

RX Gain Control Amplifier

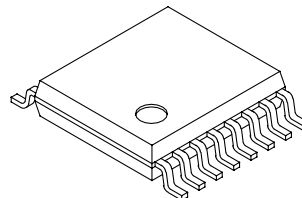
Description

CXA3201AN is an RX gain control amplifier suitable for CDMA cellular/PCS phone.

Features

- Wide gain control range
- Linear gain slope
- Wideband operation (50MHz to 300MHz)
- Very small package (16 Pin SSOP)
- Low voltage operation
- Two input ports
- Power save function included

16 pin SSOP (Plastic)



Absolute Maximum Ratings

- Supply voltage V_{CC} 6 V
- Operating temperature T_{opr} -55 to $+125$ °C
- Storage temperature T_{stg} -65 to $+150$ °C
- Allowable Power dissipation P_D 330 mW
- Supply voltage range -0.3 to 6 V
- Logic input voltage -0.3 to $V_{CC} + 0.3$ V
- Signal input voltage -0.3 to $V_{CC} + 0.3$ V
- Differential signal input voltage 0 to 2.5 V

Operating Condition

- Supply voltage V_{CC} 2.7 to 3.8 V

Applications

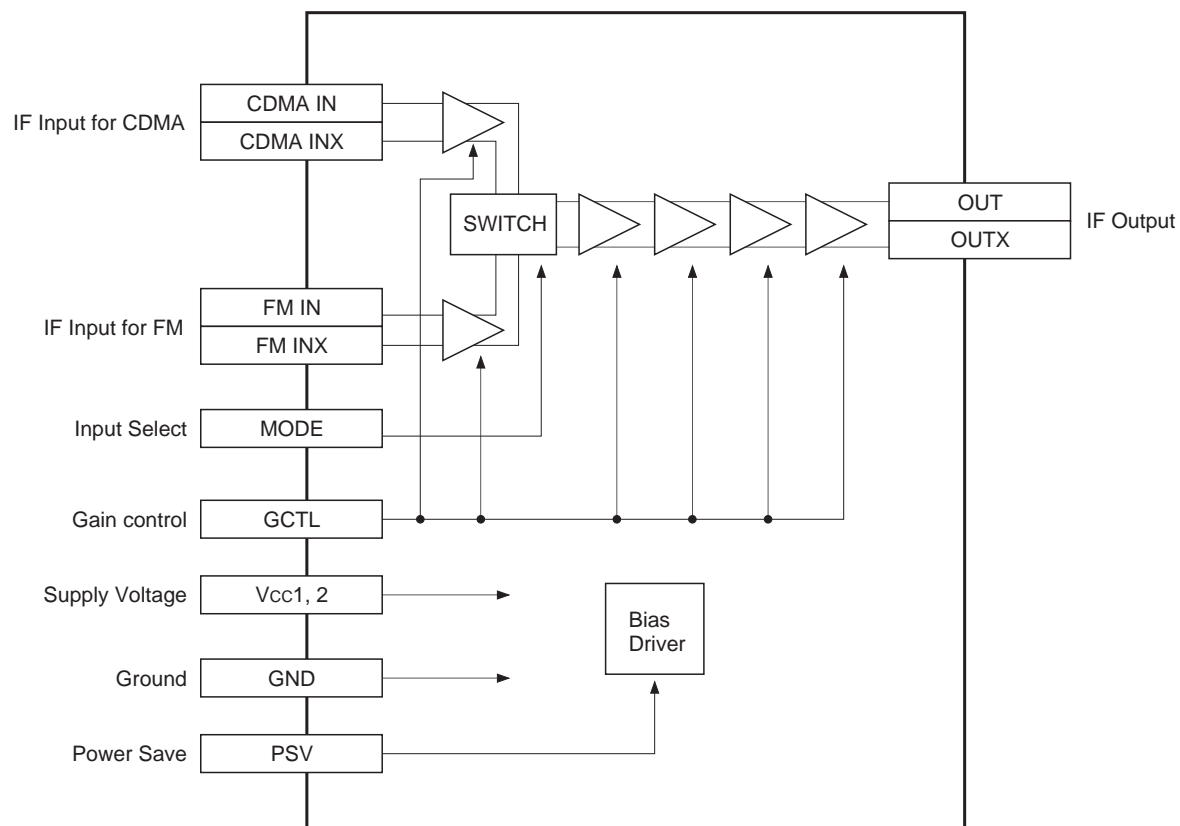
CDMA cellular/PCS phone

Structure

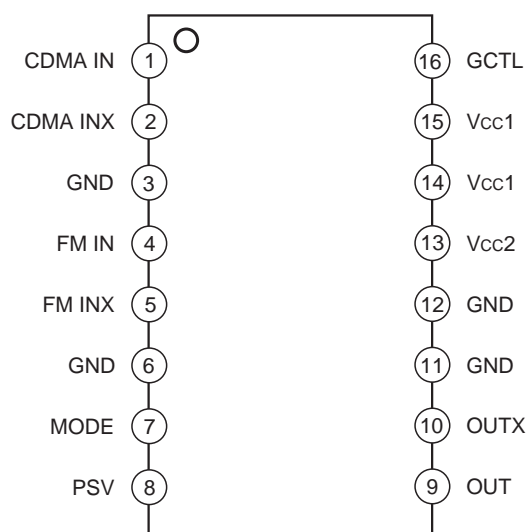
Bipolar silicon monolithic IC

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Block Diagram



Pin Configuration



Pin Description

Pin No.	Symbol	Pin voltage TYP (V)	Equivalent circuit	Description
1	CDMA IN	1.15		Differential input pins for received CDMA IF signal.
2	CDMA INX	1.15		
3 6 11 12	GND	0		Ground.
