

**WIDE-BAND AMPLIFIER**

$\mu$ PG103B is GaAs integrated circuit designed as wide band (50 MHz to 3GHz) amplifiers.

This device is most suitable for the microwave communication system and the measurement equipment.

**FEATURES**

- Ultra wide band :  $f = 50 \text{ MHz to } 3 \text{ GHz}$
- Input/output impedance matched to  $50 \Omega$
- Hermetic sealed ceramic package assures high reliability

**ORDERING INFORMATION**

PART NUMBER	PACKAGE
$\mu$ PG103B	T-31, 8 PIN CERAMIC

**ABSOLUTE MAXIMUM RATINGS ( $T_A = 25 \text{ }^\circ\text{C}$ )**

Drain Voltage	$V_{DD}$	+8	V
Gate Voltage	$V_{GG}$	-8	V
Input Voltage	$V_{in}$	-3 to +0.6	V
Input Power	$P_{in}$	+15	dBm
Total Power Dissipation*	$P_{tot}$	1.5	W
Operating Case Temperature	$T_{opt}$	-65 to +125	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-65 to +175	$^\circ\text{C}$

\*  $T_c \leq 125 \text{ }^\circ\text{C}$

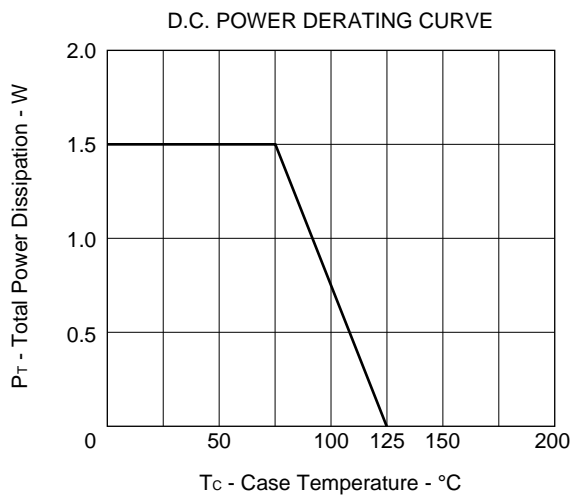
**RECOMMENDED OPERATING CONDITIONS ( $T_A = 25 \text{ }^\circ\text{C}$ )**

Drain Voltage	$V_{DD}$	+5.0 $\pm$ 0.5	V
Gate Voltage	$V_{GG}$	-5.0 $\pm$ 0.5	V
Operating Case Temperature	$T_{opt}$	-50 to +80	$^\circ\text{C}$

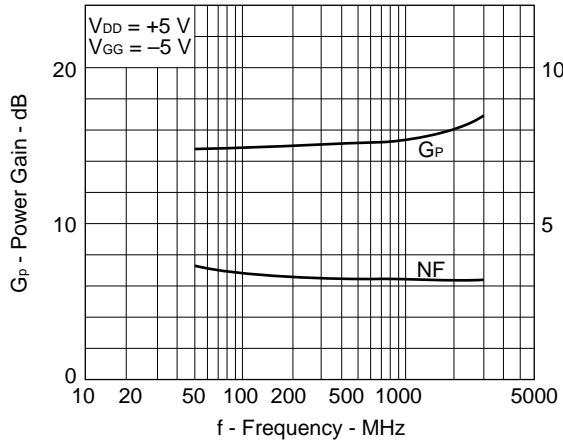
**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C, V<sub>DD</sub> = +5V, V<sub>GG</sub> = -5V)**

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain Current	I <sub>DD</sub>	40	55	80	mA	RF OFF
Gate Current	I <sub>GG</sub>		1	2	mA	
Power Gain	G <sub>p</sub>	12			dB	f = 0.05 to 2 GHz
Power Gain	G <sub>p</sub>	10			dB	f = 2 to 3 GHz
Gain Flatness	ΔG <sub>p</sub>		±1.5	±2.0	dB	f = 0.05 to 2 GHz
Gain Flatness	ΔG <sub>p</sub>		±2.0	±3.0	dB	f = 0.05 to 3 GHz
Noise Figure	NF		4.0	4.5	dB	f = 0.05 to 2 GHz
Noise Figure	NF		4.5	5.0	dB	f = 2 to 3 GHz
Input Return Loss	RL <sub>in</sub>	6	10		dB	f = 0.05 to 1 GHz
Input Return Loss	RL <sub>in</sub>	10	14		dB	f = 1 to 2 GHz
Input Return Loss	RL <sub>in</sub>	6	10		dB	f = 2 to 3 GHz
Output Return Loss	RL <sub>out</sub>	10	16		dB	f = 0.05 to 3 GHz
Isolation	I <sub>sol</sub>	30	40		dB	
Output Power at 1 dB Gain Compression Point	P <sub>o</sub> (1dB)	+7	+9		dBm	

