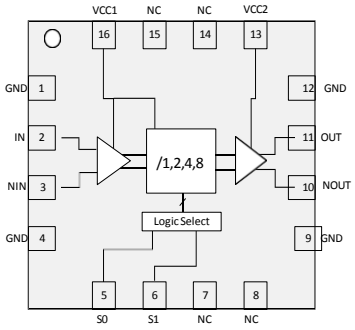
Performance Features

- Working band: DC～21GHz/N=1, DC～30GHz/N=2, 4, 8
- Low power consumption: 32mA@N=1, 45mA@N=8
- Output Power: -2dBm
- Low phase noise: -154 dBc/Hz@100kHz
- Package size: 16-pin QFN, 3mmx3mm

Typical Applications

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

Functional Block Diagram



Overview

The Model CWD005SP3 programmable divider covers 30 GHz input frequency. The programmable 2-bit bit control/1, 2, 4, 8 divider output features the industry's lowest single-sideband phase noise, low power consumption, and simple logic control.

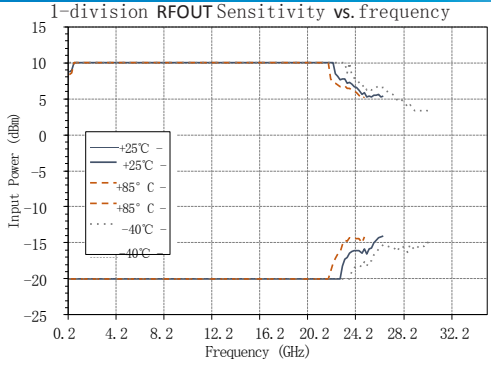
The programmable divider is available in a 16-pin 3mmx3mm surface mount leadless plastic package. The pin pad plating is NiPdAu.

Electrical performance table (TA=+25℃, VCC1=VCC2=3.3V)

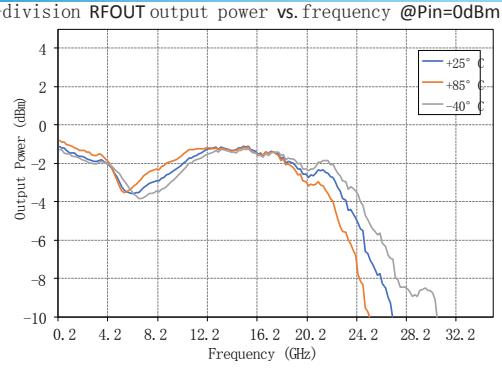
Parameter Name		Working conditions	Minimum value	Typical values	Maximum value	Unit
Input Parameters	Maximum RF input frequency (N=1)	Sine wave input	21			GHz
	Minimum RF input frequency (N=1)	Sine wave input			0.2*	GHz
	Maximum RF input frequency (N=2, 4, 8)	Sine wave input	30			GHz
	Minimum RF input frequency (N=2, 4, 8)	Sine wave input			0.5*	GHz
	RF input power range	Sine wave input	-15		8	dBm
Output parameters	Output power (N=1)		-5		0	dBm
	Output power (N=2)		-5		0	dBm
	Output power (N=4)		-5		0	dBm
	Output power (N=8)		-3		0	dBm
	SSB Phase Noise@100kHz Offset	Fin = 6 GHz, Pin = 0 dBm, N = 2		-154		dBc/Hz
Logic Input Level	High level		3		3.3	V
	Low Level		0		0.3	V
Current (Icc1+Icc2)		N = 1, S0 = L, S1 = L		32		mA
		N = 2, S0 = H, S1 = L		40		mA
		N = 4, S0 = L, S1 = H		43		mA
		N = 8, S0 = H, S1 = H		45		mA

