SONY

CXG1090TN

High Power 2 × 4 Antenna Switch MMIC with Integrated Control Logic

Description

The CXG1090TN is a high power antenna switch MMIC. The CXG1090TN is suited to connect Tx/Rx to one of 4 antennas in cellular handset such as PDC.

The CXG1090TN has the integrated control logic and can be operated with CMOS input.

This IC is designed using the Sony's GaAs J-FET process which enable the CXG1090TN to be operated with low voltage.

16 pin TSSOP (Plastic)
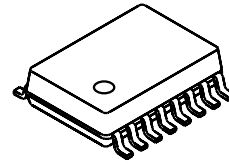
Features

• Low insertion loss: 0.30dB (Typ.)@900MHz, 0.40dB (Typ.)@1.5GHz

• Small package: TSSOP-16pin

• High power handling: PldB: 37dBm

• CMOS compatible input control

• Low bias voltage: V_{DD} = 3.0V

Applications

2 × 4 antenna switch for digital cellular telephones such as PDC handsets.
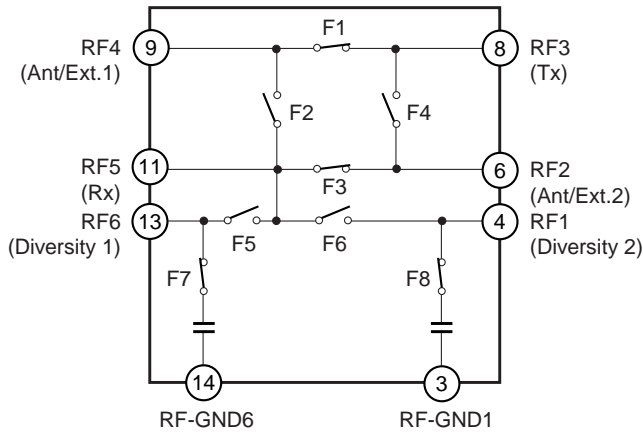
Structure

GaAs J-FET MMIC

Absolute Maximum Ratings

• Bias voltage $\quad\quad\quad$ V_{DD} $\quad\quad$ 7 $\quad\quad\quad$ V $\quad$@Ta = 25°C

• Control voltage $\quad\quad$ Vctl $\quad\quad$ 5 $\quad\quad\quad$ V $\quad$@Ta = 25°C

• Operating temperature $\quad$Topr $\quad$ −35 to +85 $\quad\quad$ °C

• Storage temperature $\quad$ Tstg $\quad$ −65 to +150 $\quad\quad$ °C

GaAs MMICs are ESD sensitive devices. Special handling precautions are required.

E99747A9Z-PS

Block Diagram

Package Outline/Pin Configuration
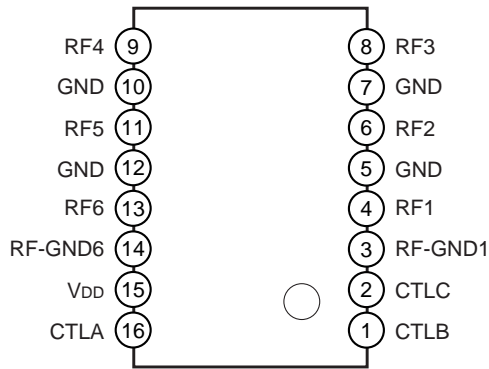
Recommended Circuit
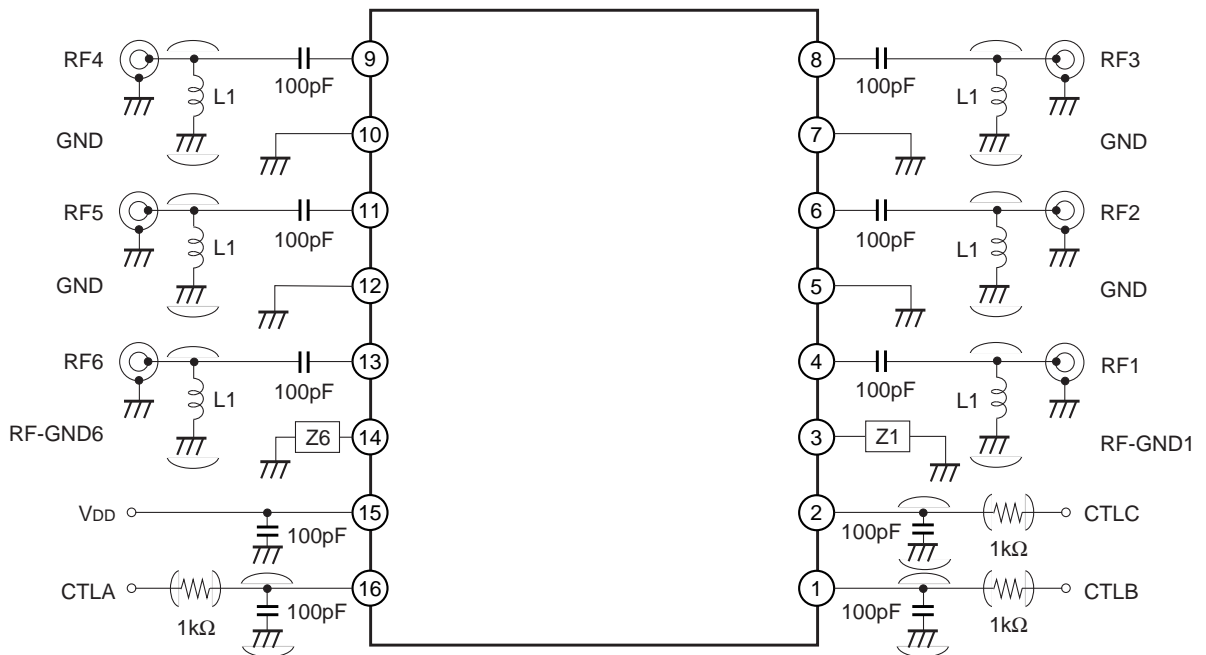
Truth Table

