AS301A Operational Amplifier

Features

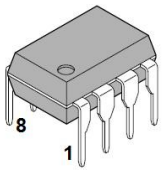
- Wide input voltage differential range
- Compensation network design flexibility
- Supply voltages from ±5V to ±18V
- Offset voltage 2 mV (typ)
- Input current 250 nA (typ)
- Offset current 30 nA (typ)
- Guaranteed drift characteristics
- Offsets guaranteed over entire common mode and supply voltage ranges
- Slew rate of 10 V/μs as a summing amplifier

AS301A



TO5-8

AS301AN



PDIP-8 (300 Mil)

General Description

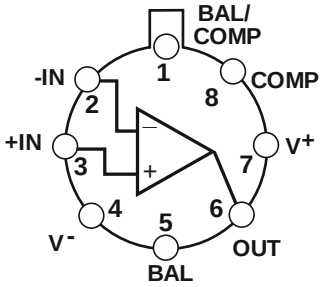
The AS301A is a general purpose operational amplifier. This amplifier offers many features which make its application nearly foolproof: overload protection on the input and output, no latch-up when the common mode range is exceeded, and freedom from oscillations and compensation with a single 30 pF capacitor. It has advantages over internally compensated amplifiers in that the frequency compensation can be tailored to the particular application.

For example, in low frequency circuits it can be overcompensated for increased stability margin. Or the compensation can be optimized to give more than a factor of ten improvements in high frequency performance for most applications.

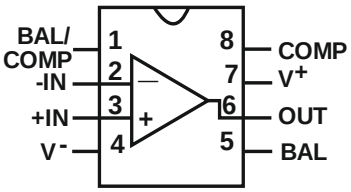
In addition, the device provides better accuracy and lower noise in high impedance circuitry. The low input currents also make it particularly well suited for long interval integrators or timers, sample and hold circuits and low frequency waveform generators. Further, replacing circuits where matched transistor pairs buffer the inputs of conventional IC op amps, it can give lower offset voltage and a drift.

The AS301AN is guaranteed over a temperature range of 0^{O}C to $+70^{O}$C and maintains performance at -45^{O}C and $+85^{O}$C.

(Top View)
TO5-8



(Top View)
PDIP-8



Pin Information

1	**BAL / COMP**	Offset Null / Compensation
2	**-IN**	Invert input
3	**+IN**	Noninvert input
4	**V^-**	Negative supply voltage
5	**BAL**	Offset Null Balance
6	**OUT**	Output
7	**V^+**	Positive supply voltage
8	**COMP**	Compensation

Absolute Maximum Ratings

	AS301A, AS301AN
Supply Voltage, V	±18V
Differential Input Voltage (Note 1)	±30V
Input Voltage (Note 1)	±15V
Operating Ambient Temp. Range	-0^{O}C to +70^{O}C
Tjmax	100^{O}C
Power Dissipation at Tamb=25^{O}C	200mW
Thermal Resistance (Typical)	135^{O}C/W
Storage Temperature Range	-65^{O}C to 150^{O}C
Lead Temperature (Soldering, 10 sec.)	260^{O}C

Electrical Characteristics (C1=30 pF, ±5 V≤ V_S≤±15V , 0^{O}C≤ Tamb≤+70^{O}C **)**

