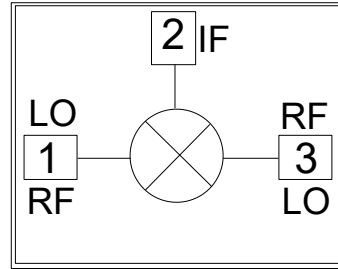


性能特点

- 变频损耗: 9dB
- L0至RF隔离: 55dB
- L0至IF隔离: 28dB
- 无源双平衡拓扑结构
- 宽IF带宽: DC~4GHz
- 芯片尺寸: 1.480*1.450mm

典型应用

- 点对点通信
- 仪器仪表
- 5G通信

功能框图

概述

SIM275/SIM275M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3.5GHz至24GHz的上变频器或下变频器。

电性能表 (T_a=+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	3.5~24			GHz
	IF端口	DC~4			GHz
本振功率范围		11		16	dBm
变频损耗	P _{in} =0dBm		9		dB
RF回波损耗	P _{in} =0dBm		9		dB
输入IP3	P _{in} =0dBm/tone, Δf=1MHz		21		dBm
输入IP2	P _{in} =0dBm		57		dBm
输入P1dB			10.5		dBm
杂散	2L0-2RF		72		dBc
	3L0-3RF		66		dBc
	2IF+1L0 ^①		70		dBc
隔离度	RF到IF端口		33		dB
	L0到RF端口		55		dB
	L0到IF端口		28		dB

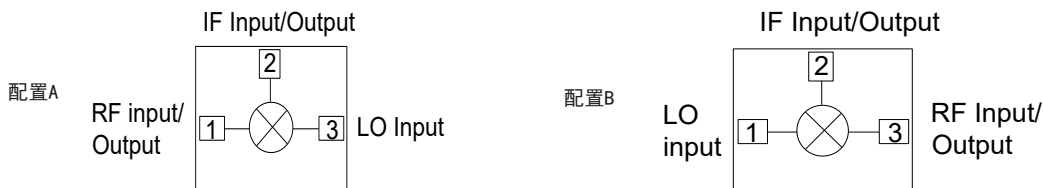
附注①: 2IF+1L0为上变频杂散指标

电性能表 (T_a=+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	4~24			GHz
	IF端口	DC~4			GHz
本振功率范围		9		14	dBm
变频损耗	Pin=0dBm		10		dB
RF回波损耗	Pin=0dBm		8		dB
输入IP3	Pin=0dBm/tone, Δf=1MHz		21.5		dBm
输入IP2	Pin=0dBm		58		dBm
输入P1dB			10.5		dBm
杂散	2LO-2RF		72		dBc
	3LO-3RF		65		dBc
	2IF+1LO ^①		69		dBc
隔离度	RF到IF端口		28		dB
	LO到RF端口		57		dB
	LO到IF端口		33		dB

附注①: 2IF+1LO为上变频杂散指标

SIM275砷化镓双平衡混频器



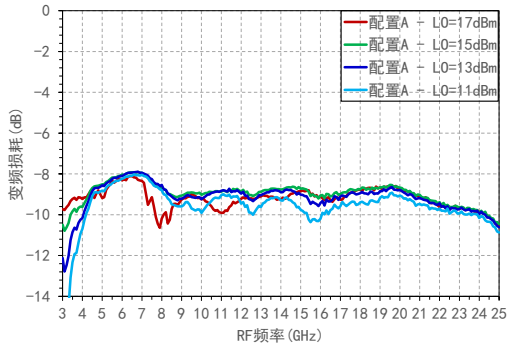
SIM275M砷化镓双平衡混频器



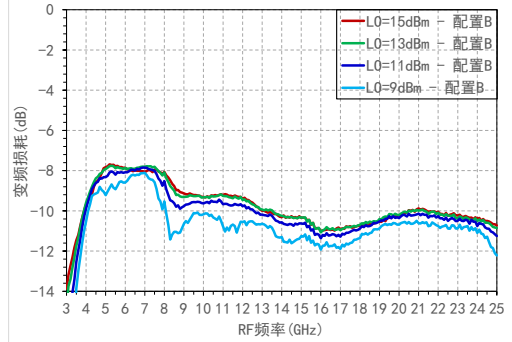
SIM275应用时可通过配置 A/B 两种不同方式来实现最佳变频损耗。如果需要较优的变频增益(转换损耗)则选择配置A(端口1作为RF输入或输出, 端口3作为LO输入)。如果您需要较低的LO驱动功率, 则选择配置B(端口1作为 LO输入, 端口3作为RF输入或输出)。

