



AOS
SEMICONDUCTOR

产品规格说明书

Product Data Sheet

AOS358AXx

WEB | www.aossemi.cn 



电源管理IC



通信接口芯片



二三极管



LDO稳压器



逻辑器件



MOSFETs



运算放大器



显示驱动



MCU单片机



光电器件



1.1MHz, Precision, Rail-to-Rail I/O CMOS Operational Amplifier

DESCRIPTIONS

The AOS358A products offer low voltage operation and rail-to-rail input and output, as well as excellent speed/power consumption ratio, providing an excellent bandwidth (1.1MHz) and slew rate of 0.5V/us. The op-amps are unity gain stable and feature an ultra-low input bias current.

The AOS358A has lower offset, which is guaranteed not upper than $\pm 4.5mV$ at 25°C with $V_s = 5V$, $V_{cm} = V_s/2$.

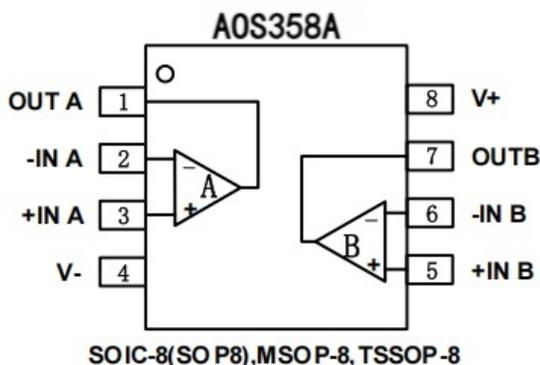
The devices are ideal for sensor interfaces, active filters and portable applications. The AOS358A families of operational amplifiers are specified at the full temperature range of -40°C to +125°C under single or dual power supplies of 2.5V to 5.5V.

FEATURES

- HIGH GAIN BANDWIDTH: 1.1MHz
- RAIL-TO-RAIL INPUT AND OUTPUT $\pm 4.5mV$ Max V_{os}
- INPUT VOLTAGE RANGE: -0.1V to +5.6V with $V_s = 5.5V$
- SUPPLY RANGE: +2.5V to +5.5V
- SPECIFIED UP TO +125°C
- Micro SIZE PACKAGES: SOIC-8

APPLICATIONS

- SENSORS
- PHOTODIODE AMPLIFICATION
- ACTIVE FILTERS
- TEST EQUIPMENT
- DRIVING A/D CONVERTERS





ABSOLUTE MAXIMUM RATINGS ⁽¹⁾

Supply Voltage, V+ to V-.....	7.0V
Input Terminals, Voltage ⁽²⁾	- 0.5 to (V+) + 0.5V
Current ⁽²⁾	±10mA
Storage Temperature	-65°C to +150°C
Operating Temperature	-40°C to +125°C
Junction Temperature.....	150°C
Package Thermal Resistance @ T _A = +25°C	
SOT23-5, SOT23-6.....	200°C/W
MSOP-10, SOIC-8, TSSOP-8.....	150°C/W
SOIC-14, TSSOP-14.....	100°C/W
Lead Temperature (Soldering, 10s)	260°C
ESD Susceptibility	
HBM	3000V
MM	200V



ESD SENSITIVITY CAUTION

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

(1) Stresses above these ratings may cause permanent damage. Exposure to absolute maximum conditions for extended periods may degrade device reliability. These are stress ratings only , and functional operation of the device at these or any other conditions beyond those specified is not implied.

(2) Input terminals are diode-clamped to the power-supply rails. Input signals that can swing more than 0.5V beyond the supply rails should be current-limited to 10mA or less.

