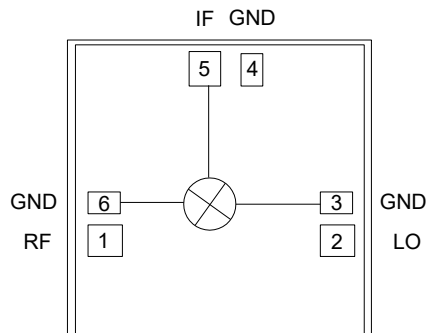


性能特点

- 变频增益: -9dB
- L0至RF隔离: 47dB
- L0至IF隔离: 42dB
- 无源双平衡拓扑结构
- 宽IF带宽: DC~4.3GHz
- 芯片尺寸: 1.400*1.030mm

典型应用

- 点对点通信
- 仪器仪表
- 5G通信

功能框图

概述

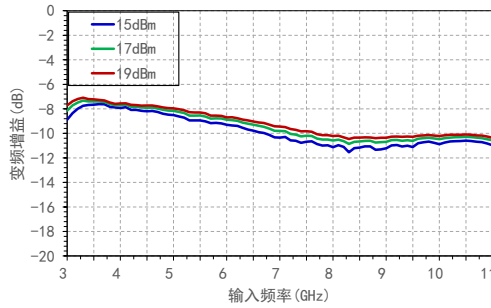
SIM221是一款通用型无源双平衡混频器,采用GaAs工艺制造。该器件为无源器件,无需偏置、外部元件或匹配电路。可用作频率3GHz至10GHz的上变频器或下变频器。

电性能表 (T_A=+25°C, IF=300MHz, LO=+17dBm USB)

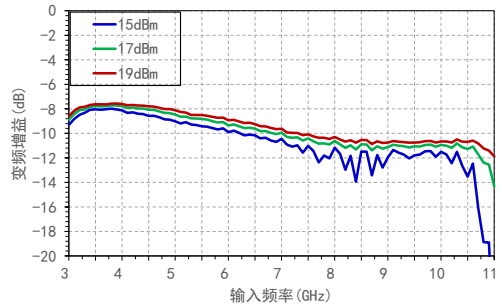
参数名称	描述	最小值	典型值	最大值	单位
频率范围	RF、LO端口	3~10			GHz
	IF端口	DC~4.3			GHz
变频增益			-9		dB
输入IP3	P _{in} =10dBm/tone, Δf=1MHz /下变频		24		dBm
输入P1dB	下变频		16		dBm
隔离度	RF到IF端口		26		dB
	L0到RF端口		47		dB
	L0到IF端口		42		dB

下变频测试曲线 (T_A=+25°C, IF=300MHz)

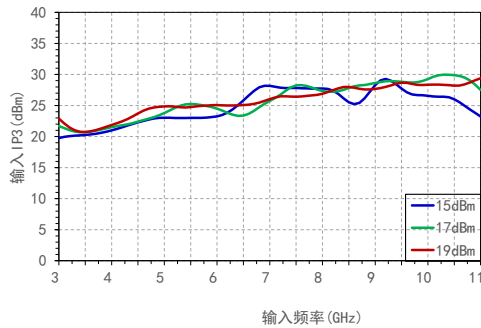
变频增益 VS 射频频率 (USB)



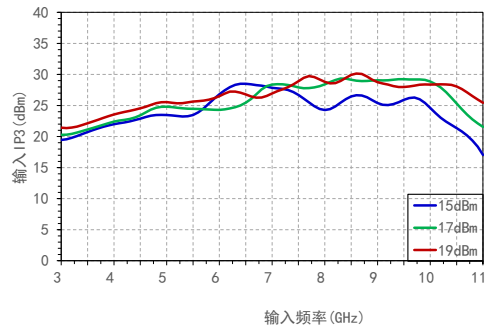
变频增益 VS 射频频率 (LSB)



输入IP3 VS 射频频率 (USB)

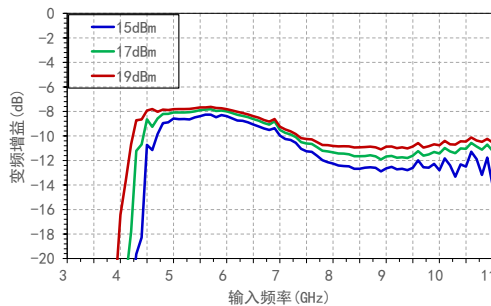


输入IP3 VS 射频频率 (LSB)

