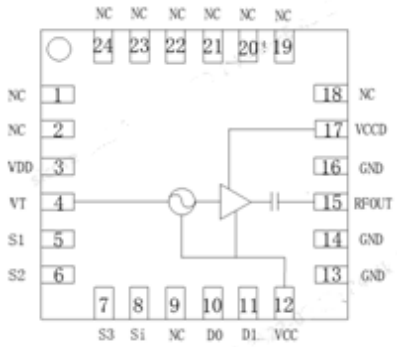
Performance Features

- Operating frequency band: 0.625GHz～10GHz
- Low power consumption: 103mA (VCC side)
- Output Power: 5dBm
- Phase noise: -106dBc/Hz@100kHz@5GHz～10GHz
- Package size: 24-pin QFN, 4mmx4mm

Typical Applications

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

Functional Block Diagram



Overview

The CWV103SP4 is a low noise, low power consumption voltage controlled oscillator, a multi-band broadband VCO with integrated divider function, covering 0.625GHz to 10GHz output frequency without gap. It has no 1st/2nd and 3rd/2nd harmonics output in the whole frequency band, and features low power consumption, low phase noise, and flat output power.

The CWV103SP4 is a 24-pin 4mmx4mm surface mount leadless plastic package. The pin pads are coated with NiPdAuAg.

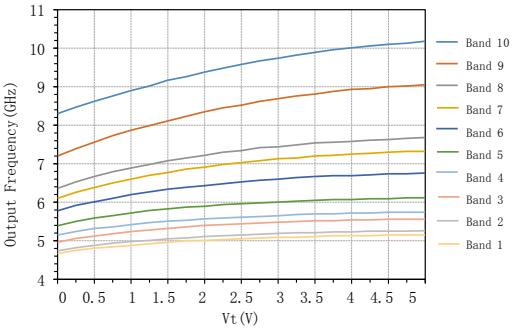
Electrical performance table (TA=+25℃,VDD=VCCD=3.3V,VCC=5V)

Parameter Name	Description	Minimum value	Typical values	Maximum value	Unit
RF Frequency Range	RFOUT		0.625～10		GHz
RF side output power	RFOUT		5		dBm
RF port single sideband phase noise @ 100kHz frequency bias	5GHz～10GHz		-106		dBc/Hz
	2.5GHz～5GHz		-112		dBc/Hz
	1.25GHz～2.5GHz		-118		dBc/Hz
	0.625GHz～1.25GHz		-124		dBc/Hz
Tuning voltage	VT	0		5	V
Bias voltage	VCC		5		V
	VDD, VCCD		3.3		V
Bias current	Icc		103		mA
	Idd		4		mA
	Iccd		45		mA
Leakage current at the tuning end (Vt=+5V)			10		μA
RF port return loss			TBD		dB
Push frequency factor			TBD		MHz/V
Switching time between frequency bands			TBD		ns
RF port harmonic suppression	2nd		25		dBc
	3nd		20		dBc

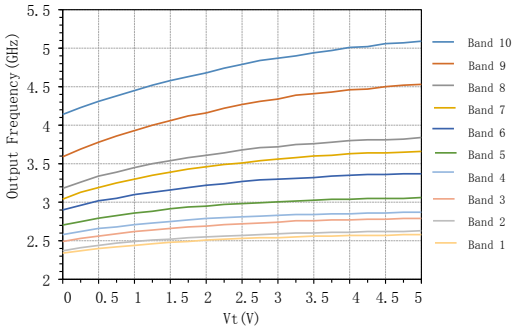
Chengdu Cuiwei Electronic Co.,LTD
Address: No. 5, Gaopeng East Road, Gaoxin District, Chengdu, China
E-mail:sales@cdcwtec.com
Website: www.cdcwtec.com

Test Curve

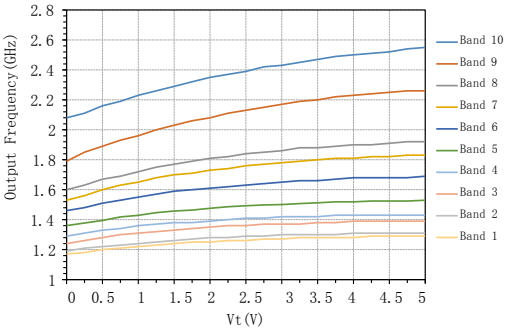
RFOUT output frequency VS Vt (D1=0 D0=0)



