

## General Description

The ETM1006 is a low cost Low Noise Amplifier (LNA) provides 28.5dB gain and 1.1dB noise figure for GPS (Global Positioning System) application in 1.57542GHz. The LNA is implemented as a two stages monolithic microwave integrated circuit (MMIC). ETM1006 can be used as a variable gain LNA offer 25dB gain control, which is controlled with 1.2 to 3.3V. The low noise figure of device can improve the sensitivity of the system and very low current consumption can maximize the battery life in portable equipment. TM1006 is packaged in a compact 3mm by 3mm leadless package.

## Features

- Single Positive Supply: +3.3V
- Gain: 28.5dB
- Noise Figure: 1.1 dB @ 1.575GHz
- Gain Adjustment: 25dB
- Low Current Consumption: 10.5mA from a +5.5V supply
- 3mm x 3mm ultra small QFN leadless package
- RoHS compliant
- MSL 1

## Applications

- GPS

## Absolute Maximum Ratings

Parameter	Maximum Rating	Unit
Supply Voltage	0 to 6	V
RF Input Power	-25	dBm
Operating Temperature	-40 to +85	°C
Storage Temperature	-55 to +150	°C

Notes:

1. Stress in excess of the maximum rating may cause permanent damage to the device.
2. Caution ! ESD Sensitive Device.

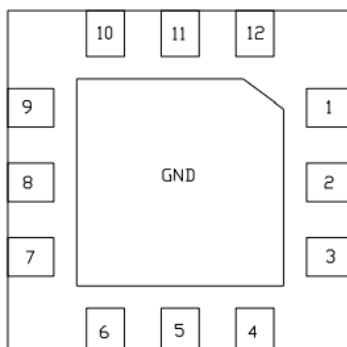
### Specification Summary

(ETM1006 Evaluation Board,  $V_{c1}=V_{c2}=V_{b1}=V_{b2}=+3.3V$ ,  $R_{Fin}=-40dBm$ ,  $T_A=+25^{\circ}C$ , unless otherwise noted.)

Parameter	Min.	Typical	Max.	Unit	Conditions
Operating Frequency Range		1.57542		GHz	
Gain	27	28.5		dB	
Noise Figure		1.1	1.5	dB	
S <sub>11</sub>		-12	-10	dB	
S <sub>22</sub>		-12	-10	dB	
Control Voltage (V <sub>apc</sub> )	1.2		3.3	V	Application circuit B
Gain Adjustment Range		25		dB	V <sub>apc</sub> 1.2 to 3.3V
Power Supply Current		8.5	10	mA	
Power Supply Voltage	2.5		5.5	V	