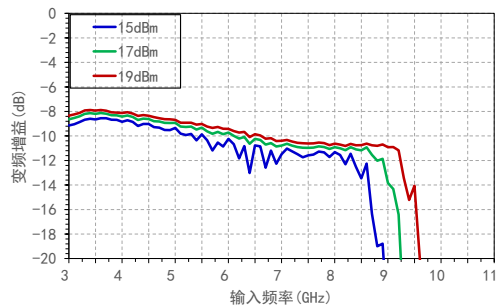


下变频测试曲线 (T_A=+25°C, IF=2.3GHz)

变频增益 VS 射频频率 (USB)

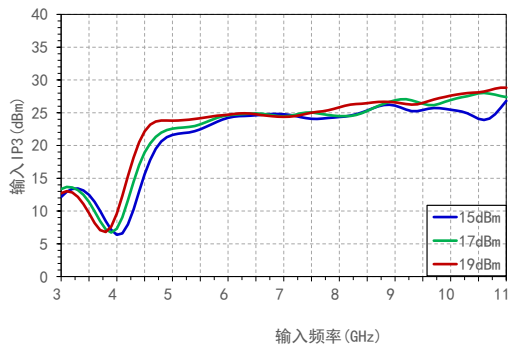


变频增益 VS 射频频率 (LSB)

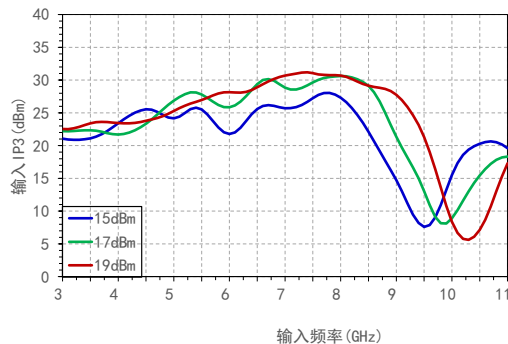


下变频测试曲线 (TA=+25°C, IF=2.3GHz)

输入IP3 VS 射频频率 (USB IF=2.3GHz)

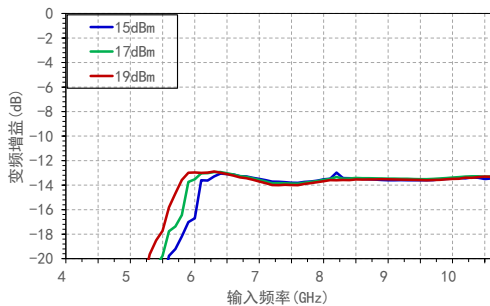


输入IP3 VS 射频频率 (LSB IF=2.3GHz)

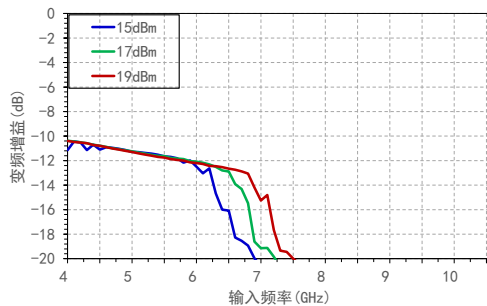


下变频测试曲线 (TA=+25°C, IF=4.3GHz)

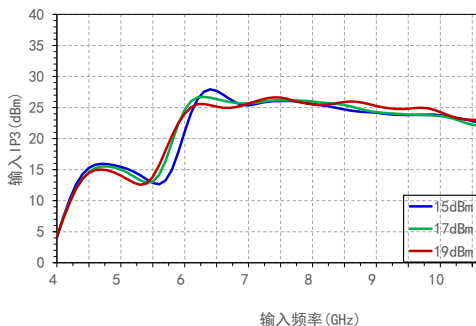
变频增益 VS 射频频率 (USB)



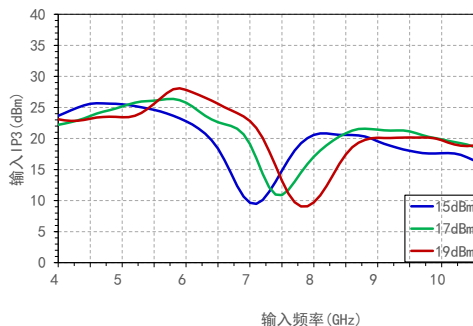
变频增益 VS 射频频率 (LSB)



