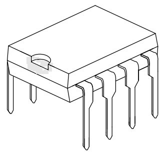
2MHz, OPERATIONAL TRANSCONDUCTANCE AMPLIFIER (OTA)



DIP-8

■ 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/µs), 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.

■ FEATURES

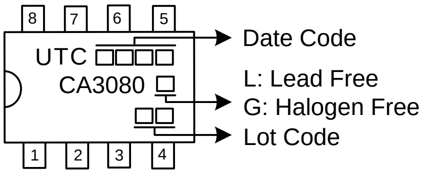
* Slew Rate (Unity Gain, Compensated): 50V/µs
* Adjustable Power Consumption: 10µW~30µW
* Flexible Supply Voltage Range: ±2V~ ±15V
* Fully Adjustable Gain: 0 to $g_M R_L$ Limit

■ ORDERING INFORMATION

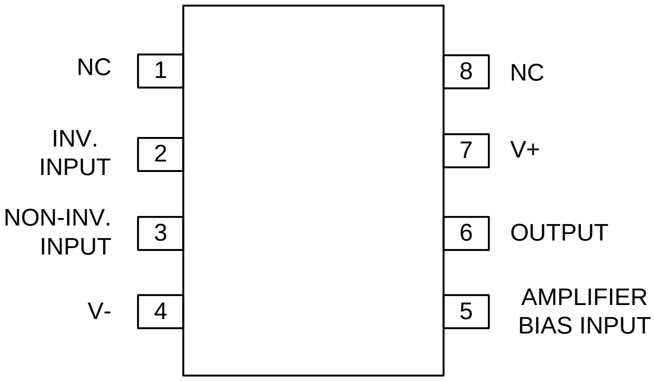
Ordering Number		Package	Packing
Lead Free	Halogen Free		
CA3080L-D08-T	CA3080G-D08-T	DIP-8	Tube

CA3080G-D08-T	
(1)Packing Type	(1) T: Tube
(2)Package Type	(2) D08: DIP-8
(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



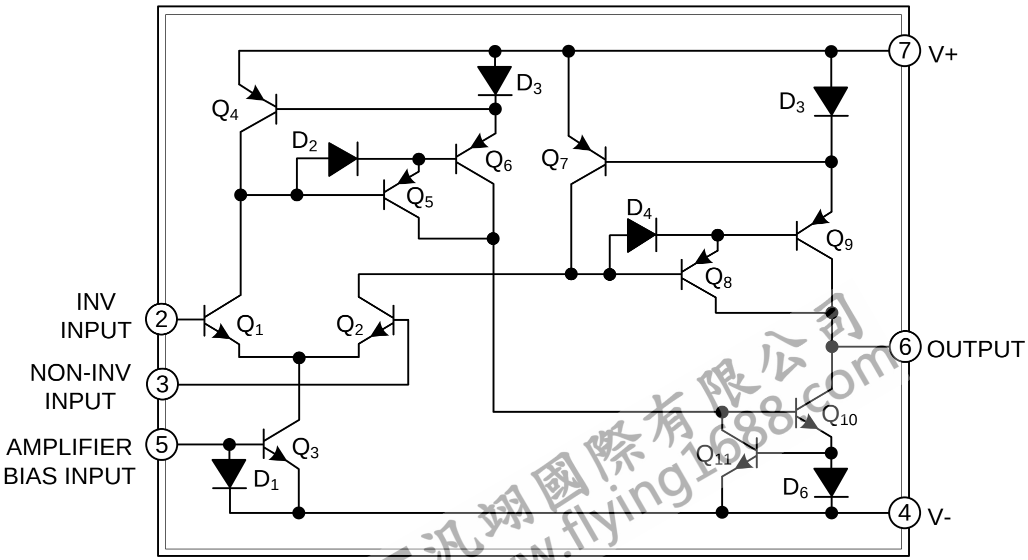
■ PIN CONFIGURATION



■ 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_{SUPPLY}=±15V, Unless Otherwise Specified

