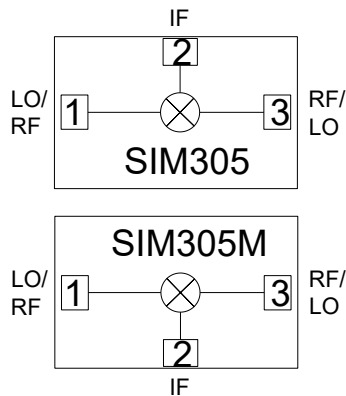


**性能特点**

- 变频损耗: 8.5dB
- L0至RF隔离: 44dB
- L0至IF隔离: 27dB
- 无源双平衡拓扑结构
- 宽IF带宽: DC~10.5GHz
- 芯片尺寸: 1.140\*1.450mm

**典型应用**

- 点对点通信
- 仪器仪表

**功能框图**

**概述**

SIM305/SIM305M是互为镜像的通用型双平衡MMIC混频器, 采用GaAs工艺制造。该器件在带宽范围内具有出色的变频损耗、卓越的隔离和杂散抑制。可用作频率8GHz至32GHz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, LSB)**

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	8~30			GHz
	IF端口	DC~10.5			GHz
本振功率范围		11		16	dBm
变频损耗	Pin=0dBm		8.5		dB
RF回波损耗	Pin=0dBm		11		dB
输入IP3	Pin=0dBm/tone, Δf=1MHz		21		dBm
输入IP2	Pin=0dBm		57		dBm
输入P1dB			10.5		dBm
杂散	2L0-2RF		69		dBc
	3L0-3RF		68		dBc
	2IF+1L0 <sup>①</sup>		65		dBc
隔离度	RF到IF端口		34		dB
	L0到RF端口		44		dB
	L0到IF端口		27		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, LSB, 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	8~30			GHz
	IF端口	DC~10.5			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		9.5		dB
输入IP3	Pin=0dBm/tone, Δf=1MHz		24		dBm
输入IP2	Pin=0dBm		59		dBm
输入P1dB			13.5		dBm
杂散	2LO-2RF		72		dBc
	3LO-3RF		80		dBc
	2IF+1LO <sup>①</sup>		62		dBc
隔离度	RF到IF端口		27		dB
	LO到RF端口		45		dB
	LO到IF端口		33		dB

附注①: 2IF+1LO为上变频杂散指标

SIM305砷化镓双平衡混频器



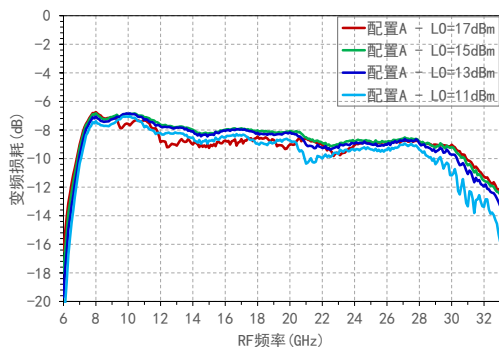
SIM305M砷化镓双平衡混频器



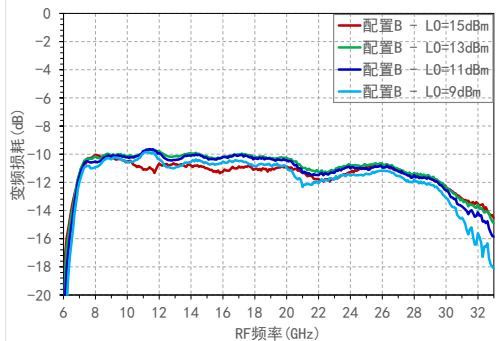
SIM305应用时可通过配置 A/B 两种不同方式来实现最佳杂散抑制。如果需要较优的变频增益(转换损耗)则选择配置A(端口1作为RF输入或输出, 端口3作为LO输入)。如果您需要较低的LO驱动功率, 则选择配置B(端口1作为 LO输入, 端口3作为RF输入或输出)。

