

TX Gain Control Amplifier

Description

CXA3222AN is a TX gain control amplifier suitable for CDMA cellular/PCS phone.

Features

- Wide gain control range
- Linear gain slope
- Wideband operation (50 MHz to 300 MHz)
- 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 $V_{cc} + 0.3V$
- Signal input voltage -0.3 to $V_{cc} + 0.3V$
- Differential signal input voltage 0 to 2.5 V

Operating Condition

- Supply voltage V_{cc} 2.7 to 3.8 V

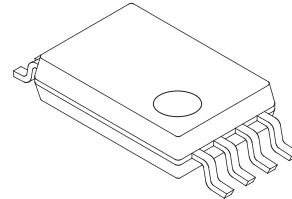
Applications

CDMA cellular/PCS phone

Structure

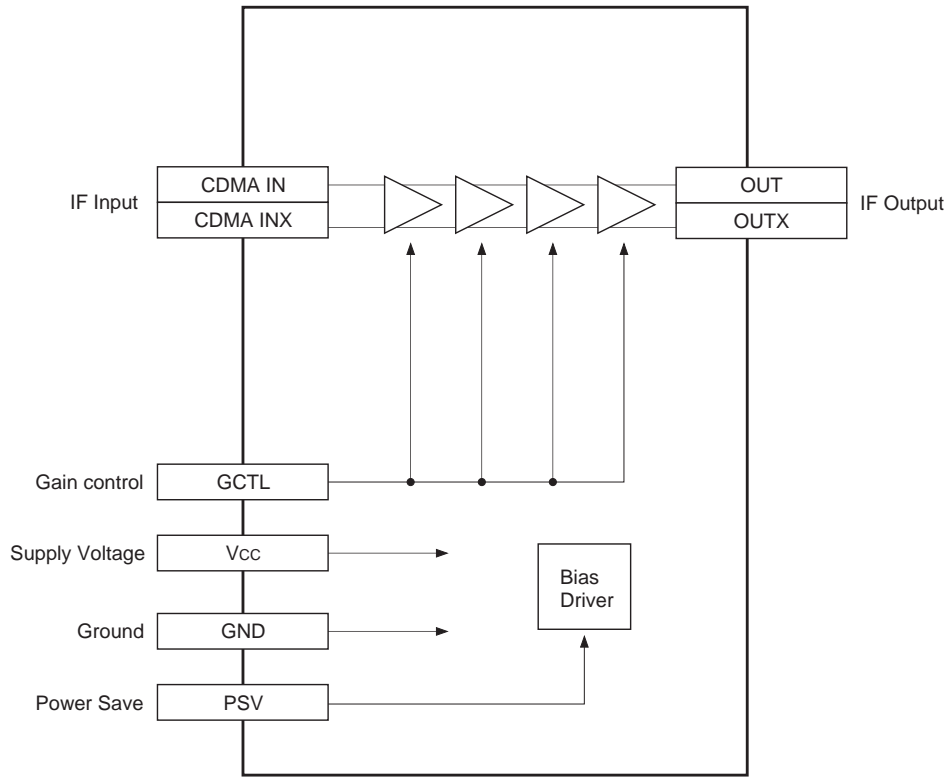
Bipolar silicon monolithic IC

8 pin SSOP (Plastic)

