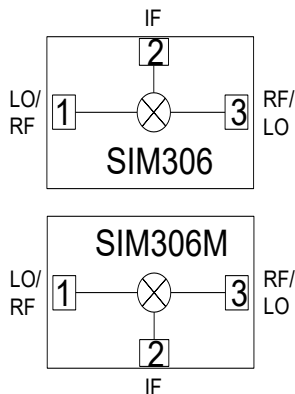


**性能特点**

- 变频损耗: 8.5dB
- L0至RF隔离: 45dB
- L0至IF隔离: 31dB
- 无源双平衡拓扑结构
- 宽IF带宽: DC~10.5GHz
- 芯片尺寸: 1.100\*1.450mm

**典型应用**

- 点对点通信
- 仪器仪表

**功能框图**

**概述**

SIM306/SIM306M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=+19dBm 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、LO端口	8~30			GHz
	IF端口	DC~10.5			GHz
本振功率范围		16		21	dBm
变频损耗	Pin=0dBm		8.5		dB
RF回波损耗	Pin=0dBm		9		dB
输入IP3	Pin=0dBm/tone, Δf=1MHz		26		dBm
输入IP2	Pin=0dBm		57		dBm
输入P1dB			15.5		dBm
杂散	2LO~2RF		69		dBc
	3LO~3RF		74		dBc
	2IF+1LO <sup>①</sup>		65		dBc
隔离度	RF到IF端口		32		dB
	L0到RF端口		45		dB
	L0到IF端口		31		dB

附注①: 2IF+1LO为上变频杂散指标

**电性能表 (T<sub>a</sub>=+25°C, IF=100MHz, LO=+17dBm 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		15		20	dBm
变频损耗	Pin=0dBm		10.5		dB
RF回波损耗	Pin=0dBm		8		dB
输入IP3	Pin=0dBm/tone, Δf=1MHz		29		dBm
输入IP2	Pin=0dBm		58		dBm
输入P1dB			18		dBm
杂散	2LO-2RF		72		dBc
	3LO-3RF		84		dBc
	2IF+1LO <sup>①</sup>		66		dBc
隔离度	RF到IF端口		31		dB
	LO到RF端口		45		dB
	LO到IF端口		31		dB

附注①: 2IF+1LO为上变频杂散指标

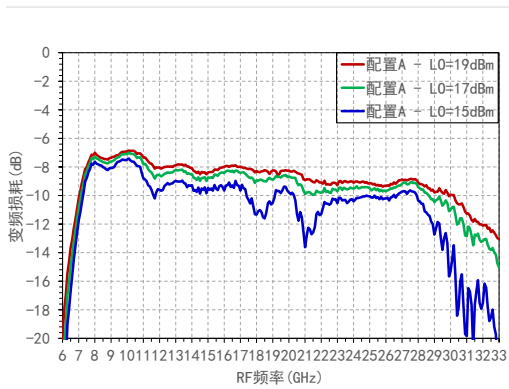
**SIM306砷化镓双平衡混频器**

**SIM306M砷化镓双平衡混频器**

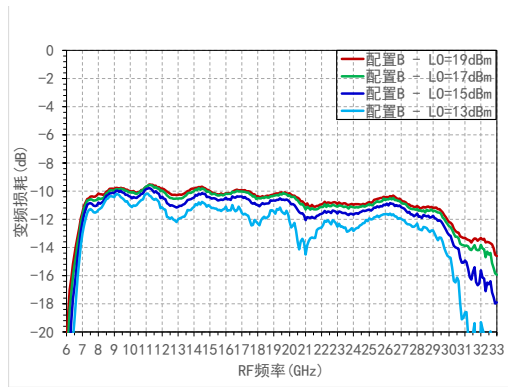

应用时可通过配置 A/B 两种不同方式来实现最佳杂散抑制。如果需要较优的变频增益(转换损耗)则选择配置A(端口1作为RF输入或输出, 端口3作为LO输入)。如果您需要较低的LO驱动功率, 则选择配置B(端口1作为 LO输入, 端口3作为RF输入或输出)。