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

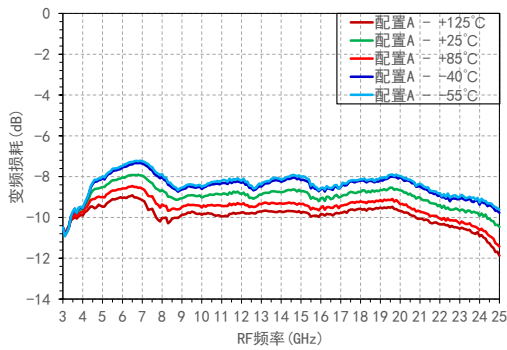
变频损耗 VS RF频率



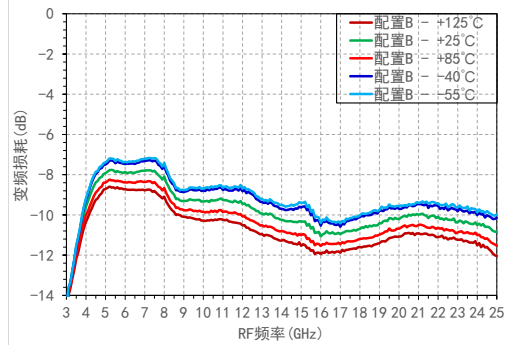
变频损耗 VS RF频率



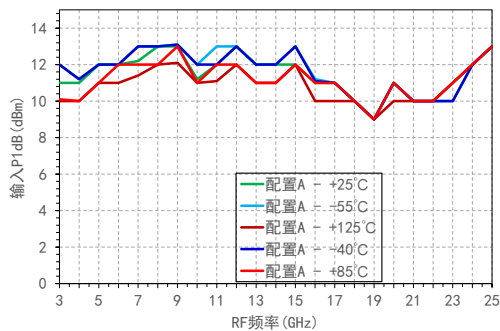
变频损耗 VS RF频率 (L0=15dBm)



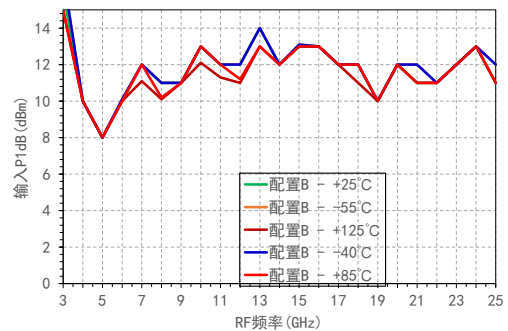
变频损耗 VS RF频率 (L0=13dBm)



输入P1dB VS RF频率 (L0=15dBm)

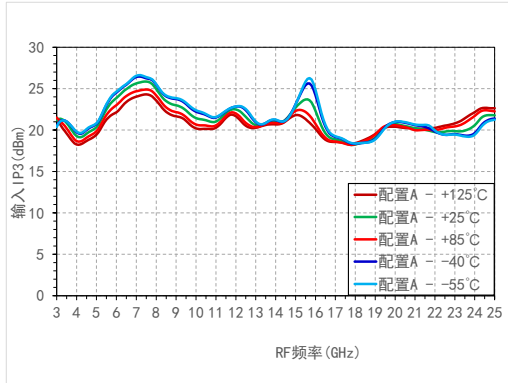


输入P1dB VS RF频率 (L0=13dBm)

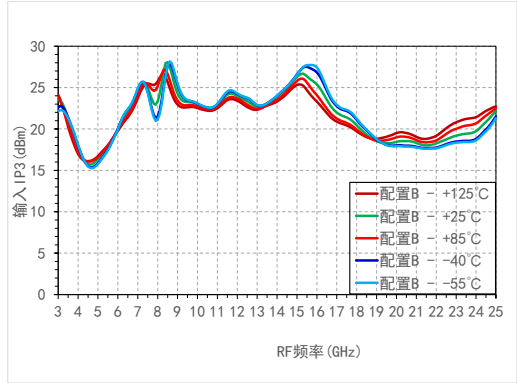


下变频测试曲线 (IF=100MHz, LSB, 配置A/B, Pin=0dBm)

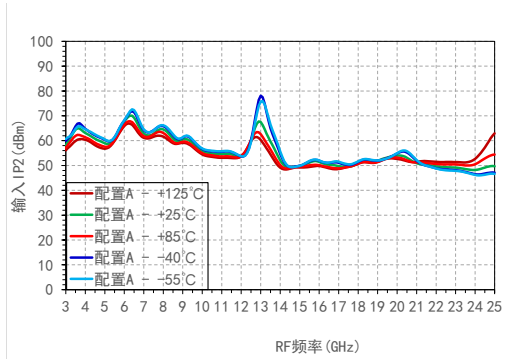
输入IP3 VS RF频率 (L0=15dBm)



