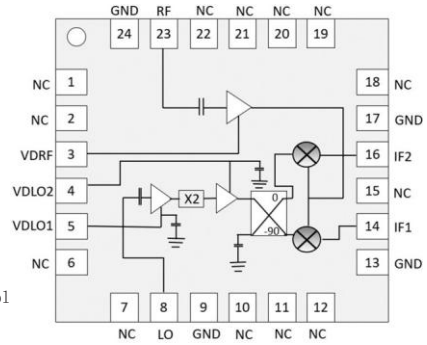
Performance Features

- Conversion gain: 14dB
- Mirror rejection: 20dBc
- 2 LO to IF isolation: 45dB
- Noise factor: 2.5dB
- Input IP3: 1dBm
- Package size: 4mm*4mm 24-pin QFN

Typical Applications

- Point-to-Point Communication
- Radar, satellite communications
- Point-to-Multiple Communications

Functional Block Diagram



Overview

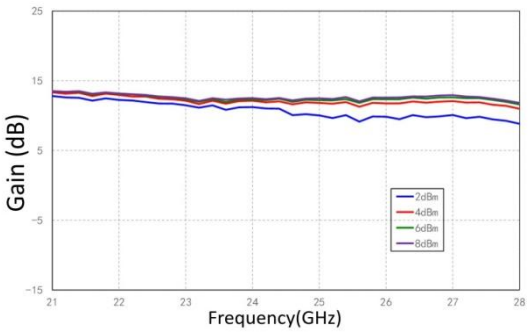
The CWDC137SP4 is a GaAs MMIC I/Q downconverter that integrates a doubl balanced mixer, a fundamental quadrature amplifier, and an RF self-biasing low-noise amplifier. This downconverter is primarily used in typical commercial communication systems.

Electrical performance table (TA=+25℃, IF=1000MHz, LO=+6dBm, VDD=VDLO1=VDLO2=VDRF=3.5V)

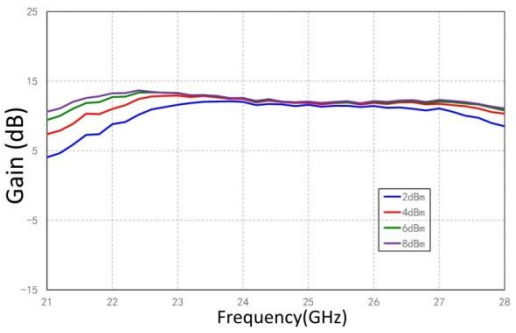
Parameter Name	Description	Minimum value	Typical values	Maximum value	Unit
Frequency range	RF Port		21~28		GHz
Frequency range	LO Port		8.3~15.5		GHz
Frequency range	IF Port		DC~3.5		GHz
Conversion gain			14		dB
Noise factor			2.5		dB
Mirror Suppression			20		dBc
Input 1dB compression point			-8		dBm
Isolation degree	2LO to RF port		-45		dB
	2LO to IF port		-20		dB
Enter IP3			1		dBm
Operating current			170	210	mA

Test Curve

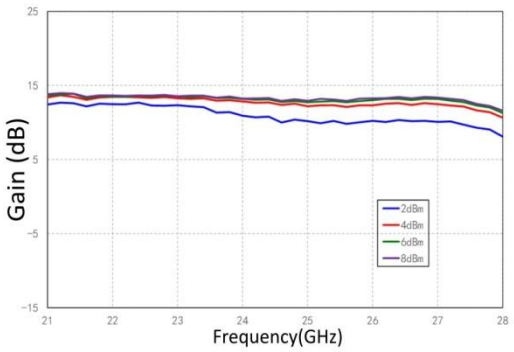
IF gain vs. RF frequency (USB IF=0.5GHz)



