

To our customers,

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## Old Company Name in Catalogs and Other Documents

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

April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

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

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## **Evaluation Board Information**

# **EC- $\mu$ PG2310TK**

## **2.34 GHz LNA Evaluation Board**

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- **Evaluation Board Pattern Layout**
- **Circuit Description**
- **LNA Performance**
- **P<sub>in</sub>-P<sub>out</sub> & IM<sub>3</sub> Performance**
- **Gain and Isolation**
- **Input and Output Return Loss**

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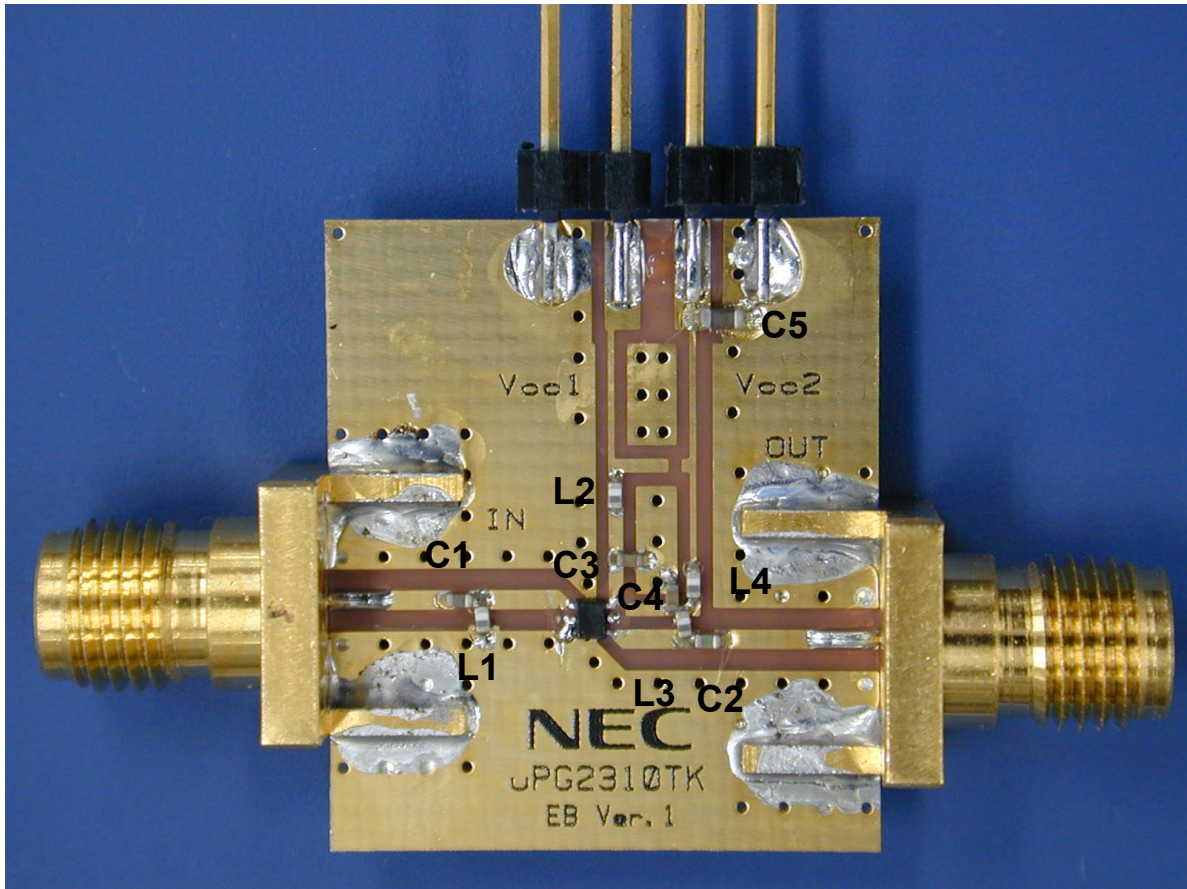
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M8E 00.4-0110

