TPMAX4230AXK-A

10-MHz Rail-to-Rail CMOS AMPLIFIERS

Features

- Supply Range：2.1V to 5.5V
- Supply Current：0.4mA
- Input Offset Voltage：3mV (MAX)
- Gain Bandwidth：10MHz
- Rail-to-Rail Input and Output
- Slew rate: 8.5V/μs
- Operating Temperature: -40°C ~ +85°C
- Type Package:SOT353

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

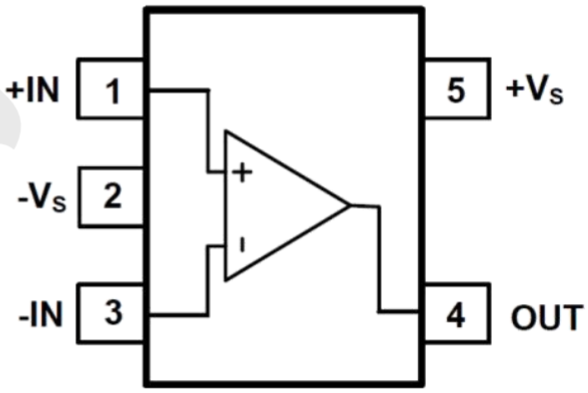
General Description

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) and slew rate (8.5V/us). The operational amplifiers are unity gain stable and feature an ultra-low input bias current.

The has lower offset voltage, which is guaranteed not upper than 0.5mV at 25°C with Vs = 5V, VCM = Vs/2.

The families of operational amplifiers under single supplies of 2.1V to 5.5V or dual power supplies of ±1.05V to ±2.75V. The devices are ideal for sensor interfaces, active filters and portable applications.

Pinout (top view)