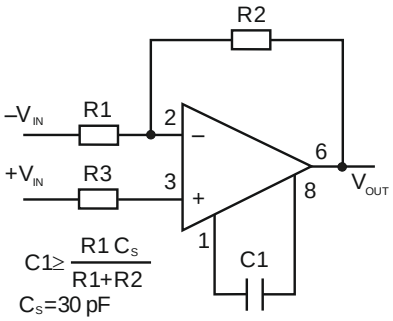
Parameter	**Conditions**	**AS301A, AS301AN**			**Units**
		Min	**Typ**	**Max**	
Input Offset Voltage	Tamb=25^{O}C, Rs≤50 kΩ		2	5	mV
Input Offset Current	Tamb=25^{O}C, R_L≥10 kΩ		30	200	nA
Input Bias Current	Tamb=25^{O}C,		250	500	nA
Input Resistance	Tamb=25^{O}C	0,5	2		MΩ
Supply Current	Vs=±15V		1,8	3	mA
Large Signal Voltage Gain	Tamb=25^{O}C, Vs=±15V, R_L≥2 kΩ, Vout=±10V	50			V/mV
Input Offset Voltage	Rs≤50kΩ, Tamb=Tmax			10	mV
Average Temperature Coefficient of Input Offset Voltage	Rs≤50 kΩ		6	30	μV/^{O}C
Input Offset Current	Tamb=Tmax			300	nA
Average Temperature Coefficient of Input Offset Current	25^{O}C≤Tamb≤Tmax		0,01	0,3	nA/^{O}C
	Tmin≤Tamb≤25^{O}C		0,02	0,6	nA/^{O}C
Input Bias Currnet	Tamb =Tmax			600	nA
Large Signal Voltage Gain	Vs=±15V, Vout=±10V, R_L≥2 kΩ	15			V/mV
Output Voltage Swing	Vs=±15V, R_L=10 kΩ	±12	±14		V
	R_L=2 kΩ	±11	±13		V
Input Voltage Range	Vs=±15V	±12	+15,-13		V
Common-Mode Rejection Ratio	Rs≤ 50 kΩ	70	90		dB
Supply Voltage Rejection Ratio	Rs≤ 50 kΩ	70	96		dB

Note 1: For supply voltages less than ±15V, the absolute maximum input voltage is equal to the supply voltage.

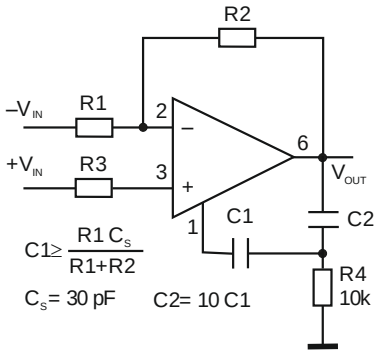
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Typical Performance Characteristics for Various Compensation Circuits

