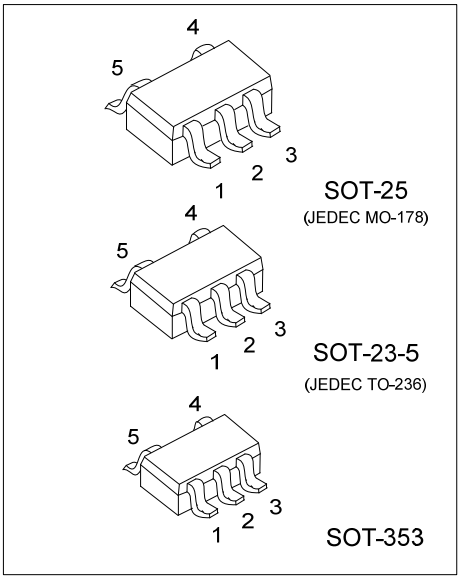
ULV6001

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 100μA (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^+ +300mV to V^- -300mV.

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

■ FEATURES

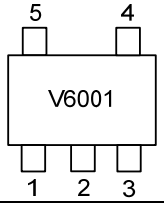
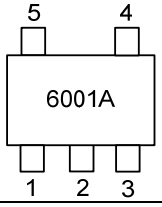
* Rail-to-Rail Input/Output
* Supply Voltage: 1.8V~5.5V
* Quiescent Current: 100μA (typ.)

■ ORDERING INFORMATION

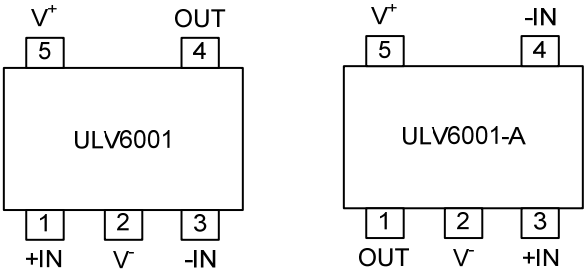
Ordering Number		Package	Packing
Lead Free	Halogen Free		
ULV6001L-AE5-R	ULV6001G-AE5-R	SOT-23-5	Tape Reel
ULV6001L-AF5-R	ULV6001G-AF5-R	SOT-25	Tape Reel
ULV6001L-AF5-A-R	ULV6001G-AF5-A-R	SOT-25	Tape Reel
ULV6001L-AL5-R	ULV6001G-AL5-R	SOT-353	Tape Reel

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

■ MARKING

ULV6001	ULV6001-A
	

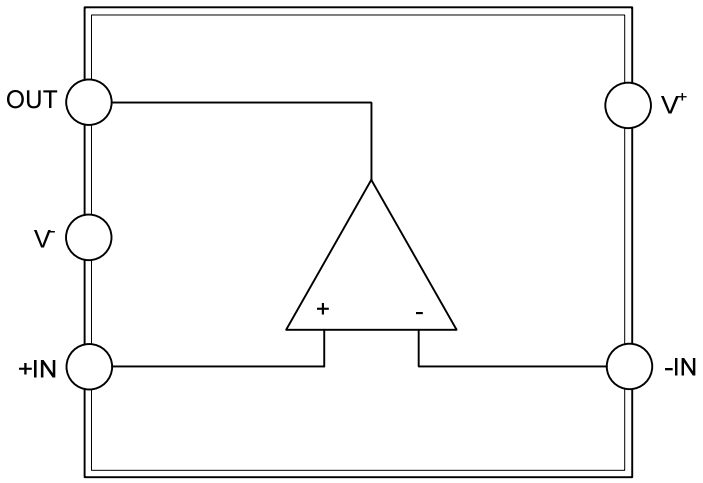
■ PIN CONFIGURATION



■ 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		$\lvert V^+ - V^- \rvert$	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)

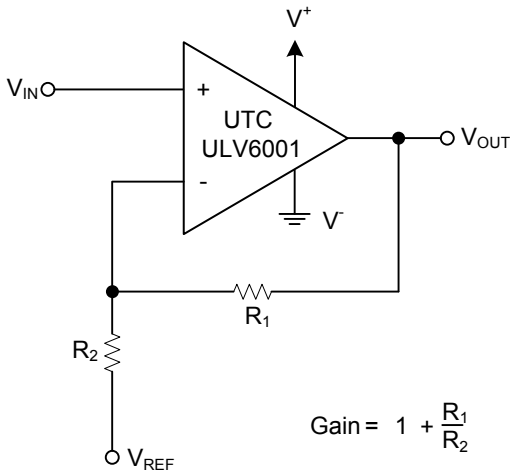
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Offset						
Input Offset Voltage	V_{OS}		-7		+7	mV
Power Supply Rejection	PSRR	V_{CM}= V^-		76		dB
Input Bias Current and Impedance						
Input Bias Current	I_B			±1.0		pA
Input Offset Current	I_{OS}			±1.0		pA
Common Mode Input Impedance	Z_{CM}			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_Q	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/$\sqrt{Hz}$
Input Noise Current Density	i_{ni}	f=1kHz		0.6		fA/$\sqrt{Hz}$

■ TYPICAL APPLICATION CIRCUIT



Non-Inverting Amplifier