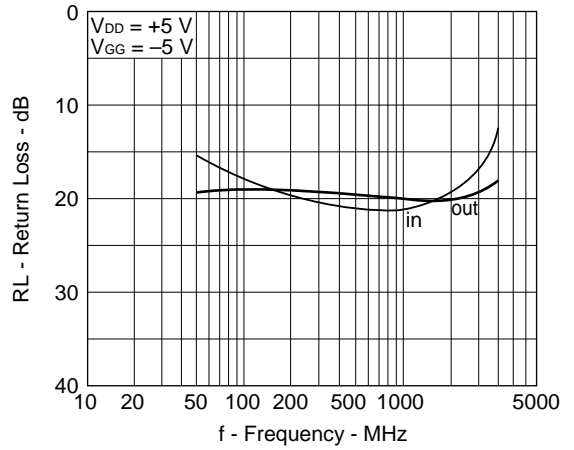
**TYPICAL PERFORMANCE CURVES**



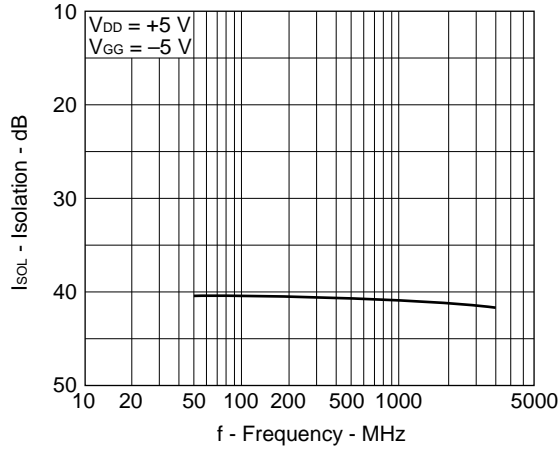
POWER GAIN AND NOISE FIGURE vs. FREQUENCY



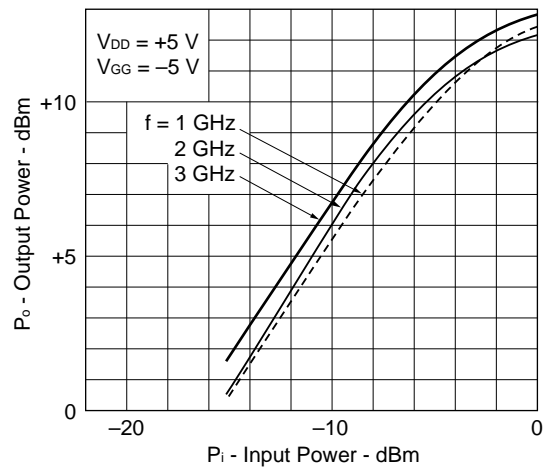
INPUT AND OUTPUT RETURN LOSS vs. FREQUENCY