4	FM IN	1.15		Differential input pins for received FM IF signal.
5	FM INX	1.15		
7	MODE	—		Input select pin. CDMA IN for High FM IN for Low.
8	PSV	—		Power save function pin. High: Active Low: Power save

Pin No.	Symbol	Pin voltage TYP (V)	Equivalent circuit	Description
9	OUT	—		Differential output pins for received CDMA IF signal. Open collector output.
10	OUTX	—		
13	Vcc2	3.0		Positive power supply for output stage.
14 15	Vcc1	3.0		Positive power supply.
16	GCTL	—		Gain control pin.

Electrical Characteristics

DC Characteristics

(V_{CC} = 3.0V, T_a = 27°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Current consumption 1	I _{cc1}	V _{psv} = 3.0V, V _{gctl} = 1.5V, Pin 13, 14	7	10.2	15	mA
Current consumption 2	I _{cc2}	V _{psv} = 0 V, V _{gctl} = 1.5V, Pin 13, 14	10	27	50	μA
Input current pin 7H	I _{modeH}	V _{mode} = 3.0V			1	
Input current pin 7L	I _{modeL}	V _{mode} = 0.5V	−1			
Input current pin 8H	I _{psvH}	V _{psv} = 3.0V			1	
Input current pin 8L	I _{psvL}	V _{psv} = 0 V	−15			
Input current pin 16H	I _{gctlH}	V _{gctl} = 3.0V			1	
Input current pin 16L	I _{gctlL}	V _{gctl} = 0.5V	−1			
MODE high voltage	V _{mH}	Pin 7	2.5			V
MODE low voltage	V _{mL}	Pin 7			0.5	
PSV high voltage	V _{psH}	Pin 8	2.5			
PSV low voltage	V _{psL}	Pin 8			0.5	

