

To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

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

April 1st, 2010
Renesas Electronics Corporation

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

Send any inquiries to <http://www.renesas.com/inquiry>.

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(Note 2) “Renesas Electronics product(s)” means any product developed or manufactured by or for Renesas Electronics.

14 GHz DIVIDE-BY-8 PRESCALER

DESCRIPTION

μ PG506B is a GaAs divide-by-8 prescaler capable of operating up to 14 GHz. It is designed as the prescaler in the frequency synthesizers of microwave applications systems and measurement equipment. The μ PG506B is a dynamic frequency divider and uses the BFL (Buffered FET Logic) circuit as the basic circuit.

FEATURES

- Wide operating frequency range $f_{in} = 8$ to 14 GHz @ $T_A = 25$ °C
- Low phase Noise
- Hermetically sealed package assures high reliability

ORDERING INFORMATION

PART NUMBER	PACKAGE
μ PG506B	K-12, 8 PIN CERAMIC

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

Supply Voltage	$V_{DD} - V_{SS1}^{*1}$	+5	V
Supply Voltage	$V_{SS2} - V_{SS1}^{*1}$	-5	V
Input Power	P_{in}	+13	dBm
Total Power Dissipation	P_{tot}	1.5 ^{*2}	W
Operating Case Temperature Range	T_c	-65 to +125	°C
Storage Temperature	T_{stg}	-65 to +175	°C

*1 $V_{SS1} = 0$ V

*2 $T_c \leq 125$ °C

RECOMMENDED OPERATING CONDITIONS ($T_A = 25$ °C)

$V_{DD} - V_{SS1}$	3.8±0.2	V
$V_{SS1} - V_{SS2}$	2.2±0.1	V

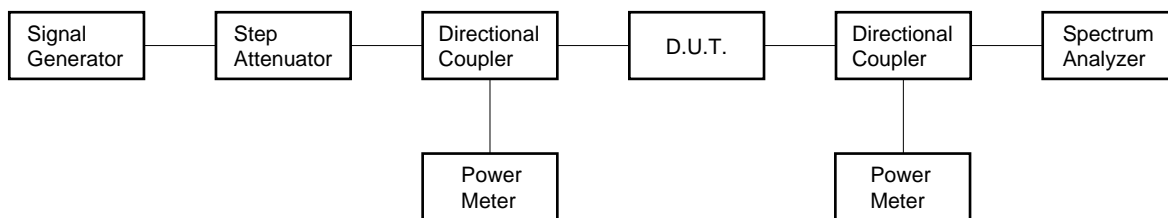
ELECTRICAL CHARACTERISTICS (T_A = 25 °C, V_{DD} = +3.8 V, V_{SS1} = 0 V, V_{SS2} = -2.2 V)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Supply Current	I _{DD}	70	105	140	mA	
Supply Current	I _{SS1}	26	35	44	mA	
Supply Current	I _{SS2}	44	70	96	mA	
Upper Limit of Input Frequency	f _{in(u)}	14			GHz	P _{in} = +6 dBm
Lower Limit of Input Frequency	f _{in(l)}			8	GHz	P _{in} = +6 dBm
Input Power	P _{in}	+2		+10	dBm	f _{in} = 9 to 13 GHz
Output Power	P _{out}	0	+2		dBm	f _{in} = 14 GHz

