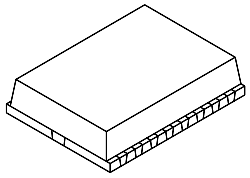
SONY

CXG1106EN

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

16 pin VSON (Plastic)



Description

The CXG1106EN is a high power antenna switch MMIC for PDC 800MHz and 1.5GHz handsets. The CXG1106EN is suited to connect Tx/Rx to one of 4 antennas. The CXG1106EN 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.

Features

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

Applications

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

Structure

GaAs J-FET MMIC

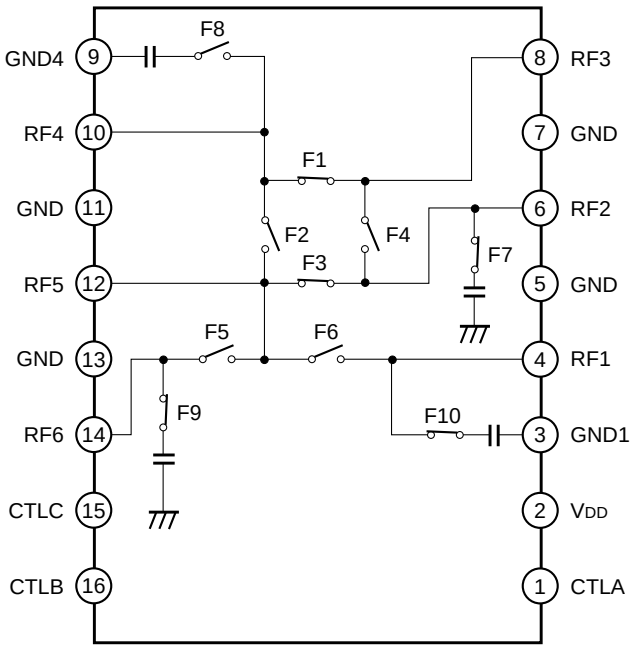
Absolute Maximum Ratings (Ta = 25°C)

• Bias voltage	V_{DD}	7	V
• Control voltage	V_{DD}	5	V
• Operating temperature	Topr	–35 to +85	°C
• Storage temperature	Tstg	–65 to +150	°C

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

E00X14B1Y-PS

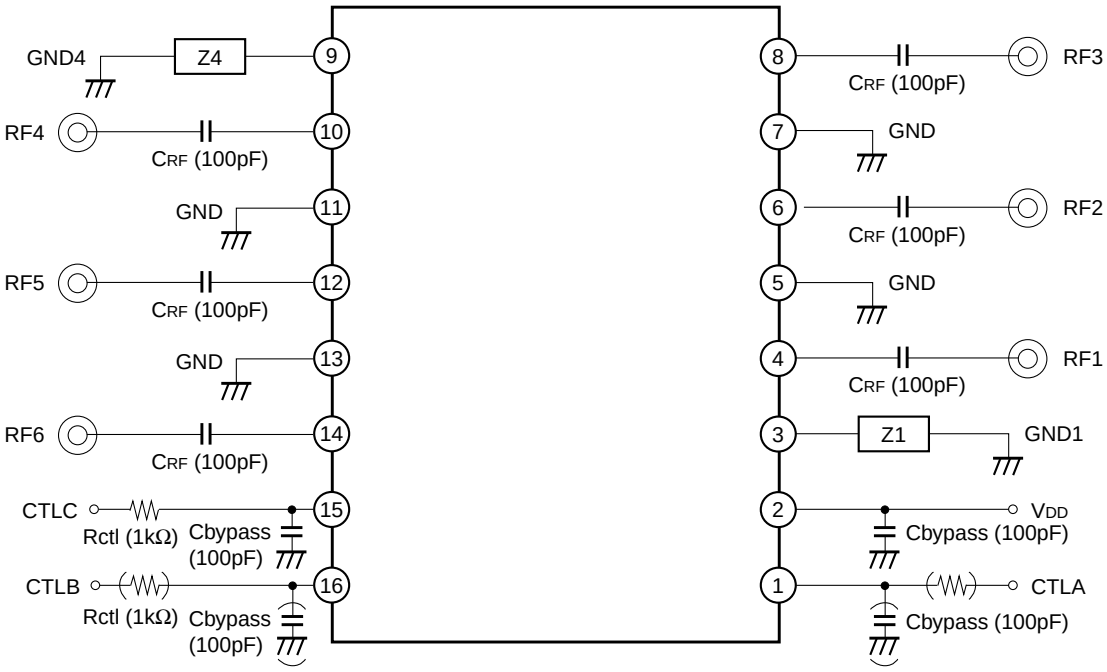
Block Diagram/Pin Configuration



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.