输入IP3 VS 射频频率 (USB)

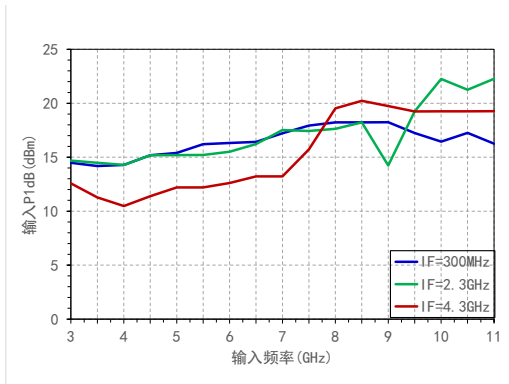


输入IP3 VS 射频频率 (LSB)

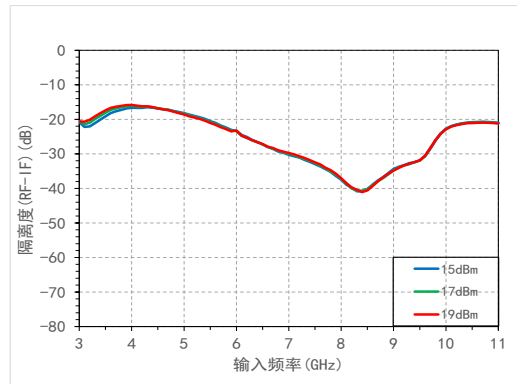


下变频测试曲线 ($T_A=+25^{\circ}\text{C}$)

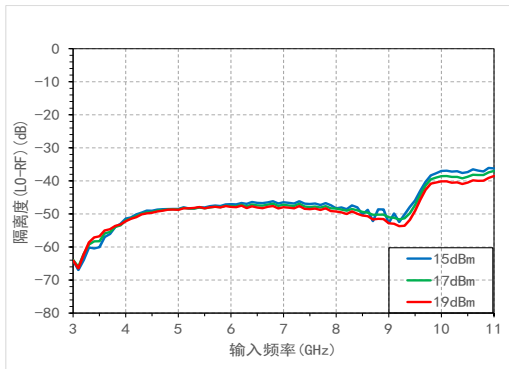
输入P1dB VS 射频频率 (LSB LO=17dBm)



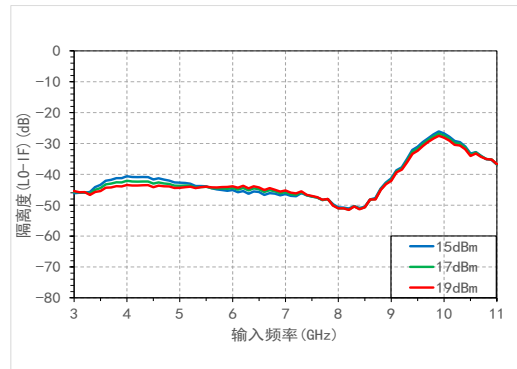
隔离度 (RF-IF) VS 射频频率



隔离度 (LO-RF) VS 射频频率

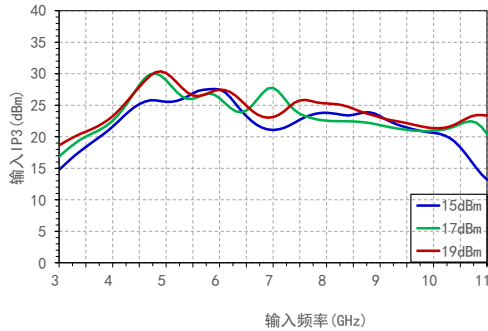


隔离度 (LO-IF) VS 射频频率

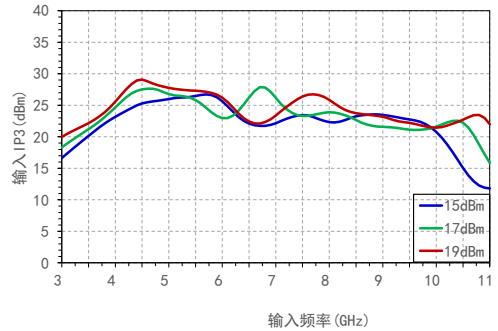


上变频测试曲线 (T_A=+25°C)

