



CanaanTek

# **CAN6107 GNSS LNA**

## **Product Description**

Rev 1.2 July, 2018

This datasheet is intended for customer's evaluation and application of the CAN6107 device.  
Under no circumstances shall CanaanTek be held liable for any damages arising from the use of this document.



CAN6107 is a high-gain, low-noise amplifier (LNA) designed for GPS, Galileo, Glonass and Beidou GNSS applications. The LNA achieves 17dB gain and 0.85dB noise figure. CAN6107 forms the optimal RF front-end for the reception of GNSS satellites. Packaged in a 6-pin  $\mu$ DFN package, the CAN6107 sits on a small form factor PCB space. It can operate from a 1.7V to 3.6V single supply and draws only 3.6mA DC current. The shutdown leakage current is only 1uA.

Ultra-low-noise figure of 0.85dB

High-power gain of 17dB

Low-power of 3.6mA operated from a single 1.7V to 3.6V voltage

Small footprint of 1.1mmx0.7mm

Thin profile of 0.45mm

Lead-free and RoHS-compliant package

High integration with few off-chip BOM and low cost

Temperature from  $-40$  to  $85$  range

Smartphone with GPS capability

PNDs (Personal Navigation Devices)

PMPs (Personal Media Players)

Automobile Navigation Systems

GNSS tracking systems

GNSS industrial applications

Software GPS

iPad like Mobile PCs

Device in a small 1.1mmx0.7mm 6-pin  $\mu$ DFN RoHS-compliant package

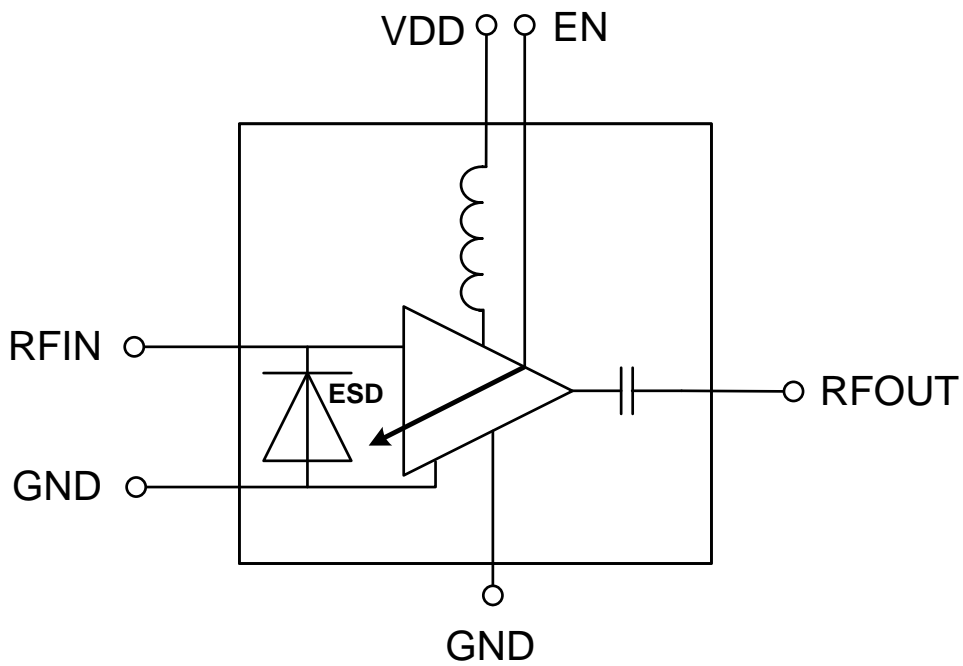
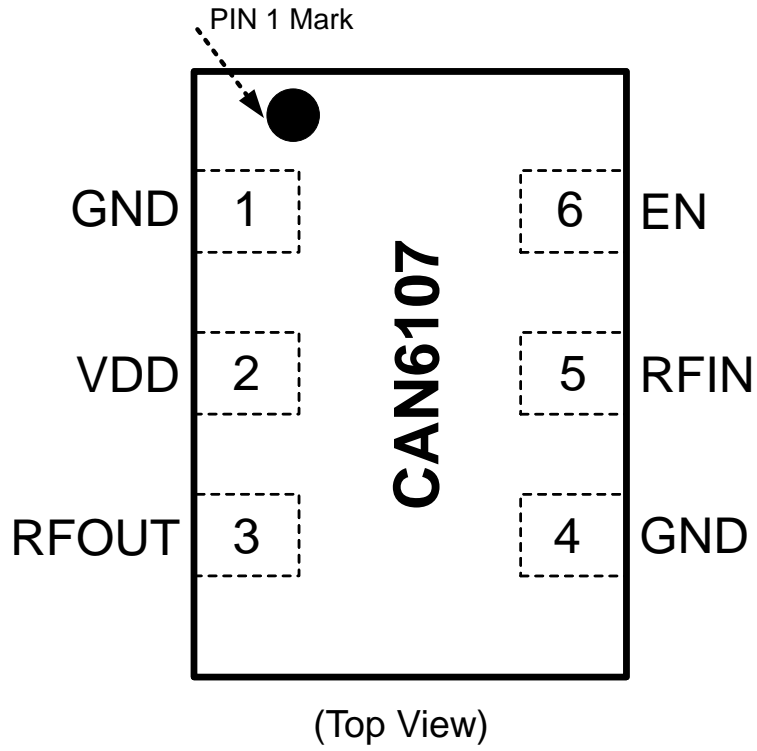


