

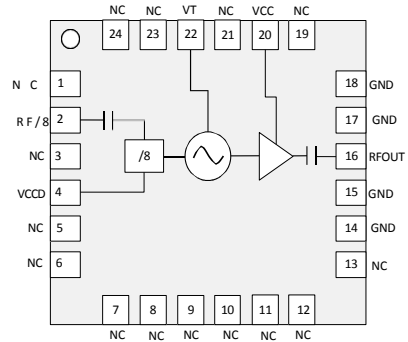
Performance Features

- Operating frequency band: 23.5 GHz to 26.8 GHz
- Low power consumption: 148mA
- Output Power: 5dBm
- Phase noise: -102dBc/Hz@100kHz
- Package size: 24-pin QFN, 4mmx4mm

Typical Applications

- Point-to-Point Communication
- Satellite Communications
- Test measurements
- Instrumentation
- 5G Communication

Functional Block Diagram



Overview

The CWV009SP4 voltage controlled oscillator features 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.

The CWV009SP4 voltage controlled oscillator is available in a 24-pin 4mmx4mm surface mount leadless plastic package. The pin pads are coated with Sn.

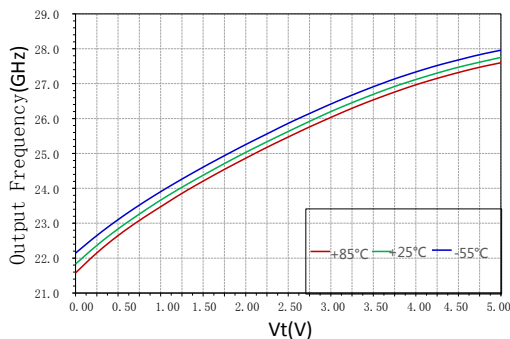
Electrical performance table (TA=+25°C, VCC=VCCD= 5 V)

Parameter Name	Port Name	Minimum value	Typical values	Maximum value	Unit
Frequency range	RFOUT	23.5 to 26.8			GHz
Output power	RFOUT	1	5	9	dBm
	RF/8	-4	-2	0	
Single-sideband phase noise @ 100kHz, Vt=+2V	RFOUT	-102			dBc/Hz
Tuning voltage	Vt	0	5		V
Bias voltage	VCC, VCCD	5			V
	Vcc (RF)	115	128	135	mA
Bias current	Vcc (DIG)	18	20	22	
	Tuning current (Vt=+5V)	Vt	1		uA
Harmonic Suppression	1st/2nd harmonic	30			dBc
	3rd/2nd harmonic	40			dBc
Push frequency factor	40			MHz/V	
Frequency temperature drift	2.55			MHz/°C	

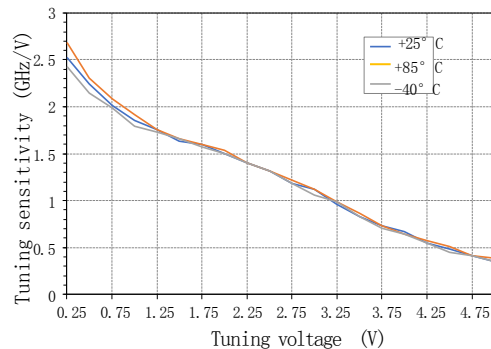
Note: When applying the chip, you need to add VCC first, then add Vt