PACKAGE/ORDERING INFORMATION

PRODUCT	ORDERING NUMBER	TEMPERATURE RANGE	PACKAGE LEAD	PACKAGE MARKING	PACKAGEOPTION
AOS358A	AOS358AXK	-40 ~125	SOIC-8(SOP8)	AOS358A	Tape and Reel , 2500
	AOS358AXM	-40 ~125	MSOP-8	AOS358A	Tape and Reel , 3000



ELECTRICAL CHARACTERISTICS

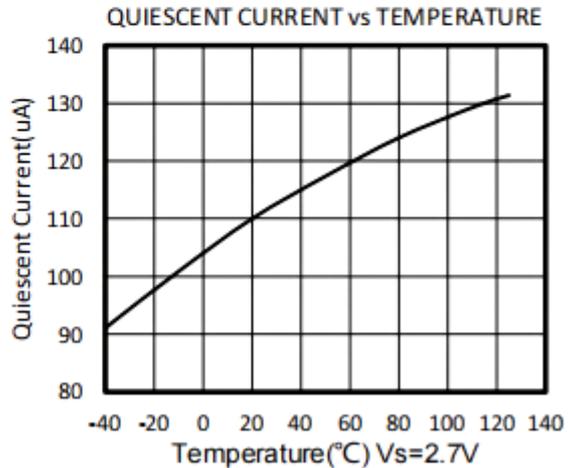
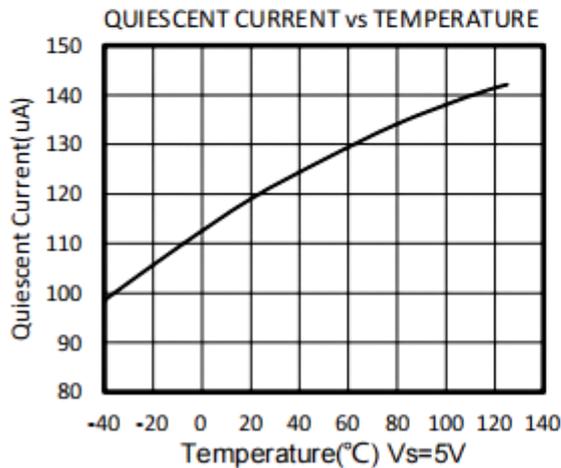
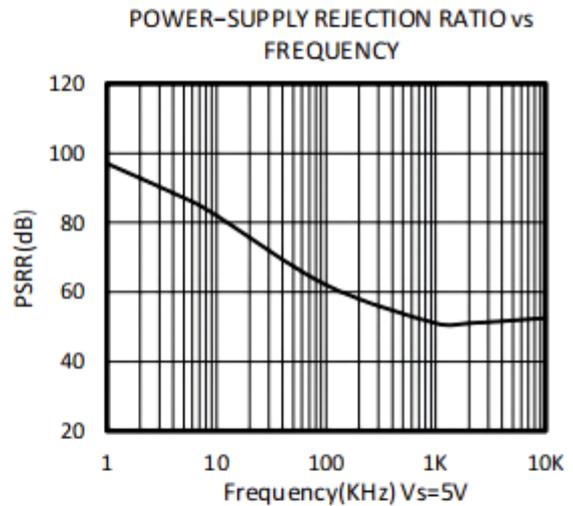
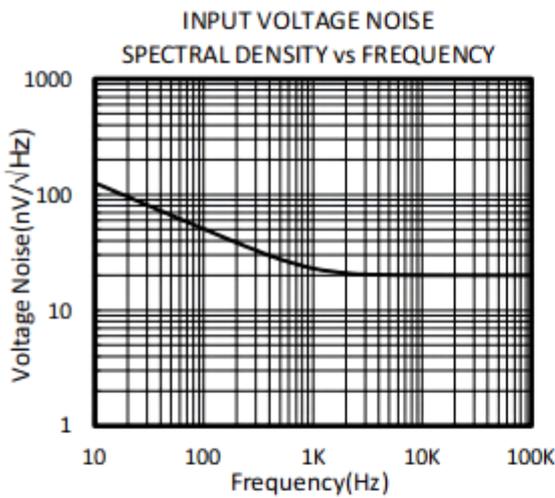
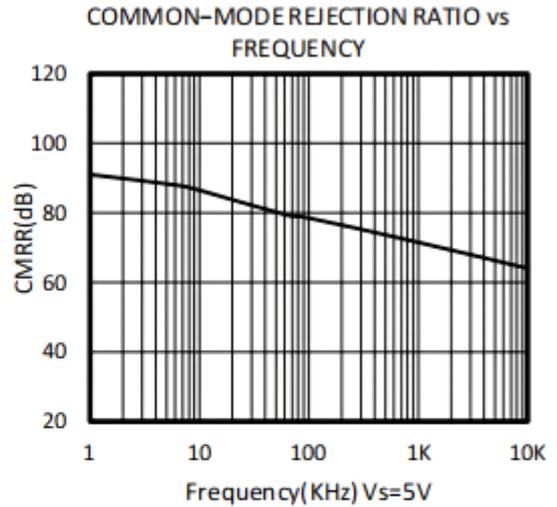
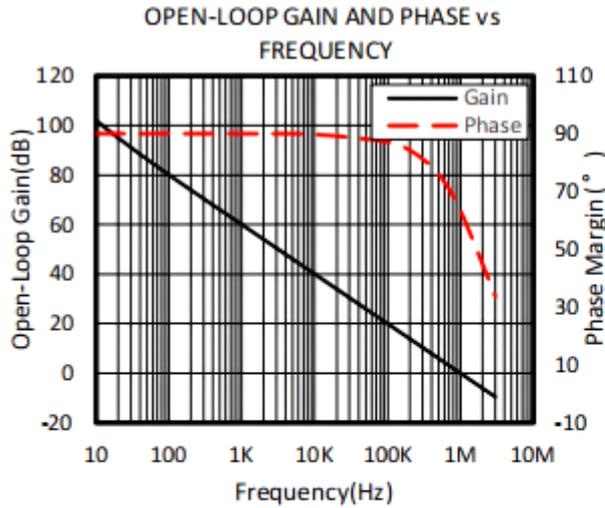
(At $T_A = +25^\circ\text{C}$, $V_S = 5\text{V}$, $R_L = 10\text{k}$ connected to $V_S/2$, and $V_{OUT} = V_S/2$, unless otherwise noted.)

