

GSM1800/1900 DPDT TX/RX Antenna Switch

Description

The CXG1017N is a high power DPDT switch suitable for Digital Cellular applications. This device is part of a growing family of MMIC Antenna switches for digital cellular and cordless radios. It uses the state-of-the-art Sony JFET process.

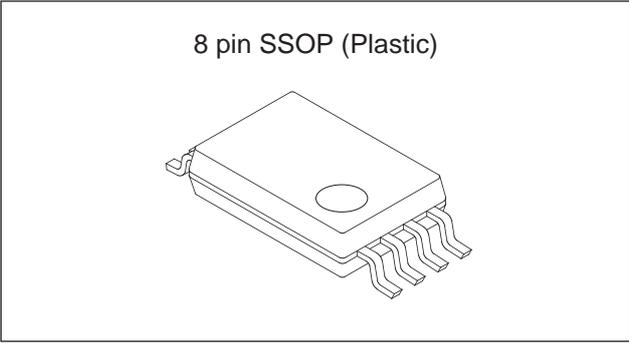
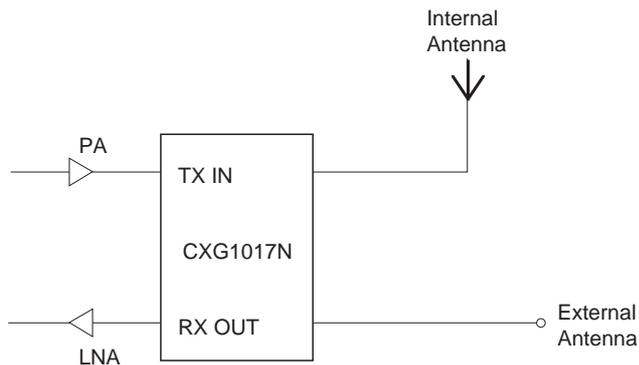
Features

- Positive voltage supply only
- Low insertion loss, typically 0.7dB at 33dBm input level
- Stable Characteristics over wide temperature range
- Fast switching-100ns Typical
- Low current consumption, 400µA typical at 5.5V
- 8 pin SSOP package (3.0 × 6.4mm)

Applications

- GSM1800 handportable
- GSM1900 handportable
- DECT basestation/handportable diversity antenna switching
- Other digital cellular and wireless local loop applications

Typical Application



ESD

As with other GaAs semiconductors, ESD precautions must be adhered to.

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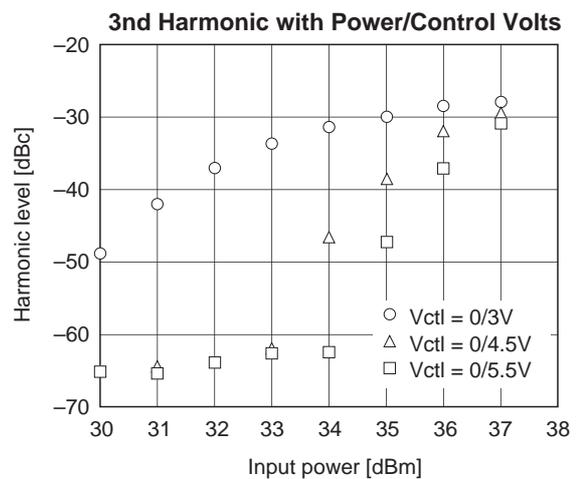
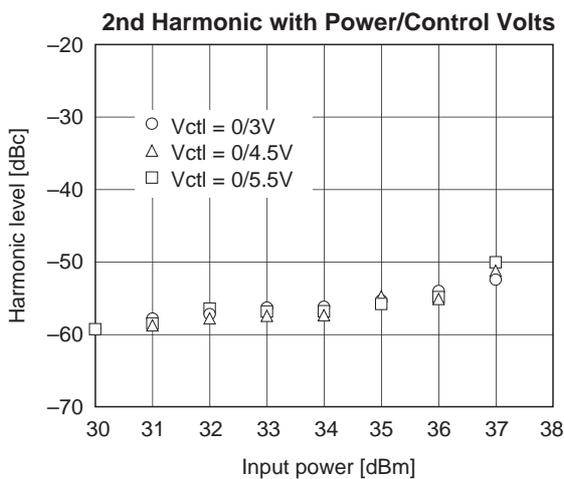
Electrical Characteristics

Measurement Conditions, unless otherwise stated: Vctl (L) = 0V, Vctl (H) = 5.5V, Pin = 33dBm GSM Burst (577µs pulse length with 8:1 Duty cycle), F = 1.75GHz. Temperature Range -25 to +75°C.

