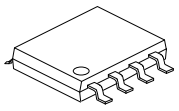
ULV6002

CMOS IC

LOW POWER RAIL TO RAIL INPUT / OUTPUT DUAL OP AMP



SOP-8

■ DESCRIPTION

The UTC **ULV6002** of operational amplifiers (op amps) with low operational voltage (1.8V, min.) is specifically designed for general-purpose applications. This amplifier will draw 150μA (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 **ULV6002** supports rail-to-rail input and output swing, with a common mode input voltage range of V_{DD} +300mV to V_{SS} -300mV.

The UTC **ULV6002** is available in the industrial and extended temperature ranges.

■ FEATURES

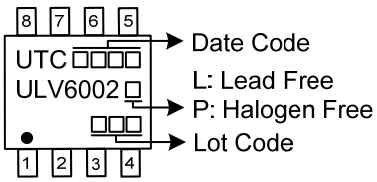
* Supply Voltage: 1.8~5.5V
* Supply Current/Amplifier: 315μA (Max.)
* Input Offset Voltage: 7mV (Max.)
* Rail-to-Rail Input and Output
* Slew Rate: 1.1V/μs (Typ.)

■ ORDERING INFORMATION

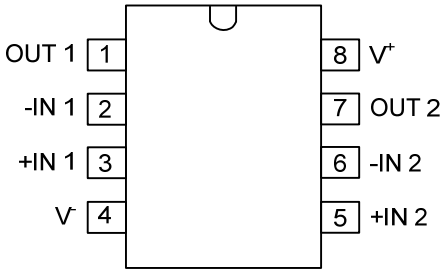
Ordering Number		Package	Packing
Lead Free	Halogen Free		
ULV6002L-S08-R	ULV6002G-S08-R	SOP-8	Tape Reel

ULV6002G-S08-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) S08: SOP-8 (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



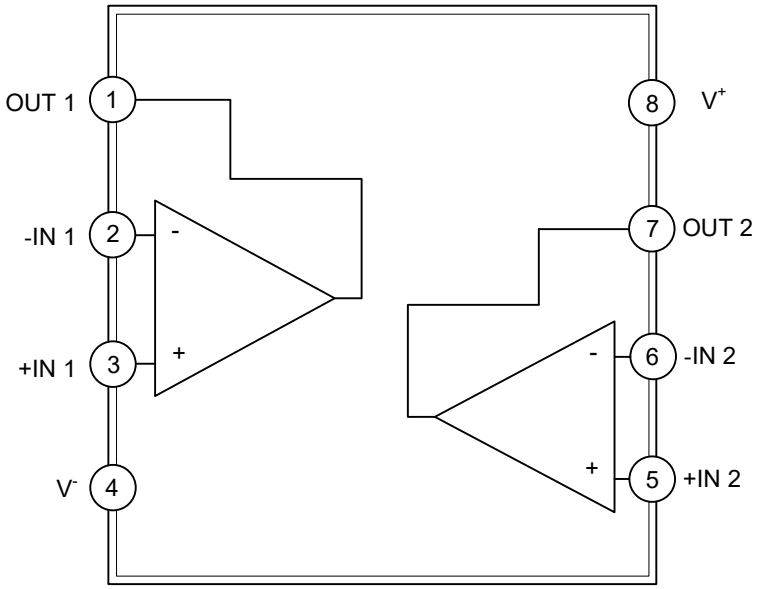
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	OUT 1	Output of 1 AMP
2	-IN 1	Inverting Input of 1 AMP
3	+IN 1	Non-inverting input of 1 AMP
4	V^-	Negative power supply
5	+IN 2	Non-inverting input of 2 AMP
6	-IN 2	Inverting input of 2 AMP
7	OUT 2	Output of 2 AMP
8	V^+	Positive power supply

■ BLOCK DIAGRAM



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

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage, V^+ to V^-	V_S	7	V
Input Common Mode Voltage Range	V_{CM}	V^- -0.3 ~ V^+ +0.3	V
Junction Temperature	T_J	+150	°C
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.

■ RECOMMENDED OPERATING CONDITIONS

Over operating free-air temperature range (Unless otherwise specified)

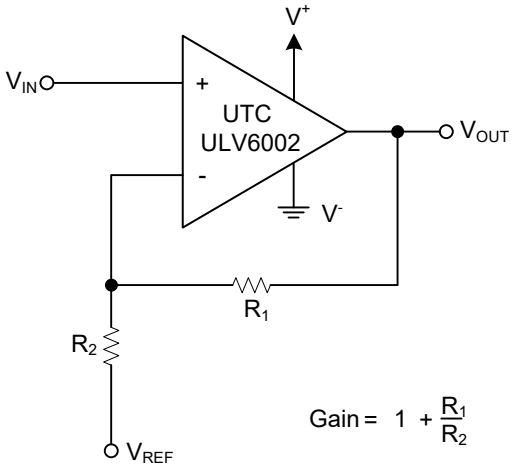
PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Supply Voltage	V^+ - V^-	1.8		5.5	V
Operating Free-Air Temperature	T_{OPR}	-40		+125	°C