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

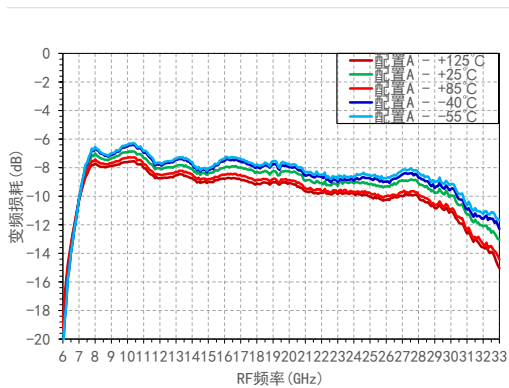
变频损耗 VS RF频率



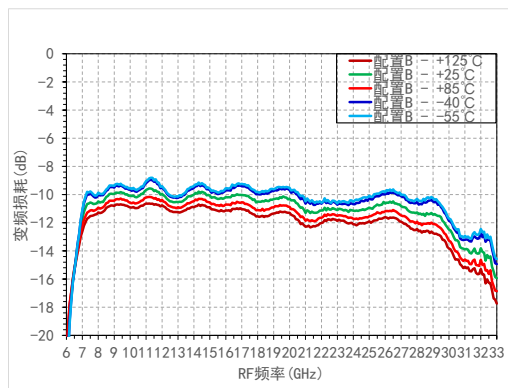
变频损耗 VS RF频率



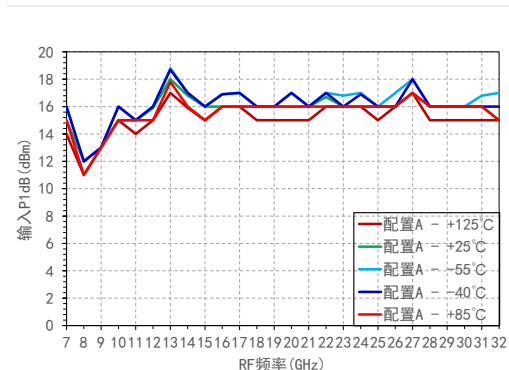
变频损耗 VS RF频率 (L0=19dBm)



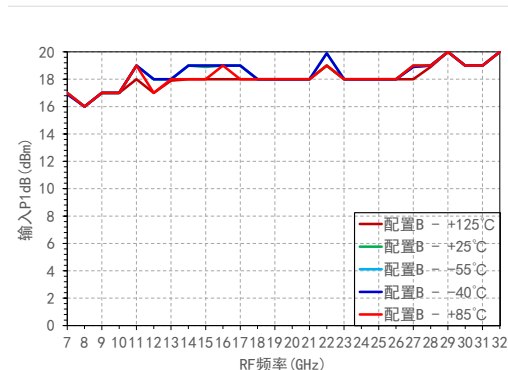
变频损耗 VS RF频率 (L0=17dBm)



输入P1dB VS RF频率 (L0=19dBm)



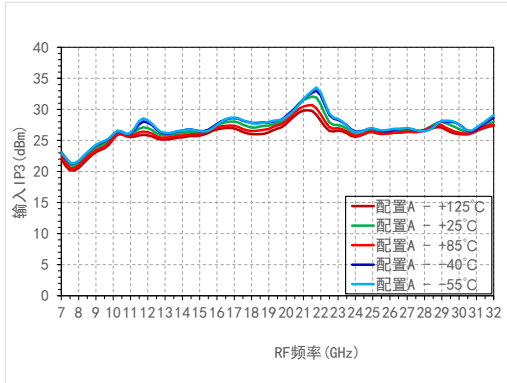
输入P1dB VS RF频率 (L0=17dBm)



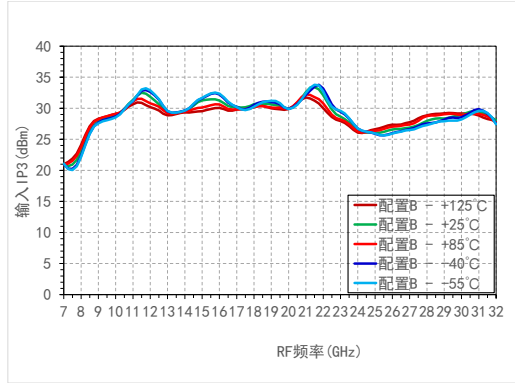
SIM  
混频器系列

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

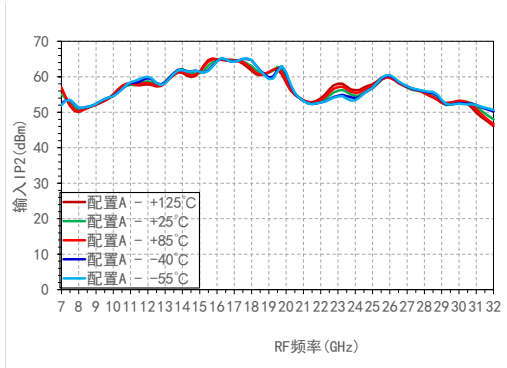
输入IP3 VS RF频率 (L0=19dBm)



