

COMLINEAR® CLC1001

Ultra-Low Noise Amplifier



FEATURES

- 0.6 nV/√Hz input voltage noise
- 1mV maximum input offset voltage
- 2.1GHz gain bandwidth product
- Minimum stable gain of 10
- 410V/μs slew rate
- 130mA output current
- -40°C to +125°C operating temperature range
- Fully specified at 5V and ±5V supplies
- CLC1001: Lead-free SOT23-6, SOIC-8
- Future option CLC2001

APPLICATIONS

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

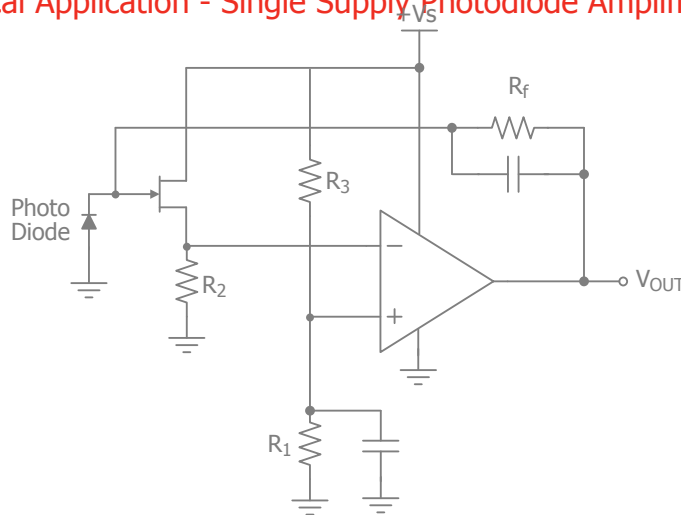
General Description

The COMLINEAR CLC1001(single) is a high-performance, voltage feedback amplifier with ultra-low input voltage noise, 0.6nV/√Hz. The CLC1001 provides 2.1GHz gain bandwidth product and 410V/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 CLC1001 is designed to operate from 4V to 12V supplies. It consumes only 12.5mA 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 CLC1001 amplifier operates over the extended temperature range of -40°C to +125°C.

If a lower minimum stable gain is required, the CLC1002 offers a minimum stable gain of 5.

Typical Application - Single Supply Photodiode Amplifier



Ordering Information

Part Number	Package	Pb-Free	RoHS Compliant	Operating Temperature Range	Packaging Method
CLC1001IST6X	SOT23-6	Yes	Yes	-40°C to +85°C	Reel
CLC1001ISO8X*	SOIC-8	Yes	Yes	-40°C to +85°C	Reel
CLC1001ISO8*	SOIC-8	Yes	Yes	-40°C to +85°C	Rail
CLC1001AST6X	SOT23-6	Yes	Yes	-40°C to +125°C	Reel
CLC1001ASO8X*	SOIC-8	Yes	Yes	-40°C to +125°C	Reel
CLC1001ASO8*	SOIC-8	Yes	Yes	-40°C to +125°C	Rail

*Preliminary Product Information

Moisture sensitivity level for all parts is MSL-1.

Product Brief

Electrical Characteristics

$T_A = 25^\circ\text{C}$, $V_S = \pm 5\text{V}$, $R_f = 200\Omega$, $R_L = 500\Omega$, $G = 10$; unless otherwise noted.

Parameter	Conditions	Min	Typ	Max	Units
Frequency Domain Response					
-3dB Gain Bandwidth Product	$G = +40$, $V_{OUT} = 0.2V_{pp}$		2100		MHz
-3dB Bandwidth	$G = +10$, $V_{OUT} = 0.2V_{pp}$		284		MHz
Large Signal Bandwidth	$G = +10$, $V_{OUT} = 2V_{pp}$		117		MHz
Time Domain Response					
Rise and Fall Time	$V_{OUT} = 1\text{V}$ step; (10% to 90%)		2.2		ns
Settling Time to 0.1%	$V_{OUT} = 1\text{V}$ step		11		ns
Overshoot	$V_{OUT} = 0.2\text{V}$ step		3		%
Slew Rate	1V step		410		V/ μs
Distortion/Noise Response					
2nd Harmonic Distortion	$2V_{pp}$, 10MHz		-81		dBc
3rd Harmonic Distortion	$2V_{pp}$, 10MHz		-75		dBc
Total Harmonic Distortion	$2V_{pp}$, 10MHz		74		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	0.1	1	mV
Average Drift			4.4		$\mu\text{V}/^\circ\text{C}$
Input Bias Current		-60	30	60	μA
Average Drift			44		nA/ $^\circ\text{C}$
Input Offset Current			0.8	6	μA
Power Supply Rejection Ratio	DC	78	83		dB
Open-Loop Gain	$V_{OUT} = V_S / 2$	74	83		dB
Supply Current	per channel		12.5	16	mA
Disable Characteristics					
Turn On Time			125		ns
Turn Off Time			840		ns
Disable Supply Current			180		mA
Input Characteristics					
Input Resistance	Non-inverting		4		M Ω
Input Capacitance			1.5		pF
Common Mode Input Range			-4.3 to 5.1		V
Common Mode Rejection Ratio	DC	75	90		dB
Output Characteristics					
Output Voltage Swing	$R_L = 500\Omega$	-3.8	± 4	3.8	V
	$R_L = 2k\Omega$		± 4		V
Output Current			± 130		mA
Short-Circuit Output Current	$V_{OUT} = V_S / 2$		± 160		mA

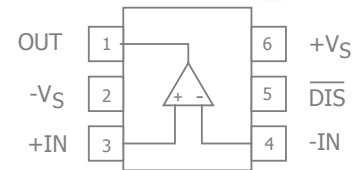
Notes:

1. 100% tested at 25°C.

Refer to the data sheet for complete product specifications.

Available Packages

CLC1001 SOT23-6
(not actual size)



COMLINEAR CLC1001 Ultra-Low Noise Amplifier Rev 1B

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

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