### Pin Assignment

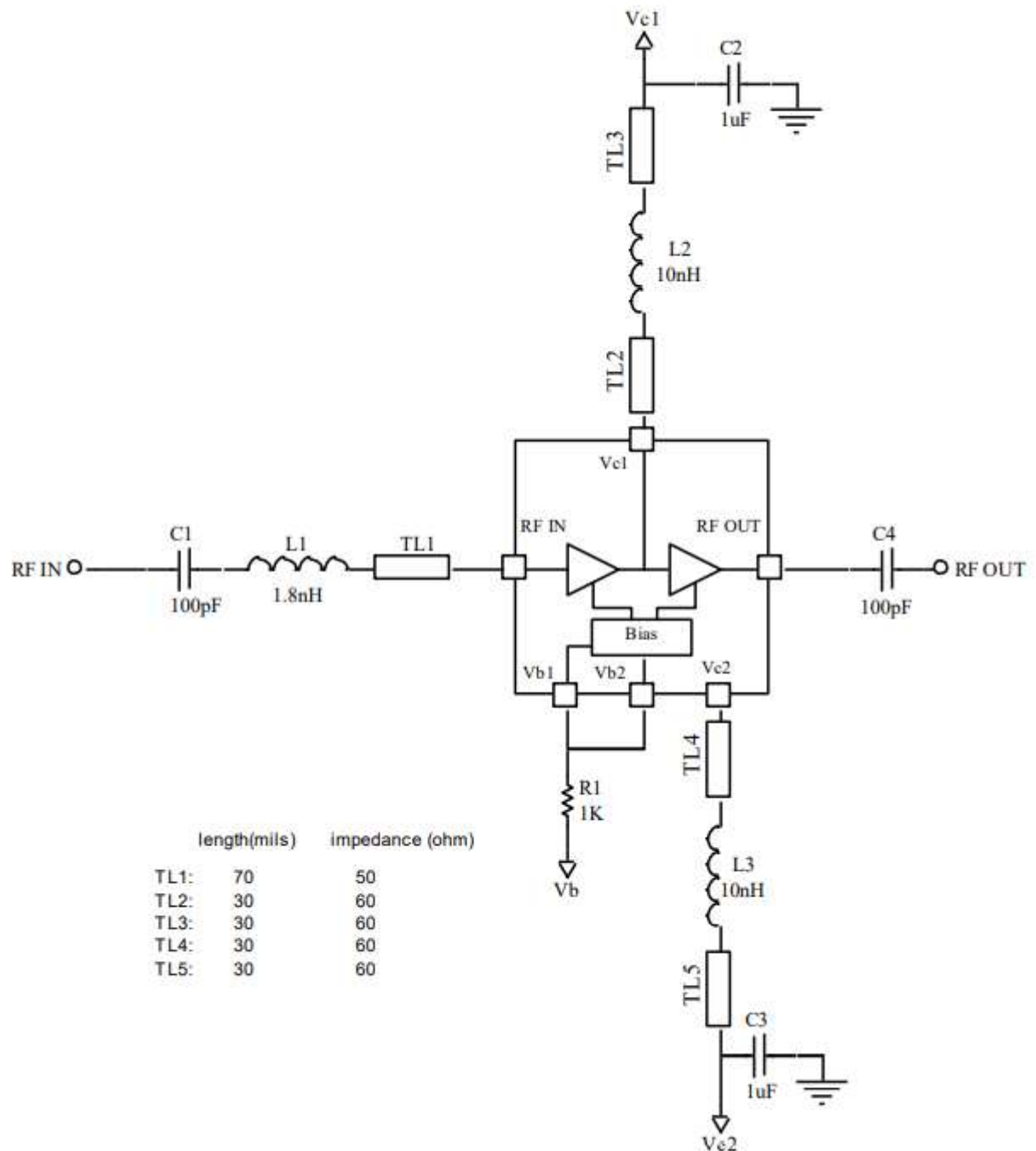
#### Bottom View



### Functional Pin Description

Name	Pin #	Description
N/C	1,3,7,9,10,12	N/C
RFin	2	The RF input of low noise amplifier.
Vb1	4	The Base of first stage. This pin needs to apply voltage.
Vb2	5	The Base of second stage. This pin needs to apply voltage.
Vc2	6	The collector of second stage. This pin needs to apply voltage.
RFout	8	The RF output of low noise amplifier.
Vc1	11	The collector of first stage. This pin needs to apply voltage.
GND	GND	The GND pin must be connected to Ground.

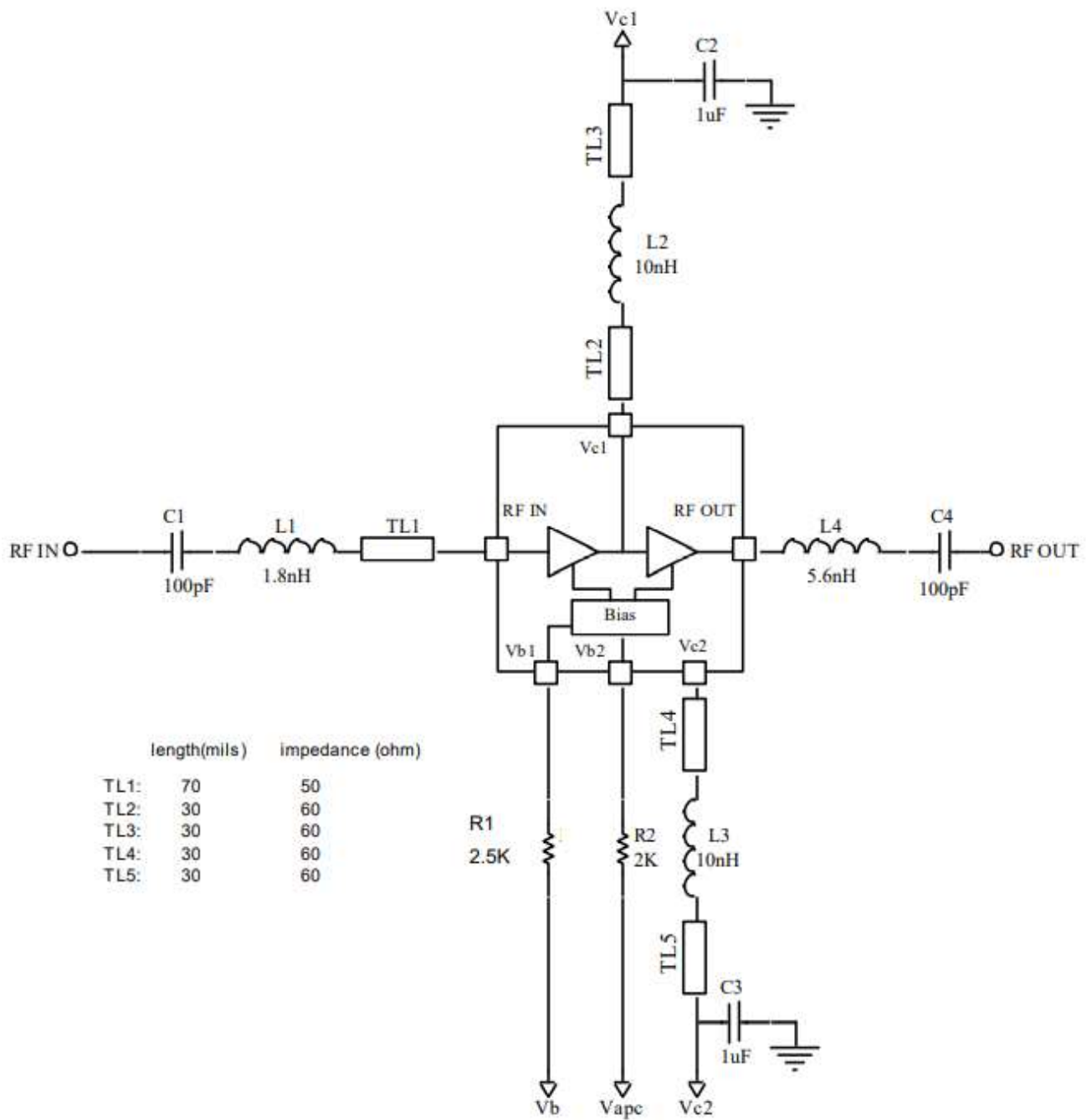
### Application Circuit A: Basic Circuit for GPS Application