Figure 1 Block Diagram for CAN6107



Pin No.	Name	Description	Connection
1	GND	Ground connection	Connect to PCB ground plane
2	VDD	power supply for LNA	Supply Voltage
3	RFOUT	RF Output	RF output. Connect either direct to saw filter input, or to match component using an inductor
4	GND	Ground connection	Connect to PCB ground plane
5	RFIN	RF Input	Requires a DC-blocking capacitor and external matching components
6	EN	Shut down input	A logic-low disables the device

Parameter	Symbol	Test Conditions	Min.	Max.	Unit
Supply Voltage	VDD	TA=+25		3.6	V
Power down Voltage	V <sub>PD_EN</sub>	TA=+25		3.6	V
LNA Max RF Input Power	P <sub>in</sub>			0	dBm
ESD:HBM, 150pF/1.5KOhm	-		2		kV
Storage Temperature	T <sub>STG</sub>		-40	+150	
Solder Reflow Temperature	T <sub>SLDR</sub>			+260	

**Note1:** This device should be handled with care within the above stress ratings. This IC has ESD protection circuits within but must be handled and assembled according to the industry practice and at the ESD protected work platforms.

Parameter	Symbol	Min.	Typ.	Max.	Unit
Ambient Operating Temperature	T <sub>A</sub>	-40	+25	+85	
Supply Voltage	VDD	1.7	3.0	3.6	V

Power Down Turn 18 reW\*n /P @.72 18 ref417.9

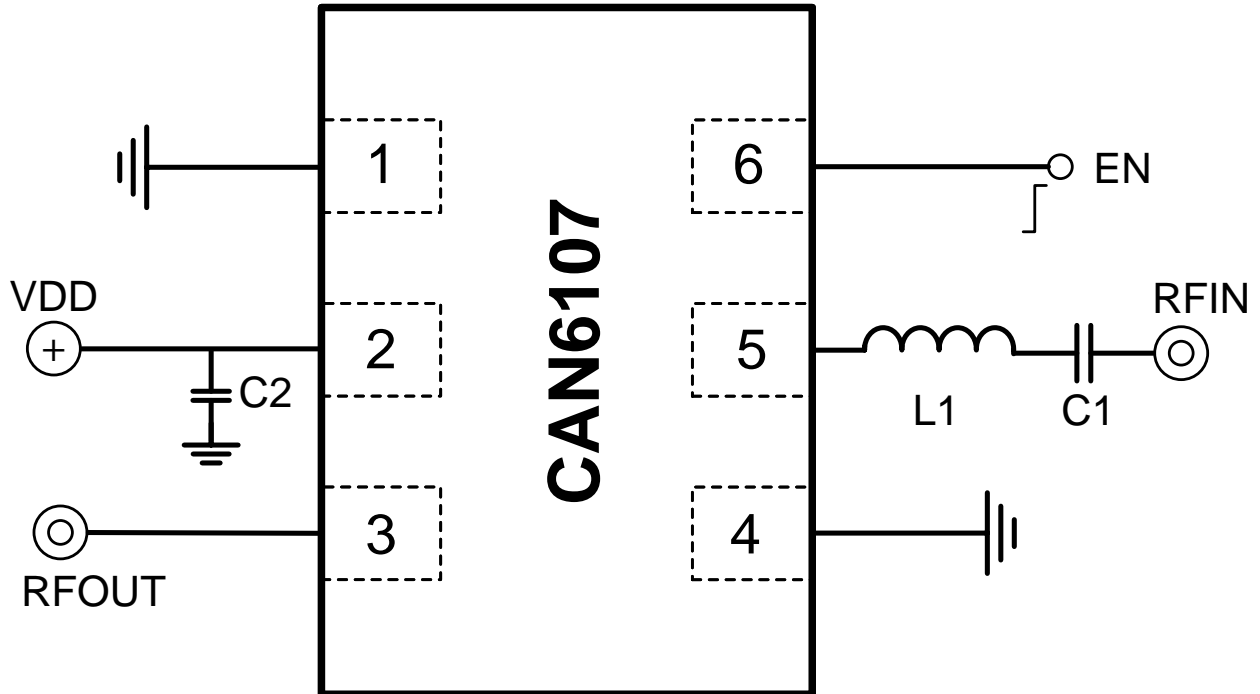
(TA = +25 , VDD = EN = 2.5V, f<sub>in</sub> = 1575.42MHz, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Circuit current	I <sub>cc</sub>	VDD=1.8V		3.6		mA
		VDD=2.5V		3.9		mA
Power Gain	G <sub>P</sub>	VDD=1.8V, Pin=-40dBm		16.7		dB
		VDD=2.5V, Pin=-40dBm		17.2		dB
Noise Figure	NF	VDD=1.8V or 2.5V		0.85		dB
Input Return Loss	RL <sub>in</sub>	VDD=2.5V		-6		dB
Output Return Loss	RL <sub>out</sub>	VDD=2.5V		-12		dB

