

**Power Amplifier/Antenna Switch for PHS**

**Description**

The CXG1015N is a power amplifier/antenna switch MMIC for PHS. This is designed using the Sony's GaAs J-FET process and operates at a single positive power supply.

**Features**

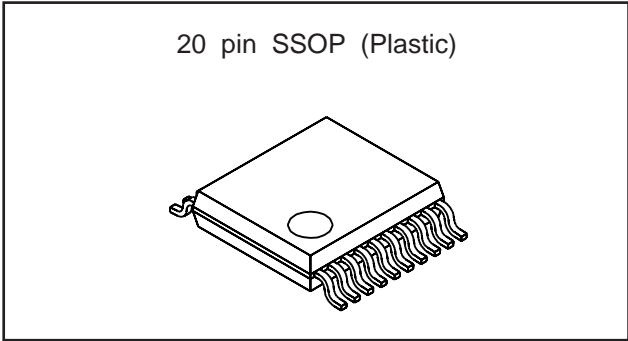
- Single positive power supply      3.0 V
- Output power                              20.2 dBm  
    (Antenna switch transfer output pin power)
- Low current consumption              160 mA  
    (Output power of 20.2 dBm)
- High power gain                         39 dB Typ.  
    (Output power of 20.2 dBm)
- Low insertion loss                       0.5 dB Typ.
- Small mold package                    20-pin SSOP  
    (Pin interval of 0.5 mm pitch)

**Structure**

GaAs J-FET MMIC

**Applications**

- Power amplifiers for PHS
- Antenna switches for PHS



**Absolute Maximum Ratings (Ta=25 °C)**

- Supply voltage                            V<sub>DD</sub>              6              V
- Voltage between gate and source      V<sub>GS0</sub>            1.5            V
- Drain current                              I<sub>DD</sub>              550           mA
- Power dissipation                        P<sub>D</sub>                3              W
- Channel temperature                    T<sub>ch</sub>              150           °C
- Operating temperature                Topr            -35 to +85   °C
- Storage temperature                    Tstg            -65 to +150 °C

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## Electrical Characteristics

### Power Amplifier + Antenna Switch Transfer Block

$V_{DD}=3.0\text{ V}$ ,  $V_{CTL}=2.0\text{ V}$ ,  $f=1.90\text{ GHz}$

( $T_a=25\text{ }^\circ\text{C}$ )

Item	Symbol	Min.	Typ.	Max.	Unit
* Current consumption	$I_{DD}$		160		mA
* Gate voltage adjustment value	$V_{GG2}$	0	0.25	0.7	V
Output power (Power Amplifier + Antenna Switch Transfer Block)	$P_{OUT}$	20.2			dBm
* Power gain	$G_P$	35.5	39	42	dB
* Adjacent channel leak power ratio (600 kHz $\pm$ 100 kHz)	ACPR600		-59	-54	dBc

- \* Values where  $V_{GG1}$  and  $V_{GG2}$  are adjusted so that  $I_{DD}$  becomes 160 mA when the power amplifier output pin and the antenna switch transfer input pin are connected on the Sony's recommended evaluation board and the output power on the antenna switch transfer output pin is 20.2 dBm.

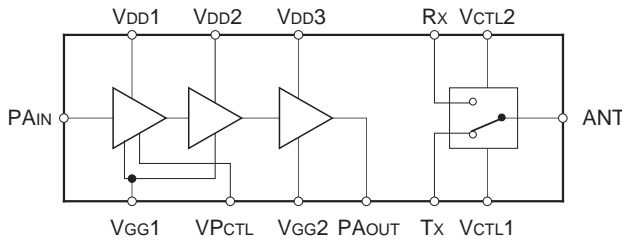
### Antenna Switch Receive Block

$V_{CTL(L)}=0\text{ V}$ ,  $V_{CTL(H)}=3.0\text{ V}$

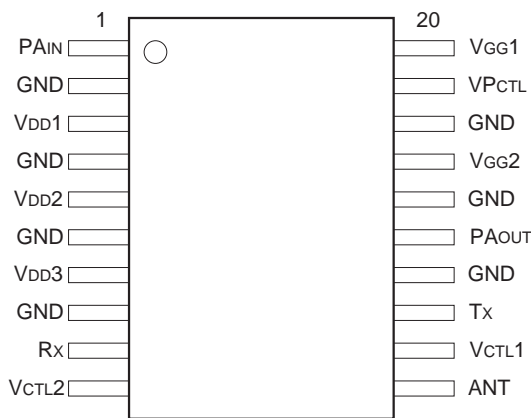
( $T_a=25\text{ }^\circ\text{C}$ )