Test Curve

RFOUT output frequency VS tuning voltage



RFOUT tuning sensitivity VS tuning voltage

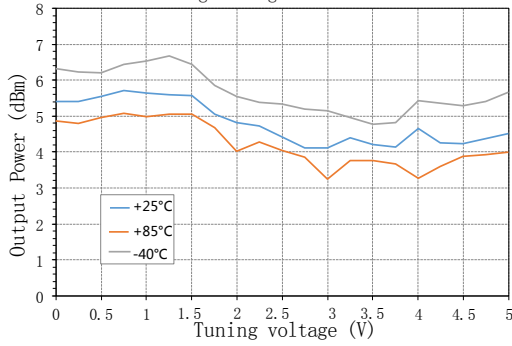


Test Curve

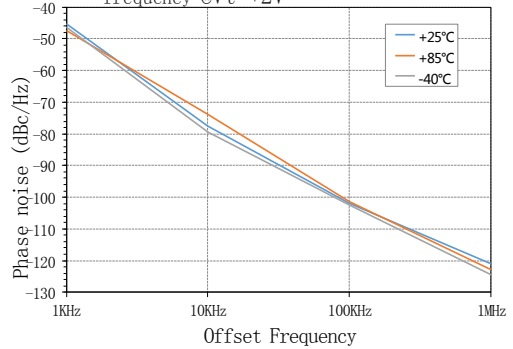
CWV

Voltage Controlled Oscillator Series

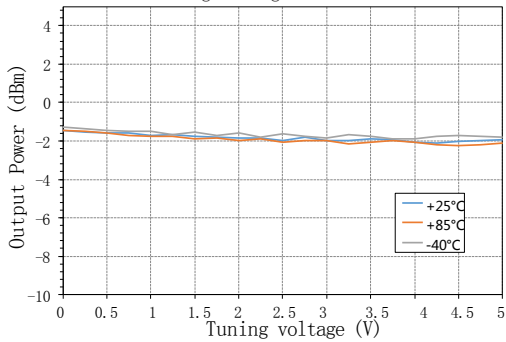
RFOUT output power vs. tuning voltage



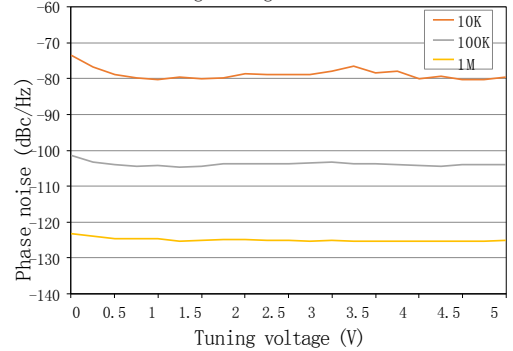
RFOUT phase noise vs. offset frequency @Vt=+2V



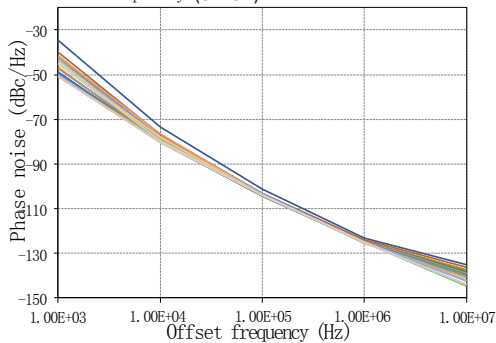
RF/8 output power vs. tuning voltage



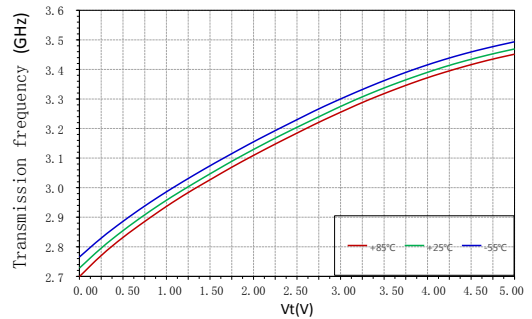
RFOUT phase noise vs. tuning voltage



RFOUT Phase Noise VS Offset Frequency (0V~5V)



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
CWV009SP4	Green resin compounds	Sn	MSL 3	S009 XXXXX	RoHS compliant

