



PRELIMINARY

Precision CMOS Single Operational Amplifier

■ **DESCRIPTION**

The AA6081 is a precision low offset voltage operational amplifier, capable of single supply operation. Performance characteristics include ultra low input bias current, high voltage gain, rail-to-rail output swing, and an input common mode voltage range that includes ground. These features, plus its low offset voltage, make the AA6081 ideally suitable for precision circuit applications. The IC is available in **8-pin TSSOP (AA6081A)** and **8-pin SOP (AA6081S)** package. For a dual operational amplifier with similar features, see the AA6082 respectively.

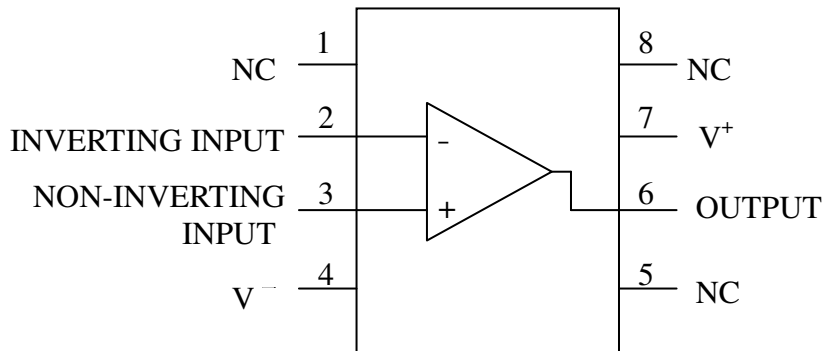
■ **FEATURES**

- 1. **Low offset voltage: 150 μ V**
- 2. **Operates from 4.5V to 15V single supply**
- 3. **Ultra low input bias current: 10fA**
- 4. **Output swing to within 20mV of supply tail, 100k load**
- 5. **Input common-mode range includes V^-**
- 6. **High voltage gain: 130 dB**
- 7. **Improved latch up immunity**

■ **APPLICATION**

- **Instrumentation amplifier**
- **Photodiode and infrared detector preamplifier**
- **Transducer amplifiers**
- **Medical instrumentation**
- **D/A converter**
- **Charge amplifier for piezoelectric transducers**

■ **AA6081 BLOCK DIAGRAM**





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■ **PIN DESCRIPTION**

Symbol	Pin No	Type	Function
NC	1	-	No Connect
IN-	2	I	Inverting INPUT
IN+	3	I	Non-Inverting INPUT
V ⁻	4	-	Negative Power Supply
NC	5	I	No Connect
OUTPUT	6	I	Amplifier OUTPUT
V ⁺	7	O	Positive Power Supply
NC	8	-	No Connect

■ **ABSOLUTE MAXIMUM RATING**

T_a = 25 °C

Parameter	Symbol	Rating			UNIT
		MIN	TYP	MAX	
Supply Voltage	V ⁺ - V ⁻	--	--	16	V
Differential Input	V _{IN}	--		±Supply Voltage	V
Operating Ambient Temperature	T _a	-40	--	85	°C
Storage Temperature	T _s	-40	--	125	°C

NOTE : Stress above those listed under “Absolute Maximum Rating” may cause device permanent damage to the device. This stress-rating only factor and functional operation of the device at these or any other conditions above those indicated in the operational section of this specification is not implied. Exposure to absolute maximum rating conditions for an extended period of time may affect device reliability of the device.



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■ **ELECTRICAL CHARACTERISTICS**

$T_a = 25^\circ\text{C}$, $V^+ = 5\text{V}$, $V^- = 0\text{V}$, $V_{CM} = 1.5\text{V}$, $V_O = 2.5\text{V}$, $R_L > 1\text{M}$

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Input offset voltage	V_{OS}	--	150	1000	μV	
Input Offset Voltage Average Drift	TCV_{OS}		1.0		$\mu\text{V}/^\circ\text{C}$	
Input Bias Current	I_B		0.01		pA	
Input offset current	I_{OS}		0.005		pA	
Input Resistance	R_{IN}		>10		Tera Ω	
Common Mode Rejection Ratio	CMRR	75	85		dB	
Positive Power Supply Rejection Ratio	+RSRR	75	85		dB	
Negative Power Supply Rejection Ratio	-PSRR	84	95		dB	
Input Common-Mode Voltage Range	V_{CM}	-0.1	-0.4	0	V	
Large Signal Voltage Gain	A_V	300	1400		V/mV	Sourcing $R_L = 2\text{K}\Omega$
		70	350			Sinking
		150	1200			Sourcing $R_L = 600\Omega$
		50	150			Sinking

■ ELECTRICAL CHARACTERISTICS (cont'd)

$T_a = 25^\circ\text{C}$, $V^+ = 5\text{V}$, $V^- = 0\text{V}$, $V_{CM} = 1.5\text{V}$, $V_O = 2.5\text{V}$, $R_L > 1\text{M}$

