

# DATA SHEET

# NEC

# GaAs INTEGRATED CIRCUIT $\mu$ PG2310TK

## GaAs MMIC LOW NOISE AMPLIFIER FOR SATELLITE RADIO

### DESCRIPTION

The  $\mu$ PG2310TK is a GaAs MMIC LNA for SDARS (Satellite Digital Audio Radio Services). High Gain and Low Distortion suit to driver stage amplifier for Satellite Radio Antenna.

### FEATURES

- High gain :  $G_P = 27.0$  dB TYP.
- Low distortion :  $OIP_3 = +28.5$  dBm TYP.
- 6-pin lead-less minimold package ( $1.5 \times 1.1 \times 0.55$  mm)

### APPLICATION

- Satellite Radio Antenna etc.

### ORDERING INFORMATION

Part Number	Order Number	Package	Marking	Supplying Form
$\mu$ PG2310TK-E2	$\mu$ PG2310TK-E2-A	6-pin lead-less minimold (1511 PKG) (Pb-Free) <sup>Note</sup>	G4W	<ul style="list-style-type: none"><li>• Embossed tape 8 mm wide</li><li>• Pin 1, 6 face the perforation side of the tape</li><li>• Qty 5 kpcs/reel</li></ul>

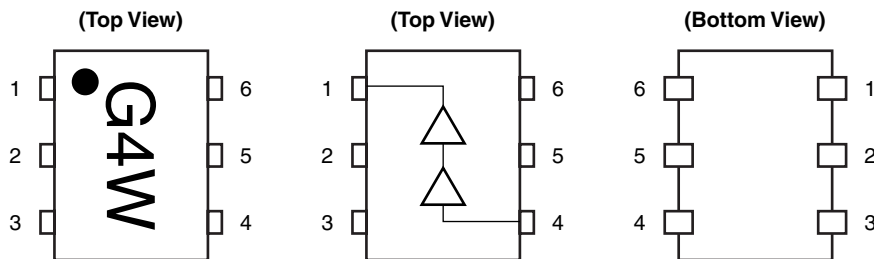
**Note** With regards to terminal solder (the solder contains lead) plated products (conventionally plated), contact your nearby sales office.

**Remark** To order evaluation samples, contact your nearby sales office.  
Part number for sample order:  $\mu$ PG2310TK

**Caution** Observe precautions when handling because these devices are sensitive to electrostatic discharge.

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Not all devices/types available in every country. Please check with local NEC Compound Semiconductor Devices representative for availability and additional information.

**PIN CONNECTIONS AND INTERNAL BLOCK DIAGRAM**



Pin No.	Pin Name
1	V <sub>cc2</sub> /OUT
2	GND
3	V <sub>cc1</sub>
4	IN
5	GND
6	GND

**ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = +25°C, unless otherwise specified)**

Parameter	Symbol	Ratings	Unit
Supply Voltage	V <sub>cc1</sub> , V <sub>cc2</sub>	+5.0	V
Input Power	P <sub>in</sub>	-10	dBm
Total Power Dissipation	P <sub>tot</sub>	300 <sup>Note</sup>	mW
Operating Ambient Temperature	T <sub>A</sub>	-45 to +85	°C
Storage Temperature	T <sub>stg</sub>	-55 to +150	°C

**Note** Mounted on double-sided copper-clad 50 × 50 × 1.6 mm epoxy glass PWB, T<sub>A</sub> = +85°C

**RECOMMENDED OPERATING RANGE**

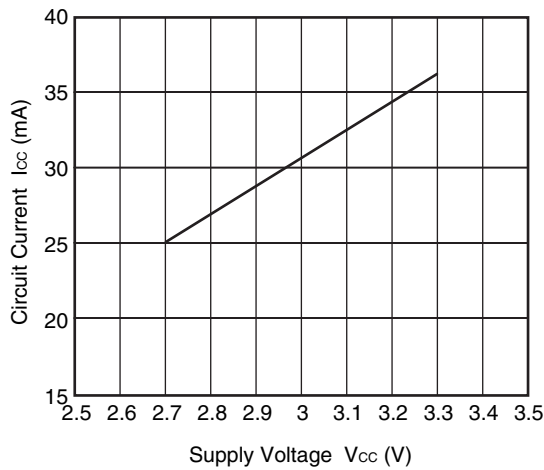
Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Operating Frequency	f <sub>opt</sub>	2 320	2 340	2 360	MHz
Supply Voltage	V <sub>cc1</sub> , V <sub>cc2</sub>	+2.7	+3.0	+3.3	V
Operating Ambient Temperature	T <sub>A</sub>	-45	+25	+85	°C