Item	Symbol	Min.	Typ.	Max.	Unit
Insertion loss	IL		0.5	0.8	dB
Isolation	ISO	20	24		dB
Control pin current	$I_{CTL}$		40	100	$\mu\text{A}$

**Block Diagram**



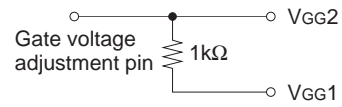
**Pin Configuration**



**Antenna Switch Operation**

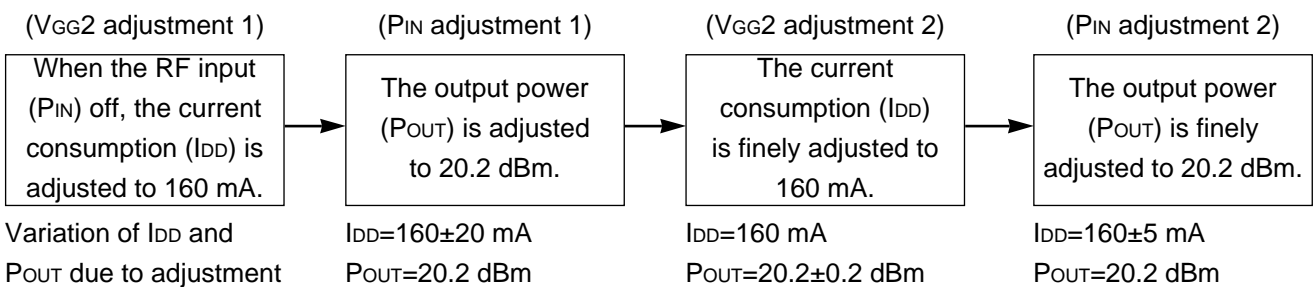
V <sub>CTL1</sub> =3 V	ANT-Tx	ON
V <sub>CTL2</sub> =0 V	ANT-Rx	OFF
V <sub>CTL1</sub> =0 V	ANT-Tx	OFF
V <sub>CTL2</sub> =3 V	ANT-Rx	ON