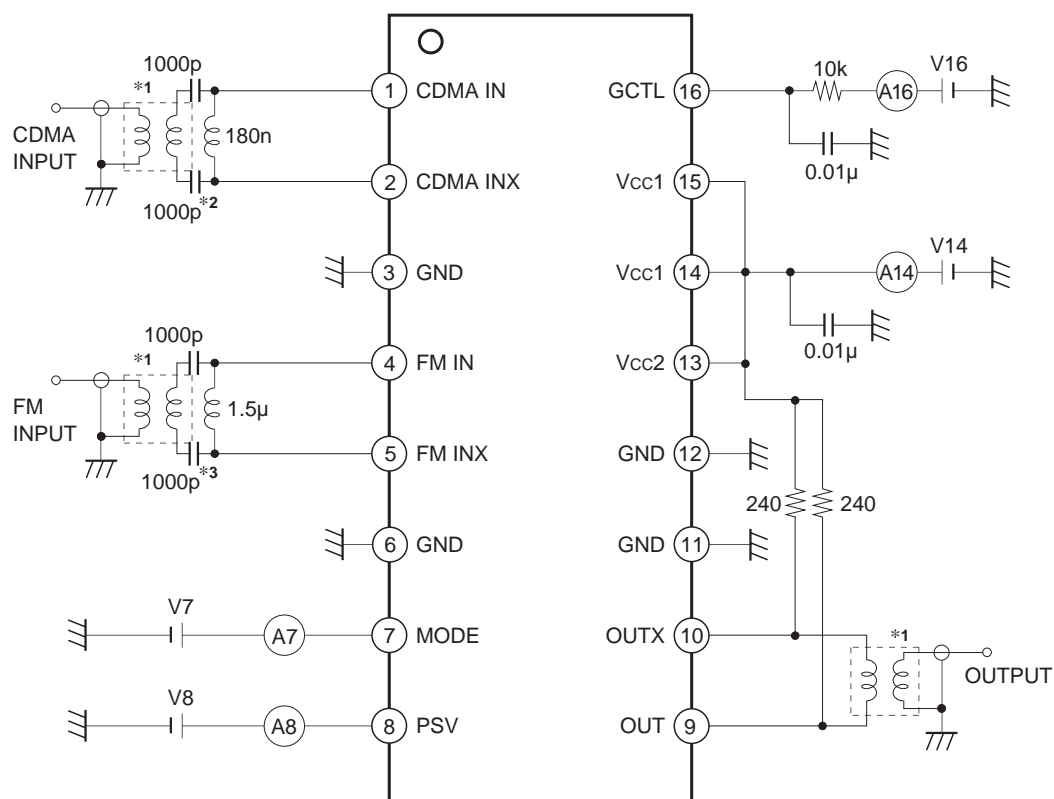
AC Characteristics

(V_{CC} = 3.0V, T_a = 27°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Operating frequency range	F _r		50		300	MHz
Gain CDMA2.4	G _{CDMA2.4}	V _{mode} = "H", f = 210.38MHz, V _{gctl} = 2.4V	42	46	50	dB
Gain CDMA1.5	G _{CDMA1.5}	V _{mode} = "H", V _{gctl} = 1.5V	−7	−3	1	
Gain CDMA0.6	G _{CDMA0.6}	V _{mode} = "H", V _{gctl} = 0.6V	−59	−55	−51	
CDMA Gain slope	G _{CLIN}	V _{mode} = "H", Gain CDMA at V _{gctl} = 2.0V − Gain CDMA at V _{gctl} = 1.0V	58	61	64	dB/V
Gain FM2.4	G _{FM2.4}	V _{mode} = "L", f = 85.38MHz, V _{gctl} = 2.4V	42	46	50	dB
Gain FM1.5	G _{FM1.5}	V _{mode} = "L", V _{gctl} = 1.5V	−7	−3	1	
Gain FM0.6	G _{FM0.6}	V _{mode} = "L", V _{gctl} = 0.6V	−59	−55	−51	
FM Gain slope	G _{FMLIN}	V _{mode} = "L", Gain FM at V _{gctl} = 2.0V − Gain FM at V _{gctl} = 1.0V	58	61	64	dB/V
Input level 3rd order intercept point	IIP3	V _{mode} = "H", G _{CDMA} = 40dB* ¹ f ₁ = 209.38MHz, f ₂ = 211.38MHz Measure of 210.38MHz	−42	−38		dBm
Noise Figure	NF	V _{mode} = "H", G _{CDMA} = 40dB* ¹ Measure of 210.38MHz		5	8	dB

