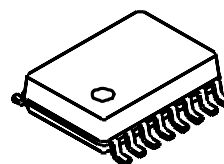


High Power 2 × 4 Antenna Switch MMIC with Integrated Control Logic

Description

The CXG1106TN is a high power antenna switch MMIC for PDC 800MHz and 1.5GHz handsets. The CXG1106TN is suited to connect Tx/Rx to one of 4 antennas. The CXG1106TN has on-chip logic circuit for operation with 3 CMOS inputs. The Sony JFET process is used for low insertion loss and low voltage operation.

16 pin TSSOP (Plastic)



Features

- Low insertion loss: 0.25dB @900MHz, 0.35dB @1.5GHz
- High linearity: Harmonic < – 65dBc
- CMOS compatible input control
- Small package: 16-pin TSSOP (2.7mm × 3.5mm)

Applications

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

Structure

GaAs J-FET MMIC

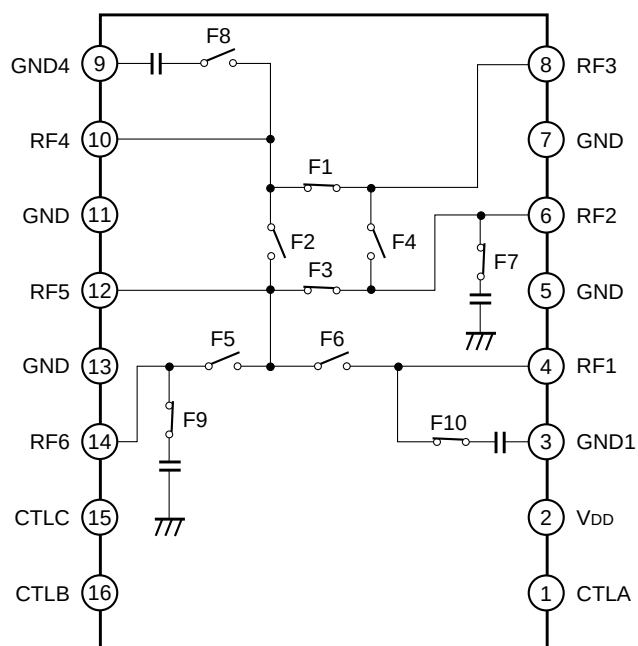
Absolute Maximum Ratings (Ta = 25°C)

• Bias voltage	V _{DD}	7	V
• Control voltage	V _{DD}	5	V
• Operating temperature	T _{opr}	–35 to +85	°C
• Storage temperature	T _{stg}	–65 to +150	°C

GaAs MMICs are ESD sensitive devices. Special handling precautions are required.
The actual ESD test data will be available later.

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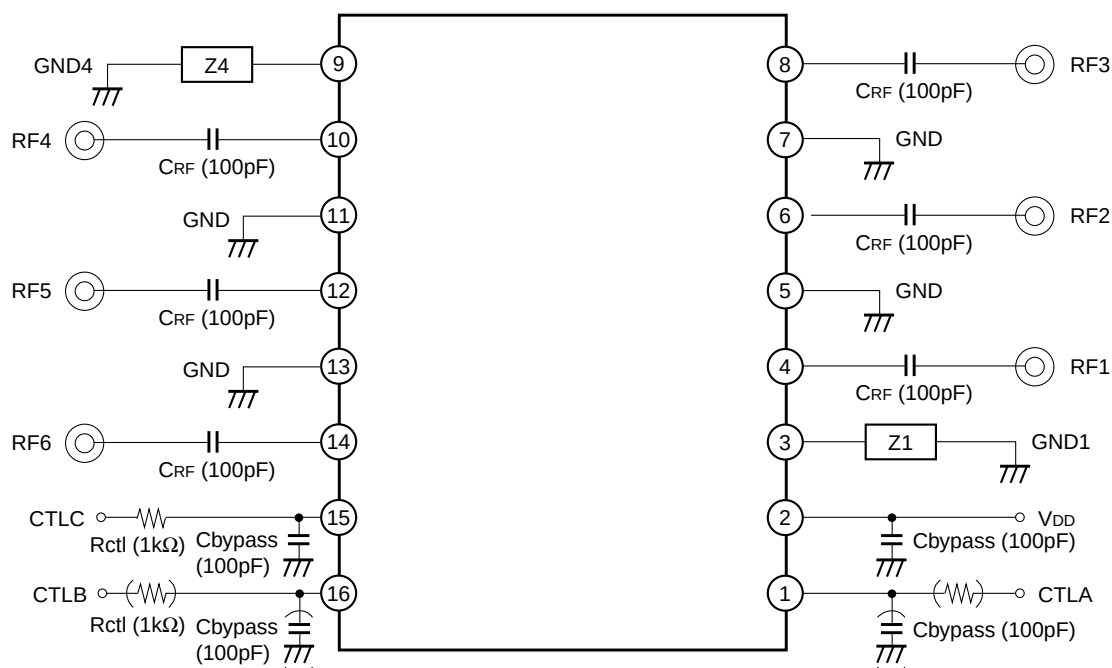
Block Diagram/Pin Configuration



