

a

Very Low-Cost High-Speed FASTFET™ Op Amps

Preliminary Technical Data

AD8033/AD8034

FEATURES

FET Input Amplifier

Single and Dual

Low Cost

High Speed

80MHz, -3 dB Bandwidth (G = +1)

80V/ms Slew Rate (G=-1)

Low Noise

10.6nV/rt Hz

5fA/rt Hz

Wide Supply Voltage Range

4V to 24V

Rail-to-Rail Output

Low Power

3.3mA/Amplifier Typ Supply Current

Small Packaging

SOIC-8; SOT23-8; SC70-5

APPLICATIONS

Instrumentation

Filters

Level Shifting

Buffering

PRODUCT DESCRIPTION

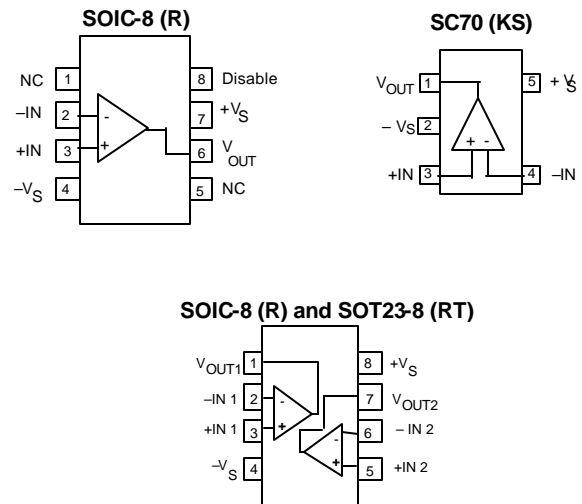
The ADAD8033/4 FASTFET™ amps are voltage feedback amplifiers with FET inputs offering ease of use and very low cost. Single (AD8033) an Dual (AD8034) versions will be available. The AD8033/4 FASTFET™ amps offer significant performance improvements over other low cost FET amps that are in the same price range.

With wide supply voltage range (4V to 24V) and bandwidth (85MHz), the AD8033/4 amps work in more applications than similarly priced FET amps. In addition they have rail-to-rail outputs for added versatility and a disable feature on the single amplifier (AD8033).

REV.PrI 2/26/02

Information furnished by Analog Devices is believed to be accurate and Reliable. However, no responsibility is assumed by Analog Devices for its use, nor for any infringements of patents or other rights of third parties that may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Analog Devices.

CONNECTION DIAGRAMS (TOP VIEW)



Despite very low cost, the amplifiers provide excellent overall performance. They offer high slew rate of 80V/μs, low input offset voltage of 6mV max, and low noise of 11nV/rt Hz.

The AD8033/4 amps also offer low power of 3.3mA/amplifier maximum, while capable of delivering up to 20mA of load current. These amplifiers are very stable and are optimized for driving capacitive loads up to 35pF.

The AD8033/4amps are the very low-cost FET amps available in small packages; SOT-23, and SC70. They are rated to work over the industrial temperature range, -40C to +85C without a premium over commercial grade products.

The AD8033 is scheduled to be released July 2002.
The AD8034 is scheduled to be released April 2002.

One Technology Way, P.O. Box 9106, Norwood, Ma 02062-9106, U.S.A.
Tel: 781/329-4700 www.analog.com
Fax: 781/326-8703 Analog.Devices, Inc., 2002

PRELIMINARY TECHNICAL DATA

AD8033/34

SPECIFICATIONS (@T_A = +25°C, V_S = +/-5V, R_L = 1kΩ, Gain =+2, unless otherwise noted)

Parameter	Conditions	AD8033/4			Units
		Min	Typ	Max	
DYNAMIC PERFORMANCE					
-3 dB Bandwidth	G =+1, V _o = 0.2Vp-p		80		MHz
	G =-1, V _o = 0.2Vp-p		29		MHz
	G =+2, V _o = 0.2Vp-p		30		MHz
	G =+2, V _o = 2Vp-p		21		MHz
Input Overdrive Recovery time	-6V to 6V input		135		ns
Output Overdrive Recovery time	-3V to 3V input, G=+2		140		ns
Slew Rate (25% to 75%)	G =+2, V _o = 4V Step, R _L = 1kΩ		80		V/μs
Settling Time to 0.1%	G =+2, V _o = 2V Step		100		ns
NOISE/HARMONIC PERFORMANCE					
Distortion	f _C = 1 MHz, V _o = 2V p-p, R _L =500Ω		-82		dBc
			-85		dBc
Third Harmonic	R _L =500Ω		-65		dBc
			-81		dBc
Crosstalk, Output to Output	f = 1 MHz, G = +2		-94		dB
Input Voltage Noise	f = 50 kHz		10.6		nV/√Hz
Input Current Noise	f = 100 kHz		5		fA/√Hz
DC PERFORMANCE					
Input Offset Voltage	T _{min} -T _{max}		1	3	mV
			TBD		mV
Input Offset Voltage Drift			6		μV/°C
Input Bias Current	T _{min} -T _{max}		1		pA
			64		pA
Input Bias Current drift			2X for each 10C change		
Open Loop Gain			90		dB
INPUT CHARACTERISTICS					
Input Resistance			1000		GΩ
Input Capacitance	+Input		2.5		pF
Input Common-Mode Voltage Range	R _L = 1kΩ		-5.2 to 4.5		V
Common-Mode Rejection Ratio			90		dB
OUTPUT CHARACTERISTICS					
Output Voltage Swing	R _L = 1kΩ 1% DC non-linearity		-4.9 to +4.9		V
Output Short Circuit Current			35		mA
Capacitive Load Drive	30% over shoot		38		pF
POWER SUPPLY					
Operating Range		4		24	V
Quiescent Current per Amplifier			3.3		mA
Power Supply Rejection Ratio			-90		dB