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

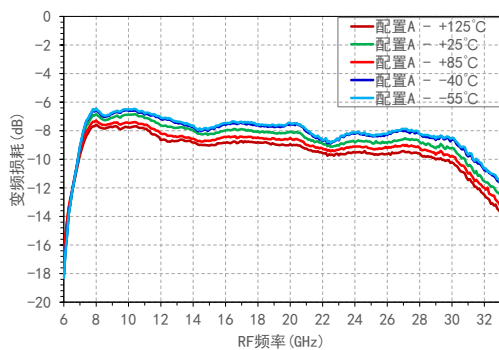
变频损耗 VS RF频率



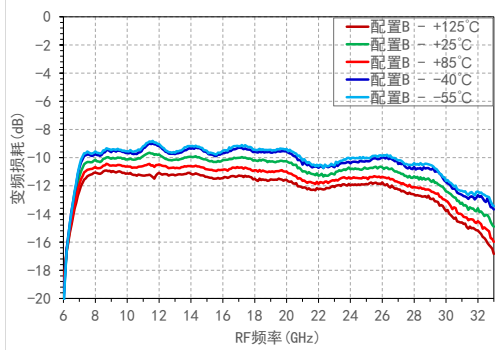
变频损耗 VS RF频率



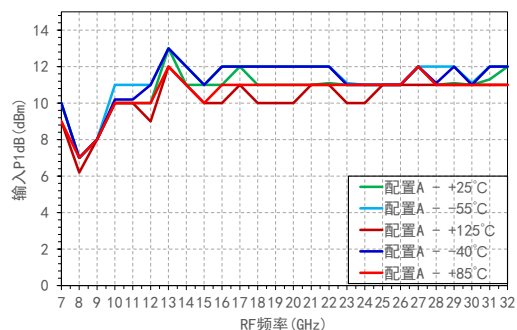
变频损耗 VS RF频率 (L0=15dBm)



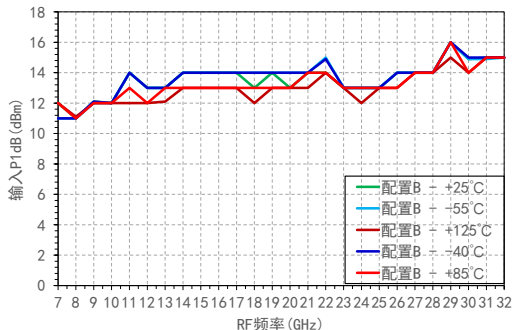
变频损耗 VS RF频率 (L0=13dBm)



输入P1dB VS RF频率 (L0=15dBm)



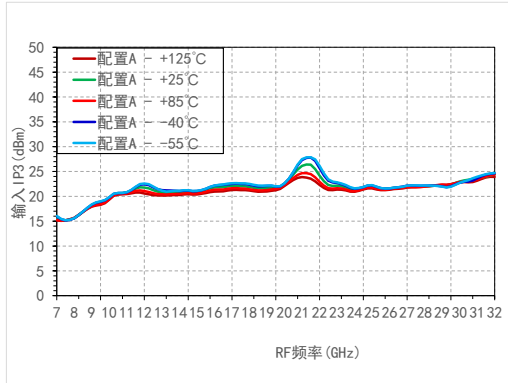
输入P1dB VS RF频率 (L0=13dBm)



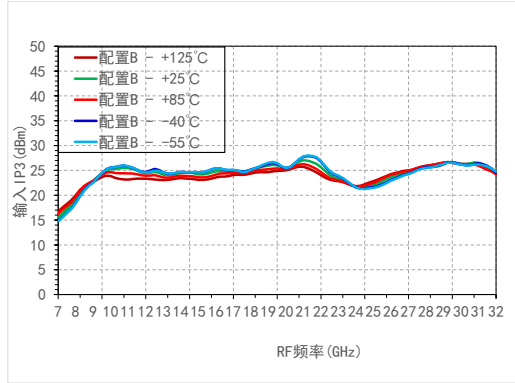
SIM  
混频器系列

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

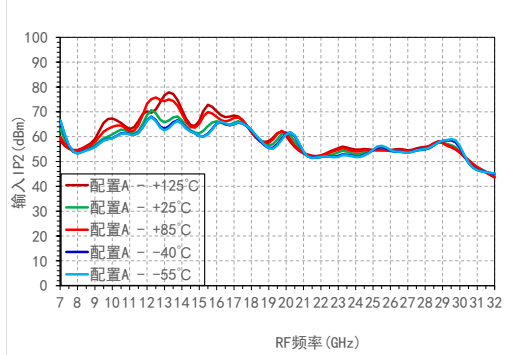
输入IP3 VS RF频率 (L0=15dBm)



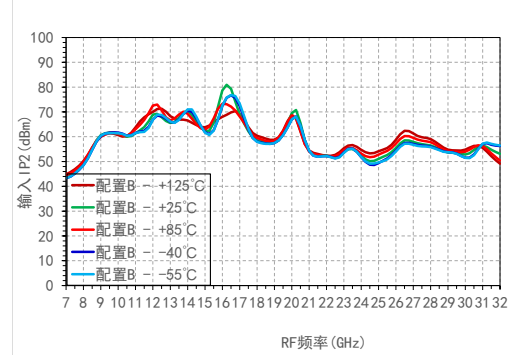
输入IP3 VS RF频率 (L0=13dBm)