Test Curve

1-division RFOUT Sensitivity vs. frequency



1-division RFOUT output power vs. frequency @Pin=0dBm



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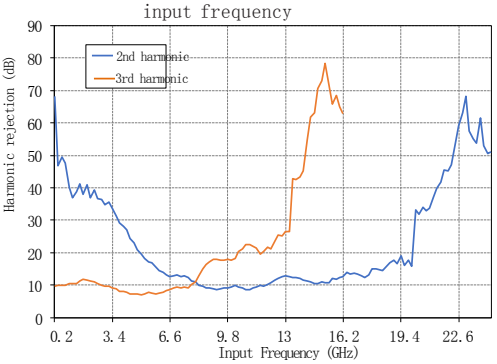
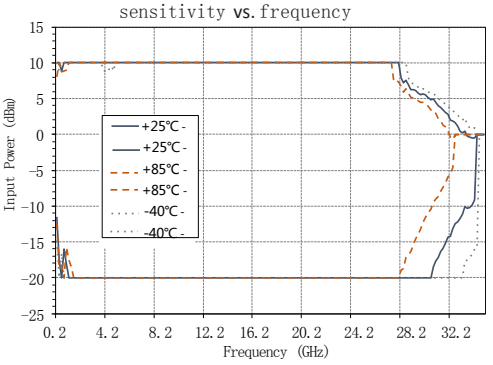
Test Curve

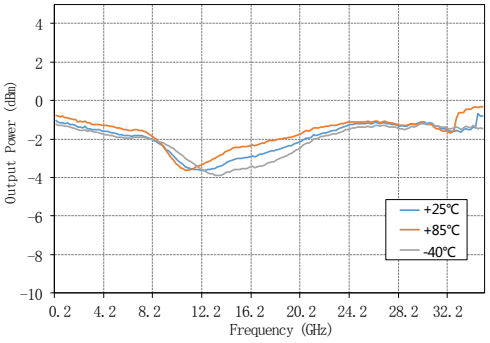
1-division harmonic suppression vs. input frequency



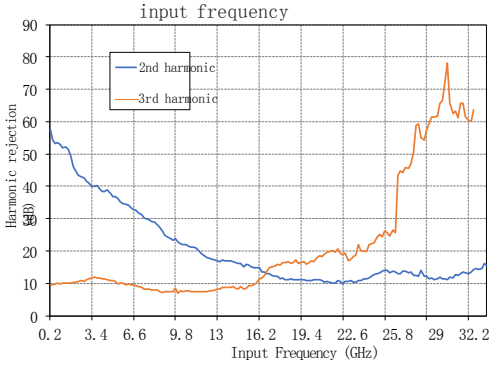
2-way RFOUT crossover sensitivity vs. frequency



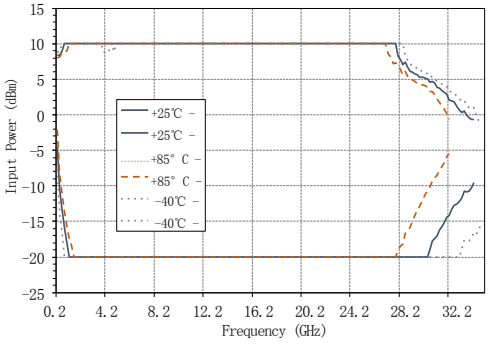
2-division RFOUT output power vs. frequency @Pin=0dBm



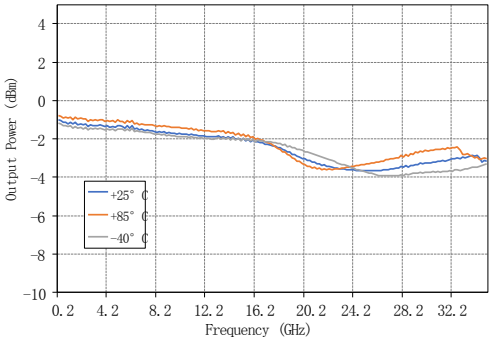
2-division harmonic suppression vs. input frequency



