

Product Features

- High Gain:18.0dB
- Low noise figure 0.75dB@1575.42MHz
- Low operation current 7.0 mA & PD current Less than 1uA
- Single supply voltage range 1.2V to 3.6V
- Small package: 1.1mmx0.7mmx0.45mm
- 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

FMLN16T high gain, low noise amplifier (LNA) is Dedicated to GPS, GLONASS Galileo and Beidou Standards. This product has an extremely low noise figure of 0.75dB,18.0dB gain and excellent Linearity.

FMLN16T works under a 1.2V to 3.6V single power supply while consumes 7.0 mA current, in Power down (PD) mode, the power consumption Will be reduced to less than 1uA.

FMLN16T uses a small 1.1mmx0.7mmx0.45mm LGA 6-pin package.



Application circuit

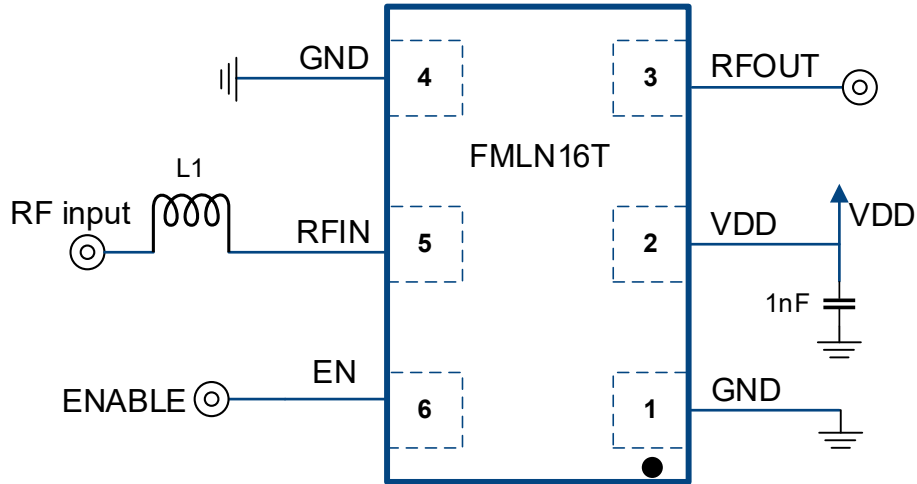


Figure 1 FMLN16T Application circuit

Table 1:

Number	Vendor	Part Number
L1	Murata	LQW15AN11N, 11nH



Pin-out Information

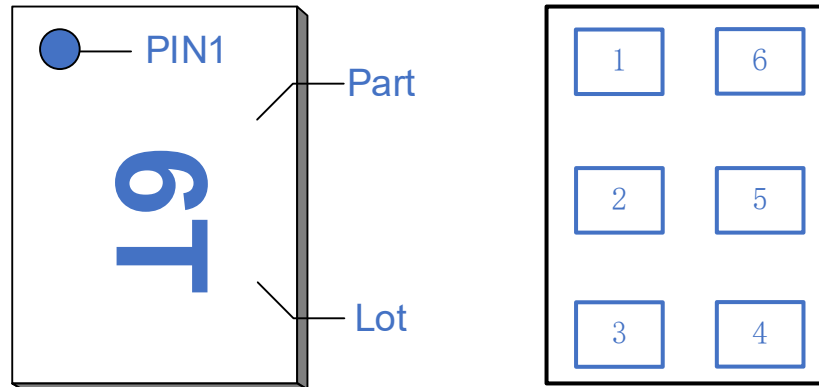


Figure 2 Pin-out Information

Table 2: Pin Description

Pin #	Name	I/O	Description
1	GND	AG	Analog VSS
2	VDD	AP	Power supply, 1.2~3.6V
3	RFOUT	AO	LNA output
4	GND	AG	Analog VSS
5	RFIN	AI	LNA input from antenna
6	EN	DI	Pull high enable, pull low into power down mode

Note: DI (digital input), DO (digital output), DIO (digital bidirectional), A (analog input), AO (analog output), A/O (analog bidirectional), AP (analog power), AG (analog ground)



Absolute Maximum Conditions

Table 3:

Parameters	Minimum	Maximum	Units
Supply voltage	-0.3	3.6	V
RF input power		+10	dBm
Storage temperature	-65	+160	°C
Junction Temperature		150	°C
Operating temperature	-40	+85	°C
Lead Temperature(soldering)		260	°C
Human Body Model, Class 1C	-2000	+2000	V
Machine Mode ESD	-125	+125	V
Charge Device Mode ESD	-500	+500	V

1: Test condition 50% duty cycle, VSWR=1:1, +25 °C

Note: Exposure to maximum rating conditions for extended periods may reduce device reliability. There is no damage to device with only one parameter set at the limit and all other parameters set at or below their nominal value. Exceeding any of the limits listed here may result in permanent damage to the device.