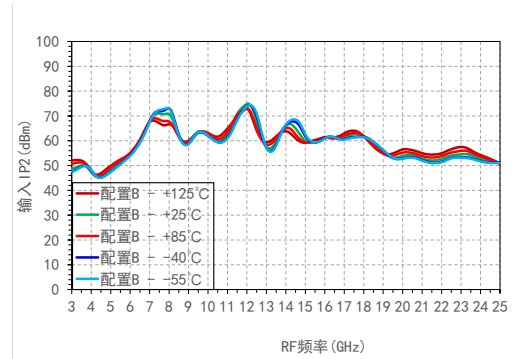
输入IP3 VS RF频率 (L0=13dBm)



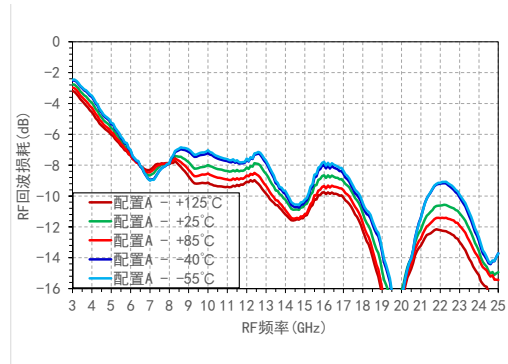
输入IP2 VS RF频率 (L0=15dBm)



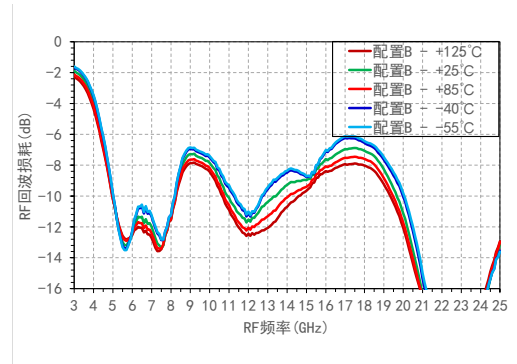
输入IP2 VS RF频率 (L0=13dBm)



RF 回波损耗 VS RF频率 (L0=15dBm)

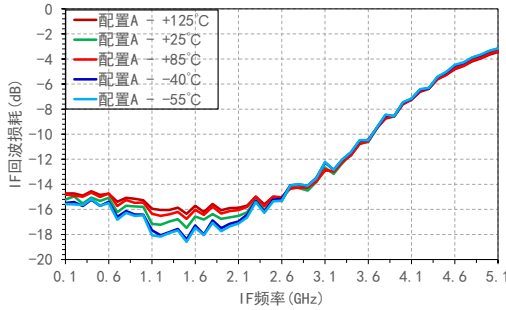


RF 回波损耗 VS RF频率 (L0=13dBm)

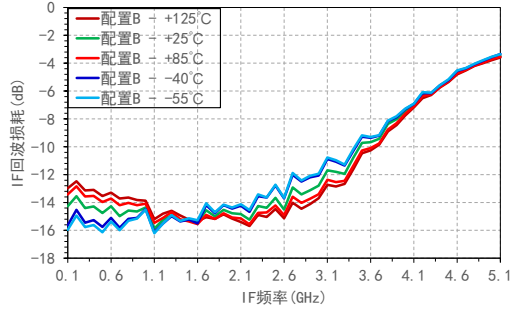


下变频测试曲线 (IF=100MHz, LSB, 配置A/B, Pin=-10dBm)

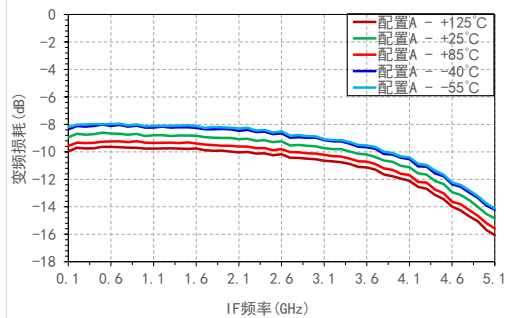
IF回波损耗 VS IF频率 (L0=15dBm)



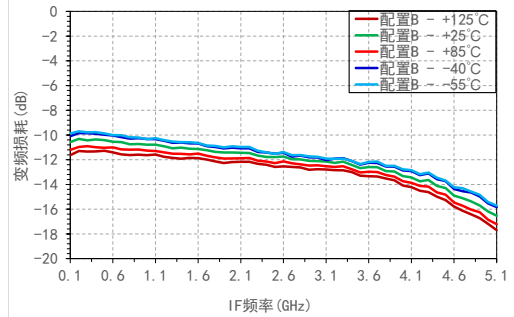
IF回波损耗 VS IF频率 (L0=13dBm)



