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High Performance High-Speed *FAST FET ™ OP AMP*

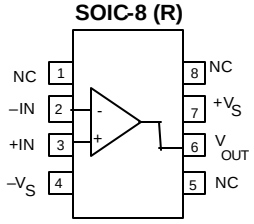
Preliminary Technical Data AD8065/AD8066

FEATURES

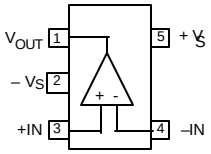
FET Input Amplifier
Single, Dual
Low Cost
High Speed
150MHz, –3 dB Bandwidth (G = +1)
180V/µs Slew Rate
Low Noise
7.0 nV/rt Hz
5fA/rt Hz
Wide Supply Voltage Range
5V to 24V
Excellent Distortion Specs
SFDR –90dB @ 1MHz
Low Power
6.5mA/Amplifier Typ Supply Current
Small Packaging
SOIC-8, SOT23-5, µSOIC

CONNECTION DIAGRAMS
(TOP VIEW)

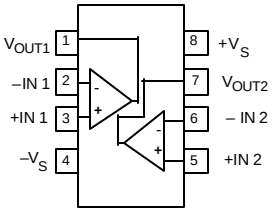
SOIC-8 (R)



SOT23-5 (RT)



SOIC-8 (R) and µSOIC (RM)



APPLICATIONS

Instrumentation
Photodiode Pre-amp
Filters
A-to-D Driver
Level Shifting
Buffering

PRODUCT DESCRIPTION

The AD8065/66 amps are voltage feedback amplifiers with FET inputs offering ease of use and low cost. The AD8065 is a single amplifier and the AD8066 is a dual amplifier. These *FAST FET*™ in ADI's proprietary XFCB process allow low noise operation (7.0nV/rt Hz and 0.1fA/rt Hz) as well as very high input impedance.

With the wide supply voltage range (5V to 24V) and wide bandwidth (150MHz), the AD8065/66 amps are designed to work in a variety of applications. For added versatility the amplifiers contain rail-to-rail outputs.

Despite being low cost, the amplifiers provide excellent overall performance. The differential gain and phase errors are 0.01% and 0.02°, along with 0.1dB flatness out to 7MHz makes these amplifiers ideal for video applications. Additionally, they offer high slew rate of 180V/µs, excellent distortion, and low input offset voltage of 1mV max.

The AD8065/66 amps offer low power of 7.0 mA/amplifier, while capable of delivering up to 30mA of load current. These amplifiers are optimized for driving capacitive loads up to 25pF. If driving larger capacitive loads, a small series resistor is needed to avoid excessive peaking or overshoot.

The AD8065/66 amps are low-cost, high-speed FET amps available in small packages, SOIC, SOT-23, and µSOIC. They are rated to work over the industrial temperature range, -40C to +85C.

The AD8065 is scheduled to be released April 2002.
The AD8066 is scheduled to be released July 2002.

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AD8065/66

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

Parameter	Conditions	AD8065/66 Min	Typ	Max	Units
DYNAMIC PERFORMANCE					
–3 dB Bandwidth	G =+1, V_o= 0.2Vp-p		150		MHz
	G =+2, V_o= 0.2Vp-p		50		MHz
	G =+1, V_o= 2Vp-p		55		MHz
Bandwidth for 0.1 dB Flatness	V_o= 0.2Vp-p, G=+2		7		MHz
Input Overdrive Recovery Time	G=-1, -5.5V to +5.5V		200		ns
Output Recovery Time	G=-1 –5.5V to +5.5V		170		ns
Slew Rate	G =+2, V_o= 4V Step		180		V/µs
Settling Time to 0.1%	G = +2, V_o = 2V Step		TBD		ns
	G=+2, Vo=8V Step		TBD		ns
NOISE/HARMONIC PERFORMANCE					
SFDR	f_C = 1 MHz, G=+2, 2Vpp		-88		dBc
	f_C = 5 MHz, G=+2, 2Vpp		-67		dBc
	fc= 1 MHz, G=+2, 8Vpp		TBD		dBc
Third Order Intercept	f_C = 10MHz, Rl=100Ω		TBD		dBm
Crosstalk, Output to Output	f = 5 MHz, G = +2		TBD		dB
Input Voltage Noise	f = 10 kHz		7		nV/√Hz
Input Current Noise	f = 10 kHz		5		fA/√Hz
Differential Gain Error	NTSC, G = +2, R_L = 150 Ω		0.01		%
Differential Phase Error	NTSC, G = +2, R_L = 150 Ω		0.02		Degree
DC PERFORMANCE					
Input Offset Voltage			0.1	2.0	mV
Tmin to Tmax			TBD		mV
Input Offset Voltage Drift			1.0		µV/°C
Input Bias Current			1		pA
	Tmin to Tmax		64		pA
Open Loop Gain	V_o = ±3 V, Rl=1 kΩ		116		dB
INPUT CHARACTERISTICS					
Common Mode Input Impedance			1000		GΩ//pf
Differential Input Impedance			4.2		GΩ//pF
Input Common-Mode Voltage Range		-5.0		2.0	V
Common-Mode Rejection Ratio	V_{CM}= -5 to 2V		127		dB
OUTPUT CHARACTERISTICS					
Output Voltage Swing	R_L = 1kΩ	-4.95		4.95	V
Output Current	V_o = +/- 2.5 V		30		mA
Capacitive Load Drive	30% over shoot		20		pF
POWER SUPPLY					
Operating Range		5		24	V
Quiescent Current per Amplifier		6.0	6.5		mA
Power Supply Rejection Ratio			-120		dB

