

1.9 GHz-BAND POWER AMPLIFIER FOR PHS

DESCRIPTION

The μ PG171GV is a 2 stages GaAs FET power amplifier which was developed for PHS (Personal Handy Phone System) application. The device can operate with 3.0 V at 1.9 GHz-band, having the high efficiency and low distortion.

It housed in an 8-pin SSOP (175 mil) that is easy to install and contributes to miniaturizing the system.

FEATURES

- Low Voltage Operation : $V_{DD} = +3.0$ V
- Low Distortion : $P_{adj1} = -60$ dBc typ. @ $V_{DD} = +3.0$ V, $f = 1.9$ GHz, $P_{out} = +21.5$ dBm, off-chip output matching
- High Efficiency : $\eta_T = 30$ % typ. @ $V_{DD} = +3.0$ V, $f = 1.9$ GHz, $P_{out} = +21.5$ dBm, off-chip output matching
- Small 8 pin SSOP (175 mil) package

APPLICATION

- Digital cordless telephone: PHS, PCS driver etc.

ORDERING INFORMATION

PART NUMBER	PACKAGE	PACKING FORM
μ PG171GV-E1	8 pin SSOP (175 mil)	Carrier tape width 12 mm, 1 pin faces toward the open end of the tape, 2000 pcs/Reel

Remark For evaluation sample order, please contact your local NEC sales office. (Part number for sample order: μ PG171GV)

ABSOLUTE MAXIMUM RATINGS ($T_A = 25$ °C)

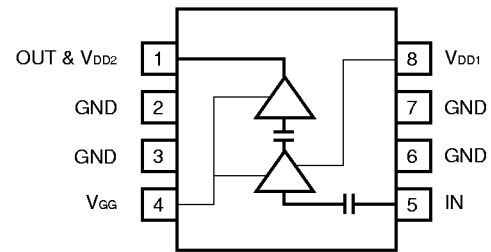
PARAMETERS	SYMBOL	RATINGS	UNIT
Supply Voltage 1, 2	$V_{DD1, 2}$	6.0	V
Supply Voltage 3	V_{GG}	-5.0	V
Input Power	P_{in}	+8	dBm
Total Power Dissipation	P_{tot}	600 (CW) 1.3 (1/8 duty ^{Note})	mW W
Operating Temperature	T_A	-30 to +80 (1/8 duty ^{Note})	°C
Storage Temperature	T_{stg}	-30 to +150	°C

Note Pulse width 0.625 msec

Caution The IC must be handled with care to prevent static discharge because its circuit is composed of GaAs MES FET.

PIN CONNECTION AND BLOCK DIAGRAM

PIN No.	CONNECTION	PIN No.	CONNECTION
1	V _{DD2} & OUT	5	IN
2	GND	6	GND
3	GND	7	GND
4	V _{GG}	8	V _{DD1}



RECOMMENDED OPERATING CONDITIONS

(T_A = 25 °C, 1/8 Duty Pulse Operation, Pulse Width: 0.625 msec)

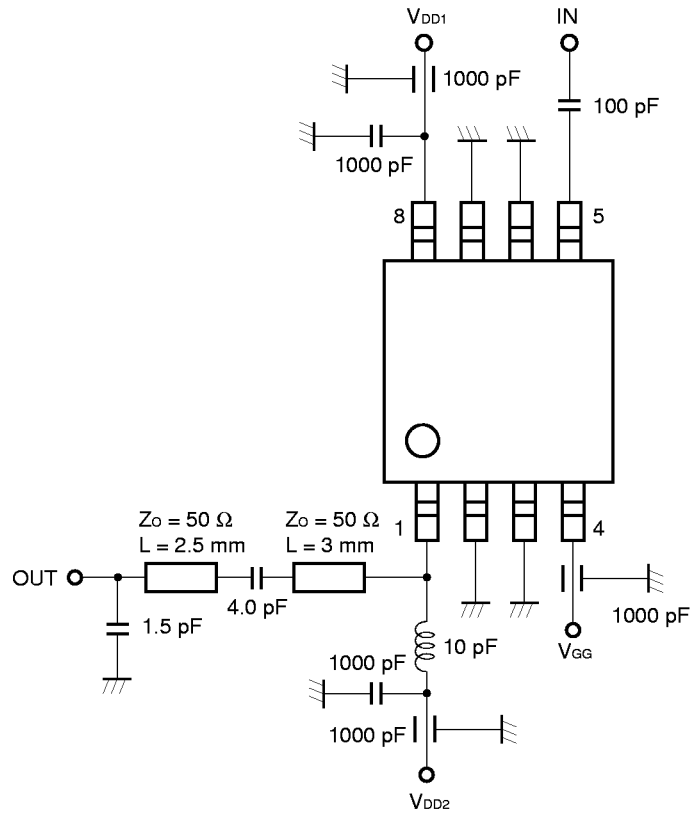
PARAMETERS	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage 1, 2	V _{DD1, 2}	+2.7	+3.0	+5.1	V
Set Current (RF OFF)	I _{DDset}		168	200	mA
Input Power	P _{in}			+5	dBm