## Evaluation Board Pattern Layout



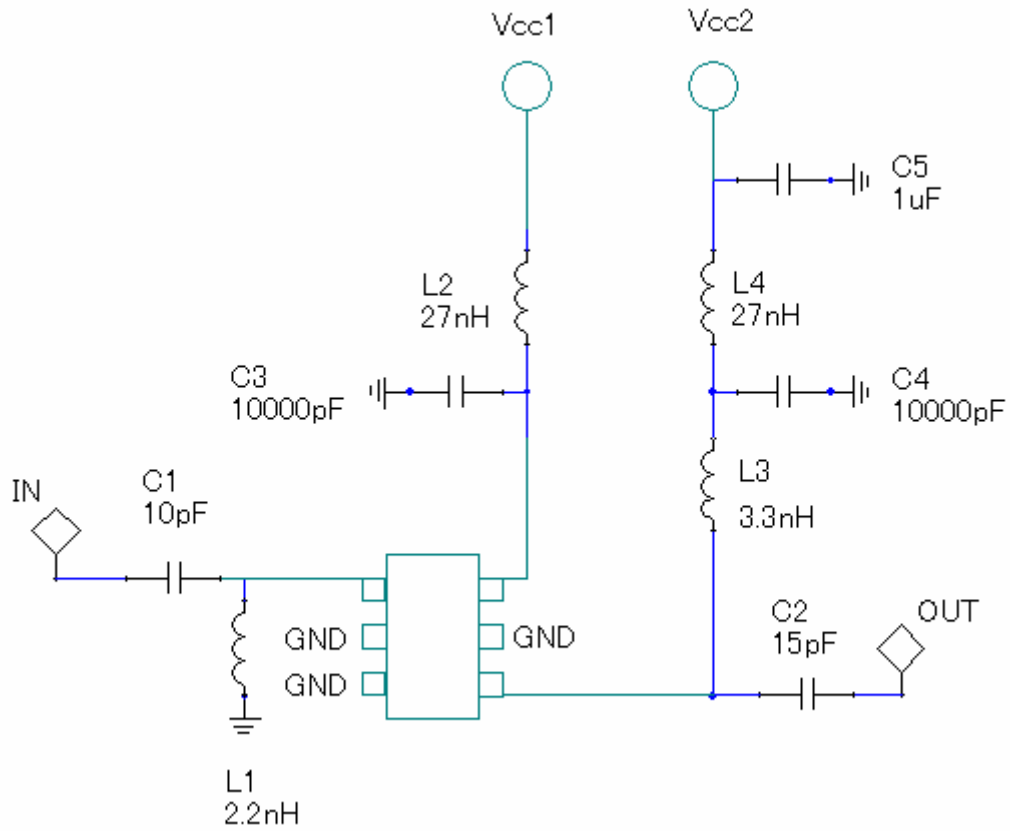
size 20.0 mm × 23.0 mm

material FR4 (ELC4756/Sumitomo)  
h = 0.4 mm,  $\epsilon_r = 4.4$

## Circuit Description

( $V_{cc1} = V_{cc2} = 3.0\text{ V}$ ,  $I_{cc} = 28.9\text{ mA}$ )

### TEST CIRCUIT



### COMPONENTS OF TEST CIRCUIT

Parts	Part Number	Maker	Symbol	Value	Unit
Chip Capacitor	GRP1552C1H100JZ01	Murata	C1	10	pF
Chip Capacitor	GRP1552C1H150JZ01	Murata	C2	15	pF
Chip Capacitor	GRP155B11E103KA01	Murata	C3, C4	10 000	pF
Chip Capacitor	GRM188F11A105ZC01	Murata	C5	1	$\mu\text{F}$
Chip Inductor	AML1005H2N2ST	FDK	L1	2.2	nH
Chip Inductor	AML1005H27NJT	FDK	L2, L4	27	nH
Chip Inductor	AML1005H22NJT	FDK	L3	3.3	nH
Transistor	$\mu\text{PG2310TK}$	NEC	TR		
DC Connector	A2-2PA-2.54DSA	Hirose			
RF Connector	01K2175-00	WAKA			
Substrate	FR4 (t = 0.4 mm)	Sumitomo			