4-way RFOUT crossover sensitivity vs. frequency



4-division RFOUT output power vs. frequency @Pin=0dBm



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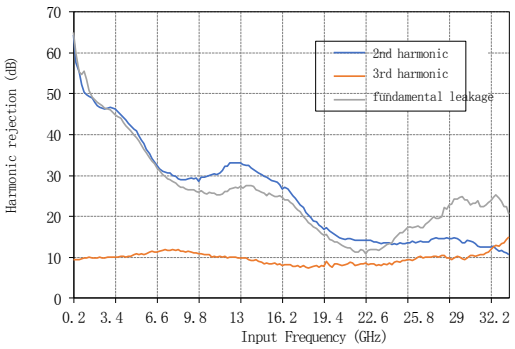
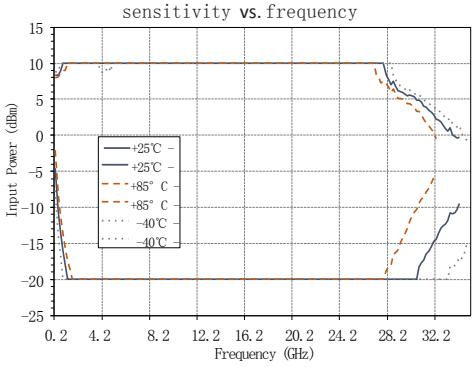
Test Curve

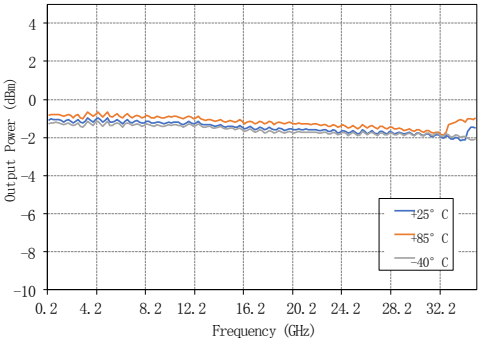
4-division harmonic suppression vs. input frequency



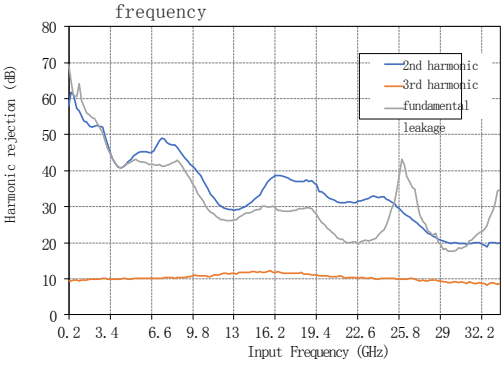
8-way RFOUT crossover sensitivity vs. frequency



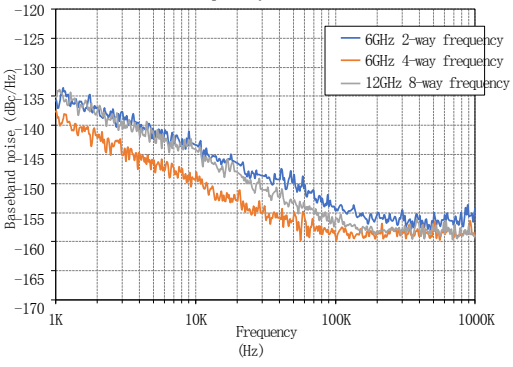
8-division RFOUT output power vs. frequency @Pin=0dBm



8-division harmonic rejection vs. input frequency



SSB VS Offset Frequency



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Extreme operating parameters

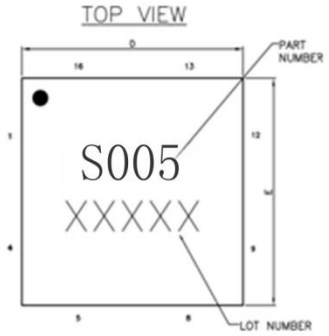
Bias voltage	3.6V
Storage temperature range	-65℃～+150℃
Operating temperature range	-40℃～+85℃
Static Protection Level (HBM)	Class 1B

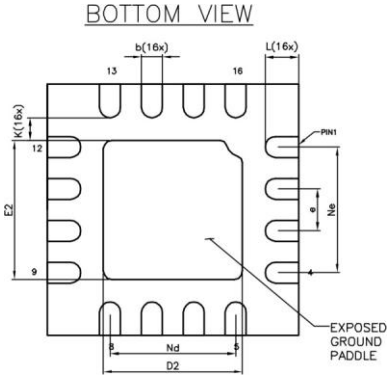
Package Information

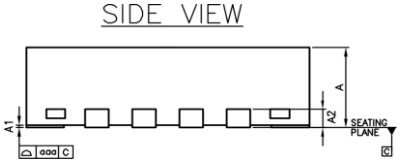
Model	Packaging Materials	Solder plate plating	MSL level [1]	Package identification [2]	Environmental requirements
CWD005SP3	Green resin compounds	NiPdAu	MSL 3	S005 XXXXX	RoHS compliant

