

TX Gain Control Amplifier

For the availability of this product, please contact the sales office.

Description

CXA3222N is a TX 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 (8 Pin SSOP)
- Low voltage operation
- High output IP3
- Power save function included

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 |
| • 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 |
|----------------|----------|------------|---|

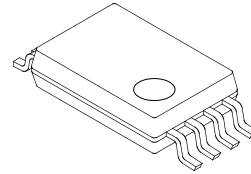
Applications

CDMA cellular/PCS phone

Structure

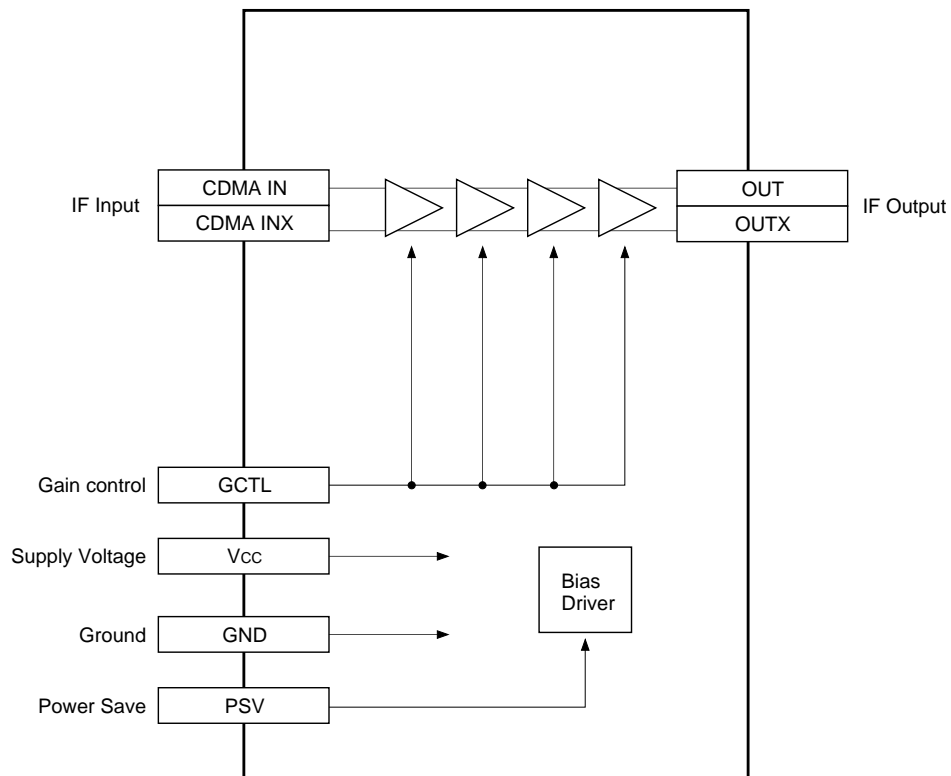
Bipolar silicon monolithic IC

8 pin SSOP (Plastic)

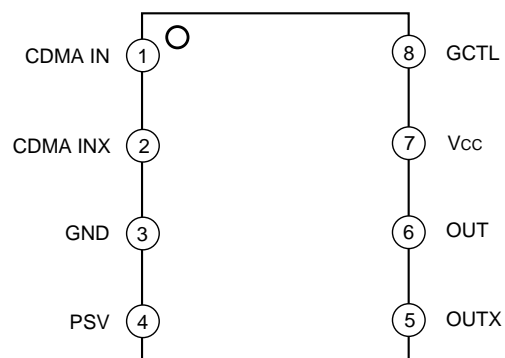


Sony reserves the right to change products and specifications without prior notice. This information does not convey any license by any implication or otherwise under any patents or other right. Application circuits shown, if any, are typical examples illustrating the operation of the devices. Sony cannot assume responsibility for any problems arising out of the use of these circuits.

