

SONY

CXG1006N

High-Frequency SPDT Antenna Switch

Description

The CXG1006N is a high power antenna switch MMIC. This IC is designed using the Sony's GaAs J-FET process and operates at a single positive power supply.

Features

- Single positive power supply operation
- Low insertion loss 0.5dB (Typ.) at 2.0GHz
- High isolation 27dB (Typ.) at 2.0GHz
- High power switching

| | | | |
|-------------|-------|-----------|----------------------|
| P1dB (Typ.) | 32dBm | at 2.0GHz | $V_{CTL} (H) = 2.0V$ |
| | | | $V_{CTL} (H) = 4.0V$ |
| | 34dBm | at 2.0GHz | |

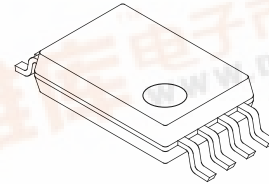
Application

Antenna switch for digital cellular telephones

Structure

GaAs J-FET MMIC

8 pin SSOP (Plastic)



Absolute Maximum Ratings (Ta = 25°C)

- Control voltage V_{ctl} 7 V
- Operating temperature T_{opr} -35 to +85 °C
- Storage temperature T_{stg} -65 to +150 °C

Operating Condition

Control voltage 0/4 V



Electrical Characteristics

V_{CTL (L)} = 0V, V_{CTL (H)} = 4V, P_{IN} = 30dBm, R_{RF} = 75kΩ

(Ta = 25°C)

| Item | Symbol | Test Condition | Min. | Typ. | Max. | Unit | |
|----------------|--------|----------------|------|------|------|------|----|
| Insertion Loss | IL1 | f = 1.0GHz | 35 | 0.3 | 0.6 | dB | |
| Isolation | ISO1 | | | 40 | | dB | |
| Insertion Loss | IL1.5 | f = 1.5GHz | 29 | 0.4 | 0.7 | dB | |
| Isolation | ISO1.5 | | | 32 | | dB | |
| Insertion Loss | IL2 | f = 2.0GHz | 24 | 0.5 | 0.8 | dB | |
| Isolation | ISO2 | | | 27 | | dB | |
| VSWR | VSWR | | | | | 1.5 | |
| Switching Time | TSW | | | | 100 | | ns |

V_{CTL (L)} = 0V, f = 2GHz

(Ta = 25°C)

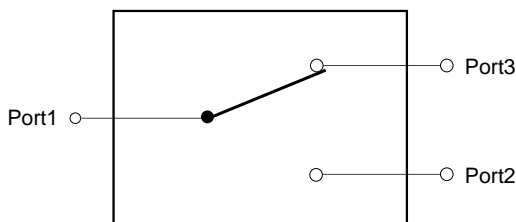
| Item | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|-----------------------|----------|---------------------------|------|------|------|------|
| 1dB Compression Point | P1dB (3) | V _{CTL (H)} = 3V | 30 | 32 | | dBm |
| 1dB Compression Point | P1dB (4) | V _{CTL (H)} = 4V | 32 | 34 | | dBm |

V_{CTL (L)} = 0V, R_{RF} = 75kΩ

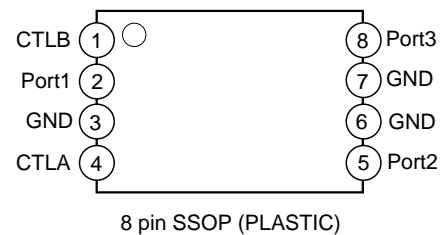
(Ta = 25°C)

| Item | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|-----------------|----------------------|---------------------------|------|------|------|------|
| Control Current | I _{CTL (1)} | V _{CTL (H)} = 3V | | 100 | 170 | μA |
| Control Current | I _{CTL (2)} | V _{CTL (H)} = 4V | | 150 | 220 | μA |
| Control Current | I _{CTL (3)} | V _{CTL (H)} = 5V | | 200 | 270 | μA |

Block Diagram

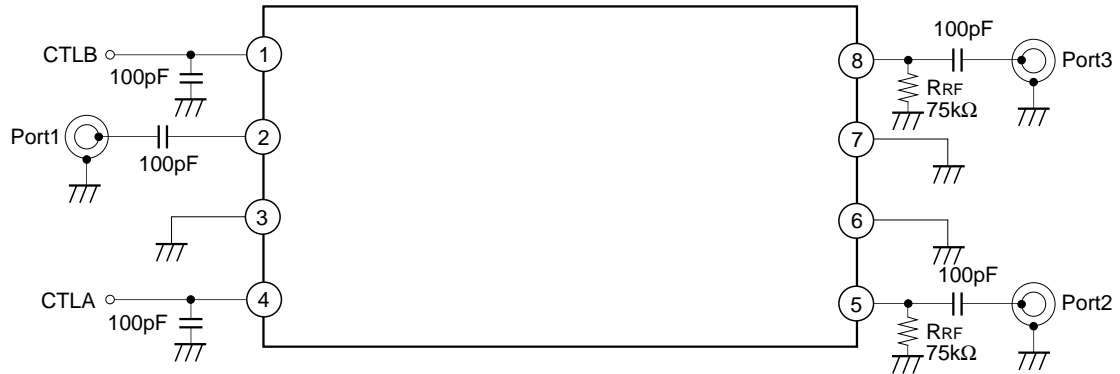


Package Outline/Pin Configuration



| V _{CTLA} | V _{CTLB} | |
|-------------------|-------------------|-----------------------------------|
| High | Low | Port1-Port2 ON Port1-Port3 OFF |
| Low | High | Port1-Port2 OFF Port1-Port3 ON |