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

Dimension







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	2.90	3.00	3.10
D2	1.51	1.66	1.76
e		0.50BSC	
Ne		1.50BSC	
Nd		1.50BSC	
E	2.90	3.00	3.10
E2	1.51	1.66	1.76
K	0.20	---	---
L	0.30	0.40	0.50
aaa		0.08	

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

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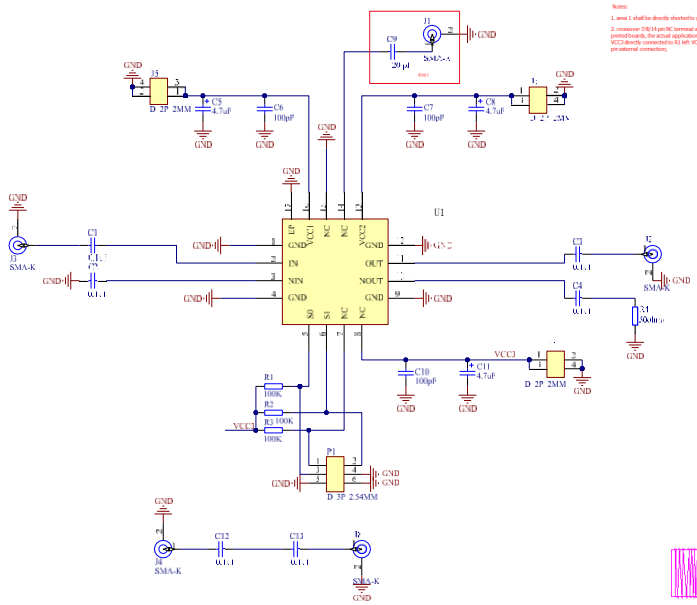
Pin Definition

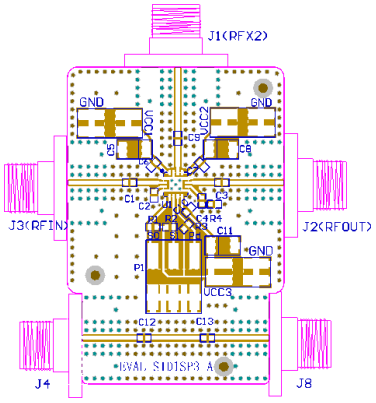
Pin Number	Function Symbols	Function Description	Pin Number	Function Symbols	Function Description
1	GND	RF Ground	9	GND	RF Ground
2	IN	RF input	10	NOUT	RF Output
3	NIN	RF input	11	OUT	RF Output
4	GND	RF Ground	12	GND	RF Ground
5	S0	Digital logic side	13	VCC2	DC Bias
6	S1	Digital logic side	14	NC	Vacant
7	NC	Vacant	15	NC	Vacant
8	NC	Vacant	16	VCC1	DC Bias

Logic control truth table

Division multiplier selection truth table			Digital logic control level	State	S0, S1
S1	S0	Divider Ratio (N)		L	0 to 0.3V
L	L	1		H	3 to 3.3V
L	H	2			
H	L	4			
H	H	8			

Evaluation Boards





Designator	Description
c1, c2, c3, c4, c12, c13	Multilayer ceramic capacitor 0402 0.1uF
C5, C8, C11	Tantalum capacitor 1206 4.7uF
C6, C7, C10	Multilayer ceramic capacitor 0402 100pF
C9	Multilayer ceramic capacitor 0402 120pF
j1, j2, j3, j4, j8	2.92mm PCB connector
VCC1, VCC2, VCC3	2 mm DC pins
P1	2.54 mm DC pins
R1, R2, R3	SMD Thick Film Resistors 0402 100K
R4	RF Resistor 0402 50ohms
U1	CWD005SP3
J1, J2, J3, J4, J8 recommended to use Nanjing Aowen D360B12E01-023 type 2.92mm connector	

Circuit board material: Rogers 4350B

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

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