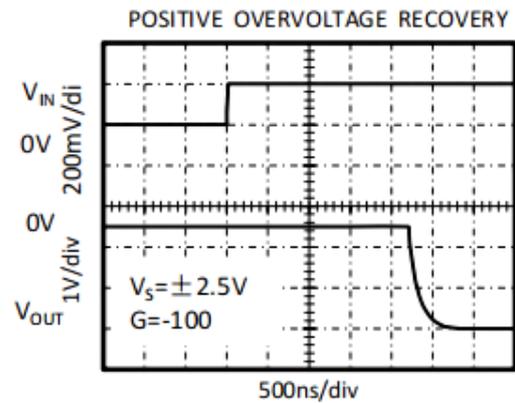
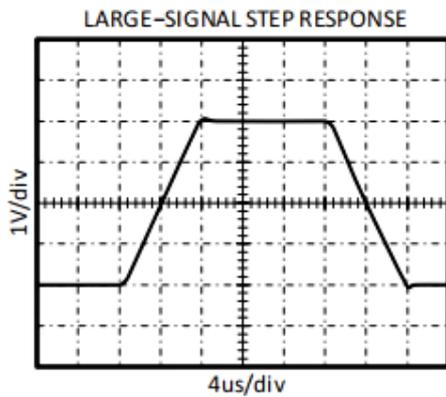
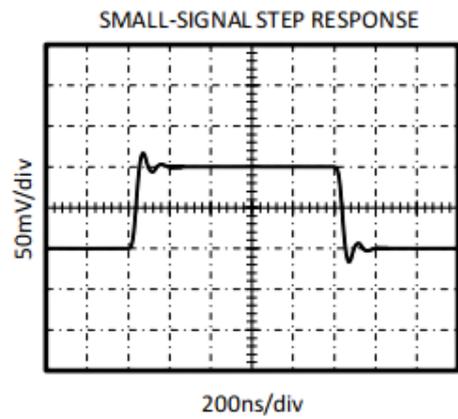
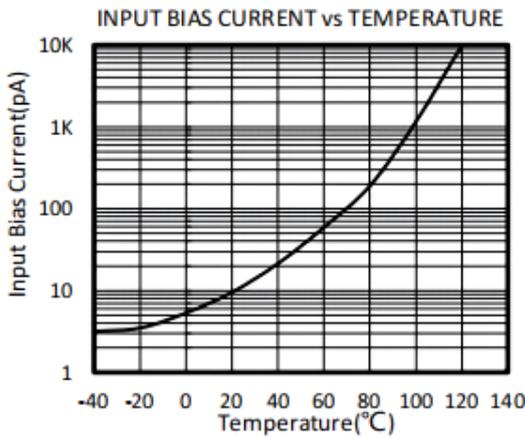
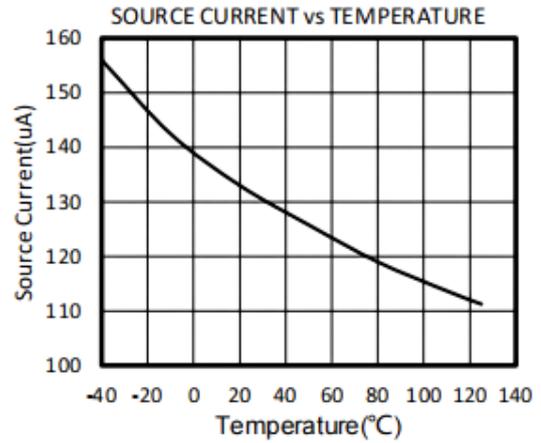
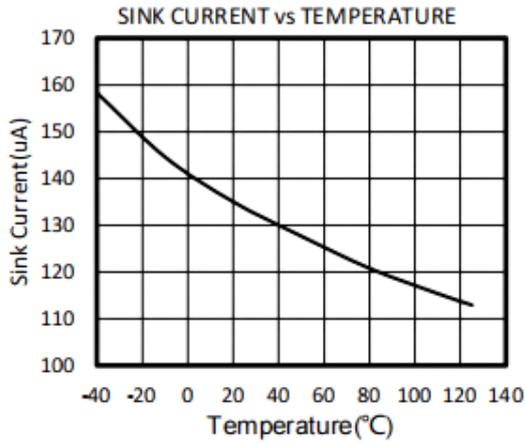
PARAMETER		CONDITIONS	T_J	AOS358A (S)			UINTS
				MIN	TYP	MAX	
POWER SUPPLY							
V_S	Operating Voltage Range		25	2.5		5.5	V
I_o	Quiescent Current/ Amplifier		25		120	220	μA
PSRR	Power-Supply Rejection Ratio	$V_S = 2.5\text{V to } 5.5\text{V}$, $V_{CM} = (V_-) + 0.5\text{V}$	25	74	90		dB
			-40 to 125	65			
INPUT							
V_{os}	Input Offset Voltage	$V_{CM} = 0\text{V to } 3.5\text{V}$	25	-4.5	± 0.8	4.5	mV
$V_{os\ TC}$	Input Offset Voltage Average Drift	-40 to 125			2		$\mu\text{V/}$
I_B	Input Bias Current		25		10	100	pA
I_{os}	Input Offset Current		25		1	10	pA
V_{CM}	Common-Mode Voltage Range	$V_S = 5.5\text{V}$	25	-0.1		5.6	V