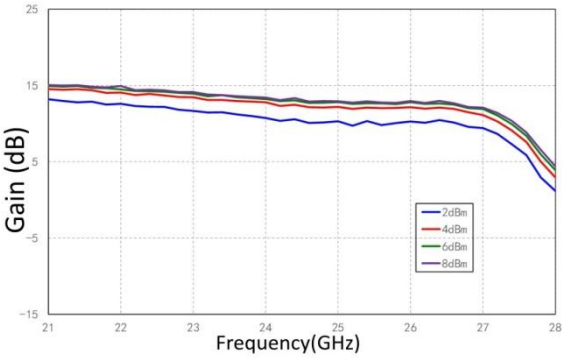
IF gain vs. RF frequency (USB IF=3.3GHz)



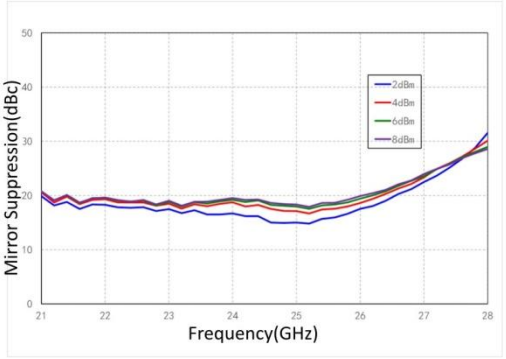
IF gain vs. RF frequency (LSB IF=0.5GHz)



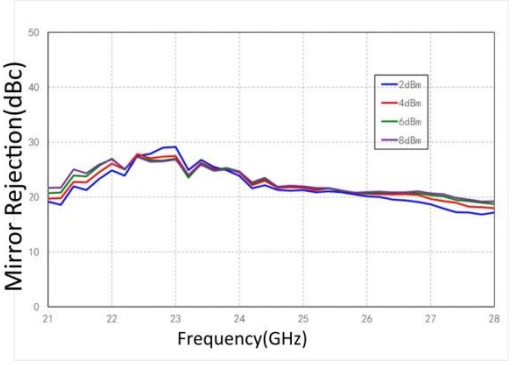
IF gain vs. RF frequency (LSB IF=3.3GHz)



Mirror suppression vs. RF frequency (USB IF=0.5GHz)



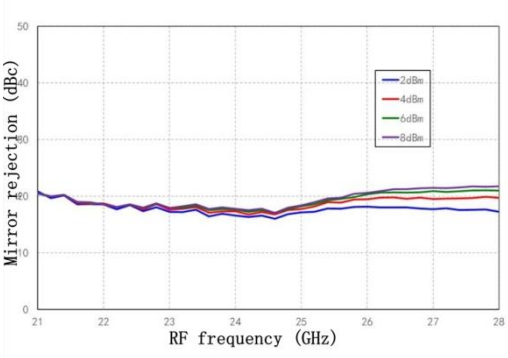
Mirror rejection vs. RF frequency (USB IF=3.3GHz)



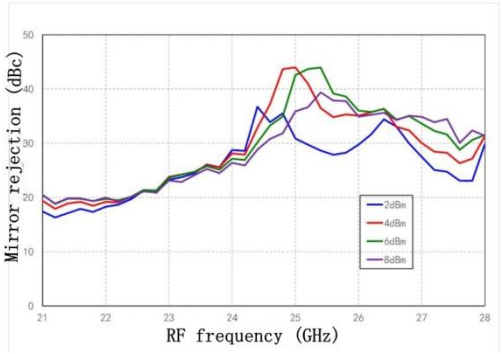
Chengdu Cuiwei Electronic Co.,LTD
Address: No. 5, Gaopeng East Road, Gaoxin District, Chengdu, China
E-mail:sales@cdcwtec.com
Website: www.cdcwtec.com

