

SP3T LNA for LTE mid-high band RX

Features

- Operating frequency 1700MHz to 2700MHz
- High power gain
 - 15dB gain at 1700MHz to 2300MHz
 - 13dB gain at 2300MHz to 2700MHz
- Low noise figure 1.0 dB
- Operation current 7.7mA
- Compact, QFN (9-pin, 1.1mm x 1.1mm x 0.55mm) package, MSL1

General Description

The AW18043HQNR is a Low Noise Amplifier (LNA) integrated with SP3T designed for LTE receiver applications.

The AW18043HQNR (LNA) is provided in a compact Quad Flat No-Lead (QFN) 1.1mmx1.1mmx0.55mm-9L package. The typical application circuit is shown in Figure 1. The pin configuration and package are shown in Figure 2.

Applications

- Cell phones
- Tablets
- Other RF front-end modules

Typical Application Circuit

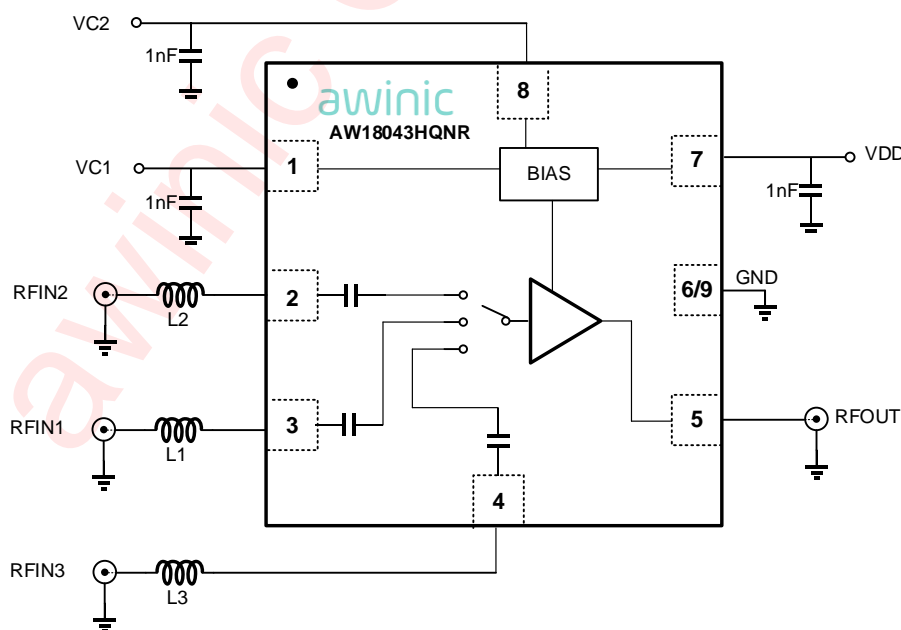


Figure1 Typical Application Circuit of AW18043HQNR

Pin Configuration And Top Mark

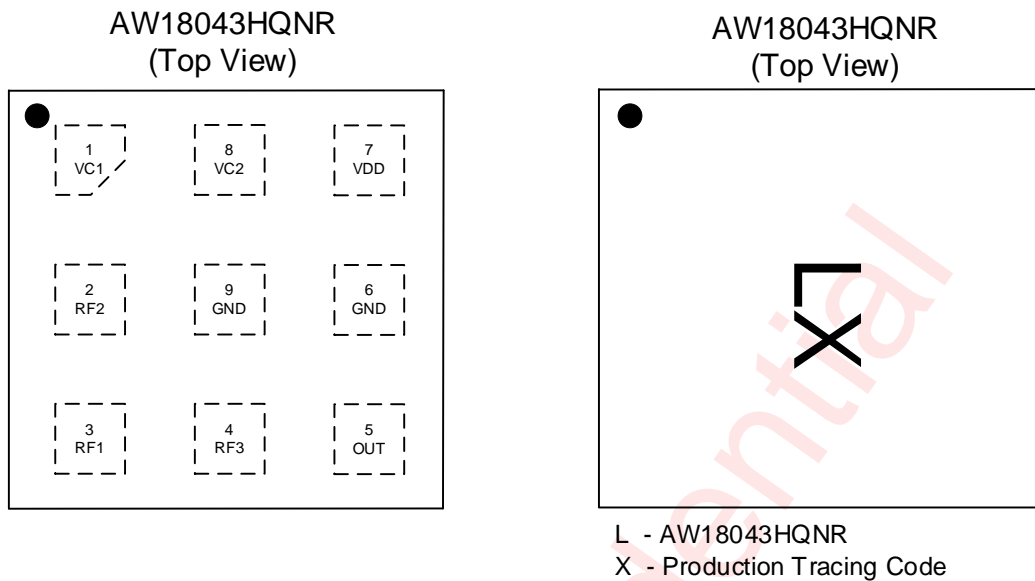


Figure2 Pin Configuration and Top Mark

Pin Definition

No.	NAME	DESCRIPTION
1	VC1	Digital control 1
2	RF2	RF-Port 2
3	RF1	RF-Port 1
4	RF3	RF-Port 3
5	OUT	RFOUT
6	GND	Ground
7	VDD	Power Supply
8	VC2	Digital control 2
9	GND	Ground

Ordering Information