**ELECTRICAL CHARACTERISTICS** ( $T_A = +25^{\circ}\text{C}$ ,  $V_{cc1} = V_{cc2} = +3.0\text{ V}$ ,  $Z_o = 50\ \Omega$ , unless otherwise specified)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Power Gain	$G_P$	$f = 2\ 340\ \text{MHz}$ , $P_{in} = -30\ \text{dBm}$	25.0	27.0	–	dB
Noise Figure	NF	$f = 2\ 340\ \text{MHz}$	–	1.8	2.0	dB
Input Return Loss	$RL_{in}$	$f = 2\ 340\ \text{MHz}$ , $P_{in} = -30\ \text{dBm}$	–	13	–	dB
Output Return Loss	$RL_{out}$	$f = 2\ 340\ \text{MHz}$ , $P_{in} = -30\ \text{dBm}$	–	15	–	dB
Output 3rd Order Distortion Intercept Point	$OIP_3$	$f_1 = 2\ 340\ \text{MHz}$ , $f_2 = 2\ 340.1\ \text{MHz}$	+26.5	+28.5	–	dBm
Circuit Current <sup>Note</sup>	$I_{cc}$	$f = 2\ 340\ \text{MHz}$ , $P_{in} = -30\ \text{dBm}$	–	30	35	mA

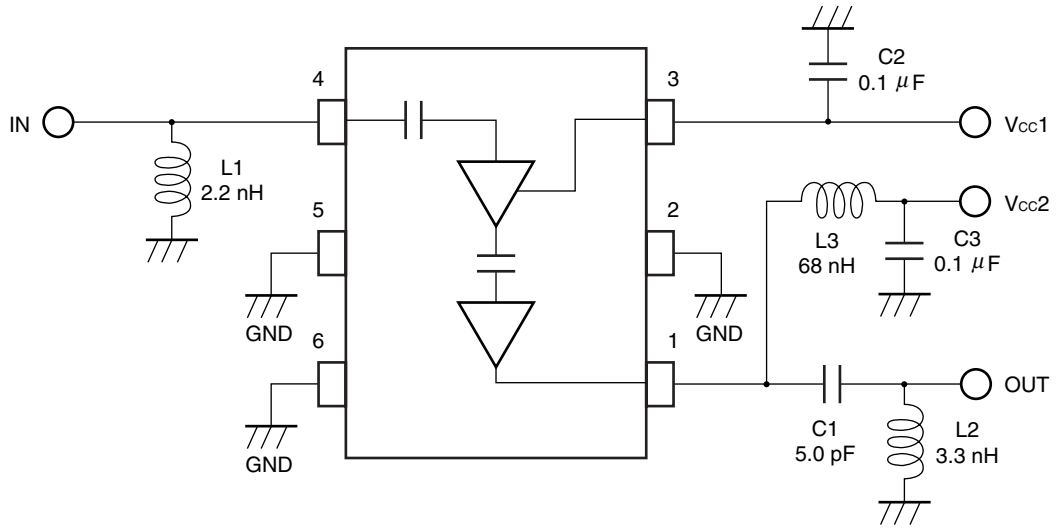
**Note** Please refer to following chart.