Test Curve

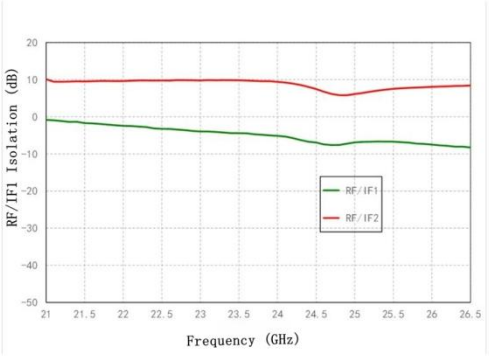
Mirror suppression vs. RF frequency (LSB IF=0.5GHz)



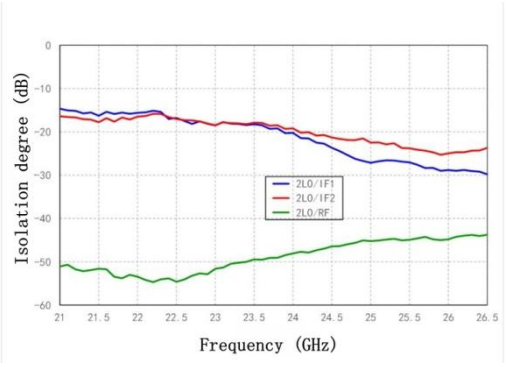
Mirror rejection vs. RF frequency (LSB IF=3.3GHz)



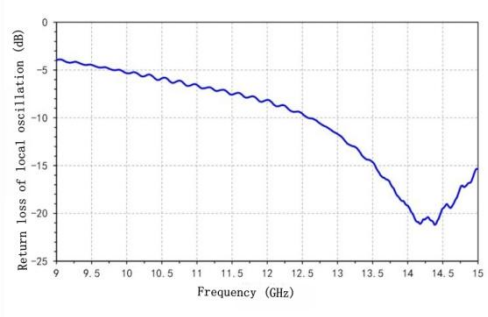
Isolation vs. frequency (RF-IF1, RF-IF2)



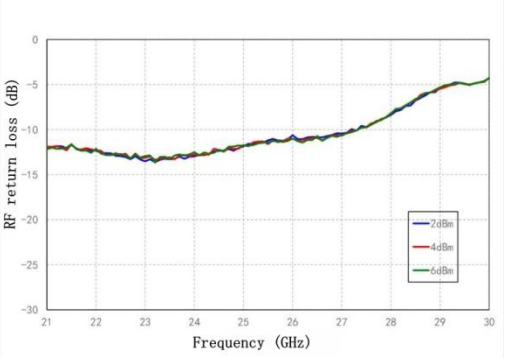
Isolation vs. frequency (2LO-IF1, 2LO-IF2, 2LO-RF)



Return loss of local oscillation VS frequency (power of 6dBm)