2/26/02 REV.PrI

PRELIMINARY TECHNICAL DATA

AD8033/34

SPECIFICATIONS (@T_A = +25°C, V_S = +5V, R_L = 1kΩ, Gain =+2, unless otherwise noted)

Parameter	Conditions	AD8033/4			Units
		Min	Typ	Max	
DYNAMIC PERFORMANCE					
-3 dB Bandwidth	G =+1, V _o = 0.2Vp-p		80		MHz
	G =-1, V _o = 0.2Vp-p		29		MHz
	G =+2, V _o = 0.2Vp-p		32		MHz
	G =+2, V _o = Vp-p		29		MHz
Input Overdrive Recovery time	-6V to 6V input		180		ns
Output Overdrive Recovery time	-6.5 to 3V input, G=+2		200		ns
Slew Rate (25% to 75%)	G =+2, V _o = 4V Step, R _L = 1kΩ		60		V/μs
Settling Time to 0.1%	G =+2, V _o = 2V Step		100		ns
NOISE/HARMONIC PERFORMANCE					
Distortion	f _C = 1 MHz, V _o = V p-p, R _L =500Ω		-80		dBc
			-83		dBc
Second Harmonic	R _L =1kΩ		-83		dBc
	R _L =500Ω		-65		dBc
Third Harmonic	R _L =1kΩ		-82		dBc
	R _L =500Ω		-94		dB
Crosstalk, Output to Output	f = 1 MHz, G = +2		-94		dB
Input Voltage Noise	f = 50 kHz		10.6		nV/√Hz
Input Current Noise	f = 100 kHz		5		fA/√Hz
DC PERFORMANCE					
Input Offset Voltage	T _{min} -T _{max}		1	3	mV
			TBD		mV
Input Offset Voltage Drift			6		μV/°C
Input Bias Current	T _{min} -T _{max}		1		pA
			64		pA
Input Bias Current drift			2X for each 10C change		
Open Loop Gain			90		dB
INPUT CHARACTERISTICS					
Input Resistance			1000		GΩ
Input Capacitance	+Input		2.5		pF
Input Common-Mode Voltage Range	R _L = 1kΩ		-0.2 to 4.2		V
Common-Mode Rejection Ratio			90		dB
OUTPUT CHARACTERISTICS					
Output Voltage Swing	R _L = 1kΩ 1% DC non-linearity		-0.1 to +4.9		V
Output Short Circuit Current			30		mA
Capacitive Load Drive	30% over shoot		25		pF
POWER SUPPLY					
Operating Range		4		24	V
Quiescent Current per Amplifier			3.3		mA
Power Supply Rejection Ratio			-90		dB

2/26/02 REV.PrI

PRELIMINARY TECHNICAL DATA

AD8033/34

SPECIFICATIONS (@T_A = +25°C, V_S = +/-12V, R_L = 1kΩ, Gain =+2, unless otherwise noted)

Parameter	Conditions	AD8033/4			Units	
		Min	Typ	Max		
DYNAMIC PERFORMANCE						
-3 dB Bandwidth	G =+1, V _o = 0.2Vp-p		80		MHz	
	G =-1, V _o = 0.2Vp-p		29		Mhz	
	G =+2, V _o = 0.2Vp-p		30		MHz	
	G =+2, V _o = 2Vp-p		21		MHz	
	Input Overdrive Recovery time	-13V to 13V input		100		ns
	Output Overdrive Recovery time	-6.5 to 6.5Vinput, G=+2		100		ns
	Slew Rate (25% to 75%)	G =+2, V _o = 4V Step , R _L = 1kΩ		80		V/μs
Settling Time to 0.1%	G =+2, V _o = 2V Step		100		ns	
NOISE/HARMONIC PERFORMANCE						
Distortion	f _C = 1 MHz, V _o = 2V p-p,					
	R _L =500Ω		-82		dBc	
Second Harmonic	R _L =1kΩ		-96		dBc	
Third Harmonic	R _L =500Ω		-66		dBc	
	R _L =1kΩ		-82		dBc	
Crosstalk, Output to Output	f = 1 MHz, G = +2		-94		dB	
Input Voltage Noise	f = 50 kHz		10.6		nV/√Hz	
Input Current Noise	f = 100 kHz		5		fA/√Hz	
DC PERFORMANCE						
Input Offset Voltage	T _{min} -T _{max}		1	3	mV	
			TBD		mV	
Input Offset Voltage Drift			6		μV/°C	
Input Bias Current	T _{min} -T _{max}		1		pA	
			64		pA	
Input Bias Current drift			2X for each 10C change			
Open Loop Gain			90		dB	
INPUT CHARACTERISTICS						
Input Resistance			1000		GΩ	
Input Capacitance	+Input		2.5		pF	
Input Common-Mode Voltage Range	R _L = 1kΩ		-12.2 to		V	
			11.7			
Common-Mode Rejection Ratio			90		dB	
OUTPUT CHARACTERISTICS						
Output Voltage Swing	R _L = 1kΩ 1% DC non-linearity		±11.9		V	
Output Short Circuit Current			60		mA	
Capacitive Load Drive	30% over shoot		38		pF	
POWER SUPPLY						
Operating Range		4		24	V	
Quiescent Current per Amplifier			3.3		mA	
Power Supply Rejection Ratio			-90		dB	

2/14/02 REV.PrI