

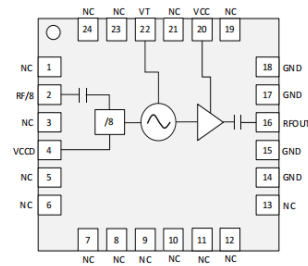
Performance Features

- Operating frequency band: 19.5GHz~22.5GHz
- Low power consumption: 140mA
- Output Power: 5.5dBm
- Phase noise: -104dBc/Hz@100kHz
- Package size: 24-pin QFN, 4mmx4mm

Typical Applications

- Point-to-Point Communication
- Satellite Communications
- Test measurements
- Instrumentation

Functional Block Diagram



Overview

CWV008SP4 type voltage controlled oscillator has very low phase noise in the same frequency range, very low 1/2, 3/2 and Nth harmonic interference, low power consumption, and flat output power characteristics.

The CWV008SP4 voltage controlled oscillator is available in a 24-pin 4mmx4mm surface mount leadless plastic package. The pin pads are coated with Sn or NiPdAu.

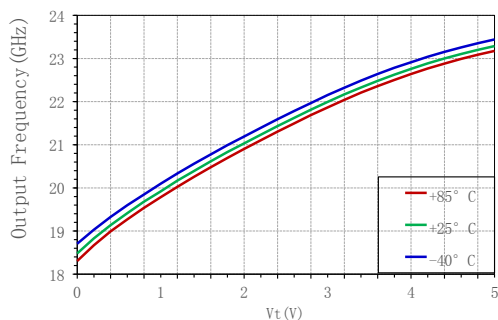
Electrical performance table (TA=+25°C, VCC=VCCD=5V)

Parameter Name	Port Name	Minimum value	Typical values	Maximum value	Unit
Frequency range	RFOUT	19.5 to 22.5			GHz
Output power	RFOUT	1.5	5	9.5	dBm
	RF/8	-3.5	-1	1.5	
Single-sideband phase noise @ 100kHz frequency	RFOUT		-104		dBc/Hz
Tuning voltage	Vt	0		5	V
Bias voltage	VCC, VCCD		5		V
Bias current	VCC	105	120	135	mA
	VCCD	17.5	20	22.5	
Tuning current (Vt=+5V)	Vt			1	uA
Harmonic Suppression	1st/2nd harmonic		30		dBc
	3rd/2nd harmonic		35		
Push frequency factor			16		MHz/V
Frequency temperature drift			2		MHz/°C

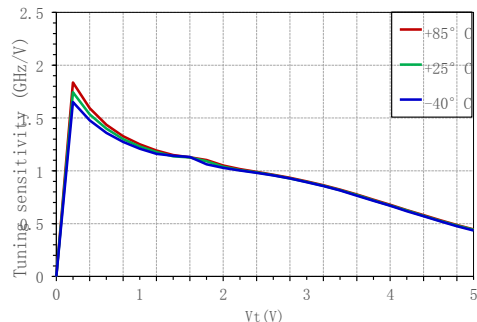
Note: When the chip is applied, VCC is added first, then Vt is added

