NEC

GaAs INTEGRATED CIRCUIT

μPG110B

2 to 8 GHz WIDE BAND AMPLIFIER

DESCRIPTION

The μPG110B is a GaAs monolithic integrated circuit designed as a wide band amplifier from 2 GHz to 8 GHz.

The device is most suitable for the gain stage required high gain characteristic of the microwave communication system and the measurement equipment.

FEATURES

- Ultra wide band: 2 to 8 GHz
- High gain: 15 dB TYP. @f = 2 to 8 GHz
- Medium power: +14 dBm TYP. @f = 2 to 8 GHz
- Input/Output impedance matched to 50 Ω
- Hermetically sealed package assures high reliability

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C)

Drain Voltage	V_{DD}	+10	V
Input Voltage	V_{IN}	–5 to +0.6	V
Input Power	P_{in}	+10	dBm
Total Power Dissipation	P_{tot}	1.5	W
Operating Case Temperature	T_C	–65 to +125	°C
Storage Temperature	T_{stg}	–65 to +175	°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Power Gain	Gp	12	15		dB	V_{DD} = +8 V
Gain Flatness	ΔG_L			±1.5	dB	f = 2.0 to 8.0 GHz
Input Return Loss	RL_{in}	6	10		dB	
Output Return Loss	RL_{out}	7	10		dB	
Isolation	ISL	30	40		dB	
P_{out} at 1 dB G.C.P.	$P_{O(1\ dB)}$	10	14		dBm	
Supply Current	I_{DD}	65	135	180	mA	

G.C.P. : Gain Compression Point

Take the heat radiation into account sufficiently to prevent the case temperature from exceeding the absolute maximum rating.

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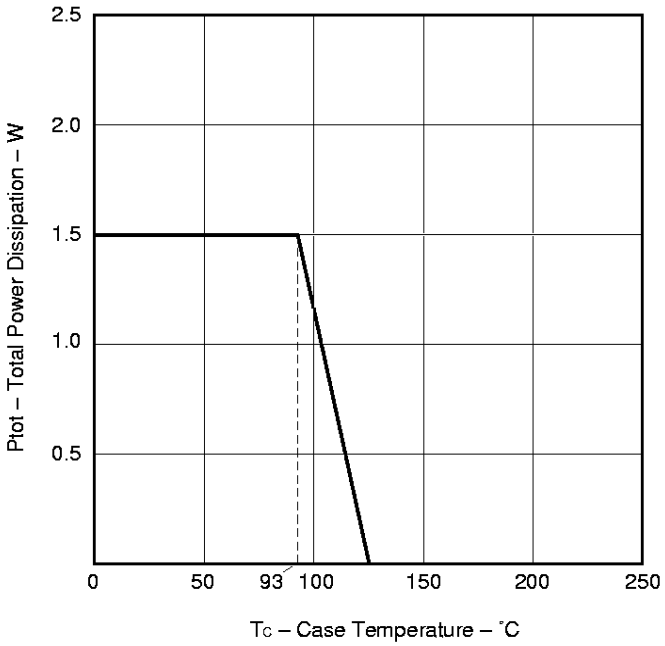
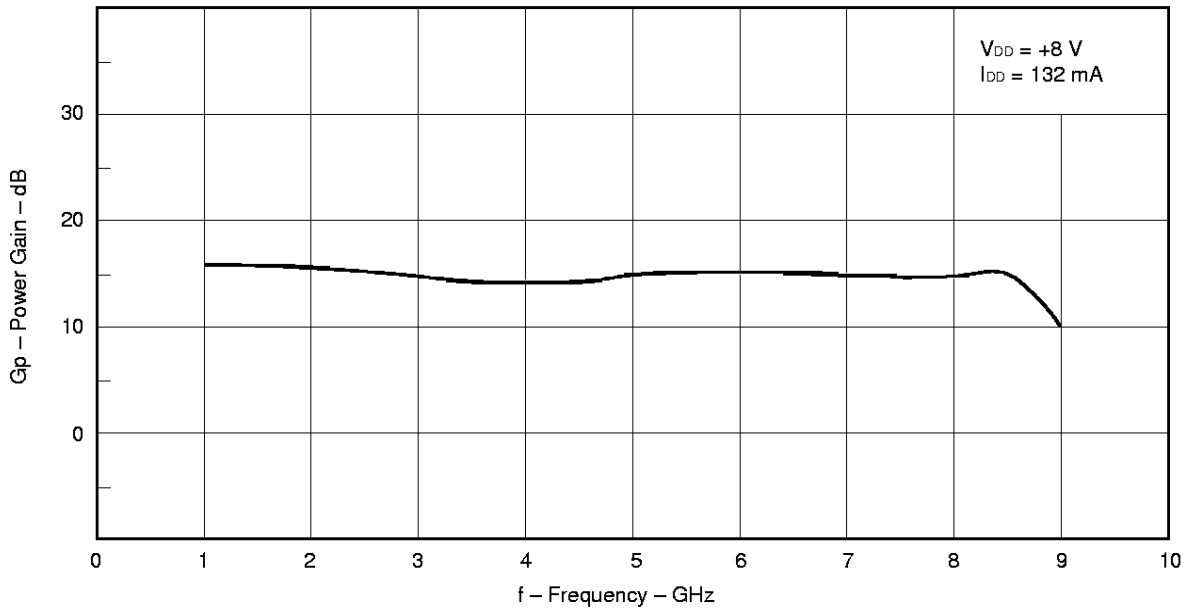
TYPICAL CHARACTERISTICS (T_A = 25 °C)

