

CW2101

30MHz ~ 4000MHz Gain Amplifier

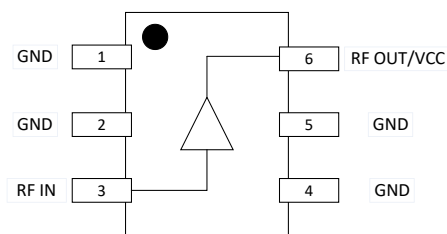
◆ Product descriptions

The CW2101 is an ultra-wideband gain amplifier with 50Ω internally matched inputs and outputs, and an operating frequency range of 30MHz ~ 4000MHz. As a high linearity, high gain amplifier, the CW2101 is able to meet the needs of a wide range of application scenarios, including small base stations, wireless relays, TDD/FDD communication systems, and other drive amplification scenarios.

◆ Key technical indicators

- Working frequency: 30MHz ~ 4000MHz
- Gain: 26.3dB@70MHz, 24.1dB@900MHz, 20.5dB@1.9GHz, 18.9dB@2.45GHz, 16.5dB@3.5GHz
- Noise factor: 1.8dB@70MHz, 1.2dB@900MHz, 1.1dB@1.9GHz, 1.4dB@2.45GHz, 1.3dB@3.5GHz
- Input/Output Return Loss: >12dB
- Output IP3: 30.3dBm@70MHz, 32dBm@900MHz, 30.8dBm@1.9GHz, 31dBm@2.45GHz, 31dBm@3.5GHz, 30.8dBm@4GHz
- Output P1dB: 18.8dBm@70MHz, 18.7dBm@900MHz, 18.8dBm@1.9GHz, 19dBm@2.45GHz, 18.2dBm@3.5GHz, 17dBm@4GHz
- Typical power consumption: 50mA@3V
- Package size: 6 PIN SOT-363

◆ Function Block Diagram

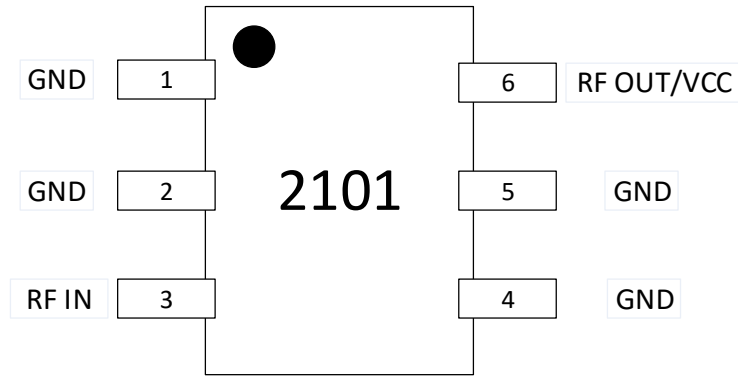


SOT-363

◆ Fields of application

- Wireless Infrastructure Highly Linear Application Systems
Mobile Communications, PCS, GSM, UMTS
Broadband Instrumentation

◆ Pin Definitions and Descriptions



Top View

mark	PIN No.	remark
GND	1,2,4,5	ground
RF OUT/VCC	6	RF output/supply +3V; additional isolation required
RF IN	3	RF input; external isolation required

◆ Limit operating parameters

norm	clarification	limit value	unit
V_{DD}	Supply Voltage	+5	V
RF Input Power	CW signal, 50 Ω , Tc=25 $^{\circ}$ C, In-band	+27	dBm
Tjmax	Tj for >106 hours MTTF	+170	$^{\circ}$ C
Ts	Storage Temperature	-50~+165	$^{\circ}$ C
θ_{JC}	Thermal Resistance	TBD	$^{\circ}$ C/W
ESD-HBM	JEDEC 22-A114	Class 1B	V
ESD-CDM	JEDEC 22-C101	Class C3	V
MSL	Per J-STD-020	MSL3	-