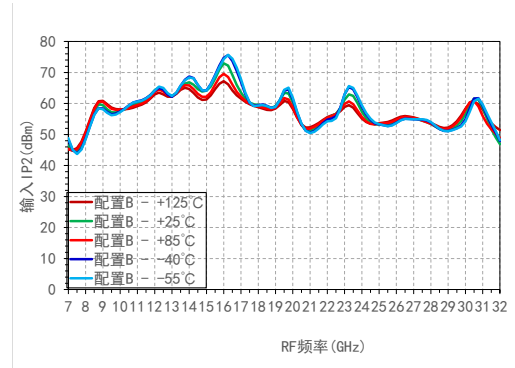
输入IP3 VS RF频率 (L0=17dBm)



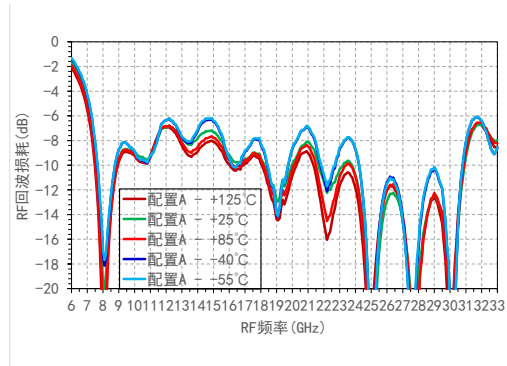
输入IP2 VS RF频率 (L0=19dBm)



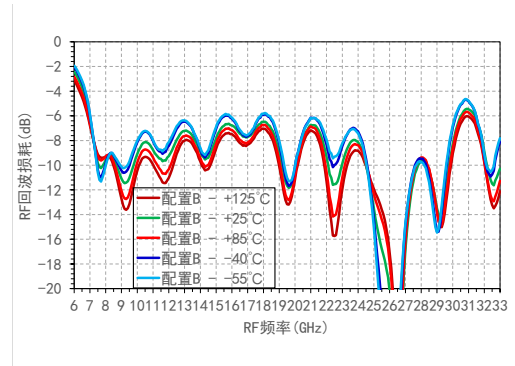
输入IP2 VS RF频率 (L0=17dBm)



RF 回波损耗 VS RF频率 (L0=19dBm)

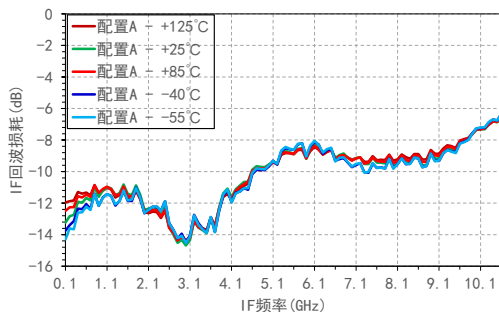


RF 回波损耗 VS RF频率 (L0=17dBm)

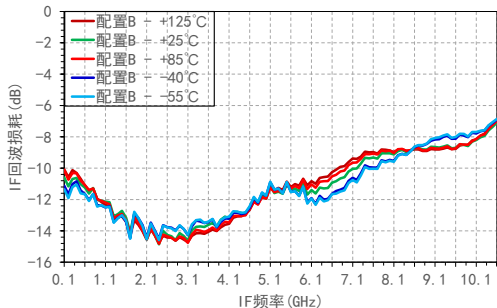


下变频测试曲线 (IF=100MHz,LSB, 配置A/B, Pin=-10dBm)

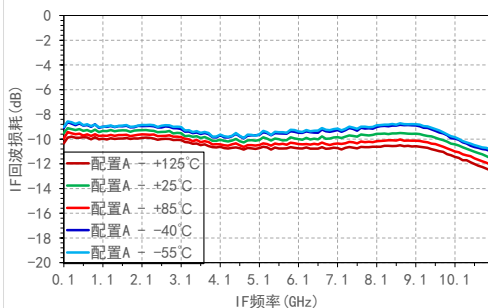
IF回波损耗 VS IF频率 (L0=19dBm)



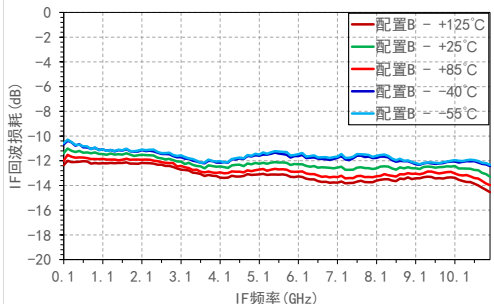
IF回波损耗 VS IF频率 (L0=17dBm)



