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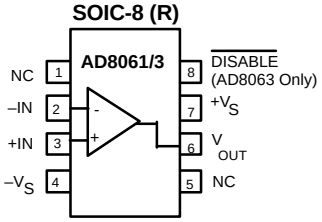
Low Cost, 300MHz Rail-to Rail Amplifiers

Preliminary Technical Data AD8061/62/63

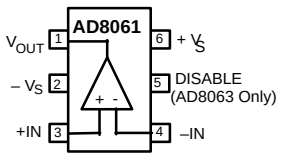
FEATURES
Low Cost
Single (AD8061)
Dual (AD8062)
Single with Disable (AD8063)
Rail-to-rail Output swing
High Speed
300MHz, –3 dB Bandwidth (G = +1)
800V/μs Slew Rate
Operates on 2.7V to 8V Supplies
Excellent Video Specs (R_L = 150Ω, G = +2)
Gain Flatness 0.1 dB to 30MHz
0.01% Differential Gain Error
0.03° Differential Phase Error
Low Power
6.8mA/Amplifier Typ Supply Current
AD8063 400μA when disabled
Small Packaging
AD8061 Available in SOIC-8 and SOT23-5
AD8062 Available in SOIC-8 and μSOIC
AD8063 Available in SOIC-8 and SOT23-6

CONNECTION DIAGRAMS
(TOP VIEW)

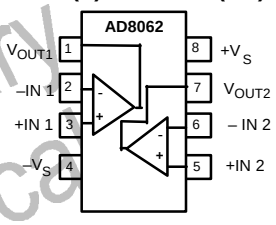
SOIC-8 (R)



SOT-23-6(RT)



SOIC-8 (R) and μSOIC (RM)



APPLICATIONS
Imaging
Photodiode Pre-amp
Professional Cameras
Hand Sets
Base Stations
DVD / CD
Filters
A-to-D Driver

PRODUCT DESCRIPTION

The AD8061, AD8062, and AD8063 are rail-to-rail out voltage feedback amplifiers offering ease of use and low cost. They have bandwidth and slew rate typically found in current feedback amplifiers. All have a wide input voltage range and output voltage swing making them easy to use on single supplies as low as 2.7V.

Despite being low cost, the AD8061, AD8062, and AD8063 provide excellent overall performance. For video applications, their differential gain and phase errors are 0.01% and 0.03° into a 150Ω load, along with 0.1dB flatness out to 30MHz. Additionally, they offer wide bandwidth to 300MHz along with 800V/μs slew rate.

The AD8061, AD8062, and AD8063 offer a typical low power of 7.0mA/amplifier, while being capable of delivering up to 50mA of load current. The AD8063 has a power down disable feature that reduces the supply current to 400μA. These features make the AD8063 ideal for portable and battery powered applications where size and power is critical.

Model	Operating Temperature Range	Package
AD8061AR	-40 to +85°C	8 Lead SOIC
AD8061ART	-40 to +85°C	5 Lead SOT23-5
AD8062AR	-40 to +85°C	8 Lead SOIC
AD8062ARM	-40 to +85°C	8 Lead μSOIC
AD8063AR	-40 to +85°C	8 Lead SOIC
AD8063ART	-40 to +85°C	6 Lead SOT23-6

REV PrD8/9/99

SPECIFICATIONS (@T_A = +25°C, V_S = +5,0, R_L = 1k, R_F = 0Ω, Gain =+1, unless otherwise noted)