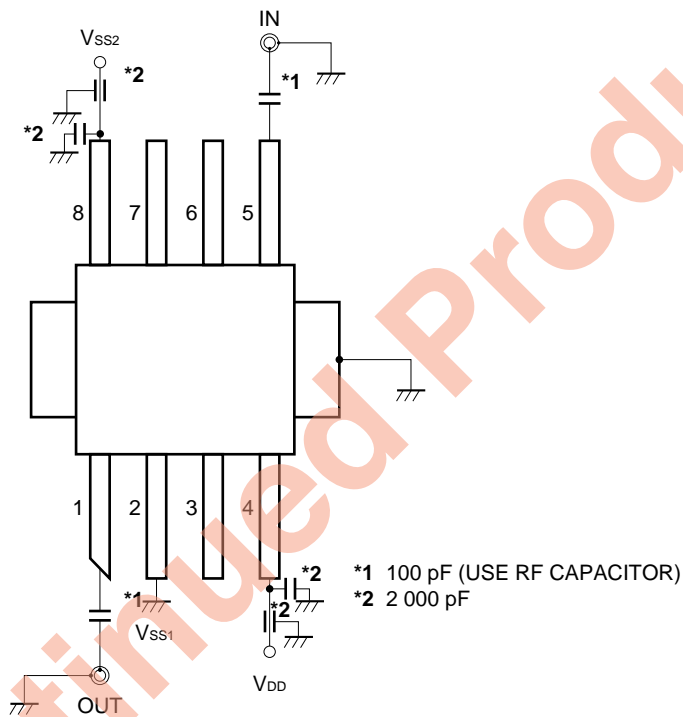
ELECTRICAL CHARACTERISTICS (T_A = -25 to +75 °C, V_{DD} = +3.8 V, V_{SS1} = 0 V, V_{SS2} = -2.2 V)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Supply Current	I _{DD}		105		mA	
Supply Current	I _{SS1}		35		mA	
Supply Current	I _{SS2}		70		mA	
Upper Limit of Input Frequency	f _{in(u)}	13.2			GHz	P _{in} = +6 dBm