**Gate Bias Circuit of Power Amplifier Block**

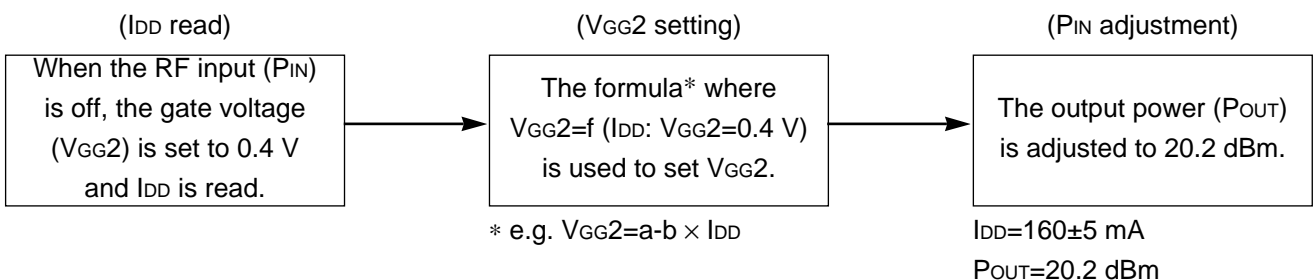


**Recommended Current Adjustment Method**

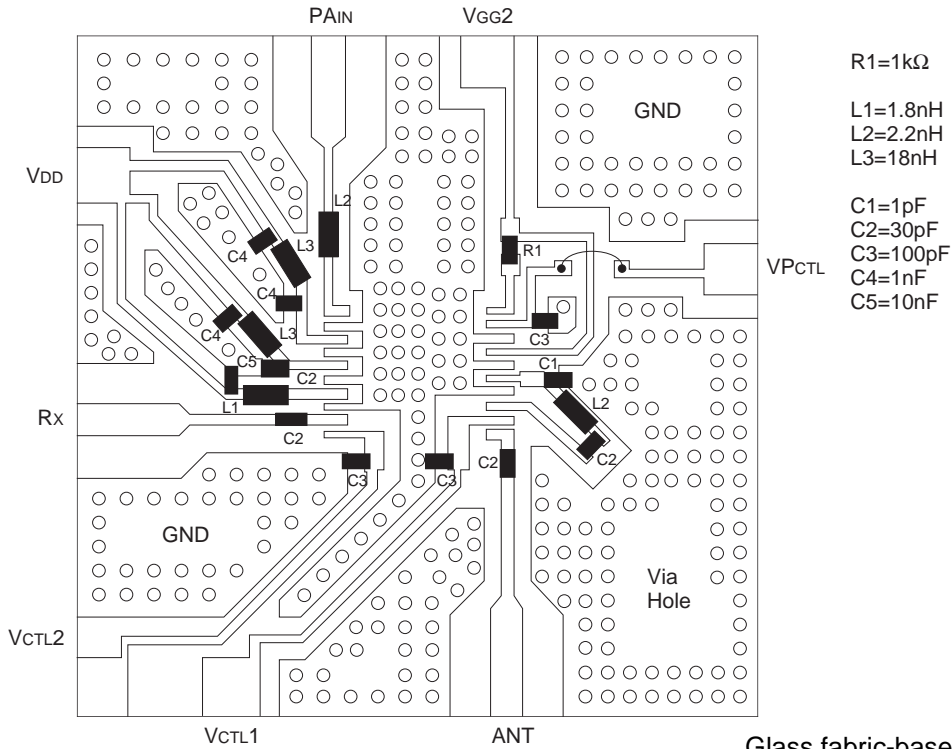
(1) V<sub>GG2</sub>/P<sub>IN</sub> separate adjustment



