

## Product Features

- High Gain: 17.5dB
- Low noise figure 0.9dB @ 1575.42MHz
- Low operation current 4.0mA & PD current less than 1uA
- Single supply voltage range 1.8V to 3.3V
- Small package 1mm×1.5mm×0.5mm
- Low cost BOM
- Lead-Free and RoHS-Compliant

## Product Applications

- Automotive Navigation
- Personal Navigation Device (PND)
- Cell Phone with GPS
- MID/PAD with GPS

## Product Description

FMLN16G high gain, low noise amplifier (LNA) is dedicated to GPS, GLONASS and Galileo standards.

This product has an extremely low noise figure of 0.9dB, 17.5dB gain and excellent linearity.

FMLN16G works under a 1.8V to 3.3V single power supply while consumes 7.5 mA current, in power down (PD) mode, the power consumption will be reduced to less than 1uA.

FMLN16G uses a small 1mm×1.5mm×0.5mm DFN 6-pin package.



## Absolute Maximum Conditions

Table 1:

Parameters	Minimum	Maximum	Units
Power Supply	-0.3	3.3	V
Other Pin to GND	-0.3	VDD+0.3	V
RF input power		+15	dBm
Junction Temperature		+150	°C
Storage Temperature	-55	+150	°C
Lead Temperature		+260	
Soldering Temperature (reflow)		+260	°C
Machine Mode ESD	-125	+125	V
Human Body Model ESD	-2000	+2000	V
Charge Device Mode ESD	-500	+500	V

Note: Continuous wave for 5000hrs, 50°C

## DC Characteristics

Table 2:

Parameters	Test Condition	Min	Typ	Max	Units
Supply voltage		1.8	2.8	3.3	V
Supply current	EN=High, VDD=2.8	4.0	7.5	9.0	mA
	EN=High, VDD=1.8	3.0	4.0	4.5	
	EN=Low	0	0.1	1	uA
EN Input High		1.6	1.8	VDD	V
EN Input Low		0	0	0.3	V



## AC Characteristics

**Table 3:**

Parameters	Test Condition	Min.	Typ.	Max.	Units
RF Operating frequency	None		1575.42		MHz
Power Gain		16	17.5	19	dB
	Note8	16	17.5	19	
Noise Figure		0.6	0.9	1.1	dB
Input Return Loss	Note1	-15	-10		dB
	Note8	-15	-10		
Output Return Loss	Note1	-15	-10		dB
	Note8	-15	-10		
Reverse Isolation	Note1		-25		dB
VSWR	Note1		1.9		
Desense	Note2		0.25		dB
700M Harmonic	Note4		-53.5		dBm
Input Power 1-dB Compression Point	900MHz		-5		dBm
	1575MHz		-10		
	2400MHz		4		
Input Out-Band IP2	Note7		42		dBm
Input In-Band IP3	Note4		-5		dBm
Input Out-Band IP3	Note5		+2		dBm
Stability	Note3	1.0			

(TA=-40~+90°C, typically TA=25°C VDD=2.8V, all data measured on EVB, unless otherwise noted.)

**Note1:** sweep power -30dBm, 1575.42MHz

**Note2:** jammed signal @ 1463MHz & 1712MHz, -20dBm

**Note3:** frequency range 500MHz-5GHz

**Note4:** f1 = 787.76MHz, -25dBm, Input referred 2nd Harmonics

**Note5:** f1 = 1574.5 MHz, f2 = 1575.5 MHz, -30dBm

**Note6:** f1 = 1712.7 MHz, -20dBm, f2 = 1850 MHz, -65dBm, IP3=  $(2*P1+P2+ Gain_{1575MHz} - IM3)/2$

**Note7:** f1 = 824.6 MHz, -25dBm, f2 = 2400 MHz, -32dBm, IP2 =  $Pin\_avg - (IM2 - Gain_{1575MHz})$

**Note8:** Beidou frequency range B1: 1559.052MHz---1591.788MHz



### Application circuit

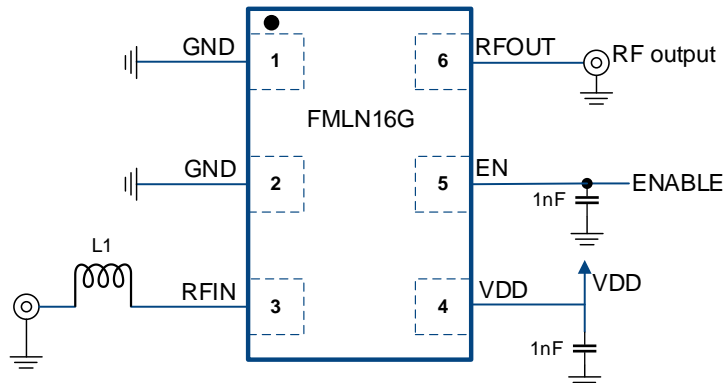


Figure 1 Application circuit

Table 5:

Number	Vendor	Type	Part Number
L1	Murata	Wired inductor, high Q	LQW15AN9N1, 9.1nH



Pin-out Information

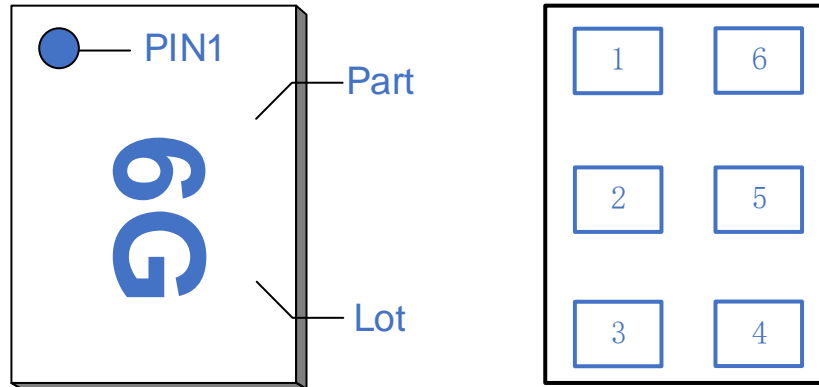


Figure 2 Pin-out Information

Table 6: Pin Description

Pin #	Name	I/O	Description
1	GND	AG	Analog VSS
2	GND	AG	Analog VSS
3	RFIN	AI	LNA input from antenna
4	VDD	AP	Power supply, 1.8~3.3V
5	EN	DI	Pull high enable, pull low into power down mode
6	RFOUT	AO	LNA output

**Note:** DI (digital input), DO (digital output), DIO (digital bidirectional), AI (analog input), AO (analog output), AIO (analog bidirectional), AP (analog power), AG (analog ground)