## LNA Performance

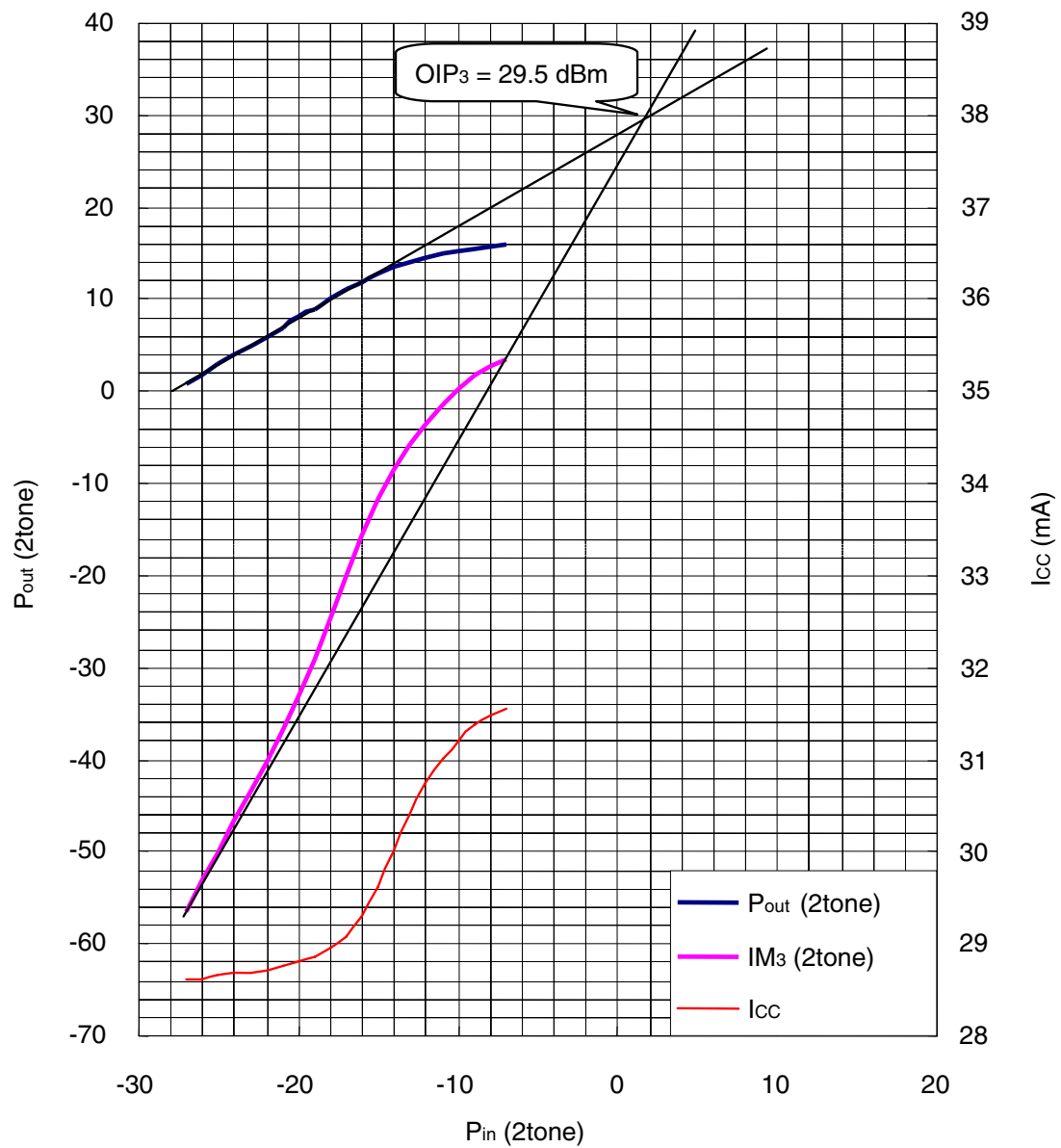
( $V_{CC1} = V_{CC2} = 3.0\text{ V}$ )

Item	Gain	I <sub>CC</sub>	R <sub>L</sub> <sub>in</sub>	R <sub>L</sub> <sub>out</sub>	OIP <sub>3</sub> <sup>Note</sup>	NF
Unit	(dB)	(mA)	(dB)	(dB)	(dBm)	(dB)
2.32 GHz	28.1	28.9	12.2	17.2	29.5	1.5
2.35 GHz	27.8		12.4	15.6		
Spec f = 2.34 GHz	> 25	< 35	–	–	> 26.5	< 2.0