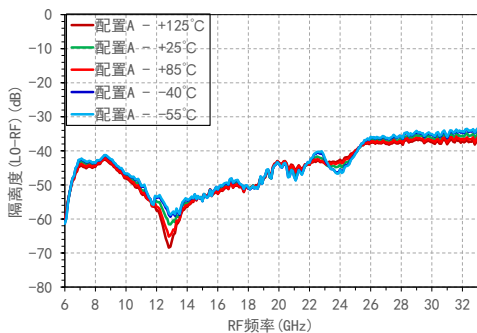
变频损耗 VS IF频率 (L0=19dBm, L0=25GHz)



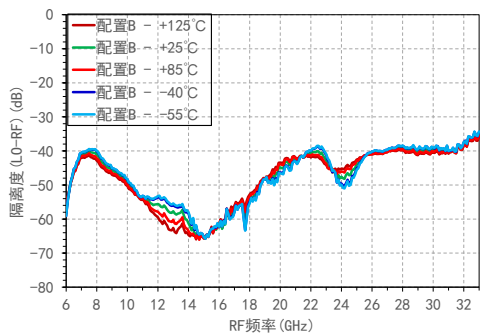
变频损耗 VS IF频率 (L0=17dBm, L0=25GHz)



L0-RF隔离度 VS 射频频率 (L0=19dBm)

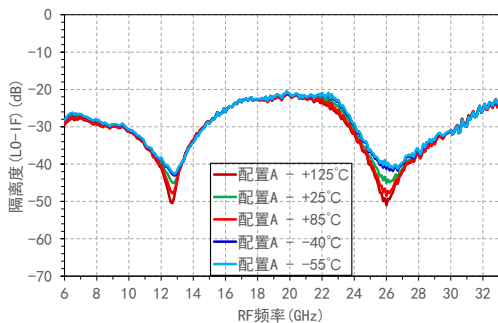


L0-RF隔离度 VS 射频频率 (L0=17dBm)

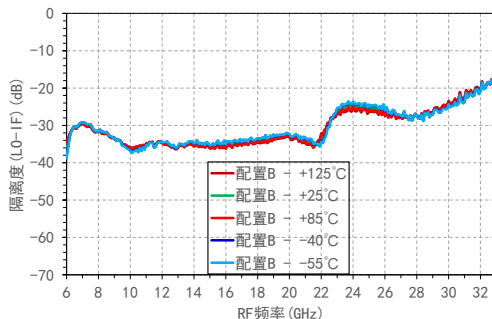


下变频测试曲线 (IF=100MHz,LSB, 配置A/B, Pin=-10dBm)

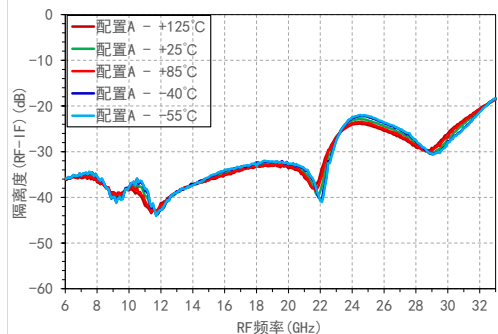
L0-IF隔离度 VS 射频频率 (L0=19dBm)



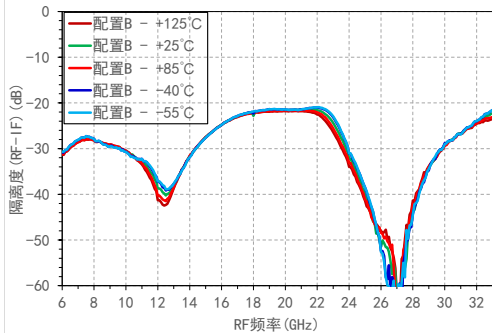
L0-IF隔离度 VS 射频频率 (L0=17dBm)



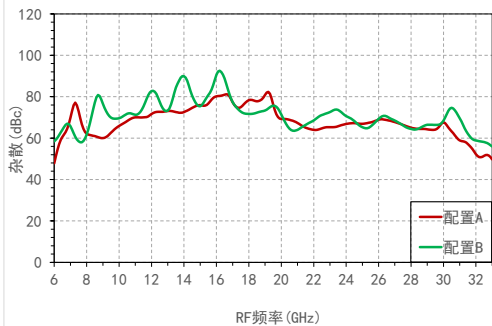
RF-IF隔离度 VS 射频频率 (L0=19dBm)



