

To our customers,

Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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Evaluation Board Information

EC-NE3505M04

2.4 GHz LNA Evaluation Board

- **Evaluation Board Pattern Layout**
- **Circuit Description**
- **Noise Figure and Associated Gain**
- **Gain and Isolation Data**
- **Input and Output Return Loss Data**
- **1 dB Gain Compression Output Power Data**

Caution	GaAs Products	<p>This product uses gallium arsenide (GaAs). GaAs vapor and powder are hazardous to human health if inhaled or ingested, so please observe the following points.</p> <ul style="list-style-type: none"> • Follow related laws and ordinances when disposing of the product. If there are no applicable laws and/or ordinances, dispose of the product as recommended below. 1. Commission a disposal company able to (with a license to) collect, transport and dispose of materials that contain arsenic and other such industrial waste materials. 2. Exclude the product from general industrial waste and household garbage, and ensure that the product is controlled (as industrial waste subject to special control) up until final disposal. • Do not burn, destroy, cut, crush, or chemically dissolve the product. • Do not lick the product or in any way allow it to enter the mouth.
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This document outlines general applications for this product. The application circuits and circuit constants provided in this document are simply examples and should not be used for mass production design. Be aware also that there is no intention to standardize the restrictions and characteristics of these application circuits.

The characteristics of high-frequency devices in particular vary depending on the external components and mounting pattern used.

Customers are requested to confirm all characteristics when designing a system based in part or wholly on the information in this document.

