



CA3080

Preliminary

LINEAR INTEGRATED CIRCUIT

2MHz, OPERATIONAL TRANSCONDUCTANCE AMPLIFIER (OTA)

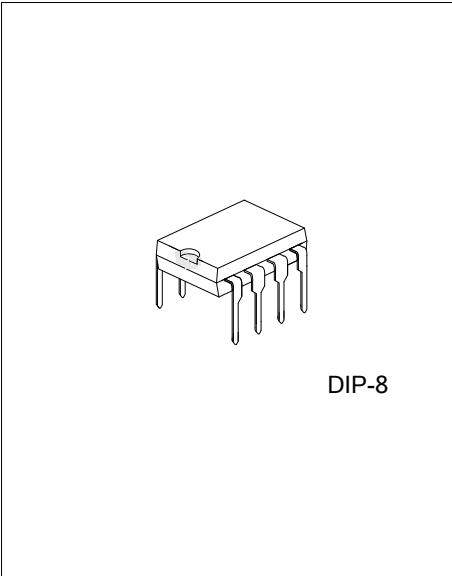
DESCRIPTION

The UTC CA3080, a high-performance operational -transconductance-amplifier (OTA) with Gatable-Gain Blocks, can be suitable applied in much several different conditions.

The UTC CA3080's characteristics are specifically controlled for applications such as sample-hold, gain-control, multiplexing, etc.

The UTC CA3080 type has differential input and a single-ended, push-pull, class A output. In addition, this type has an amplifier bias input which may be used either for gating or for linear gain control. This type also has a high output impedance and it's transconductance (g_m) is directly proportional to the amplifier bias current (I_{ABC}).

The UTC CA3080 type is notable for its excellent slew rate (50V/ μ s), which makes it especially useful for multiplexer and fast unity-gain voltage followers. This type is especially applicable for multiplexer applications because power is consumed only when the devices are in the "ON" channel state.



DIP-8

FEATURES

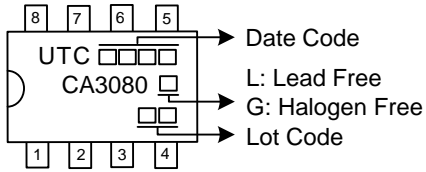
- * Slew Rate (Unity Gain, Compensated): 50V/ μ s
- * Adjustable Power Consumption: 10 μ W~30 μ W
- * Flexible Supply Voltage Range: \pm 2V~ \pm 15V
- * Fully Adjustable Gain: 0 to g_{mRL} Limit

ORDERING INFORMATION

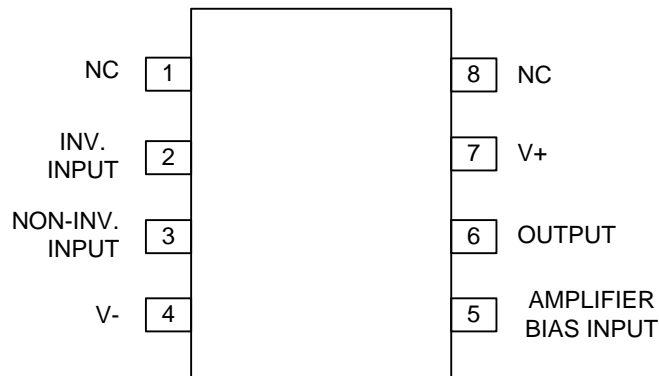
Ordering Number		Package	Packing
Lead Free	Halogen Free		
CA3080L-D08-T	CA3080G-D08-T	DIP-8	Tube

<p>CA3080G-D08-T</p> <ul style="list-style-type: none"> (1) Packing Type (2) Package Type (3) Green Package 	<ul style="list-style-type: none"> (1) T: Tube (2) D08: DIP-8 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING



