

Features

- Supply Range: 2.2V to 5.5V
- Supply Current: 510 μ A/ch
- Input Offset Voltage: 2.5mV (MAX)
- Gain Bandwidth: 10MHz
- Rail-to-Rail Input and Output
- Slew rate: 6.5V/ μ s
- Operating Temperature: -40°C ~ +85°C
- Type Package: SOT23-5

Applications

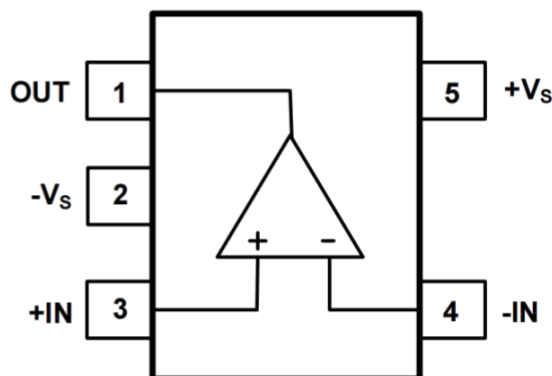
- Temperature Sensors
- Battery-Powered Instruments
- Smoke/Gas/Environment Sensors
- Medical Equipment
- Portable Instruments and Mobile Device
- Active Filters
- Piezo Electrical Transducer Amplifier
- Sensor Interface
- Handheld Test Equipment

General Description

The families of products offer low voltage operation and rail-to-rail input and output, as well as excellent speed/power consumption ratio, providing an excellent bandwidth (10MHz), a slew rate of 6.5V/ μ s, and a quiescent current of 510 μ A/amplifier at 5V. The op-amps are unity gain stable and feature an ultra-low input bias current.

They are designed to provide optimal performance in low-voltage systems. They provide rail-to-rail I/O, and the maximum input offset voltage are 2.5mV for the devices. Their capacitive load capability is also good at low supply voltages.

Pinout (top view)



