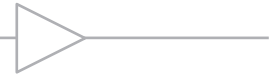


COMLINEAR® CLC1002

Ultra-Low Noise Amplifier



FEATURES

- 0.6 nV/√Hz input voltage noise
- 1mV maximum input offset voltage
- 965MHz gain bandwidth product
- Minimum stable gain of 5
- 170V/μs slew rate
- 130mA output current
- -40°C to +125°C operating temperature range
- Fully specified at 5V and ±5V supplies
- CLC1002: Lead-free SOT23-6, SOIC-8
- Future option CLC2002

APPLICATIONS

- Transimpedance amplifiers
- Pre-amplifier
- Low noise signal processing
- Medical instrumentation
- Probe equipment
- Test equipment
- Ultrasound channel amplifier

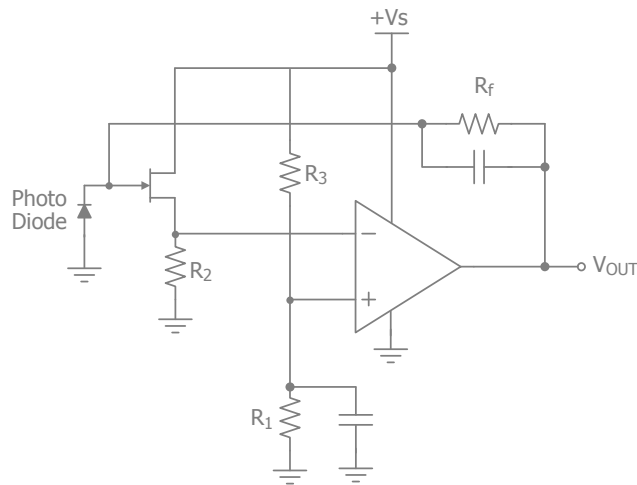
General Description

The COMLINEAR CLC1002(single) is a high-performance, voltage feedback amplifier with ultra-low input voltage noise, 0.6nV/√Hz. The CLC1002 provides 965MHz gain bandwidth product and 170V/μs slew rate making it well suited for high-speed data acquisition systems requiring high levels of sensitivity and signal integrity. This COMLINEAR high-performance amplifier also offers low input offset voltage.

The COMLINEAR CLC1002 is designed to operate from 4V to 12V supplies. It consumes only 13mA of supply current per channel and offers a power saving disable pin that disables the amplifier and decreases the supply current to below 225μA. The CLC1002 amplifier operates over the extended temperature range of -40°C to +125°C.

If larger bandwidth or slew rate is required, a higher minimum stable gain version is available, the CLC1001 offers a minimum stable gain of 10 with 2.1GHz GBWP and 410V/μs slew rate.

Typical Application - Single Supply Photodiode Amplifier



Ordering Information

Part Number	Package	Pb-Free	RoHS Compliant	Operating Temperature Range	Packaging Method
CLC1002IST6X	SOT23-6	Yes	Yes	-40°C to +85°C	Reel
CLC1002ISO8X*	SOIC-8	Yes	Yes	-40°C to +85°C	Reel
CLC1002ISO8*	SOIC-8	Yes	Yes	-40°C to +85°C	Rail
CLC1002AST6X	SOT23-6	Yes	Yes	-40°C to +125°C	Reel
CLC1002ASO8X*	SOIC-8	Yes	Yes	-40°C to +125°C	Reel
CLC1002ASO8*	SOIC-8	Yes	Yes	-40°C to +125°C	Rail

*Preliminary Product Information

Moisture sensitivity level for all parts is MSL-1.

Electrical Characteristics

$T_A = 25^\circ\text{C}$, $V_S = \pm 5\text{V}$, $R_f = 100\Omega$, $R_L = 500\Omega$, $G = 5$; unless otherwise noted.

Parameter	Conditions	Min	Typ	Max	Units
Frequency Domain Response					
-3dB Gain Bandwidth Product	$G = +21$, $V_{OUT} = 0.2V_{pp}$		965		MHz
-3dB Bandwidth	$G = +5$, $V_{OUT} = 0.2V_{pp}$		290		MHz
Large Signal Bandwidth	$G = +5$, $V_{OUT} = 2V_{pp}$		61		MHz
Time Domain Response					
Rise and Fall Time	$V_{OUT} = 1\text{V}$ step; (10% to 90%)		3.8		ns
Settling Time to 0.1%	$V_{OUT} = 1\text{V}$ step		12		ns
Overshoot	$V_{OUT} = 0.2\text{V}$ step		2		%
Slew Rate	1V step		170		V/ μs
Distortion/Noise Response					
2nd Harmonic Distortion	$2V_{pp}$, 10MHz		-75		dBc
3rd Harmonic Distortion	$2V_{pp}$, 10MHz		-66		dBc
Total Harmonic Distortion	$2V_{pp}$, 10MHz		65.5		dB
Input Voltage Noise	> 100KHz		0.6		nV/ $\sqrt{\text{Hz}}$
Input Current Noise	> 100KHz		4.2		pA/ $\sqrt{\text{Hz}}$
DC Performance					
Input Offset Voltage		-1	0.5	1	mV
Average Drift			4.3		$\mu\text{V}/^\circ\text{C}$
Input Bias Current		-60	30	60	μA
Average Drift			44		nA/ $^\circ\text{C}$
Input Offset Current			0.3	6	μA
Power Supply Rejection Ratio	DC	78	83		dB
Open-Loop Gain	$V_{OUT} = V_S / 2$	70	83		dB
Supply Current	per channel		13	16	mA
Disable Characteristics					
Turn On Time			115		ns
Turn Off Time			210		ns
Disable Supply Current			180		mA
Input Characteristics					
Input Resistance	Non-inverting		9.4		M Ω
Input Capacitance			1.82		pF
Common Mode Input Range			-4.3 to 5		V
Common Mode Rejection Ratio	DC	75	90		dB
Output Characteristics					
Output Voltage Swing	$R_L = 500\Omega$	-3.3	± 4	3.6	V
	$R_L = 2k\Omega$		± 4		V
Output Current			± 130		mA
Short-Circuit Output Current	$V_{OUT} = V_S / 2$		± 165		mA

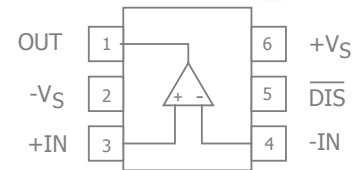
Notes:

1. 100% tested at 25°C.

Refer to the data sheet for complete product specifications.

Available Packages

CLC1002 SOT23-6
(not actual size)



For additional information regarding our products, please visit the CADEKA at: cadeka.com

CADEKA Headquarters Loveland, Colorado

T: 970.663.5452

T: 877.663.5452 (toll free)

CADEKA, the CADEKA logo design, COMLINEAR, the COMLINEAR logo design, and ARCTIC are trademarks or registered trademarks of CADEKA Microcircuits LLC. All other brand and product names may be trademarks of their respective companies.

Copyright ©2007-2008 by CADEKA Microcircuits LLC. All rights reserved.

