



**AS662 Dual Operational Transconductance Amplifiers (OTA) with buffer**

**Features**

- $g_m$  adjustable over 6 decades
- excellent  $g_m$  linearity
- excellent matching between amplifiers
- controlled buffer
- high output SNR
- LM13700 functional replacement

**Applications**

- current-controlled amplifiers
- stereo audio amplifiers
- current-controlled impedances
- current-controlled filters
- current-controlled oscillators
- multiplexers
- VCA
- S&H circuits

**AS662 D**

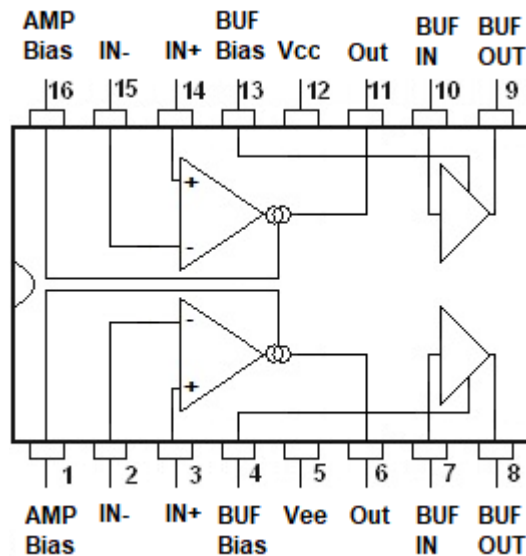


SOIC 16 , 150mil, 1.27 mm

**General Description**

The AS662D consists of two current-controlled transconductance amplifiers OTA, each with differential inputs and a push-pull output. Both amplifiers share common supplies, but operate independently. Two buffers allows external control and gives flexibility in application.

**Connection Diagram**



**Pin Functions**

Pin		Description
Name	Number	
Amp bias 1,2	1, 16	Current bias input
IN+ 1,2	3, 14	Positive input
IN- 1,2	2, 15	Negative input
OUT 1,2	6, 11	Output
BUF IN	7, 10	Buffer input
BUF OUT	8, 9	Buffer output
BUF BIAS	4, 13	Buffer bias
Vcc	12	Positive power supply
Vee	5	Negative power supply



**Absolute Maximum Ratings**

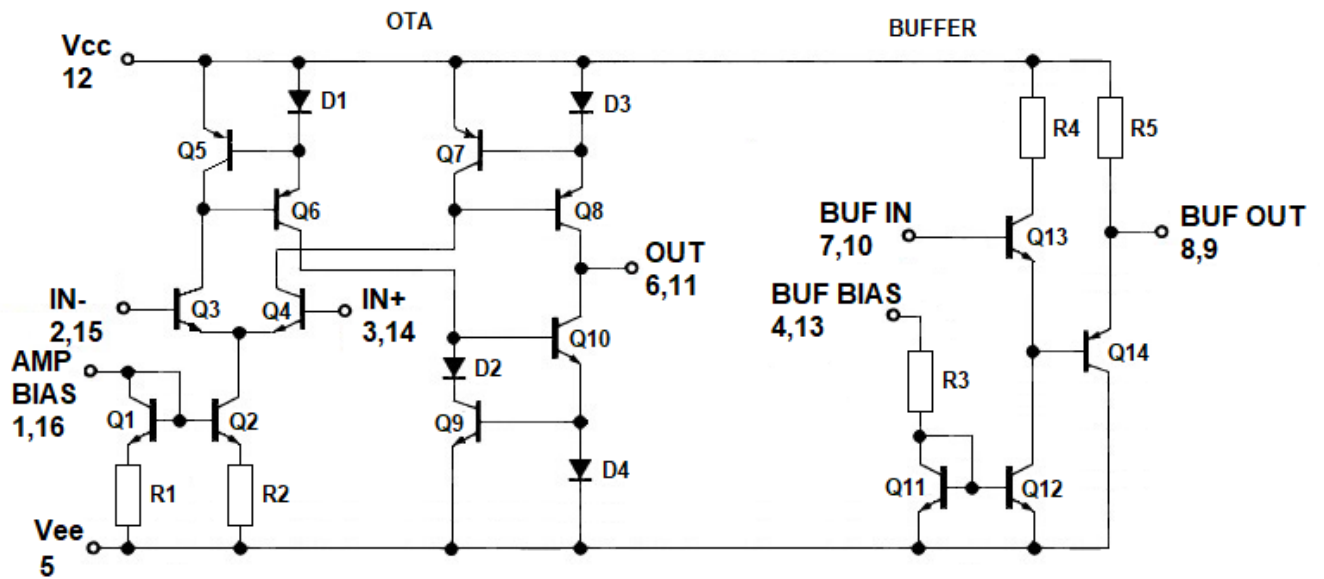
Supply voltage	36 V <sub>DC</sub> or ±18 V
Differential input voltage	± 5 V
Amplifier bias current (I <sub>ABC</sub> )	2 mA

**Electrical Characteristics**

( V<sub>s</sub> = ±15 V, T<sub>A</sub> = 25°C, amplifier bias current (I<sub>AMP BIAS</sub>) = 500 µA, amplifier output load - 27 kΩ, buffer load – 47 kΩ. )