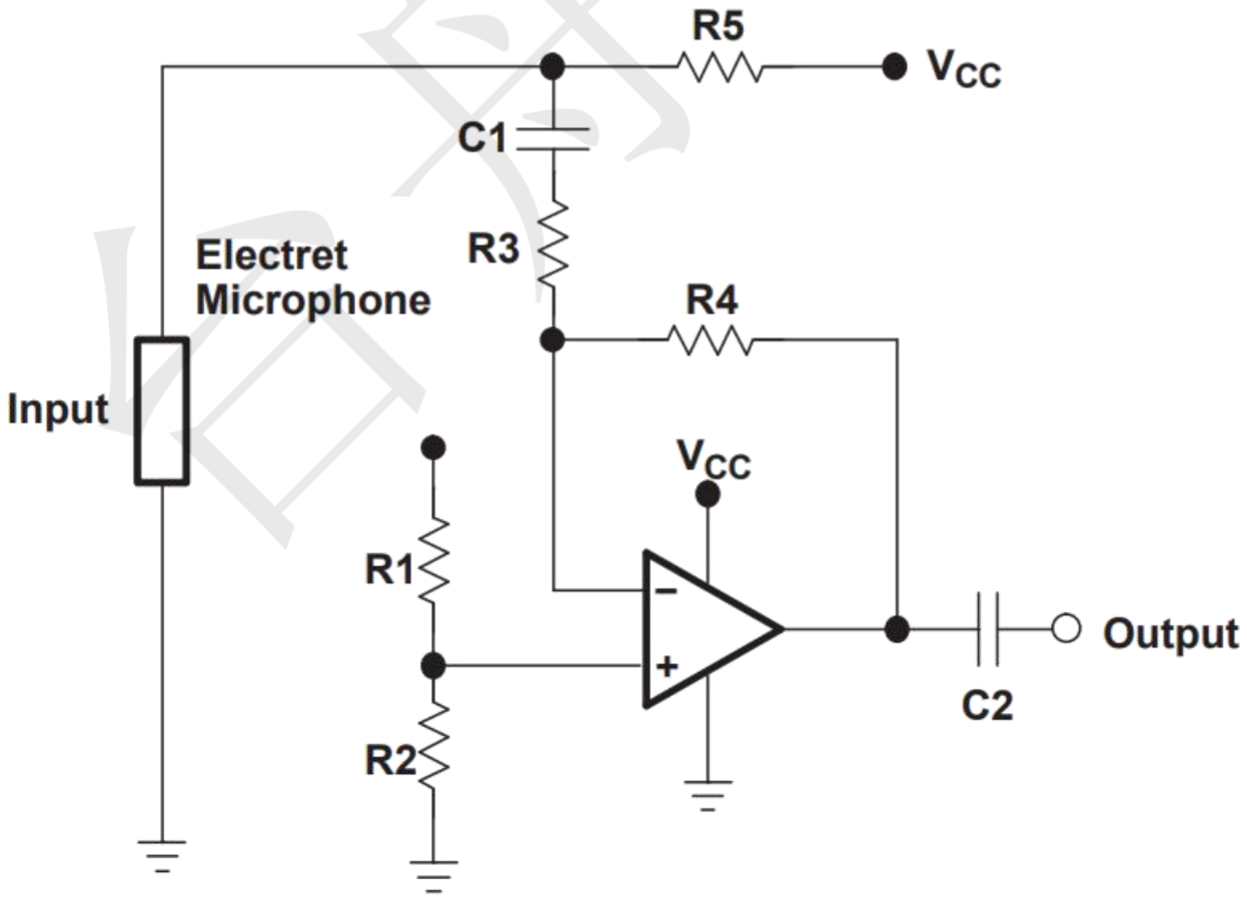
Pin Configurations

Pin Number	Pin Name	Pin Function
1	+IN	In-phase input
2	-Vs	Chip Supply Voltage(Negative)/GND
3	-IN	Reverse input
4	OUT	Output
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~+7V		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	-150 ~ +150		mA
IOUT to GND	Output Short-Circuit	Continuous		mA
LT	Lead Temperature (Soldering, 10 sec.)	260		°C
TA	Operating Temperature Range	-40	125	°C
TJ	Junction Temperature	-40	150	°C
Tstg	Storage Temperature Range	-65	150	°C