Block Diagram



Pin Configuration



Pin Description

| Pin No. | Symbol | Pin voltage TYP (V) | Equivalent circuit | Description |
|---------|----------|---------------------|--------------------|--|
| 1 | CDMA IN | 1.1 | | Differential input pins for CDMA transmit IF signal. |
| 2 | CDMA INX | 1.1 | | |
| 3 | GND | 0 | | Ground. |
| 4 | PSV | — | | Power save function pin. High: Active Low: Power save |
| 5 | OUTX | — | | Differential output pins for transmit IF signal. Open collector output. |
| 6 | OUT | — | | |
| 7 | Vcc | 3.0 | | Positive power supply. |
| 8 | 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 7 | 10 | 15.7 | 21.5 | mA |
| Current consumption 2 | I _{cc2} | V _{psv} = 0 V, V _{gctl} = 1.5V, Pin 7 | 5 | 18 | 40 | μA |
| Input current pin 4H | I _{psvH} | V _{psv} = 3.0V | | | 1 | |
| Input current pin 4L | I _{psvL} | V _{psv} = 0 V | -15 | | | |
| Input current pin 8H | I _{gctlH} | V _{gctl} = 3.0V | | | 1 | |
| Input current pin 8L | I _{gctlL} | V _{gctl} = 0.5V | -1 | | | |
| PSV high voltage | V _{psH} | Pin 4 | 2.5 | | | V |
| PSV low voltage | V _{psL} | Pin 4 | | | 0.5 | |

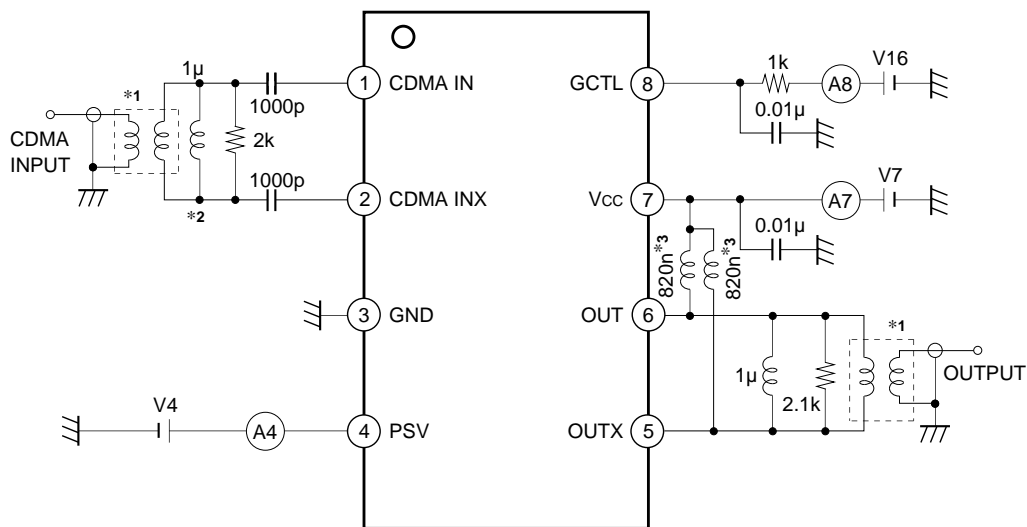
AC Characteristics

(V_{CC} = 3.0V, T_a = 27°C)

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---------------------------------------|-------------------|--|------|------|------|------|
| Operating frequency range | F _r | | 50 | | 300 | MHz |
| Gain 2.3 | G _{2.3} | f = 130.38MHz, level = -22.5dBm, V _{gctl} = 2.3V | 13 | 17 | 21 | dB |
| Gain 1.5 | G _{1.5} | V _{gctl} = 1.5V | -28 | -24 | -20 | |
| Gain 1.0 | G _{1.0} | V _{gctl} = 1.0V | -58 | -54 | -50 | |
| Gain 0.7 | G _{0.7} | V _{gctl} = 0.7V | -75 | -70 | -65 | |
| Gain slope | G _{CLIN} | Gain at V _{gctl} = 2.0V – Gain at V _{gctl} = 1.0V | 56 | 59 | 62 | dB/V |
| Input level 3rd order intercept point | IIP ₃ | G = 15dB* ¹ f ₁ = 129.38MHz, f ₂ = 131.38MHz Measure of 130.38MHz | -8.5 | -4.5 | | dBm |
| Noise Figure | NF | G = 15dB* ¹ Measure of 130.38MHz | | 28 | 32 | dB |

