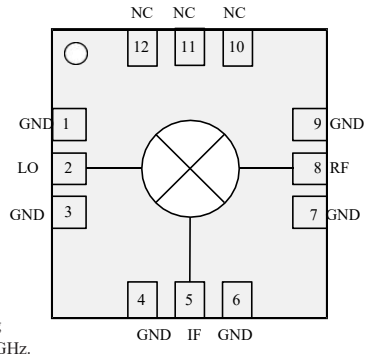
Performance characteristics

- Conversion loss: 9dB
- LO to RF isolation: 45dB
- LO to IF isolation: 35dB
- Passive double balanced topology
- Wide IF bandwidth: DC ~ 6GHz
- Package size: 3mm*3mm 12-lead QFN

Typical application

- Point-to-point communication
- Instruments and meters
- 5G communication

Functional block diagram



Overview

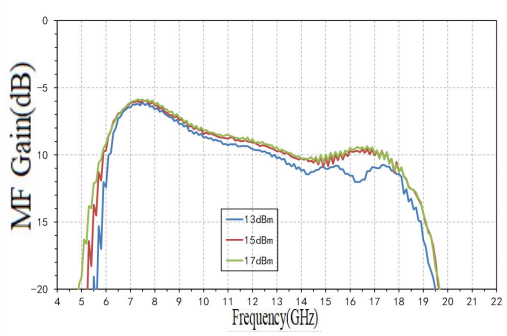
The CWM8004SP3B is a general purpose double balanced mixer manufactured using the GaAs process. The device is passive and does not require bias, external components or matching circuits. It can be used as an up-converter or down-converter with frequencies from 6GHz to 18GHz.

Electrical performance table (TA=+25 ℃)

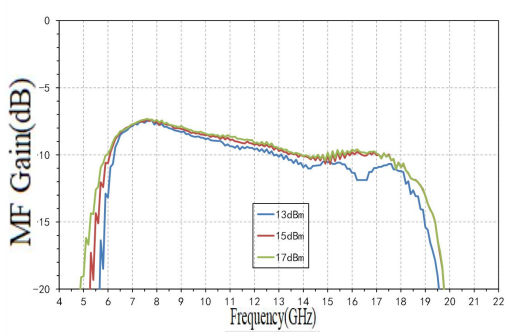
Parameter name	Describe	Minimum value	Typical value	Maximum value	Unit
Radio frequency	RF, LO ports	6 ~ 18			GHz
Intermediate frequency	IF port	DC ~ 6			GHz
Conversion loss			9	11	dB
Noise figure	SSB		9	11	dB
Isolation	LO to RF port		45		dB
	LO to IF port		35		dB
	RF to IF ports		22		dB
Enter 1dB compression point			12		dB
Enter IP3			24		dBm

Test curve

IF gain VS RF frequency (up-conversion)



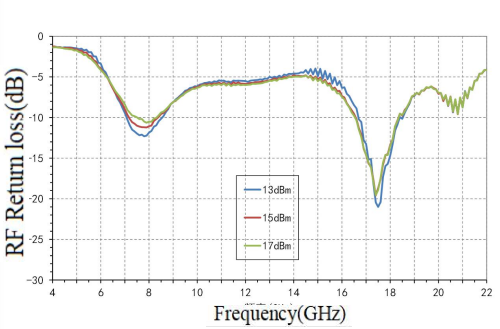
IF gain VS RF frequency (down conversion)



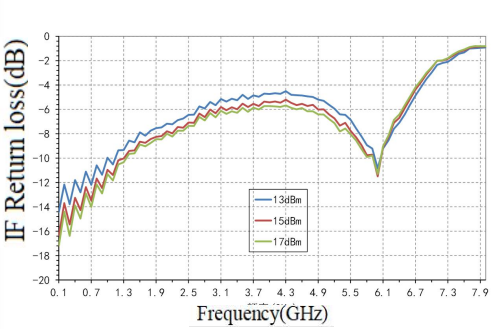
Chengdu Cuiwei Electronic Co.,LTD
Address: No. 5, Gaopeng East Road, Gaoxin District, Chengdu, China
E-mail:sales@cdcwtec.com
Website: www.cdcwtec.com

Test curve

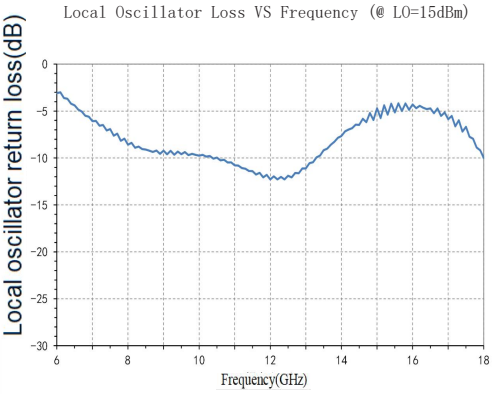
RF loss VS frequency (@ LO=13, 15, 17dBm)



