

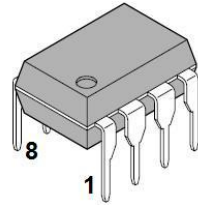


AS3080E – Operational Transconductance Amplifier (OTA) with linearizing diodes

Features

- maximum offset < 800 μ V
- slew rate (unity gain, compensated). 50V/ μ s
- adjustable power consumption. 10 μ W to 30 μ W
- flexible supply voltage range. \pm 2V to \pm 15V
- fully adjustable gain. 0 to $g_m R_L$ Limit
- tight g_m spread. 1,6:1
- extended g_m linearity 4 Decades
- linearizing diodes

AS3080E

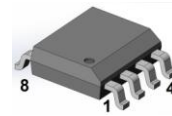


PDIP-8 300mil, 2.54 mm

Applications

- Sample and Hold
- Multiplexer
- Voltage Follower
- Multiplier
- Comparator

AS3080ED



SOIC-8 150mil, 1.27 mm

General Description

The AS3080E is a gain block which is the operational-transconductance-amplifier (OTA).

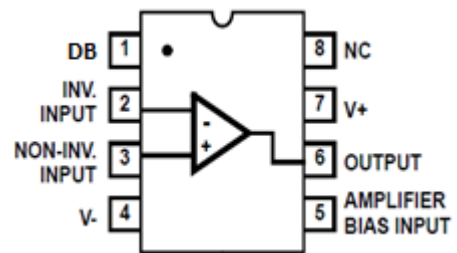
The AS3080E have differential input and a single-ended, push-pull, class A output. Amplifier bias input may be used either for gating or for linear gain control. High output impedance and transconductance (g_m) is directly proportional to the amplifier bias current (I_{ABC}). Linearizing diodes are provided at the inputs to reduce distortion and allow higher input levels. The result is a 10-dB signal-to-noise improvement referenced to 0,5 percent THD.

The AS3080E is notable for it's high slew rate (50V/ μ s), which makes it especially useful for multiplexer and fast unity-gain voltage followers. It is especially applicable for multiplexer applications because power is consumed only when the devices are in the "ON" channel state.

Pin Information

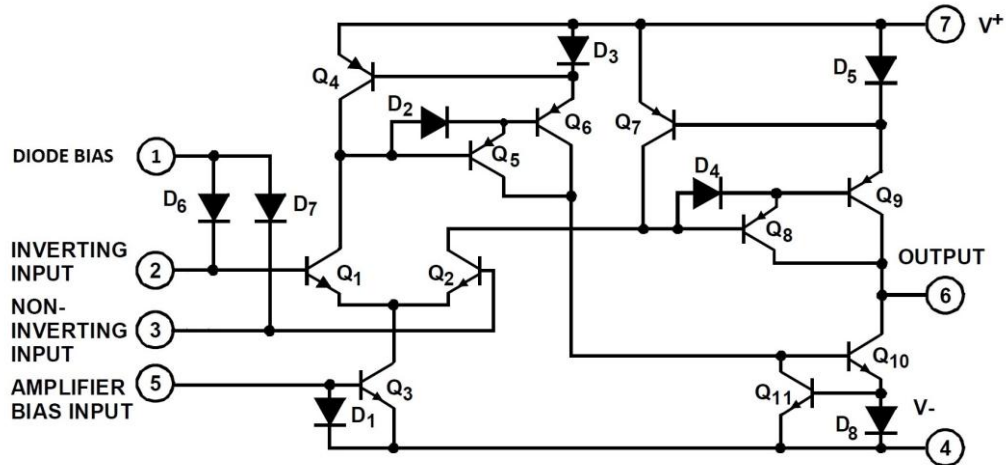
Pin No	Pin Name	Description
1	DB	Diode Bias
2	-IN	Inverting input
3	+IN	Noninverting input
4	-VEE	Negative supply
5	I _{ABC}	Amplifier bias input
6	OUT	Output
7	+VCC	Positive supply
8	NC	Not connect

Pinouts (PDIP, SOIC) Top view





Functional diagram of AS3080E



Absolute Maximum Ratings

Supply Voltage (Between V+ and V-).....+36V
 Differential Input Voltage.....5V
 Input Voltage RangeV+ to V-
 Input Signal Current1mA
 Amplifier Bias Current (I_{ABC}).....10mA
 Output Short Circuit Duration (Note 1).....Indefinite
 Linearizing Diode Bias Current, I_{DB}.....5mA
 Peak Input Current with Linearizing Diode.....±I_{DB}

Operating Conditions

Temperature Range
 AS3080E 0°C to 70°C
 Supply Voltage Range (Typ).....±2V to ±15V

CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

NOTE:

- Short circuit may be applied to ground or to either supply.