ELECTRICAL CHARACTERISTICS (Unless otherwise specified, T_A = 25 °C, V_{DD1} = V_{DD2} = 3.0 V, -2.5 < V_{GG} < -0.5, Set Current I_{DDset} = 168 mA, P_{out} = +21.5 dBm, $\pi/4$ DQPSK modulated signal input, Off chip output matching)

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Operating Frequency	f		1895		1918	MHz
Power Gain	G _p		20	22		dB
Total Current	I _{DD}			160	200	mA
Total Efficiency	η_T		24	30		%
Harmonics (n = 2 to 4)	nf _o			-40	-30	dBc
Gate Voltage	V _{GG}	I _{DDset} = 168 mA, P _{in} = OFF	-2.5		-0.5	V
Gate Current	I _{GG}		-1.0		0	mA
Adjacent Channel Power 1	P _{adj1}	$\Delta f = \pm 600$ kHz		-60	-55	dBc
$\Delta f = \pm 600$ kHz	P _{adj2}	$\Delta f = \pm 900$ kHz		-65	-60	dBc
Input VSWR	—			2:1		—
Output VSWR	—			3:1		—

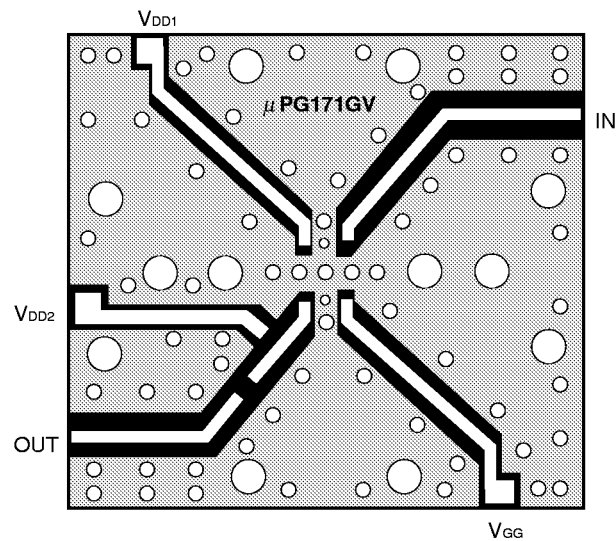
TEST CIRCUIT (PRELIMINARY)