Test Curve

RFOUT output frequency VS tuning voltage



RFOUT tuning sensitivity VS tuning voltage

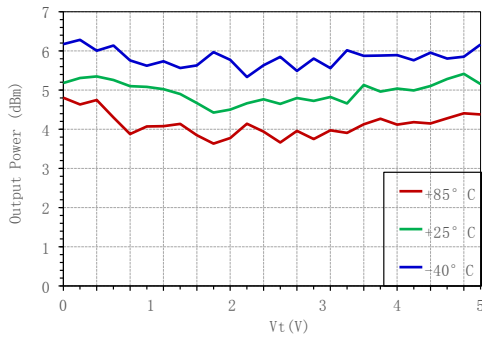


Test Curve

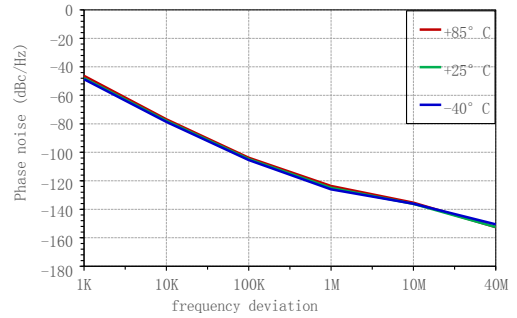
CWV

Voltage Controlled Oscillator Series

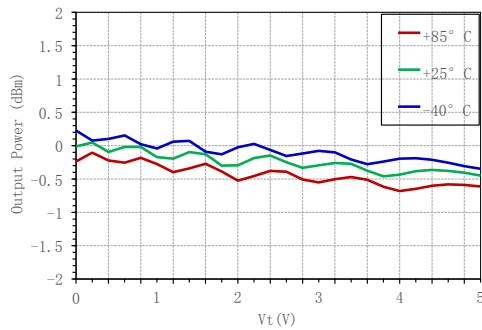
RFOUT output power vs. tuning voltage



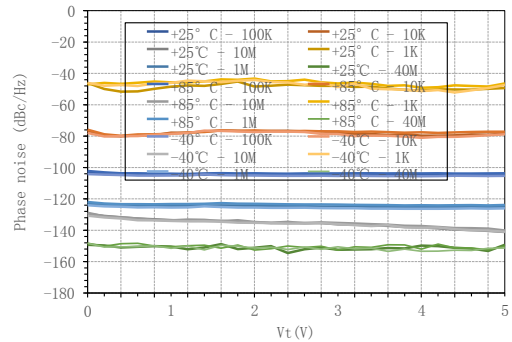
RFOUT phase noise vs. offset frequency @Vt=+3V



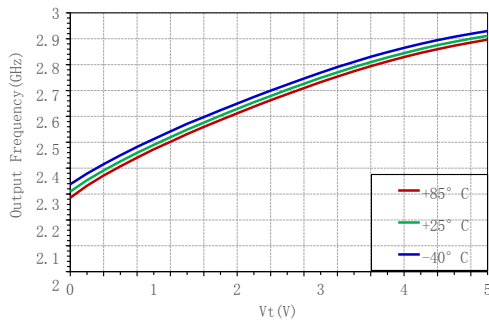
RF/8 output power vs. tuning voltage



RFOUT phase noise vs. tuning voltage



RF/8 output frequency vs. tuning voltage



Extreme operating parameters

Bias voltage	5.5V
Tuning voltage	0V to 5.5V
Storage temperature range	-65°C~+150°C
Operating temperature range	-40°C~+85°C
Electrostatic protection level (HBM)	Class 1B

Package Information

Model	Packaging materials	Solder plate plating	MSL level (1)	Package identification (2)	Environmental requirements
CWV008SP4	Green resin compounds	Sn or NiPdAu	MSL 3	S008 XXXXX	RoHS compliant

(1) Maximum reflow temperature 260° C

(2) XXXXX is the lot number

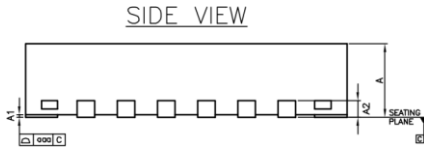
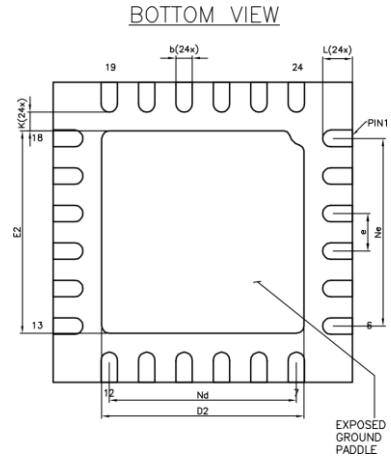
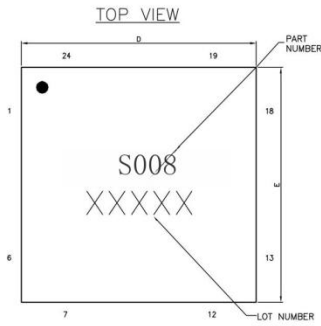
Pin Definition