Specifications

DC Characteristics

Table 4:

Parameters	Test Condition	Min.	Typ.	Max.	Units
Supply voltage		1.2	2.8	3.6	V
Supply current	EN=High		7.0		mA
	VDD=1.8V		4.0		
	EN=Low			1	µA
EN Input High		0.8			V
EN Input Low				0.6	V

(Typically VDD = 2.8 V, TA = +25 °C, Unless Otherwise Noted)



AC Characteristics

Table 5:

Parameters	Test Condition	Min.	Typ.	Max.	Units
RF Operating frequency	None		1575.42		MHz
Power Gain			18.0		dB
Noise Figure			0.75		dB
Input Return Loss	Note1		-10		dB
Output Return Loss			-10		dB
Reverse Isolation	Note1		-26		dB
VSWR	Note1		1.9		
Input Power 1-dB Compression Point	1575MHz		-10		dBm
	900MHz		-2		
	2400MHz		-9		
Input IP2	Note6		42		dBm
Input In-Band IP3	Note4		-1		dBm
Input Out-Band IP3	Note5		+15		dBm
Stability	Note3	1.5			
Jammed Noise Figure	Note2		0.75		dB

(Typically VDD = 2.80 V, TA = +25 °C, all data measured on Lingchip' s EVB, Unless Otherwise Noted)

Note1: sweep power -30dBm, 1575.42MHz

Note2: jammed signal @ 1.8GHz & 950 MHz, -30dBm

Note3: frequency range 500MHz-5GHz

Note4: f1=1574.5MHz, f2=1575.5MHz, -30dBm

Note5: f1=2400MHz, f2=2000MHz, -30dBm IP3=pin-(IM3-Gain1575MHz)/2

Note6: f1=2475MHz, f2=900MHz, -30dBm, IP2=pin-(IM2- Gain1575MHz), IMD2 referred to input port.

Note7: Beidou frequency range B1: 1559.052MHz — 1591.788MHz



Table 6:

Parameters	Test Condition	Min.	Typ.	Max.	Units
RF Operating frequency	None		1575.42		MHz
Power Gain			16.0		dB
Noise Figure			0.95		dB
Input Return Loss	Note1		-10		dB
Output Return Loss			-10		dB
Reverse Isolation	Note1		-25		dB
VSWR	Note1		1.9		
Input Power 1-dB Compression Point	1575MHz		-11		dBm
	900MHz		-1		
	2400MHz		-9		
Input IP2	Note6		38		dBm
Input In-Band IP3	Note4		-3		dBm
Input Out-Band IP3	Note5		+13		dBm
Stability	Note3	1.5			
Jammed Noise Figure	Note2		0.95		dB

(Typically VDD = 1.80 V, TA = +25 °C, all data measured on Lingchip' s EVB, Unless Otherwise Noted)