Parameter	Conditions	AD8061/62/63 Min	Typ	Max	Units
DYNAMIC PERFORMANCE					
–3 dB Bandwidth	G =+1, V_o= 0.2Vp-p		300		MHz
	G =-1,+2, V_o= 0.2Vp-p		115		MHz
	G =+1, V_o= 2Vp-p		TBD		MHz
Bandwidth for 0.1 dB Flatness	V_o= 0.2Vp-p,		30		MHz
Slew Rate	G =+1, V_o= 1V Step , R_L = 2kΩ		500		V/µs
	G =+2, V_o= 2V Step , R_L = 2kΩ		800		V/µs
Settling Time to 0.1%	G = +2, V_o = 2V Step		20		ns
NOISE/HARMONIC PERFORMANCE					
SFDR	f_C = 5 MHz, V_o = 2V p-p, R_L = 1kΩ		-77		dBc
	f_C = 20 MHz, V_o = 2V p-p, R_L = 1kΩ		-50		dBc
Crosstalk, Output to Output	f = 5 MHz, G = +2		-90		dBc
Input Voltage Noise	f = 100 kHz		8.5		nV/√Hz
Input Current Noise	f = 100 kHz		1.2		pA/√Hz
Differential Gain Error	NTSC, G = +2, R_L = 150 Ω		0.01		%
Differential Phase Error	NTSC, G = +2, R_L = 150 Ω		0.03		Degree
Third Order Intercept	f = 10 MHz		28		dBc
DC PERFORMANCE					
Input Offset Voltage			1	6	mV
	T_{min} - T_{max}		TBD		mV
Input Offset Voltage Drift			3.5		µV/°C
Input Offset Voltage Matching	AD8062 only		1	7.5	mV
Input Bias Current			6	9	µA
	T_{min} - T_{max}		TBD		µA
Input Bias Current Matching	AD8062 only		1	4.5	µA
Input Offset Current			0.3		±µA
Input Offset Current Matching	AD8062 only		1	4.5	µA
Open Loop Gain	V_o = ±2.0 V, R_L = 150Ω	68	74		dB
	V_o = ±2.0 V, R_L = 2kΩ	74	80		dB
INPUT CHARACTERISTICS					
Input Resistance			3		MΩ
Input Capacitance			1		pF
Input Common-Mode Voltage Range	R_L = 1kΩ		-5.3 to 3.2		V
Common-Mode Rejection Ratio	V_{CM} = 2.2V to –4.2V	62	70		dB
OUTPUT CHARACTERISTICS					
Output Voltage Swing	R_L = 150 Ω	0.3		4.75	V
	R_L = 2kΩ	0.25		4.85	V
Output Current	V_o = +/- 2.5 V		50		mA
Capacitive Load Drive	30% over shoot		15		pF
POWER DOWN DISABLE					
Turn-on Time			TBD		ns
Turn-off Time			TBD		ns
Input Voltage - Disabled			TBD		V
Input Voltage - Enabled			TBD		V
POWER SUPPLY					
Operating Range		2.7	5	8	V
Quiescent Current per Amplifier			7.0	9.5	mA
Supply Current when Disabled			0.4		mA
Power Supply Rejection Ratio		72	80		dB

SPECIFICATIONS (@T_A = +25°C, V_S = +3V, R_L = 1k, R_F = 0Ω, Gain =+1, unless otherwise noted)

Parameter	Conditions	AD8061/62/63 Min	Typ	Max	Units
DYNAMIC PERFORMANCE					
–3 dB Bandwidth	G =+1, V_o= 0.2Vp-p		300		MHz
	G =-1,+2, V_o= 0.2Vp-p		115		MHz
	G =+1, V_o= 1Vp-p		TBD		MHz
Bandwidth for 0.1 dB Flatness	V_o= 0.2Vp-p,		30		MHz
Slew Rate	G =+1, V_o= 0.7V Step , R_L = 2kΩ		280		V/µs
	G =+2, V_o= 1.5V Step , R_L = 2kΩ		250		V/µs
Settling Time to 0.1%	G = +2, V_o = 1V Step		40		ns
NOISE/HARMONIC PERFORMANCE					
SFDR	f_C = 5 MHz, V_o = 1.0V p-p, R_L = 1kΩ		TBD		dBc
	f_C = 20 MHz, V_o = 1.0V p-p, R_L = 1kΩ		TBD		dBc
Crosstalk, Output to Output	f = 5 MHz, G = +2		-90		dBc
Input Voltage Noise	f = 100 kHz		8.5		nV/√Hz
Input Current Noise	f = 100 kHz		1.2		pA/√Hz
Differential Gain Error	NTSC, G = +2, R_L = 150 Ω		0.3		%
Differential Phase Error	NTSC, G = +2, R_L = 150 Ω		0.4		Degree
Third Order Intercept	f = 10 MHz		6.5		dBc
SFDR	F = 5 MHz		-62		dBc
DC PERFORMANCE					
Input Offset Voltage			1	6	mV
	T_{min} - T_{max}		2		mV
Input Offset Voltage Drift			3.5		µV/°C
Input Bias Current			4	8.5	µA
	T_{min} - T_{max}		6	10	µA
Input Offset Current			0.3		±µA
Open Loop Gain					dB
	V_o = ±2.5 V		90		dB
INPUT CHARACTERISTICS					
Input Resistance			3		MΩ
Input Capacitance	+Input		1		pF
Input Common-Mode Voltage Range	R_L = 1kΩ		-5.3 to 3.2		V
Common-Mode Rejection Ratio	V_{CM} = 0.3V to 1.7V	62	70		dB
OUTPUT CHARACTERISTICS					
Output Voltage Swing	R_L = 150 Ω	0.3		2.85	V
	R_L = 2kΩ	0.25		2.9	V
Output Current	V_o = +2.5V		30		mA
Capacitive Load Drive	30% over shoot		15		pF
POWER DOWN DISABLE					
Turn-on Time			TBD		ns
Turn-off Time			TBD		ns
Input Voltage - Disabled			TBD		V
Input Voltage - Enabled			TBD		V
POWER SUPPLY					
Operating Range		2.7	3	8	V
Quiescent Current per Amplifier			7.0	9.0	mA
Supply Current when Disabled			0.4		mA
Power Supply Rejection Ratio		72	-80		dB