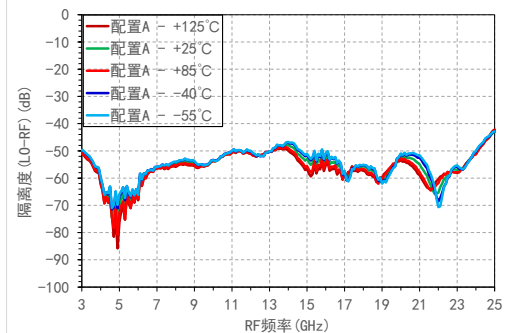
变频损耗 VS IF频率 (L0=15dBm, LO=20GHz)



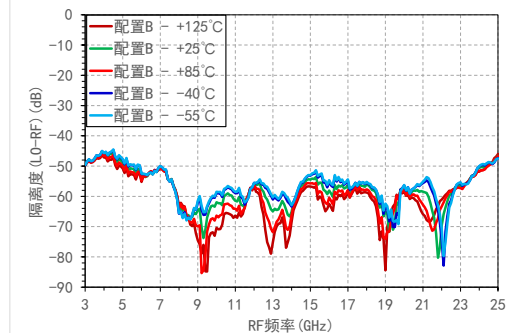
变频损耗 VS IF频率 (L0=13dBm, LO=20GHz)



LO-RF隔离度 VS 射频频率 (L0=15dBm)



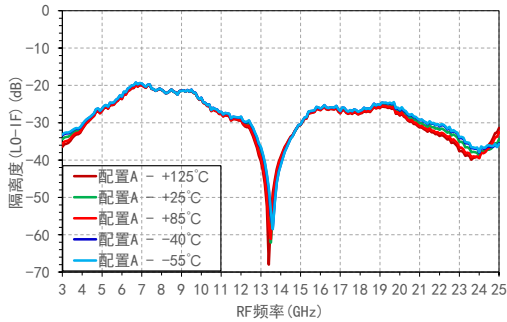
LO-RF隔离度 VS 射频频率 (L0=13dBm)



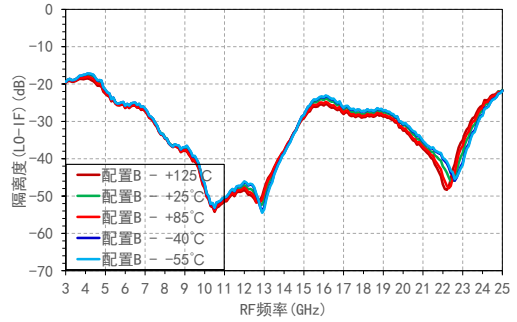
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混频器系列

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

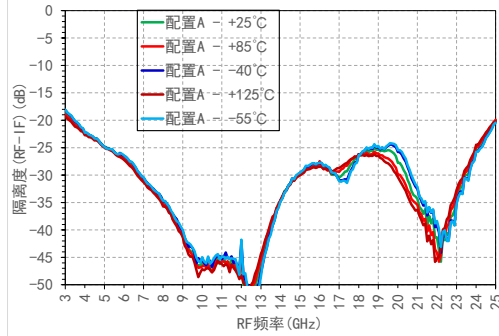
L0-IF隔离度 VS 射频频率 (L0=15dBm)



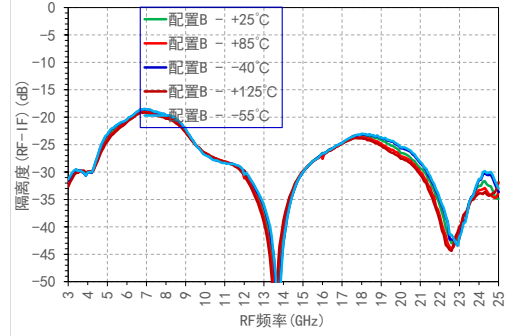
L0-IF隔离度 VS 射频频率 (L0=13dBm)



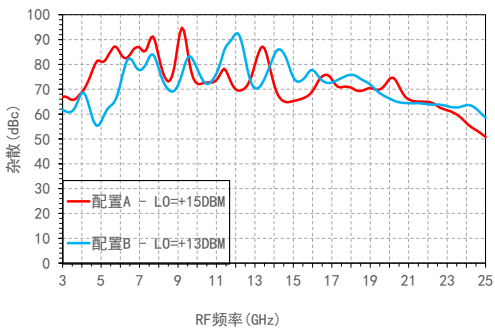
RF-IF隔离度 VS 射频频率 (L0=15dBm)



