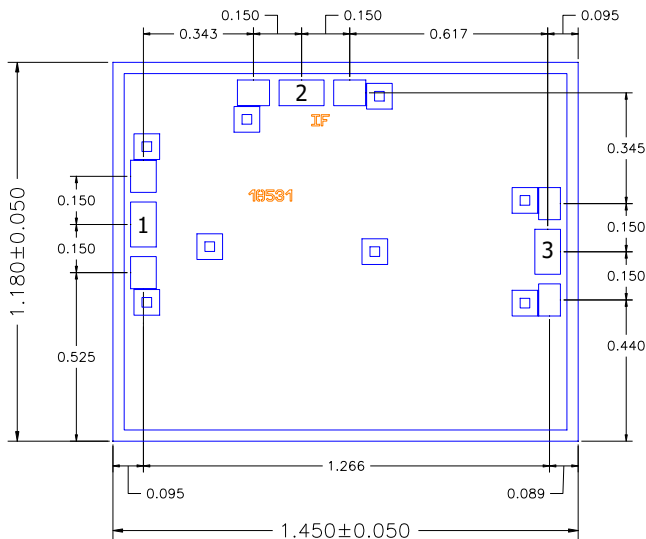
**注意事项**

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。


**SIM**
**混频器系列**
**引脚定义**

引脚	功能符号	描述	示意图
1	LO/RF	DC对地开路, 交流匹配50欧姆。芯片内部无隔直电容。	 P1
2	IF	DC 对二极管短路。 芯片内部无隔直电容。若芯片外端口不加隔直电容时，电源电流不能超过12mA，否则器件会损坏。	 P2
3	RF/LO	DC对地开路, 交流匹配50欧姆。芯片内部无隔直电容。	 P3

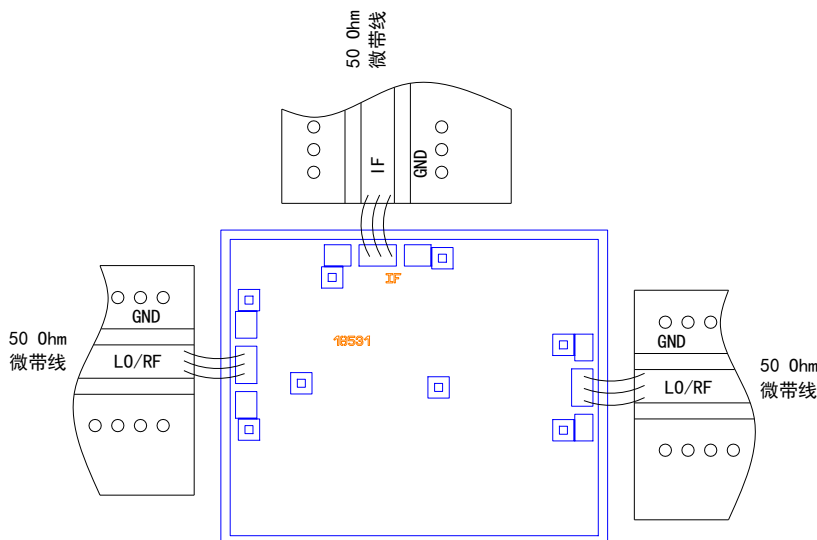
外形尺寸图



说明:

1. 单位:毫米;
2. 键合压点材质镀金;
3. 芯片厚度:0.100±0.015 (mm);
4. 不能在通孔上进行键合;
5. 芯片背面金属化;
6. 芯片背面接地;

芯片装配图



说明:

1. 芯片背面接地, 粘接材料: 导电胶;
2. 芯片键合线材料: 1mil Au;
3. 键合时注意图所有线长尽量短