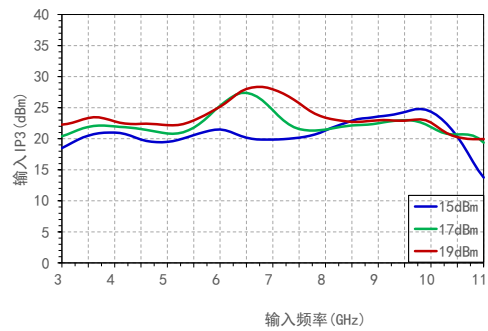
输入IP3 VS 射频频率 (USB IF=0.3GHz)



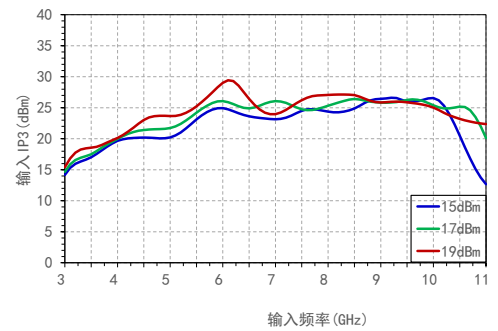
输入IP3 VS 射频频率 (LSB IF=0.3GHz)



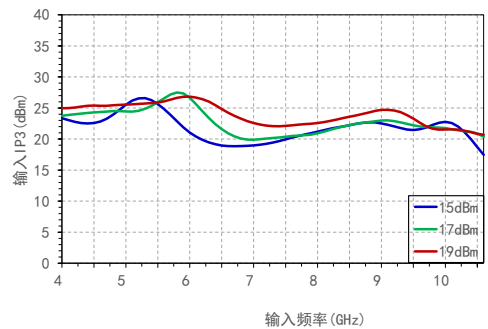
输入IP3 VS 射频频率 (USB IF=2.3GHz)



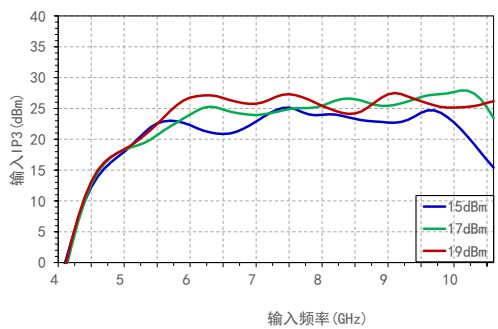
输入IP3 VS 射频频率 (LSB IF=2.3GHz)



输入IP3 VS 射频频率 (USB IF=4.3GHz)

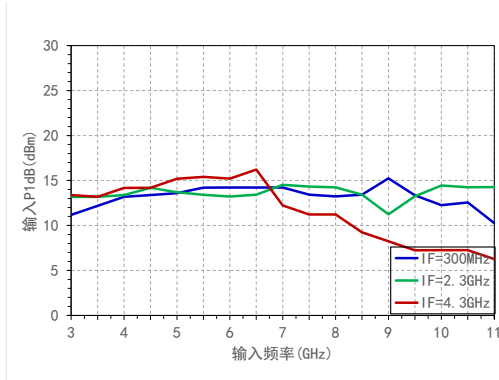


输入IP3 VS 射频频率 (LSB IF=4.3GHz)



上变频测试曲线 (T_A=+25°C)

输入P1dB VS 射频频率 (USB L0=17dBm)


杂散(下变频)

		M*LO					
		0	1	2	3	4	5
M*RF	0	/	14.59	48.47	32.32	59.33	52.22
	1	11.76	0.00	26.31	28.33	60.95	55.09
	2	69.44	53.79	83.61	67.45	87.21	98.39
	3	100.29	81.03	65.20	64.78	71.67	73.40
	4	98.28	88.35	101.66	100.72	103.00	103.19
	5	88.78	86.04	88.43	87.01	87.46	103.64
	RF=3.1GHz&-5dBm; L0=3GHz&+17dBm						

		M*LO					
		0	1	2	3	4	5
M*RF	0	/	12.72	34.24	51.95	42.74	64.37
	1	12.87	0.00	53.47	45.82	62.29	54.58
	2	71.88	53.54	102.08	80.07	87.85	95.26
	3	91.50	62.93	81.50	85.69	102.49	84.37
	4	97.34	102.07	93.53	87.10	96.57	97.95
	5	103.77	103.63	102.53	91.10	82.44	90.29
	RF=3.1GHz&-5dBm; L0=6.1GHz&+17dBm						