Truth Table

On Pass	CTLA	CTLB	CTLC	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
RF3 – RF2	H	—	L	L	H	L	H	L	L	L	H	H	H
RF3 – RF4	H	—	H	H	L	H	L	L	L	H	L	H	H
RF5 – RF2	L	L	L	H	L	H	L	L	L	L	H	H	H
RF5 – RF4	L	L	H	L	H	L	H	L	L	H	L	H	H
RF5 – RF6	L	H	L	L	L	L	L	H	L	H	H	L	H
RF5 – RF1	L	H	H	L	L	L	L	L	H	H	H	H	L

Recommended Circuit



When using this IC, the following external components should be used:

Rctl: This resistor is used to improve ESD performance. 1kΩ is recommended.

CRF: This capacitor is used for RF decoupling and must be used for all application. 100pF is recommended.

Cbypass: This capacitor is used for DC line filtering. 100pF is recommended.

DC Bias Condition

(Ta = 25°C)

Item	Min.	Typ.	Max.	Unit
V _{DD}	+2.4	+3.0	+3.6	V
V _{ctl} (H)	+2.0	+3.0	+3.6	V
V _{ctl} (L)	0		+0.4	V

Electrical Characteristics 1

(Ta = 25°C)

Item	Symbol	Port	Condition	Min.	Typ.	Max.	Unit
Insertion loss	IL	RF3 – RF2	*1		0.25	0.50	dB
		RF3 – RF4	*1		0.25	0.50	dB
		RF5 – RF2	*2		0.45	0.70	dB
		RF5 – RF4	*2		0.55	0.80	dB
		RF5 – RF6	*2		0.35	0.60	dB
		RF5 – RF1	*2		0.35	0.60	dB
Isolation	ISO.	RF3 – RF2	*1	20	23		dB
		RF3 – RF4	*1	23	26		dB
		RF5 – RF2	*2	25	28		dB
		RF5 – RF4	*2	21	24		dB
		RF5 – RF6	*2	22	25		dB
		RF5 – RF1	*2	27	33		dB
VSWR	VSWR		50Ω		1.2	1.6	—
Harmonics	2fo	RF3 – RF2	*3		–75	–60	dBc
		RF3 – RF4	*3		–75	–60	dBc
	3fo	RF3 – RF2	*3		–67	–60	dBc
		RF3 – RF4	*3		–67	–60	dBc
ACP	±50kHz	RF3 – RF2	*3		–67	–57	dBc
		RF3 – RF4	*3		–67	–57	dBc
	±100kHz	RF3 – RF2	*3		–75	–65	dBc
		RF3 – RF4	*3		–75	–65	dBc
1dB compression input power	P1dB	RF3 – RF2	V _{DD} = 2.8V	33	35		dBm
		RF3 – RF4	V _{DD} = 2.8V	33	35		dBm
Switching speed	TSW				2		μs
Bias current	I _{DD}		V _{DD} = 3.0V		0.45	0.75	mA
Control current	I _{ctl}		V _{ctl} (H) = 3V		40	70	μA

*1 Pin = 29.5dBm, 0/3V control, V_{DD} = 3.0V, 889MHz to 960MHz*2 Pin = 10dBm, 0/3V control, V_{DD} = 3.0V, 810MHz to 885MHz*3 π/4-shifted DQPSK, Pin = 29.5dBm, 0/3V control, V_{DD} = 3.0V, 889MHz to 960MHz,
ACP (±50kHz) < – 70dBc, ACP (±100kHz) < – 75dBc, 2nd harmonic < – 75dBc, 3rd harmonic < – 75dBc

Electrical Characteristics 2

(Ta = 25°C)

