

Features

- General Purpose, Low Cost
- Gain Bandwidth Product: 1MHz
- Single power supply voltage range: 3V~32V
- Dual power supply voltage range:
 $\pm 1.5V$ to $\pm 16V$
- Low power consumption:
typical value $0.5mA@VCC = 5V$
- Internal frequency compensation
- Output short circuit protection
- Type Package:SOP-8

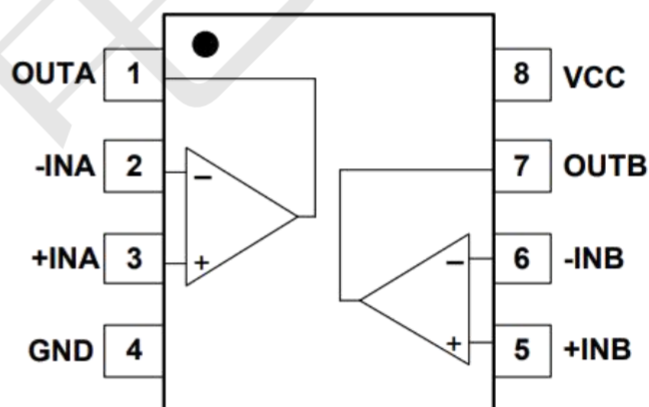
Applications

- Temperature Sensors
- Battery-Powered Instruments
- Smoke/Gas/Environment Sensors
- Medical Equipment
- Portable Instruments and Mobile Device
- Active Filters
- Piezo Electrical Transducer Amplifier
- Sensor Interface
- Audio amplifier

General Description

This is a dual channel low-power differential operational amplifier that can be powered by a single or dual power supply. has high open-loop gain, internal compensation, high common mode input range, good temperature stability, and output short-circuit protection. It can operate at power supply voltages as low as 3.0V or as high as 32V, with a common mode input range including negative power supply, eliminating the need for external bias, and an output voltage range including negative power supply voltage.

Pinout (top view)



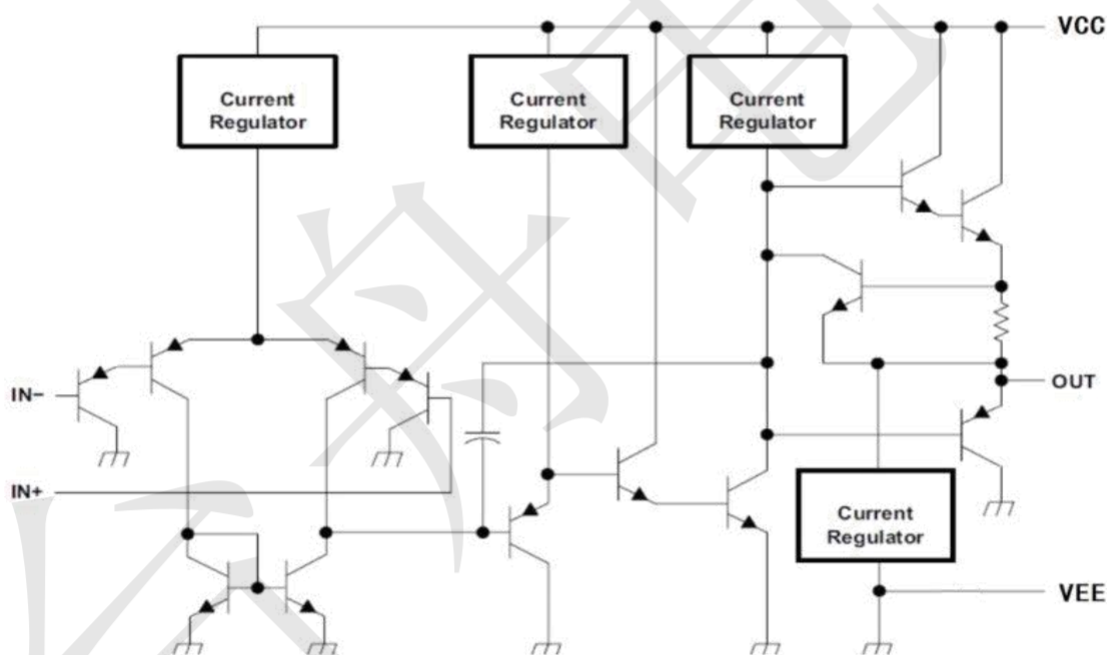
Pin Configurations

Pin Number	Pin Name	Pin Function
1	OUT A	Output A
2	-IN A	Reverse input A
3	+IN A	In-phase input A
4	GND	Chip Supply Voltage(Negative)/GND
5	+IN B	In-phase input B
6	-IN B	Reverse input B
7	OUT B	Output B
8	VCC	Chip Supply Voltage(Positive)/VCC