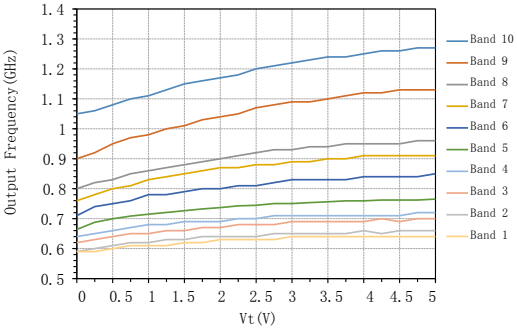
RFOUT output frequency VS Vt (D1=0 D0=1)



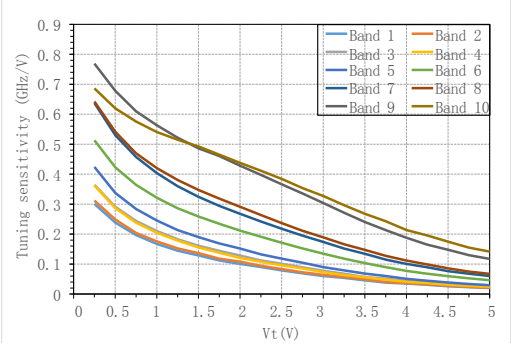
RFOUT output frequency VS Vt (D1=1 D0=0)



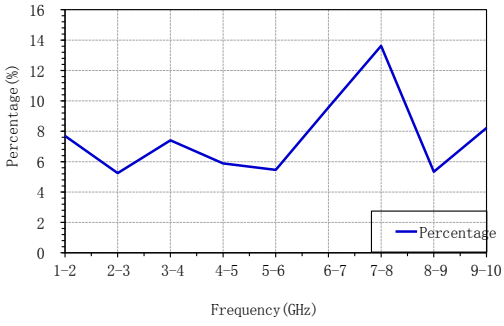
RFOUT output frequency VS Vt (D1=1 D0=1)



RFOUT tuning sensitivity VS Vt (D1=0 D0=0)



RFOUT band crossover percentage VS crossover band (D1=0 D0=0)



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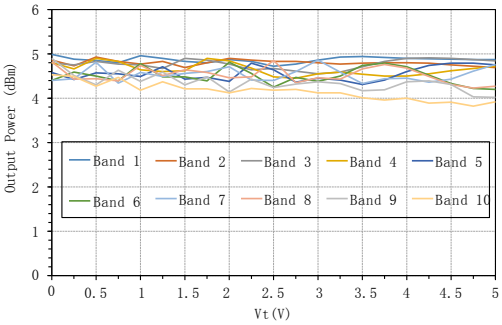
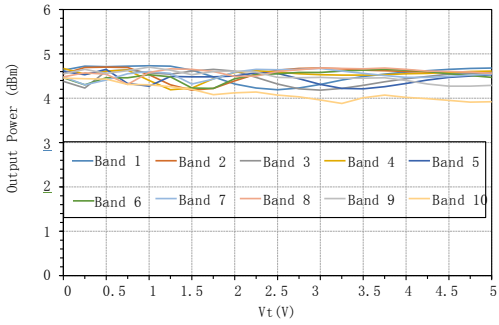
Address: No. 5, Gaopeng East Road, Gaoxin District, Chengdu, China
E-mail:sales@cdcwtec.com
Website: www.cdcwtec.com

Test Curve

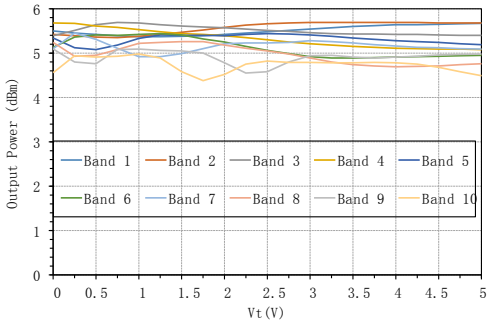
RFOUT output power VS Vt (D1=0 D0=0)