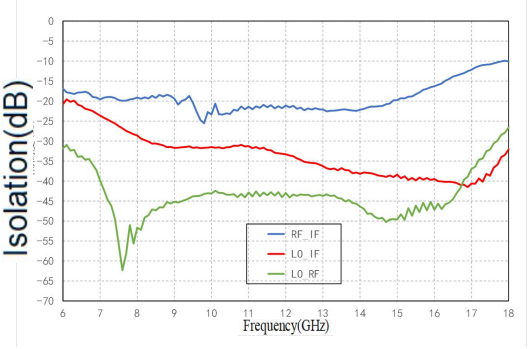
IF Wave Loss VS Frequency (@ LO=13, 15, 17dBm



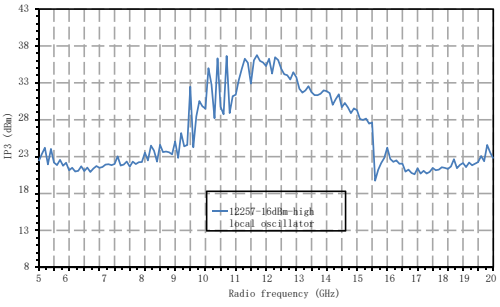
Local Oscillator Loss VS Frequency (@ LO=15dBm)



Isolation VS frequency



IP3 VS RF Frequency
(High Local Oscillator)



Chengdu Cuiwei Electronic Co.,LTD
Address: No. 5, Gaopeng East Road, Gaoxin District, Chengdu, China
E-mail:sales@cdcwtec.com
Website: www.cdcwtec.com

Operating parameters

Operating temperature	-40 ℃ ~ + 85 ℃

Absolute maximum rating

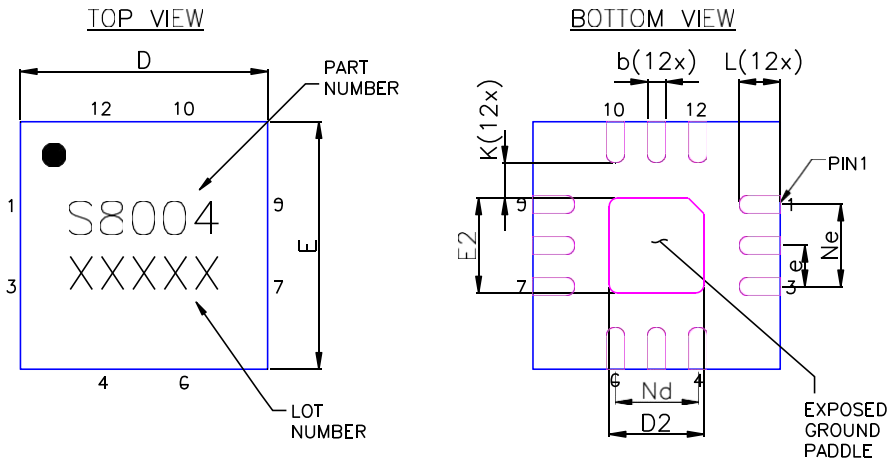
RF input power	25dBm
LO input power	25dBm
Storage temperature	-65 ℃ ~ + 150 ℃
ESD (HBM)	TBD

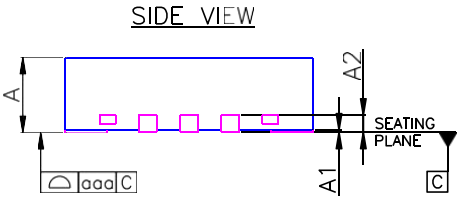
Encapsulation information

Model	Packaging material	Pad coating	MSL Rank [1]	Package ID [2]	Environmental protection requirements
CWM8004SP3B	Green resin compound	Sn	MSL 3	S8004 XXXXX	RoHS compliant

[1] The maximum flow soldering temperature is 260 ℃
[2] XXXXX is the batch number

Overall dimensions





Description: 1. Unit: mm
2. Lead frame material: copper alloy
3. Package surface warpage: ≤ 0. 05mm
4. Please connect all ground pins to PCB RF ground

Dimension Table (unit:mm)