Note1: sweep power -30dBm,1575.42MHz

Note2: jammed signal @ 1.8GHz & 950 MHz, -30dBm

Note3: frequency range 500MHz-5GHz

Note4: f1=1574.5MHz, f2=1575.5MHz, -30dBm

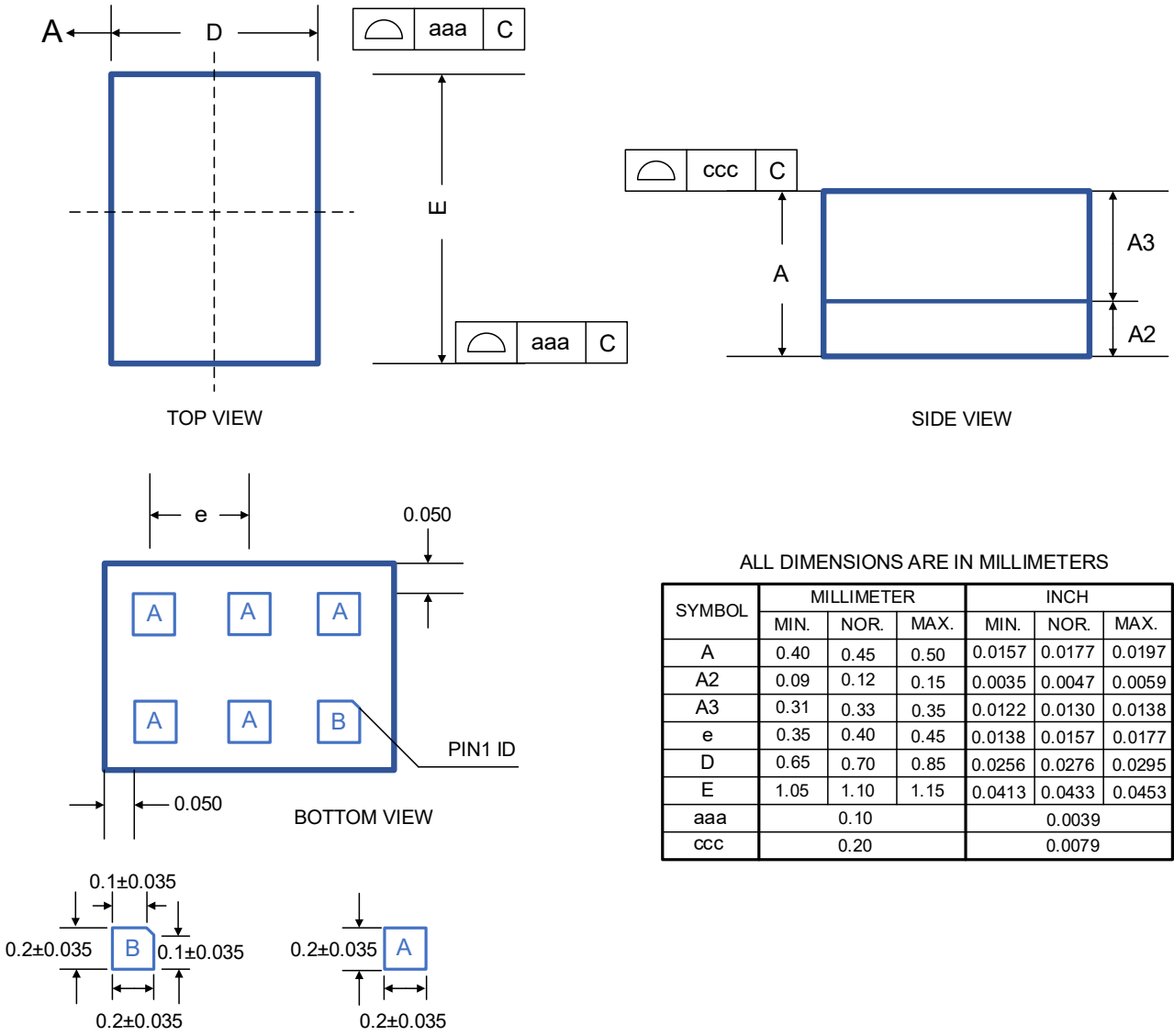
Note5: f1=2400MHz, f2=2000MHz, -30dBm IP3=pin-(IM3-Gain1575MHz)/2

Note6: f1=2475MHz, f2=900MHz, -30dBm, IP2=pin-(IM2- Gain1575MHz), IMD2 referred to input port.

Note7: Beidou frequency range B1: 1559.052MHz — 1591.788MHz



Package Outline Dimension



ALL DIMENSIONS ARE IN MILLIMETERS

SYMBOL	MILLIMETER			INCH		
	MIN.	NOR.	MAX.	MIN.	NOR.	MAX.
A	0.40	0.45	0.50	0.0157	0.0177	0.0197
A2	0.09	0.12	0.15	0.0035	0.0047	0.0059
A3	0.31	0.33	0.35	0.0122	0.0130	0.0138
e	0.35	0.40	0.45	0.0138	0.0157	0.0177
D	0.65	0.70	0.85	0.0256	0.0276	0.0295
E	1.05	1.10	1.15	0.0413	0.0433	0.0453
aaa	0.10			0.0039		
ccc	0.20			0.0079		

Figure 2 Package Outline Dimension



富满微电子集团股份有限公司

FINE MADE MICROELECTRONICS GROUP CO., LTD.

FMLN16T

Low Noise GPS Amplifier

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.

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