**Note** f = 2.34 GHz, 0.1 MHz offset

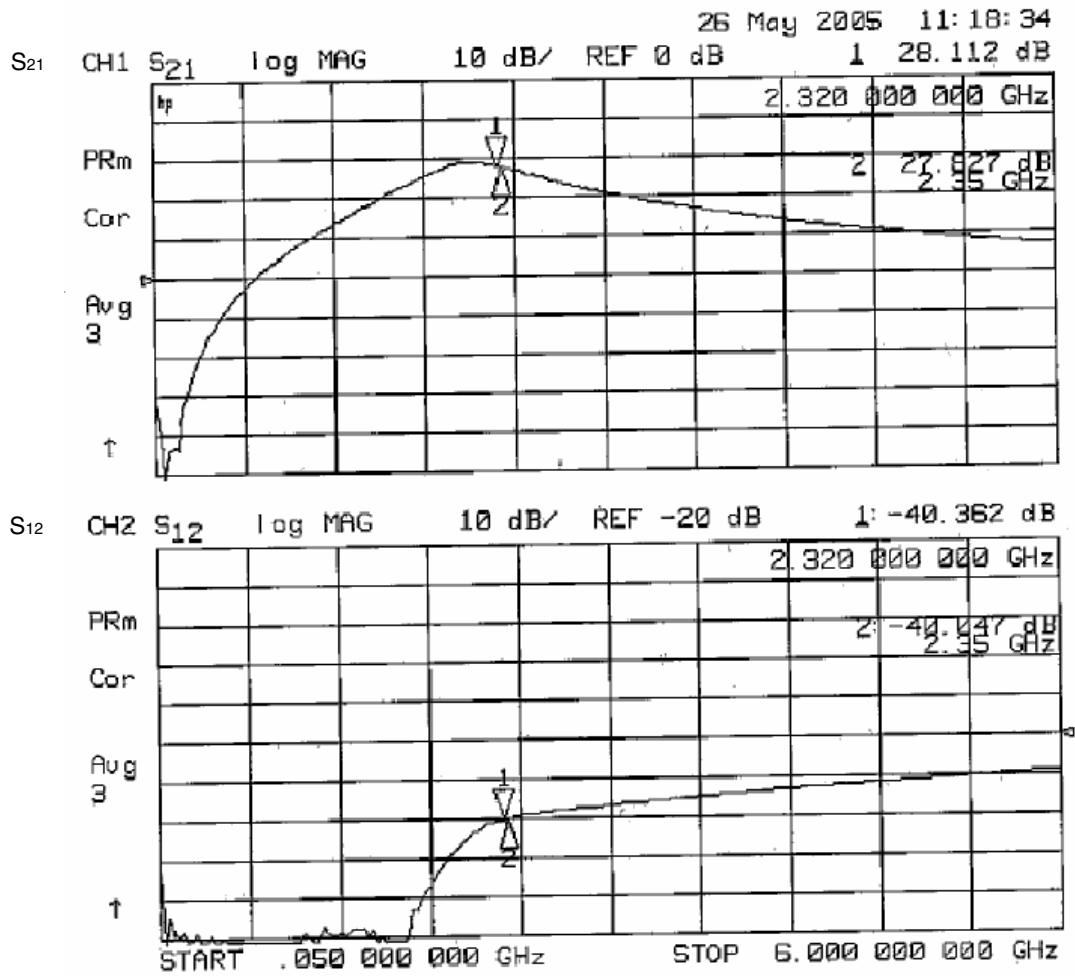
## Pin-Pout & IM3 Performance

( $V_{CC1} = V_{CC2} = 3.0\text{ V}$ , I<sub>CC</sub> = 28.9 mA, f = 2.34 GHz 0.1 MHz offset)