(TA = +25 , VDD = EN = 2.5V, f<sub>in</sub> = 1575.42MHz, unless otherwise specified)

Parameter	Symbol	Test Conditions	Reference	Unit
Isolation	ISL		26	dB
Input 3 <sup>rd</sup> Order Distortion intercept Point	IIP <sub>3</sub>	(Note 1)	-10	dBm
Gain 1 dB Compression Input Power	P <sub>in(1dB)</sub>		-16	dBm

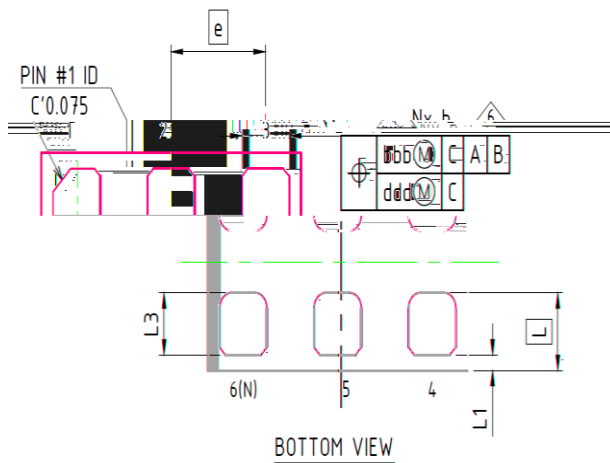
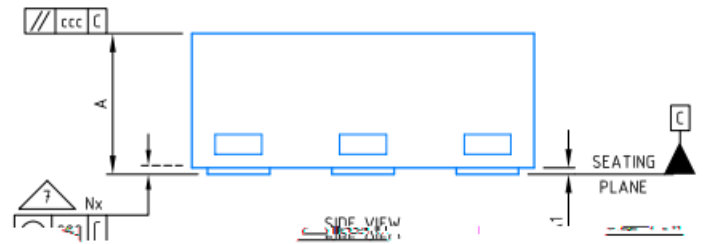
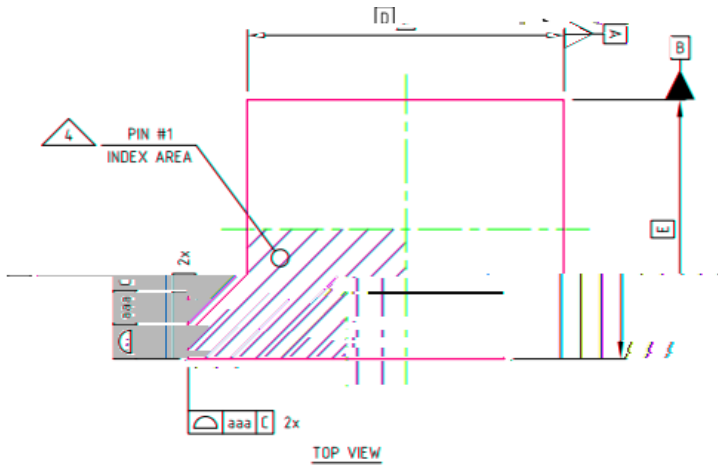
**Note1:** Measured with the two tones located at 5MHz and 10MHz offset from the center of the GPS band with -40dBm/tone.