Control			ON	F1	F2	F3	F4	F5	F6	F7	F8
CTLA	CTLB	CTLC									
H	L	L	RF3 → RF2	OFF	ON	OFF	ON	OFF	OFF	ON	ON
H	L	H	RF3 → RF4	ON	OFF	ON	OFF	OFF	OFF	ON	ON
L	L	L	RF5 → RF2	ON	OFF	ON	OFF	OFF	OFF	ON	ON
L	L	H	RF5 → RF4	OFF	ON	OFF	ON	OFF	OFF	ON	ON
L	H	L	RF5 → RF6	OFF	OFF	OFF	OFF	ON	OFF	OFF	ON
L	H	H	RF5 → RF1	OFF	OFF	OFF	OFF	OFF	ON	ON	OFF

DC Bias Condition $\quad\quad$ (Ta = 25°C)

Parameter	Min.	Typ.	Max.	Unit
Vctl (H) A to C	2.4		3.6	V
Vctl (L) A to C	0		0.8	V
V_{DD}	2.8		3.2	V

Electrical Characteristics (Vctl (L) = 0V, Vctl (H) = 3V, Ta = 25°C)

Parameter		Frequency	Condition	Min.	Typ.	Max.	Unit
Insertion loss	RF3-RF2	889 to 960MHz	Pin = 29.5dBm, V_{DD} = 2.8 to 3.0V		0.32	0.55	dB
	RF3-RF4	889 to 960MHz	Pin = 29.5dBm, V_{DD} = 2.8 to 3.0V		0.30	0.55	dB
	RF5-RF2	810 to 885MHz	Pin = 7dBm, V_{DD} = 2.8 to 3.0V		0.55	0.85	dB
	RF5-RF4	810 to 885MHz	Pin = 7dBm, V_{DD} = 2.8 to 3.0V		0.55	0.85	dB
	RF5-RF1	810 to 885MHz	Pin = 7dBm, V_{DD} = 2.8 to 3.0V		0.5	0.8	dB
	RF5-RF6	810 to 885MHz	Pin = 7dBm, V_{DD} = 2.8 to 3.0V		0.5	0.8	dB
Isolation	RF3-RF2	889 to 960MHz	Pin = 29.5dBm, V_{DD} = 2.8 to 3.0V	17	19		dB
	RF3-RF4	889 to 960MHz	Pin = 29.5dBm, V_{DD} = 2.8 to 3.0V	17	21		dB
	RF5-RF2	810 to 885MHz	Pin = 7dBm, V_{DD} = 2.8 to 3.0V	17	21		dB
	RF5-RF4	810 to 885MHz	Pin = 7dBm, V_{DD} = 2.8 to 3.0V	17	19		dB
	RF5-RF1	810 to 885MHz	Pin = 7dBm, V_{DD} = 2.8 to 3.0V	27	34		dB
	RF5-RF6	810 to 885MHz	Pin = 7dBm, V_{DD} = 2.8 to 3.0V	20	25		dB
VSWR	Each ON Port	810 to 960MHz				1.4	
ACP (±50kHz)	RF3-RF2	889 to 960MHz	Pin = 29.5dBm, V_{DD} = 3.0V[*1]		−67	−57	dBc
	RF3-RF4		Pin = 29.5dBm, V_{DD} = 2.8V[*1]		−67	−55	dBc
ACP (±100kHz)	RF3-RF2	889 to 960MHz	Pin = 29.5dBm, V_{DD} = 3.0V[*1]		−75	−65	dBc
	RF3-RF4		Pin = 29.5dBm, V_{DD} = 2.8V[*1]		−75	−62	dBc
2nd harmonics	RF3-RF2	889 to 960MHz	Pin = 29.5dBm, V_{DD} = 3.0V[*1]		−67	−60	dBc
	RF3-RF4		Pin = 29.5dBm, V_{DD} = 2.8V[*1]		−67	−57	dBc
3nd harmonics	RF3-RF2	889 to 960MHz	Pin = 29.5dBm, V_{DD} = 3.0V[*1]		−67	−60	dBc
	RF3-RF4		Pin = 29.5dBm, V_{DD} = 2.8V[*1]		−67	−57	dBc
Control current					85	150	μA
Bias current			V_{DD} = 3.0V		0.45	1	mA
			V_{DD} = 2.8V		0.4	0.9	mA
Switching speed					1.0	5.0	μs