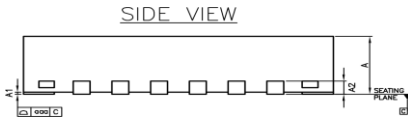
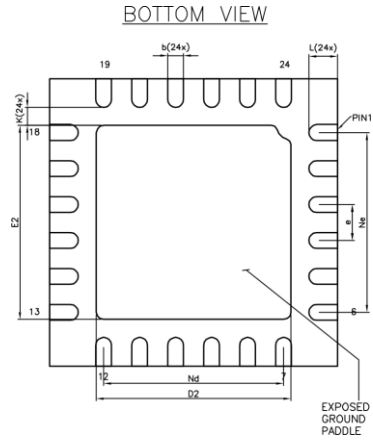
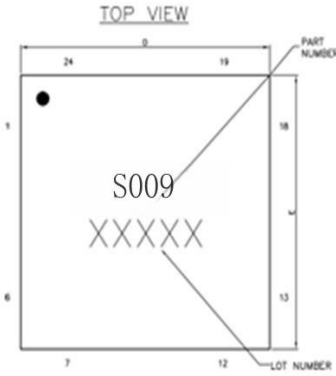
[1] Maximum reflow temperature 260° C

[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

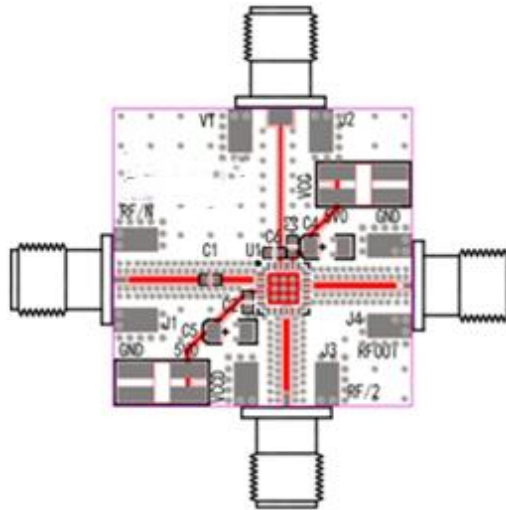
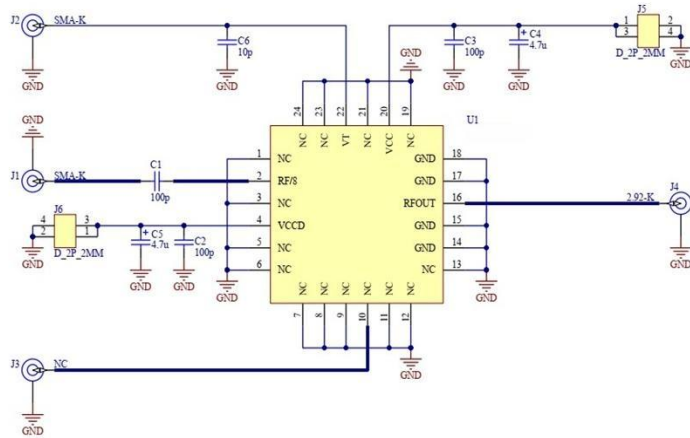


Description:

1. Unit: mm
2. Lead frame material: copper alloy
3. Lead spacing tolerance non-cumulative
4. Surface warpage of tube shell: 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	0.80	0.90	1.00
A1	0.00	0.02	0.05
A2	0.203Ref		
b	0.18	0.25	0.30
D	3.95	4.00	4.05
D2	2.55	2.70	2.80
e	0.50BSC		
Ne	2.50BSC		
Nd	2.50BSC		
E	3.95	4.00	4.05
E2	2.55	2.70	2.80
K	0.15	---	---
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 1206 4.7uF
C6	Multilayer Ceramic Capacitor 0402 10pF
J1, J2	SMA-K PCB Connectors
J4	2.92-K PCB Connectors
J5, J6	2.0mm DC pins
U1	CWV009SP4
J1, J2 Recommended SMA-K connector for NJ Aowen D550B12E01-023 J4 We recommend using NJ Aowen D360B12E01-023 type 2.92-K 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 50 ohm impedance, and the ground pin of the package shell should be grounded nearby (similar to the figure), and there should be enough ground holes to connect the top and bottom ground.