SPECIFICATIONS (@T_A = +25°C, V_S = +2.7V, R_L = 1k, R_F = 0Ω, Gain =+1, unless otherwise noted)

Parameter	Conditions	AD8061/62/63 Min	Typ	Max	Units
DYNAMIC PERFORMANCE					
–3 dB Bandwidth	G =+1, V_o= 0.2Vp-p		300		MHz
	G =-1,+2, V_o= 0.2Vp-p		115		MHz
	G =+1, V_o= 1Vp-p		TBD		MHz
Bandwidth for 0.1 dB Flatness	V_o= 0.2Vp-p,		30		MHz
Slew Rate	G =+1, V_o= 0.7V Step , R_L = 2kΩ		280		V/µs
	G =+2, V_o= 1.5V Step , R_L = 2kΩ		250		V/µs
Settling Time to 0.1%	G = +2, V_o = 1V Step		40		ns
NOISE/HARMONIC PERFORMANCE					
SFDR	f_C = 5 MHz, V_o = 1.0V p-p, R_L = 1kΩ		TBD		dBc
	f_C = 20 MHz, V_o = 1.0V p-p, R_L = 1kΩ		TBD		dBc
Crosstalk, Output to Output	f = 5 MHz, G = +2		-90		dBc
Input Voltage Noise	f = 100 kHz		8.5		nV/√Hz
Input Current Noise	f = 100 kHz		1.2		pA/√Hz
Differential Gain Error	NTSC, G = +2, R_L = 150 Ω		0.3		%
Differential Phase Error	NTSC, G = +2, R_L = 150 Ω		0.4		Degree
Third Order Intercept	f = 10 MHz		6.5		dBc
SFDR	F = 5 MHz		-62		dBc
DC PERFORMANCE					
Input Offset Voltage			1	6	mV
	T_{min} - T_{max}		2		mV
Input Offset Voltage Drift			3.5		µV/°C
Input Bias Current			4	8.5	µA
	T_{min} - T_{max}		6	10	µA
Input Offset Current			0.3		±µA
Open Loop Gain					dB
	V_o = ±2.5 V		90		dB
INPUT CHARACTERISTICS					
Input Resistance			3		MΩ
Input Capacitance	+Input		1		pF
Input Common-Mode Voltage Range	R_L = 1kΩ		-5.3 to 3.2		V
Common-Mode Rejection Ratio	V_{CM} = 0.45 to 1.55V	62	70		dB
OUTPUT CHARACTERISTICS					
Output Voltage Swing	R_L = 150 Ω	0.3		2.55	V
	R_L = 2kΩ	0.25		2.6	V
Output Current	V_o = +2.5V		30		mA
Capacitive Load Drive	30% over shoot		15		pF
POWER DOWN DISABLE					
Turn-on Time			TBD		ns
Turn-off Time			TBD		ns
Input Voltage - Disabled			TBD		V
Input Voltage - Enabled			TBD		V
POWER SUPPLY					
Operating Range		2.7	3	8	V
Quiescent Current per Amplifier			7.0	9.0	mA
Supply Current when Disabled			0.4		mA
Power Supply Rejection Ratio		72	-80		dB