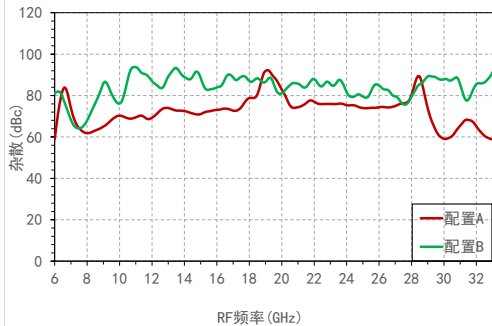
RF-IF隔离度 VS 射频频率 (L0=17dBm)



2L0-2RF 杂散 VS RF频率



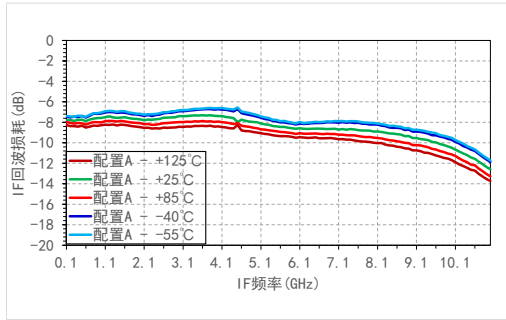
3L0-3RF 杂散 VS RF频率



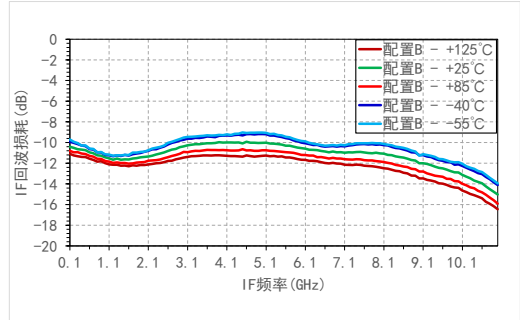
SIM  
混频器系列

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=19dBm, LO=8GHz)



变频损耗 VS IF频率 (LO=17dBm, LO=8GHz)



下变频杂散表

配置A

		M*LO					
		0	1	2	3	4	5
M*RF	0	/	-6.30	13.70	8.18	15.42	14.10
	1	32.86	0.00	30.94	51.31	40.27	44.29
	2	82.08	53.77	66.26	52.53	87.99	58.15
	3	95.87	87.72	77.17	63.97	75.42	84.23
	4	89.11	79.33	87.69	84.47	88.92	87.56
	5	86.54	83.38	81.18	81.44	84.45	98.31

RF=8GHz&-10dBm; LO=8.1GHz&+19dBm

配置B

		M*LO					
		0	1	2	3	4	5
M*RF	0	/	-5.70	19.80	3.42	16.31	15.46
	1	17.52	0.00	52.33	44.86	39.40	34.74
	2	67.44	57.61	61.81	60.97	90.07	57.77
	3	76.47	75.28	84.92	68.25	88.45	78.82
	4	90.57	90.54	95.05	98.25	95.49	89.55
	5	82.01	85.83	87.06	85.00	80.74	85.24

RF=8GHz&-10dBm; LO=8.1GHz&+17dBm

配置A

		M*LO					
		0	1	2	3	4	5
M*RF	0	/	-14.58	7.44	/	/	/
	1	23.73	0.00	39.11	23.11	/	/
	2	67.84	70.77	72.18	65.92	84.60	/
	3	/	74.26	78.55	75.94	96.17	75.28
	4	/	/	72.92	82.55	94.18	88.00
	5	/	/	/	90.69	86.65	107.42

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

配置B

		M*LO					
		0	1	2	3	4	5
M*RF	0	/	-3.59	3.04	/	/	/
	1	11.43	0.00	40.09	24.13	/	/
	2	87.98	74.31	71.42	92.71	73.27	/
	3	/	76.65	/	83.40	84.86	85.05
	4	/	/	87.74	94.44	101.61	79.29
	5	/	/	/	91.80	92.73	97.39

RF=19GHz&-10dBm; LO=19.1GHz&+17dBm

配置A

		M*LO					
		0	1	2	3	4	5
M*RF	0	/	-5.06	/	/	/	/
	1	21.40	0.00	33.76	/	/	/
	2	/	60.15	65.93	62.31	/	/
	3	/	/	94.44	76.22	90.06	/
	4	/	/	/	96.49	99.39	79.18
	5	/	/	/	/	79.26	100.06