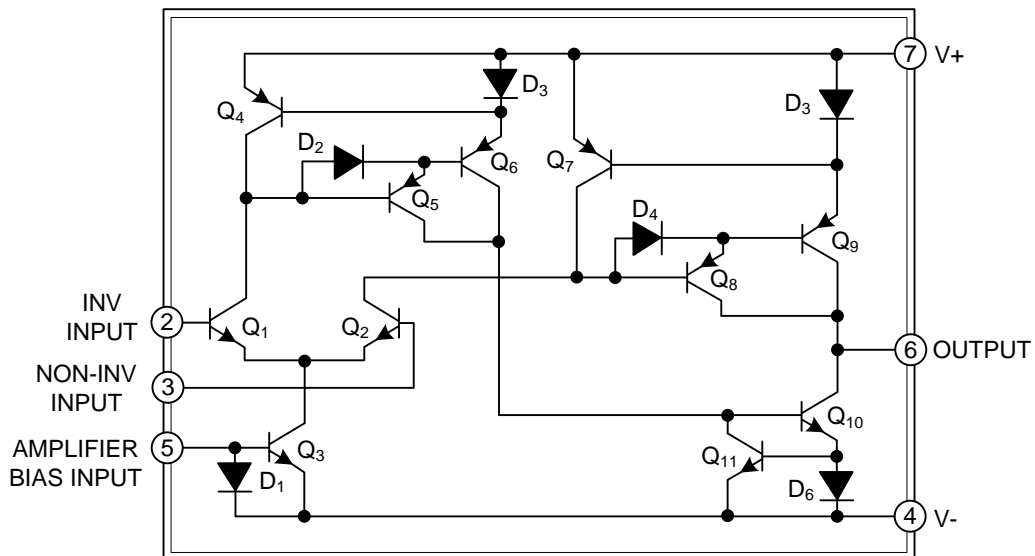
PIN CONFIGURATION



PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1, 8	NC	NC
2	INV- INPUT	Negative input
3	NON-INV INPUT	Positive input
4	V-	Negative supply voltage
5	AMPLIFIER BIAS INPUT	Bias input
6	OUTPUT	output
7	V+	Positive supply voltage
8	NC	NC

BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage (Between V+ and V- Terminal)	V_{CC}	36	V
Differential Input Voltage	V_{DI}	5	V
Input Voltage	V_{IN}	V+ ~ V-	
Input Signal Current	I_{SC}	1	mA
Amplifier Bias Current	I_{ABC}	2	mA
Maximum Junction Temperature (Plastic Package)	T_J	+150	°C
Maximum Storage Temperature Range	T_{STG}	-65 ~ +150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.
Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ OPERATING CONDITIONS

PARAMETER	SYMBOL	RATINGS	UNIT
Temperature Range	T_{STG}	-40 ~ +125	°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Thermal Resistance (Typical)	θ_{JA}	130	°C/W

Note: θ_{JA} is measured with the component mounted on an evaluation PC board in free air.

■ ELECTRICAL CHARACTERISTICS

For Equipment Design, $V_{\text{SUPPLY}} = \pm 15\text{V}$, Unless Otherwise Specified

