CXA3001N

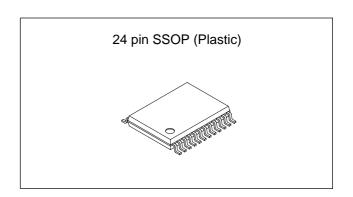
RX Gain Control Amplifier

Description

CXA3001N is an RX gain control amplifier for CDMA cellular mobile phone.

Features

- Wide gain control range
- · Linear gain slope
- Noise figure Typ. 6dB at Gain = 45dB
- Output IP₃ Typ. +2dBm at Gain = 40dB
- 2 input ports
- Power save function included



Absolute Maximum Ratings

Supply voltage	Vcc	6	V
 Operating temperature 	Topr	-40 to +85	°C
Storage temperature	Tstg	-65 to +150	°C
 Allowable power dissipation 	PD	420	mW
 Supply voltage range 		-0.3 to 6	V
 Logic input voltage 		-0.3 to Vcc +0.3	V
 Signal input voltage 		-0.3 to Vcc +0.3	V
• Differential signal input voltage		0 to 2.5	V

Operating Conditions

Supply voltage 3.1 to 3.8 V

Applications

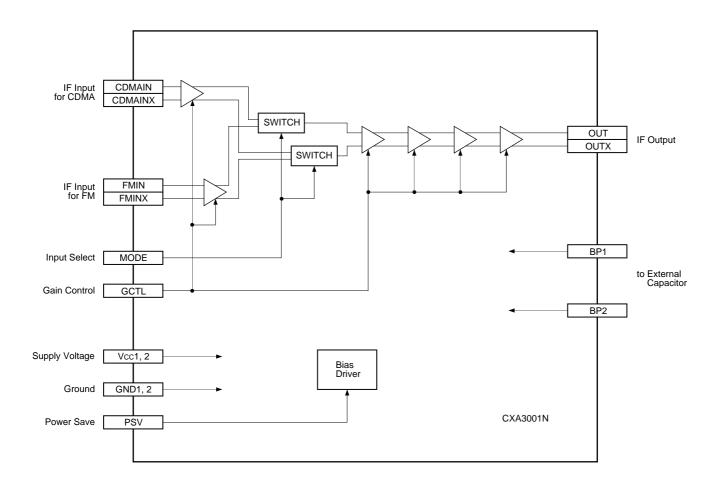
- CDMA cellular mobile phone
- CDMA & AMPS cellular phone

Structure

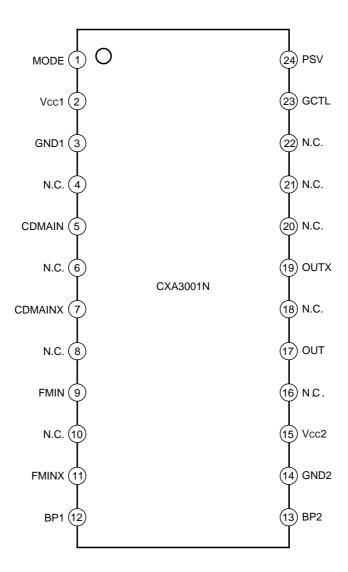
Bipolar sillicon monolithic IC

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Block Diagram



Pin Configuration



Pin Description

Pin No.	Symbol	Pin voltage Typ. (V)	Equivalent circuit	Description
1	MODE		Vcc1 30k GND1	Input select pin. CDMAIN for High. FMIN for Low.
2	Vcc1	3.6		Positive power supply.
3	GND1	0		Ground.
4 6 8 10	N.C.			No connection.
5	CDMAIN	1.2	->	Differential input pins for
7	CDMAINX	1.2	GND1	received CDMA IF signal.
9	FMIN	1.2	2k	Differential input pins for
11	FMINX	1.2	9 (11)	received FM IF signal.
12	BP1	0.4	Vcc2	Connected to GND with
13	BP2	2.4		capacitor 0.01μF.
14	GND2	0	(9) → (7) \$ 20k 20k \$	Ground for output stage.
15	Vcc2	3.6		Positive power supply for output stage.
17	OUT	1.7	(2) (3) (4) (3)	Differential output pins for
19	OUTX	1.7	GND2	received IF signal.