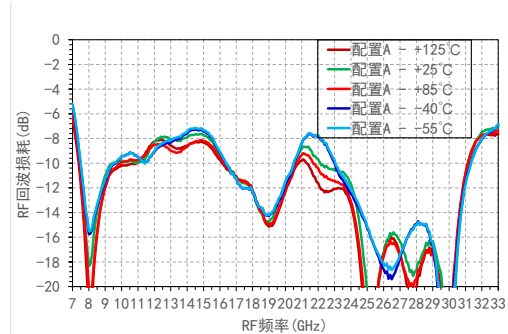
输入IP2 VS RF频率 (L0=15dBm)



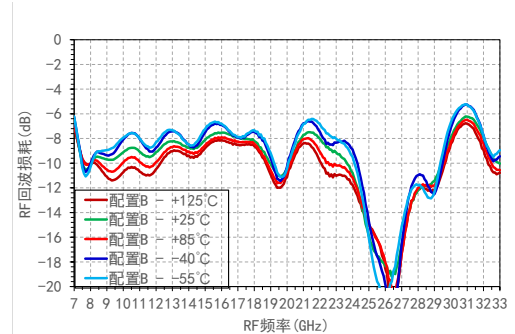
输入IP2 VS RF频率 (L0=13dBm)



RF 回波损耗 VS RF频率 (L0=15dBm)

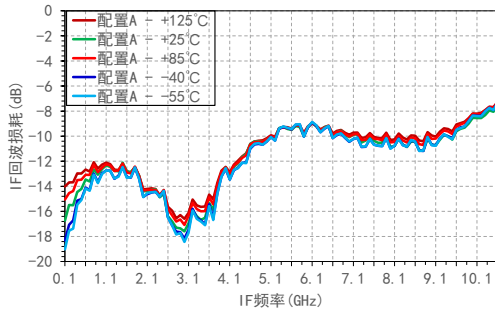


RF 回波损耗 VS RF频率 (L0=13dBm)

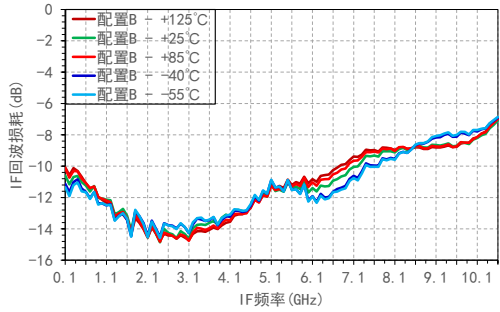


下变频测试曲线 (IF=100MHz,LSB, 配置A/B, Pin=-10dBm)

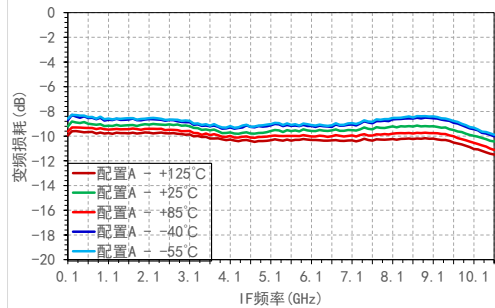
IF回波损耗 VS IF频率 (L0=15dBm)



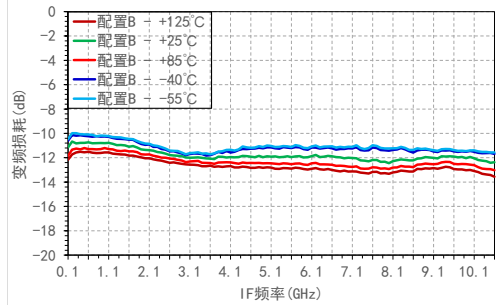
IF回波损耗 VS IF频率 (L0=13dBm)



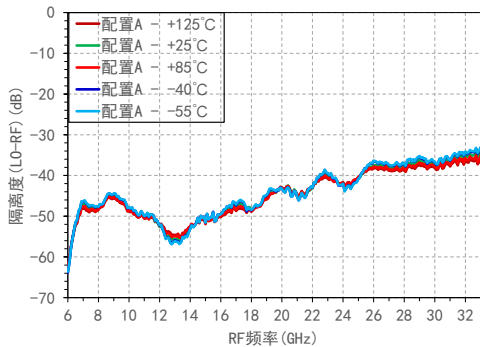
变频损耗 VS IF频率 (L0=15dBm, L0=25GHz)