CMRR	Common-Mode Rejection Ratio	$V_S = 5.5\text{V}$, $V_{CM} = -0.1\text{V to } 4\text{V}$	25	74	90		dB
			-40 to 125	68			
			25	63	80		
		$V_S = 5.5\text{V}$, $V_{CM} = -0.1\text{V to } 5.6\text{V}$	-40 to 125	57			
OUTPUT							
A_{OL}	Open-Loop Voltage Gain	$R_L = 2\text{K}$, $V_o = 0.15\text{V to } 4.85\text{V}$	25	85	105		dB
			-40 to 125	80			
			25	88	110		
		$R_L = 10\text{K}$, $V_o = 0.05\text{V to } 4.95\text{V}$	-40 to 125	83			
	Output Swing From Rail	$R_L = 2\text{K}$	25		25		mV
		$R_L = 10\text{K}$			8		
I_{out}	Output Current Source		25		130		mA
FREQUENCY RESPONSE							
SR	Slew Rate		25		0.5		V/ μs
GBP	Gain-Bandwidth Product		25		1.1		MHz
PM	Phase Margin		25		64		$^\circ$
t_s	Setting Time, 0.1%				1.3		μs
	Over Load Recovery Time	$V_{IN} = \text{Gain } V_S$			2.3		μs
NOISE							
e_n	Input Voltage Noise Density	$f = 1\text{KHz}$	25		22		nV/ Hz
		$f = 10\text{KHz}$	25		20		nV/ Hz