◆ Recommended working conditions

Norm	clarification	minimum value	typical value	max value	unit
V_{DD}	working voltage	+2.5	+3	+3.5	V
Tcase	operating temperature	-40	-	+105	$^{\circ}$ C

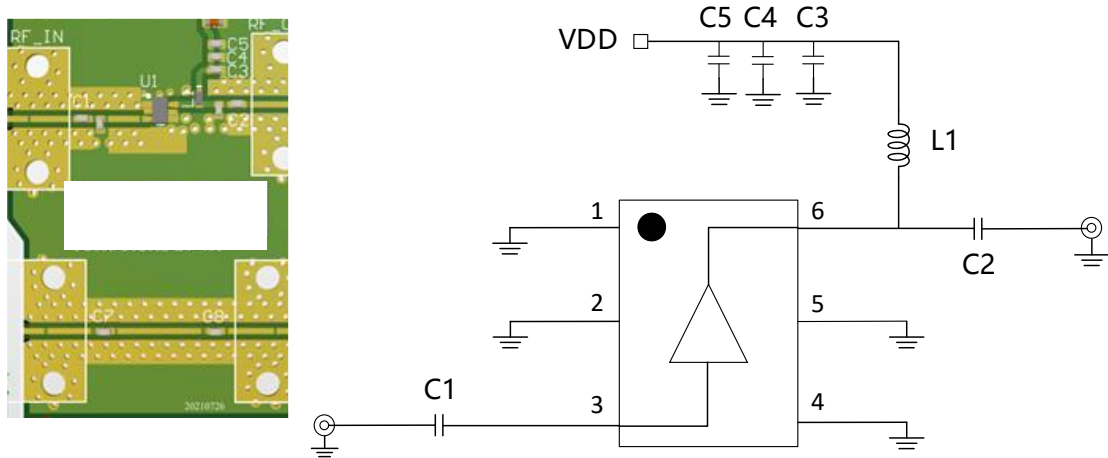
◆ Typical performance parameters

Test conditions: $V_{DD}=+3V$, $I_{DD}=50mA$, $T_C=+25^{\circ}C$

Norm	Test Fre.	minimum value	typical value	max value	unit
Frequency		30		4000	MHz
Gain	70MHz	-	26.3	-	dB
	900MHz	-	24	-	
	1900MHz	-	20.4	-	
	2450MHz	-	18.8	-	
	3500MHz	-	16.5	-	
	4000MHz	-	15.6	-	
Input Return Loss	70MHz		13	-	dB
	900MHz	-	13.3	-	
	1900MHz	-	13.4	-	
	2450MHz	-	13.9	-	
	3500MHz	-	13.3	-	
	4000MHz	-	11.5	-	
Output Return Loss	70MHz		24.5	-	dB
	900MHz	-	20.2	-	
	1900MHz	-	15.5	-	
	2450MHz	-	14.1	-	
	3500MHz	-	15	-	
	4000MHz	-	17	-	
Noise Figure	70MHz	-	1.8	-	dB
	900MHz	-	1.2	-	
	1900MHz	-	1	-	
	2450MHz	-	1.4	-	
	3500MHz	-	1.3	-	
	4000MHz	-	1.7	-	
OP1dB	70MHz	-	18.8	-	dBm
	900MHz	-	18.7	-	
	1900MHz	-	18.8	-	
	2450MHz	-	18.9	-	
	3500MHz	-	18.2	-	
	4000MHz	-	16.8	-	
OIP3 ⁽¹⁾	70MHz	-	30.3	-	dBm
	900MHz	-	32.1	-	
	1900MHz	-	30.8	-	
	2450MHz	-	31	-	
	3500MHz	-	31	-	
	4000MHz	-	30.8	-	
I_{DD}		-	50	-	mA
V_{DD}		-	3	-	V

Note 1: $P_{out} = 0dBm/Tone$, $\Delta f = 1MHz$;