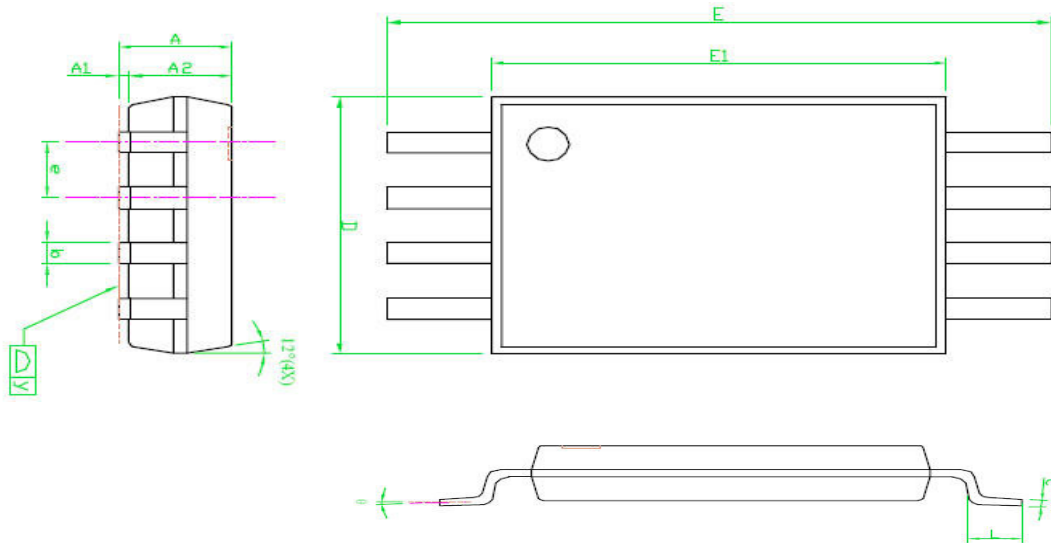
Output Swing	V_O	4.8	4.87		V	$V^+ = 5\text{V}$ $R_L = 2\text{K}\Omega$ to 2.5V
			0.10	0.19		
		4.5	4.61			$V^+ = 5\text{V}$ $R_L = 600\Omega$ to 2.5V
			0.3	0.63		
		14.3	14.63			$V^+ = 15\text{V}$ $R_L = 2\text{K}\Omega$ to 7.5V
			0.26	0.48		
		12.8	13.9			$V^+ = 15\text{V}$ $R_L = 600$ to 7.5V
			0.79	1.42		
Output Current $V^+ = 5\text{V}$	I_O	16	22		mA	Sourcing, $V_O = 0\text{V}$
		16	21			Sinking, $V_O = 5\text{V}$
Output Current $V^+ = 15\text{V}$	I_O	28	30		mA	Sourcing, $V_O = 0\text{V}$
		28	34			Sinking, $V_O = 13\text{V}$
Supply Current	I_S		450	750	μA	$V^+ = 5\text{V}$, $V_O = 1.5\text{V}$
			550	850		$V^+ = 15\text{V}$, $V_O = 7.5\text{V}$



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■ TSSOP-8 – AA6081A – PACKAGE DIMENSION



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	---	---	1.20	---	---	0.048
A1	0.05	---	0.15	0.002	---	0.006
A2	0.80	1.00	1.05	0.031	0.039	0.041
b	0.19	---	0.30	0.007	---	0.012
C	0.09	---	0.20	0.004	---	0.008
D	2.90	3.00	3.10	0.114	0.118	0.122
E	6.20	6.40	6.60	0.244	0.252	0.260
E1	4.30	4.40	4.50	0.169	0.173	0.177
e	---	0.65	---	---	0.026	---
L	0.45	0.60	0.75	0.018	0.024	0.030
y	---	---	0.10	---	---	0.004
θ	0°	---	8°	0°	---	8°

NOTES:

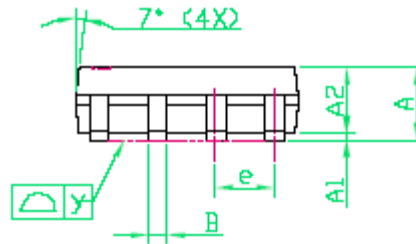
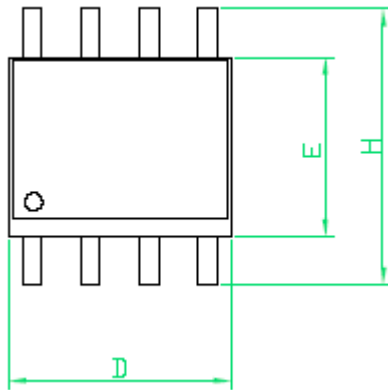
1. Package body sizes exclude mold flash protrusions or gate burrs.
2. Tolerance ± 0.1 mm (4 mil) unless otherwise specified
3. Coplanarity:0.1 mm
4. Controlling dimension is millimeter converted inch dimensions are not necessarily exact.
5. Followed from JEDEC MO-153.



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■ SOP-8 – AA6081S – PACKAGE DIMENSION



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.35	1.60	1.75	0.053	0.063	0.069
A1	0.10	---	0.25	0.004	---	0.010
A2	---	1.45	---	---	0.057	---
b	0.33	---	0.51	0.013	---	0.020
C	0.19	---	0.25	0.007	---	0.010
D	4.80	---	5.00	0.189	---	0.197
E	3.80	---	4.00	0.150	---	0.157
e	---	1.27	---	---	0.050	---
H	5.80	---	6.20	0.228	---	0.244
L	0.40	---	1.27	0.016	---	0.050
y	---	---	0.10	---	---	0.004
θ	0°	---	8°	0°	---	8°

NOTES:

1. Package body sizes exclude moldflash protrusions or gate burns.
2. Tolerance ± 0.1 mm (4 mil) unless otherwise specified
3. Coplanarity: 0.1 mm
4. Controlling dimension is millimeter converted inch dimensions are not necessarily exact
5. Followed from JEDEC MS-012