RF=30GHz&-10dBm; LO=30.1GHz&+19dBm

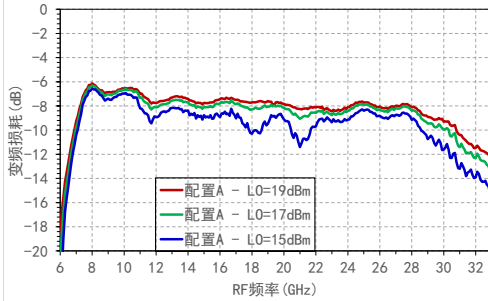
配置B

		M*LO					
		0	1	2	3	4	5
M*RF	0	/	-11.89	/	/	/	/
	1	19.62	0.00	32.12	/	/	/
	2	/	85.31	66.46	62.54	/	/
	3	/	/	85.90	86.35	79.15	/
	4	/	/	/	69.72	81.62	79.62
	5	/	/	/	/	78.39	97.56

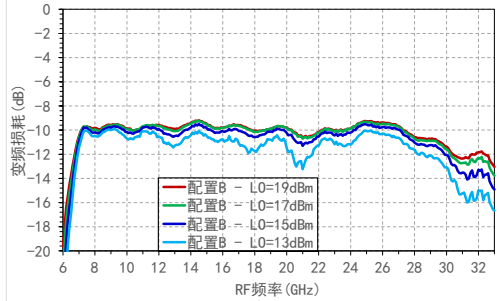
RF=30GHz&-10dBm; LO=30.1GHz&+17dBm

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

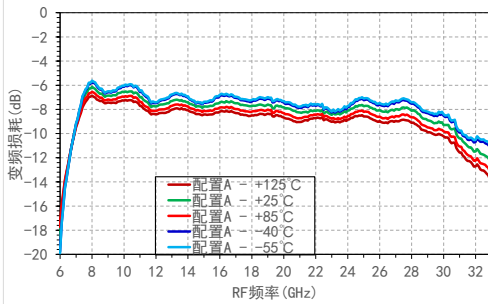
变频损耗 VS RF频率



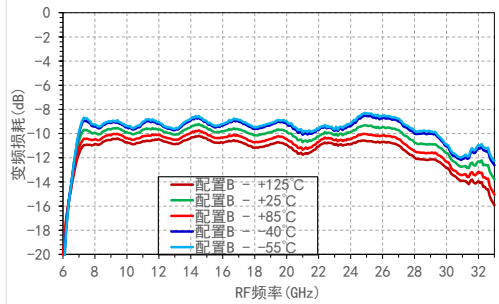
变频损耗 VS RF频率



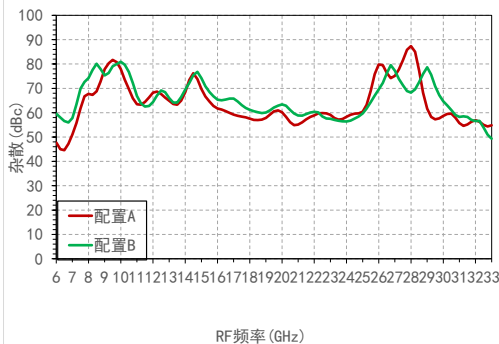
变频损耗 VS RF频率 (LO=19dBm)



变频损耗 VS RF频率 (LO=17dBm)



2IF+1LO杂散 VS RF频率



SIM

混频器系列



**上变频杂散表**
**配置A**

		M*LO					
		0	1	2	3	4	5
M*IF	-5	92.72	85.08	80.81	103.25	80.81	74.63
	-4	113.63	120.94	93.39	91.48	86.26	77.08
	-3	119.41	74.85	92.16	69.48	92.40	78.69
	-2	95.42	63.22	66.34	68.04	62.55	70.58
	-1	65.37	-0.39	28.91	11.69	25.83	35.69
	0	/	4.89	-1.99	21.37	12.06	24.18
	1	64.80	0.00	30.80	12.03	25.68	35.77
	2	109.78	66.05	63.19	68.89	61.45	68.47
	3	90.05	72.29	86.31	70.48	102.57	76.76
	4	97.91	106.75	110.36	102.42	79.60	96.64
	5	89.31	88.07	83.36	104.23	97.47	74.88