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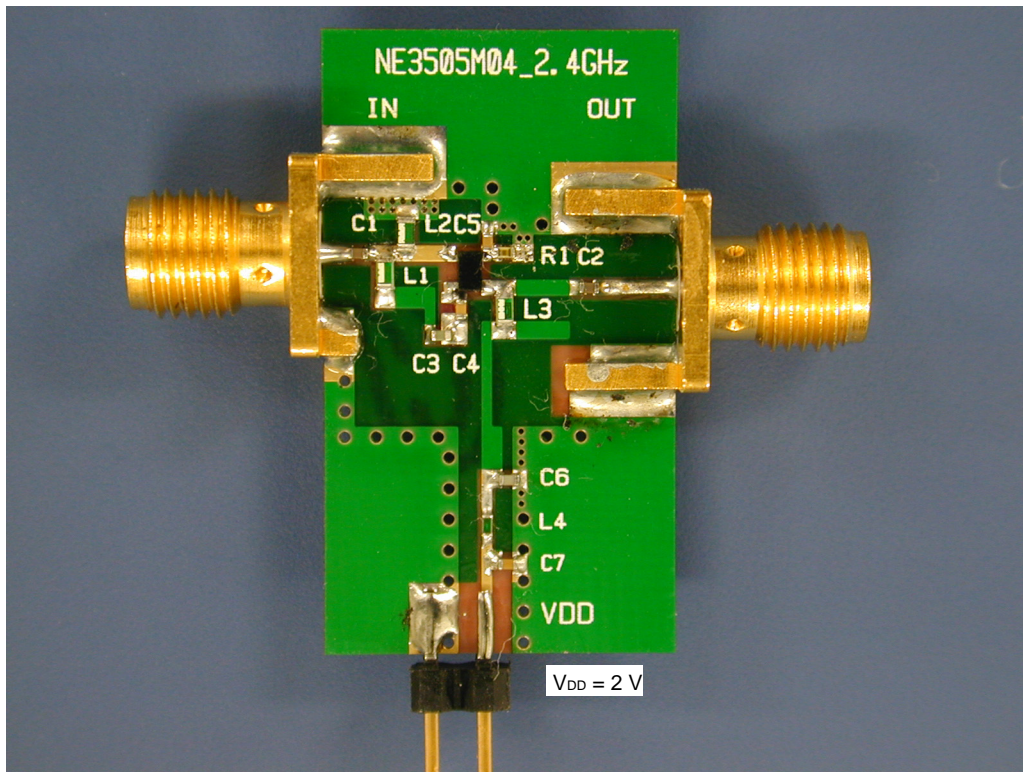
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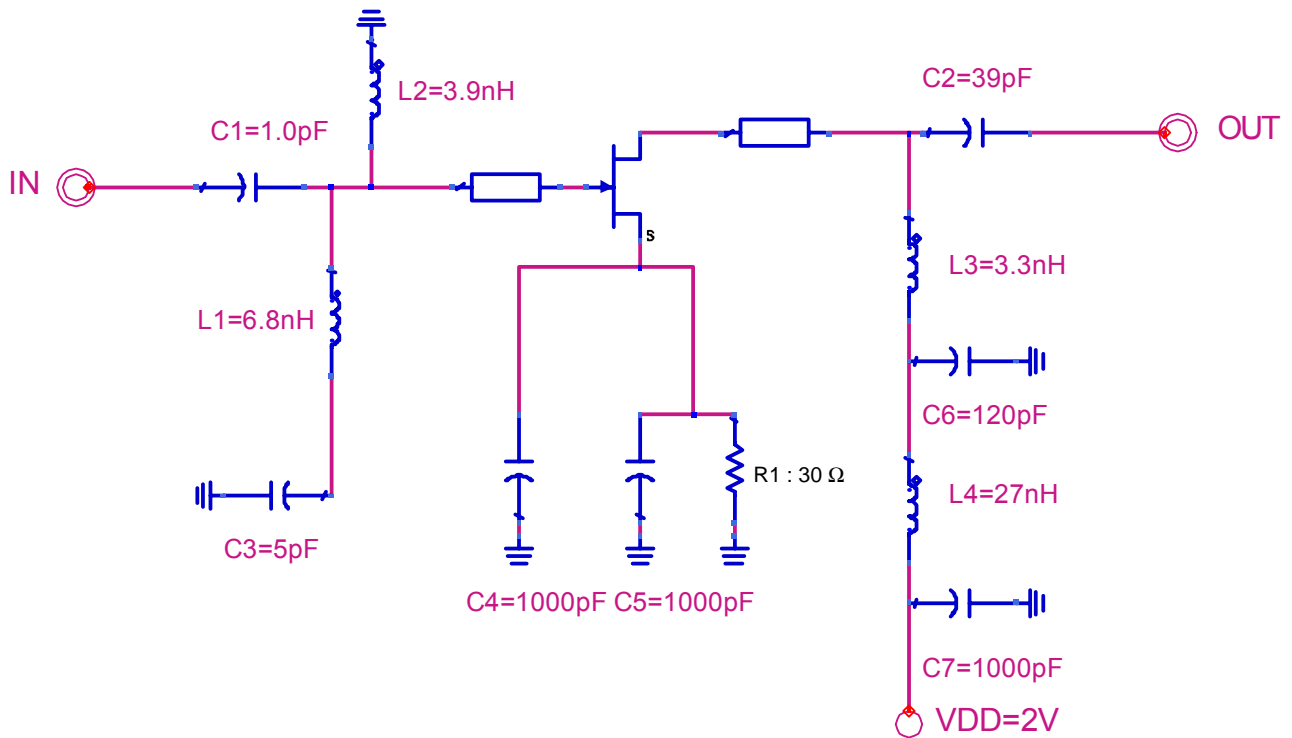
Evaluation Board Pattern Layout



