

SONY

CXG1090EN

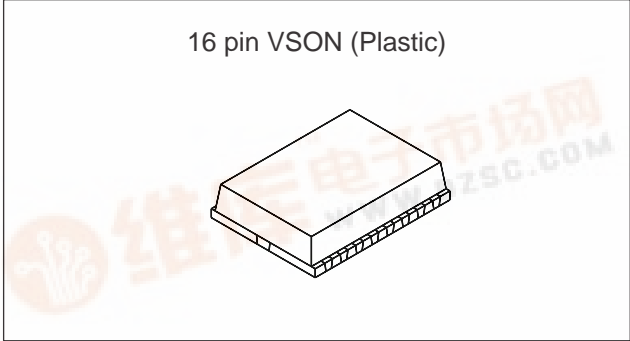
High Power 2 × 4 Antenna Switch MMIC with Integrated Control Logic

Description

The CXG1090EN is a high power antenna switch MMIC. This IC is suited to connect Tx/Rx to one of 4 antennas in cellular handset such as PDC.

The CXG1090EN 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 CXG1090EN to be operated with low voltage.



Features

- Low insertion loss: 0.30dB (Typ.)@900MHz, 0.40dB (Typ.)@1.5GHz
- Small package: 16-pin VSON
- High power handling: PI dB: 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 | V _{DD} | 7 | V | @Ta = 25°C |
| • Control voltage | V _{CTL} | 5 | V | @Ta = 25°C |
| • Operating temperature | T _{opr} | -35 to +85 | °C | |
| • Storage temperature | T _{stg} | -65 to +150 | °C | |

Note on Handling

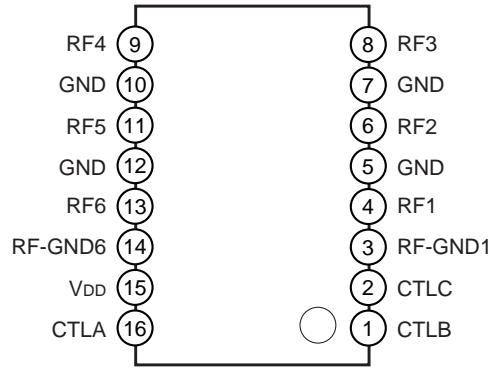
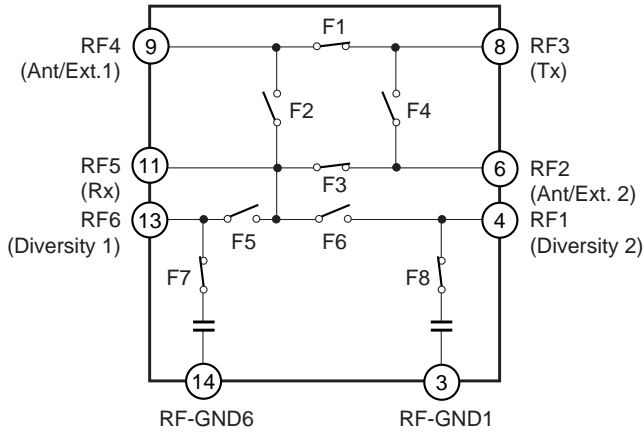
GaAs MMICs are ESD sensitive devices. Special handling precautions are required.