		M*LO					
		0	1	2	3	4	5
M*RF	0	/	13.40	40.56	23.00	52.10	52.51
	1	15.65	0.00	21.39	16.58	45.73	55.47
	2	62.72	70.36	95.93	68.16	77.61	68.89
	3	84.58	93.90	82.25	99.51	97.86	61.21
	4	88.12	86.01	83.25	91.95	92.66	101.11
	5	86.40	98.75	85.55	100.54	93.17	95.23
	RF=6.1GHz&-5dBm; L0=3.1GHz&+17dBm						

		M*LO					
		0	1	2	3	4	5
M*RF	0	/	12.78	40.88	52.64	46.43	67.82
	1	16.61	0.00	38.02	39.10	55.67	53.48
	2	63.18	70.80	72.99	71.37	92.81	87.33
	3	100.58	100.13	86.11	69.67	87.23	87.94
	4	94.25	92.59	94.65	96.01	88.90	97.29
	5	87.48	105.02	86.93	86.96	94.58	88.69
	RF=6.1GHz&-5dBm; L0=6GHz&+17dBm						

杂散(下变频)

		M*LO					
		0	1	2	3	4	5
M*RF	0	/	6.27	30.11	46.14	46.35	61.35
	1	13.32	0.00	33.08	45.45	67.83	71.44
	2	61.10	45.74	69.69	75.87	77.31	91.11
	3	90.11	90.69	71.19	84.50	88.29	91.02
	4	95.27	93.89	93.07	87.08	83.64	83.58
	5	90.30	92.86	81.90	84.59	89.75	91.63
RF=6.1GHz&-5dBm; LO=9.1GHz&+17dBm							

		M*LO					
		0	1	2	3	4	5
M*RF	0	/	10.61	36.03	38.99	37.58	64.43
	1	11.10	0.00	47.85	38.19	56.95	43.22
	2	53.59	88.92	78.60	63.02	82.57	93.82
	3	89.66	87.93	82.36	82.70	75.83	67.56
	4	73.19	82.08	83.21	82.94	82.19	85.68
	5	/	66.56	87.77	76.73	76.42	81.44
RF=10.1GHz&-5dBm; LO=7.1GHz&+17dBm							

		M*LO					
		0	1	2	3	4	5
M*RF	0	/	-4.50	32.11	52.73	64.04	/
	1	14.11	0.00	47.25	49.99	79.91	80.83
	2	56.84	70.43	63.54	65.09	95.62	88.04
	3	82.12	97.20	82.20	83.59	93.80	92.82
	4	77.43	77.69	86.50	96.22	99.94	86.74
	5	/	71.83	98.88	82.30	100.68	89.30
RF=10.1GHz&-5dBm; LO=10GHz&+17dBm							

杂散(上变频)

		M*LO					
		0	1	2	3	4	5
M*IF	-5	87.92	76.87	101.34	93.47	98.10	80.80
	-4	87.65	87.86	98.38	98.24	86.19	97.25
	-3	84.75	66.89	83.60	99.43	90.82	80.53
	-2	73.68	49.96	66.15	71.23	84.25	102.21
	-1	28.52	-0.35	30.22	27.00	34.36	55.23
	0	/	15.65	12.48	30.81	44.39	52.94
	1	28.51	0.00	30.97	27.50	34.04	57.54
	2	73.64	51.21	66.70	77.21	89.66	83.74
	3	85.47	69.54	97.43	97.89	80.27	98.27
	4	86.76	97.34	95.96	100.11	88.76	84.47
	5	101.22	80.90	96.59	87.90	84.66	95.36
IF=0.1GHz&-7dBm; LO=5GHz&+17dBm							

		M*LO					
		0	1	2	3	4	5
M*IF	-5	93.01	101.51	87.94	87.80	98.23	96.05
	-4	79.76	97.58	84.04	98.77	95.96	97.54
	-3	74.60	70.53	88.26	69.91	95.46	82.46
	-2	55.57	48.63	67.33	99.11	96.76	88.58
	-1	9.81	-1.14	25.35	23.88	36.47	53.26
	0	/	14.50	10.94	29.35	42.78	51.67
	1	9.80	0.00	38.30	30.68	30.84	62.44
	2	55.46	49.67	66.63	82.05	82.63	95.19
	3	74.52	70.31	90.76	89.54	85.93	86.73
	4	83.24	94.68	96.86	90.72	91.78	80.14
	5	93.68	84.95	80.72	83.02	90.09	89.59
IF=0.95GHz&-7dBm; LO=5GHz&+17dBm							