Part Number	Temperature	Package	Marking	Moisture Sensitivity Level	Environmental Information	Delivery Form
AW18043HQNR	-40°C~85°C	WBQFN 1.1mmX1.1mm X0.55mm-9L	L	MSL1	ROHS+HF	4500 units/ Tape and Reel

Absolute Maximum Ratings^(NOTE1)

PARAMETERS	RANGE	Condition
Supply Voltage VDD	-0.3V to +3.3V	T _A =+25 °C
Supply Voltage VIO	-0.3V to +3.3V	T _A =+25 °C
Max input power (Gain mode)	10dBm	CW, VSWR=1:1, T _A =+25 °C
Operating free-air temperature range	-40°C to 85°C	
Storage temperature T _{STG}	-65°C to 150°C	
Lead temperature (soldering 10 seconds)	260°C	
ESD		
HBM (Human Body Model) ^(NOTE 2)	±1500V	
CDM (Charged Device Model) ^(NOTE 3)	±1000V	
Latch Up ^(NOTE 4)	+IT: 200mA -IT: -200mA	

NOTE1: Conditions out of those ranges listed in "absolute maximum ratings" may cause permanent damages to the device. In spite of the limits above, functional operation conditions of the device should within the ranges listed in "recommended operating conditions". Exposure to absolute-maximum-rated conditions for prolonged periods may affect device reliability.

NOTE2: The human body model is a 100pF capacitor discharged through a 1.5kΩ resistor into each pin. Test method: ESDA/JEDEC JS-001-2017.

NOTE3: All pins. Test method: ESDA/JEDEC JS-002-2018.