Lower Limit of Input Frequency	f _{in(l)}			8.2	GHz	P _{in} = +6 dBm
Input Power	P _{in}	+2		+10	dBm	f _{in} = 9.2 to 12.2 GHz
Output Power	P _{out}	-1	+1		dBm	f _{in} = 13.2 GHz

TEST CIRCUIT BLOCK DIAGRAM

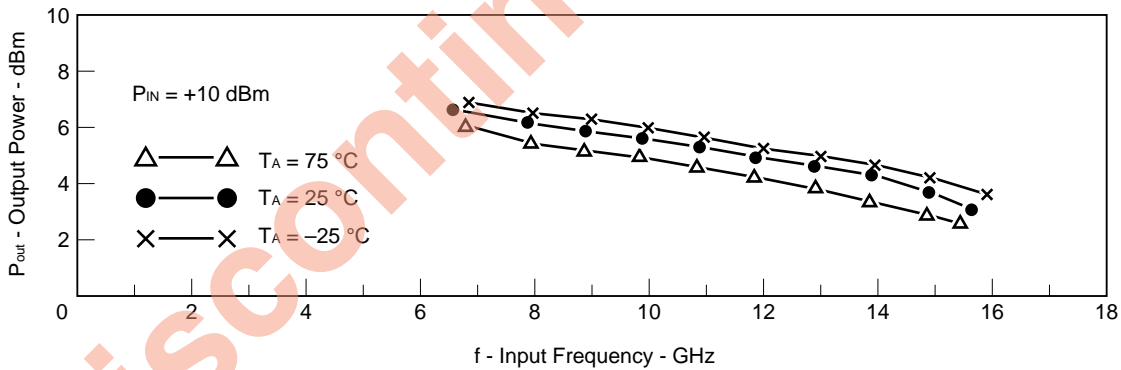
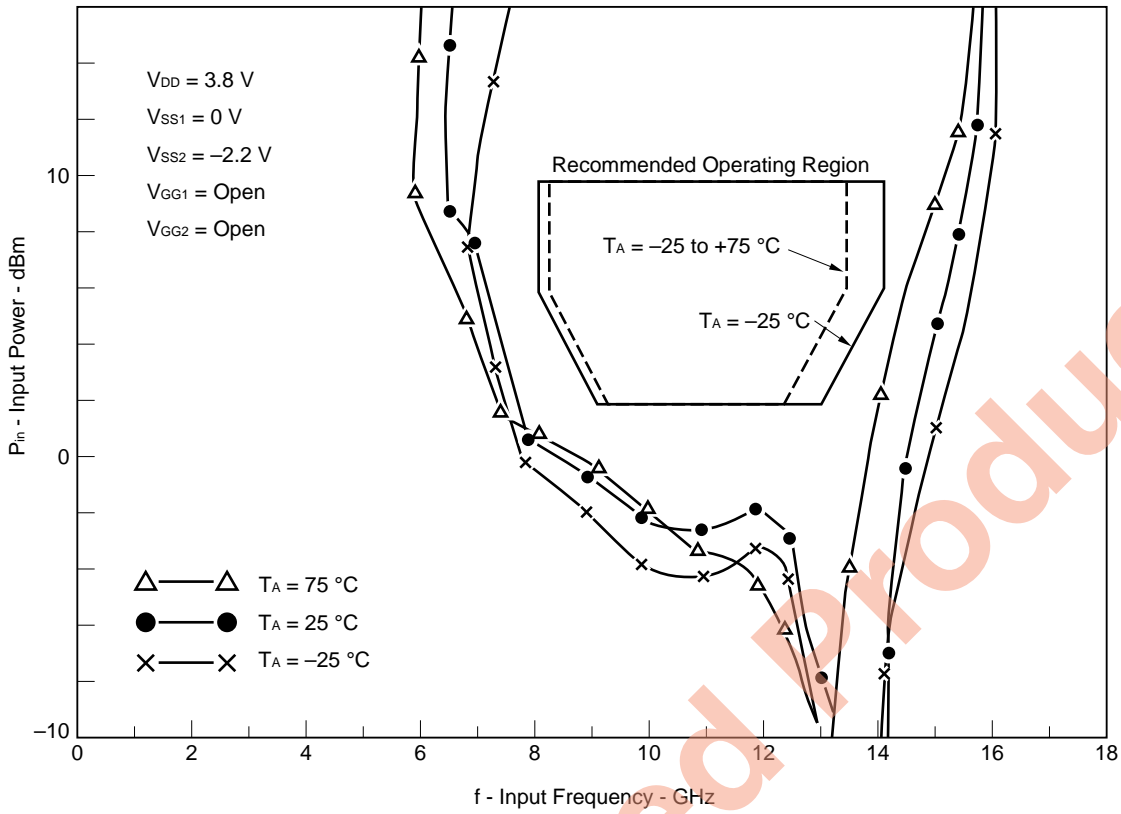