Electrical Specifications T_A=25°C, V_{SUPPLY}=±15V, unless otherwise specified

PARAMETER	SYMBOL	TEST CONDITIONS	AS3080E			UNITS
			MIN	TYP	MAX	
Input Offset Voltage	V _{IO}	I _{ABC} = 5µA	-	300	800	µV
		I _{ABC} = 500µA	-	400	800	µV
Input Offset Voltage Change	ΔV _{IO}	I _{ABC} = 500µA to 5µA	-	200	800	µV
V _{OS} including diodes (V _{OSDB})	ΔV _{IO} DB	I _{db} = 500 µA	-	800	1500	µV
Input Offset Voltage Drift	ΔV _{IO} /ΔT	I _{ABC} = 100µA, T _A = Full Temperature Range	-	3	-	µV/°C
Input Offset Voltage Sensitivity	Positive	ΔV _{IO} /ΔV+	-	-	150	µV/V
	Negative	ΔV _{IO} /ΔV-	-	-	150	µV/V
Input Offset Current	I _{IO}	I _{ABC} = 500µA	-	0,12	0,6	µA
Input Bias Current	I _{IB}	I _{ABC} = 500µA	-	2	5	µA
		I _{ABC} = 500µA, T _A = Full Temperature Range	-	-	15	µA
Differential Input Current	I _{ID}	I _{ABC} = 0, V _{DIFF} = 4V	-	0,008	5	nA
Amplifier Bias Voltage	V _{ABC}	I _{ABC} = 500µA	-	0,71	-	V
Input Resistance	R _I	I _{ABC} = 500µA	10	26	-	kΩ
Output Resistance	R _O	I _{ABC} = 500µA	-	15	-	MΩ
Input Capacitance	C _I	I _{ABC} = 500µA, f = 1MHz	-	3.6	-	pF
Output Capacitance	C _O	I _{ABC} = 500µA, f = 1MHz	-	7,5	-	pF