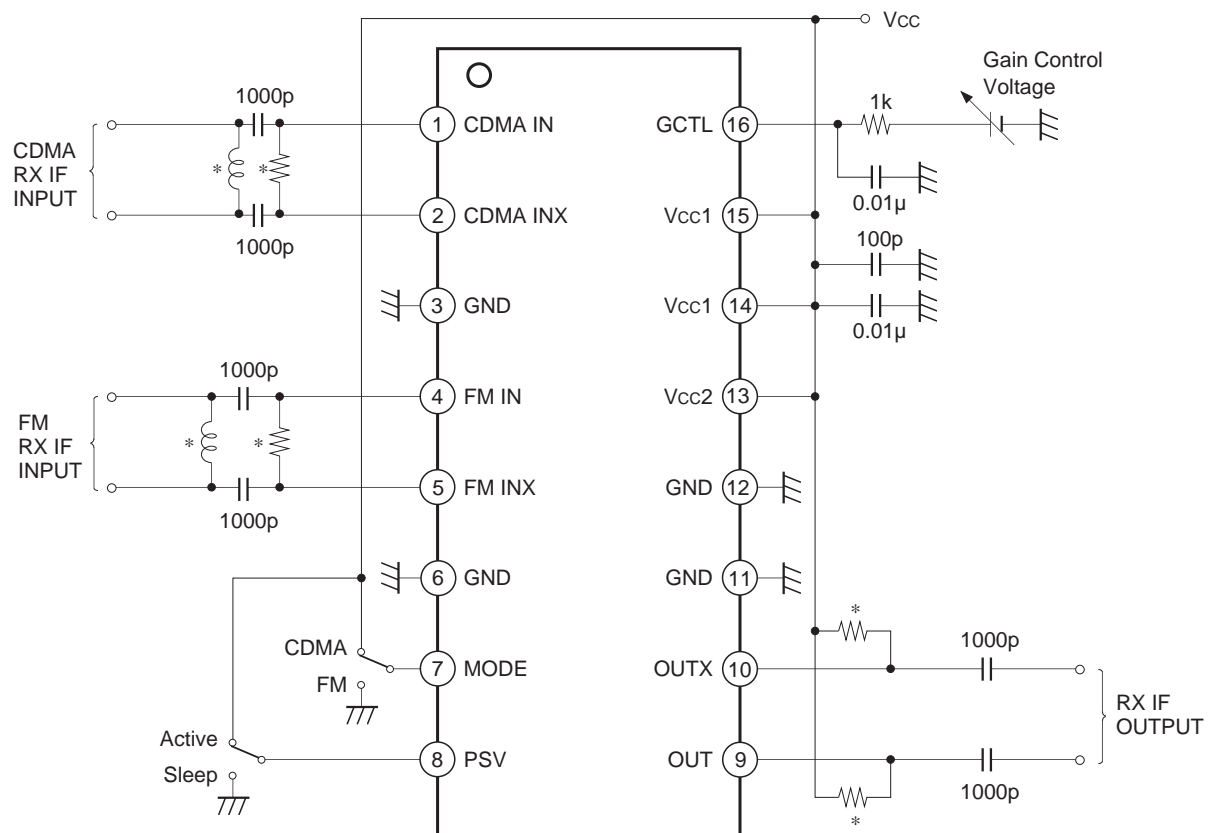
*¹ Adjust GCTL voltage, and set the overall gain to 40dB.

Measurement Circuit



- *1 TOKO, Inc. B5FL 616DS-1135
 *2 Coilcraft, Inc. 0805HS-181TKBC
 *3 Coilcraft, Inc. 1008CS-152XKBC

Application Circuit



* Must be adjusting values to result a best impedance matching between BPF filter and this IC.