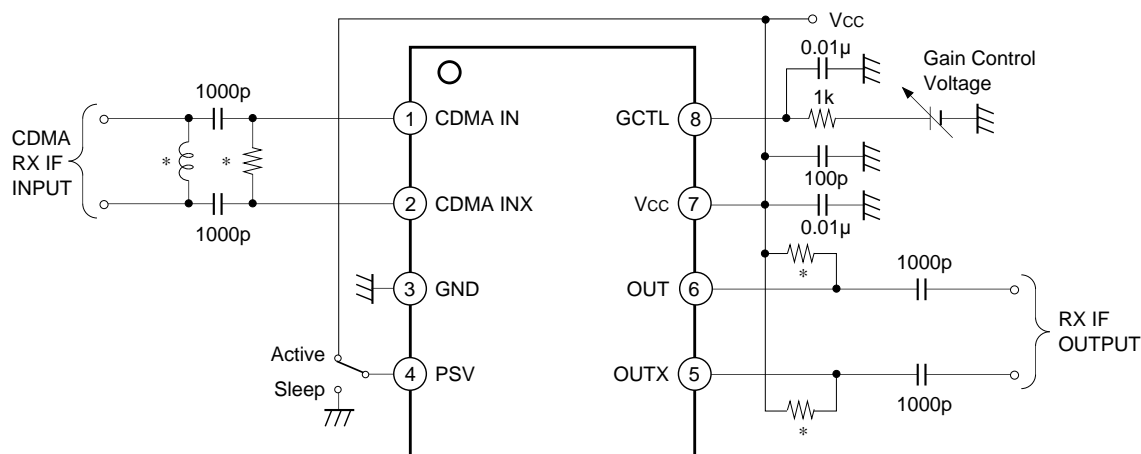
*1 Adjust GCTL voltage, and set the overall gain to 15dB.

Measurement Circuit



- *1 TOKO, Inc. B5FL 616DS-1135
- *2 Coilcraft, Inc. 1008HS-102TKBC
- *3 Coilcraft, Inc. 1008HS-821TKBC

Application Circuit



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

Application circuits shown are typical examples illustrating the operation of the devices. Sony cannot assume responsibility for any problems arising out of the use of these circuits or for any infringement of third party patent and other right due to same.

Design Reference Values

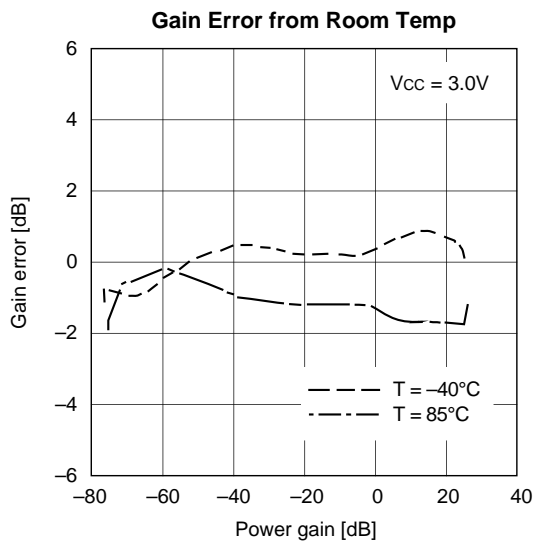
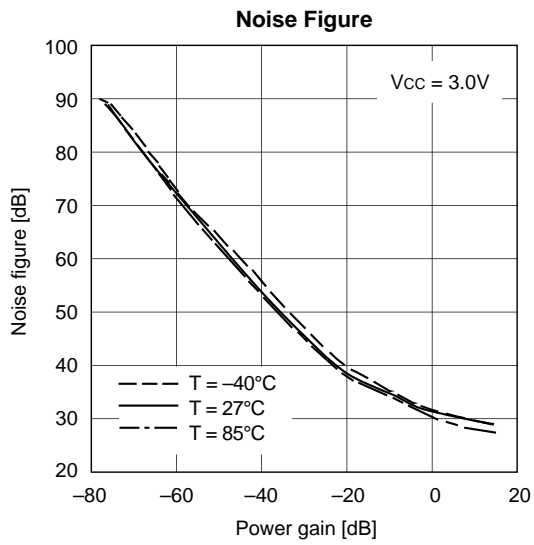
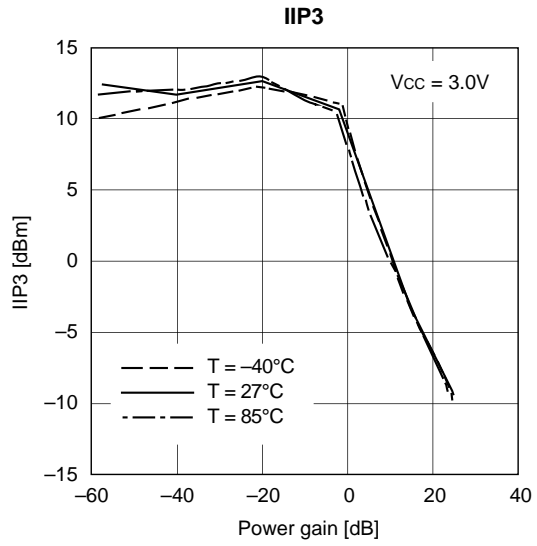
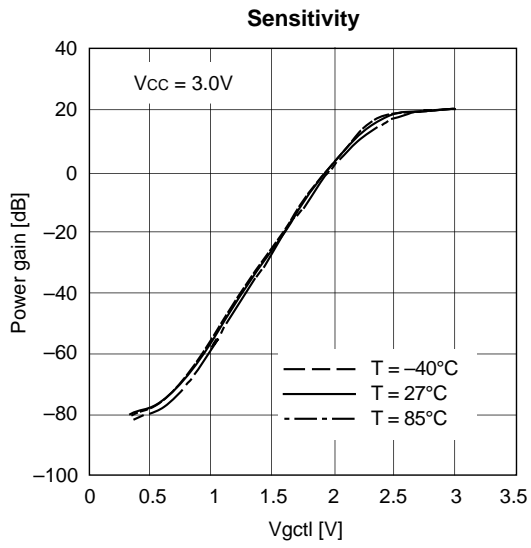
Single ended measurement