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Offset Voltage		V_{OS}	$I_{\text{ABC}} = 5\mu\text{A}$		0.3	2	mV
			$I_{\text{ABC}} = 500\mu\text{A}$		0.4	2	mV
Input Offset Voltage Change		ΔV_{OS}	$I_{\text{ABC}} = 500\mu\text{A} \sim 5\mu\text{A}$		0.1		mV
Input Offset Voltage Sensitivity	Positive	$\Delta V_{\text{IO}/V+}$	$I_{\text{ABC}} = 500\mu\text{A}$			150	$\mu\text{V}/\text{V}$
	Negative	$\Delta V_{\text{IO}/V-}$				150	$\mu\text{V}/\text{V}$
Input Offset Current		I_{OS}	$I_{\text{ABC}} = 500\mu\text{A}$		0.12	0.6	μA
Input Bias Current		I_{B}	$I_{\text{ABC}} = 500\mu\text{A}$		2	5	μA
Differential Input Current		I_{DI}	$I_{\text{ABC}} = 0, V_{\text{DIFF}} = 4\text{V}$		0.008	5	nA
Amplifier Bias Voltage		V_{BIAS}	$I_{\text{ABC}} = 500\mu\text{A}$		0.71		V
Input Resistance		R_{I}	$I_{\text{ABC}} = 500\mu\text{A}$		36		k Ω
Input Capacitance		C_{I}	$I_{\text{ABC}} = 500\mu\text{A}, f = 1\text{MHz}$		5		pF
Input-to-Output Capacitance		C_{I} to C_{O}	$I_{\text{ABC}} = 500\mu\text{A}, f = 1\text{MHz}$		0.024		pF
Common-Mode Input-Voltage Range		V_{ic}	$I_{\text{ABC}} = 500\mu\text{A}$	12~ -12	13.6~ -14.5		V
Forward Transconductance (Large Signal)		gm	$I_{\text{ABC}} = 500\mu\text{A}$	6700	9600	13000	μmho
Output Capacitance		C_{O}	$I_{\text{ABC}} = 500\mu\text{A}, f = 1\text{MHz}$		10		pF
Output Resistance		R_{O}	$I_{\text{ABC}} = 500\mu\text{A}$		15		M Ω
Peak Output Current		I_{O}	$I_{\text{ABC}} = 5\mu\text{A}, R_{\text{L}} = 0\Omega$	3	5	7	μA
			$I_{\text{ABC}} = 500\mu\text{A}, R_{\text{L}} = 0\Omega$	350	500	650	μA
Peak Output Voltage	Positive	V_{Om}	$I_{\text{ABC}} = 5\mu\text{A}, R_{\text{L}} = \infty$		13.8		V
	Negative				-14.5		V
	Positive		$I_{\text{ABC}} = 500\mu\text{A}, R_{\text{L}} = \infty$	12	13.5		V
	Negative			-12	-14.4		V
Amplifier Supply Current		I_{CC}	$I_{\text{ABC}} = 500\mu\text{A}$	0.8	1.1	1.3	mA
Device Dissipation		P_{D}	$I_{\text{ABC}} = 500\mu\text{A}$	24	30	36	mW
Magnitude of Leakage Current		I_{IEAK}	$I_{\text{ABC}} = 0, V_{\text{TP}} = 0$		0.08	5	nA
			$I_{\text{ABC}} = 0, V_{\text{TP}} = 36\text{V}$		0.3	5	nA
Propagation Delay		T_{P}	$I_{\text{ABC}} = 500\mu\text{A}$		55		ns
Common-Mode Rejection Ratio		CMRR	$I_{\text{ABC}} = 500\mu\text{A}$	80	110		dB
Open-Loop Bandwidth		BW	$I_{\text{ABC}} = 500\mu\text{A}$		2		MHz
Slew Rate		SR	Uncompensated		75		V/ μs
			Compensated		50		V/ μs

■ TYPICAL APPLICATION CIRCUIT

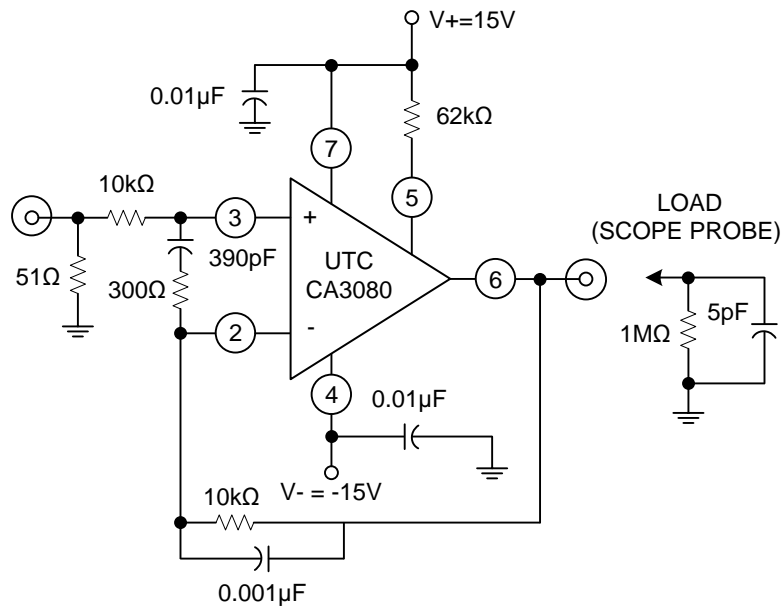
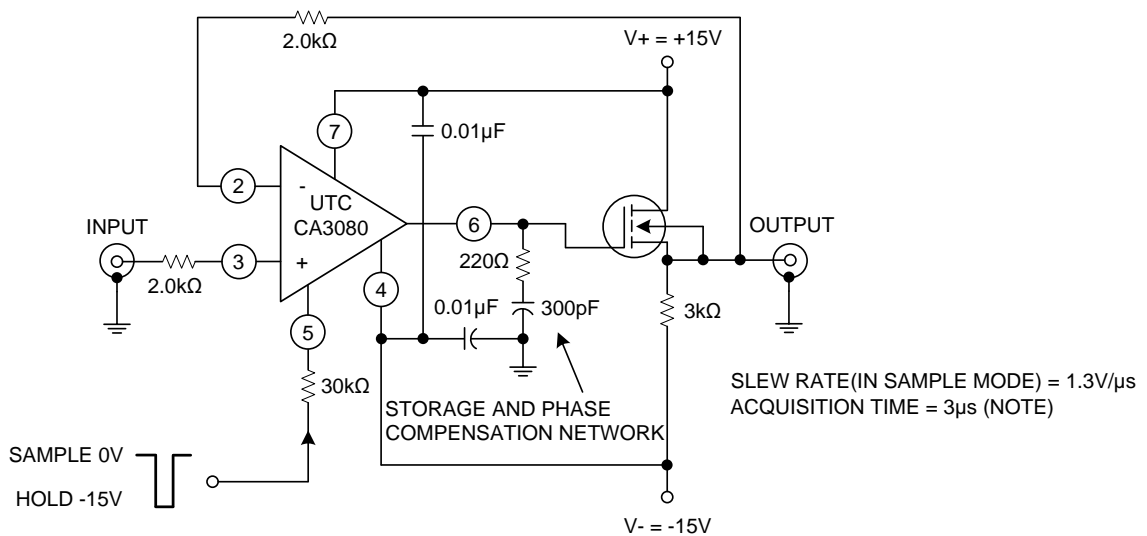