NOTE4: Standard: JESD78E

Truth Table

VC2	VC1	Active Path
0	1	RF1 active
1	0	RF2 active
1	1	RF3 active
0	0	Power down

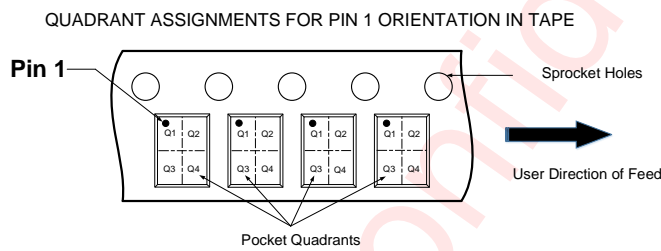
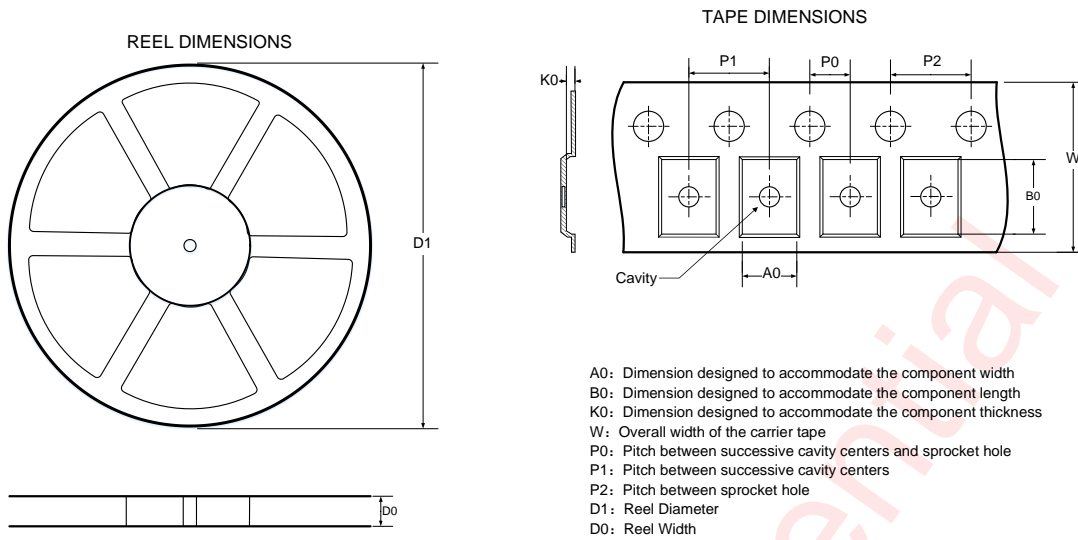
Note: "1" = 1.4 V to VDD. "0" = 0 V to +0.3 V.

Electrical Characteristics

Typically, $T_A=+25^{\circ}\text{C}$ and $V_{DD}=2.8\text{V}$, $V_{EN}=1.8\text{V}$. Input matched to 50Ω using a 4.7nH inductor for 2300MHz to 2700MHz and a 7.5nH inductor for 1700MHz to 2300MHz (unless otherwise noted), all data measured on AW18043HQNR's EVB

Symbol	Parameter	Test Condition	Min	Typ	Max	Units
DC Electrical Characteristic						
V_{DD}	Supply Voltage		1.65	2.8	3.3	V
V_{CTL}	Digital Input-Logic High		1.4		VDD	V
	Digital Input-Logic Low				0.3	V
I_{DD}	Supply Current	VDD=2.8V	4	7.7	10	mA
RF Specifications						
G_p	Power Gain	1700MHz – 2300MHz	13	15	17	dB
		2300MHz – 2700MHz	11.5	13.5	15.5	dB
RL_{in}	Input Return Loss	1700MHz – 2300MHz		-10	-5	dB
		2300MHz – 2700MHz		-10	-6	dB
RL_{out}	Output Return Loss	1700MHz – 2300MHz		-10	-6	dB
		2300MHz – 2700MHz		-10	-5	
ISO	Reverse Isolation	1700MHz – 2300MHz	22	25		dB
		2300MHz – 2700MHz	22	25		
NF	Noise Figure	1700MHz – 2300MHz		1.0	1.4	dB
		2300MHz – 2700MHz		1.1	1.5	
IP1dB	In-band input 1dB-compression point	1700MHz – 2300MHz	-10	-8		dBm
		2300MHz – 2700MHz	-6	-4		
K	Stability Factor		1			
t_{on}	Switching on time	50% VCTL to 10/90% RF		1	2	us
t_{off}	Switching off time	50% VCTL to 90/10% RF		1	2	us
t_{st}	Startup time	Shutdown state to any RF switch state		2	3	us

Tape and Reel Information



Note: The above picture is for reference only. Please refer to the value in the table below for the actual size