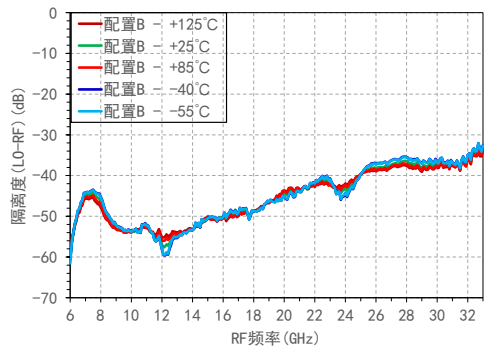
变频损耗 VS IF频率 (L0=13dBm, L0=25GHz)



L0-RF隔离度 VS 射频频率 (L0=15dBm)



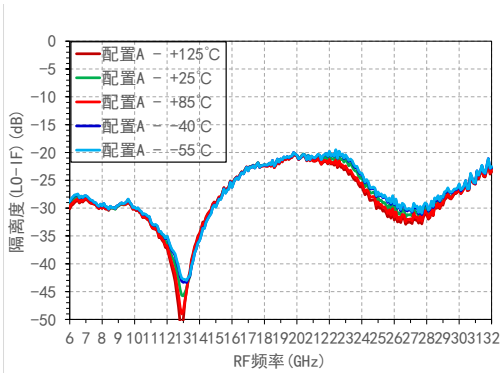
L0-RF隔离度 VS 射频频率 (L0=13dBm)



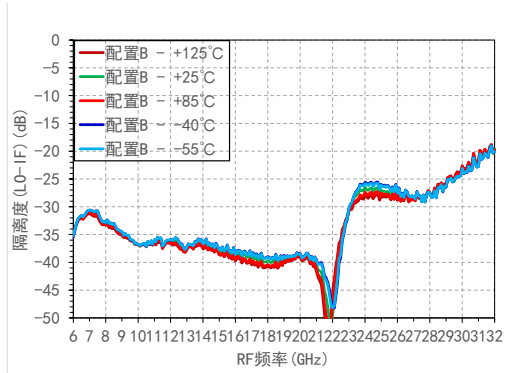
SIM  
混频器系列

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

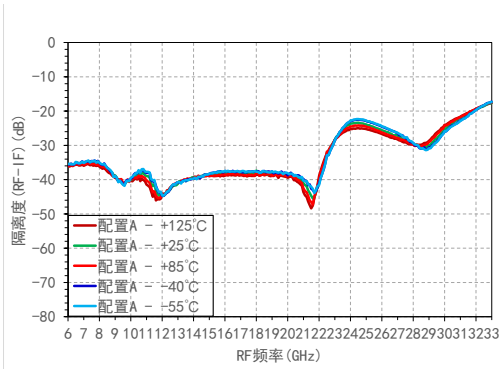
L0-IF隔离度 VS 射频频率 (L0=15dBm)



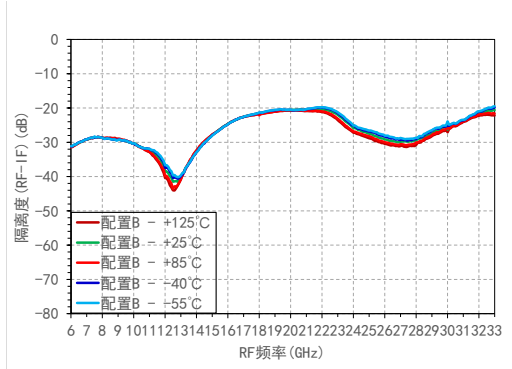
L0-IF隔离度 VS 射频频率 (L0=13dBm)



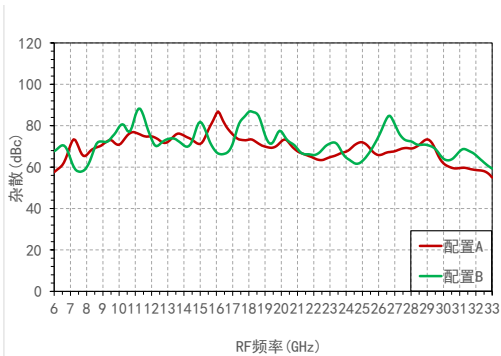
RF-IF隔离度 VS 射频频率 (L0=15dBm)