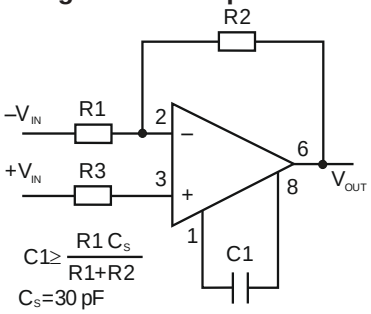
Balancing Circuit



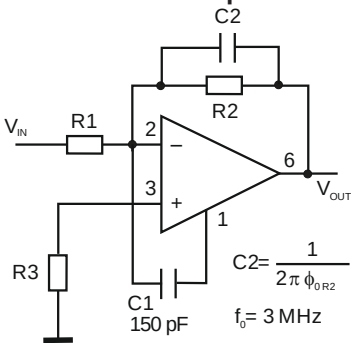
Two Pole Compensation

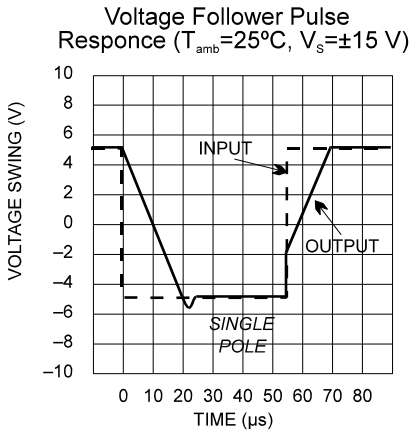


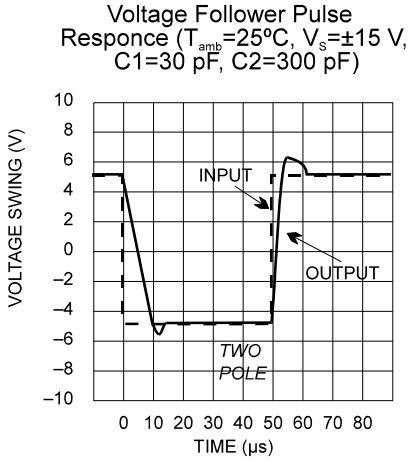
Single Pole Compensation

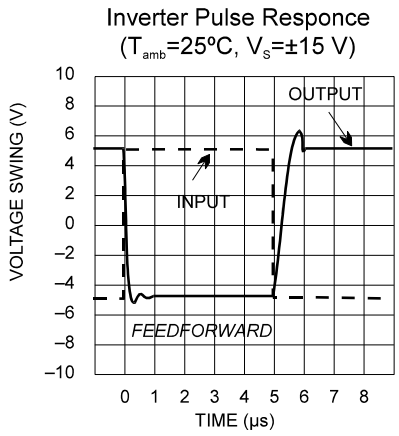


Feedforward Compensation

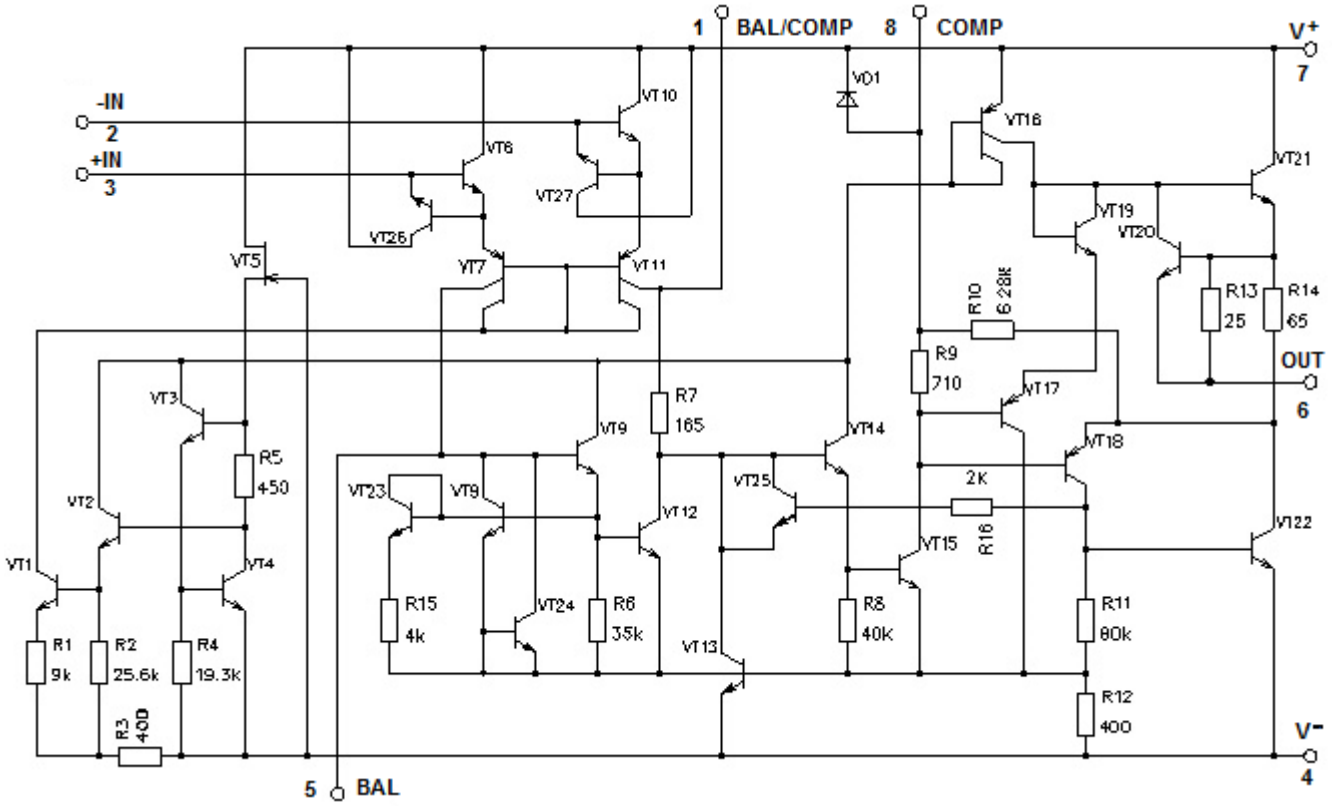






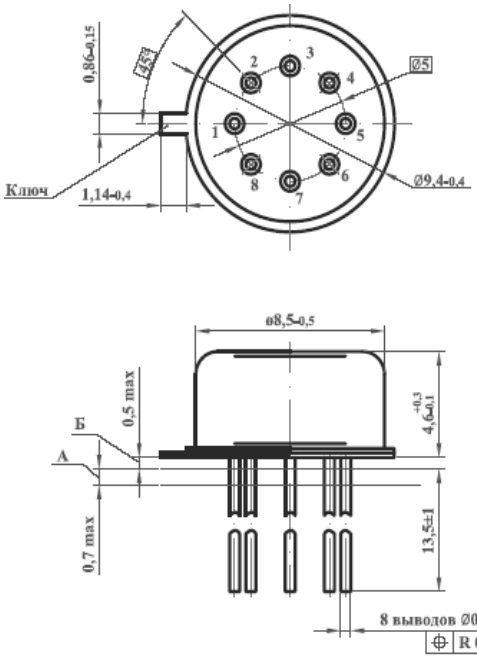