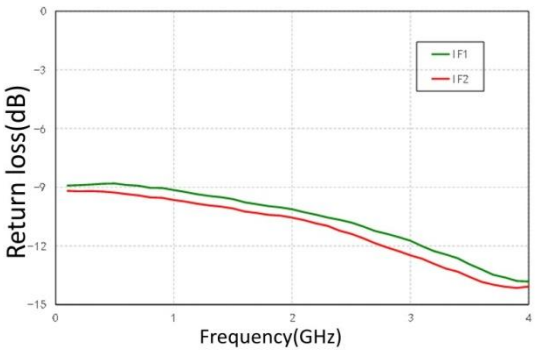


RF return loss vs. frequency

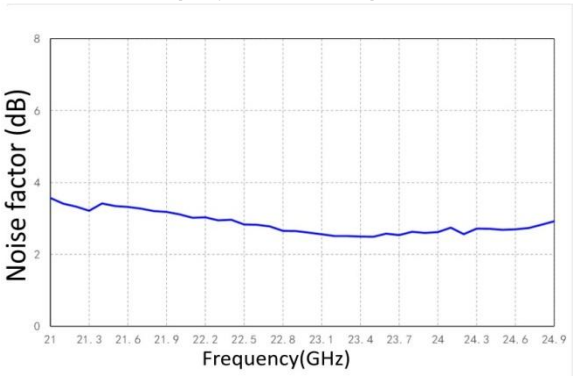


Test Curve

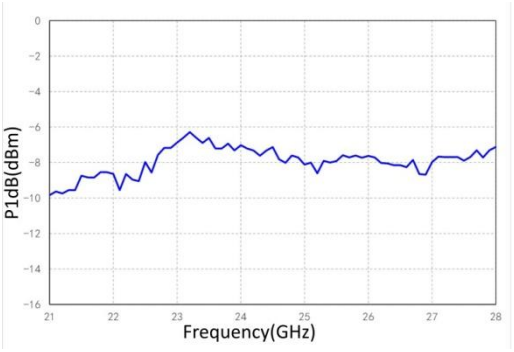
IF return loss vs. RF frequency (LSB@LO=10.5GHz power is 6dBm)



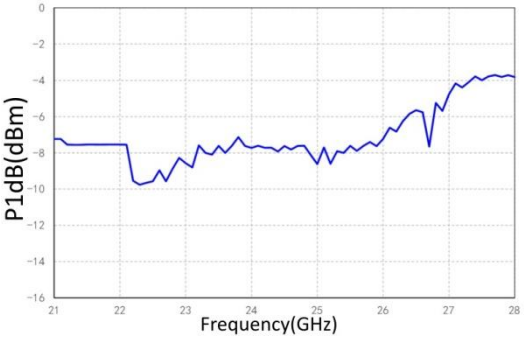
Noise factor vs. frequency (LSB@LO=12.5GHz power 6dBm)



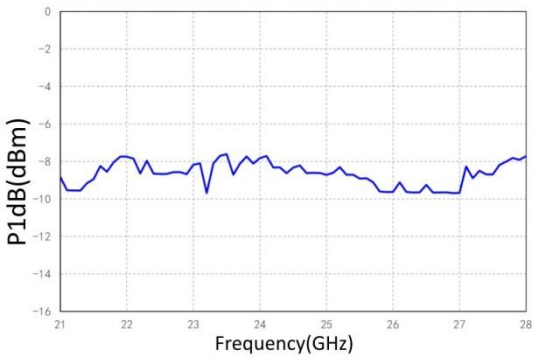
P1dB VS RF frequency (USB IF=0.5GHz power is 6dBm)



P1dB VS RF frequency (USB IF=3.3GHz power is 6dBm)



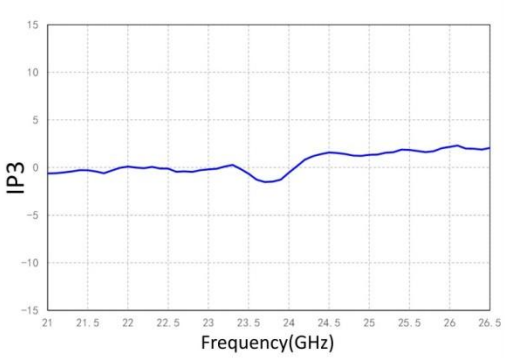
P1dB VS RF frequency (LSB IF=0.5GHz Power is



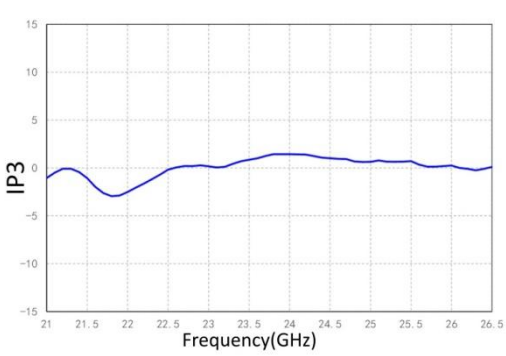
Chengdu Cuiwei Electronic Co.,LTD
Address: No. 5, Gaopeng East Road, Gaoxin District, Chengdu, China
E-mail:sales@cdcwtec.com
Website: www.cdcwtec.com