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Design Reference Values

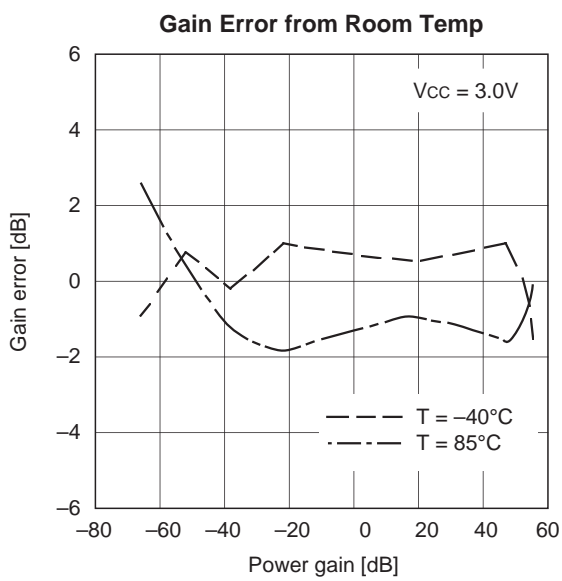
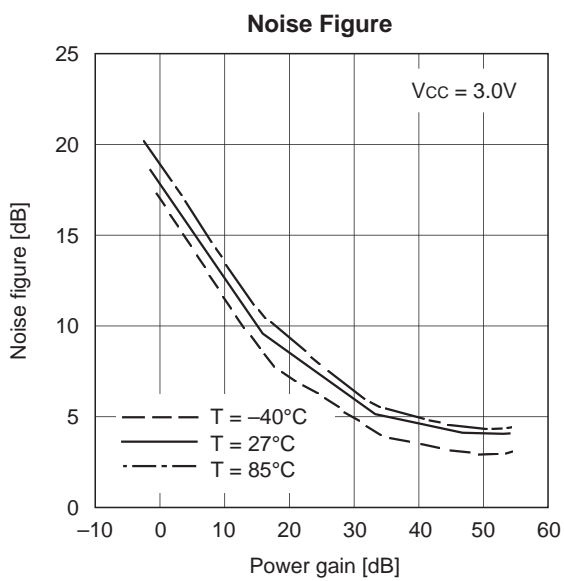
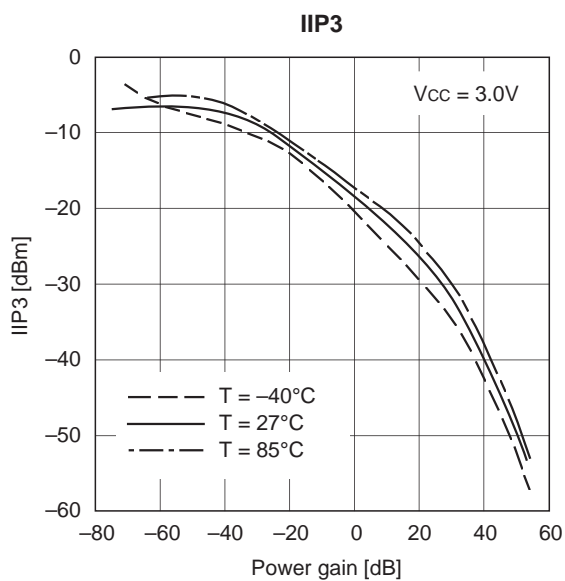
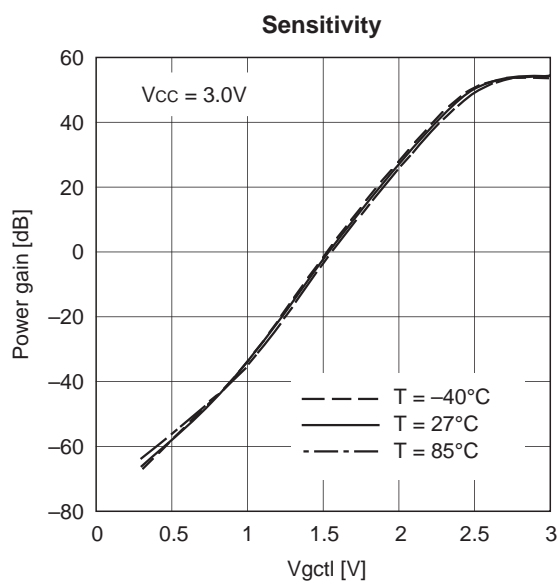
Single ended measurement

($V_{CC} = 3.0V$, $T_a = 27^{\circ}C$)

Item	Symbol	Conditions	Typ.	Unit
Input resistance	Rin	$f = 210.38MHz$, $V_{gctl} = 1.5V$	1.6	$k\Omega$
Input capacitance	Cin		1.4	pF
Output resistance	Rout		5.9	$k\Omega$
Output capacitance	Cout		0.85	pF