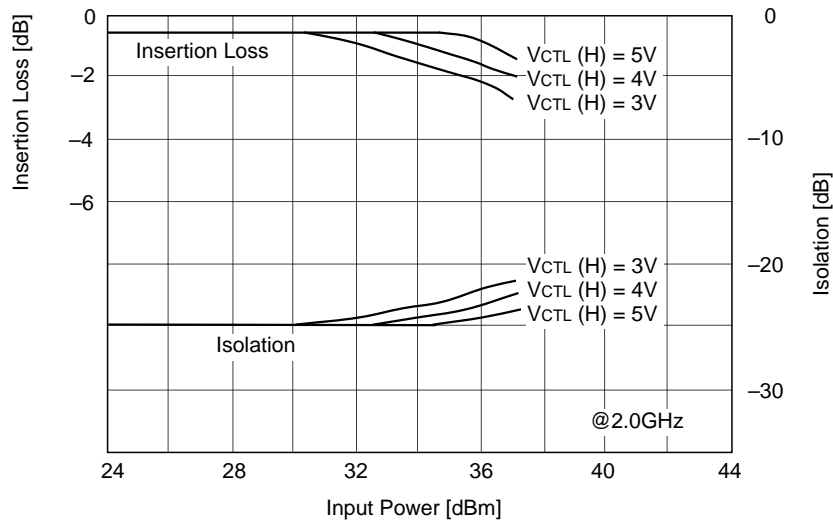
Recommended Circuit



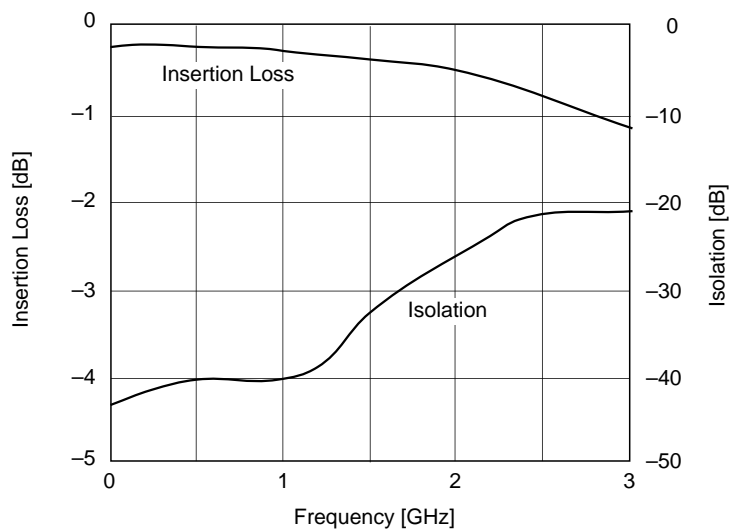
* R_{RF} is used to stabilize the electrical characteristics at high power signal input

Example of Representative Characteristics (T_a = 25°C)

Insertion Loss and Isolation vs. Input Power

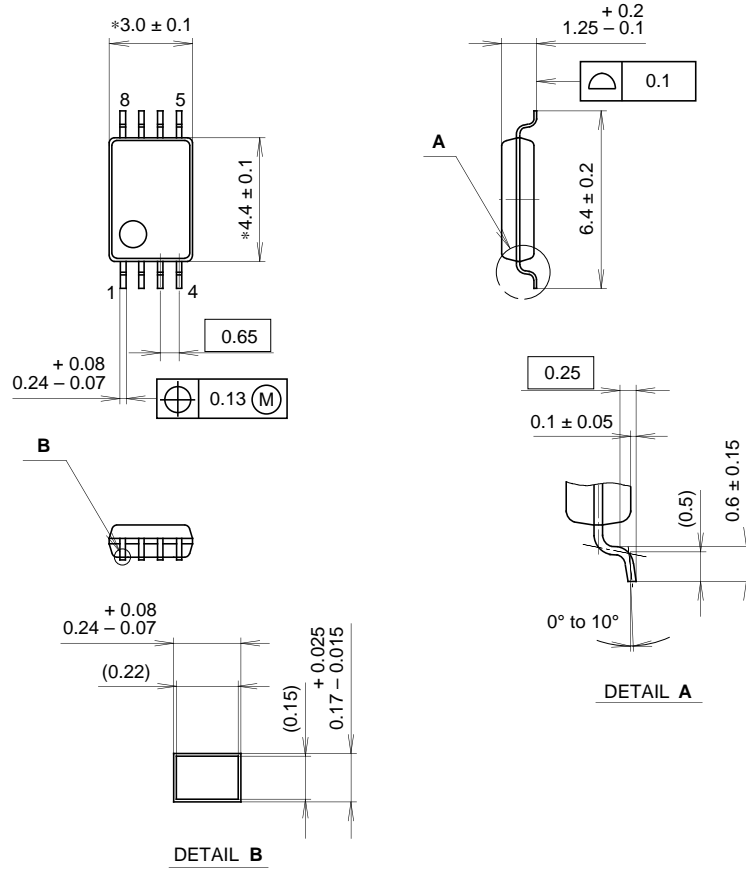


Insertion Loss and Isolation vs. Frequency



Package Outline Unit: mm

8PIN SSOP (PLASTIC)



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

PACKAGE STRUCTURE

| | |
|------------|----------------|
| SONY CODE | SSOP-8P-L01 |
| EIAJ CODE | SSOP008-P-0044 |
| JEDEC CODE | _____ |

| | |
|------------------|----------------------------|
| PACKAGE MATERIAL | EPOXY RESIN |
| LEAD TREATMENT | SOLDER / PALLADIUM PLATING |
| LEAD MATERIAL | COPPER ALLOY |
| PACKAGE WEIGHT | 0.04g |