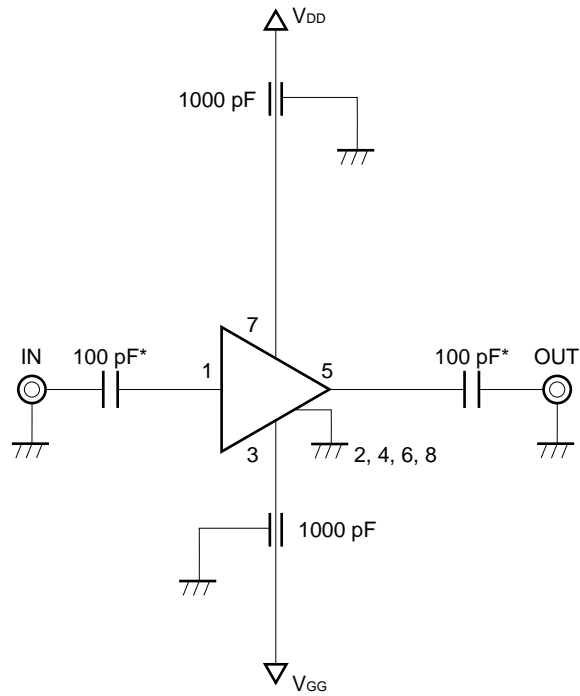
ISOLATION vs. FREQUENCY



OUTPUT POWER vs. INPUT POWER

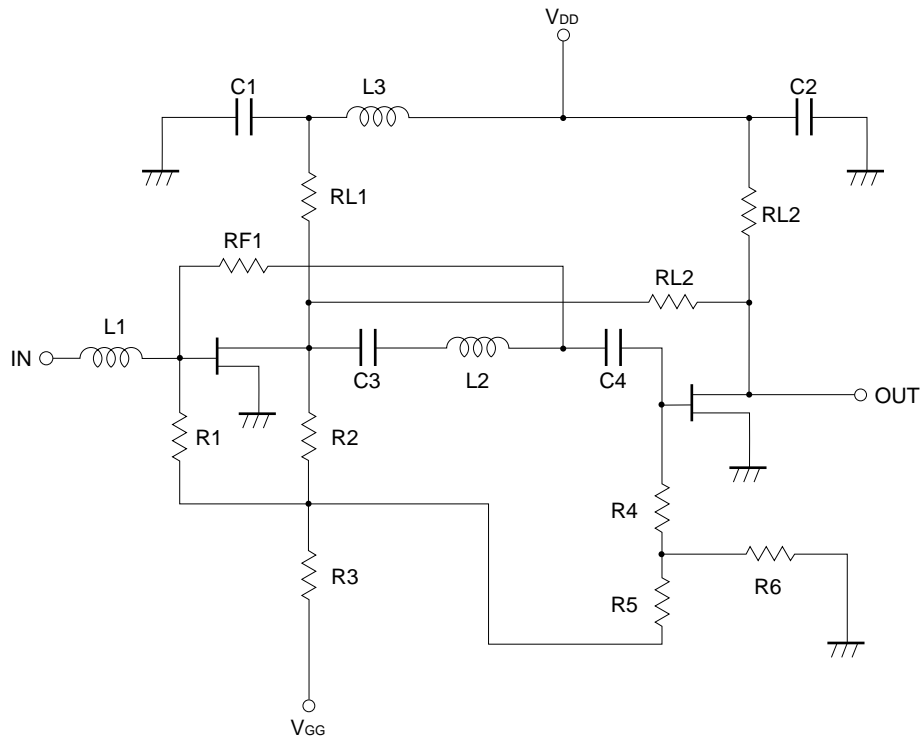


TEST CIRCUIT



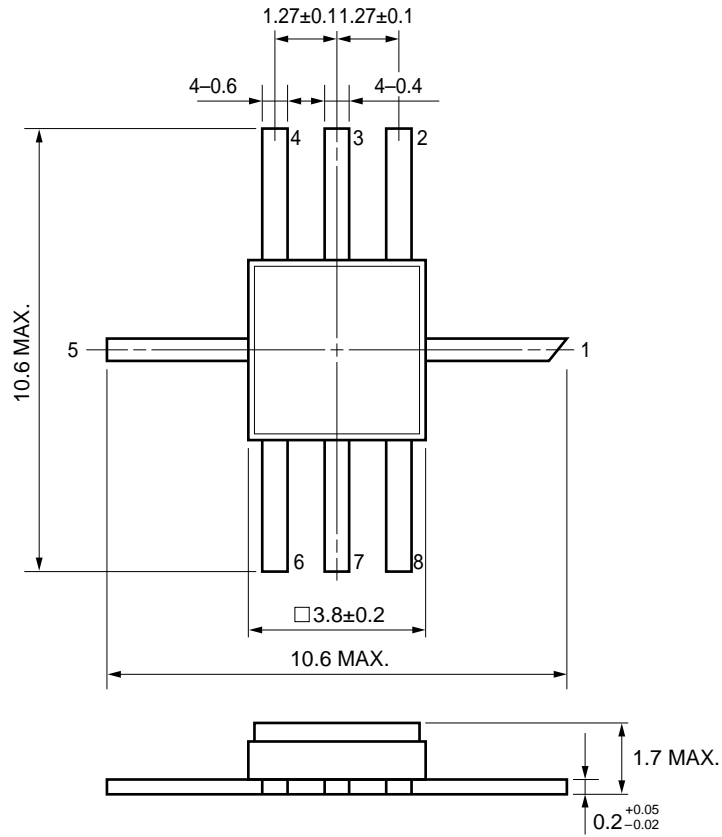
\* Chip capacitor

EQUIVALENT CIRCUIT



OUTLINE DIMENSIONS (Unit : mm)

PACKAGE OUTLINE



PIN CONNECTIONS:

- 1. INPUT
- 2. GND
- 3. V<sub>GG</sub>
- 4. GND
- 5. OUTPUT
- 6. GND
- 7. V<sub>DD</sub>
- 8. GND

**RECOMMENDED SOLDERING CONDITIONS**

The following conditions (see table below) must be met when soldering this product.

Please consult with our sales offices in case other soldering process is used, or in case soldering is done under different conditions.

**TYPES OF SURFACE MOUNT DEVICE**

For more details, refer to our document “SEMICONDUCTOR DEVICE MOUNTING TECHNOLOGY MANUAL” (C10535EJ7V01F00).

μPG103B

Soldering process	Soldering conditions	Symbol
Infrared ray reflow	Peak package’s surface temperature: 230 °C or below, Reflow time: 10 seconds or below (210 °C or higher), Number of reflow process: 1, Exposure limit*: None	
Partial heating method	Terminal temperature: 260 °C or below, Flow time: 10 seconds or below, Exposure limit*: None	

\* Exposure limit before soldering after dry-pack package is opened.  
Storage conditions: 25 °C and relative humidity at 65 % or less.

**Note** Do not apply more than a single process at once, except for “Partial heating method”.

**PRECAUTION** This IC must be handled with great care to prevent static discharge because its circuitry is composed of GaAs MES FET.

**Caution**

**The Grate Care must be taken in dealing with the devices in this guide.  
The reason is that the material of the devices is GaAs (Gallium Arsenide), which is designated as harmful substance according to the Japanese law concerned.  
Keep the Japanese law concerned and so on, especially in case of removal.**

[MEMO]

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Anti-radioactive design is not implemented in this product.