◆ Application Recommended Circuits



Evaluation Board Device List

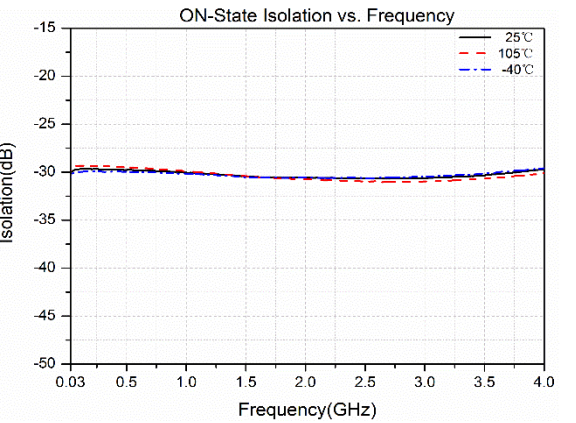
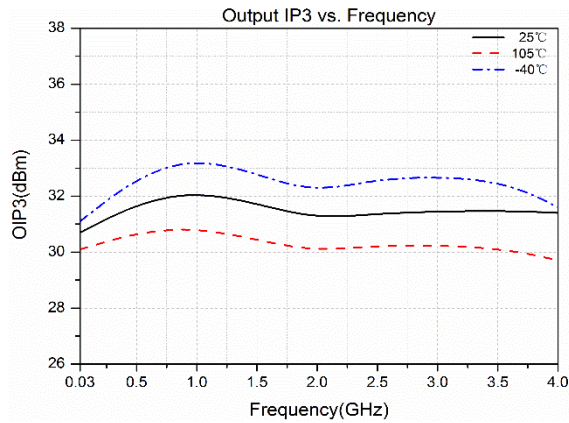
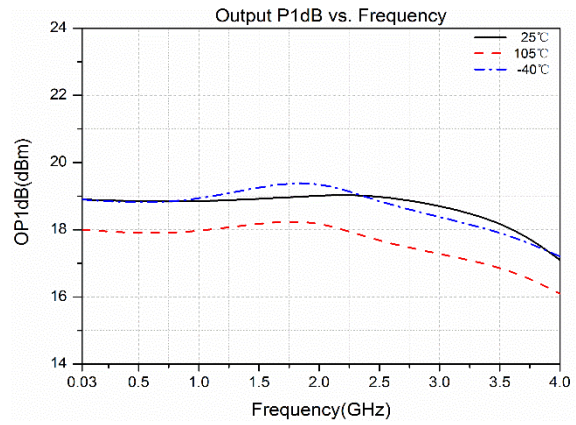
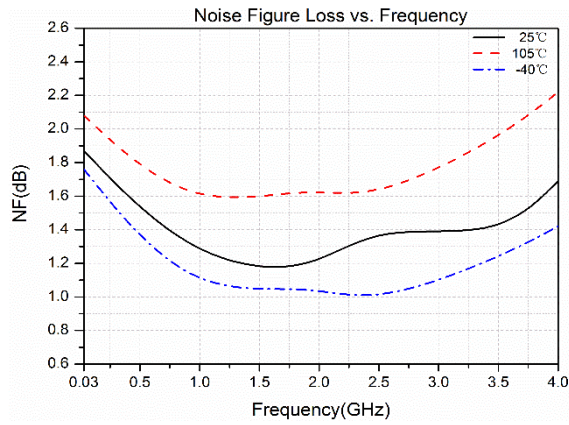
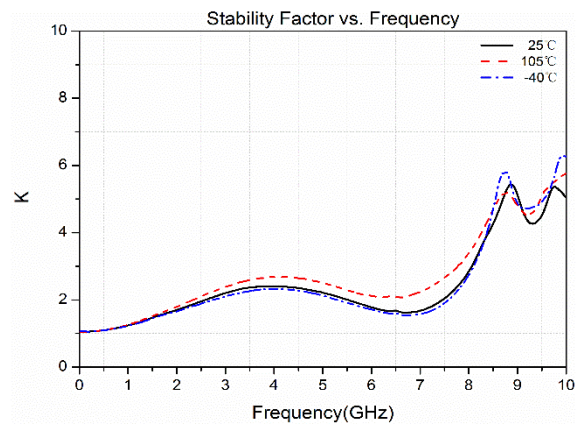
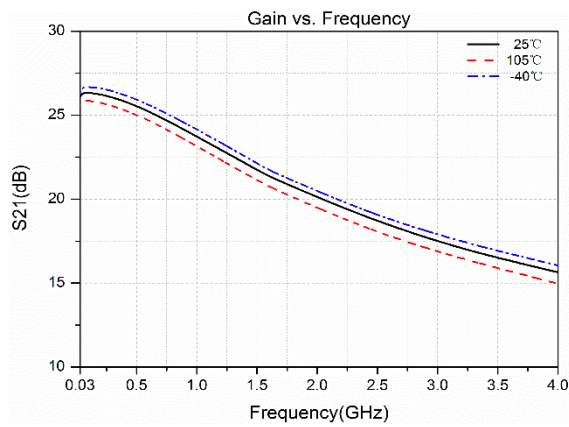
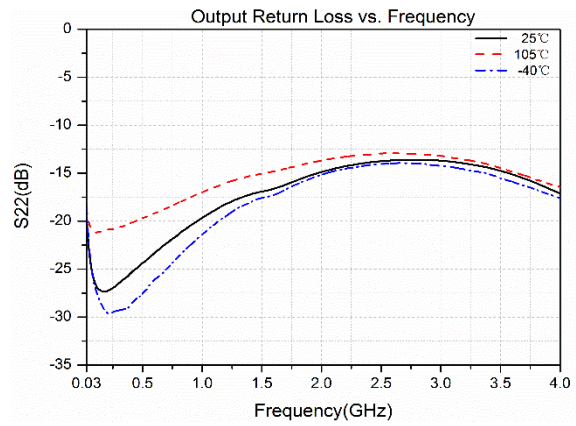