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

| Item | Symbol | Conditions | Typ. | Unit |
|--------------------|--------|-----------------------------|------|------------|
| Input resistance | Rin | f = 130.38MHz, Vgctl = 1.5V | 10 | k Ω |
| Input capacitance | Cin | | 0.92 | pF |
| Output resistance | Rout | | 6 | k Ω |
| Output capacitance | Cout | | 0.9 | pF |

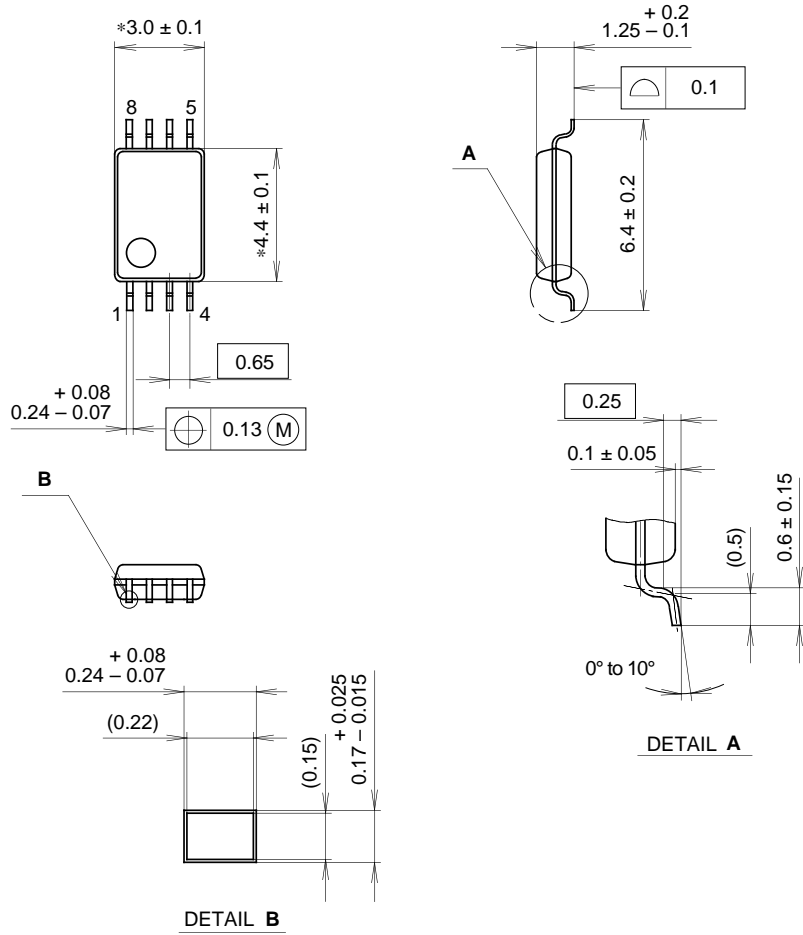
Notes on Operation

- 1) This IC is a wideband amplifier with wide gain control range. The decoupling capacitors between GND Pin and Vcc Pin should be as close to the IC as possible.
- 2) The resistors connected to Pins 5 and 6 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 is 500 Ω . 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

8PIN SSOP (PLASTIC)



NOTE: Dimension "*" does not include mold protrusion.

PACKAGE STRUCTURE

| | |
|------------|----------------|
| SONY CODE | SSOP-8P-L01 |
| EIAJ CODE | SSOP008-P-0044 |
| JEDEC CODE | _____ |

| | |
|------------------|----------------------------|
| PACKAGE MATERIAL | EPOXY RESIN |
| LEAD TREATMENT | SOLDER / PALLADIUM PLATING |
| LEAD MATERIAL | COPPER ALLOY |
| PACKAGE MASS | 0.04g |