Pin Number	Function Symbols	Function Description	Pin Number	Function Symbols	Function Description
1	NC	Vacant	13	NC	Vacant
2	RF/8	RF Output	14	GND	RF Ground
3	NC	Vacant	15	GND	RF Ground
4	VCCD	DC Bias	16	RFOUT	RF Output
5	NC	Vacant	17	GND	RF Ground
6	NC	Vacant	18	GND	RF Ground
7	NC	Vacant	19	NC	Vacant
8	NC	Vacant	20	VCC	DC Bias
9	NC	Vacant	21	NC	Vacant
10	NC	Vacant	22	VT	Tuning voltage
11	NC	Vacant	23	NC	Vacant
12	NC	Vacant	24	NC	Vacant

Dimension

CWV

Voltage Controlled Oscillator Series

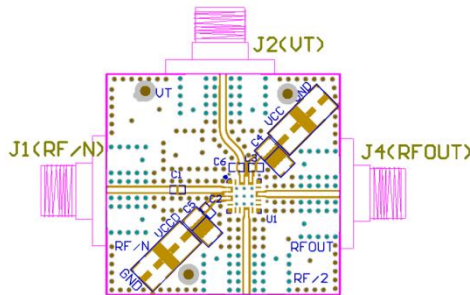
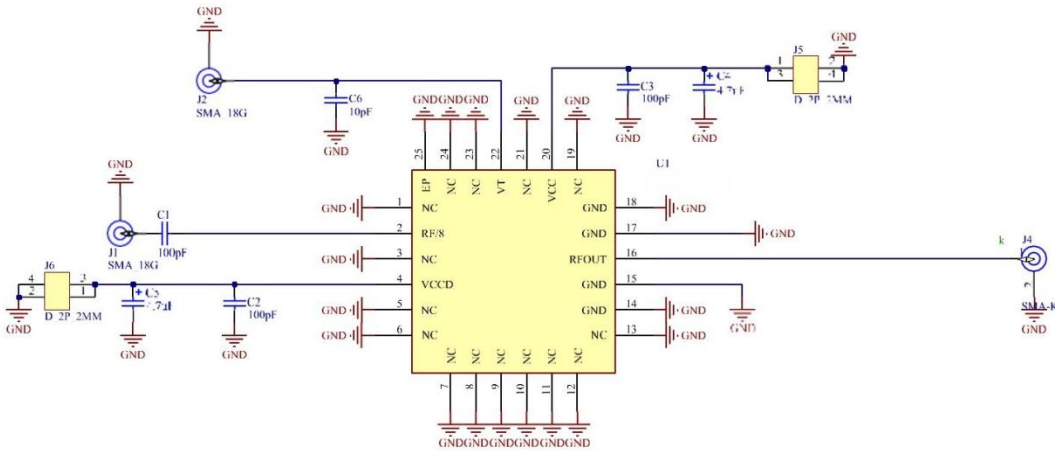


Description:

1. Unit: mm
2. Lead frame material: copper alloy
3. Lead spacing tolerance non-cumulative
4. Tube shell surface warpage: not more than 0.05mm
5. All ground pins should be connected 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	0.18	0.25	0.30
D	2.90	3.00	3.10
D2	1.41	1.56	1.70
e	0.50BSC		
Ne	1.50BSC		
Nd	1.50BSC		
E	2.90	3.00	3.10
E2	1.41	1.56	1.70
K	0.20	---	---
L	0.30	0.40	0.50
aaa	0.08		

Evaluation Boards



Designator	Description
C1, C2, C3	Multilayer ceramic capacitor 0402 100pF
C4, C5	Tantalum Capacitor - Solid 4.7uF 1206
C6	Multilayer ceramic capacitor 10pF 0402
J1, J2	SMA PCB connector
J4	2.92mm PCB connector
VCCD, VCC	2 mm DC pins
U1	CWV008SP4
J1, J2 recommended to use Nanjing Aowen D550B12E01-048 SMA connector. J4 recommended to use Nanjing Aowen D360B12E01-023 2.92mm connector	

Circuit board material: Rogers 4350B

The circuit board of the device application should be designed according to the RF circuit design method, the signal line should be designed according to the 50 ohm impedance, and the ground pin of the package shell should be grounded nearby (similar to the figure), and there should be enough grounding holes to connect the top and bottom ground layers.