2/26/02 REV.PrK

AD8065/66

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

Parameter	Conditions	AD8065/66 Min	Typ	Max	Units
DYNAMIC PERFORMANCE					
–3 dB Bandwidth	G =+1, V_o= 0.2Vp-p		150		MHz
	G =+2, V_o= 0.2Vp-p		50		MHz
	G =+1, V_o= 2Vp-p		55		MHz
Bandwidth for 0.1 dB Flatness	V_o= 0.2Vp-p, G=+2		7		MHz
Input overdrive recovery			TBD		ns
Output overdrive recovery			TBD		ns
Slew Rate	G =+2, V_o= 4V Step		180		V/µs
Settling Time to 0.1%	G = +2, V_o = 2V Step		TBD		ns
	G=+2, Vo=8V Step		TBD		ns
NOISE/HARMONIC PERFORMANCE					
SFDR	f_C = 1 MHz, G=+2, 2Vpp		-100		dBc
	f_C = 5 MHz, G=+2, 2Vpp		-67		dBc
	fc= 1MHz, G=+2, 10Vpp		-85		dBc
Third Order Intercept	f_C = 10MHz, R_l=100		TBD		dBm
Crosstalk, Output to Output	f = 5 MHz, G = +2		TBD		dB
Input Voltage Noise	f = 10 kHz		7		nV/√Hz
Input Current Noise	f = 10 kHz		5		fA/√Hz
Differential Gain Error	NTSC, G = +2, R_L = 150 Ω		0.01		%
Differential Phase Error	NTSC, G = +2, R_L = 150 Ω		0.02		Degree
DC PERFORMANCE					
Input Offset Voltage			0.1	2.0	mV
	Tmin to Tmax		TBD		mV
Input Offset Voltage Drift			1		µV/°C
Input Bias Current			1		pA
	Tmin to Tmax		TBD		pA
Input Offset Current			1		±pA
	Tmin to Tmax		TBD		pA
Open Loop Gain	V_o = ±10 V, Rl=1kΩ		125		dB
INPUT CHARACTERISTICS					
Common Mode Input Impedance			1000		GΩ//pF
Differential Input Impedance			3		GΩ//pF
Input Common-Mode Voltage Range	R_L = 1kΩ	-12.0		9.0	V
Common-Mode Rejection Ratio	V_{CM}= -12V to +9V		127		dB
OUTPUT CHARACTERISTICS					
Output Voltage Swing	R_L = 1kΩ	-11.9		11.7	V
Output Current	V_o = +/- 4.5 V		30		mA
Capacitive Load Drive	30% over shoot		25		pF
POWER SUPPLY					
Operating Range		5		24	V
Quiescent Current per Amplifier		6.0	6.5		mA
Power Supply Rejection Ratio			-120		dB

2-26-02 REV.PrK

AD8065/66

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

Parameter	Conditions	AD8065/66 Min	Typ	Max	Units
DYNAMIC PERFORMANCE					
–3 dB Bandwidth	G =+1, V_o= 0.2Vp-p		165		MHz
	G =+2, V_o= 0.2Vp-p		50		MHz
	G =+1, V_o= 2Vp-p		TBD		MHz
Input Overdrive Recovery Time	G=1 –0.5V to 5.5V		200		ns
Bandwidth for 0.1 dB Flatness	V_o= 0.2Vp-p, G=+2		6		MHz
Slew Rate	G =+1, V_o= 2V Step , R_L = 2kΩ		160		V/µs
Settling Time to 0.1%	G = +2, V_o = 2V Step		TBD		ns
NOISE/HARMONIC PERFORMANCE					
SFDR	f_C = 1 MHz, G=+2, 2Vpp		-90		dBc
	f_C = 5 MHz, G=+2, 2Vpp		-70		dBc
Third Order Intercept	f_C = 10MHz, Rl=100Ω		TBD		dBm
Crosstalk, Output to Output	f = 5 MHz, G = +2		TBD		dB
Input Voltage Noise	f = 10 kHz		7		nV/√Hz
Input Current Noise	f = 10 kHz		5		fA/√Hz
Differential Gain Error	NTSC, G = +2, R_L = 150 Ω		0.01		%
Differential Phase Error	NTSC, G = +2, R_L = 150 Ω		0.02		Degree
DC PERFORMANCE					
Input Offset Voltage			0.1	2.0	mV
	Tmin to Tmax		TBD		mV
Input Offset Voltage Drift			1		µV/°C
Input Bias Current			1		pA
	Tmin to Tmax		TBD		pA
Input Offset Current			1		pA
	Tmin to Tmax		TBD		pA
Open Loop Gain	V_o = 1 to 4 V,		116		dB
INPUT CHARACTERISTICS					
Common mode Input Impedance			1000		GΩ
Differential Input Impedance			4.2		GΩ
Input Common-Mode Voltage Range	R_L = 1kΩ	0		2.0	V
Common-Mode Rejection Ratio	V_{CM}= 0 to 2V		TBD		dB
OUTPUT CHARACTERISTICS					
Output Voltage Swing	R_L = 1kΩ	0.15		4.9	V
	R_L = 150Ω	0.16		4.84	V
Output Current	V_o = +0.5 Vto TBD		30		mA
Capacitive Load Drive	30% over shoot		5		pF
POWER SUPPLY					
Operating Range		5		24	V
Quiescent Current per Amplifier		6.0	6.5		mA
Power Supply Rejection Ratio			-120		dB

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