



ULV6001

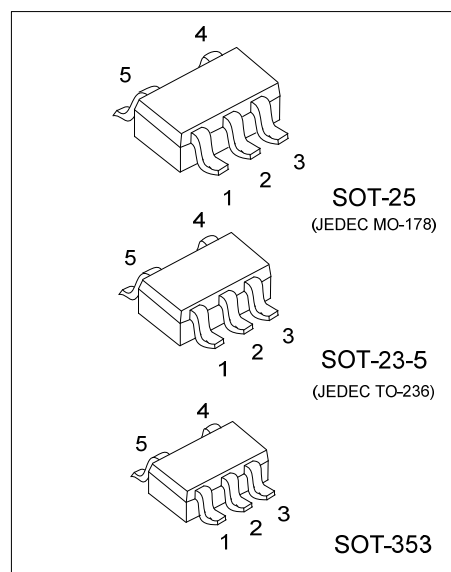
CMOS IC

LOW POWER RAIL TO RAIL
INPUT / OUTPUT OP AMP

■ DESCRIPTION

The UTC **ULV6001** of operational amplifiers (op amps) with low operational voltage (1.8V, min.) is specifically designed for general-purpose applications. This amplifier will draw 100 μ A (typ.) quiescent current when the single supply voltage is as low as 1.8V. It also has a power supply range of 1.8V to 5.5V. Additionally, the UTC **ULV6001** supports rail-to-rail input and output swing, with a common mode input voltage range of $V^+ + 300\text{mV}$ to $V^- - 300\text{mV}$.

The UTC **ULV6001** is available in the industrial and extended temperature ranges.



■ FEATURES

- * Rail-to-Rail Input/Output
- * Supply Voltage: 1.8V~5.5V
- * Quiescent Current: 100 μ A (typ.)

■ ORDERING INFORMATION

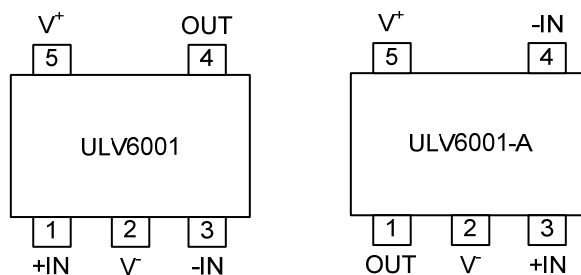
Ordering Number		Package	Packing
Lead Free	Halogen Free		
ULV6001L-AE5-R	ULV6001G-AE5-R	SOT-23-5	Tape Reel
ULV6001L-AF5-R	ULV6001G-AF5-R	SOT-25	Tape Reel
ULV6001L-AF5-A-R	ULV6001G-AF5-A-R	SOT-25	Tape Reel
ULV6001L-AL5-R	ULV6001G-AL5-R	SOT-353	Tape Reel

ULV6001G-AF5-A-R	
(1) Packing Type	(1) R: Tape Reel
(2) Pin Code	(2) A: refer to PIN CONFIGURATIONS
(3) Package Type	(3) AE5: SOT-23-5, AF5: SOT-25, AL5: SOT-353
(4) Green Package	(4) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

ULV6001	ULV6001-A

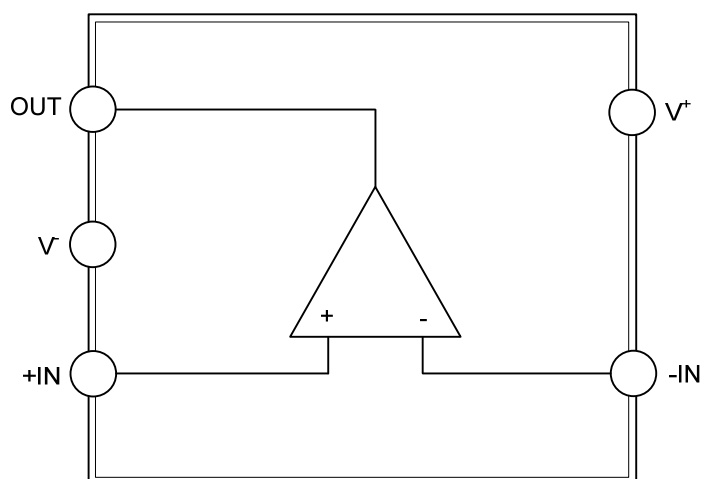
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NAME	DESCRIPTION
+IN	Non-inverting Input
V ⁻	Negative Power Supply
-IN	Inverting Input
OUT	Output
V ⁺	Positive Power Supply