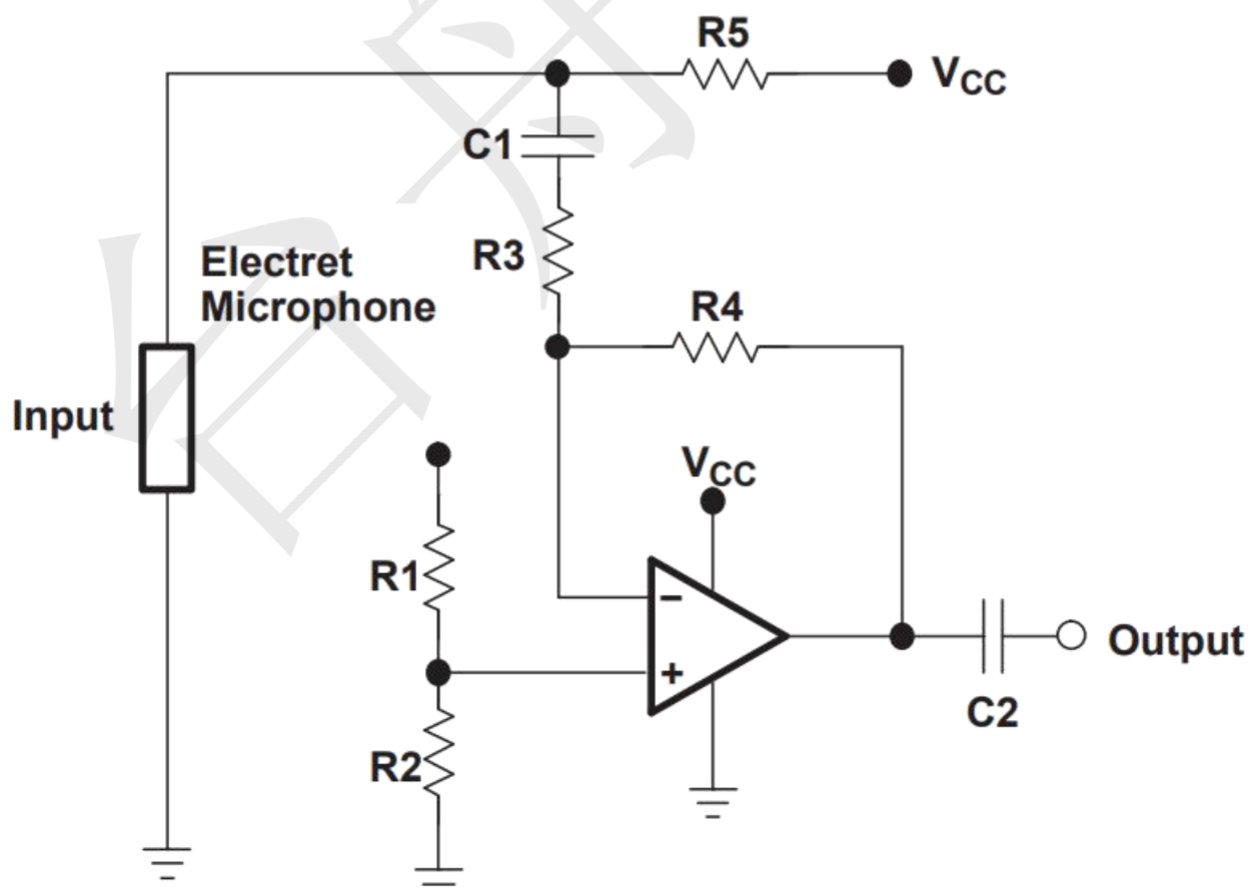
Pin Configurations

Pin Number	Pin Name	Pin Function
1	OUT	Output
2	-Vs	Chip Supply Voltage(Negative)/GND
3	+IN	In-phase input
4	-IN	Reverse input
5	+Vs	Chip Supply Voltage(Positive)/VDD

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

Condition		Rating	UNIT
VDD to GND	Power Supply Voltage	-0.5V~+6V	V
IN+ or IN-	Signal Input Terminals Voltage	GND-0.5V~VDD+0.5V	V
IIN	Signal Input Terminals Current	-10 ~ +10	mA
IOUT	Signal output Terminals Current	-200 ~ +200	mA
IOUT to GND	Output Short-Circuit	Continuous	mA
LT	Lead Temperature (Soldering, 10 sec.)	260	°C
TA	Operating Temperature Range	-40 85	°C
TJ	Junction Temperature	-40 150	°C
Tstg	Storage Temperature Range	-65 150	°C

Typical Application



Electrical Characteristics

(At $T_A = +25^\circ\text{C}$, $V_S = +5\text{V}$, $V_{IN}=V_{OUT}= V_S/2$, unless otherwise noted.)

PARAMETER		CONDITIONS	MIN	TYP	MAX	UNIT
OFFSET VOLTAGE						
V _{OS}	Input Offset Voltage		-2.5	0.8	2.5	mV
dV _{OS} /dT	Input Offset Voltage Average Drift	T _A = -40°C to 85°C	--	0.6	--	μV/°C
INPUT CURRENT						
I _B	Input Bias Current		--	10	--	pA
I _{OS}	Input Offset Current		--	5	--	pA
NOISE						
V _N	Input Voltage Noise	f=0.1Hz to 10Hz	--	4	--	μV _{PP}
e _n	Input Voltage Noise PSD	f=1kHz	--	8	--	nV/√Hz
INPUT VOLTAGE						
V _{CM}	Common-Mode Voltage Range		V _{S-}	--	V _{S+} +0.1	V
CMRR	Common-Mode Rejection Ratio	V _{CM} =0.1V to 4V	85	95	--	dB
FREQUENCY RESPONSE						
GBW	Gain-Bandwidth Product		--	10	--	MHz
SR	Slew Rate	G = +1, V _{IN} =2V Step	--	6	--	V/μs
t _s	Settling Time	G = +1, V _{IN} =2V Step	--	0.6	--	μs

Electrical Characteristics

(At $T_A = +25^\circ\text{C}$, $V_S = +5\text{V}$, $V_{IN}=V_{OUT}= V_S/2$, unless otherwise noted.)

PARAMETER		CONDITIONS	MIN	TYP	MAX	UNIT
OUTPUT						
A_v	Open-Loop Voltage Gain	$V_{OUT}=0.5V$ to $4.8V$	95	105	--	dB
V_{OH}	High output voltage swing	$R_L=10k\Omega$	--	--	5	mV
V_{OL}	Low output voltage swing	$R_L=10k\Omega$	--	--	5	mV
I_{SC}	Output Short-Circuit Current	Source Current	--	26	--	mA
		Sink Current	--	50	--	mA
$C_L^{(1)}$	Capacitive Load Drive	$G = +1$, $V_{IN}=0.2V$ Step	--	--	1000	pF
POWER SUPPLY						
PSRR	Power-Supply Rejection Ratio	$V_S=2.5V$ to $5.5V$	90	100	--	dB
V_S	Operating Voltage Range	$I_O=0A$	2.2	--	5.5	V
I_Q	Quiescent Current/Amplifier	$I_O=0A$	--	510	600	μA

Note 1: Capacitive load drive means that above a given maximum value, the output waveform will oscillate under the step response.