Pin No.	Symbol	Pin voltage Typ. (V)	Equivalent circuit	Description
16 18 20 21 22	N.C.			No connection.
23	GCTL		Vcc1 GND1	Gain control pin with a ripple filter.
24	PSV		Vcc1 24 40k GND1	Power save function pin. High: Active Low: Power save

Electrical Characteristics

DC characteristics

 $(Vcc = 3.6V, Ta = 25^{\circ}C)$

Parameter	Symbol	Conditions	Min.	Тур.	Max.	Unit
Current consumption 1	Icc1	V _{GCTL} = 1.5V, Pin 2	10	14	19	mA
Current consumption 2	Icc2	VGCTL = 1.5V, Pin 15	4.7	6.6	9.0	11114
Current consumption 3	Icc3	V _{PSV} = 0.5V, Pin 2			1	
Current consumption 4	Icc4	V _{PSV} = 0.5V, Pin 15			1	
Input current pin 1H	Iмоде н	VMODE = 3V			10	
Input current pin 1L	IMODE L	VMODE = 0.5V	-20],
Input current pin 23H	IGCTL H	VGCTL = 3V			10	μA
Input current pin 23L	IGCTL L	VGCTL = 0.5V	-10			
Input current pin 24H	IPSV H	VPSV = 3V			10	
Input current pin 24L	IPSV L	VPSV = 0.5V	-10			
MODE high voltage	Vмн	Pin 1	3			
MODE low voltage	VML	Pin 1			0.5	
PSV high voltage	VPSH	Pin 24	3]
PSV low voltage	Vpsl	Pin 24			0.5	

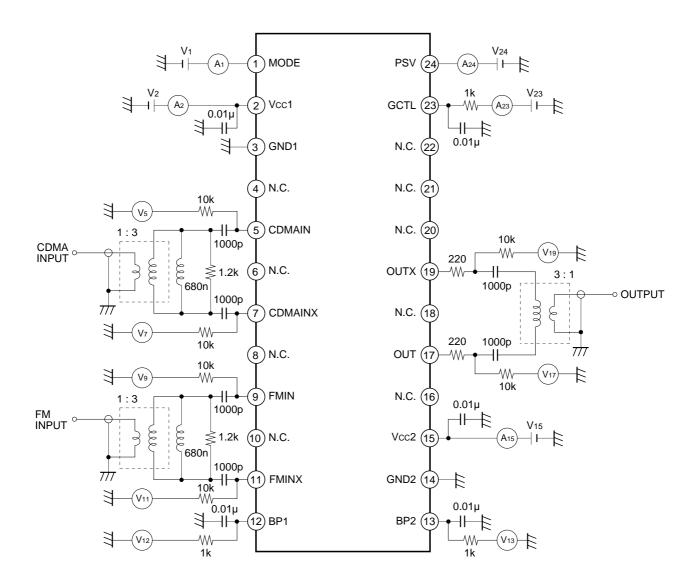
AC characteristics

 $(Vcc = 3.6V, Ta = 25^{\circ}C)$

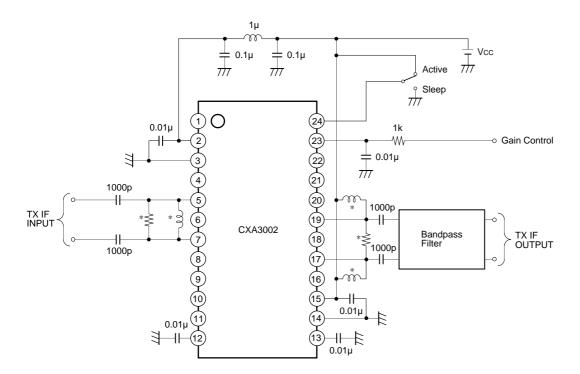
Parameter	Symbol	Con	nditions	Min.	Тур.	Max.	Unit
Operating frequency range	FR			10		100	MHz
Gain CDMA2.3	G CDMA2.3	VMODE = "H" VGCTL = 2.3V	f = 85.38MHz Level = -50dBm	37	41	46	
Gain CDMA1.5	GCDMA1.5	VMODE = "H" VGCTL = 1.5V	Level = -30dBm	-7.5	-3	1.5	dB
Gain CDMA0.7	G CDMA0.7	VMODE = "H" VGCTL = 0.7V	Level = -10dBm	– 55	-49	-44	
CDMA Gain slope	GCLIN	VMODE = "H"	VGCTL = 1 to 2V	57	60	63	dB/V
Gain FM2.3	G Fм2.3	VMODE = "L" VGCTL = 2.3V	f = 85.38MHz Level = -50dBm	37	41	46	
Gain FM1.5	GFM1.5	VMODE = "L" VGCTL = 1.5V	Level = -30dBm	-7.5	-3	1.5	dB
Gain FM0.7	G Fм0.7	VMODE = "L" VGCTL = 0.7V	Level = -10dBm	– 55	-49	-44	
FM Gain slope	GFMLIN	VMODE = "L"	$V_{GCTL} = 1 \text{ to } 2V$	57	60	63	dB/V
Input level 3rd order intercept point	IIP3	VMODE = "H" GCDMA = 40dB* F1 = 86.38MHz F2 = 87.38MHz Measure of 85.38	MHz	-42	-38		dBm
Noise Figure	NF	VMODE = "H" GCDMA = 40dB* Used 1MHz BPF Measure of 85.38	MHz		6.5	9.5	dB

 $^{^{\}ast}$ Adjust GCTL voltage, and set the overall gain to 40dB.