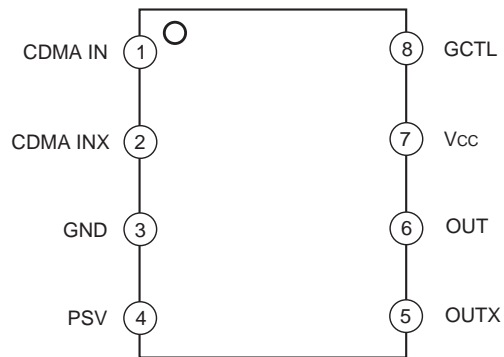


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Block Diagram



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}=3.0 V, T_a=27 °C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Current consumption 1	I _{CC1}	V _{PSV} =3.0 V, V _{GCTL} =1.5 V, Pin 7	10	15.7	21.5	mA
Current consumption 2	I _{CC2}	V _{PSV} =0 V, V _{GCTL} =1.5 V, Pin 7	5	18	40	μA
Input current pin 4H	I _{PSVH}	V _{PSV} =3.0 V			1	
Input current pin 4L	I _{PSVL}	V _{PSV} =0 V	-15			
Input current pin 8H	I _{GCTH}	V _{GCTL} =3.0 V			1	
Input current pin 8L	I _{GCTL}	V _{GCTL} =0.5 V	-1			
PSV high voltage	V _{PSH}	Pin 4	2.5			V
PSV low voltage	V _{PSL}	Pin 4			0.5	

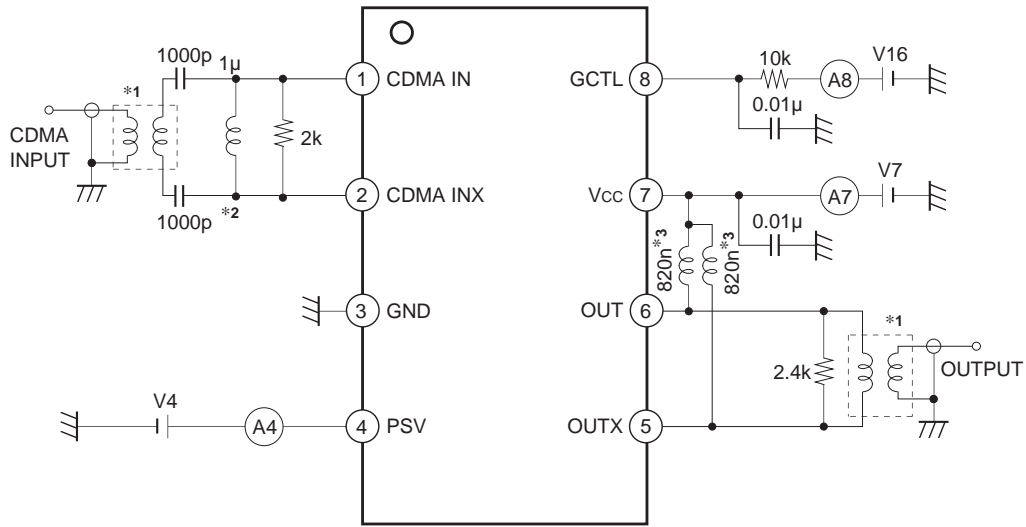
AC Characteristics

(V_{CC}=3.0 V, 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=130.38 MHz, level=-22.5 dBm, V _{GCTL} =2.3 V	13	17	21	dB
Gain 1.5	G _{1.5}	V _{GCTL} =1.5 V	-28	-24	-20	
Gain 1.0	G _{1.0}	V _{GCTL} =1.0 V	-58	-54	-50	
Gain 0.7	G _{0.7}	V _{GCTL} =0.7 V	-75	-70	-65	
Gain slope	G _{CLIN}	Gain at V _{GCTL} =2.0 V – Gain at V _{GCTL} =1.0 V	57	60	63	dB/V
Input level 3rd order intercept point	IIP ₃	G=15 dB *1 f ₁ =129.38 MHz, f ₂ =131.38 MHz Measure of 130.38 MHz	-8.5	-4.5		dBm
Noise Figure	NF	G=15 dB *1 Measure of 130.38 MHz		28	32	dB