Representative Schematic Diagram



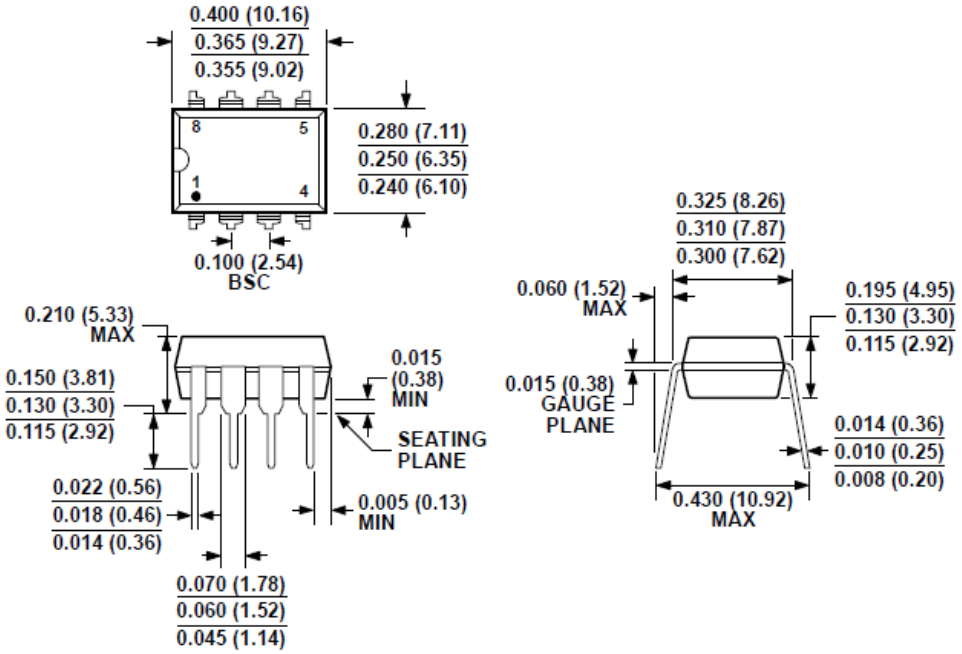
Dimensional drawings of the used cases

AS301A
Botton view



TO-5 (3101.8-1)
Units in millimeters

AS301AN



8-Lead Plastic Dual-in-Line Package (PDIP)
Units in inches and (millimeters)

Revision history

Date	Revision	Changes
24-Jan-2019	**1**	Initial version
25-Feb-2019	**2**	Minor changes