(2) Simple adjustment

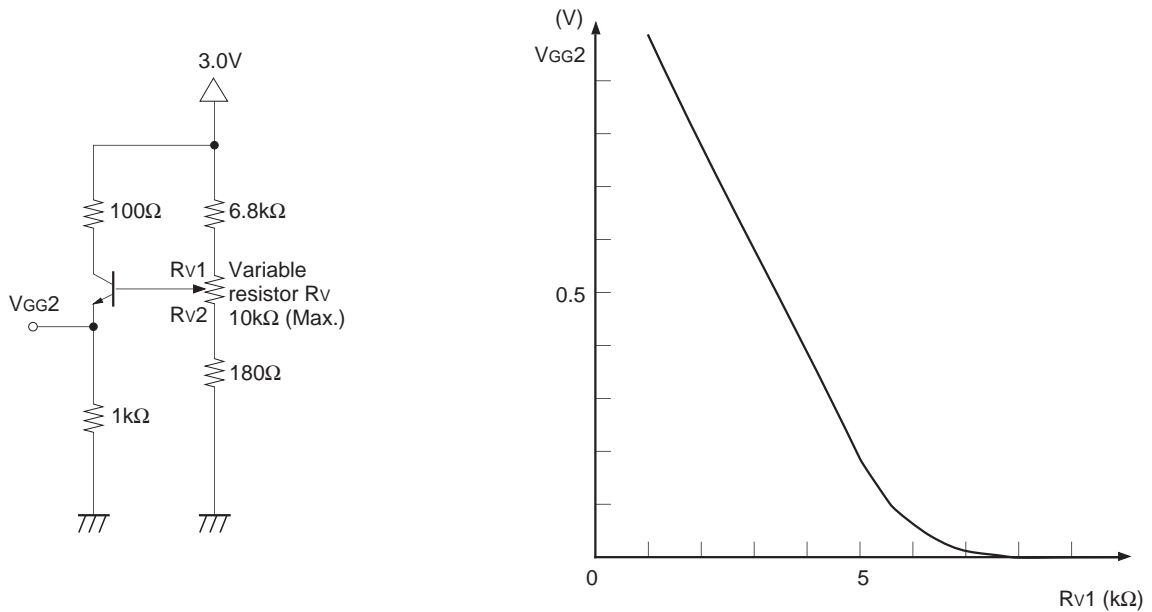


Recommended Evaluation Circuit



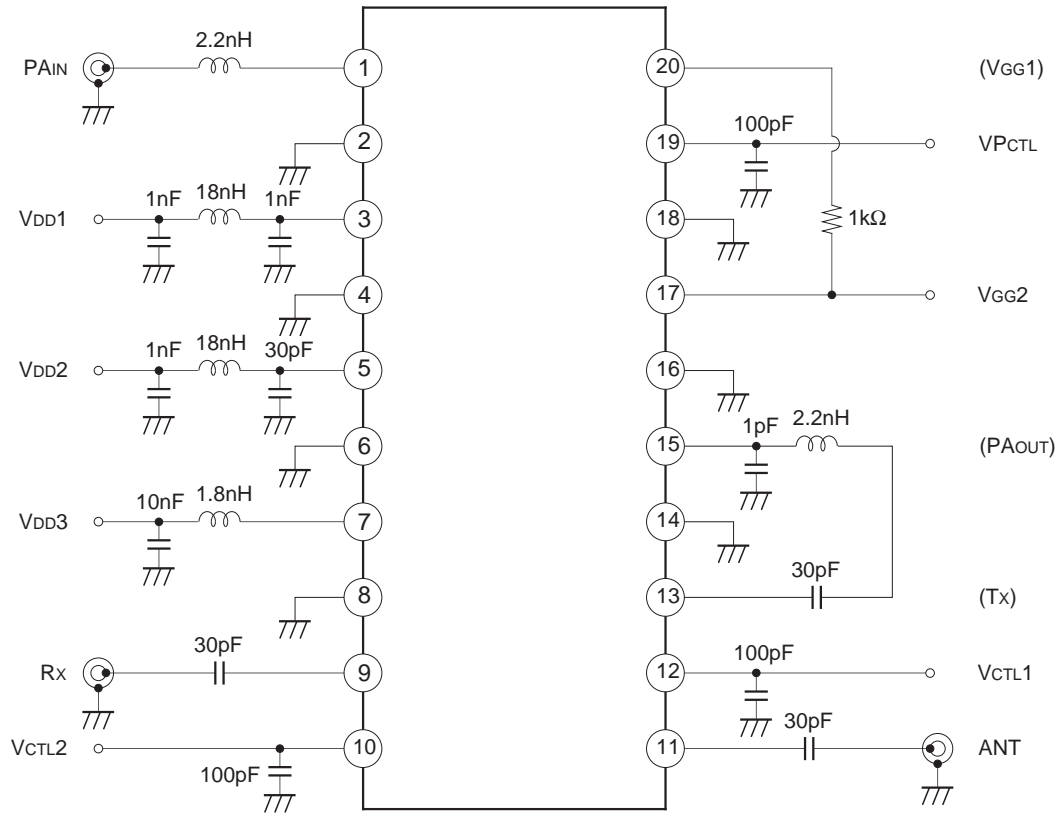
Glass fabric-base epoxy board  
 GND for the overall back side  
 Dimension : 25 mm × 25 mm  
 Thickness : 0.2 mm