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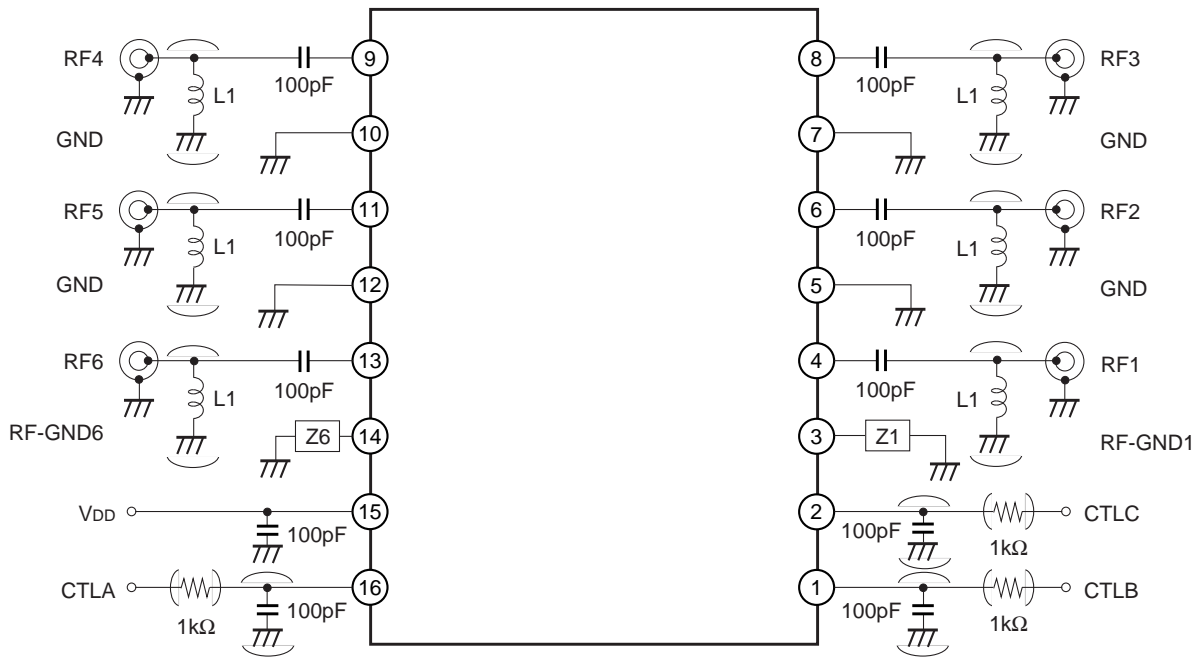


Block Diagram

Pin Configuration



Recommended Circuit



- * DC blocking capacitors (CRF) are needed.
- * Recommended to use bypass capacitors (Cbypass).
- * Recommended to use control resistors (RCTL), when it is necessary to improve the electrostatic discharge strength (ESD).

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

(Ta = 25°C)

Item	Min.	Typ.	Max.	Unit
V _{CTL} (H) A to C	2.4		3.6	V
V _{CTL} (L) A to C	0		0.8	V
V _{DD}	2.8		3.2	V

Electrical Characteristics 1

(V_{CTL} (L) = 0V, V_{CTL} (H) = 3V, Ta = 25°C)

Item		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	31	38		dB
	RF5-RF6	810 to 885MHz	Pin = 7dBm, V _{DD} = 2.8 to 3.0V	24	29		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
3rd 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

Electrical Characteristics 2

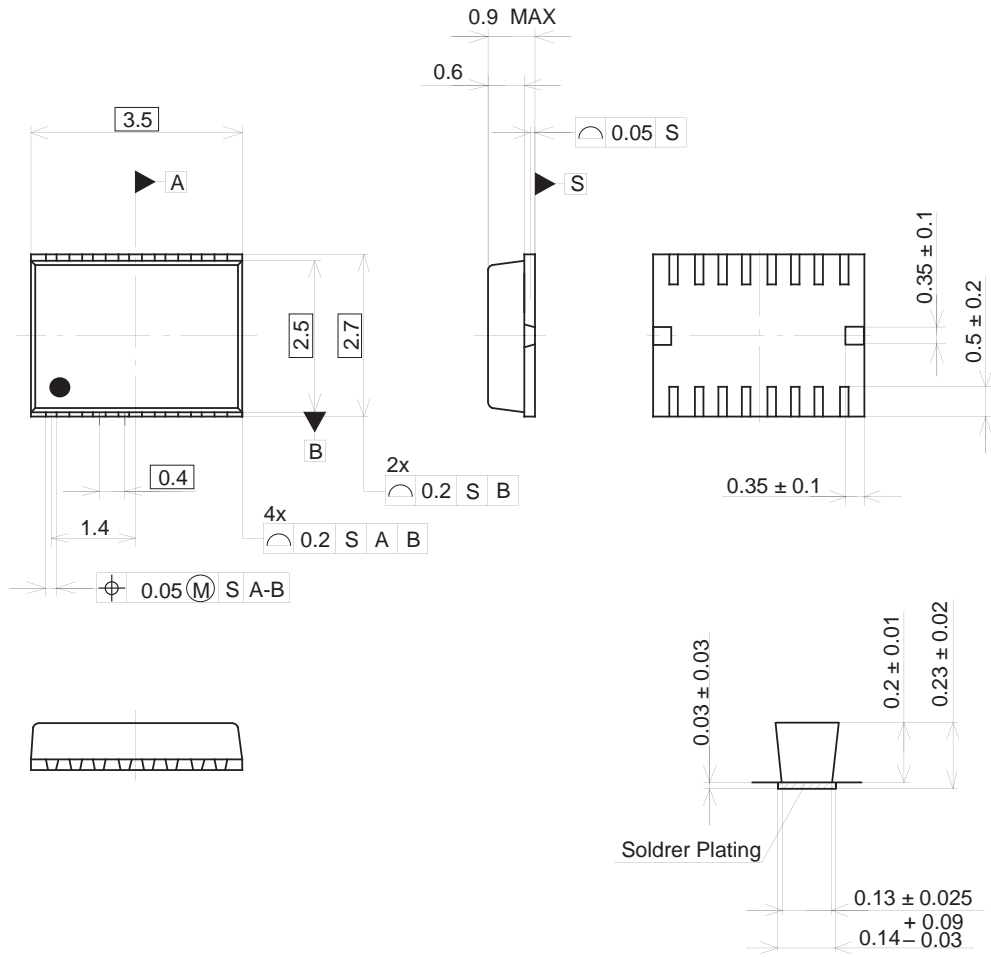
(V_{CTL} (L) = 0V, V_{CTL} (H) = 3V, Ta = 25°C)