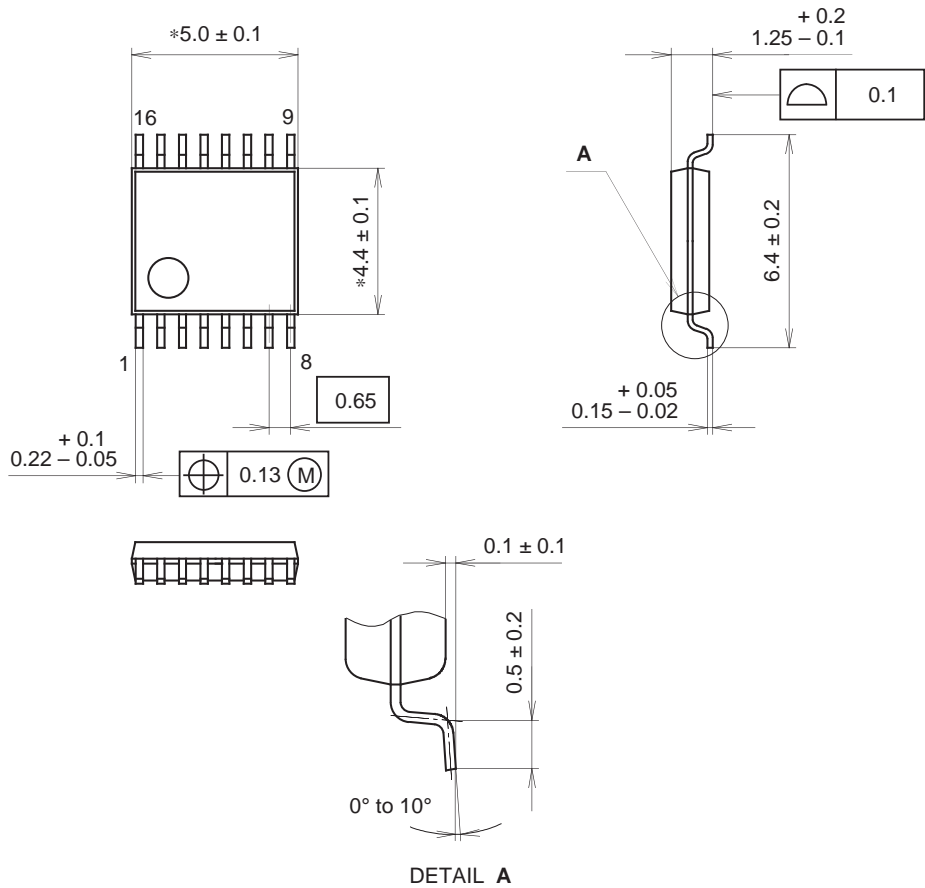
Notes on Operation

- 1) This IC is a wideband amplifier with wide gain control range. The decoupling capacitors between GND Pin and V_{CC} Pin should be as close to the IC as possible.
- 2) The resistors connected to Pins 9 and 10 should be as close to the IC as possible.
- 3) This IC assumes the excellent characteristics when the differential input impedance between Pins 1 and 2, Pins 4 and 5 is 500Ω . Refer to the Measurement Circuit for the external element settings, etc.
- 4) Pay attention to handling this IC because its electrostatic discharge strength is weak.



Package Outline Unit: mm

16PIN SSOP (PLASTIC)



NOTE: Dimension “*” does not include mold protrusion.

PACKAGE STRUCTURE

SONY CODE	SSOP-16P-L01	PACKAGE MATERIAL	EPOXY RESIN
EIAJ CODE	SSOP016-P-0044	LEAD TREATMENT	SOLDER / PALLADIUM PLATING
JEDEC CODE	_____	LEAD MATERIAL	42/COPPER ALLOY
		PACKAGE MASS	0.1g

NOTE : PALLADIUM PLATING
This product uses S-PdPPF (Sony Spec.-Palladium Pre-Plated Lead Frame).