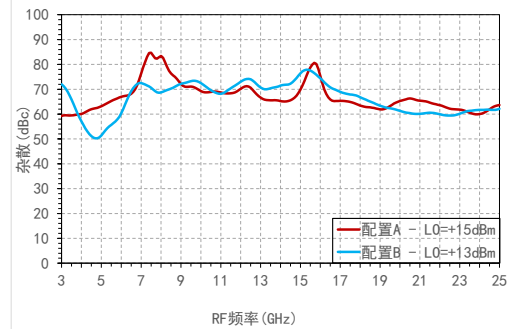
RF-IF隔离度 VS 射频频率 (L0=13dBm)



2L0-2RF 杂散 VS RF频率

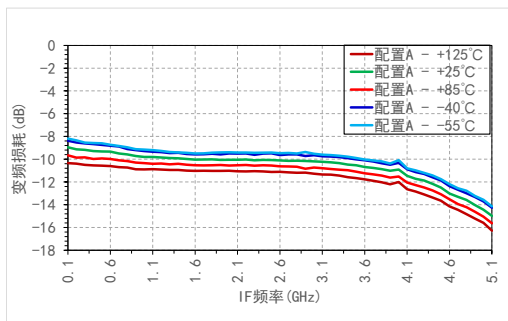


3L0-3RF 杂散 VS RF频率

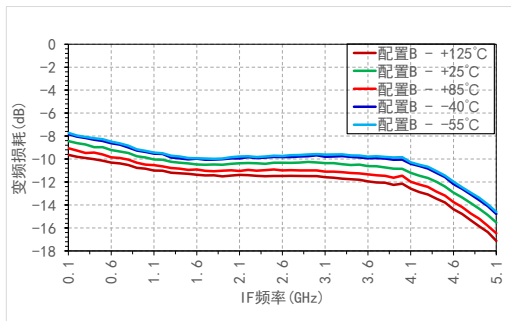


下变频测试曲线 (IF=100MHz,USB, 配置A/B, Pin=-10dBm)

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*L0					
		0	1	2	3	4	5
M*RF	0	/	-7.31	42.29	17.20	37.21	22.80
	1	16.72	0.00	32.85	30.16	31.74	35.06
	2	72.90	56.74	83.16	55.79	83.25	65.35
	3	81.73	79.31	75.50	65.01	78.42	77.47
	4	92.20	81.24	92.90	81.53	99.87	93.30
	5	75.92	84.07	96.11	95.18	79.70	91.70

RF=5GHz&-10dBm; LO=5.1GHz&+15dBm

配置B

		M*L0					
		0	1	2	3	4	5
M*RF	0	/	-8.40	17.66	9.83	34.14	11.24
	1	15.89	0.00	51.40	28.76	51.97	26.30
	2	69.41	52.16	62.41	53.14	72.89	58.55
	3	82.57	80.59	76.11	57.76	89.45	80.08
	4	78.04	80.11	93.42	87.88	83.03	89.39
	5	76.13	87.55	94.32	92.51	87.17	99.82

RF=5GHz&-10dBm; LO=5.1GHz&+13dBm

配置A

		M*L0					
		0	1	2	3	4	5
M*RF	0	/	8.89	20.26	7.71	/	/
	1	37.97	0.00	45.11	23.36	34.93	/
	2	70.56	76.22	72.27	71.97	94.34	58.04
	3	84.97	92.67	84.34	66.15	84.26	87.33
	4	/	89.77	95.75	88.34	84.28	96.66
	5	/	/	73.60	84.57	92.61	91.81

RF=13GHz&-10dBm; LO=13.1GHz&+15dBm

配置B

		M*L0					
		0	1	2	3	4	5
M*RF	0	/	14.32	17.68	-0.16	/	/
	1	29.52	0.00	58.84	24.84	42.32	/
	2	71.75	71.89	71.46	68.87	74.09	58.60
	3	67.09	74.68	76.68	71.28	88.74	81.69
	4	/	72.46	87.16	87.72	92.16	81.02
	5	/	/	66.67	73.94	97.65	85.10

RF=13GHz&-10dBm; LO=13.1GHz&+13dBm

配置A

		M*L0					
		0	1	2	3	4	5
M*RF	0	/	-1.52	27.34	/	/	/
	1	40.93	0.00	45.96	37.40	/	/
	2	84.41	64.27	63.85	66.63	72.00	/
	3	/	81.28	84.95	63.13	75.04	78.49
	4	/	/	85.30	97.39	84.32	78.70
	5	/	/	/	90.41	89.52	83.57