TEST CIRCUIT

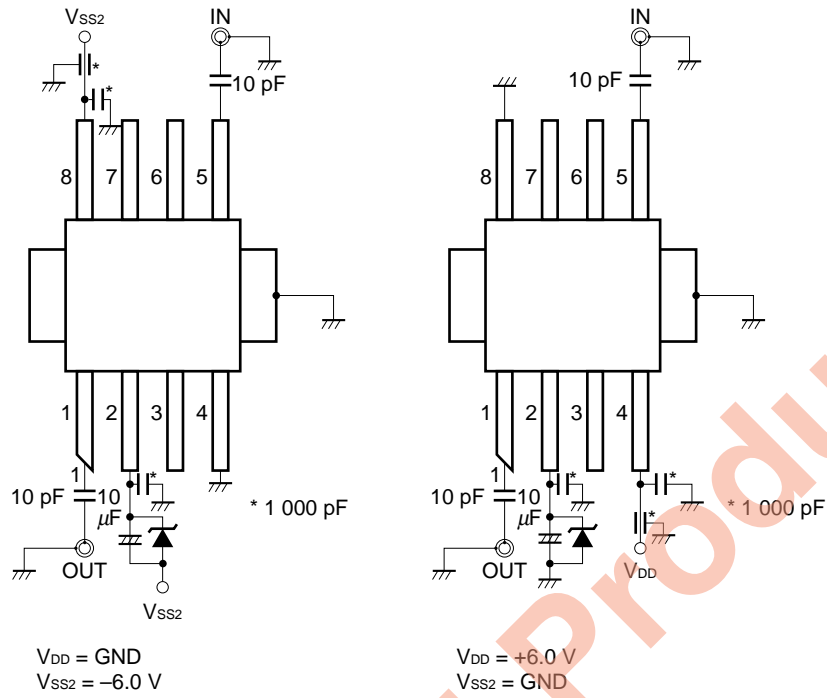


Discontinued Product

TYPICAL CHARACTERISTICS



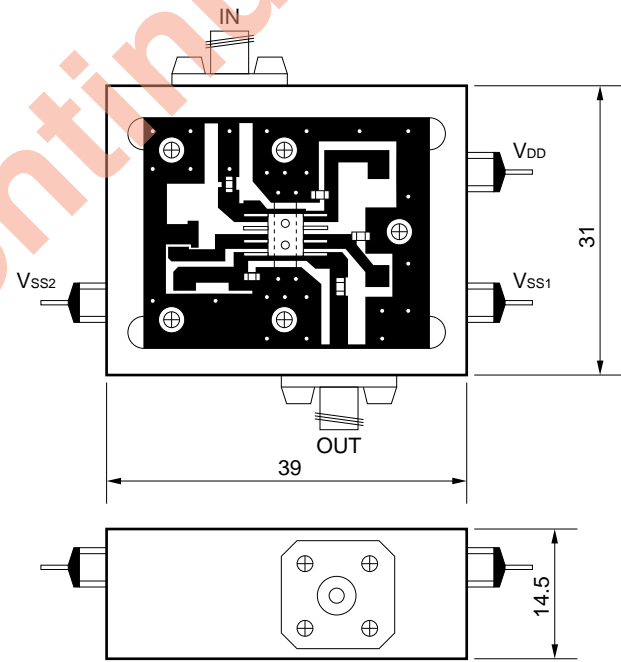
SINGLE BIAS SUPPLY



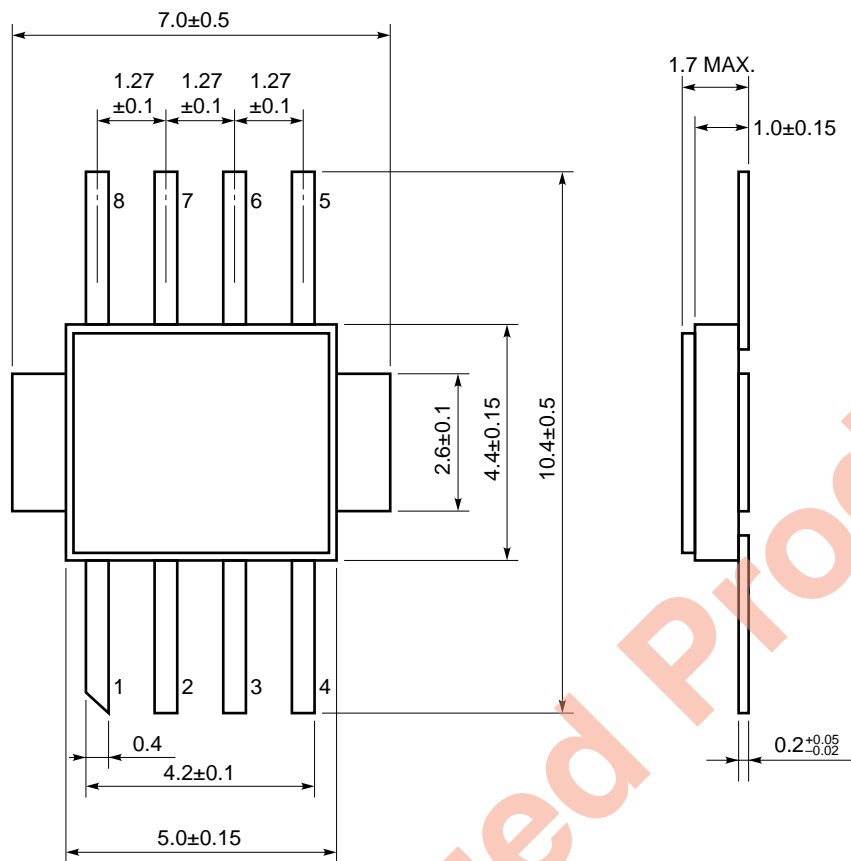
For V_{SS1} , the bias voltage of $-6.0 V$ should be applied through 2.2 V zener diode.

V_{SS1} should be connected to GND through 2.2 V zener diode.

TEST JIG DRAWING (Unit: mm)



PACKAGE DIMENSIONS (Unit: mm)



- 1: OUTPUT
- 2: V_{SS1}
- 3: Non Connection
- 4: V_{DD}
- 5: INPUT
- 6: V_{GG1} } (Normally open)
- 7: V_{GG2} }
- 8: V_{SS2}
- FLANGE: 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” (C10535E).