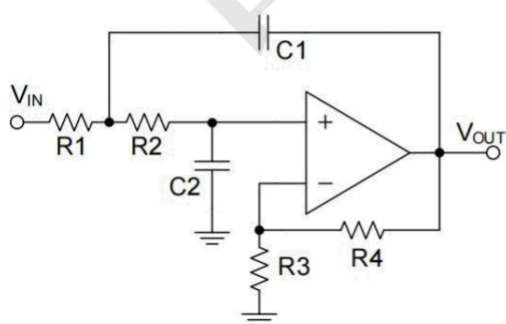
Absolute Maximum Ratings (@TA = +25°C, unless otherwise specified.)

Condition		Rating		UNIT
VDD to GND	Power Supply Voltage	32 or ± 16		V
IN+ or IN-	Signal Input Terminals Voltage	± 32		V
OUT to GND	Output Short-Circuit	± 60		mA
TJ	Junction Temperature	150		°C
LT	Lead Temperature (Soldering, 10 sec.)	260		°C
TA	Operating Temperature Range	-20	85	°C
Tstg	Storage Temperature Range	-65	150	°C

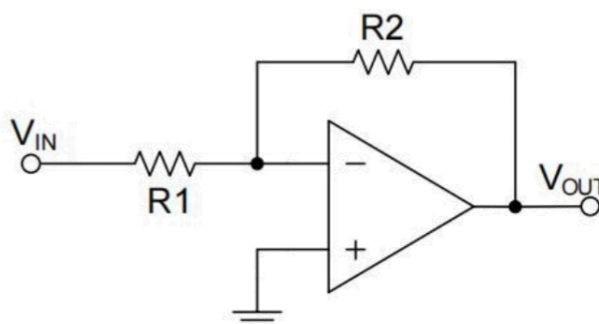
BLOCK DIAGRAM



Typical Applications



low-pass filter



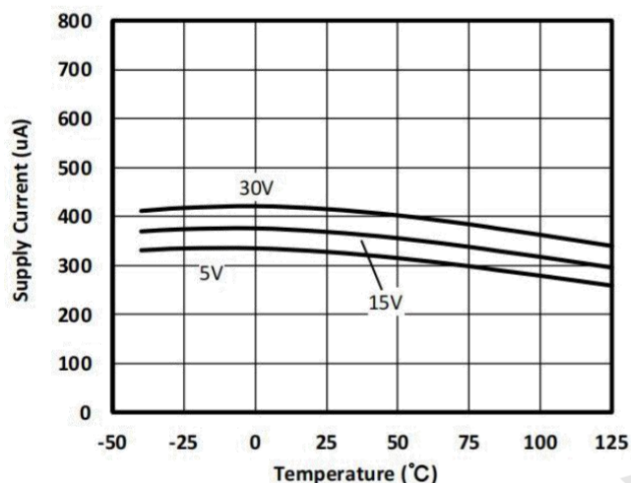
Reverse amplifier

Electrical Characteristics

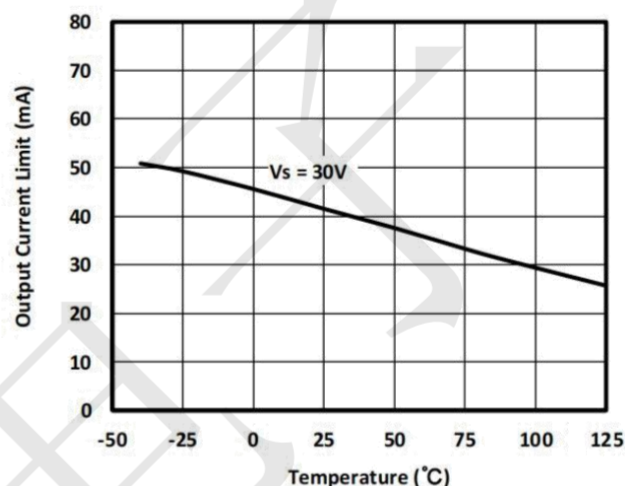
(At $T_A = +25^\circ\text{C}$, $V_S = +5\text{V}$, $V_{IN} = 0\text{V}$, unless otherwise noted.)