Recommended Gate Bias Circuit and Circuit Characteristics



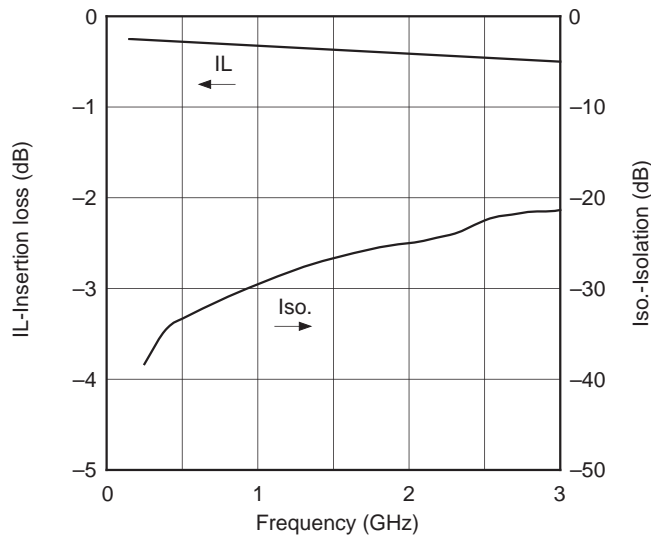
Application circuits shown are typical examples illustrating the operation of the devices. Sony cannot assume responsibility for any problems arising out of the use of these circuits or for any infringement of third party patent and other right due to same.

Recommended External Circuit

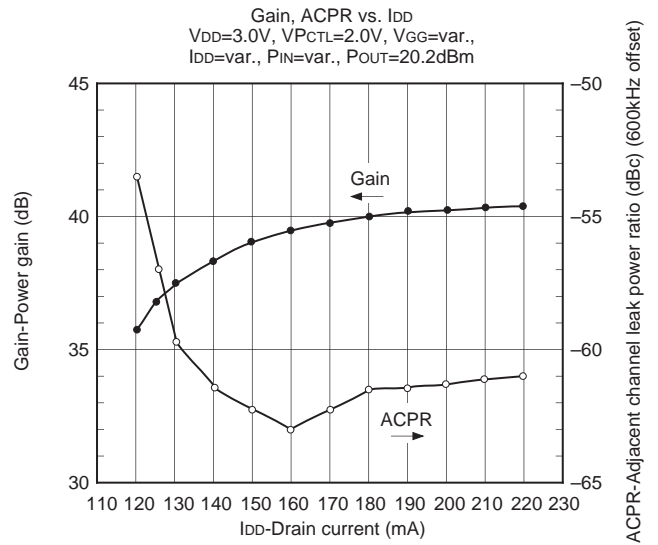
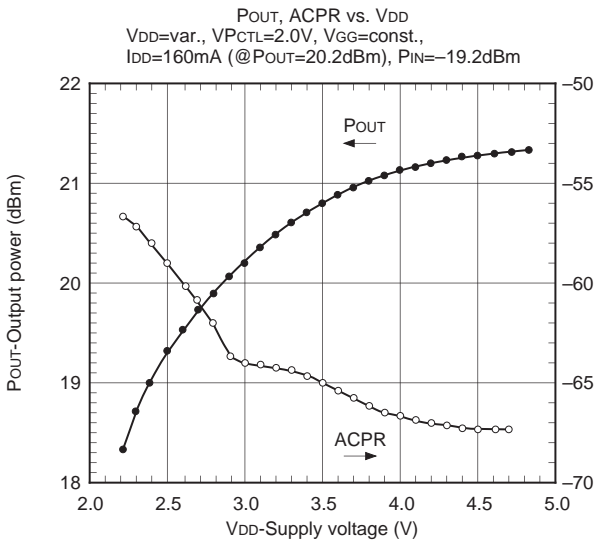
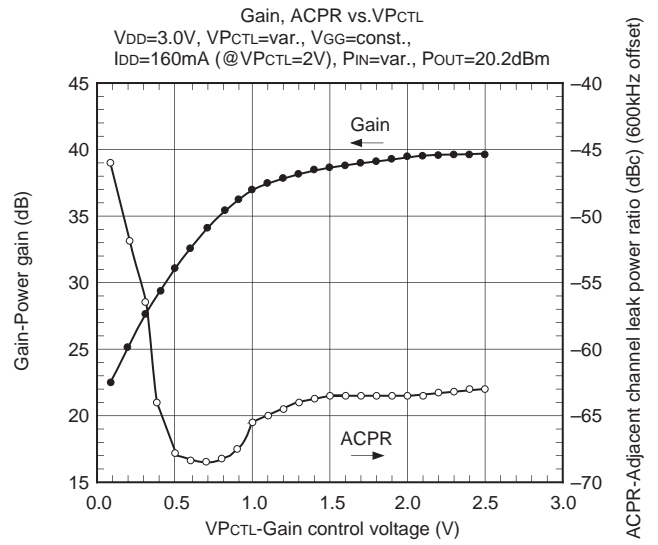
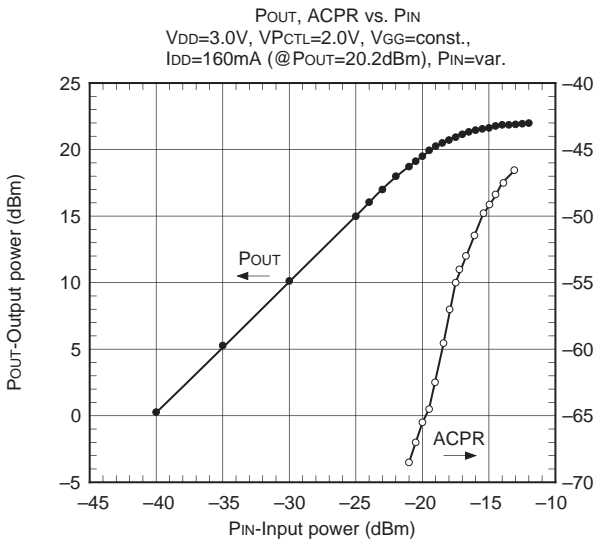