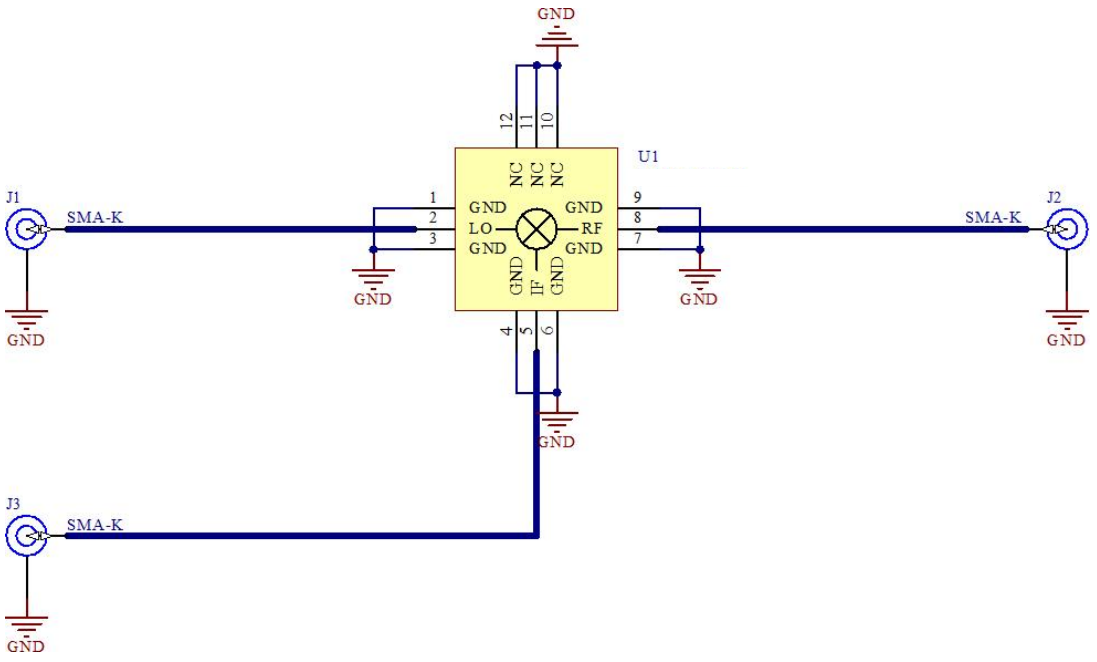
Symbol	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
A2		0.20Ref	
b	0.17	0.22	0.27
D	2.90	3.00	3.10
D2	1.05	1.15	1.25
e		0.50BSC	
Ne		1.00BSC	
Nd		1.00BSC	
E	2.90	3.00	3.10
E2	1.05	1.15	1.25
K	0.20	---	---
L	0.40	0.50	0.60
aaa		0.08	

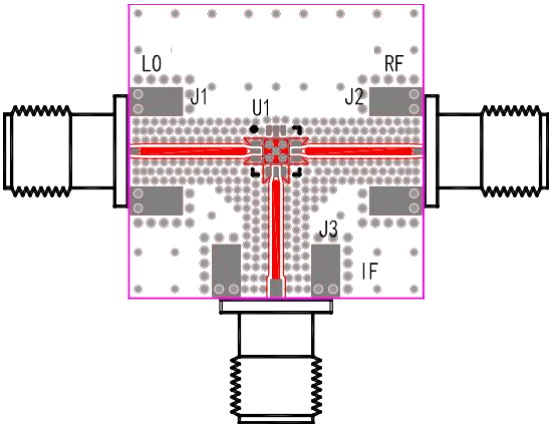
Pin definition

Pin number	Functional symbol	Functional description	Pin number	Functional symbol	Functional description
1	GND	Radio frequency ground	7	GND	Radio frequency ground
2	LO	Local oscillator input	8	RF	Radio frequency input
3	GND	Radio frequency ground	9	GND	Radio frequency ground
4	GND	Radio frequency ground	10	NC	Vacancy
5	IF	IF output	11	NC	Vacancy
6	GND	Radio frequency ground	12	NC	Vacancy

Chengdu Cuiwei Electronic Co.,LTD
Address: No. 5, Gaopeng East Road, Gaoxin District, Chengdu, China
E-mail:sales@cdcwtec.com
Website: www.cdcwtec.com

Evaluation board





Circuit board material: Rogers 4350B

DeCWgnator	Description
J1, J2, J3	SMA-K connector Nanjing Aowen D550B12E01-048
U1	CWM8004SP3B
Nanjing Aowen D550B12E01-048 SMA joint is recommended for J1, J2 and J3	

The circuit board used in the device shall be designed according to the design method of RF circuit, the signal line shall be designed according to the impedance of 50 ohm, and the grounding pin of the package housing shall be grounded nearby (similar to the figure), and there shall be enough grounding holes connecting the top layer and the bottom layer.