



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

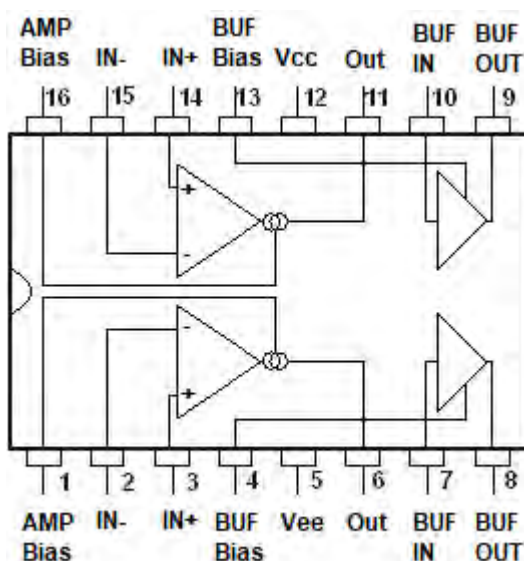


SOIC 16 , 150mil, 1.27 mm

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

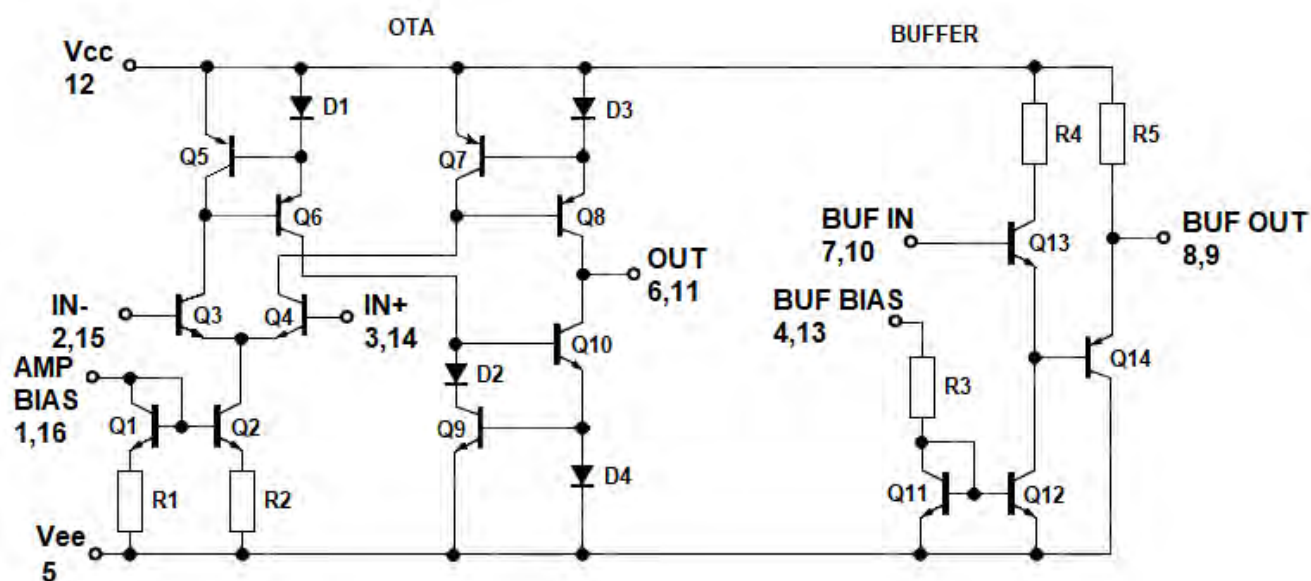
Supply voltage	36 V _{DC} or ±18 V
Differential input voltage	± 5 V
Amplifier bias current (I _{ABC})	2 mA

Electrical Characteristics

(V_s = ±15 V, T_A = 25°C, amplifier bias current (I_{AMP BIAS}) = 500 µA, amplifier output load - 27 kΩ, buffer load – 47 kΩ.)