Soldering process	Soldering conditions	Symbol
Partial heating method	Terminal temperature: 260 °C or below, Flow time: 10 seconds or below, Exposure limit*: None	

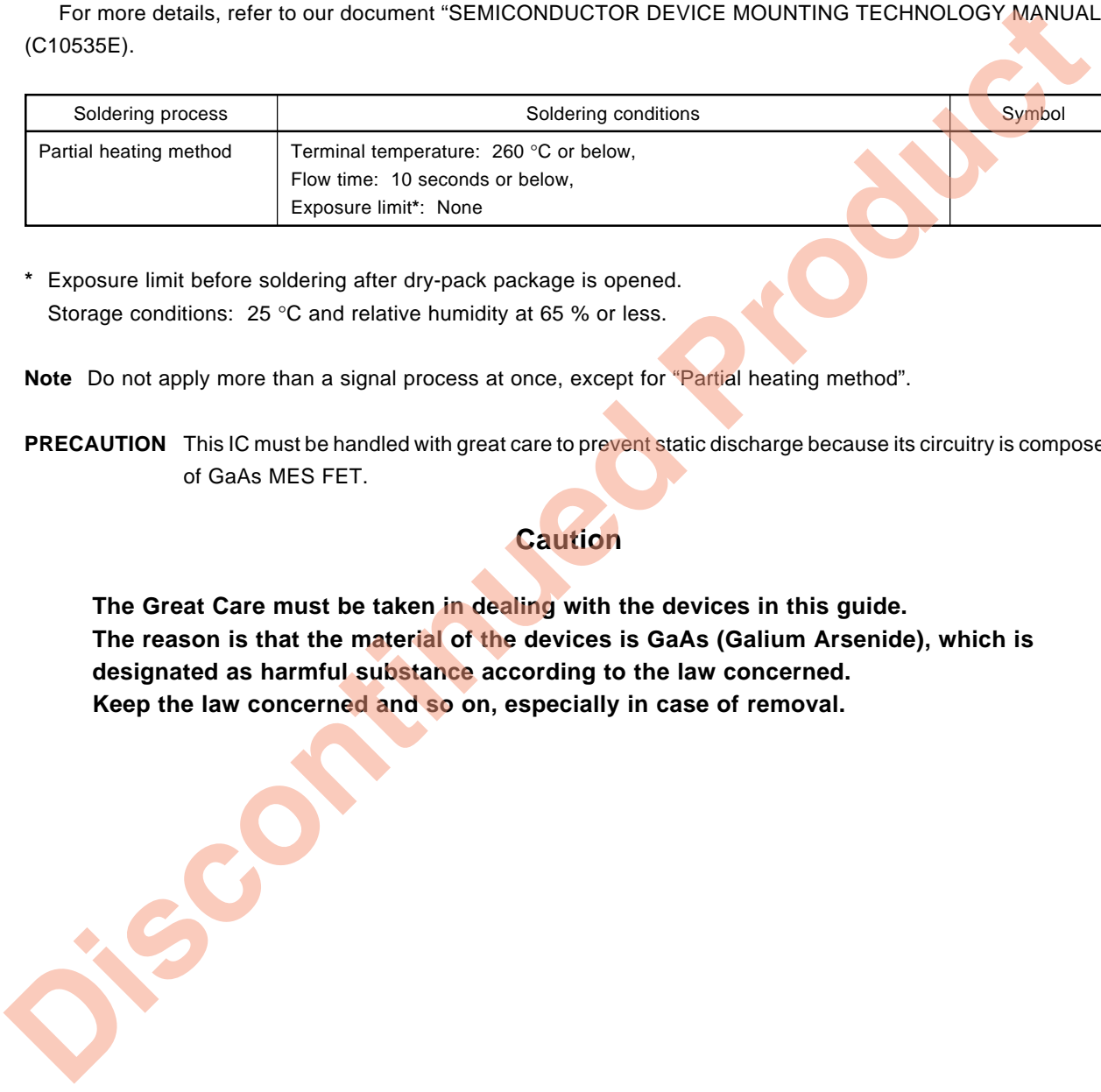
* Exposure limit before soldering after dry-pack package is opened.
Storage conditions: 25 °C and relative humidity at 65 % or less.

Note Do not apply more than a signal 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 Great Care must be taken in dealing with the devices in this guide.
The reason is that the material of the devices is GaAs (Galium Arsenide), which is designated as harmful substance according to the law concerned.
Keep the 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 is "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 an NEC sales representative in advance.

Anti-radioactive design is not implemented in this product.