#### Note:

The voltage Range of Vcc1, Vcc2 and Vb is from 2.5V to 5.5V The GND pin must be connected to Ground, or the device will not work.

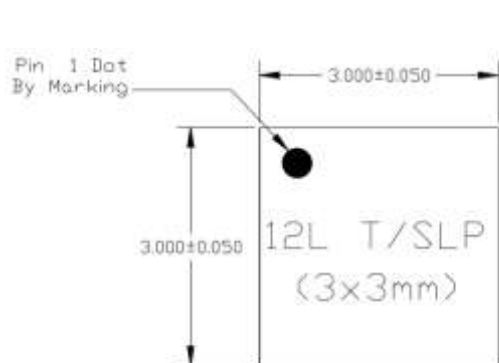
### Application Circuit B: Circuit of Variable Gain Application



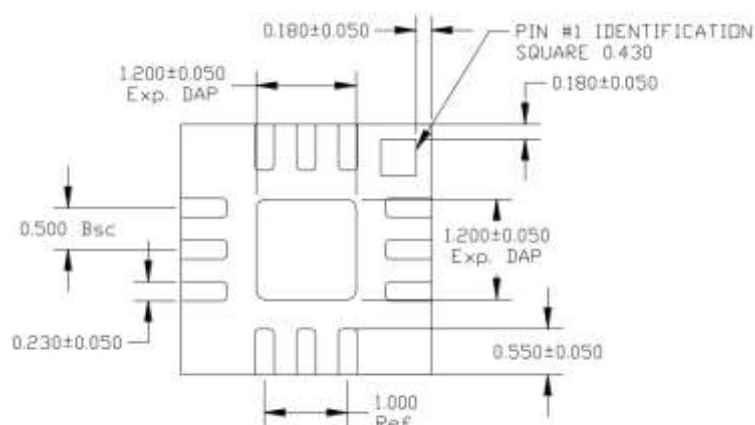
Note:

$V_{c1} = V_{c2} = V_b = 3.3V$  and  $V_{apc}$  is the control voltage of gain.

### Package Information



TOP VIEW



BOTTOM VIEW

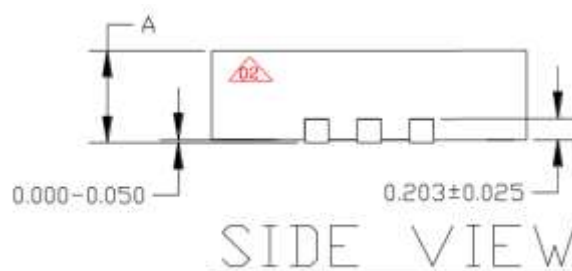
#### NOTE:

- 1) TSLP AND SLP SHARE THE SAME EXPOSE OUTLINE BUT WITH DIFFERENT THICKNESS:

A	TSLP		SLP
	MAX.	0.800	0.900
	NOM.	0.750	0.850
	MIN.	0.700	0.800



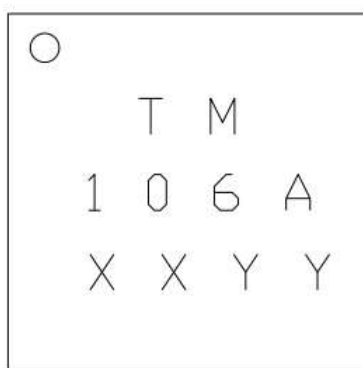
ALL MEASUREMENT IN (MM)



### Ordering Information

ETM1006 □ R  
└ Q1 = QFN-12

### Product Marking



XXYY means date code

### SMT Reflow Profile