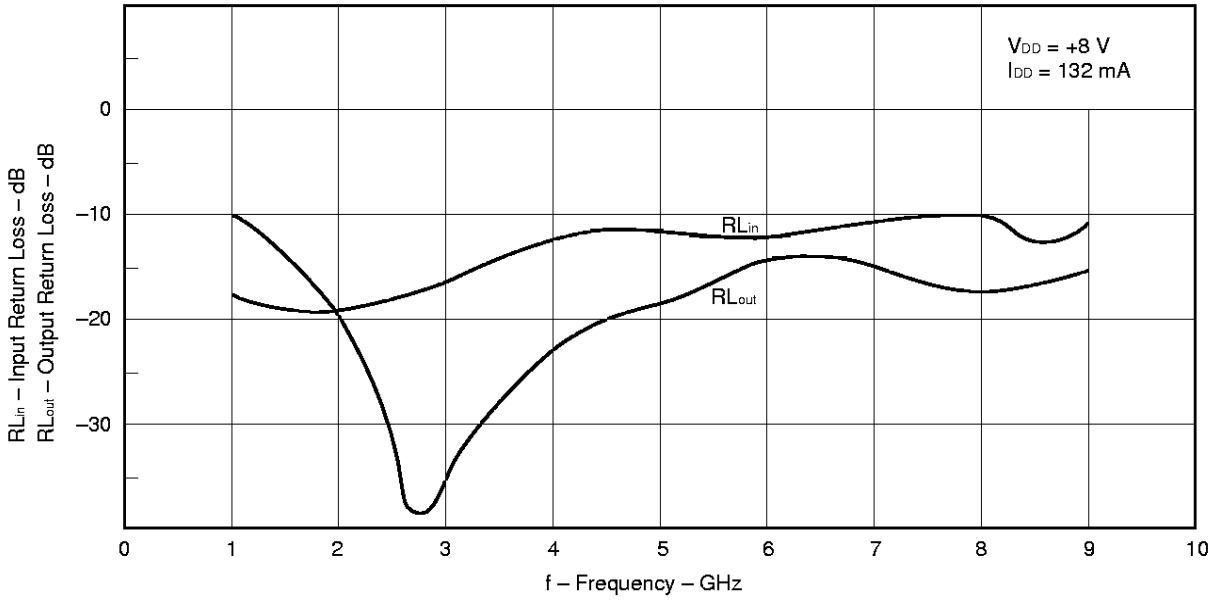
POWER DERATING CURVE



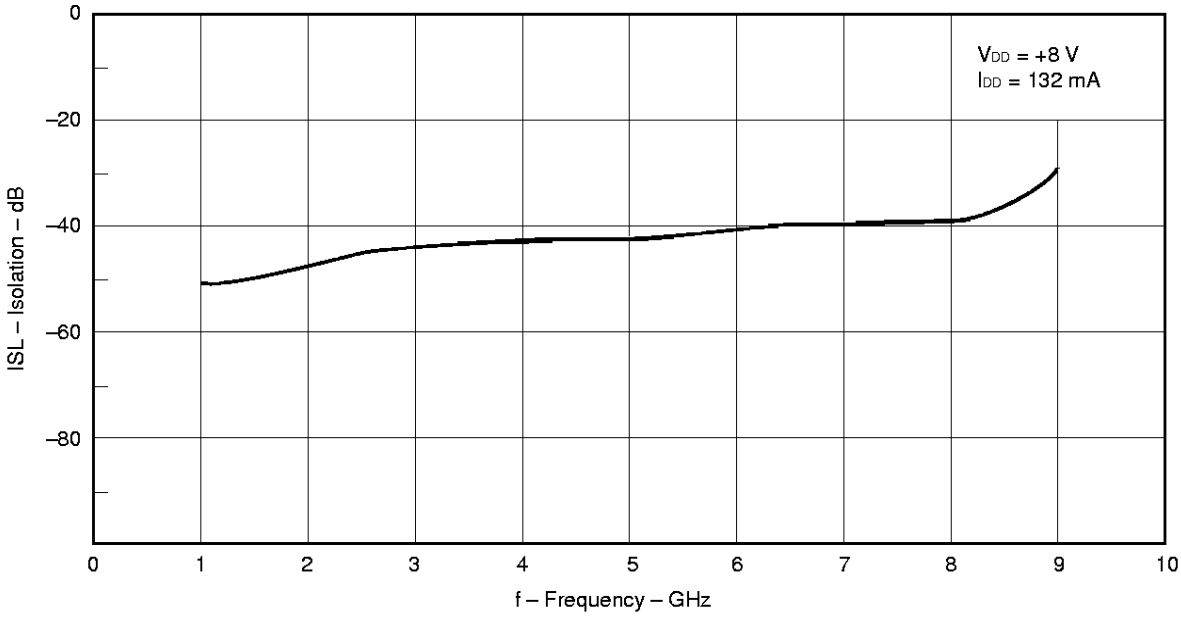
POWER GAIN vs. FREQUENCY



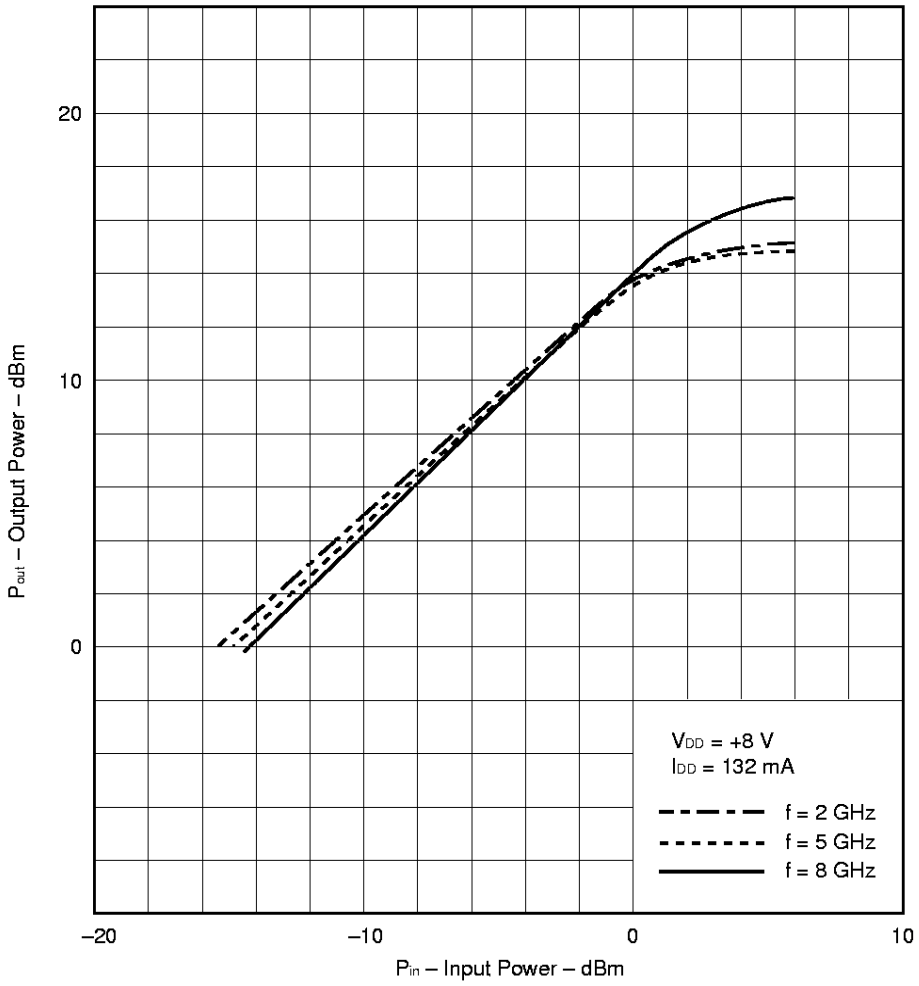
INPUT RETURN LOSS vs. FREQUENCY



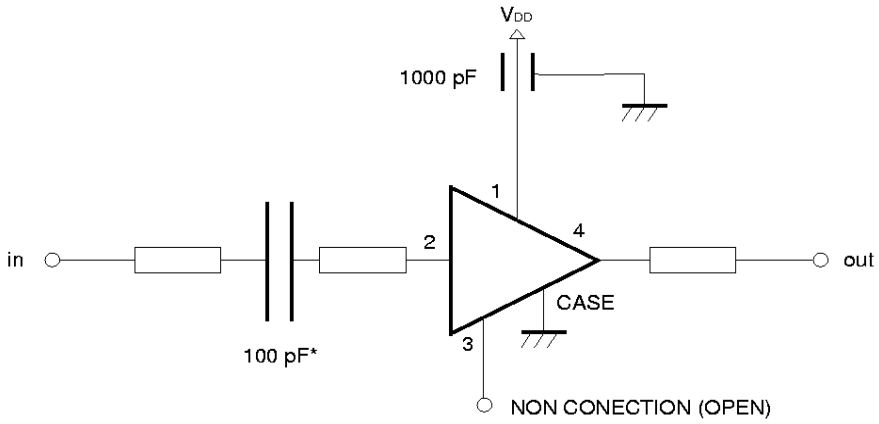
ISOLATION vs. FREQUENCY



OUTPUT POWER vs. INPUT POWER

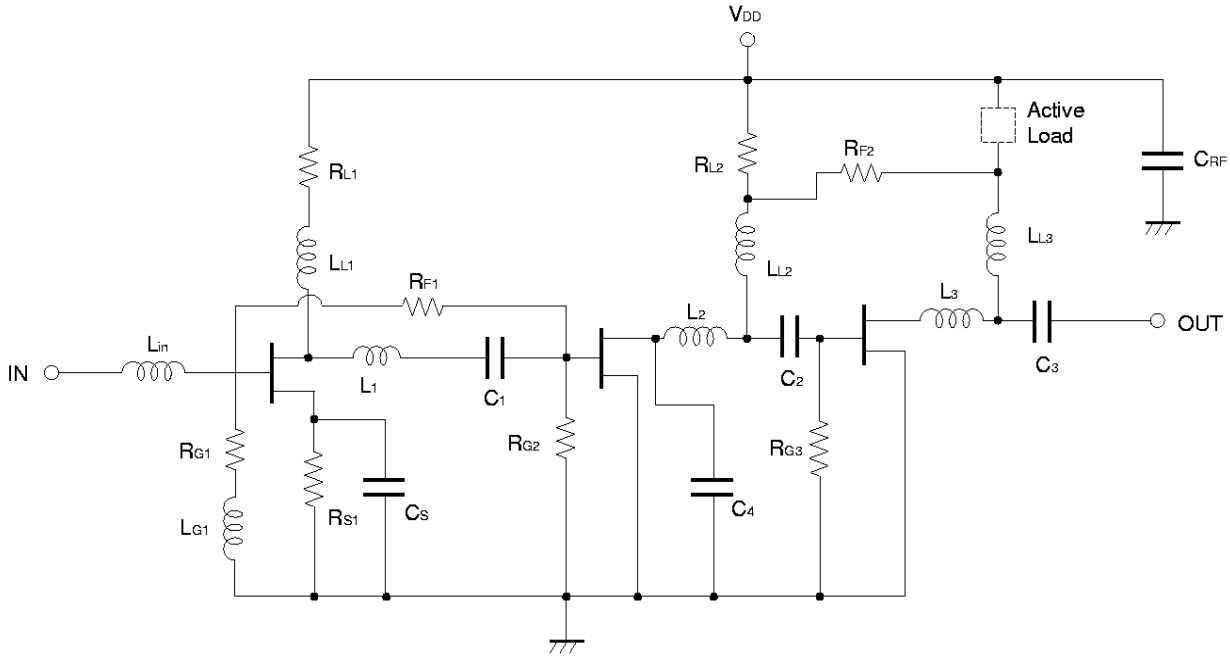


APPLICATION CIRCUIT

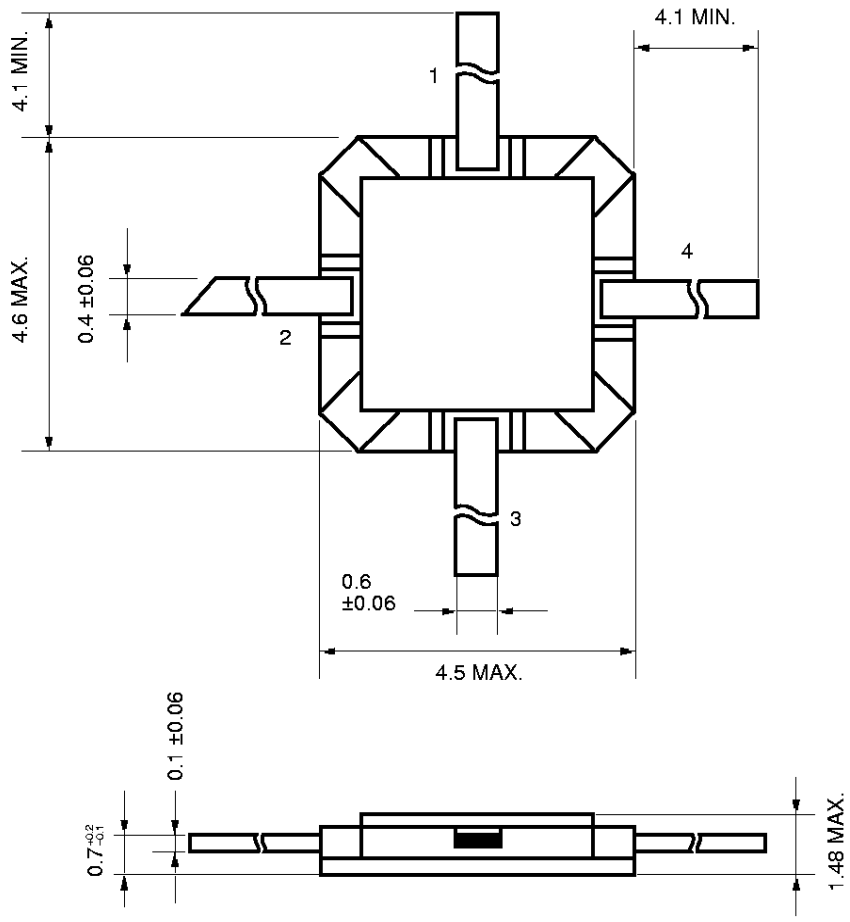


* Chip capacitor

EQUIVALENT CIRCUIT



PACKAGE DIMENSIONS (Unit: mm)



1: V_{DD}
2: IN
3: NON CONNECTION
4: OUT
CASE: 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.

[μPG110B]

Soldering process	Soldering conditions	Symbol
Partial heating method	Terminal temperature: 300 °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".

ATTENTION

Take great care to prevent static electricity because the IC circuity is composed of GaAs MES FET.

Caution

The Great 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 law concerned.
Keep the Japanese law concerned and so on, especially in case of removal.

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NEC devices are classified into the following three quality grades:
" Standard" , " Special" , and " Specific" . The Specific quality grade applies only to devices developed based on a customer designated " quality assurance program" for a specific application. The recommended applications of a device depend on its quality grade, as indicated below. Customers must check the quality grade of each device before using it in a particular application.

Standard: Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots

Special: Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support)

Specific: Aircrafts, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems or medical equipment for life support, etc.

The quality grade of NEC devices in " Standard" unless otherwise specified in NEC's Data Sheets or Data Books. If customers intend to use NEC devices for applications other than those specified for Standard quality grade, they should contact NEC Sales Representative in advance.
Anti-radioactive design is not implemented in this product.

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