[*1] Input Signal: ACP (±50kHz) < −65dBc, APC (±100kHz) < −75dBc,
2nd harmonics < −65dBc, 3rd harmonics < −65dBc

Package Outline   Unit: mm

16PIN TSSOP(PLASTIC)

DETAIL **B**

PACKAGE STRUCTURE

PACKAGE MATERIAL	EPOXY RESIN
LEAD TREATMENT	SOLDER PLATING
LEAD MATERIAL	COPPER ALLOY
PACKAGE MASS	0.03g
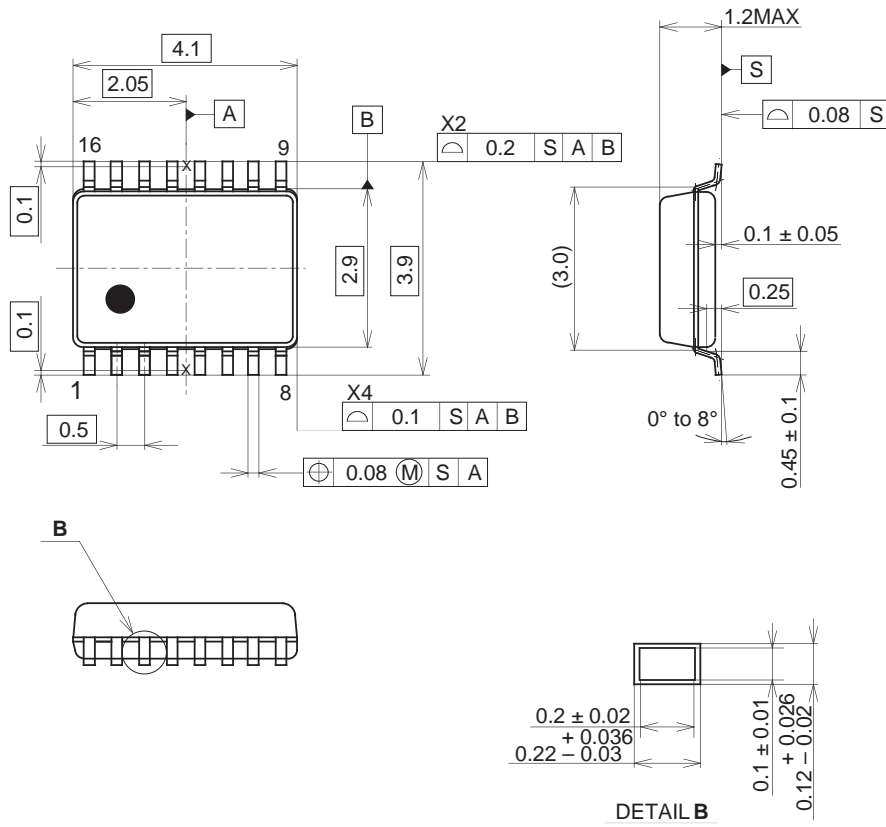
SONY CODE	TSSOP-16P-L01
EIAJ CODE	————
JEDEC CODE	————