RF=22GHz&-10dBm; LO=22.1GHz&+15dBm

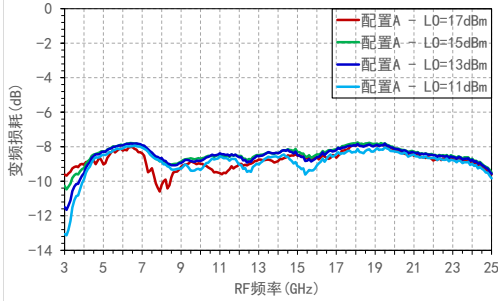
配置B

		M*L0					
		0	1	2	3	4	5
M*RF	0	/	9.96	24.12	/	/	/
	1	23.99	0.00	43.66	35.23	/	/
	2	63.13	63.03	64.39	83.37	77.97	/
	3	/	60.74	74.26	59.58	87.76	61.79
	4	/	/	76.29	78.41	88.06	86.57
	5	/	/	/	67.76	73.51	81.52

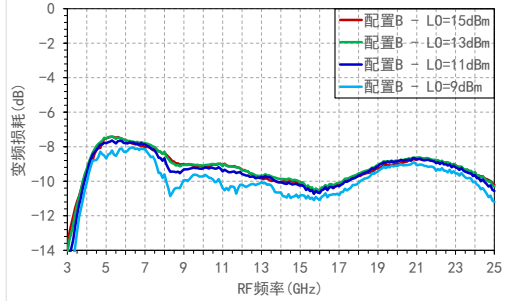
RF=22GHz&-10dBm; LO=22.1GHz&+13dBm

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

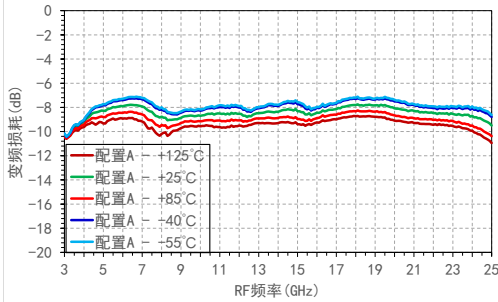
变频损耗 VS RF频率



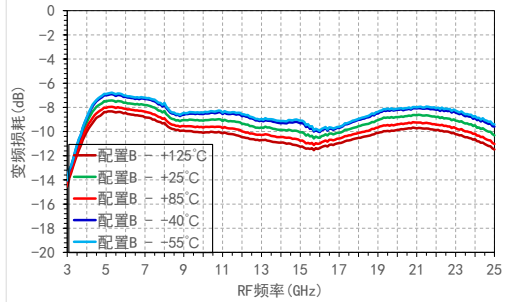
变频损耗 VS RF频率



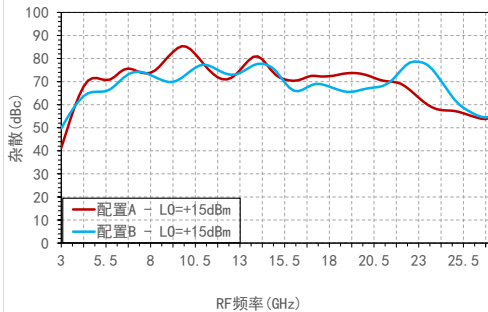
变频损耗 VS RF频率 (LO=15dBm)



变频损耗 VS RF频率 (LO=13dBm)



2IF+1LO杂散 VS RF频率



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上变频杂散表

		配置A					
	M*IF	M*LO					
		0	1	2	3	4	5
	-5	85.40	81.04	82.84	104.82	104.14	99.78
	-4	89.48	97.05	90.79	87.47	86.25	79.93
	-3	104.78	65.32	104.31	64.18	83.91	65.75
	-2	80.10	68.60	57.76	69.48	59.85	67.53
	-1	19.27	0.01	29.48	11.51	42.16	37.38
	0	/	20.35	3.48	23.30	11.70	28.20
	1	19.29	0.00	32.30	12.45	40.77	30.30
	2	76.94	63.52	56.12	64.91	57.46	67.04
	3	93.61	65.05	103.45	66.84	77.98	65.59
	4	91.29	102.87	107.28	105.68	87.02	77.98
	5	108.67	99.87	98.92	90.27	82.44	78.68
		IF=0.1GHz&-10dBm; LO=5.1GHz&+15dBm					