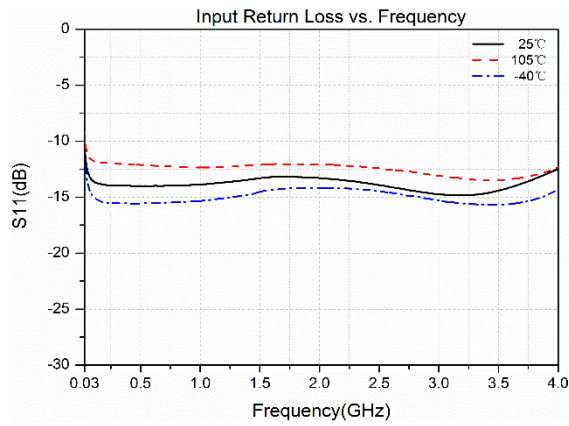
Symbol	Value	Size	Part Number	Manufacturer
C1, C2	1000pF, 10%, 50V, X7R	0402	0402B102K500NT	Murata
C3	330pF, $\pm 5\%$ 50V, C0G	0402	CL05C331JB5NUNC	SAMSUNG
C4	1uF, 10%, 10V, X7R	0402	GRM155Z71A105KE01D	Murata
C5	4.7uF, 10%, 10V, X7R	0402	0603B475K100NT	FH
L1	1000nH, $\pm 10\%$	0402	LQM15CA1R0K00D	Murata