PARAMETER	SYMBOL	TEST Conditions	MIN	TYP	MAX	UNIT
Input offset voltage	V_{IO}	$V_{CC}=5\text{V to }32\text{V}$, $V_{ICM}=V_{ICM(\min)}$, $V_O=1.4\text{V}$	--	± 2	± 5	mV
Input offset current	I_{IO}	$V_O=1.4\text{V}$	--	± 10	± 50	nA
Input bias current	I_B	$V_O=1.4\text{V}$	--	± 50	± 250	nA
Common mode input voltage	V_{ICM}	$V_{CC}=5\text{V to }32\text{V}$	VEE	--	$V_{CC}-1.5$	V
Open-loop voltage gain	A_{OL}	$V_{CC}=15\text{V}$, $V_O=1\text{V to }11\text{V}$; $R_L \geq 10\text{ k}\Omega$, connected to VEE	--	100	--	V/mV
Common-mode rejection ratio	CMRR	$V_{CC}=5\text{V to }32\text{V}$, $V_{ICM}=V_{ICM(\min)}$	--	80	--	dB
Power supply voltage suppression ratio	PSRR	$V_{CC}=5\text{V to }32\text{V}$, $f=20\text{KHz}$	--	90	--	dB
Channel isolation degree	CS	$f=1\text{kHz} \sim 20\text{kHz}$	--	120	--	dB
Output high-level voltage	V_{OH}	$V_{CC}=15\text{V}$, $V_{ID}=1\text{V}$	$I_{OUT}=-50\mu\text{A}$	--	13.6	V
			$I_{OUT}=-1\text{mA}$	--	13.5	V
			$I_{OUT}=-5\text{mA}$	--	13.4	V
		$V_{CC}=32\text{V}$, $V_{ID}=1\text{V}$	$R_L=2\text{K}\Omega$	--	30	V
Output low-level voltage	V_{OL}	$V_{CC}=15\text{V}$, $V_{ID}=-1\text{V}$	$I_{OUT}=50\mu\text{A}$	--	0.1	V
			$I_{OUT}=1\text{mA}$	--	0.3	V
			$I_{OUT}=5\text{mA}$	--	0.7	V
		$V_{CC}=32\text{V}$, $V_{ID}=-1\text{V}$	$R_L=2\text{K}\Omega$	--	1.0	V
Output short-circuit current	I_{SC}	$V_{CC}=10\text{V}$, $V_{EE}=-10\text{V}$, $V_O=0\text{V}$	--	± 40	± 60	mA
Working current of power supply	I_{CC1}	$V_{CC}=5\text{V}$, $V_O=1/2V_{CC}$, No load	--	0.5	--	mA
	I_{CC2}	$V_{CC}=32\text{V}$, $V_O=1/2V_{CC}$, No load	--	0.6	--	mA
Gain Bandwidth Product	GBWP		--	1.0	--	MHz
Conversion rate	SR		--	0.4	--	V/ μS

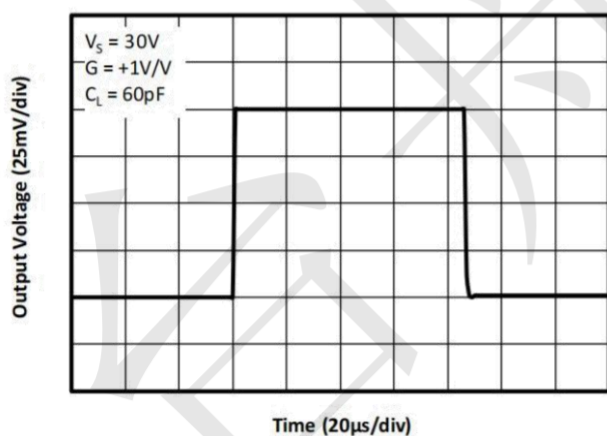
Typical Performance Characteristics (@TA = +25°C, unless otherwise specified.)



