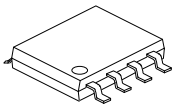
12μA, RAIL-TO-RAIL INPUT/OUTPUT, CMOS OPERATIONAL AMPLIFIER



SOP-8

■ DESCRIPTION

The UTC **ULV8522** (dual) is low cost, voltage feedback amplifier. The device can operate from 2.1V to 5.5V single supply, while consuming only 12μA quiescent current per amplifier. It provides rail-to-rail input with a wide input common mode voltage range and rail-to-rail output voltage swing. This feature makes UTC **ULV8522** appropriate for buffering ASIC.

The UTC **ULV8522** offers a gain-bandwidth product of 170kHz. It's well suited for piezoelectric sensors, integrators and photodiode amplifiers.

The UTC **ULV8522** is designed into a wide range of applications, such as battery-powered instrumentation, safety monitoring, portable systems, and transducer interface circuits in low power systems.

■ FEATURES

* Supply Voltage: 2.1V ~ 5.5V
* Low Supply Current /Amplifier: 12μA (Typ.)
* Input Offset Voltage: 5.5mV (Max)
* Rail-to-Rail Input and Output
* Slew Rate: 0.08V/μs (Typ.)

■ ORDERING INFORMATION

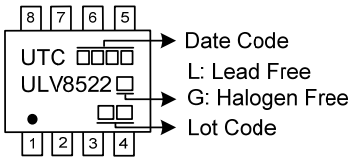
Ordering Number		Package	Packing
Lead Free	Halogen Free		
ULV8522L-S08-R	ULV8522G-S08-R	SOP-8	Tape Reel

ULV8522G-S08-R

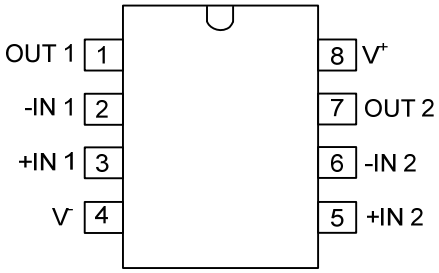
(1)Packing Type
(2)Package Type
(3)Green Package

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

■ MARKING



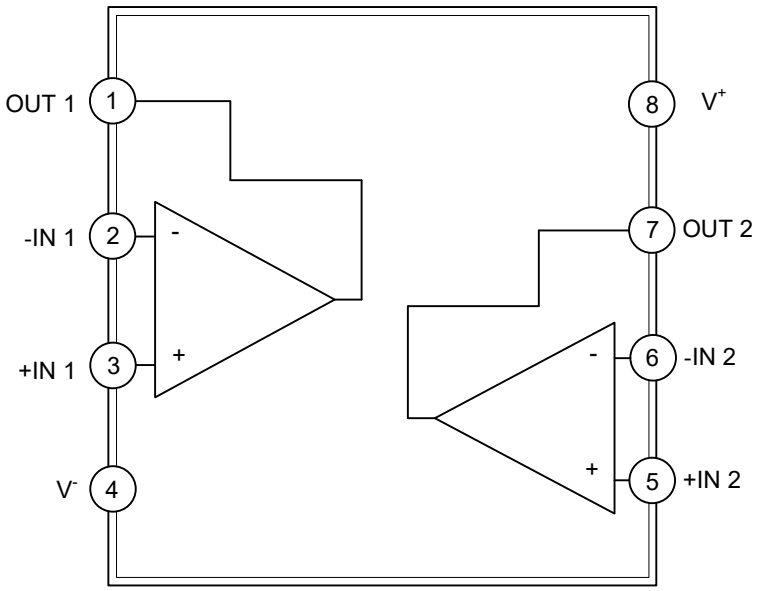
■ PIN CONFIGURATION



■ 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

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage, V^+ to V^-	V_S	6	V
Common-Mode Input Voltage	V_{CM}	V^- -0.3 ~ V^+ +0.3	V
Junction Temperature	T_J	+150	°C
Storage Temperature Range	T_{STG}	-65 ~ +150	°C

Notes: 1. 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.
2. Input terminals are diode-clamped to the power-supply rails. Input signals that can swing more than 0.3V beyond the supply rails must be current-limited to 10mA or less.
3. Short-circuit to ground.

■ RECOMMENDED OPERATING CONDITIONS

over operating free-air temperature range (unless otherwise specified)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Supply Voltage	V^+ - V^-	2.1		5.5	V
Operating Free-Air Temperature	T_{OPR}	-40		+125	°C