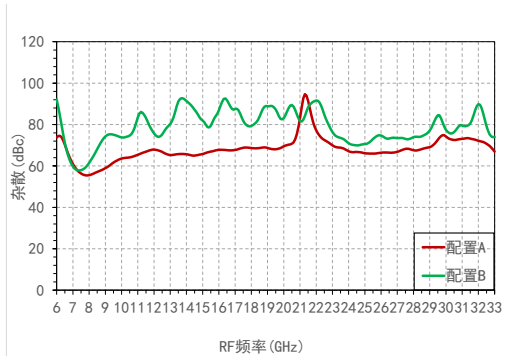
RF-IF隔离度 VS 射频频率 (L0=13dBm)



2L0-2RF 杂散 VS RF频率



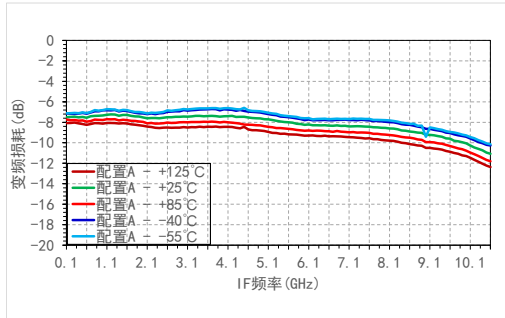
3L0-3RF 杂散 VS RF频率



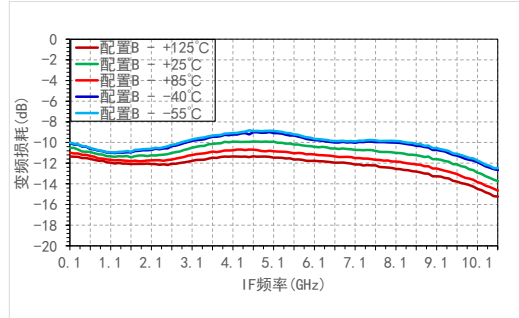
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**下变频测试曲线 (IF=100MHz, USB, 配置A/B, Pin=-10dBm)**

变频损耗 VS IF频率 (LO=15dBm, LO=8GHz)



变频损耗 VS IF频率 (LO=13dBm, LO=8GHz)


**下变频杂散表**
**配置A**

		M*LO					
		0	1	2	3	4	5
M*RF	0	/	-2.14	22.09	10.65	24.33	15.45
	1	35.46	0.00	31.82	38.38	39.27	44.48
	2	82.03	51.68	70.99	48.26	95.48	50.23
	3	73.17	88.83	73.76	55.56	72.17	82.55
	4	94.27	96.97	82.48	83.61	99.61	98.61
	5	85.86	94.78	85.36	83.37	98.36	106.95

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

**配置B**

		M*LO					
		0	1	2	3	4	5
M*RF	0	/	-0.35	25.17	10.00	23.65	18.47
	1	18.39	0.00	58.72	33.09	41.05	35.40
	2	68.49	57.58	60.26	58.37	74.61	54.41
	3	77.77	93.21	88.84	59.94	76.52	92.22
	4	91.58	77.25	93.02	81.23	83.98	94.07
	5	83.85	82.02	90.09	84.73	83.81	85.60

RF=8GHz&-10dBm; LO=8.1GHz&+13dBm

**配置A**

		M*LO					
		0	1	2	3	4	5
M*RF	0	/	-10.87	14.09	/	/	/
	1	30.28	0.00	48.65	19.07	/	/
	2	80.56	64.96	68.52	63.41	85.32	/
	3	/	84.77	85.98	67.09	79.08	85.21
	4	/	/	84.55	86.77	90.83	82.22
	5	/	/	/	78.48	79.80	90.14

RF=19GHz&-10dBm; LO=19.1GHz&+15dBm

**配置B**

		M*LO					
		0	1	2	3	4	5
M*RF	0	/	6.76	9.81	/	/	/
	1	10.77	0.00	41.49	21.03	/	/
	2	87.42	74.30	72.13	75.79	83.09	/
	3	/	76.83	77.86	76.62	92.23	70.66
	4	/	/	84.23	93.66	89.30	78.77
	5	/	/	/	89.30	84.66	86.40

RF=19GHz&-10dBm; LO=19.1GHz&+13dBm

**配置A**

		M*LO					
		0	1	2	3	4	5
M*RF	0	/	-4.91	/	/	/	/
	1	19.59	0.00	32.97	/	/	/
	2	/	57.47	63.02	57.15	/	/
	3	/	/	90.88	79.95	81.99	/
	4	/	/	/	75.72	101.23	79.44
	5	/	/	/	/	81.12	87.52