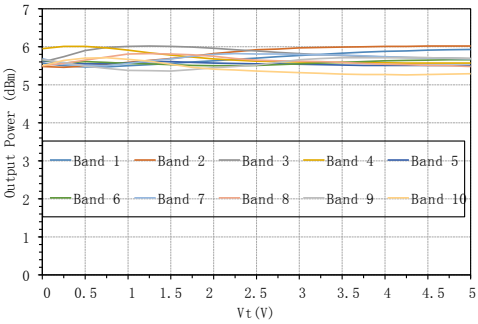
RFOUT output power VS Vt (D1=0 D0=1)



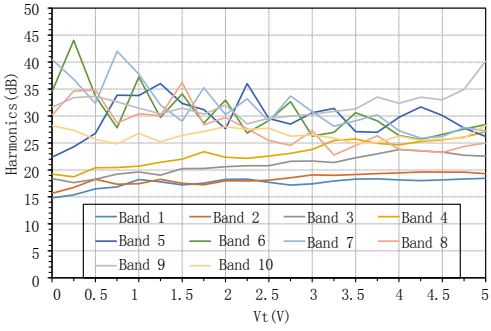
RFOUT output power VS Vt (D1=1 D0=0)



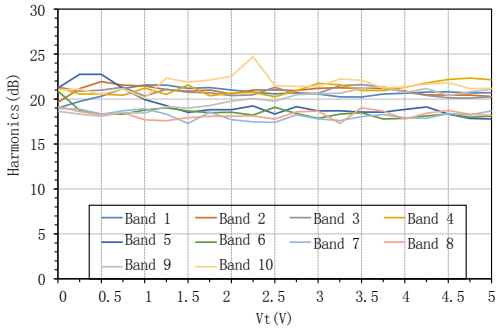
RFOUT output power VS Vt (D1=1 D0=1)



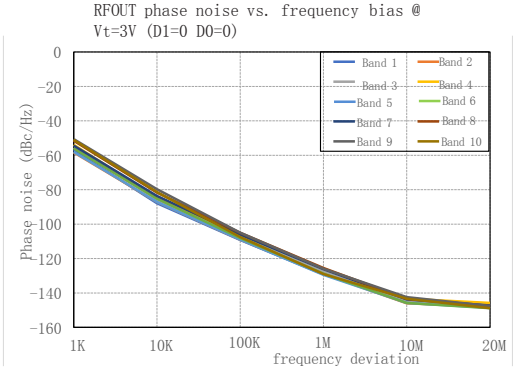
2nd harmonic suppression VS
Vt(D1=0 D0=0)

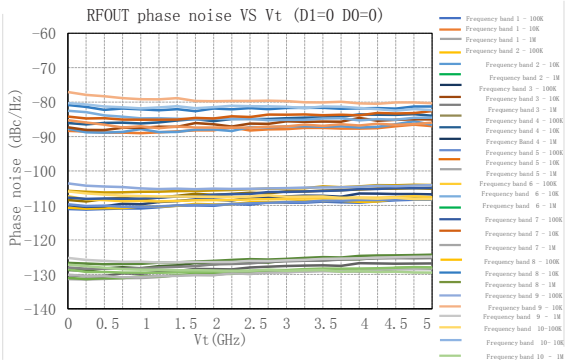


3rd harmonic suppression VS
Vt(D1=0 D0=0)



Test Curve





Extreme operating parameters

Bias voltage	5.5V (VCC)
	3.6V (VDD,VCCD)
Tuning voltage	0V to 5.5V
S1;S2;S3;Si	3.6V
D0;D1	3.6V
Storage temperature range	-65℃～+150℃
Operating temperature range	-40℃～+85℃
Electrostatic protection level (HBM)	TBD

Package Information

Model	Packaging Materials	Solder plate plating	MSL level [1]	Package identification [2]	Environmental requirements
CWV103SP4	Green resin compounds	NiPdAuAg	MSL 3	S103 XXXXX	RoHS compliant