BOM Descriptions	Symbol	Size	Value	Unit
Chip Capacitor	C1	0402	100	pF
Chip Capacitor	C2	0402	10	nF
Chip inductor	L1	0402	9	nH

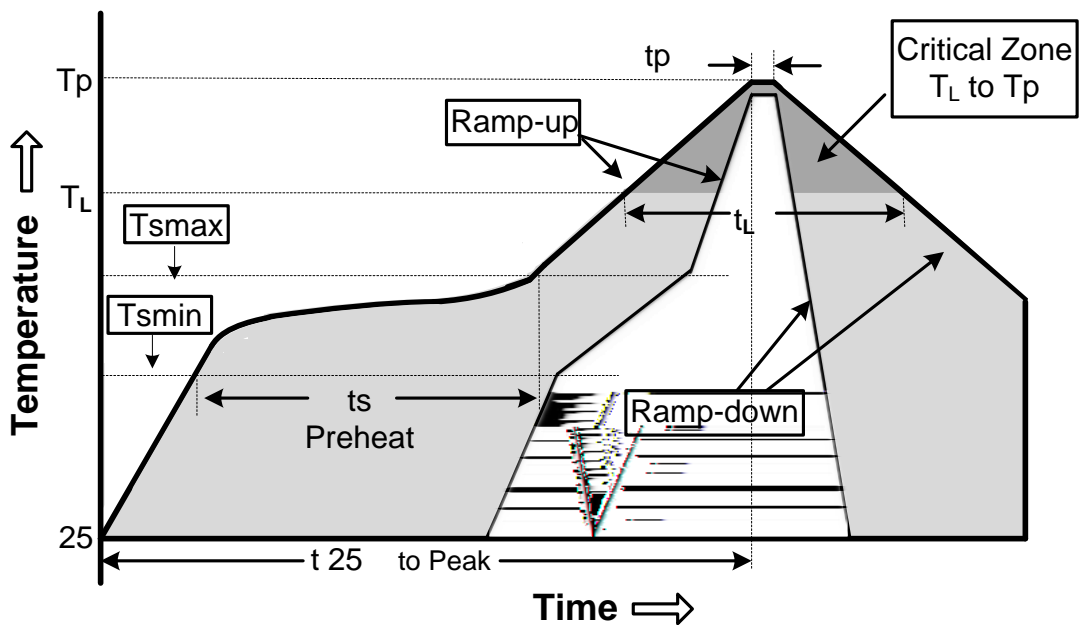
1. These component values are for reference only and are subject to change with customer specific PCB layout design.
2. The input matching inductor L1 is recommended for high Q off-chip inductor, the accuracy of which is within 5% to 10%.

**6-PIN PLASTIC TSON (UNIT: mm)**



	MILLMETER		
SYMBOL	MIN	NOR	MAX
A	0.41	0.45	0.5
A1	0	0.02	0.05
A3	---	0.127 Ref	---
b	0.15	0.2	0.25
D	1.10 BSC		
E	0.70 BSC		
e	0.40 BSC		
L	0.25 BSC		
L1	0.00	0.05	0.10
L3	0.15	0.20	0.25
aaa	0.05		
bbb	0.07		
ccc	0.10		
ddd	0.05		
eee	0.08		
N	6		

Profile Feature	SnPb Eutectic Assembly	Lead (Pb) Free Assembly
Average Ramp-up Rate ( $T_L$ to $T_p$ )	3 /s (max)	3 /s (max)
<b>Preheat</b>		
Temperature Min. ( $T_{smin}$ )	100	150
Temperature Max. ( $T_{smax}$ )	150	200
Time (Min. to Max.) ( $t_s$ )	60 – 120s	60 – 80s
<b>Ramp Up</b>		
$T_{smax}$ to $t_L$	-	3 /s (max)
Time 25 to Peak Temperature	6 mins.(max)	8 mins.(max)
<b>Reflow</b>		
Temperature ( $t_L$ )	183	217
Time maintained above $t_L$	60 – 150s	60 – 150s
Peak Temperature ( $t_p$ )	240± 5	260 + 0/-5
Time Within 5 of Actual Peak Temperature ( $t_p$ )	10 - 30s	20 - 40s
<b>Ramp-Down</b>		
Ramp-Down Rate	6 /s (max)	6 /s (max)





Revision	Release Date	Description
Rev1.0	2017.11	First Version.
Rev1.1	2018.04	Update electrical characteristics.
Rev1.2	2018.07	Update VDD=1.8V spec.