Package Outline Dimension

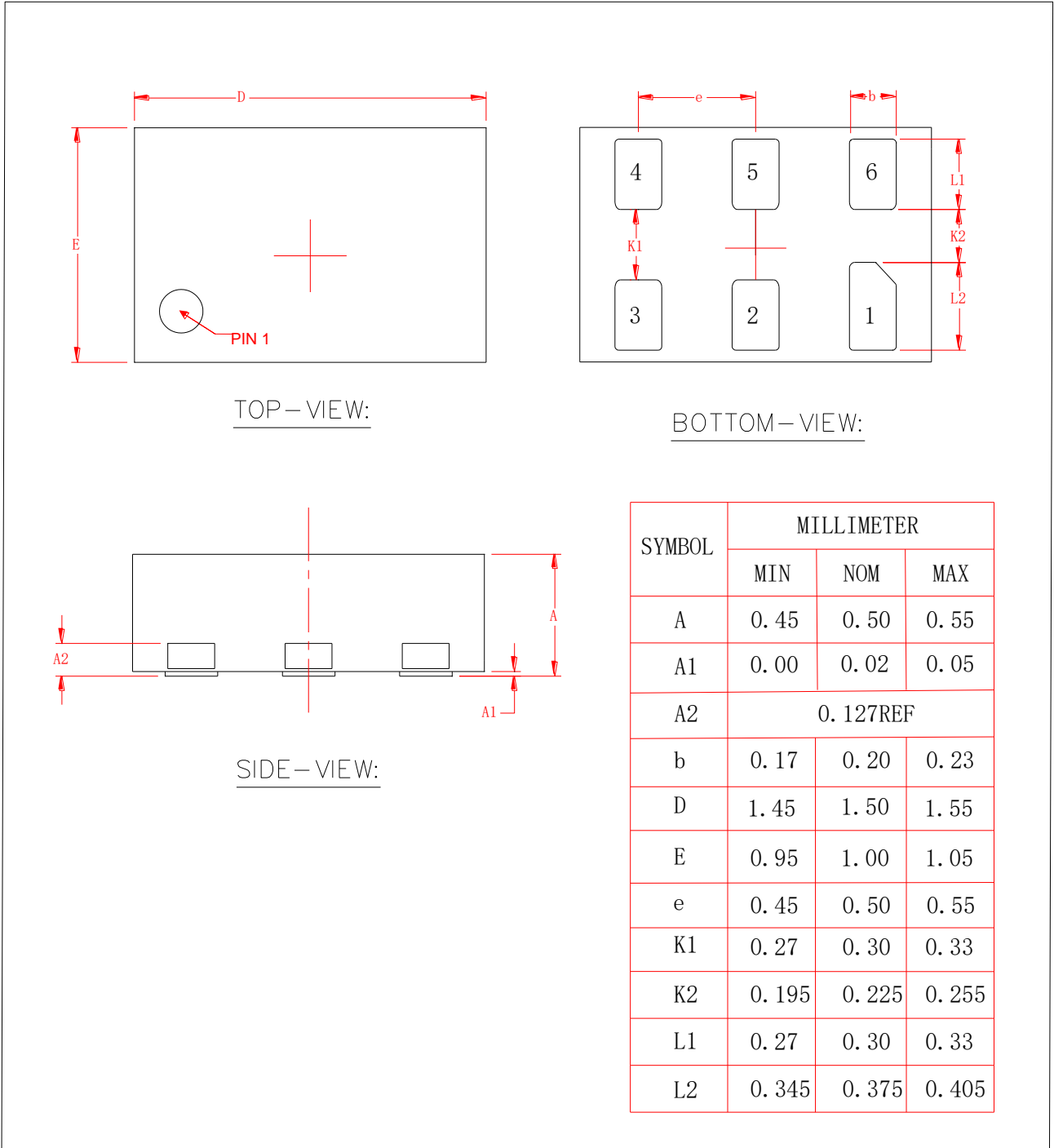


Figure 3 Package Outline Dimension



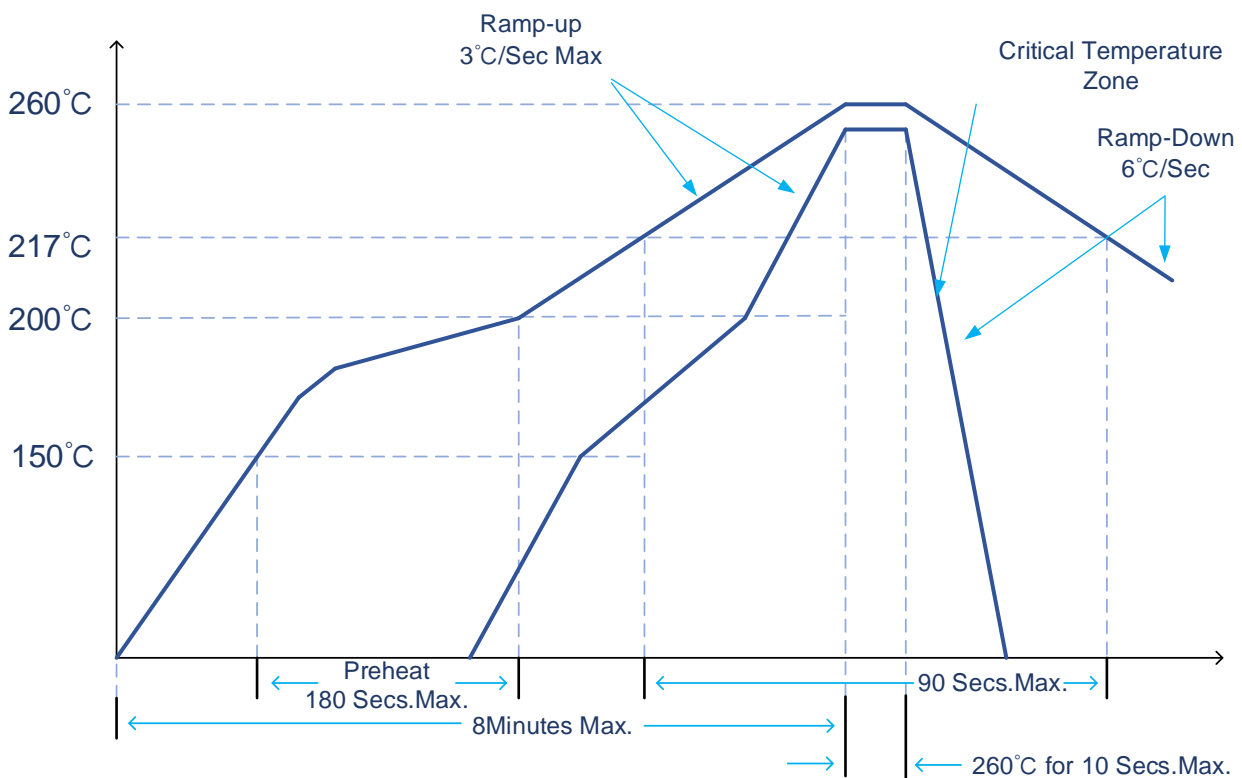
## ESD Sensitivity

Integrated circuits are ESD sensitive and can be damaged by static electric charge. Proper ESD protection techniques should be applied when devices are operated.

## RoHS Compliant

This product does not contain lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE) , and are considered RoHS compliant.

## Reflow Chart



NOTE: Reflow Profile with 240°C peak also acceptable.

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