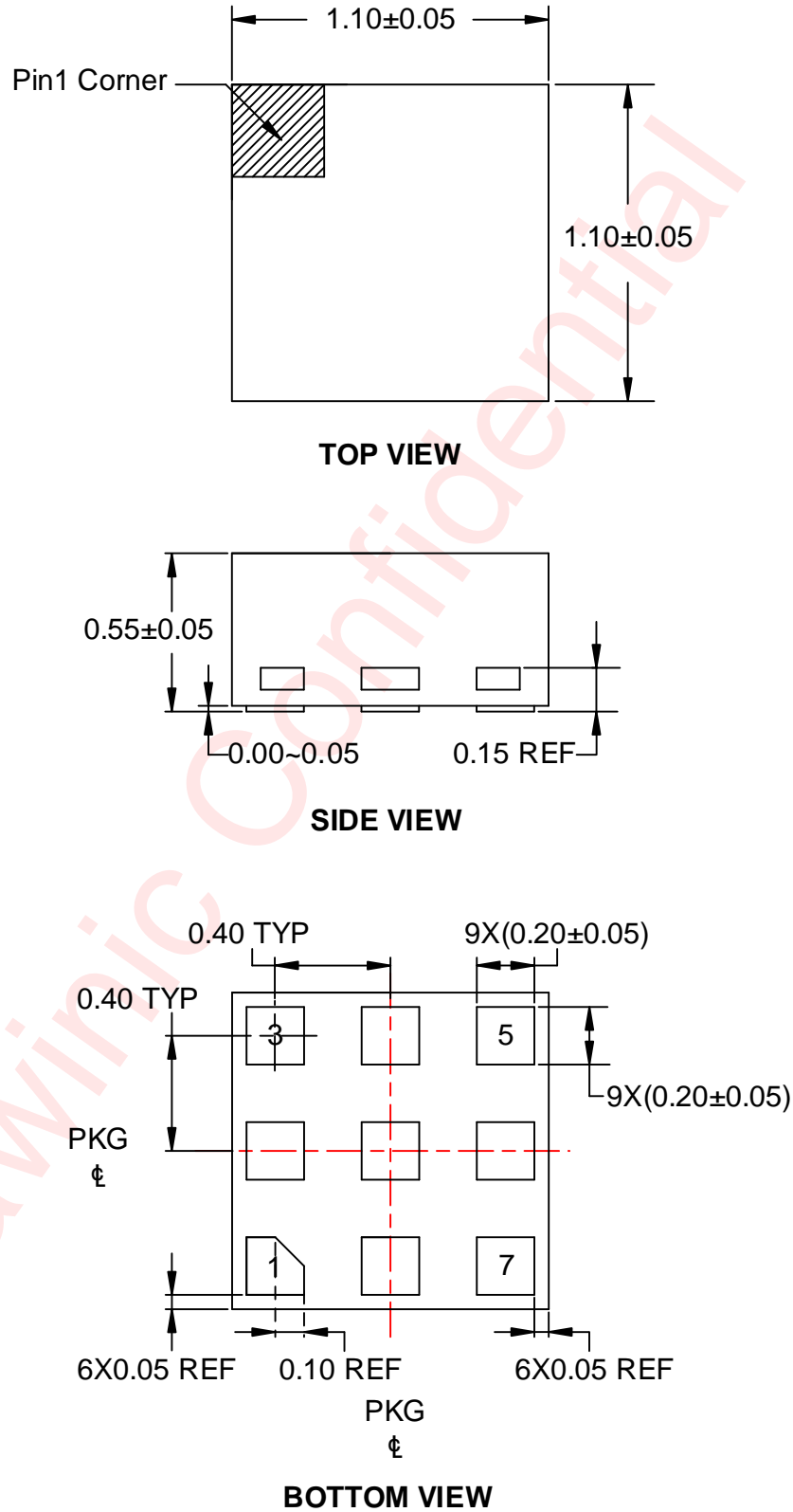
DIMENSIONS AND PIN1 ORIENTATION

D1 (mm)	D0 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
178	8.4	1.3	1.3	0.69	2	4	4	8	Q1