Parameter	Min.	Typ.	Max.	Unit
Insertion loss		0.7	0.95	dB
Isolation	14	16		dB
VSWR			1.5	
Switching time		100		ns
Harmonic levels		-56	-50	dBc
Control currents		400	800	µA
P0.1dB		34.5		dBm
P0.3dB		35.5		dBm
P0.1dB for Vctl (H) = 4.5V		34		dBm
P0.1dB for Vctl (H) = 3.0V		29		dBm

Control Voltage Selection, Vctl (H)

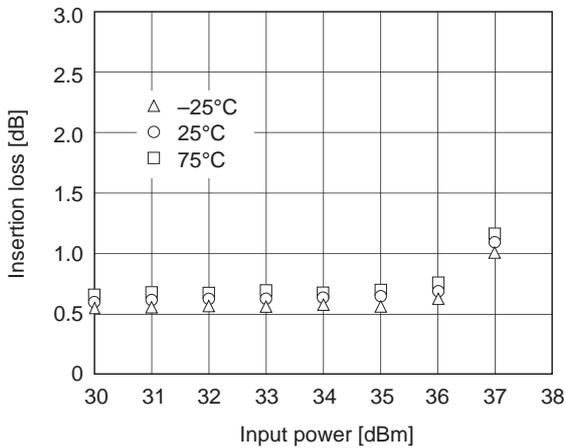
The choice of control voltage will determine the compression characteristic of the switch and the generation of harmonics. The table above indicates the sensitivity of P0.1dB to control voltage, whilst the graphs below indicate the sensitivity of harmonic levels:



Compression Characteristics

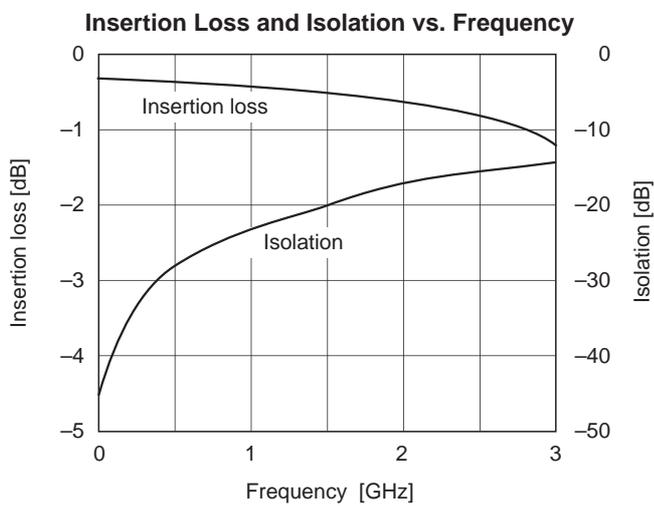
Measurement Conditions: Vctl (L) = 0V, Vctl (H) = 5.5V, GSM Burst, F = 1.75GHz
 Temperature range -25 to +75°C.

Typical Characteristics over Temperature:

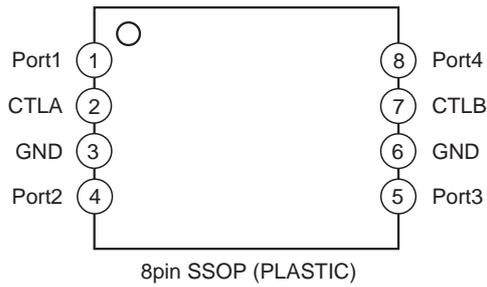


Frequency Characteristics

Measurement Conditions: Vctl (L) = 0V, Vctl (H) = 5.5V, Pin = 0dBm CW, T = 25°C

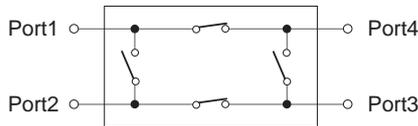


Schematic/Pinout



Pin No.	FUNCTION
1	RF PORT1
2	Ctl (A)
3	GROUND
4	RF PORT2
5	RF PORT3
6	GROUND
7	Ctl (B)
8	RF PORT4

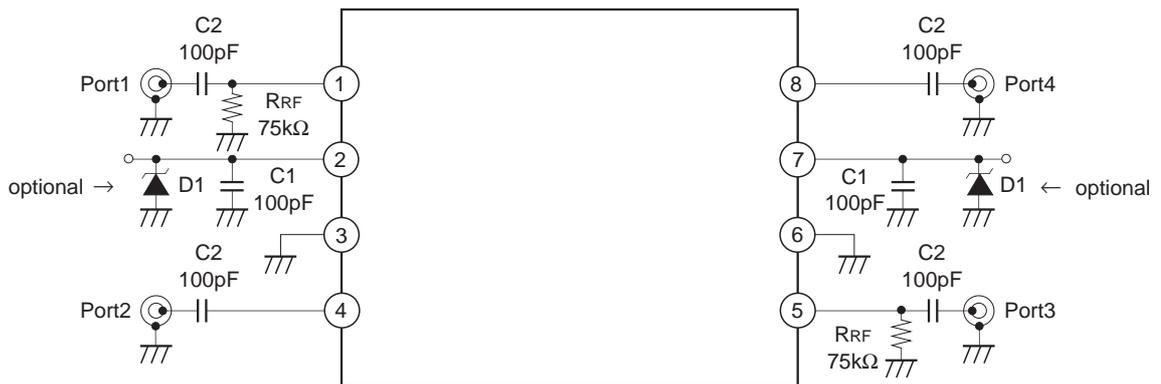
Block Diagram/Truth Table



V _{CTLA}	V _{CTLB}	
High	Low	Port1-Port2, Port3-Port4 ON Port2-Port3, Port4-Port1 OFF
Low	High	Port2-Port3, Port4-Port1 ON Port1-Port2, Port3-Port4 OFF

Note) Internal and External Antenna Connections should be diagonally opposite (1-3, 2-4).

External Circuitry



When using the CXG1017N, the following external components should be used:

- C1: This is used for signal line filtering 100pF is recommended.
- C2: This is used for RF De-coupling and must be used in all applications. 100pF is recommended.
- R_{rf}: This resistor is used to stabilize the dc operating point at high power levels. A value of 75kΩ is recommended.
- D1: 6.2V Zener diodes may be incorporated at the Control lines, as indicated, in order to give improved ESD performance if necessary.

ESD Precautions

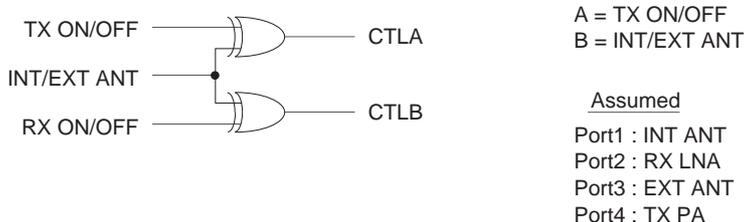
As this is a GaAs MMIC, ESD precautions must be adhered to, as outlined in at standard Data Book. Please contact Sony if detailed ESD performance data is required.

Configuration of External Logic Circuitry

For most portable applicaitons, the following logic states are normally available.:

1. TX ON/OFF
2. RX ON/OFF
3. INT/EXT ANT.

A simple Logic circuit, using EXOR gates may be used to drive the CXG1017N. The following is a suggested schematic:



Absolute Maximum Ratings (Ta = 25°C)

• Control voltage	Vctl	7	V
• Operating temperature	Topr	-30 to +85	°C
• Storage temperature	Tstg	-65 to +150	°C
• Input Power	Pin	37	dBm