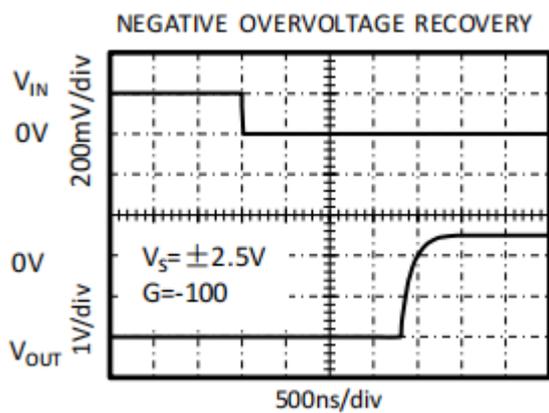


TYPICAL CHARACTERISTICS

At $T_A = +25^\circ\text{C}$, $V_S = 5\text{V}$, $R_L = 10\text{k}$ connected to $V_S/2$, $V_{OUT} = V_S/2$, unless otherwise noted.









APPLICATION NOTES

The AOS358A is high precision, rail-to-rail operational amplifiers that can be run from a single-supply voltage 2.5V to 5.5V ($\pm 1.25V$ to $\pm 2.75V$). Supply voltages higher than 7V (absolute maximum) can permanently damage the amplifier.

Rail-to-rail input and output swing significantly increases dynamic range, especially in low-supply applications.

Good layout practice mandates use of a 0.1uF capacitor place closely across the supply pins.

LAYOUT GUIDELINS

Attention to good layout practices is always recommended. Keep traces short. When possible, use a PCB ground plane with surface-mount components placed as close to the device pins as possible. Place a 0.1uF capacitor closely across the supply pins. These guidelines should be applied throughout the analog circuit to improve performance and provide benefits such as reducing the EMI susceptibility.