Typical Application



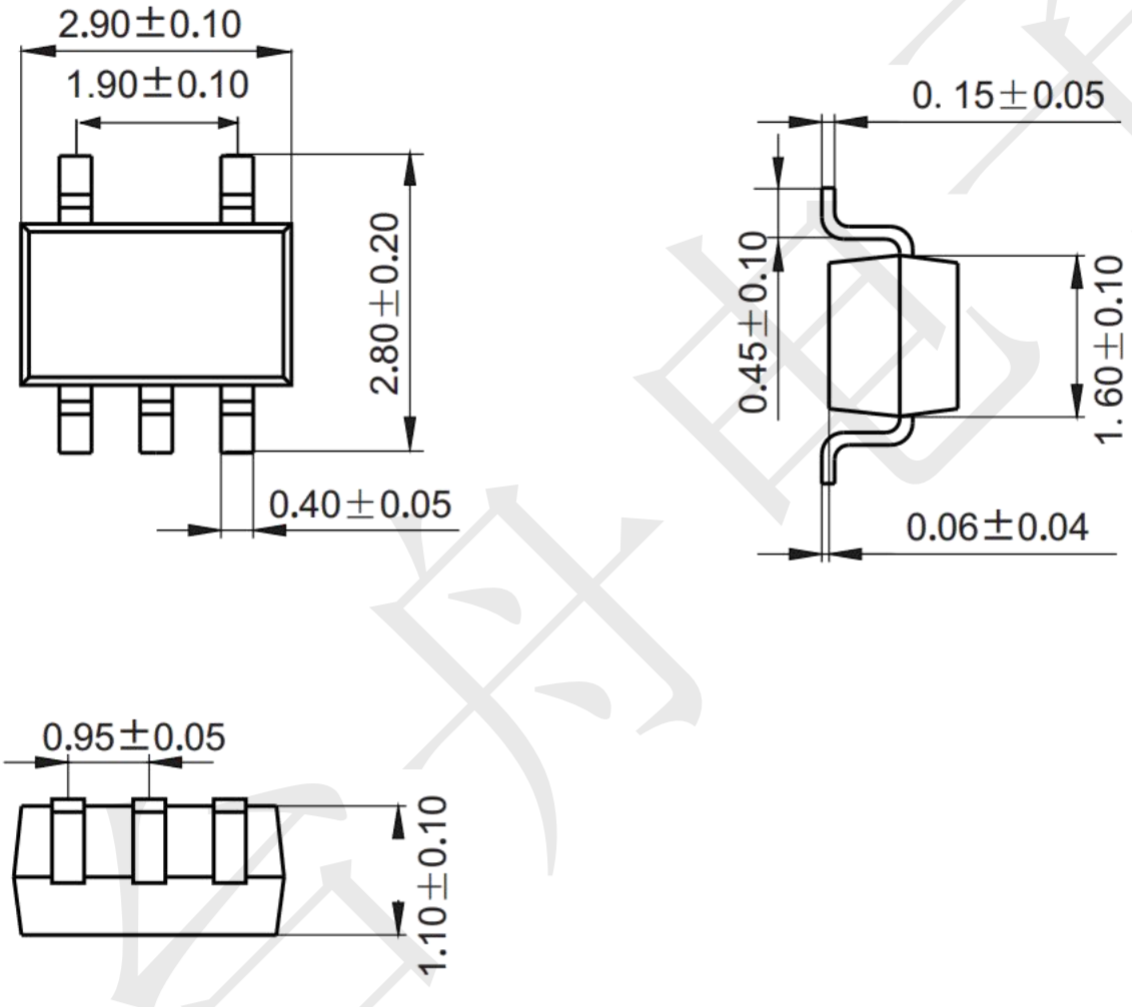
Electrical Characteristics

(At TA=+25℃, Vs=5V, RL=10kΩ connected to VS/2, and VOUT=VS/2, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
POWER SUPPLY						
Operating Voltage Range	V_S		2.1	--	5.5	V
Quiescent Current/Amplifier	I_Q	Vs=5V, IN+=V-, IN-=OUT	--	0.4	--	mA
Power-Supply Rejection Ratio	PSRR	Vs=2.5V to 5.5V, V_{CM}=(V-)+0.5V	75	--	--	dB
Turn-on Time	t_{ON}		--	12	--	μs
INPUT						
Input Offset Voltage	V_{OS}	V_{CM}= V_S/2,	-3	±0.2	+3	mV
Input Offset Voltage Average Drift	V_{OS} TC	T_A=-40℃~+125℃	--	±2.6	--	uV/℃
Input Bias Current	I_B		-10	±1	+10	pA
Input Offset Current	I_{OS}		-10	±1	+10	pA
Common-Mode Voltage Range	V_{CM}	Vs=5.5V	-0.2	--	5.7	V
Common-Mode Rejection Ratio	CMRR	Vs= 5.5V, V_{CM}=-0.2V to 4V	70	--	--	dB
		Vs= 5.5V, V_{CM}=-0.2V to 5.7V	65	--	--	dB
OUTPUT						
Open-Loop Voltage Gain	A_{OL}	R_L=2KΩ, V_O=0.15V to 4.85V	86	--	--	dB
		R_L=10KΩ, V_O=0.05V to 4.95V	96	--	--	dB
Output Swing From Rail		R_L=2KΩ	--	50	--	mV
		R_L=10KΩ	--	10	--	mV
Output Current Source	I_{OUT}		--	140	--	mA
FREQUENCY RESPONSE						
Slew Rate	SR		--	8.5	--	V/μs
Gain-Bandwidth Product	GBP		--	10	--	MHz
Phase Margin	PM		--	62	--	°
Setting Time,0.1%	ts		--	0.5	--	μs
Overload Recovery Time		V_{IN}·Gain≥V_S	--	3.2	--	μs
NOISE						
Input Voltage Noise Density	en	f = 1KHz	--	9.5	--	nV/√Hz
		f = 10KHz	--	6.5	--	nV/√Hz

Package information (Unit: mm)

SOT353 (Unit: mm)



Mounting Pad Layout (Unit: mm)