CIRCUIT CURRENT vs. SUPPLY VOLTAGE



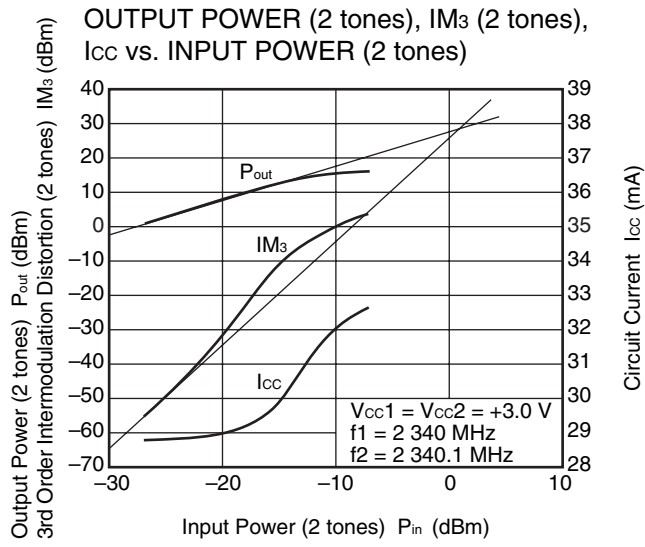
**Remark** The graph indicates nominal characteristics.

TEST CIRCUIT



The application circuits and their parameters are for reference only and are not intended for use in actual design-ins.

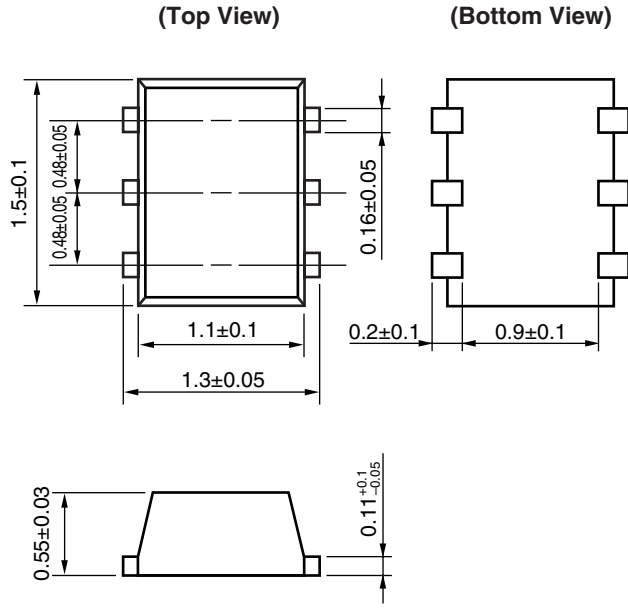
**TYPICAL CHARACTERISTICS (T<sub>A</sub> = +25°C, unless otherwise specified)**



**Remark** The graph indicates nominal characteristics.

PACKAGE DIMENSIONS

6-PIN LEAD-LESS MINIMOLD (1511 PKG) (UNIT: mm)



**RECOMMENDED SOLDERING CONDITIONS**

This product should be soldered and mounted under the following recommended conditions. For soldering methods and conditions other than those recommended below, contact your nearby sales office.

Soldering Method	Soldering Conditions	Condition Symbol
Infrared Reflow	Peak temperature (package surface temperature) : 260°C or below Time at peak temperature : 10 seconds or less Time at temperature of 220°C or higher : 60 seconds or less Preheating time at 120 to 180°C : 120±30 seconds Maximum number of reflow processes : 3 times Maximum chlorine content of rosin flux (% mass) : 0.2%(Wt.) or below	IR260
Wave Soldering	Peak temperature (molten solder temperature) : 260°C or below Time at peak temperature : 10 seconds or less Preheating temperature (package surface temperature) : 120°C or below Maximum number of flow processes : 1 time Maximum chlorine content of rosin flux (% mass) : 0.2%(Wt.) or below	WS260
Partial Heating	Peak temperature (terminal temperature) : 350°C or below Soldering time (per side of device) : 3 seconds or less Maximum chlorine content of rosin flux (% mass) : 0.2%(Wt.) or below	HS350

**Caution Do not use different soldering methods together (except for partial heating).**

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M8E 00.4-0110

<p><b>Caution</b></p>	<p>GaAs Products</p>	<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"> <li>• 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.               <ol style="list-style-type: none"> <li>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.</li> <li>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.</li> </ol> </li> <li>• Do not burn, destroy, cut, crush, or chemically dissolve the product.</li> <li>• Do not lick the product or in any way allow it to enter the mouth.</li> </ul>
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► For further information, please contact

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