TYPICAL CHARACTERISTICS

(At $T_A = +25^\circ\text{C}$, $V_S = \pm 2.5\text{V}$, $V_{IN} = V_{OUT} = V_S/2$, unless otherwise noted.)

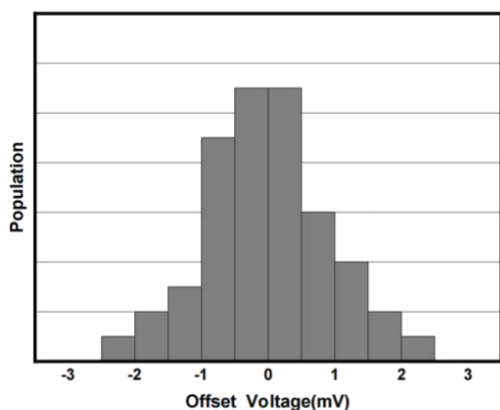


Figure 2. Offset Voltage Production Distribution

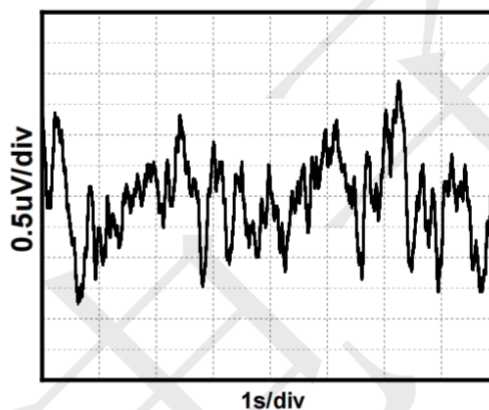


Figure 3. 0.1Hz to 10Hz Noise

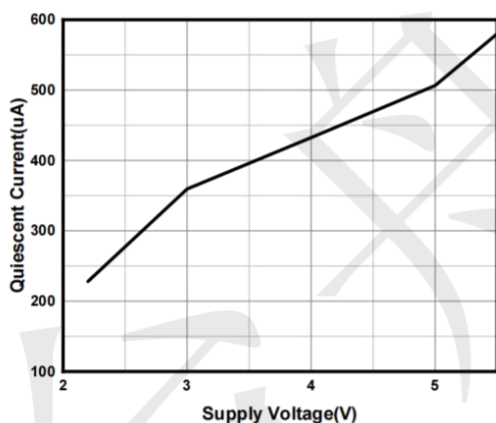


Figure 4. Quiescent Current vs Supply Voltage