RF=30GHz&-10dBm; LO=30.16GHz&+15dBm

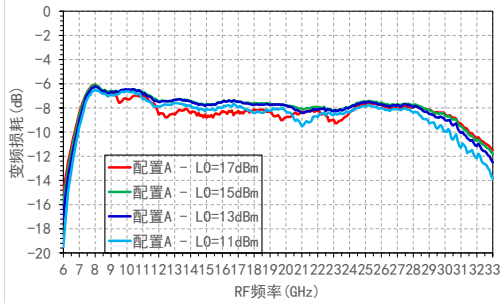
**配置B**

		M*LO					
		0	1	2	3	4	5
M*RF	0	/	-8.65	/	/	/	/
	1	16.27	0.00	33.35	/	/	/
	2	/	69.35	63.46	65.52	/	/
	3	/	/	75.43	71.87	80.06	/
	4	/	/	/	80.06	97.59	73.19
	5	/	/	/	/	90.68	93.68

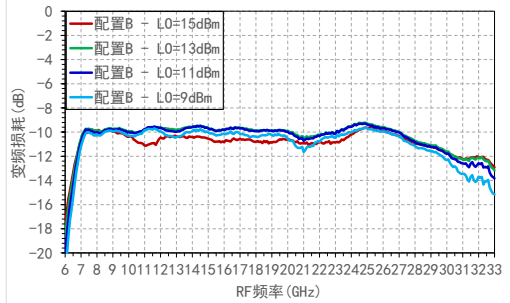
RF=30GHz&-10dBm; LO=30.16GHz&+13dBm

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

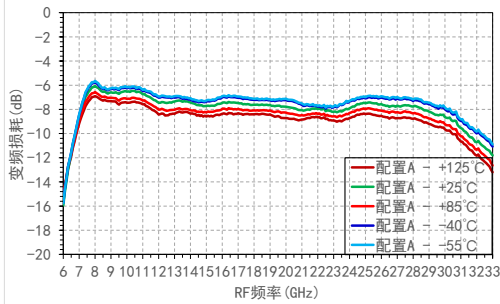
变频损耗 VS RF频率



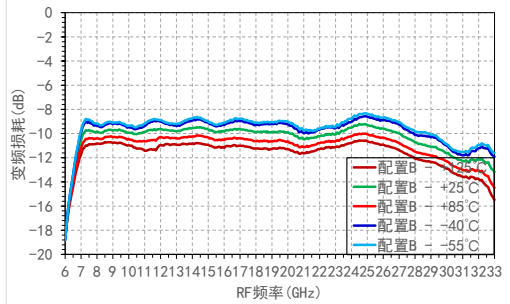
变频损耗 VS RF频率



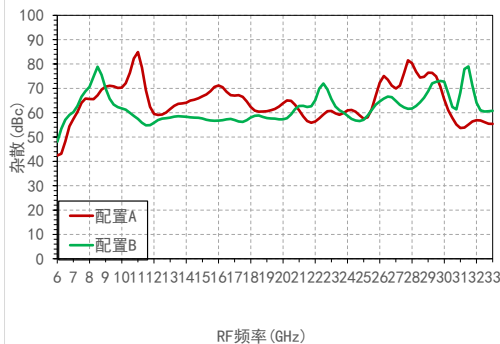
变频损耗 VS RF频率 (LO=15dBm)



变频损耗 VS RF频率 (LO=13dBm)



2IF+1LO杂散 VS RF频率



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混频器系列



## 上变频杂散表

**18535&上变频&配置A&+25°C**

		M*LO					
		0	1	2	3	4	5
M*IF	-5	92.79	117.38	98.29	88.41	105.21	94.55
	-4	98.39	81.35	100.09	82.64	80.91	81.99
	-3	89.99	64.64	78.34	62.33	88.59	75.74
	-2	95.19	62.52	59.37	63.13	56.55	66.72
	-1	68.36	-0.48	30.58	11.26	27.39	39.53
	0	/	12.71	2.50	22.32	15.33	38.24
	1	68.28	0.00	33.33	11.44	27.16	39.93
	2	88.50	64.38	57.99	64.67	56.23	64.60
	3	97.34	62.70	94.59	62.31	81.08	81.61
	4	92.75	85.39	82.44	87.06	82.48	73.80
	5	110.82	118.39	117.63	100.89	80.09	79.10

IF=0.1GHz&-10dBm; LO=8.1GHz&+15dBm

**18535&上变频&配置B&+25°C**

		M*LO					
		0	1	2	3	4	5
M*IF	-5	111.33	85.43	83.45	79.56	94.36	66.42
	-4	100.81	101.95	95.49	84.52	94.69	92.46
	-3	85.35	66.58	109.18	73.35	81.44	70.66
	-2	91.23	71.90	67.23	73.06	60.24	88.67
	-1	66.83	-0.62	28.93	10.65	39.73	44.56
	0	/	11.08	13.94	22.74	15.16	29.65
	1	67.79	0.00	25.79	10.30	40.70	43.18
	2	87.87	69.07	69.49	99.77	59.83	82.26
	3	108.85	70.40	99.74	72.08	74.58	73.62
	4	108.15	106.67	79.36	94.55	97.10	95.08
	5	83.14	82.63	82.88	97.90	90.52	90.33