INSTRUMENTATION AMPLIFIER

In the three-op amp, instrumentation amplifier configuration shown in Figure 2

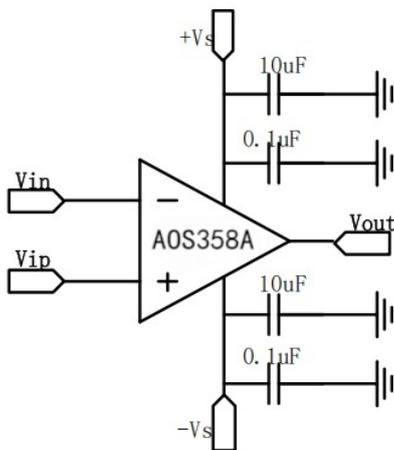


Figure1. Amplifier with Bypass Capacitors

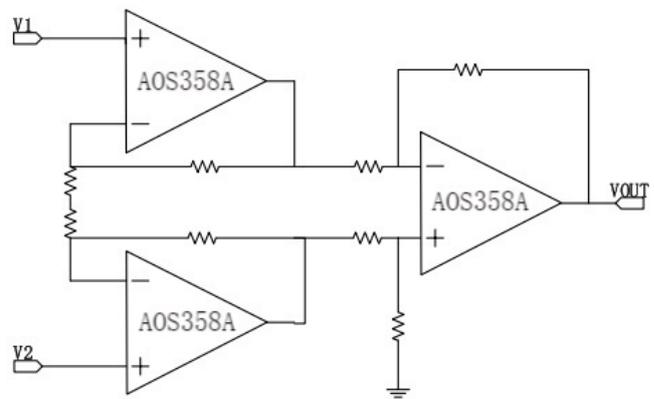
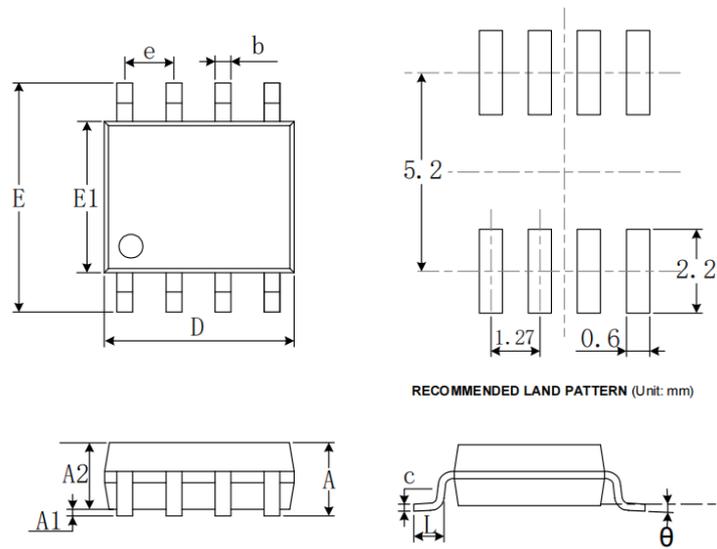


Figure2. Amplifier instrumentation amplifier



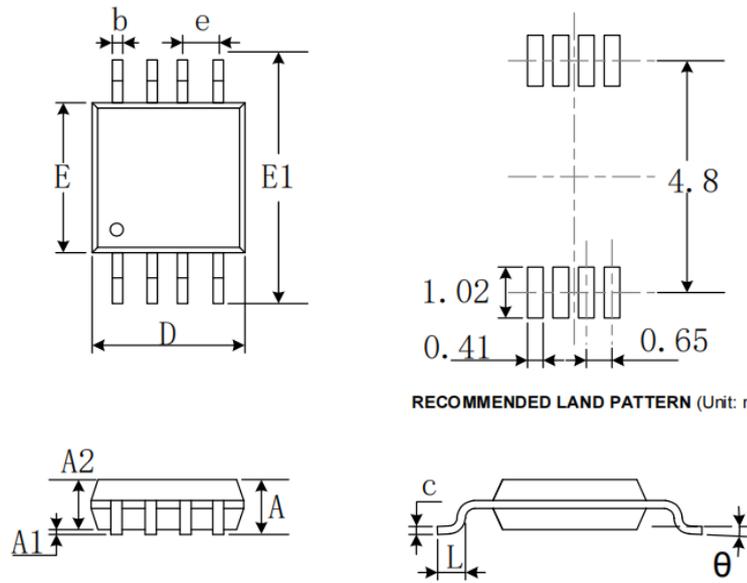
PACKAGE OUTLINE DIMENSIONS
SOIC-8



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	0.007	0.010
D	4.800	5.000	0.189	0.197
e	1.270 (BSC)		0.050 (BSC)	
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
L	0.400	1.270	0.016	0.050
	0°	8°	0°	8°



MSOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.820	1.100	0.032	0.043
A1	0.020	0.150	0.001	0.006
A2	0.750	0.950	0.030	0.037
b	0.250	0.380	0.010	0.015
c	0.090	0.230	0.004	0.009
D	2.900	3.100	0.114	0.122
e	0.650 (BSC)		0.026 (BSC)	
E	2.900	3.100	0.114	0.122
E1	4.750	5.050	0.187	0.199
L	0.400	0.800	0.016	0.031
	0°	6°	0°	6°