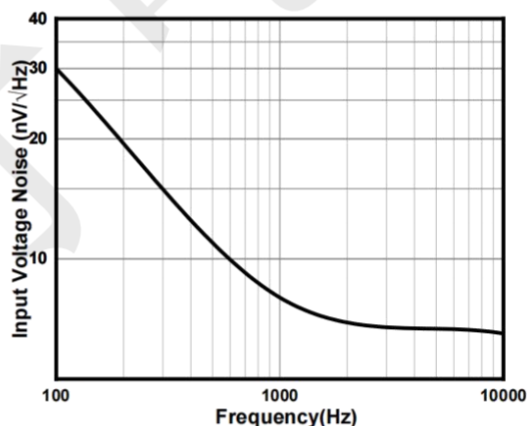


Figure 5. Input Voltage Noise Spectral Density

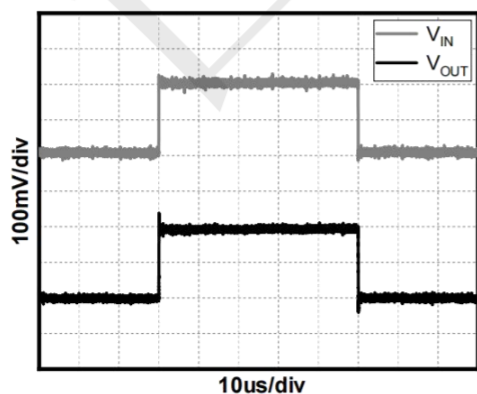


Figure 6. Small-Signal Step Response

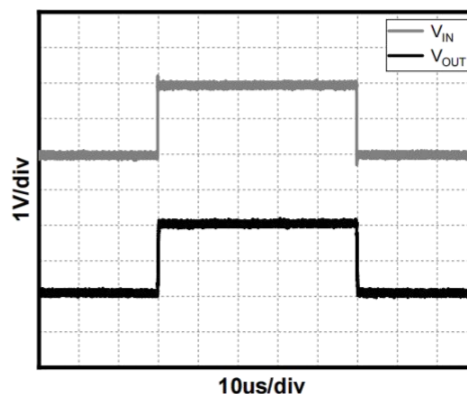
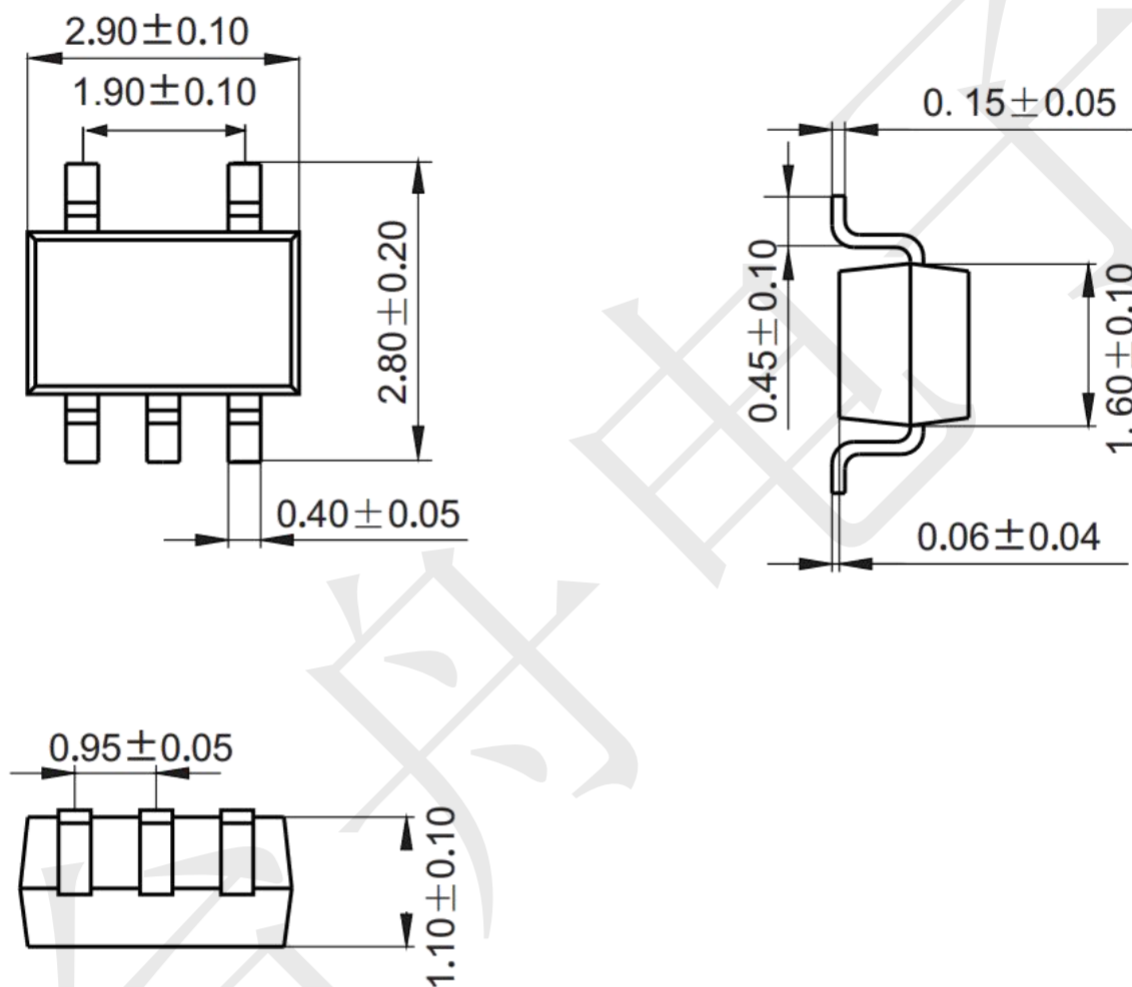


Figure 7. Large-Signal Step Response

Package informantion (Unit: mm)

SOT23-5



Mounting Pad Layout (Unit: mm)