Figure 1. Schematic diagram of the UTC CA3080 in a unity-gain voltage follower configuration



Note: Time required for output to settle within $\pm 3\text{mV}$ of a 4V step.

Figure 2. Schematic diagram of the UTC CA3080 in a sample-and-hold configuration

■ TYPICAL APPLICATION CIRCUIT (Cont.)

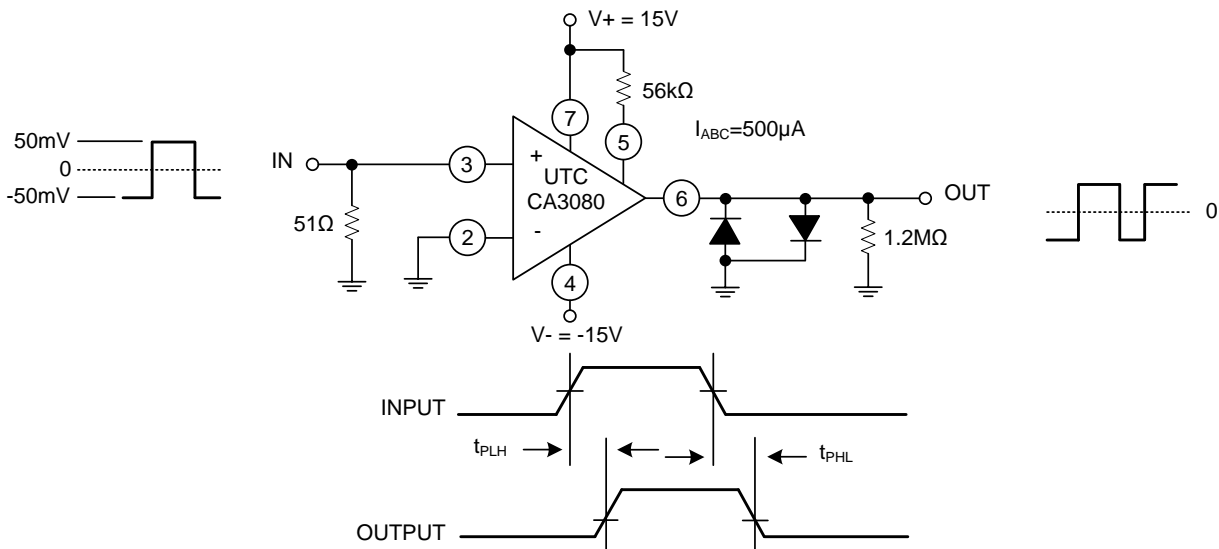


Figure 3. Propagation delay test circuit and associated waveforms

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