Test Curve

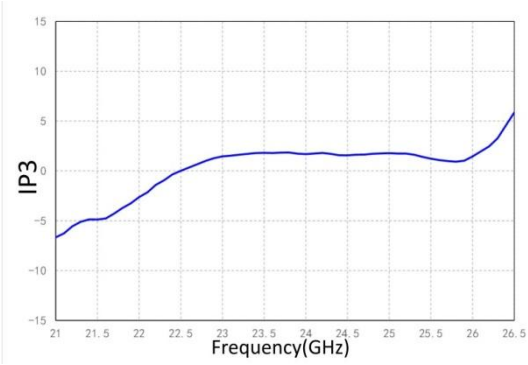
IP3 VS RF Frequency (USB IF=1GHz Power of 6dBm)



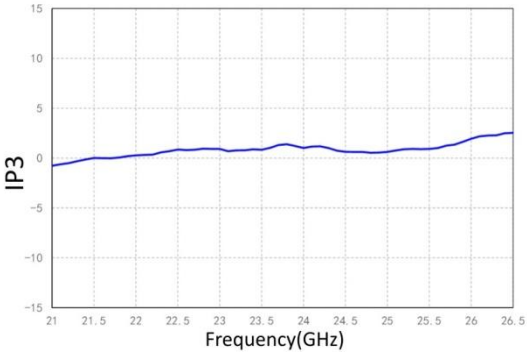
IP3 VS RF frequency (LSB IF=1GHz Power of 6dBm)



IP3 VS RF frequency (USB IF=3.3GHz power of 6dBm)



IP3 VS RF frequency (LSB IF=3.3GHz Power is 6dBm)



Working parameters

Operating temperature	-40℃～+85℃

Absolute maximum rating

RF input power	2dBm
LO input power	10dBm
VDD	5V
Channel temperature	175° C
Storage temperature	-65℃～+150℃
Operating temperature	-55℃～+85℃
ESD (HBM)	Class 1A

Package Information

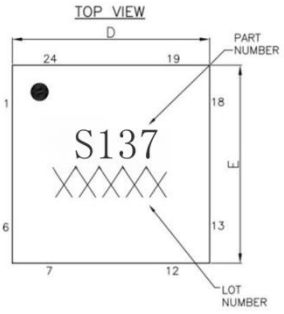
Model	Packaging Materials	Solder plate plating	MSL level [1]	Package identification [2]	Environmental requirements
CWDC137SP4	Green resin compounds	Sn	MSL 3	S137 XXXXX	RoHS compliant

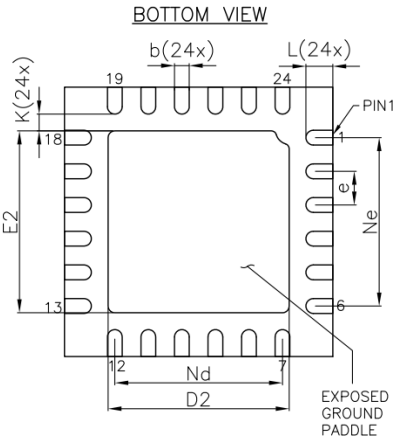
[1] Maximum reflow temperature 260°C

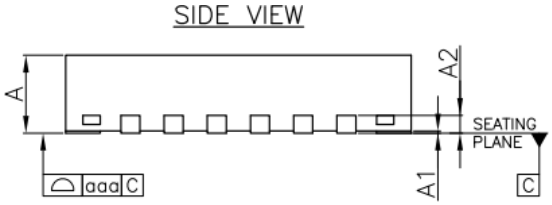
[2] XXXXX is the lot number

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

Dimension







Description:

1. Unit: mm
2. Lead frame material: copper alloy
3. Package surface warpage: ≤0.05mm
4. All ground pins please connect PCB RF ground