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Power Supply	V ⁺ - V ⁻	7.0	V
Current at Input Pins	I _{IN}	±2	mA
Analog Inputs (V _{IN} ⁺ , V _{IN} ⁻)		V ⁻ -1.0 ~ V ⁺ +1.0	V
All Inputs and Outputs		V ⁻ -0.3 ~ V ⁺ +0.3	V
Difference Input Voltage		V ⁺ - V ⁻	V
Operating Temperature Range	T _A	-40 ~ +85	°C
Maximum Junction Temperature	T _J	+150	°C
Storage Temperature	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.

■ DC ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified)

(V⁺=+1.8V~+5.5V, V⁻=GND, V_{CM}= V⁺/2, R_L=10kΩ to V⁺/2, and V_{OUT} ≈ V⁺/2)

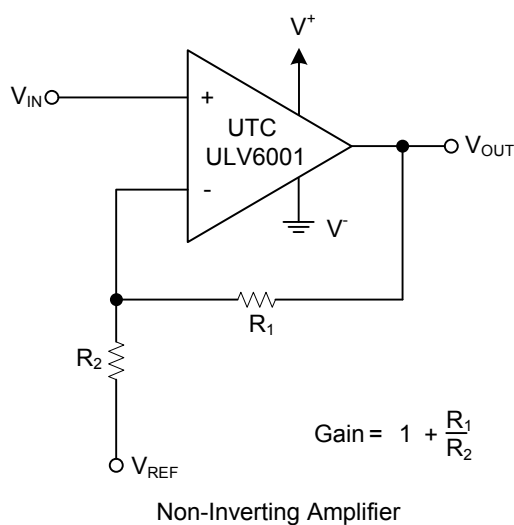
V ⁺ = +1.8V ~ +5.5V, V ⁻ = GND, V _{CM} = V _{I2} , R _L = 10kΩ to V _{I2} , and V _{OUT} ~ V _{I2})						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Offset						
Input Offset Voltage	V _{OS}		-7		+7	mV
Power Supply Rejection	PSRR	V _{CM} = V ⁻		76		dB
Input Bias Current and Impedance						
Input Bias Current	I _B			±1.0		pA
Input Offset Current	I _{OS}			±1.0		pA
Common Mode Input Impedance	Z _{CM}			10 ¹³ 6		Ω pF
Differential Input Impedance	Z _{DIFF}			10 ¹³ 3		Ω pF
Common Mode						
Common Mode Input Range	V _{CMR}		V ⁻ -0.3		V ⁺ +0.3	V
Common Mode Rejection Ratio	CMRR	V _{CM} =-0.3V~5.3V, V ⁺ =5V	60	76		dB
Open-Loop Gain						
DC Open-Loop Gain (Large Signal)	A _{OL}	V _{OUT} =0.3V~ V ⁺ - 0.3V, V _{CM} = V ⁻	88	112		dB
Output						
Maximum Output Voltage Swing	V _{OL} , V _{OH}	V ⁺ =5.5V	V ⁺ +0.1		V ⁺ -0.1	V
Output Short-Circuit Current	I _{SC}	V ⁺ =1.8V		±12		mA
		V ⁺ =5.5V		±50		mA
Power Supply						
Supply Voltage	V _{DD}		1.8		5.5	V
Quiescent Current per Amplifier	I _O	I _O =0, V ⁺ =5.5V		100	315	μA

■ AC ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified)

(V⁺=+1.8V~+5.5V, V⁻=GND, V_{CM}= V⁺/2, V_{OUT} ≈ V⁺/2, R_L=10kΩ to V⁺/2, and C_L=60pF)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
AC Response						
Gain Bandwidth Product	GBWP			1.5		MHz
Phase Margin	PM	G=+1V/V		110		°
Slew Rate	SR			0.9		V/μs
Noise						
Input Noise Voltage	E _{ni}	f=0.1Hz~10Hz		6.1		μVp-p
Input Noise Voltage Density	e _{ni}	f=1kHz		28		nV/√Hz
Input Noise Current Density	i _{ni}	f=1kHz		0.6		fA/√Hz

■ TYPICAL APPLICATION CIRCUIT



UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.