[1] Maximum reflow temperature 260° C
[2] XXXXX is the lot number

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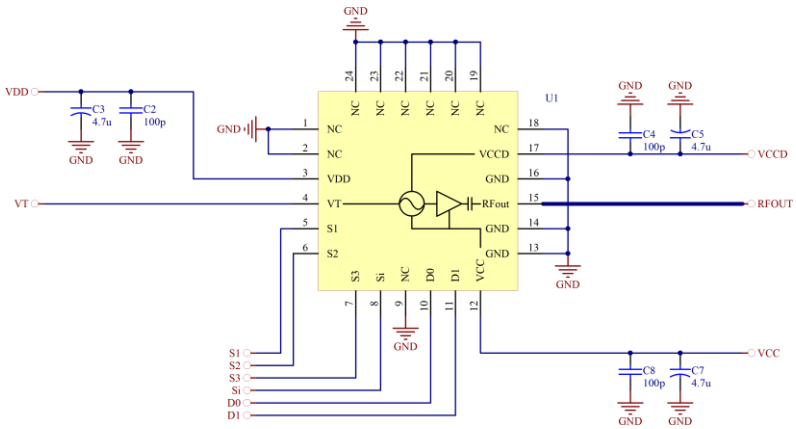
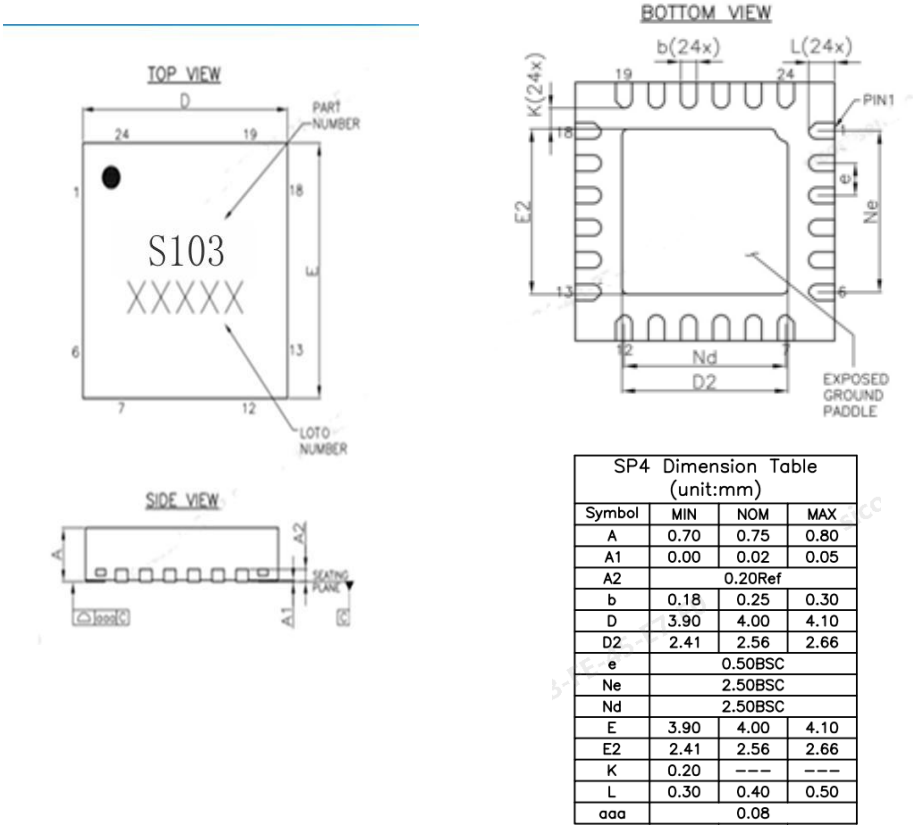
Typical Application Diagram



Dimension



SP4 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	2.41	2.56	2.66
e		0.50BSC	
Ne		2.50BSC	
Nd		2.50BSC	
E	3.90	4.00	4.10
E2	2.41	2.56	2.66
K	0.20	---	---
L	0.30	0.40	0.50
aaa		0.08	

Pin Definition

Pin Number	Function Symbols	Function Description
1-2;9; 18-24	NC	No internal connections
3	VDD	Power port for +3.3V
4	VT	Control voltage and adjustment input, modulation bandwidth dependent on drive source impedance
5-8	S1;S2;S3;Si	Digital Logic Control Port
10-11	D0;D1	Control ports
12	VCC	Power port for +5.0V
13-14;16	GND	Exposed paddle at the bottom of the RF ground package is also an RF & DC RF ground
15	RFOUT	RF output port
17	VCCD	Power port for +3.3V

