FAN4230

Dual, High Speed, 2.5V to 12V, Rail-to-Rail Amplifier

Features at ±5V

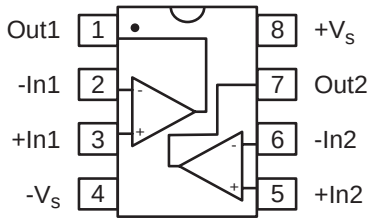
- 2.5mA supply current per amplifier
- 358MHz bandwidth
- Output voltage range at R_L = 150Ω: -4.9V to 4.81V
- Input includes negative rail
- 217V/µs slew rate
- ±130mA output short circuit current
- 12nV/√Hz input voltage noise
- Competes with AD8052 and LMH6643
- Package options (MSOP-8 and SOIC-8)
- Fully specified at +3V, +5V, and ±5V supplies

Applications

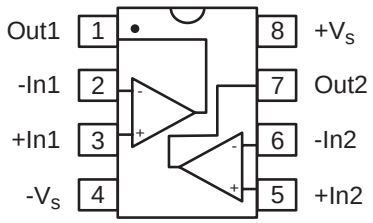
- A/D driver
- Active filters
- CCD imaging systems
- CD/DVD ROM
- Coaxial cable drivers
- Portable/battery-powered applications
- Twisted pair driver
- Video driver

Pin Assignments

SOIC



MSOP



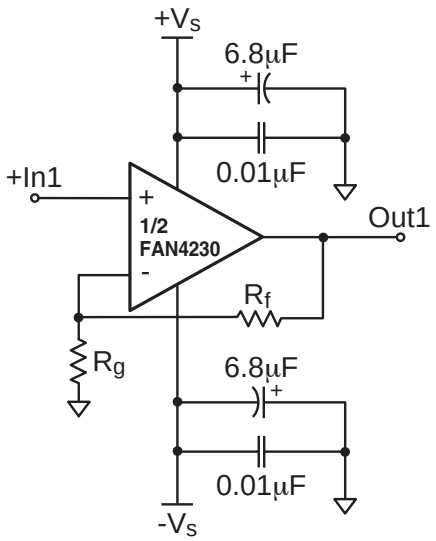
Description

The FAN4230 is a dual, low cost, high performance, voltage feedback amplifier that consumes only 2.5mA of supply current while providing ±130mA of output short circuit current. The FAN4230 is designed to operate from 2.5V to 12V (±6V) supplies. The common mode voltage range extends below the negative rail and the output provides rail-to-rail performance.

The FAN4230 is designed on a complimentary bipolar process and provides 358MHz of bandwidth and 217V/µs of slew rate at a supply voltage of ±5V. The combination of low power, rail-to-rail performance, low voltage operation, and tiny package options make the FAN4230 well suited for use in many general purpose high speed applications.

TBD

Typical Application



Electrical Characteristics (V_s = +3V, G = 2, R_L = 2kΩ to V_s/2; unless noted)

Parameters	Conditions	TYP	Min & Max	UNITS	NOTES
Case Temperature		+25°C	+25°C		
Frequency Domain Response					
-3dB bandwidth	G = +1, V_O = 0.2V_{pp}	295		MHz	
	G = +2, V_O = 0.2V_{pp}	119		MHz	
full power bandwidth	G = +2, V_O = 2V_{pp}	75		MHz	
gain bandwidth product		155		MHz	
Time Domain Response					
rise and fall time	0.2V step	2.74		ns	
settling time to 0.1%	2V step	TBD		ns	
overshoot	0.2V step,	8		%	
slew rate	3V step, G = -1	215		V/µs	
Distortion and Noise Response					
2nd harmonic distortion	1V_{pp}, 5MHz	-80		dBc	
3rd harmonic distortion	1V_{pp}, 5MHz	-80		dBc	
THD	1V_{pp}, 5MHz	75		dB	
input voltage noise	>1MHz	12.45		nV/√Hz	
crosstalk	10MHz	TBD		dB	
DC Performance					
input offset voltage		1		mV	1
average drift		TBD		µV/°C	
input bias current		-5		µA	1
average drift		TBD		nA/°C	
input offset current		TBD		µA	1
power supply rejection ratio	DC	73		dB	1
open loop gain		82		dB	1
quiescent current per amplifier		2.5		mA	1
Input Characteristics					
input resistance		TBD		MΩ	
input capacitance		TBD		pF	
input common mode voltage range		-0.3 to 1.8		V	
common mode rejection ratio	DC, V_{cm} = 0V to V_s - 1.5	82		dB	1
Output Characteristics					
output voltage swing	R_L = 2kΩ to V_s/2	0.02 to 2.97		V	1
	R_L = 150Ω to V_s/2	0.05 to 2.93		V	1
linear output current		+99/-99		mA	
short circuit output current		±130		mA	
power supply operating range		3	2.5 to 12	V	

Min/max ratings are based on product characterization and simulation. Individual parameters are tested as noted. Outgoing quality levels are determined from tested parameters.

NOTES:

1) 100% tested at +25°C.