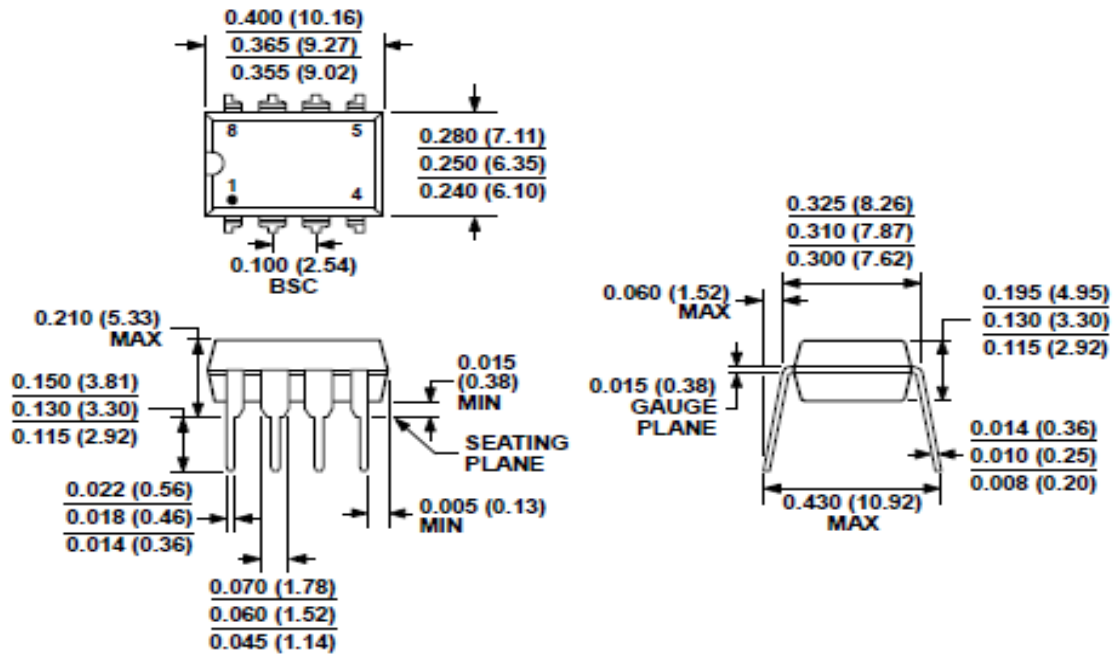


PARAMETER	SYMBOL	TEST CONDITIONS	AS3080E			UNITS	
			MIN	TYP	MAX		
Input-to-Output Capacitance	C _{IO}	I _{ABC} = 500μA, f = 1MHz	-	0,024	-	pF	
Common Mode Input-Voltage Range	V _{ICR}	I _{ABC} = 500μA	-	12 to -12	13,6 to -14,6	V	
Forward Transconductance (Large Signal)	G _M	I _{ABC} = 500μA,	7700	9600	12000	μS	
		Full Temp. Range	4000	-	-	μS	
Peak Output Current	Source	I _{OM+}	I _{ABC} = 5μA, R _L = 0Ω	3	5	7	μA
	Sink	I _{OM-}	I _{ABC} = 500μA, R _L = 0Ω	350	500	650	μA
Peak Output Current Sink and Source	I _{OM}	I _{ABC} = 500μA, R _L = 0Ω Full Temp. Range	300	-	-	μA	
Peak Output Voltage	Positive	V _{OM+}	I _{ABC} = 5μA, R _L = ∞	12	13,8	-	V
	Negativ	V _{OM-}		-12	-14,5	-	V
	Positive	V _{OM+}	I _{ABC} = 500μA, R _L = ∞	12	13,5	-	V
	Negativ	V _{OM-}		-12	-14,4	-	V
Amplifier Supply Current	I ₊	I _{ABC} = 500μA	0,8	1	1,2	mA	
Device Dissipation	P _D	I _{ABC} = 500μA	24	30	36	mW	
Magnitude of Leakage Current	I _{OL}	I _{ABC} = 0, V _{TP} = 0V	-	0,08	5	nA	
		I _{ABC} = 0, V _{TP} = 36V	-	0,3	5	nA	
Common Mode Rejection Ratio	CMRR	I _{ABC} = 500μA	80	110	-	dB	
Propagation Delay	t _{PHL} , t _{PLH}	I _{ABC} = 500μA	-	45	-	ns	
Open-Loop Bandwidth	BW _{OL}	I _{ABC} = 500μA	-	2	-	MHz	
Slew Rate,	SR _U	Uncompensated	-	75	-	V/μs	
	SR _C	Compensated	-	50	-	V/μs	

Device type	Package
AS3080E	PDIP-8 (300mil)
AS3080E D	SOIC-8 (150mil)

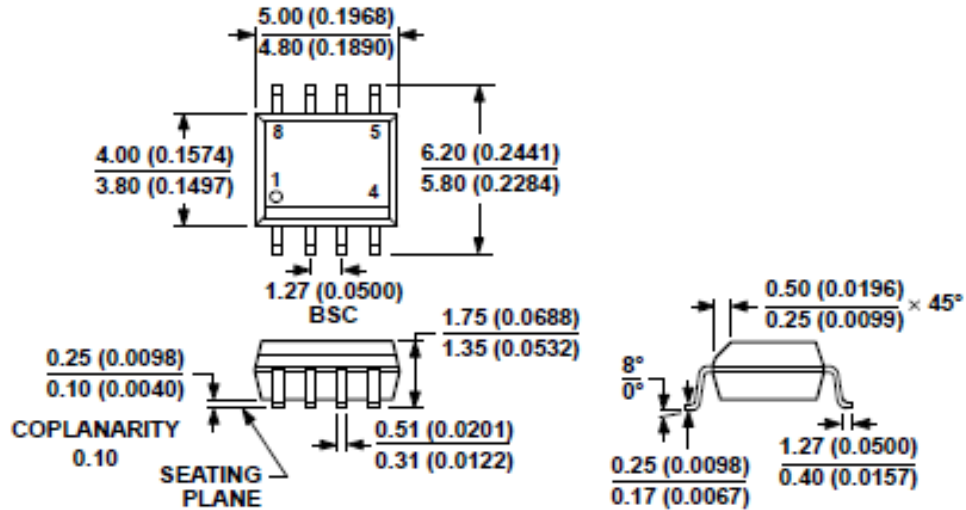
OUTLINE DIMENSIONS
 Dimensions show in inches and (millimeters)

AS3080E



8-Lead Plastic Dual In-Line Package (PDIP)

AS3080ED



8-Lead Standard Small Outline Package (SOIC_N)

Revision history

Date	Revision	Changes
17-Aug-2020	1	Initial version