IF=0.1GHz&-10dBm; LO=8.1GHz&+13dBm

**18535&上变频&配置A&+25°C**

		M*LO					
		0	1	2	3	4	5
M*IF	-5	88.67	105.93	82.22	/	/	/
	-4	92.12	83.34	96.26	/	/	/
	-3	107.39	72.29	90.32	/	/	/
	-2	92.10	63.96	83.57	/	/	/
	-1	67.35	0.35	19.97	/	/	/
	0	/	9.51	16.27	/	/	/
	1	67.38	0.00	21.33	/	/	/
	2	87.48	61.98	74.73	/	/	/
	3	109.63	74.12	98.29	/	/	/
	4	88.14	99.47	78.46	/	/	/
	5	92.96	87.37	91.63	/	/	/

IF=0.1GHz&-10dBm; LO=19.1GHz&+15dBm

**18535&上变频&配置B&+25°C**

		M*LO					
		0	1	2	3	4	5
M*IF	-5	97.94	101.86	83.00	/	/	/
	-4	103.52	78.52	102.32	/	/	/
	-3	109.17	72.46	93.51	/	/	/
	-2	90.35	62.02	76.98	/	/	/
	-1	70.89	0.24	34.96	/	/	/
	0	/	10.40	18.82	/	/	/
	1	69.54	0.00	33.78	/	/	/
	2	90.80	59.22	92.15	/	/	/
	3	111.24	85.91	72.50	/	/	/
	4	84.46	100.19	93.94	/	/	/
	5	85.16	102.39	73.71	/	/	/

IF=0.1GHz&-10dBm; LO=19.1GHz&+13dBm

**18535&上变频&配置A&+25°C**

		M*LO					
		0	1	2	3	4	5
M*IF	-5	90.78	80.84	/	/	/	/
	-4	99.37	100.60	/	/	/	/
	-3	109.12	71.48	/	/	/	/
	-2	108.89	63.49	/	/	/	/
	-1	67.22	-0.02	/	/	/	/
	0	/	1.58	/	/	/	/
	1	66.67	0.00	/	/	/	/
	2	0.00	62.86	/	/	/	/
	3	119.63	67.32	/	/	/	/
	4	91.84	102.40	/	/	/	/
	5	92.75	78.52	/	/	/	/

IF=0.1GHz&-10dBm; LO=30.1GHz&+15dBm

**18535&上变频&配置B&+25°C**

		M*LO					
		0	1	2	3	4	5
M*IF	-5	85.29	93.72	/	/	/	/
	-4	98.86	100.07	/	/	/	/
	-3	104.70	72.10	/	/	/	/
	-2	99.03	95.09	/	/	/	/
	-1	67.76	-0.25	/	/	/	/
	0	/	0.83	/	/	/	/
	1	67.06	0.00	/	/	/	/
	2	108.78	69.63	/	/	/	/
	3	105.44	71.53	/	/	/	/
	4	88.45	96.98	/	/	/	/
	5	89.73	82.63	/	/	/	/

IF=0.1GHz&-10dBm; LO=30.1GHz&+13dBm


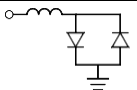

**绝对最大额定值**

RF/L0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

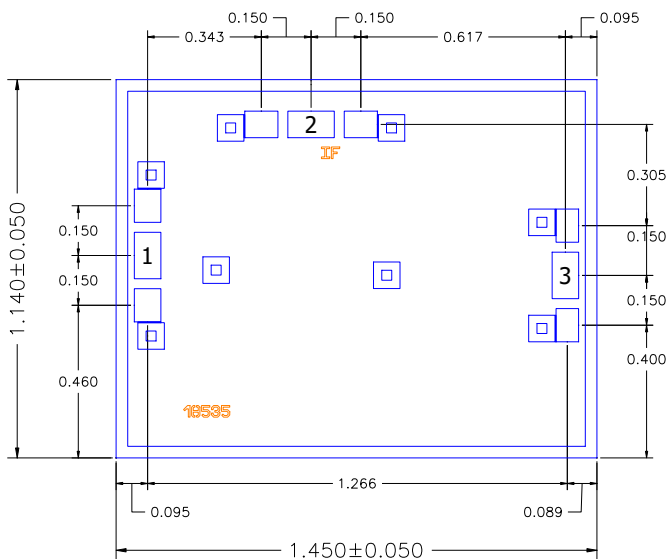
**注意事项**

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**
**引脚定义**
**混频器系列**

引脚	功能符号	描述	示意图
1	L0/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/L0	DC对地开路, 交流匹配50欧姆。芯片内部无隔直电容。	 P3