size 17.0 mm × 30.0 mm

material FR4 (ELC4756/Sumitomo)
h = 0.4 mm, $\epsilon_r = 4.6$

Circuit Description



Noise Figure and Associated Gain

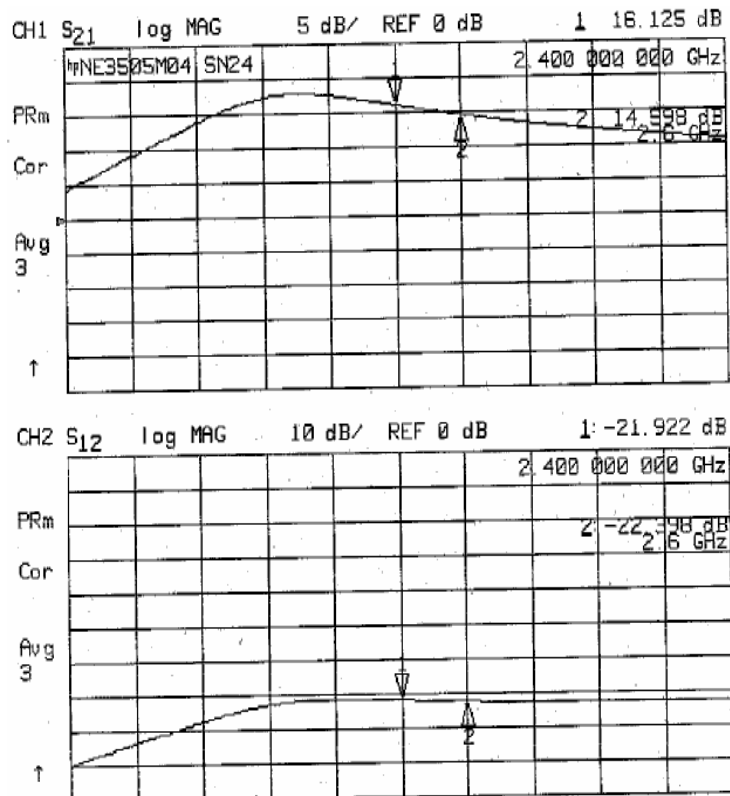
(EC-NE3505M04 2.4 GHz LNA/ $V_{DD} = 2$ V, $I_D = 15.4$ mA, $T_A = 25^\circ\text{C}$)

Item	Symbol	Data	Unit
Noise Figure	NF ^{Note}	0.65	dB
Associated Gain	Ga ^{Note}	15.9	dB
Return Loss (in)	RLin	5.5	dB
Return Loss (out)	RLout	11.0	dB
Output Power at 1 dB Compression Point	P (1 dB)	8.2	dBm

Note Without loss of the test fixture (0.11 dB). Substrate is FR-4

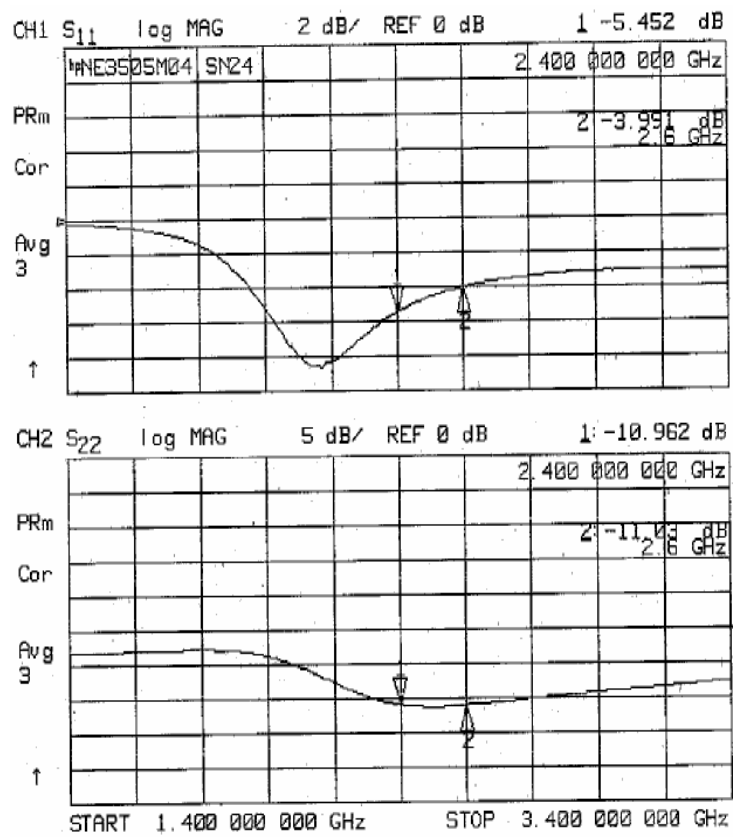
Gain and Isolation Data

(EC-NE3505M04 2.4 GHz LNA/ $V_{DD} = 2$ V, $I_D = 15.4$ mA)