**IF=0.1GHz~-10dBm; LO=8.1GHz&+19dBm**

**配置B**

		M*LO					
		0	1	2	3	4	5
M*IF	-5	107.11	97.43	94.84	77.98	106.23	92.48
	-4	107.64	102.71	92.67	79.16	83.56	96.47
	-3	106.81	75.85	91.23	97.33	99.89	78.24
	-2	106.65	74.22	70.77	68.62	63.37	73.32
	-1	67.25	-0.58	28.02	11.10	37.31	50.95
	0	/	1.80	10.04	15.56	11.75	25.86
	1	66.89	0.00	24.94	10.76	37.10	50.38
	2	105.51	72.34	72.11	78.43	61.78	76.36
	3	94.71	76.04	83.02	97.54	93.75	76.18
	4	116.65	79.78	83.88	82.30	97.22	79.57
	5	104.91	103.00	105.61	79.25	74.88	88.56

**IF=0.1GHz~-10dBm; LO=8.1GHz&+17dBm**

**配置A**

		M*LO					
		0	1	2	3	4	5
M*IF	-5	100.12	87.93	90.18	/	/	/
	-4	87.31	82.63	80.68	/	/	/
	-3	105.09	83.70	77.61	/	/	/
	-2	92.77	63.86	75.98	/	/	/
	-1	63.99	0.40	17.34	/	/	/
	0	/	6.85	16.64	/	/	/
	1	64.48	0.00	18.31	/	/	/
	2	109.15	61.91	91.16	/	/	/
	3	91.86	93.71	70.94	/	/	/
	4	91.67	83.59	73.32	/	/	/
	5	97.19	87.65	77.34	/	/	/

**IF=0.1GHz~-10dBm; LO=19.1GHz&+19dBm**

**配置B**

		M*LO					
		0	1	2	3	4	5
M*IF	-5	97.50	80.14	71.19	/	/	/
	-4	86.95	96.12	76.37	/	/	/
	-3	104.78	85.54	95.08	/	/	/
	-2	110.49	64.34	91.65	/	/	/
	-1	70.21	0.18	35.98	/	/	/
	0	/	8.24	10.58	/	/	/
	1	70.61	0.00	33.91	/	/	/
	2	94.67	61.86	103.79	/	/	/
	3	108.61	81.87	93.25	/	/	/
	4	113.73	94.66	94.03	/	/	/
	5	110.14	81.94	76.30	/	/	/

**IF=0.1GHz~-10dBm; LO=19.1GHz&+17dBm**

**配置A**

		M*LO					
		0	1	2	3	4	5
M*IF	-5	100.08	110.10	/	/	/	/
	-4	85.71	78.36	/	/	/	/
	-3	91.12	73.81	/	/	/	/
	-2	115.18	63.88	/	/	/	/
	-1	62.25	0.04	/	/	/	/
	0	/	-5.09	/	/	/	/
	1	62.40	0.00	/	/	/	/
	2	89.66	61.51	/	/	/	/
	3	90.49	79.38	/	/	/	/
	4	87.31	79.48	/	/	/	/
	5	90.81	82.28	/	/	/	/

**IF=0.1GHz~-10dBm; LO=30.1GHz&+19dBm**

**配置B**

		M*LO					
		0	1	2	3	4	5
M*IF	-5	89.40	97.46	/	/	/	/
	-4	82.78	75.52	/	/	/	/
	-3	86.28	102.10	/	/	/	/
	-2	106.17	67.19	/	/	/	/
	-1	67.55	-0.18	/	/	/	/
	0	/	-1.50	/	/	/	/
	1	67.71	0.00	/	/	/	/
	2	101.68	66.56	/	/	/	/
	3	108.40	95.99	/	/	/	/
	4	88.73	74.51	/	/	/	/
	5	84.77	84.49	/	/	/	/