		配置B					
	M*IF	M*LO					
		0	1	2	3	4	5
	-5	91.96	86.57	108.40	99.64	102.50	87.62
	-4	97.66	88.45	85.97	107.90	105.68	114.34
	-3	93.97	71.06	94.70	95.19	86.03	75.56
	-2	92.42	70.87	59.94	78.37	58.68	73.51
	-1	43.93	-0.06	29.77	17.71	48.25	22.86
	0	/	4.70	-6.25	20.39	3.23	26.47
	1	43.95	0.00	29.20	17.43	45.06	21.04
	2	90.43	113.27	58.82	88.25	55.13	77.23
	3	101.43	69.00	100.25	76.08	98.41	74.69
	4	88.61	87.59	85.43	85.17	115.42	86.34
	5	101.10	81.98	109.17	94.53	103.06	103.52
		IF=0.1GHz&-10dBm; LO=5.1GHz&+15dBm					

		配置A					
	M*IF	M*LO					
		0	1	2	3	4	5
	-5	95.29	104.33	92.46	88.30	/	/
	-4	88.68	98.52	75.73	104.45	/	/
	-3	108.09	73.29	99.52	72.18	/	/
	-2	92.48	74.25	75.49	78.16	/	/
	-1	17.22	-0.16	15.63	17.47	/	/
	0	/	13.95	5.92	31.98	/	/
	1	/	0.00	16.00	17.36	/	/
	2	94.41	82.32	73.74	91.81	/	/
	3	90.66	78.48	102.40	79.25	/	/
	4	87.58	84.79	78.42	84.43	/	/
	5	92.10	81.06	81.61	80.66	/	/
		IF=0.1GHz&-10dBm; LO=13.1GHz&+15dBm					

		配置B					
	M*IF	M*LO					
		0	1	2	3	4	5
	-5	88.76	77.60	100.42	79.22	/	/
	-4	105.93	84.43	75.09	94.48	/	/
	-3	110.90	70.38	100.35	73.35	/	/
	-2	97.10	73.55	49.93	67.97	/	/
	-1	39.92	-0.14	31.42	13.47	/	/
	0	/	26.40	-4.07	26.80	/	/
	1	39.91	0.00	29.58	13.18	/	/
	2	108.70	92.50	51.53	74.79	/	/
	3	106.00	71.09	90.22	76.08	/	/
	4	91.32	90.61	100.35	77.59	/	/
	5	90.18	109.18	95.36	74.15	/	/
		IF=0.1GHz&-10dBm; LO=13.1GHz&+15dBm					

		配置A					
	M*IF	M*LO					
		0	1	2	3	4	5
	-5	106.11	79.21	91.16	/	/	/
	-4	93.33	88.23	83.74	/	/	/
	-3	92.33	103.66	91.15	/	/	/
	-2	84.42	71.85	61.38	/	/	/
	-1	18.80	0.14	30.66	/	/	/
	0	/	29.33	12.23	/	/	/
	1	18.80	0.00	30.10	/	/	/
	2	81.95	69.96	60.19	/	/	/
	3	109.36	72.88	69.12	/	/	/
	4	87.85	80.67	101.64	/	/	/
	5	87.03	79.13	77.30	/	/	/
		IF=0.1GHz&-10dBm; LO=22.1GHz&+15dBm					

		配置B					
	M*IF	M*LO					
		0	1	2	3	4	5
	-5	97.12	101.09	73.27	/	/	/
	-4	88.08	106.06	73.90	/	/	/
	-3	112.21	74.35	104.04	/	/	/
	-2	86.95	66.19	68.34	/	/	/
	-1	41.83	0.15	33.52	/	/	/
	0	/	28.54	19.98	/	/	/
	1	41.79	0.00	34.49	/	/	/
	2	98.00	72.91	70.73	/	/	/
	3	104.39	106.66	96.76	/	/	/
	4	111.19	80.10	77.50	/	/	/
	5	92.48	105.78	86.12	/	/	/
		IF=0.1GHz&-10dBm; LO=22.1GHz&+15dBm					


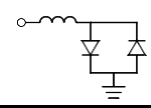

绝对最大额定值

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

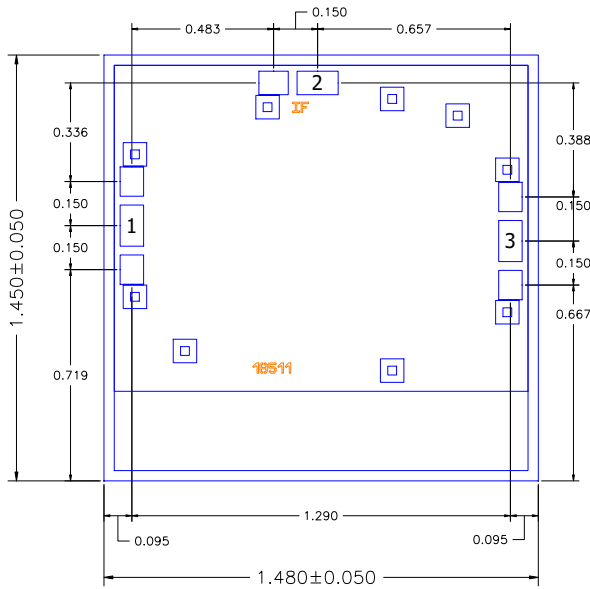
注意事项

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对地短路, 交流匹配50欧姆。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。	
2	IF	DC 对二极管耦合, 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。	
3	RF/L0	DC对地短路, 交流匹配50欧姆。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。	