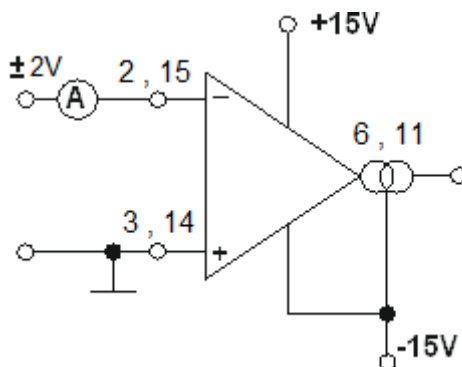
PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OTA					
Input offset voltage (V _{OS}) AS662D AS662D*	I _{AMP BIAS} = 5 µA			250 700	µV
Input offset change (V _{OSCH})	5 µA ≤ I _{AMP BIAS} ≤ 500 µA		0	1	mV
Input offset current (I _{OI})			0	0,2	µA
Input bias current (I _I)			0,9	1,5	µA
	Over specified temperature range		1	8	
Forward transconductance (g _m)	I _{AMP BIAS} = 500 µA	7700	8500	9100	µS
	Over specified temperature range	5400			
g _m tracking			0,3		dB
Peak output current	R _L = 0, I _{AMP BIAS} = 5 µA		4,7		µA
	R _L = 0, I _{AMP BIAS} = 500 µA	400	450	510	
	R _L = 0, over specified temp range	300			
Supply current, V+	I _{AMP BIAS} = 500 µA, both channels		6,5	7,5	mA
Supply current, V-	I _{AMP BIAS} = 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 _i = 5 mVrms	70	100		dB
Differential input current (I _{DIC})	I _{AMP BIAS} = 0 (refer to test circuit)		5.4	16	nA
Leakage current (I _{LC})	I _{AMP BIAS} = 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	R _L = 27kΩ	11	12,5	V
V _{OS} sensitivity	Negative	R _L = 27kΩ		-12,5	-11 V
	Positive	ΔV _{OS} /ΔV ⁺		20	150 µV/V
	Negative	ΔV _{OS} /ΔV ⁻		20	150 µV/V
Distortion	I _{control} = 200 µA, V _i = 5 mVrms		0,25	1	%
Residual noise 1	I _{control} = 0 µA, BPF (30~20 kHz, 3 dB, 6 dB / Oct)		-100	-90	dBm
Residual noise 2	I _{control} = 200 µA, BPF (30~20 kHz, 3 dB, 6 dB / Oct)		-85	-66	dBm
Leakage level	I _{control} = 0 µA, V _{in} = -30 dBm f _{in} = 20 kHz		-100	-75	dBm
Buffer					
Buffer offset	U _{BUF BIAS} = 0 V, U _{BUF IN} = 0V		-0,01	-0,1	V
Buffer input bias current	U _{BUF BIAS} = 0 V, U _{BUF IN} = 0V		1,2	2	µA
Peak output voltage					
	Positive	R _L = 47kΩ	11	12,5	V
Negative	R _L = 47kΩ		-12,5	-11	V

Functional block diagram - one Operational Transconductance Amplifier



$R1 \sim R2 \sim 400 \text{ Ohm}$; $R3 \sim 40k$; $R4 \sim 500 \text{ Ohm}$; $R5 \sim 10k$ (tolerance $\pm 20\%$)

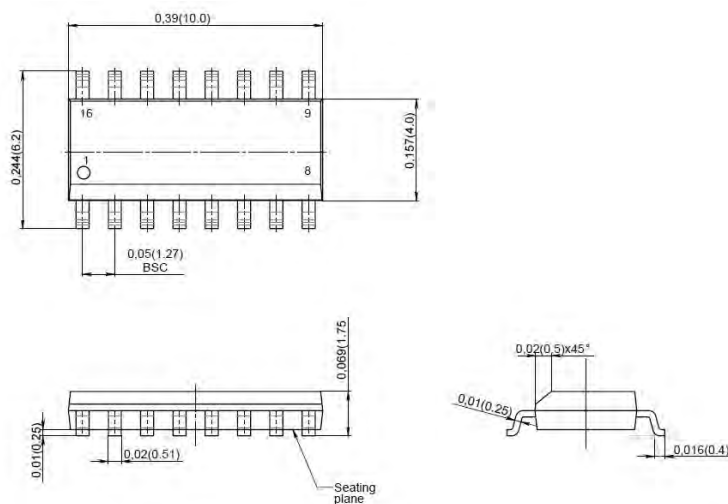
Differential Input Current Test Circuit





PART NUMBER	PACKAGE	BODY SIZE (NOM)	Additonal 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