**IF=0.1GHz~-10dBm; LO=30.1GHz&+17dBm**


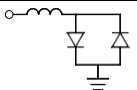

**绝对最大额定值**

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

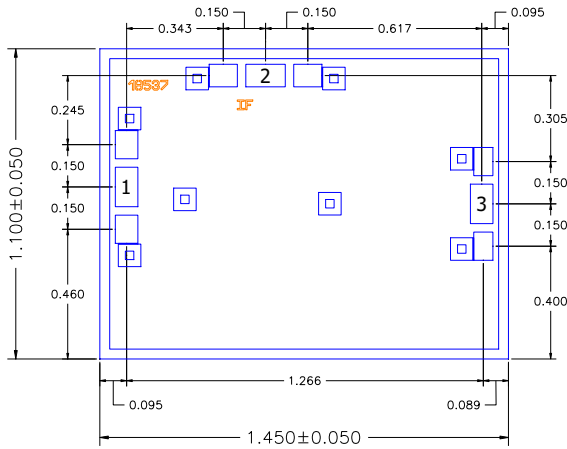
**注意事项**

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**
**混频器系列**
**引脚定义**

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

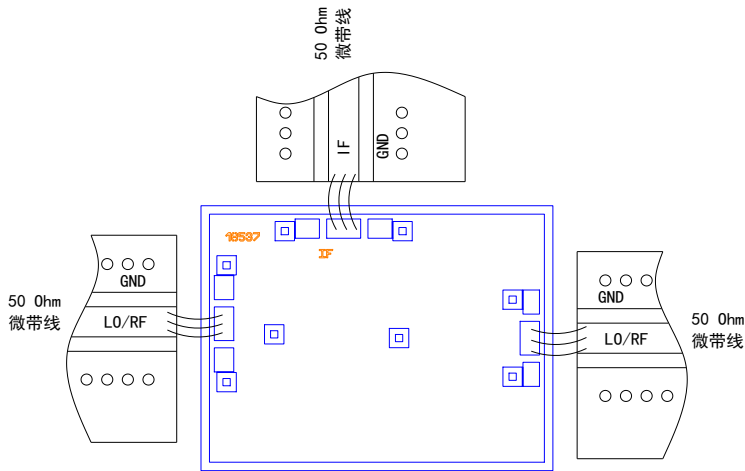
SIM306外形尺寸图



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;

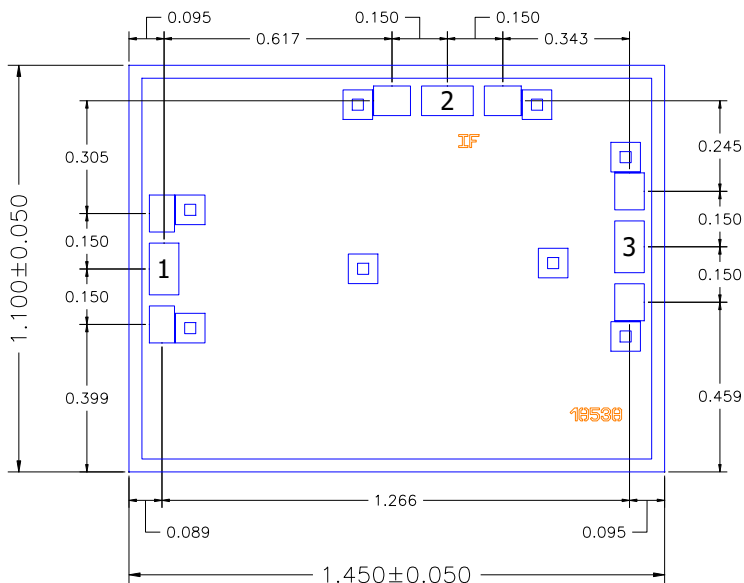
SIM306芯片装配图



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;

SIM306M外形尺寸图

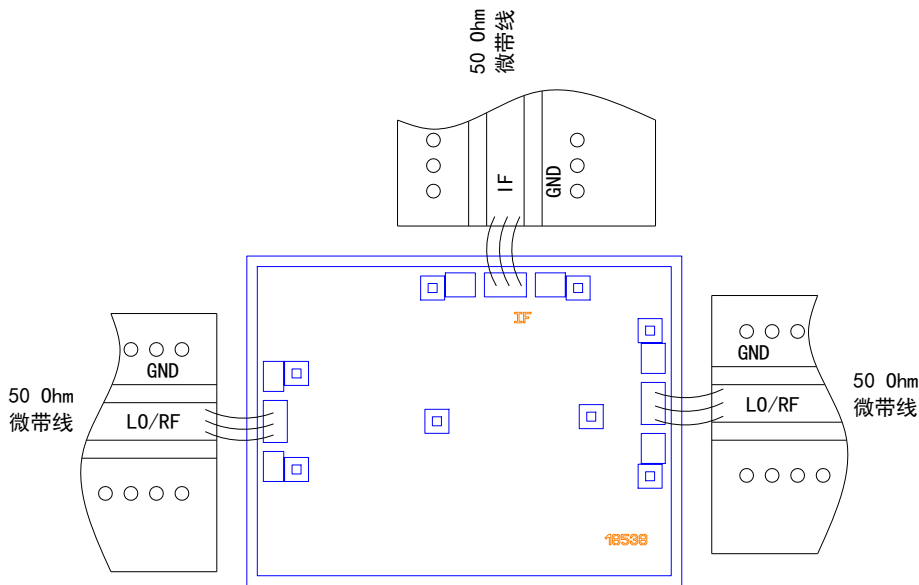


说明:

1. 单位: 毫米;
2. 键合压点材质镀金;
3. 芯片厚度:  $0.100 \pm 0.015$  (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

SIM306M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