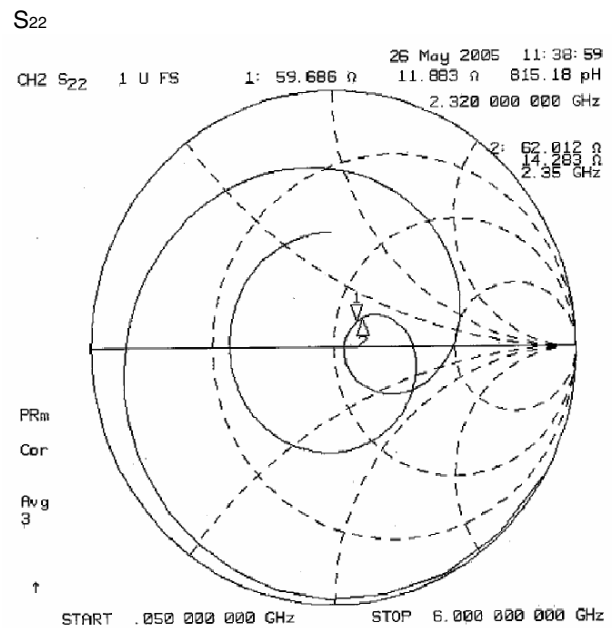
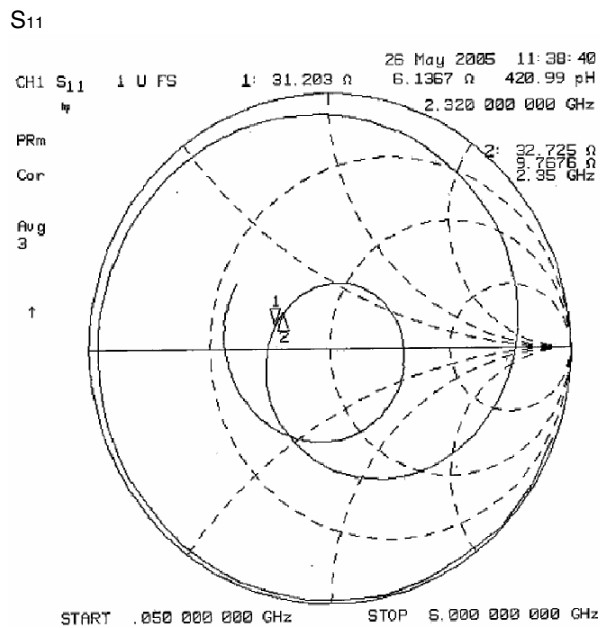
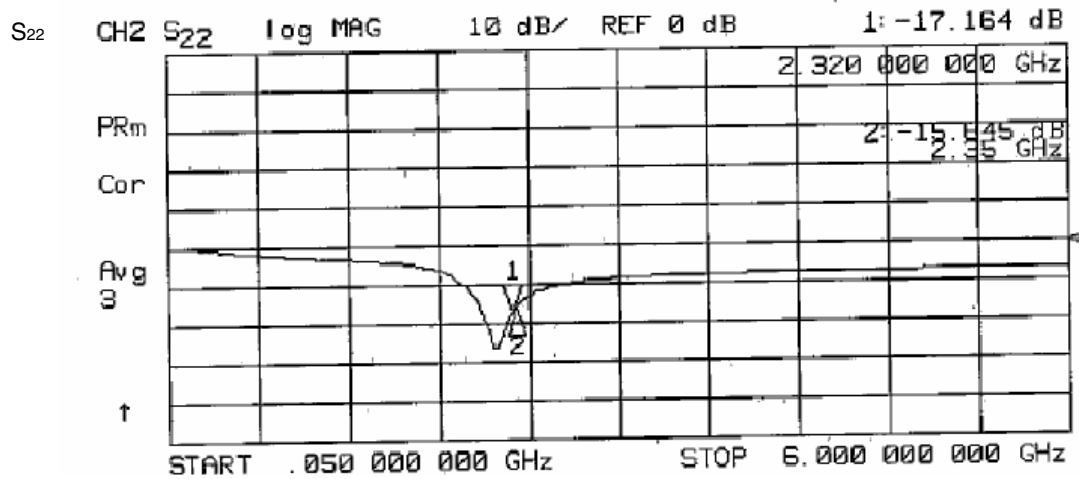
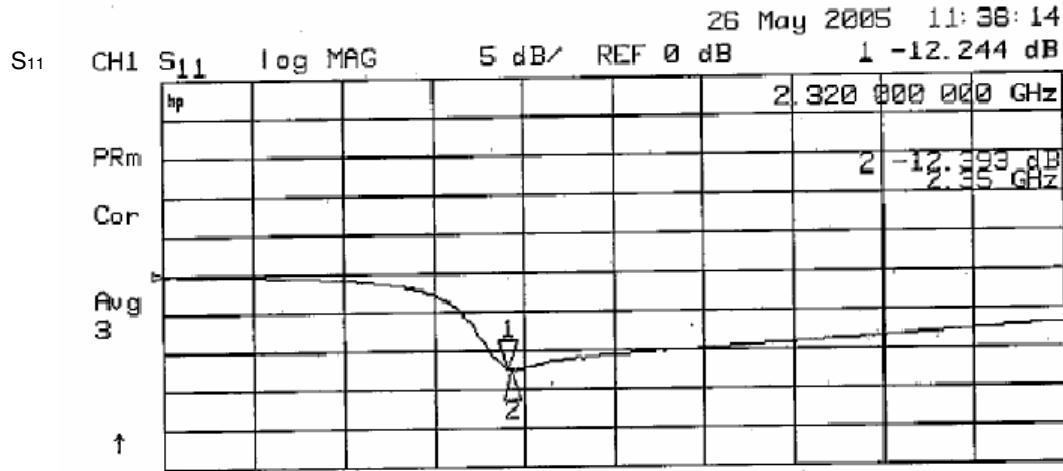
## Gain and Isolation

(Vcc1 = Vcc2 = 3.0 V, Icc = 28.9 mA)



# Input and Output Return Loss

(Vcc1 = Vcc2 = 3.0 V, Icc = 28.9 mA)



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