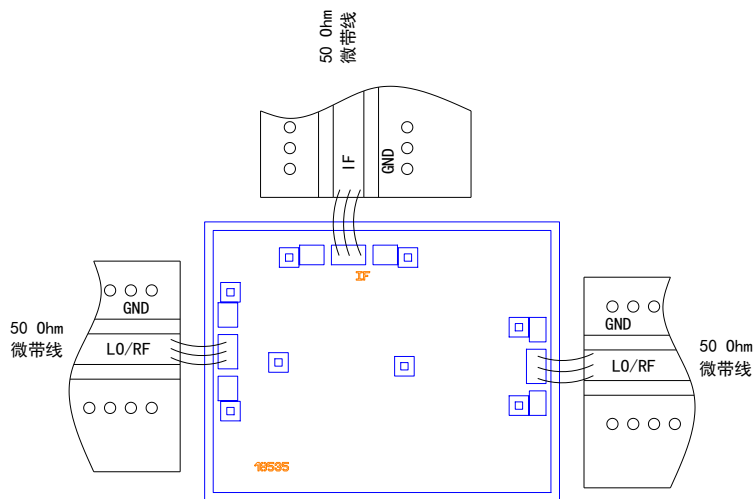
SIM305外形尺寸图



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;

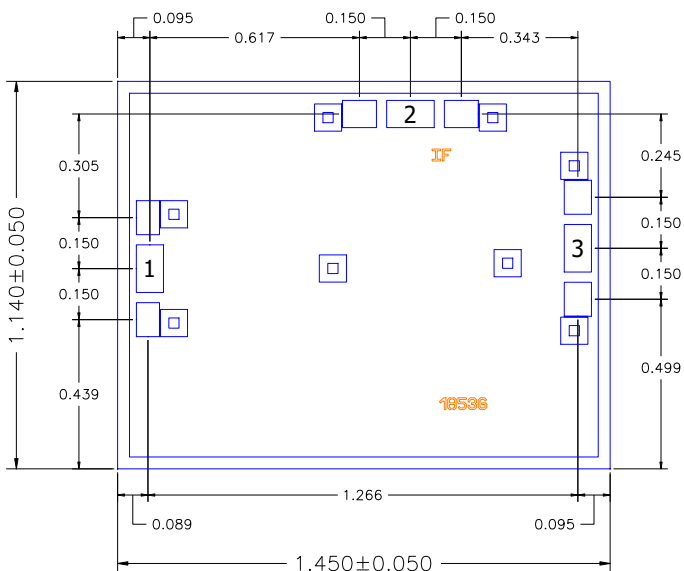
SIM305芯片装配图



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;

SIM305M外形尺寸图

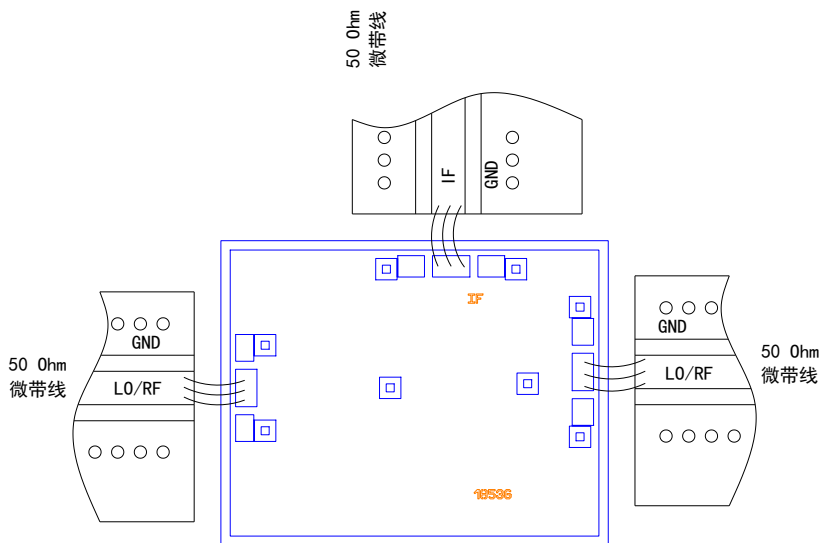


说明:

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;

SIM

SIM305M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;

双通道典型应用