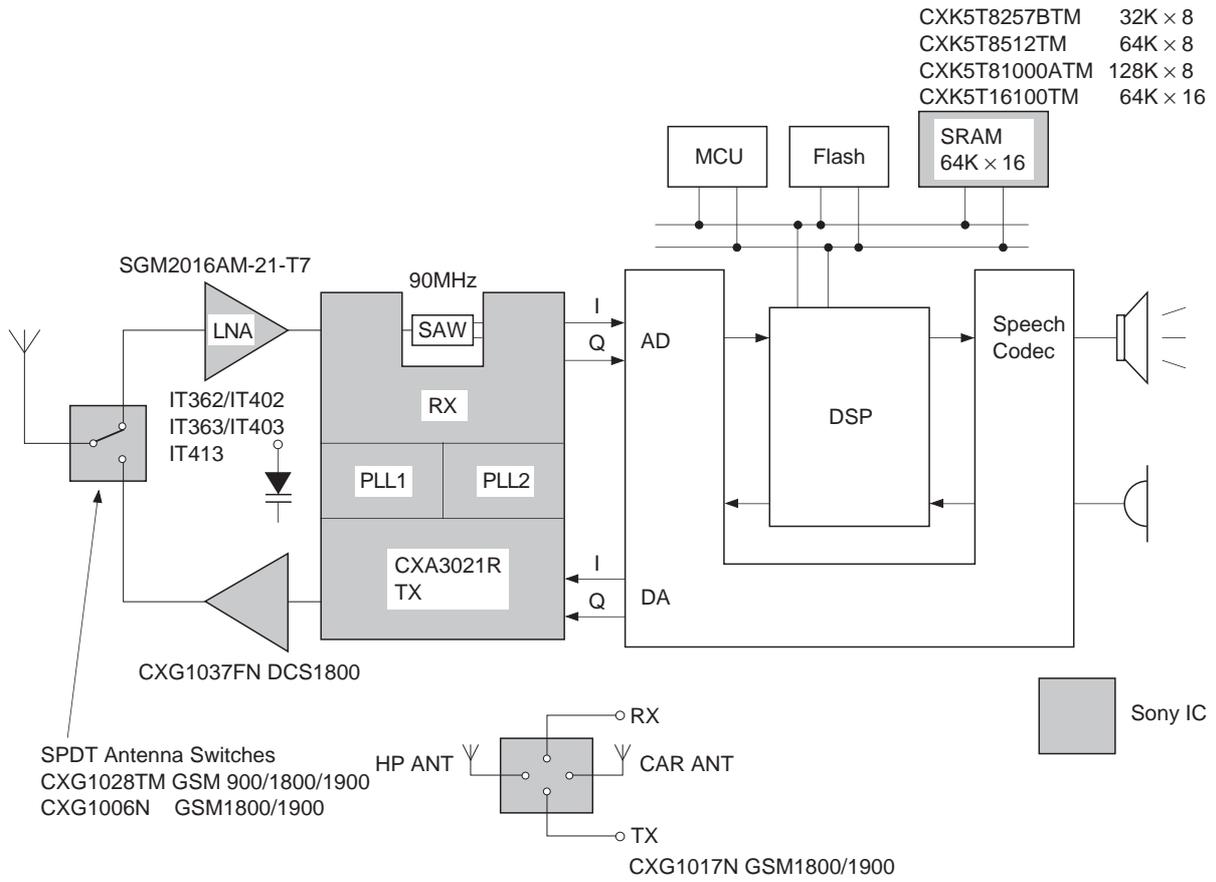
Tape and Reel Information

This device is available in Tape and Reel. Order CXG1017N-T4

Reel Quantity: 1000 pieces/reel

Reel Dimensions: 245mm. There are detailed on Page 1-112 of the package manual 93.

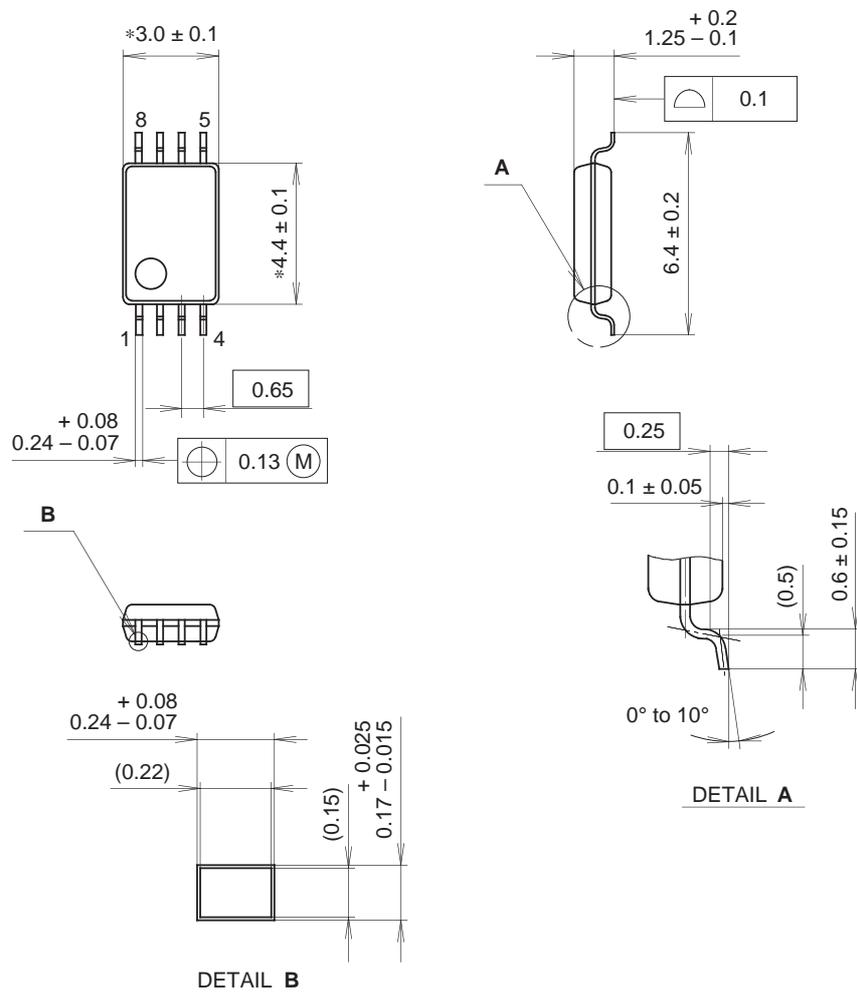
Sony GSM Lineup



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 MASS	0.04g