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

■ TYPICAL APPLICATION CIRCUIT

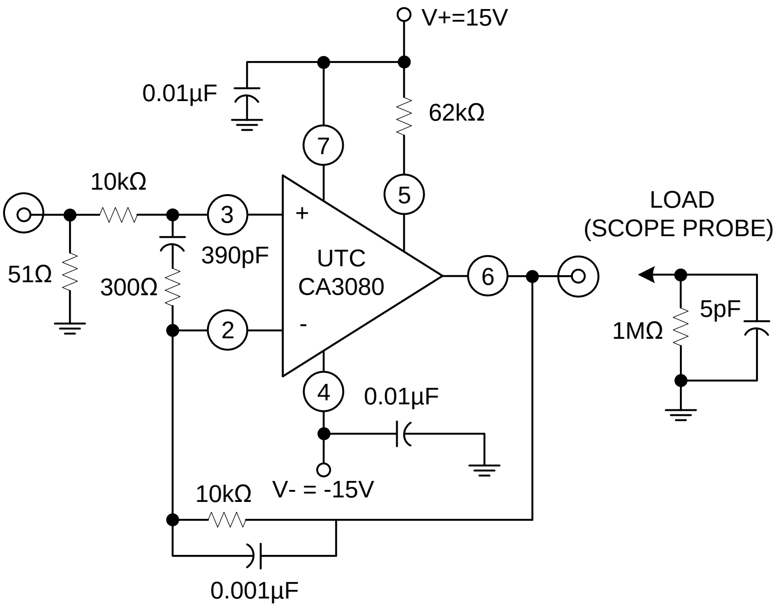
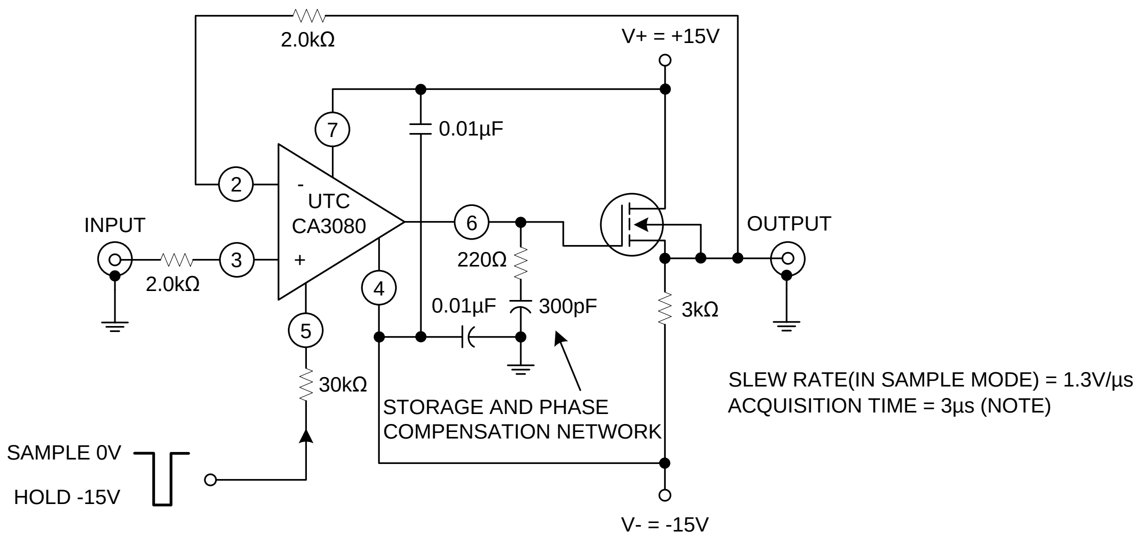


Figure 1. Schematic diaghram of the UTC CA3080 in a unity-gain voltage follower configuration



Note: Time required for output to settle within ±3mV of a 4V step.

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

■ TYPICAL APPLICATION CIRCUIT (Cont.)

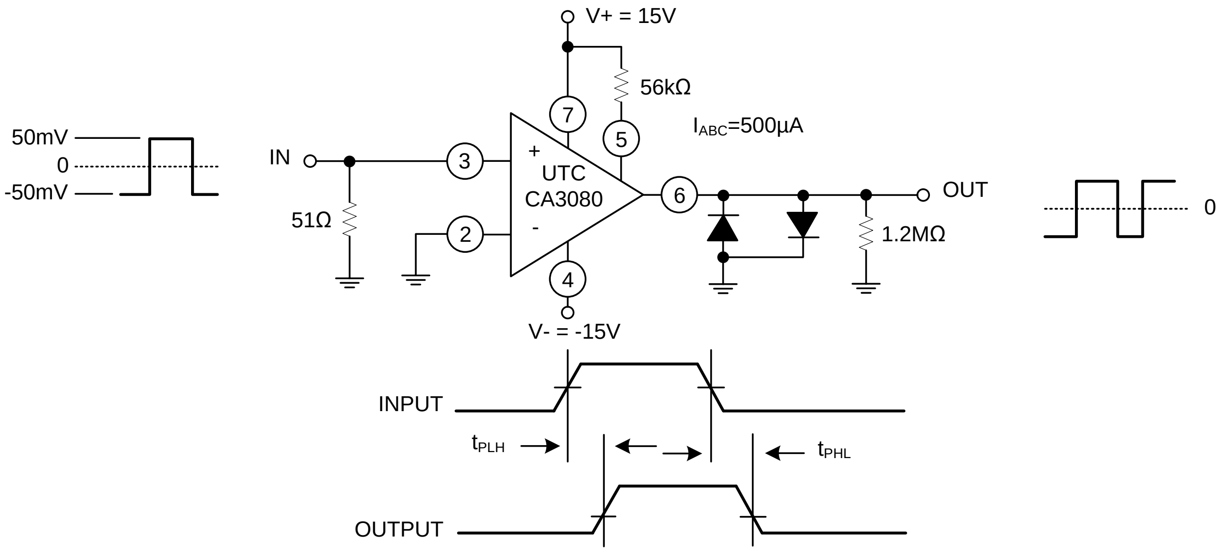


Figure 3. Propagation delay test circuit and associated waveforms