Input and Output Return Loss Data

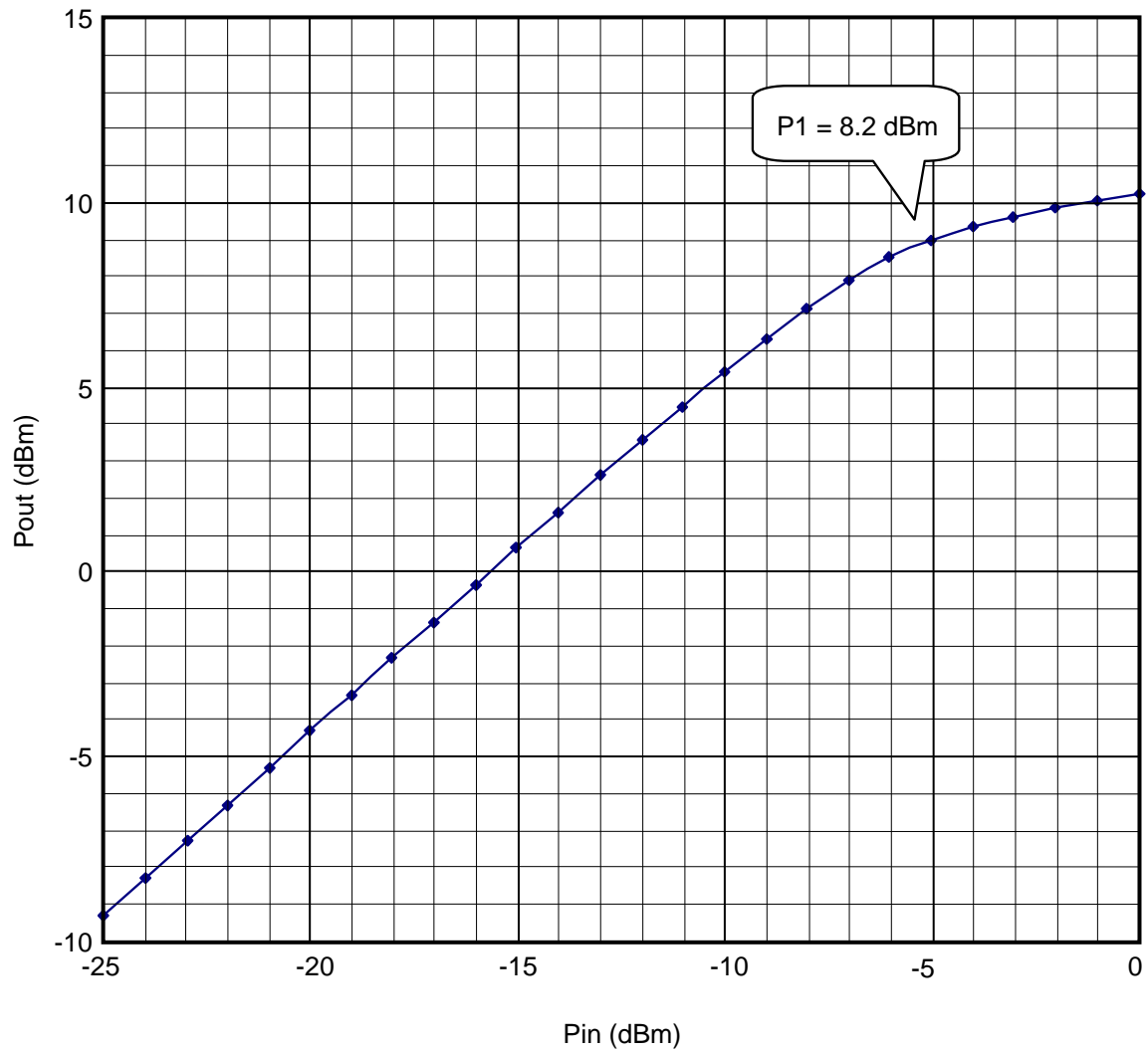
(EC-NE3505M04 2.4 GHz LNA/ $V_{DD} = 2$ V, $I_D = 15.4$ mA)



1 dB Gain Compression Output Power Data

(EC-NE3505M04 2.4 GHz LNA/ $V_{DD} = 2\text{ V}$, $I_D = 15.4\text{ mA}$)

NE3505M04 Pin vs. Pout



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