Item		Frequency	Condition	Min.	Typ.	Max.	Unit
Insertion loss	RF3-RF2	1429 to 1453MHz	Pin = 29.5dBm, V _{DD} = 2.8 to 3.0V		0.40	0.70	dB
	RF3-RF4	1429 to 1453MHz	Pin = 29.5dBm, V _{DD} = 2.8 to 3.0V		0.40	0.70	dB
	RF5-RF2	1477 to 1501MHz	Pin = 7dBm, V _{DD} = 2.8 to 3.0V		0.65	0.95	dB
	RF5-RF4	1477 to 1501MHz	Pin = 7dBm, V _{DD} = 2.8 to 3.0V		0.65	0.95	dB
	RF5-RF1	1477 to 1501MHz	Pin = 7dBm, V _{DD} = 2.8 to 3.0V		0.60	0.90	dB
	RF5-RF6	1477 to 1501MHz	Pin = 7dBm, V _{DD} = 2.8 to 3.0V		0.60	0.90	dB
Isolation	RF3-RF2	1429 to 1453MHz	Pin = 29.5dBm, V _{DD} = 2.8 to 3.0V	12	15		dB
	RF3-RF4	1429 to 1453MHz	Pin = 29.5dBm, V _{DD} = 2.8 to 3.0V	15	18		dB
	RF5-RF2	1477 to 1501MHz	Pin = 7dBm, V _{DD} = 2.8 to 3.0V	15	18		dB
	RF5-RF4	1477 to 1501MHz	Pin = 7dBm, V _{DD} = 2.8 to 3.0V	13	16		dB
	RF5-RF1	1477 to 1501MHz	Pin = 7dBm, V _{DD} = 2.8 to 3.0V	35	40		dB
	RF5-RF6	1477 to 1501MHz	Pin = 7dBm, V _{DD} = 2.8 to 3.0V	20	25		dB
VSWR	Each ON Port	1429 to 1501MHz				1.4	
ACP (±50kHz)	RF3-RF2	1429 to 1453MHz	Pin = 29.5dBm, V _{DD} = 3.0V*1		-67	-55	dBc
	RF3-RF4		Pin = 29.5dBm, V _{DD} = 2.8V*1		-67	-53	dBc
ACP (±100kHz)	RF3-RF2	1429 to 1453MHz	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	1429 to 1453MHz	Pin = 29.5dBm, V _{DD} = 3.0V*1		-67	-60	dBc
	RF3-RF4		Pin = 29.5dBm, V _{DD} = 2.8V*1		-67	-57	dBc
3rd harmonics	RF3-RF2	1429 to 1453MHz	Pin = 29.5dBm, V _{DD} = 3.0V*1		-67	-57	dBc
	RF3-RF4		Pin = 29.5dBm, V _{DD} = 2.8V*1		-67	-55	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 VSON(PLASTIC)



NOTE:1) The dimensions of the terminal section apply to the ranges of 0.1mm and 0.25mm from the end of a terminal.

TERMINAL SECTION

PACKAGE STRUCTURE

SONY CODE	VSON-16P-01
EIAJ CODE	_____
JEDEC CODE	_____

PACKAGE MATERIAL	EPOXY RESIN
LEAD TREATMENT	SOLDER PLATING
LEAD MATERIAL	COPPER ALLOY
PACKAGE MASS	0.02 g