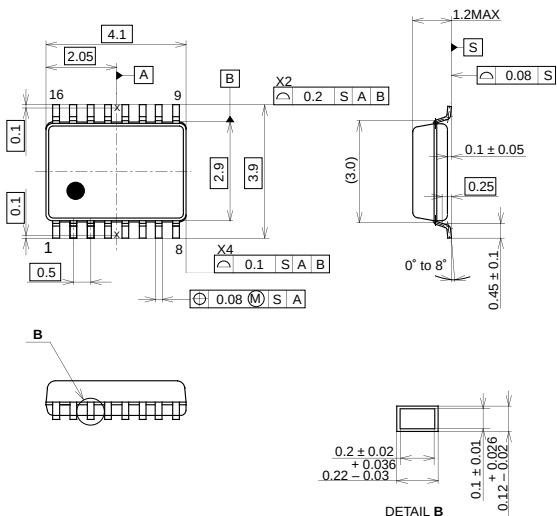
Item	Symbol	Port	Condition	Min.	Typ.	Max.	Unit
Insertion loss	IL	RF3 – RF2	*1		0.40	0.65	dB
		RF3 – RF4	*1		0.35	0.60	dB
		RF5 – RF2	*2		0.60	0.85	dB
		RF5 – RF4	*2		0.80	1.05	dB
		RF5 – RF6	*2		0.40	0.65	dB
		RF5 – RF1	*2		0.40	0.65	dB
Isolation	ISO.	RF3 – RF2	*1	17	20		dB
		RF3 – RF4	*1	21	24		dB
		RF5 – RF2	*2	24	27		dB
		RF5 – RF4	*2	19	22		dB
		RF5 – RF6	*2	18	21		dB
		RF5 – RF1	*2	25	31		dB
VSWR	VSWR		50Ω		1.2	1.6	—
Harmonics	2fo	RF3 – RF2	*3		–75	–60	dBc
		RF3 – RF4	*3		–75	–60	dBc
	3fo	RF3 – RF2	*3		–67	–60	dBc
		RF3 – RF4	*3		–67	–60	dBc
ACP	±50kHz	RF3 – RF2	*3		–67	–57	dBc
		RF3 – RF4	*3		–67	–57	dBc
	±100kHz	RF3 – RF2	*3		–75	–65	dBc
		RF3 – RF4	*3		–75	–65	dBc
1dB compression input power	P1dB	RF3 – RF2	V _{DD} = 2.8V	33	35		dBm
		RF3 – RF4	V _{DD} = 2.8V	33	35		dBm
Switching speed	TSW				2		μs
Bias current	I _{DD}		V _{DD} = 3.0V		0.45	0.75	mA
Control current	I _{ctl}		V _{ctl} (H) = 3V		40	70	μA

*1 Pin = 29.5dBm, 0/3V control, V_{DD} = 3.0V, 1429MHz to 1453MHz*2 Pin = 10dBm, 0/3V control, V_{DD} = 3.0V, 1477MHz to 1501MHz*3 $\pi/4$ -shifted DQPSK, Pin = 29.5dBm, 0/3V control, V_{DD} = 3.0V, 1429MHz to 1453MHz,
ACP (±50kHz) < – 70dBc, ACP (±100kHz) < – 75dBc, 2nd harmonic < – 75dBc, 3rd harmonic < – 75dBc

Package Outline

Unit: mm

16PIN TSSOP (PLASTIC)

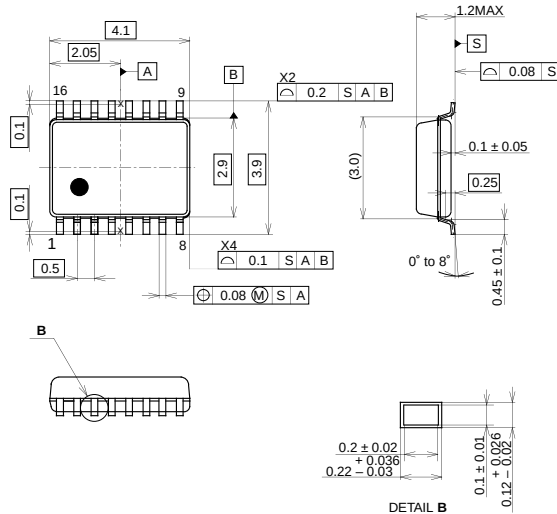


PACKAGE STRUCTURE

SONY CODE	TSSOP-16P-L01
EIAJ CODE	
JEDEC CODE	

PACKAGE MATERIAL	EPOXY RESIN
LEAD TREATMENT	SOLDER PLATING
LEAD MATERIAL	COPPER ALLOY
PACKAGE MASS	0.03g

16PIN TSSOP (PLASTIC)



PACKAGE STRUCTURE

SONY CODE	TSSOP-16P-L01
EIAJ CODE	
JEDEC CODE	

PACKAGE MATERIAL	EPOXY RESIN
LEAD TREATMENT	SOLDER PLATING
LEAD MATERIAL	COPPER ALLOY
PACKAGE MASS	0.03g

LEAD PLATING SPECIFICATIONS

ITEM	SPEC.
LEAD MATERIAL	COPPER ALLOY
SOLDER COMPOSITION	Sn-Bi Bi:1-4wt%
PLATING THICKNESS	5-18μm