Electrical Characteristics (V_S = +5V, G = 2, R_L = 2kΩ to V_S/2; unless noted)

Parameters	Conditions	TYP	Min & Max	UNITS	NOTES
Case Temperature		+25°C	+25°C		
Frequency Domain Response					
-3dB bandwidth	G = +1, V_O = 0.2V_{pp}	325		MHz	
	G = +2, V_O = 0.2V_{pp}	122		MHz	
full power bandwidth	G = +2, V_O = 2V_{pp}	75		MHz	
gain bandwidth product		155		MHz	
Time Domain Response					
rise and fall time	0.2V step	2.71		ns	
settling time to 0.1%	2V step	TBD		ns	
overshoot	0.2V step,	5.9		%	
slew rate	5V step, G = -1	217		V/µs	
Distortion and Noise Response					
2nd harmonic distortion	2V_{pp}, 5MHz	-76		dBc	
3rd harmonic distortion	2V_{pp}, 5MHz	-77		dBc	
THD	2V_{pp}, 5MHz	73		dB	
input voltage noise	>1MHz	12.36		nV/√Hz	
crosstalk	10MHz	TBD		dB	
DC Performance					
input offset voltage		1		mV	1
average drift		TBD		µV/°C	
input bias current		-4.9		µA	1
average drift		TBD		nA/°C	
input offset current		TBD		µA	1
power supply rejection ratio	DC	73		dB	1
open loop gain		85		dB	1
quiescent current per amplifier		2.5		mA	1
Input Characteristics					
input resistance		TBD		MΩ	
input capacitance		TBD		pF	
input common mode voltage range		-0.3 to 3.8		V	
common mode rejection ratio	DC, V_{cm} = 0V to V_S - 1.5	85		dB	1
Output Characteristics					
output voltage swing	R_L = 2kΩ to V_S/2	0.02 to 4.96		V	1
	R_L = 150Ω to V_S/2	0.07 to 4.89		V	1
linear output current		+99/-99		mA	
short circuit output current		±130		mA	
power supply operating range		5	2.5 to 12	V	

Min/max ratings are based on product characterization and simulation. Individual parameters are tested as noted. Outgoing quality levels are determined from tested parameters.

NOTES:

1) 100% tested at +25°C.

Electrical Characteristics (V_s = ±5V, G = 2, R_L = 2kΩ to V_s/2; unless noted)

PARAMETERS	CONDITIONS	TYP	MIN & MAX	UNITS	NOTES
Case Temperature		+25°C	+25°C		
Frequency Domain Response					
-3dB bandwidth	G = +1, V_O = 0.2V_{pp}	358		MHz	
	G = +2, V_O = 0.2V_{pp}	123		MHz	
full power bandwidth	G = +2, V_O = 2V_{pp}	77		MHz	
gain bandwidth product		155		MHz	
Time Domain Response					
rise and fall time	0.2V step	2.7		ns	
settling time to 0.1%	1V step	TBD		ns	
overshoot	0.2V step,	3.8		%	
slew rate	10V step, G = -1	217		V/µs	
Distortion and Noise Response					
2nd harmonic distortion	2V_{pp}, 5MHz	-73		dBc	
3rd harmonic distortion	2V_{pp}, 5MHz	-77		dBc	
THD	2V_{pp}, 5MHz	72		dB	
input voltage noise	>1MHz	12.29		nV/√Hz	
crosstalk	10MHz	TBD		dB	
DC Performance					
input offset voltage		-1		mV	1
average drift		TBD		µV/°C	
input bias current		-4.5		µA	1
average drift		TBD		nA/°C	
input offset current		TBD		µA	1
power supply rejection ratio	DC	73		dB	1
open loop gain		92		dB	1
quiescent current per amplifier		2.5		mA	1
Input Characteristics					
input resistance		TBD		MΩ	
input capacitance		TBD		pF	
input common mode voltage range		-5.3 to +3.8		V	
common mode rejection ratio	DC, V_{cm} = 0V to V_s - 1.5	92		dB	1
Output Characteristics					
output voltage swing	R_L = 2kΩ to V_s/2	-4.94 to 4.93		V	1
	R_L = 150Ω to V_s/2	-4.9 to 4.81		V	1
linear output current		+99/-99		mA	
short circuit output current		±130		mA	
power supply operating range		±5	2.5 to 12	V	

Min/max ratings are based on product characterization and simulation. Individual parameters are tested as noted. Outgoing quality levels are determined from tested parameters.

NOTES:

1) 100% tested at +25°C.

Absolute Maximum Ratings

supply voltage	0 to +12V
maximum junction temperature	+175°C
storage temperature range	-65°C to +150°C
lead temperature (10 sec)	+300°C
operating temperature range (recommended)	-40°C to +85°C
input voltage range	+V_s +0.5V; -V_s -0.5V
internal power dissipation	see power derating curves

Package Thermal Resistance

Package	θ_{JA}
8 lead SOIC	152°C/W
8 lead MSOP	206°C/W

Ordering Information

Model	Part Number	Package	Container	Pack Qty
FAN4230	FAN4230IMU8X	MSOP-8	Reel	3000
FAN4230	FAN4230IM8X	SOIC-8	Reel	2500

Temperature range for all parts: -40°C to +85°C.