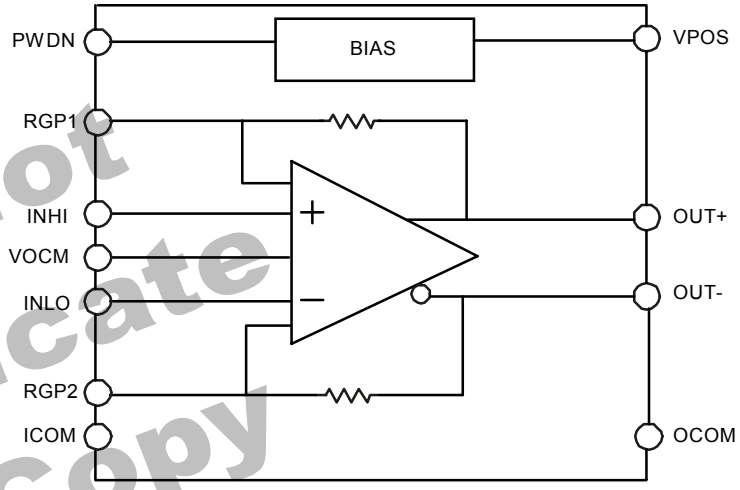
ANALOG DEVICES

Low Distortion Differential Amplifier

Advanced Data Sheet AD8351

FEATURES
-3dB Bandwidth of 2.0GHz
Resistor Programmable Gain
Differential Input and Output
5kΩ Differential Input
100Ω Differential Output
I/O Impedance Independent of Load
Low Noise Output Stage 9nV/√Hz
Low Harmonic Distortion
-92dBc @ 20MHz
-77dBc @ 100MHz
Single Supply Operation: 3 to 5 V
Adjustable Output Common Mode Voltage
Power Down Feature
10 Pin μSOIC Package

APPLICATIONS
Differential ADC Driver
IF Sampling Receivers
RF/IF Gain Blocks
SAW Filter Interfacing
Single – Ended to Differential Conversion



PRODUCT DESCRIPTION

The AD8351 is a low cost differential amplifier useful in RF and IF applications up to 2.0 GHz. The gain can be set from unity to 15dB using a single external gain resistor. The AD8351 provides a 100Ω differential output impedance that is independent of load conditions. The low noise low distortion performance and constant output impedance makes the AD8351 a useful gain block in high dynamic range differential signal chains.

The AD8351 is designed to satisfy the demanding performance requirements of communications transceiver applications. The device can be used as a general purpose gain block, an ADC driver, and high speed data interface driver, among other functions. The AD8351 can also be used as a single-ended to differential converter.

Fabricated in ADI's high speed XFCB process, the high bandwidth of the AD8351 provides high frequency performance and low distortion. The quiescent current of the AD8351 is 23mA typically. The AD8351 amplifier comes in a compact 10 pin μSOIC package and will operate over the temperature range of -40°C to +85°C.

AD8351-SPECIFICATIONS

(V_S=5V, T=25°C unless otherwise noted)

Parameter	Conditions	Min	Typ	Max	Units
DYNAMIC PERFORMANCE					
-3 dB Bandwidth	G = 0 dB, Vout ≤ 1.5 Vp-p		3300		MHz
	G = 10 dB, dB, Vout ≤ 1.5 Vp-p		2200		MHz
	G = 15 dB, Vout ≤ 1.5 Vp-p		1400		MHz
Bandwidth for 0.1dB Flatness	G = 0 dB, Vout ≤ 1.5 Vp-p		570		MHz
	G = 10 dB, Vout ≤ 1.5 Vp-p		360		MHz
	G = 15 dB, Vout ≤ 1.5 Vp-p		270		MHz
Slew Rate	R_L = 500Ω, Vout = 2V step		11000		V/µs
	R_L = 100Ω, Vout = 2V step		9000		V/µs
Settling Time	2V step to 0.1%		1.6		ns
Overdrive Recovery Time	Vin = 4V to 0V step, Vout ≤ ±10mV		3.1		ns
Gain Supply Sensitivity	Vs ± 4%		-46		dB/V
Gain Temperature Sensitivity	-40 °C to 85 °C		0.4		mdB/°C
Reverse Isolation (S12)	@ 200MHz		-50		dB
NOISE/HARMONIC PERFORMANCE					
33MHz with Vout ≤ 2 Vp-p					
Second Harmonic	R_L = 500Ω, Single-Ended		-86		dBc
Third Harmonic	R_L = 500Ω		-85		dBc
Second Harmonic	R_L = 100Ω, Single-Ended		-70		dBc
Third Harmonic	R_L = 100Ω		-67		dBc
Two-Tone IMD	R_L = 500Ω		-93		dBc
100MHz with Vout ≤ 2 Vp-p					
Second Harmonic	R_L = 500Ω, Single-Ended		-77		dBc
Third Harmonic	R_L = 500Ω		-77		dBc
Second Harmonic	R_L = 100Ω, Single-Ended		-73		dBc
Third Harmonic	R_L = 100Ω		-63		dBc
Two-Tone IMD	R_L = 500Ω		-85		dBc
200MHz with Vout ≤ 2 Vp-p					
Second Harmonic	R_L = 500Ω, Single-Ended		-70		dBc
Third Harmonic	R_L = 500Ω		-70		dBc
Second Harmonic	R_L = 100Ω, Single-Ended		-74		dBc
Third Harmonic	R_L = 100Ω		-57		dBc
Two-Tone IMD	R_L = 500Ω		-78		dBc
Input Spectral Noise Density	G = 10dB RTI		3.2		nV/√Hz
Output Spectral Noise Density	@ 200 MHz		9		nV/√Hz
INPUT/ OUTPUT CHARACTERISTICS					
Input Common Mode Voltage Range	@ 10 MHz		1.2 – 3.8		V
Max Output Voltage Swing	@ 10 MHz		3.8		Vp-p
Input Bias Current			±20		µA
Input Resistance			3		kΩ
Input Capacitance			1.1		pF
CMRR (single ended)	@ 200MHz		-57		dB
Output Resistance			50		Ω
Output Capacitance			1.1		pF

AD8351-SPECIFICATIONS (V_S=5V, T=25°C unless otherwise noted)

Parameter	Conditions	Min	Typ	Max	Units
POWER INTERFACE					
Supply Voltage		3		5.5	V
Quiescent Current			23		mA
PSSR			-50		dB