■ ELECTRICAL CHARACTERISTICS

(V_S=+1.8V~+5.5V, V_{CM}=V_S/2, R_L=10kΩ, and V_{OUT} ≈ V_S/2, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Supply Current/Amplifier	I_Q	I_O=0, V_s=5.5V			160	315	μA
Power Supply Rejection Ratio	PSRR	V_{CM}=V^-			76		dB
Input Offset Voltage	V_{OS}					7	mV
Input Bias Current	I_B				±1.0		pA
Input Offset Current	I_{OS}				±1.0		pA
Common-Mode Voltage Range	V_{CM}			V^--0.3		V^++0.3	V
Common-Mode Rejection Ratio	CMRR	V_{CM}=-0.3V~5.3V, V^+=5V		60	76		dB
Large Signal Voltage Gain	A_V	V_O=0.3V~V^+-0.3V		80			dB
Output Voltage	V_O	R_L=10kΩ	V_{OH}	V^+-0.1			V
			V_{OL}			V^-+0.1	V
Short-Circuit Current	I_{SC}	Sourcing			18		mA
		Sinking			12		mA
Slew Rate	SR				1.1		V/μs
Gain-Bandwidth Product	GBW				1.5		MHz
Input Voltage Noise Density	e_n	f=1kHz			30		nV/$\sqrt{Hz}$

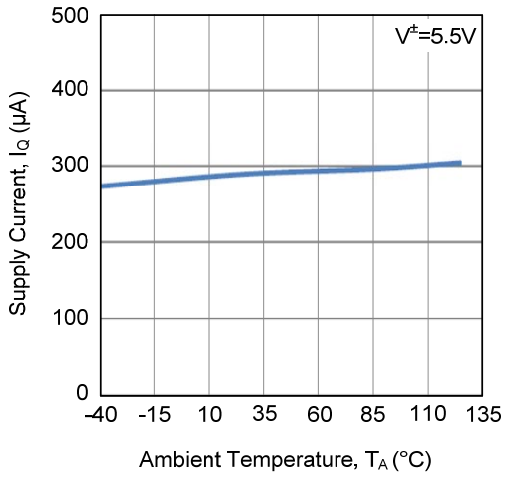
■ TYPICAL APPLICATION CIRCUIT



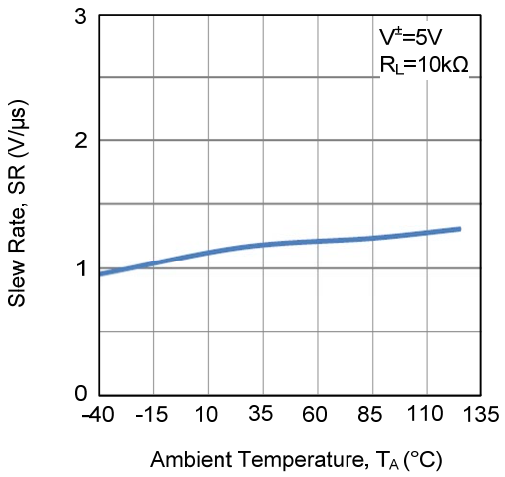
Non-Inverting Amplifier

■ TYPICAL CHARACTERISTICS

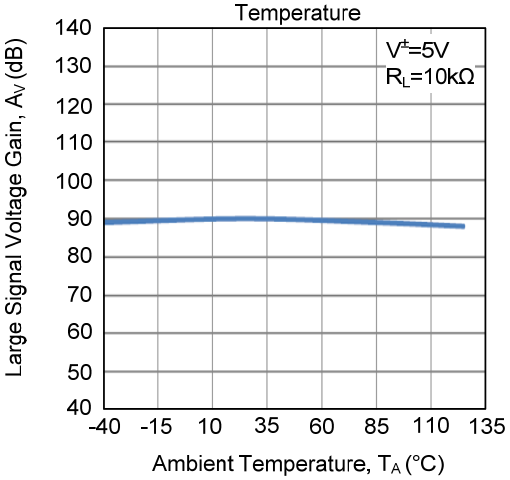
Supply Current vs. Temperature



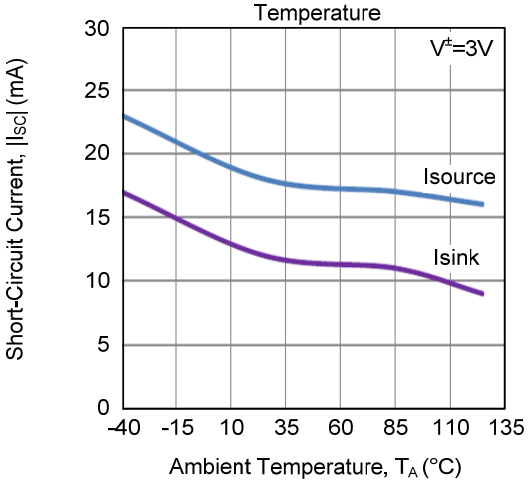
Slew Rate vs. Temperature



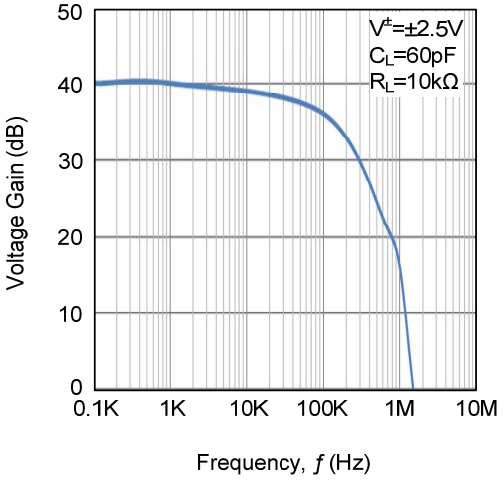
Large Signal Voltage Gain vs. Temperature



Output Short Circuit Current vs. Temperature



Voltage Gain vs. Frequency



Phase Shift vs. Frequency