Measurement Circuit



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

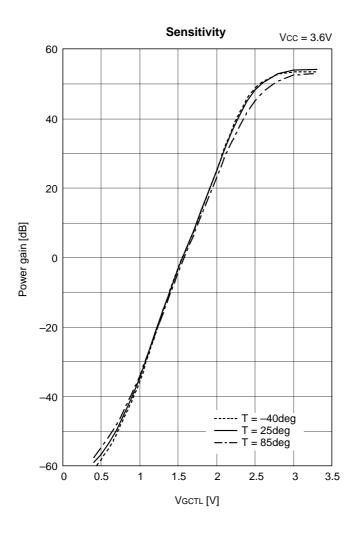
Single ended measurement

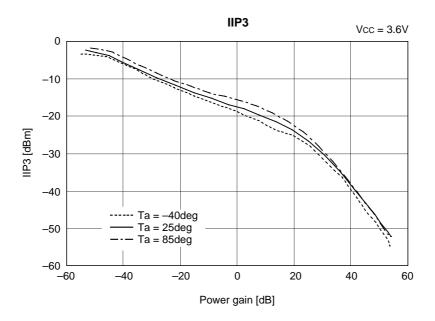
 $(Vcc = 3.6V, Ta = 25^{\circ}C)$

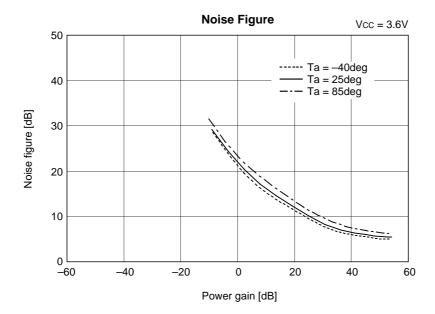
Item	Symbol	Conditions	Тур.	Unit
Input resistance	Rin		900	Ω
Input capacitance	Cin	f = 85.38MHz, VGCTL = 1.5V	9	pF
Output resistance	Rоит		30	Ω

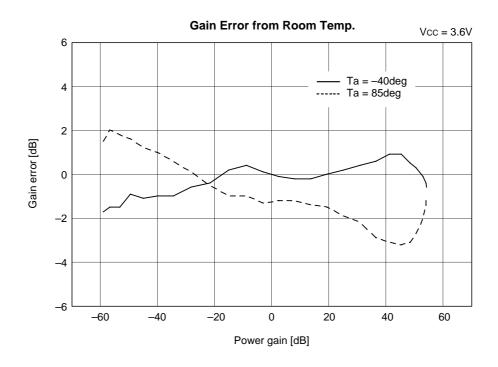
Notes on Operation

- 1) This IC is a wideband amplifier with wide gain control range. Separate Pin 3 (GND1) and Pin 14 (GND2) to prevent interference between input and output. Furthermore, the decoupling capacitors between Pins 2 and 3, Pins 14 and 15 should be as close to the IC as possible.
- 2) The resistors connected to Pins 17 and 19 should be as close to the IC as possible.
- 3) This IC assumes the excellent characteristics when the differential input impedance between Pins 5 and 7, Pins 9 and 11 is 500Ω. Refer to the Measurement Circuit for the external element settings, etc.
- 4) Connect the capacitors, which are connected to Pins 12 and 13, to Pin 14 (GND2).
- 5) Pay attention to handling this IC because its electrostatic discharge strength is weak.



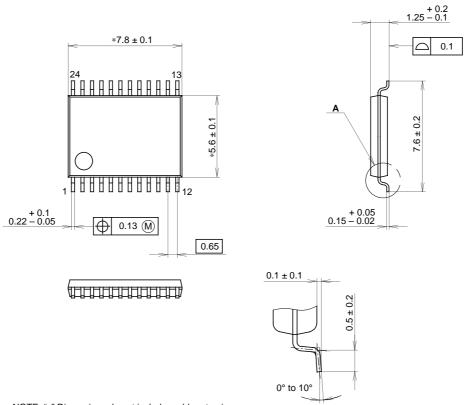






Package Outline Unit: mm

24PIN SSOP(PLASTIC)



NOTE: "*" Dimensions do not include mold protrusion.

DETAIL A

PACKAGE STRUCTURE

EPOXY RESIN

0.1g

SOLDER/PALLADIUM PLATING

42/COPPER ALLOY

		PACKAGE MATERIAL
SONY CODE	SSOP-24P-L01	LEAD TREATMENT
EIAJ CODE	SSOP024-P-0056	LEAD MATERIAL
JEDEC CODE		PACKAGE WEIGHT