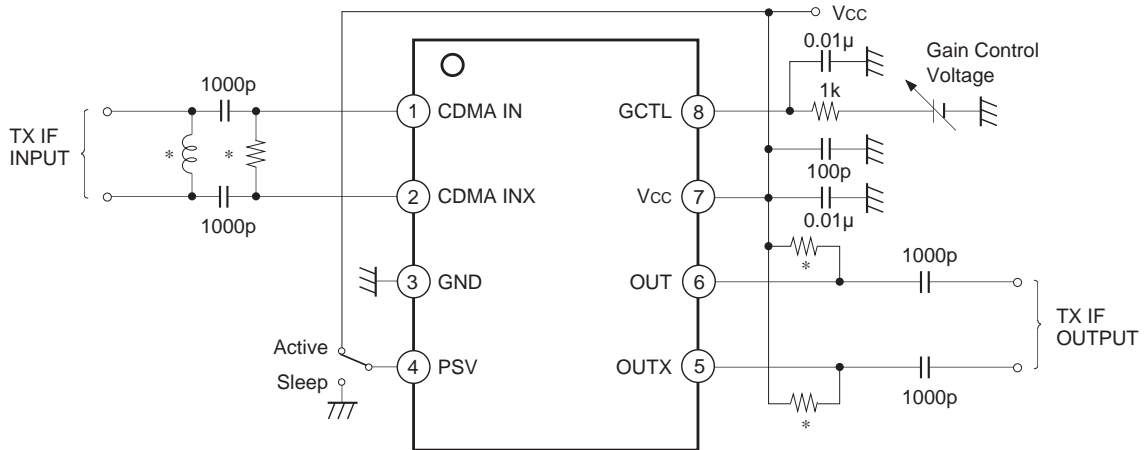
*1 Adjust GCTL voltage, and set the overall gain to 15 dB.

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.

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Design Reference Values

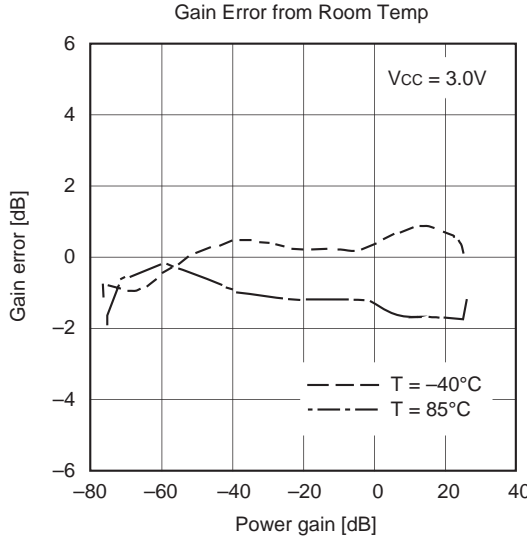
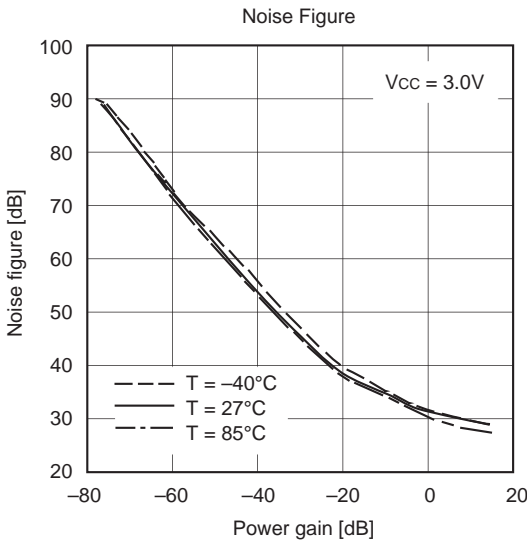
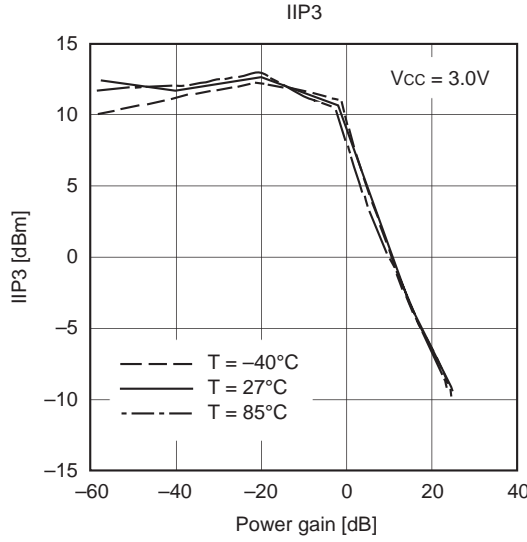
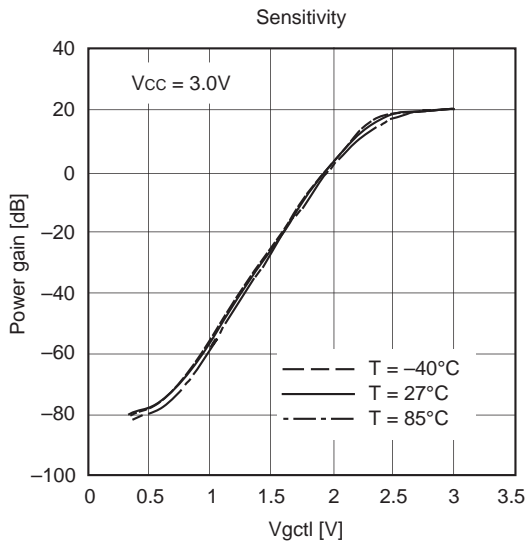
Single ended measurement