C_{RF}: 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
Vctl (H)	+2.0	+3.0	+3.6	V
Vctl (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	Ictl		Vctl (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)

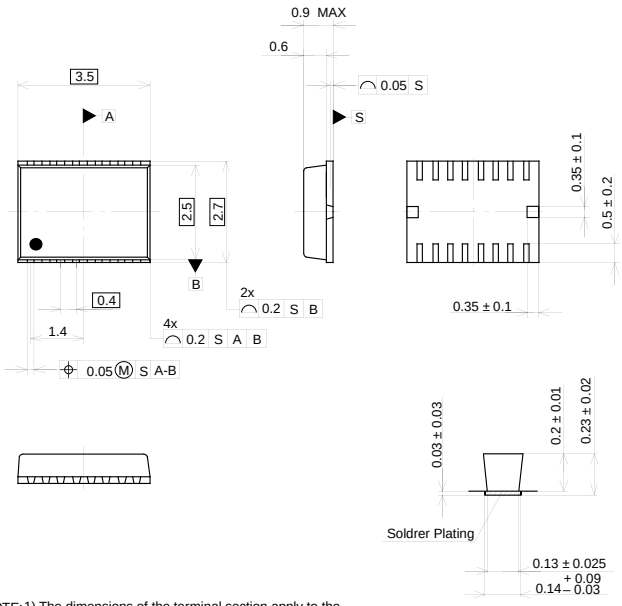
Item	Symbol	Port	Condition	Min.	Typ.	Max.	Unit
Insertion loss	IL	RF3 – RF2	*1		0.40	0.65	dB
		RF3 – RF4	*1		0.35	0.60	dB
		RF5 – RF2	*2		0.60	0.85	dB
		RF5 – RF4	*2		0.80	1.05	dB
		RF5 – RF6	*2		0.40	0.65	dB
		RF5 – RF1	*2		0.40	0.65	dB
Isolation	ISO.	RF3 – RF2	*1	17	20		dB
		RF3 – RF4	*1	21	24		dB
		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	Ictl		Vctl (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 π/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 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.

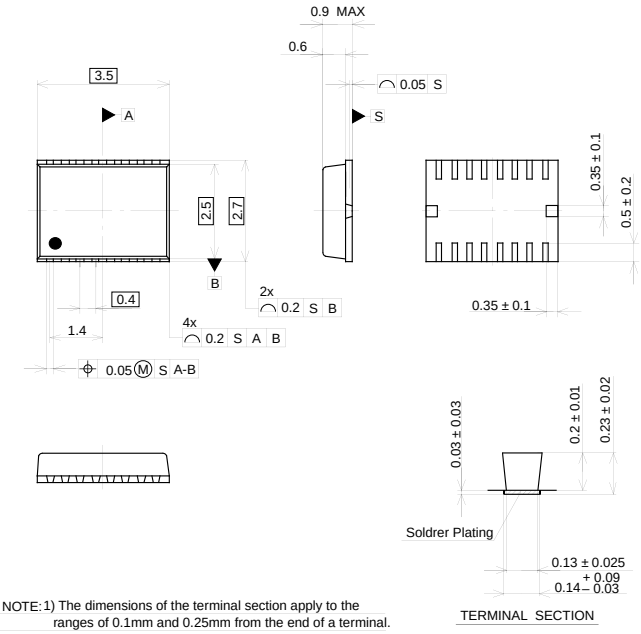
PACKAGE STRUCTURE

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

SCT Ass'y

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.

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

LEAD PLATING SPECIFICATIONS

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