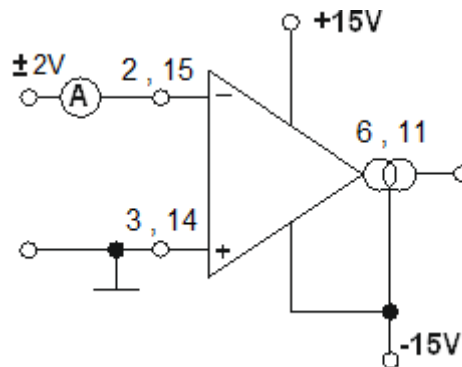
PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OTA</b>					
Input offset voltage (V <sub>OS</sub> ) AS662D AS662D*	I <sub>AMP BIAS</sub> = 5 µA			250 700	µV
Input offset change (V <sub>OSCH</sub> )	5 µA ≤ I <sub>AMP BIAS</sub> ≤ 500 µA		0	1	mV
Input offset current (I <sub>oi</sub> )			0	0,2	µA
Input bias current (I <sub>i</sub> )			0,9	1,5	µA
	Over specified temperature range		1	8	
Forward transconductance (g <sub>m</sub> )	I <sub>AMP BIAS</sub> = 500 µA	7700	8500	9100	µS
	Over specified temperature range	5400			
g <sub>m</sub> tracking			0,3		dB
Peak output current	R <sub>L</sub> = 0, I <sub>AMP BIAS</sub> = 5 µA		4,7		µA
	R <sub>L</sub> = 0, I <sub>AMP BIAS</sub> = 500 µA	400	450	510	
	R <sub>L</sub> = 0, over specified temp range	300			
Supply current, V+	I <sub>AMP BIAS</sub> = 500 µA, both channels		6,5	7,5	mA
Supply current, V-	I <sub>AMP BIAS</sub> = 500 µA, both channels	-9.5	-8		mA
CMRR		80	100		dB
Common-mode range		±12	±13		V
Crosstalk	Referred to input, f = 1 kHz, V <sub>i</sub> = 5 mVrms	70	100		dB
Differential input current (I <sub>DIC</sub> )	I <sub>AMP BIAS</sub> = 0 (refer to test circuit)		5.4	16	nA
Leakage current (I <sub>LC</sub> )	I <sub>AMP BIAS</sub> = 0 (refer to test circuit)		0.2		nA
Input resistance		10	26		kΩ
Open-loop bandwidth			2		MHz
Slew rate	Unity gain compensated		50		V/µs
Peak output voltage					
	Positive Negative	R <sub>L</sub> = 27kΩ R <sub>L</sub> = 27kΩ	11 -12,5	12,5 -11	V V
V <sub>OS</sub> sensitivity					
	Positive Negative	ΔV <sub>OS</sub> /ΔV <sup>+</sup> ΔV <sub>OS</sub> /ΔV <sup>-</sup>	20 20	150 150	µV/V µV/V
Distortion	I <sub>control</sub> = 200 µA, V <sub>i</sub> = 5 mVrms		0,25	1	%
Residual noise 1	I <sub>control</sub> = 0 µA, BPF (30~20 kHz, 3 dB, 6 dB / Oct)		-100	-90	dBm
Residual noise 2	I <sub>control</sub> = 200 µA, BPF (30~20 kHz, 3 dB, 6 dB / Oct)		-85	-66	dBm
Leakage level	I <sub>control</sub> = 0 µA, V <sub>in</sub> = -30 dBm f <sub>in</sub> = 20 kHz		-100	-75	dBm
<b>Buffer</b>					
Buffer offset	U <sub>BUF BIAS</sub> = 0 V, U <sub>BUF IN</sub> = 0V		-0,01	-0,1	V
Buffer input bias current	U <sub>BUF BIAS</sub> = 0 V, U <sub>BUF IN</sub> = 0V		1,2	2	µA
Peak output voltage					
	Positive Negative	R <sub>L</sub> = 47kΩ R <sub>L</sub> = 47kΩ	11 -12,5	12,5 -11	V V

**Functional block diagram - one Operational Transconductance Amplifier**



R1 ~ R2 ~ 400 Ohm ; R3 ~ 40k ; R4 ~ 500 Ohm ; R5 ~ 10k (tolerance +-20%)

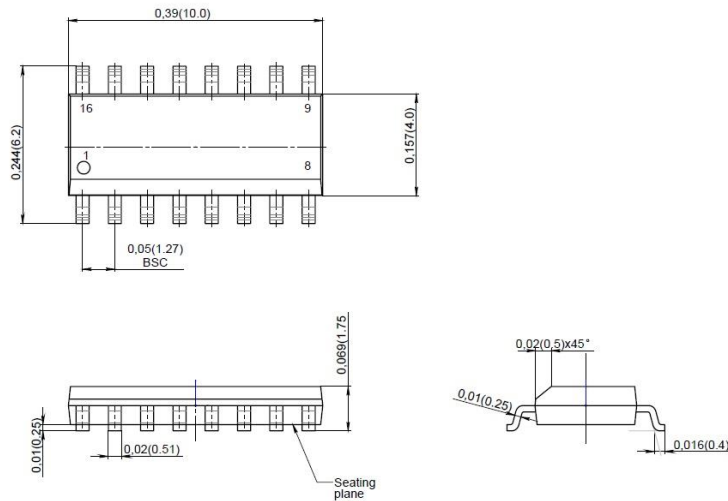
**Differential Input Current Test Circuit**





PART NUMBER	PACKAGE	BODY SIZE (NOM)	Additional marking
AS662D	SOIC 16	150 mil, 1.27 mm pitch	-----
AS662D *	SOIC 16	150 mil, 1.27 mm pitch	white dot

Package Dimensions in millimeters (inches)  
SOIC-16 (150 mil)



Revision history

Date	Revision	Changes
20-Dec-2021	1	Preliminary version 1
13-Apr-2022	2	Final version