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

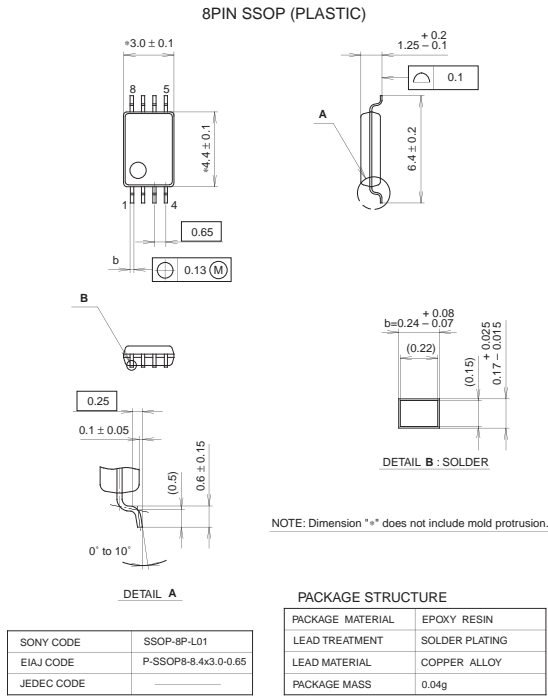
Item	Symbol	Conditions	Typ.	Unit
Input resistance	Rin	f=130.38 MHz, Vgctl=1.5 V	10	k Ω
Input capacitance	Cin		0.92	pF
Output resistance	Rout		6	k Ω
Output capacitance	Cout		0.9	pF

Notes on Operation

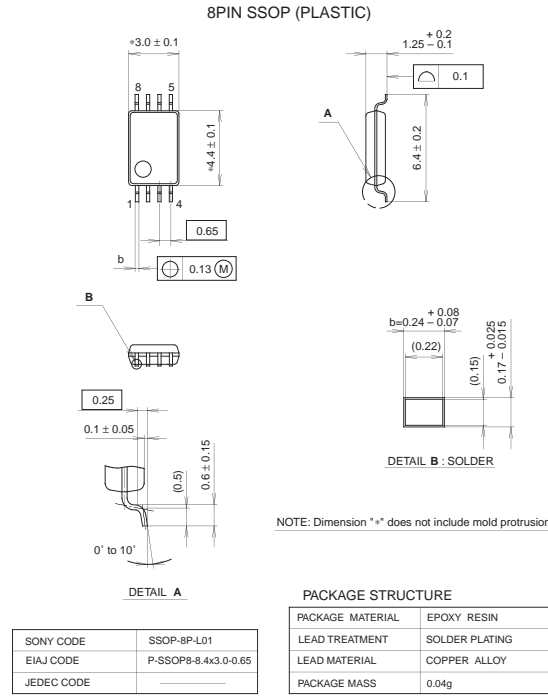
- 1) This IC is a wideband amplifier with wide gain control range. The decoupling capacitors between GND Pin and Vcc Pin should be as close to the IC as possible.
- 2) The resistors connected to Pins 5 and 6 should be as close to the IC as possible.
- 3) This IC assumes the excellent characteristics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



SCT Ass'y



LEAD PLATING SPECIFICATIONS

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