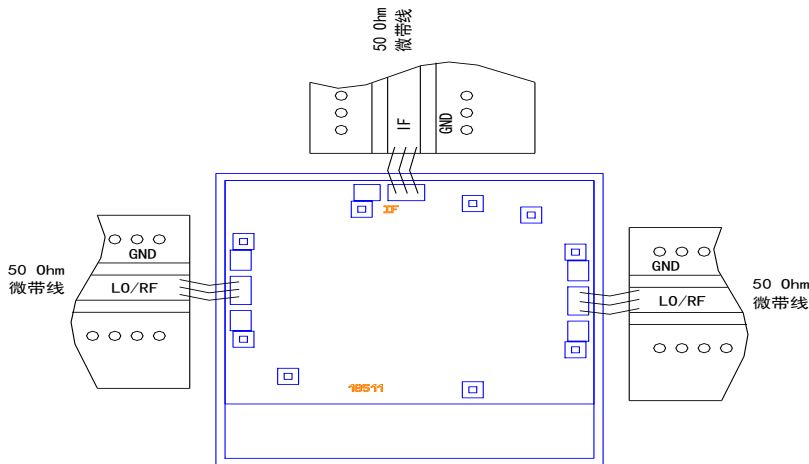
SIM275外形尺寸图



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;

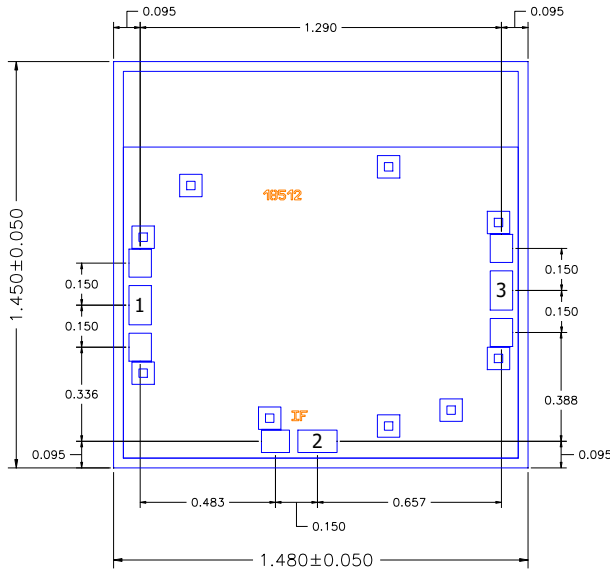
SIM275芯片装配图



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

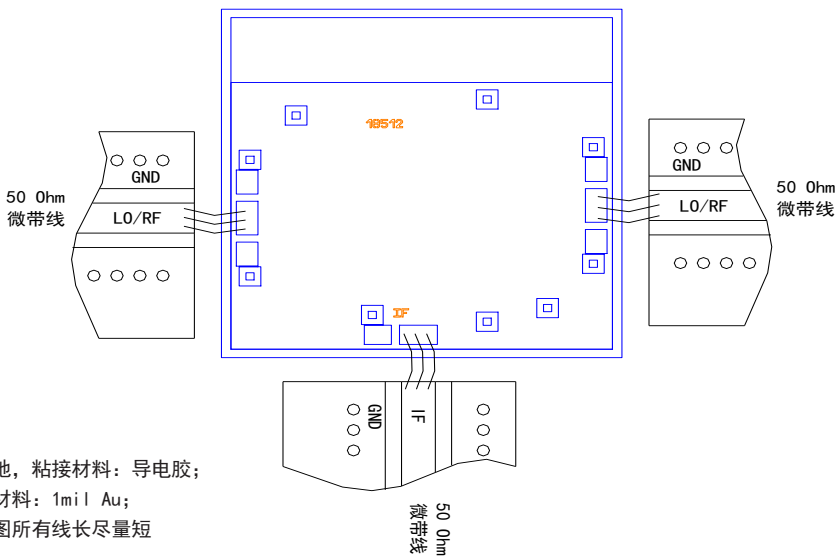
SIM275M外形尺寸图



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;

SIM275M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