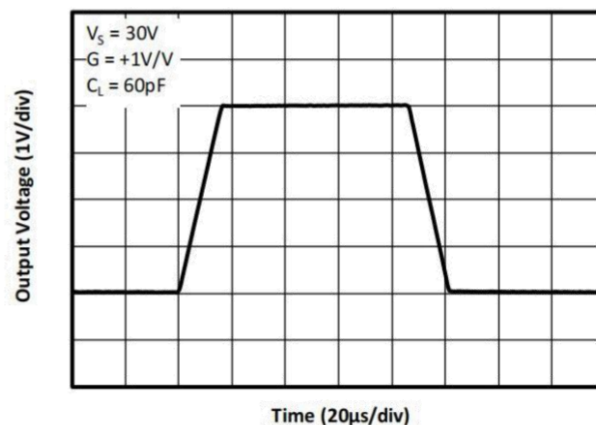
Relationship between power supply current and temperature



The relationship between output limit current and temperature



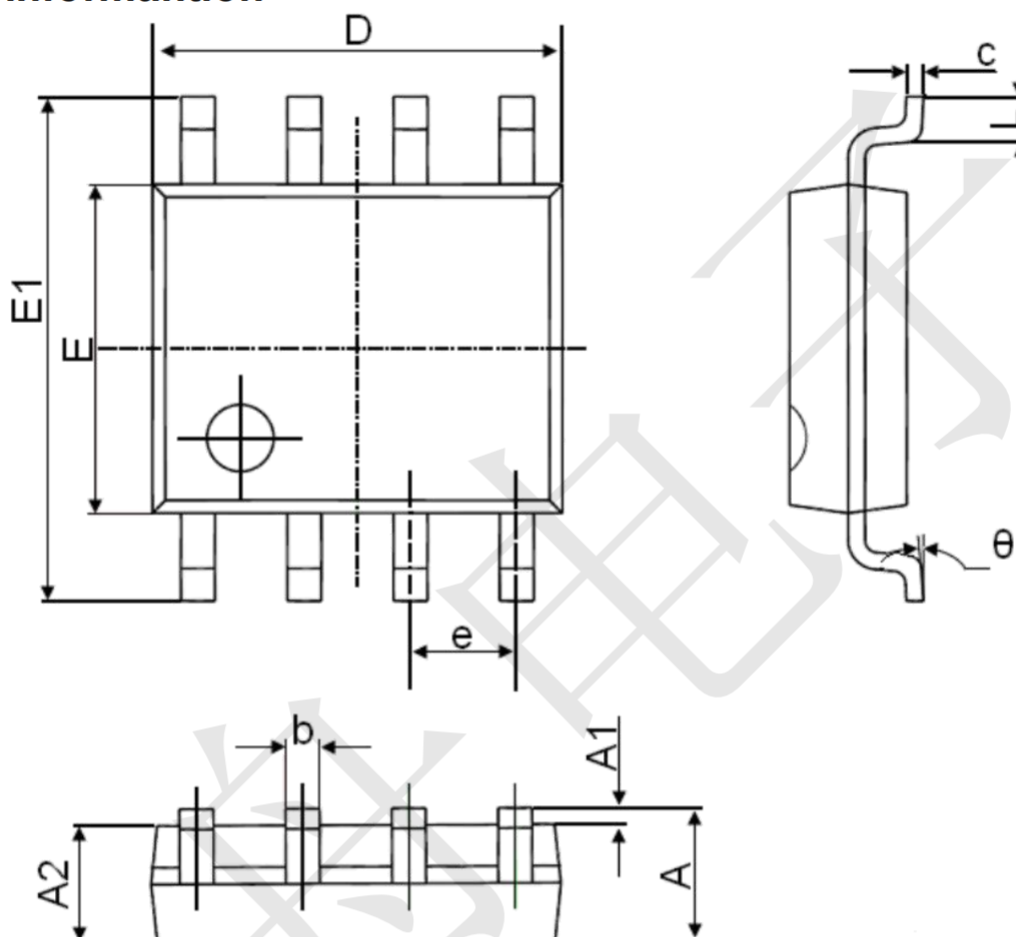
Small signal impulse response (non inverted)



Large signal impulse response (non inverting)

Package information

SOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°