Example of Representative Characteristics (Ta=25 °C)  
Antenna Switch Receive Block

IL, Iso. vs. Freq.

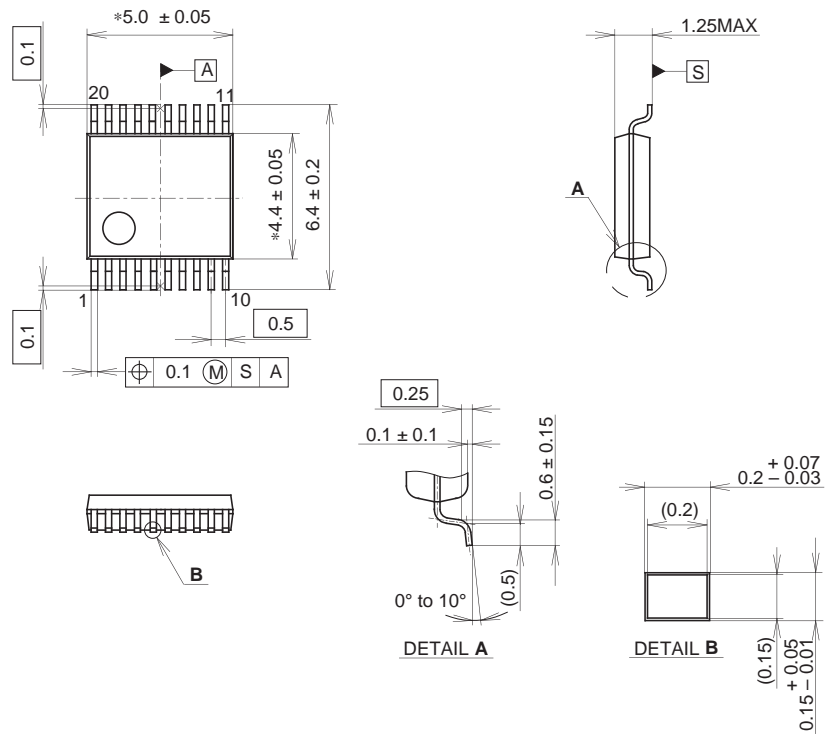


**Example of Representative Characteristics**  
**Power Amplifier + Antenna Switch Transfer Block**



Package Outline Unit : mm

20PIN SSOP(PLASTIC)



NOTE: Dimension "\*" does not include mold protrusion.

PACKAGE STRUCTURE

SONY CODE	SSOP-20P-L03	PACKAGE MATERIAL	EPOXY RESIN
EIAJ CODE	SSOP020-P-0044	LEAD TREATMENT	SOLDER/PALLADIUM PLATING
JEDEC CODE		LEAD MATERIAL	COPPER ALLOY
		PACKAGE MASS	0.1g