$V_{DD1} = V_{DD2} = 3.0\text{ V}$, $f = 1.9\text{ GHz}$



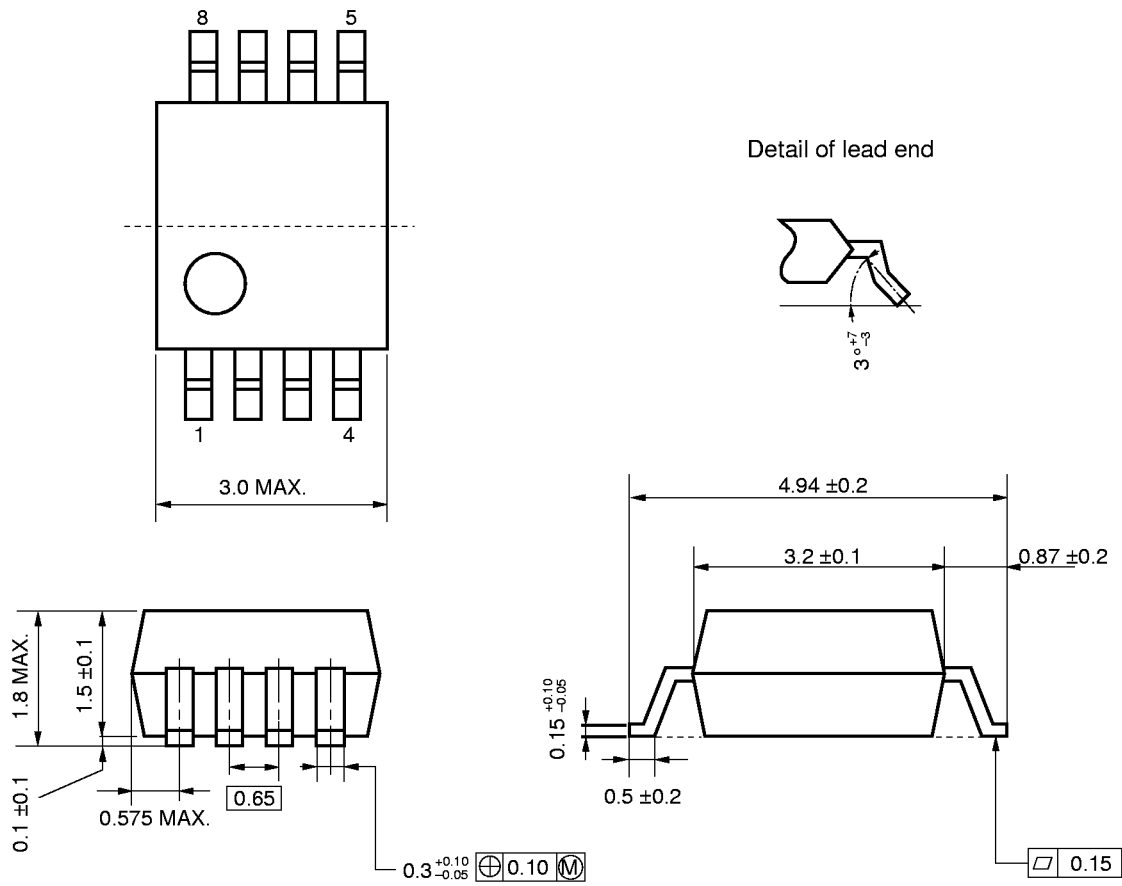
EVALUATION BOARD

Epoxy glass: $\epsilon = 4.6$, $t = 0.4\text{ mm}$, Board Dimension: $38 \times 40\text{ mm}$, RF Line width = 0.7 mm



PACKAGE OUTLINE

8 pin Plastic SSOP (175 mil) (Unit : mm)



RECOMMENDED SOLDERING CONDITIONS

This product should be soldered in the following recommended conditions. Other soldering methods and conditions than the recommended conditions are to be consulted with our sales representatives.

[μPG171GV]

Soldering process	Soldering conditions	Recommended condition symbol
Infrared ray reflow	Package peak temperature: 235°C, Hour: Within 30 s (more than 210°C) Time: 3 times, Limited days: no ^{Note}	IR35-00-3
VPS	Package peak temperature: 215°C, Hour: Within 40 s (more than 200°C) Time: 3 times, Limited days: no ^{Note}	VP15-00-3
Wave soldering	Soldering tub temperature: less than 260°C, Hour: Within 10 s Time: 1 time, Limited days: no ^{Note}	WS60-00-1
Pin part heating	Pin area temperature: less than 300°C, Hour: Within 3 s, Limited days: no ^{Note}	

Note It is storage days after opening a dry pack, the storage conditions are 25°C, less than 65% RH.

Caution The combined use of soldering method is to be avoided (However, except the pin area heating method).