Logic control parameters

Frequency control word truth table		
D1	D0	Frequency Range(GHz)
0	0	5 to 10
0	1	2.5 to 5
1	0	1.25～2.5
1	1	0.625 to 1.25

Logical State	d0, d1, s1, s2, s3, si
0	0V~0.3V
1	3V~3.3V

Recommended Logic Control States				Output Frequency Band
S1	S2	S3	Si	
0	0	0	1	Band 1
1	0	0	1	Band 2
0	1	0	1	Band 3
1	0	0	0	Band 4
0	1	0	0	Band 5
1	0	1	1	Band 6
0	0	1	0	Band 7
1	0	1	0	Band 8
0	1	1	0	Band 9
1	1	1	0	Band 10
Other states are not evaluated				

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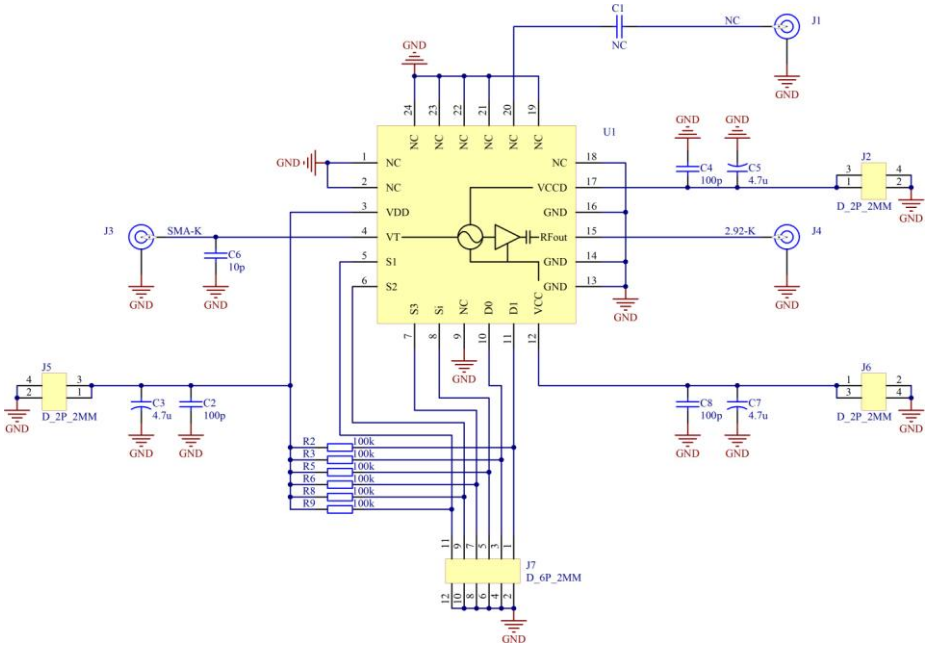
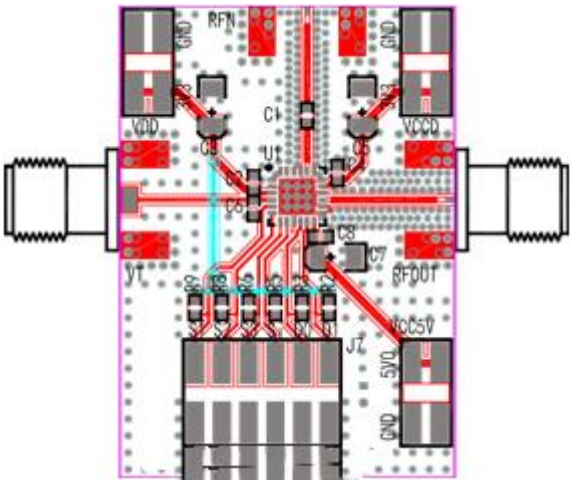
Evaluation Boards





Designator	Description
C3, C5, C7	Tantalum capacitor 1206
C2, C4, C8	Multilayer ceramic capacitors
C6	Multilayer ceramic capacitors
J3, J4	SMA-K PCB Connectors
J2, J5, J6	2.0mm DC pins
U1	CWV103SP4
J1, J2 Recommended for use with Nanjing Aowen D550B12E01-023 SMA-K connector.	
NC indicates that the port is unused or the device is not soldered. The chip NC port can be connected externally to GND.	