All dimensions are nominal

Figure 3 Tape and Reel Information

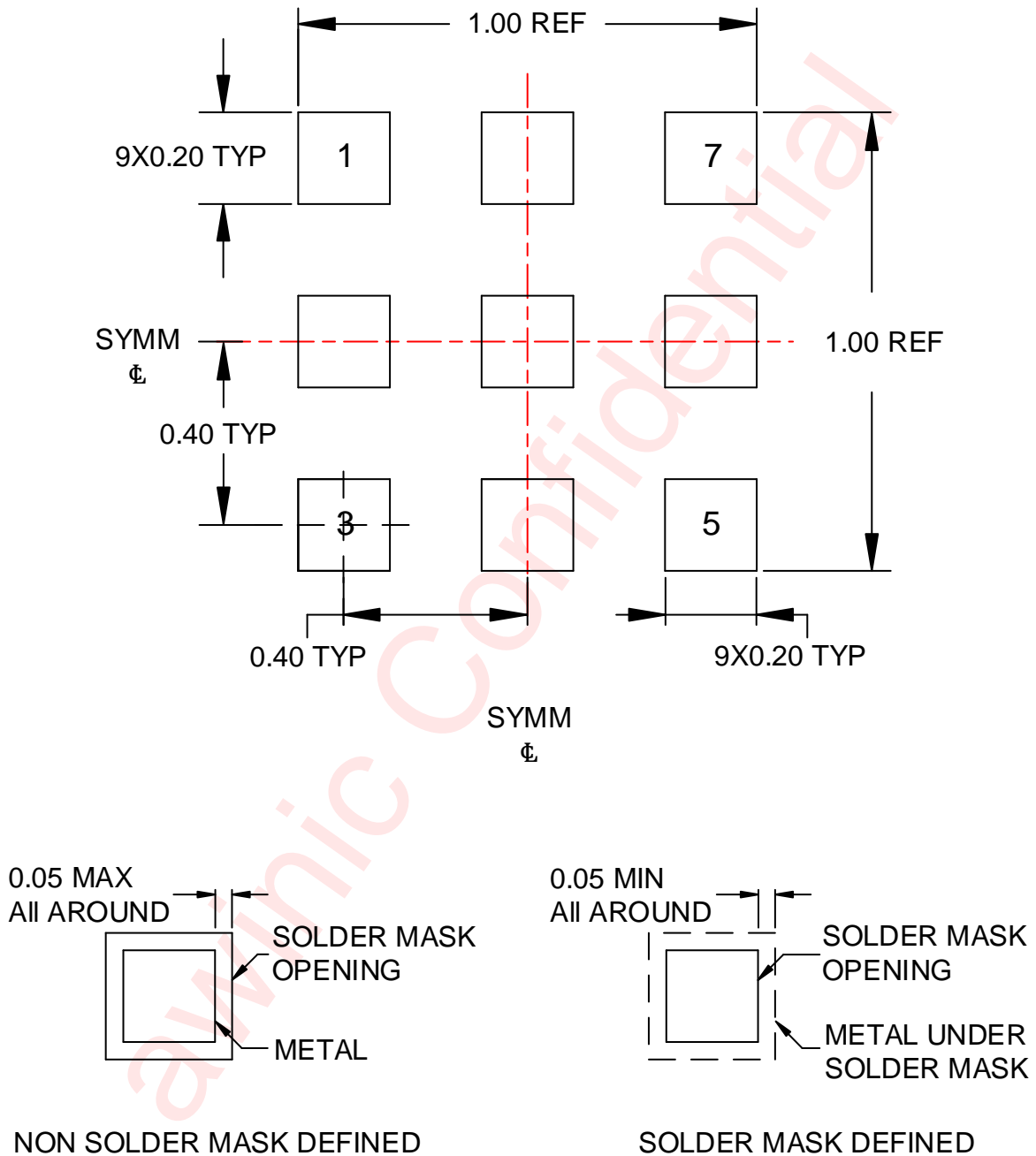
Package Outline Dimension



Unit: mm

Figure 4 Package Outline Dimension

Land Pattern Data



Unit: mm

Figure 5 Land Pattern

Revision History

Version	Date	Change Record
V1.0	Mar. 2022	Officially Released

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