◆ EVB Typical performance

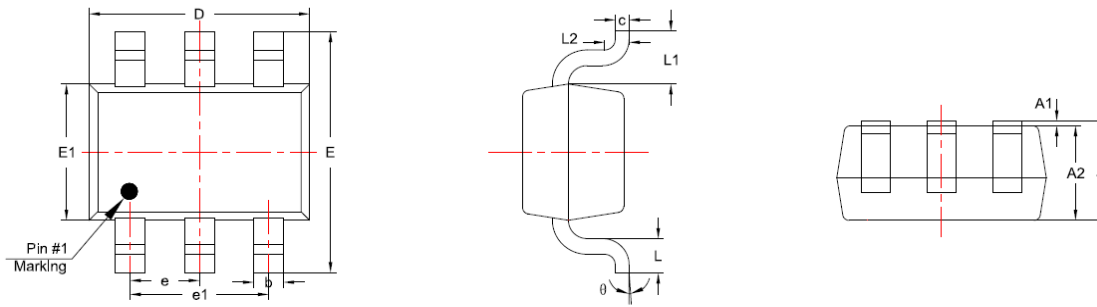
Test conditions: $V_{DD}=+3V @ 50mA$, $T_c = +25^\circ C$

Frequency	70	900	1900	2450	3500	4000	MHz
Gain	26.3	24.1	20.4	18.8	16.5	15.6	dB
Noise Figure	1.8	1.2	1.1	1.4	1.3	1.7	dB
Input Return Loss	13.1	13.9	13.2	13.8	14.4	12.5	dB
Output Return Loss	24.8	20.5	15.2	13.8	14.7	17.1	dB
P1dB	18.8	18.7	18.8	18.9	18.2	16.8	dBm
OIP3	30.3	32	30.8	31	31	30.8	dBm

◆ Performance curves - VDD = +3V

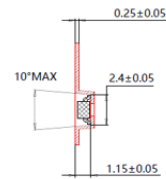
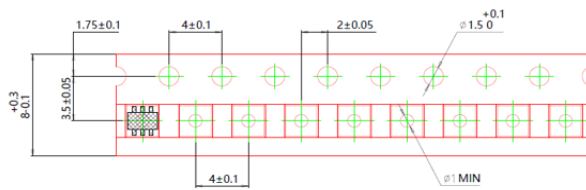


◆ Package size



Symbol	Millimeter		
	Min	Nom	Max
A	0.90	1.00	1.10
A1	0.00	0.05	0.10
A2	0.90	0.95	1.00
b	0.22	0.30	0.35
c	0.09	0.12	0.15
D	2.00	2.10	2.20
E	2.15	2.30	2.45

Symbol	Millimeter		
	Min	Nom	Max
E1	1.15	1.25	1.35
e	0.65 TYP		
e1	1.20	1.30	1.40
L	0.26	0.36	0.46
L1	0.525 REF		
θ	0°	4°	8°



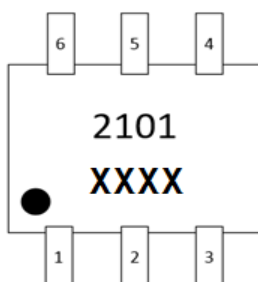
SECTION B-B



SECTION A-A

Feature	Measure	Symbol	Size(mm)	Tolerance(mm)
Cavity	Length	Ao	2.35	±0.15
	Width	Bo	2.4	±0.15
	Depth	Ko	1.15	±0.15
	Pitch	P1	4.0	±0.1
Centerline Distance	Cavity to perforation-length direction	P2	2.0	±0.05
	Cavity to perforation-width direction	F	3.5	±0.05
Cover Tape	width	C	5.5	±0.1
Carrier Tape	width	W	8	±0.05

◆ Marking drawing



Pin1 dot

The first line: represents the main model of the product, i.e. the main model of 2101 is CW2101.

The second line: used for product iteration model differentiation or internal identification traceability

◆ Notes

Weldability

Compatible with lead-free (up to 260°C reflow temperature) and tin/lead (up to 245°C reflow temperature) soldering processes. Solder profile available on request.

Contact plating: ENEPIG

Hazardous Substance Compliance

This part complies with the 2015/863/ EU RoHS standard. (Restrictions on the use of certain hazardous substances in electrical and electronic equipment). The product also has the following properties:

RoHS compliant

REACH compliant

Halogen-free (fluorine, chlorine, bromine, iodine)