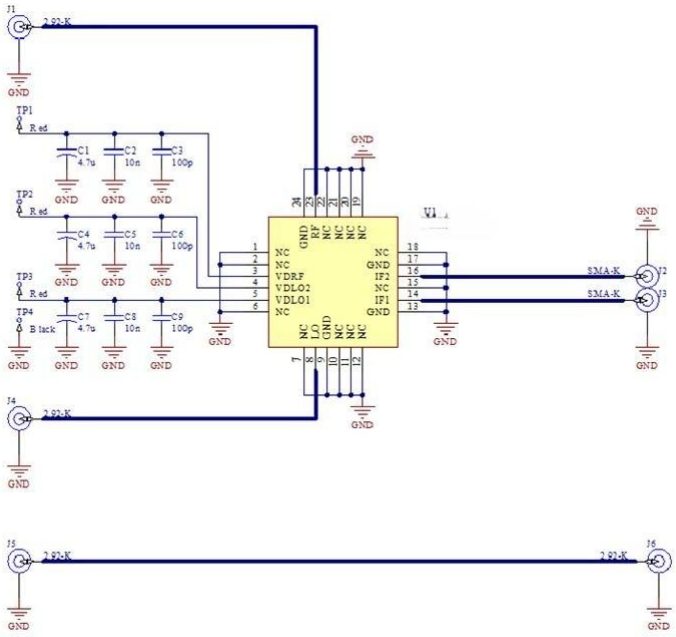
Dimension Table (unit:mm)			
Symbol	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
A2		0.20Ref	
b	0.18	0.25	0.30
D	3.90	4.00	4.10
D2	2.55	2.70	2.80
e		0.50BSC	
Ne		2.50BSC	
Nd		2.50BSC	
E	3.90	4.00	4.10
E2	2.55	2.70	2.80
K	0.20	---	---
L	0.30	0.40	0.50
aaa		0.08	

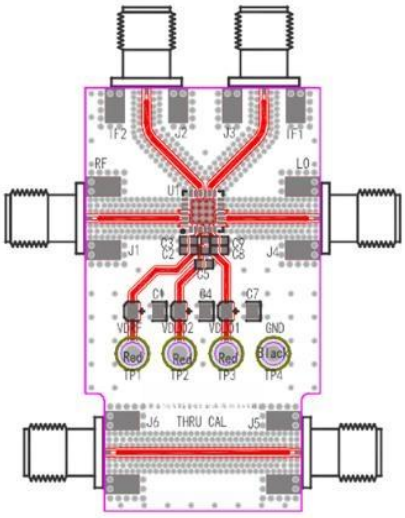
Pin Definition

Pin Number	Function Symbols	Function Description	Pin Number	Function Symbols	Function Description
1	NC	Vacant	13	GND	RF Ground
2	NC	Vacant	14	IF1	IF output 1
3	VDRF	RF amplifier voltage	15	NC	Vacant
4	VDL2	Local amplifier voltage2	16	IF2	IF output 2
5	VDL1	Local oscillator amplifier voltage1	17	GND	RF Ground
6	NC	Vacant	18	NC	Vacant
7	NC	Vacant	19	NC	Vacant
8	LO	Local oscillator input	20	NC	Vacant
9	GND	RF Ground	21	NC	Vacant
10	NC	Vacant	22	NC	Vacant
11	NC	Vacant	23	RF	RF input
12	NC	Vacant	24	GND	RF Ground

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 Boards





Designator	Description
C1,C4,C7	4.7uf Tantalum Capacitor 1206
C2,C5,C8	10nf Ceramic Capacitor 0402
C3,C6,C9	100pf Ceramic Capacitor 0402
TP4	Test point terminal red
TP1,TP2,TP3	Test point terminal black
J2,J3	SMA-K connector Nanjing Aowen D550B12E01-048
U1	CWDC137SP4
J1,J4,J5,J6 recommended to use 2.92-K connector	

Circuit board material: Rogers 4350B

The circuit board for the device application should be designed in accordance with the RF circuit design method and the signal

The grounding pin of the package housing should be grounded nearby (similar to the diagram), and there should be enough ground holes to connect the top and bottom ground.

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