杂散 (上变频)

	M*L0						
		0	1	2	3	4	5
M*IF	-5	87.19	82.64	104.66	84.22	93.84	85.06
	-4	81.50	102.75	98.90	82.66	94.58	80.55
	-3	83.60	92.39	80.68	63.96	85.76	83.03
	-2	64.55	77.93	62.19	96.97	79.65	79.91
	-1	6.15	-1.48	23.97	21.66	37.12	60.58
	0	/	13.98	10.34	28.79	42.18	50.67
	1	6.15	0.00	38.87	35.09	28.35	64.27
	2	64.71	61.43	74.90	94.78	93.61	91.81
	3	79.19	66.06	96.24	80.23	93.40	76.96
	4	81.96	84.66	92.24	79.55	92.31	87.98
	5	88.94	80.90	83.25	87.55	94.71	75.22

IF=1.95GHz&-7dBm; L0=5GHz&+17dBm

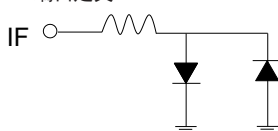
绝对最大额定值

RF/IF输入功率	28dBm
L0输入功率	28dBm
存储温度	-65°C~+150°C
工作温度	-40°C~+85°C
ESD_HBM	Class 1A

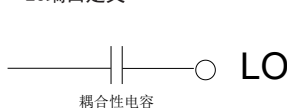
引脚定义

序号	功能符号	功能描述	尺寸
1	RF	射频端口, 交流耦合外端匹配到50Ω	70um X 140um
2	L0	本振端口, 交流耦合外端匹配到50Ω	70um X 140um
5	IF	中频端口, 直流耦合外端匹配到50Ω	100um X 140um
3-4; 6	GND	射频地	70um X 100um / 100um X 100um

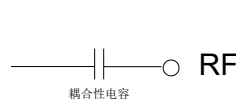
IF端口定义



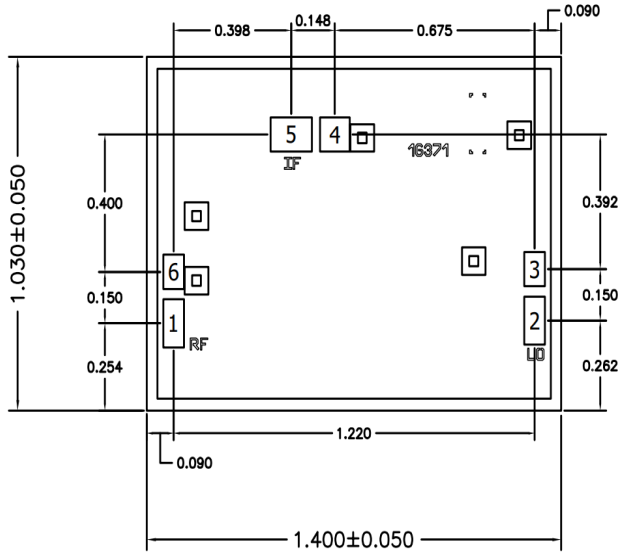
L0端口定义



RF端口定义



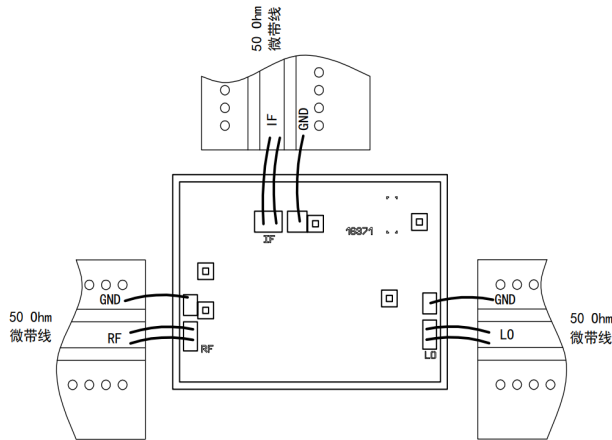
外形尺寸图



说明:

- 1、单位: 毫米
- 2、键合压点材质镀金
- 3、芯片厚度: 0.100mm±0.150mm
- 4、不能在通孔上进行键合, 未编号键合压点也不需要键合
- 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: 1 mil Au
- 3、键合时注意图中线长尽量短