■ ELECTRICAL CHARACTERISTICS

(V_S=+5V, R_L=500kΩ, and V_{OUT}=V_S / 2, T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Supply Current/Amplifier	I_Q	I_{OUT}=0			12	20	μA
Power Supply Rejection Ratio	PSRR	V_S=+2.5V ~ +5.5V, V_{CM}=0.5V		65	95		dB
Input Offset Voltage	V_{OS}	V_{CM}=V_S/2			1.5	5.5	mV
Input Offset Voltage Drift	$\Delta V_{OS}/\Delta T$				3.5		μV/°C
Input Bias Current	I_B				5		pA
Input Offset Current	I_{OS}				5		pA
Common-Mode Voltage Range	V_{CM}	V_S=5.5V			-0.1~ 5.6		V
Common-Mode Rejection Ratio	CMRR	V_S=5.5V, V_{CM}=- 0.1V ~ 4V		70	92		dB
		V_S=5.5V, V_{CM}=-0.1V ~ 5.6V		60	78		dB
Large Signal Voltage Gain	A_V	R_L=500kΩ, V_O=0.015V ~ 4.985V		90	106		dB
		R_L=100kΩ, V_O=0.1V ~ 4.9V		88	104		dB
Output Voltage	V_O	R_L=500kΩ	V_{OH}	4.990	4.998		V
		R_L=500kΩ	V_{OL}		5	10	mV
Short-Circuit Current	I_{SC}	Sourcing		60	83		mA
		Sinking		60	72		mA
Slew Rate	SR	R_L=100kΩ			0.08		V/μs
Gain-Bandwidth Product	GBW				170		kHz
Input Voltage Noise Density	e_n	f=1kHz			90		nV/$\sqrt{Hz}$
		f=10kHz			48		nV/$\sqrt{Hz}$

■ TYPICAL APPLICATION CIRCUIT

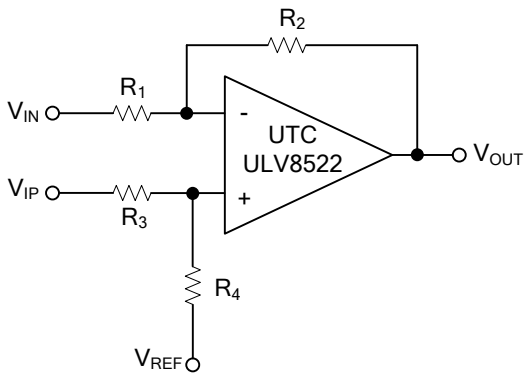


Figure 1: Differential Amplifier

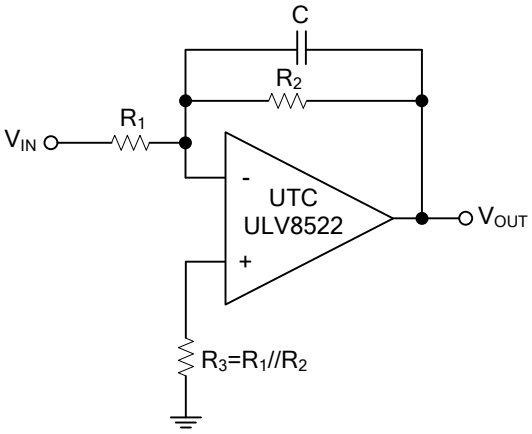
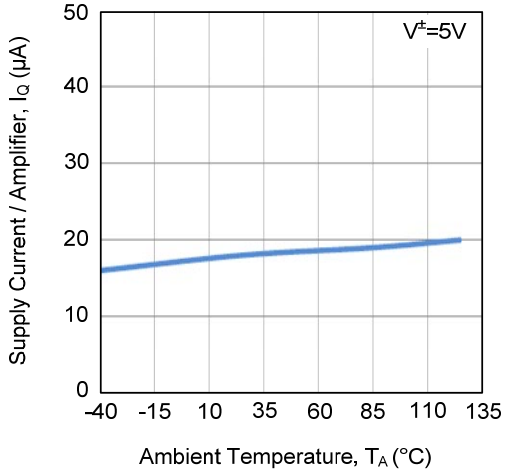


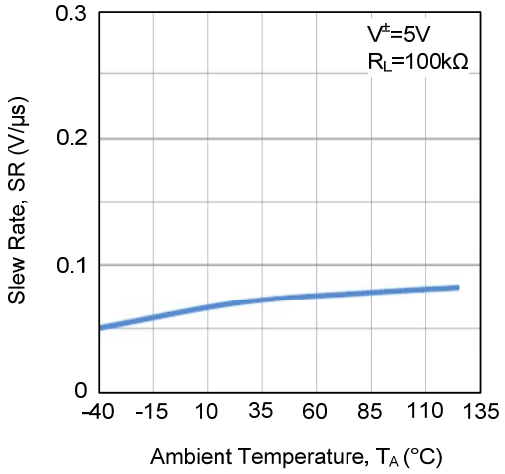
Figure 2: Active Low-Pass Filter

■ TYPICAL CHARACTERISTICS

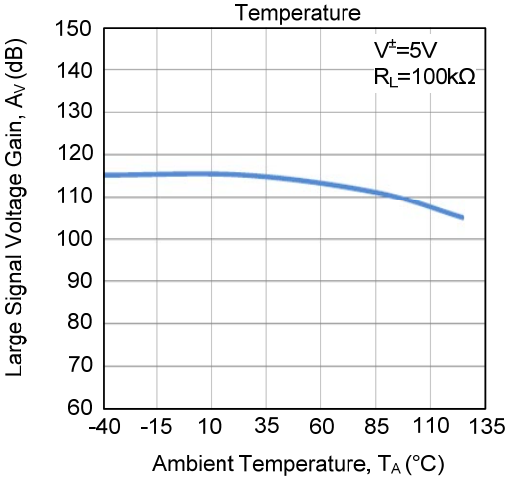
Supply Current vs. Temperature



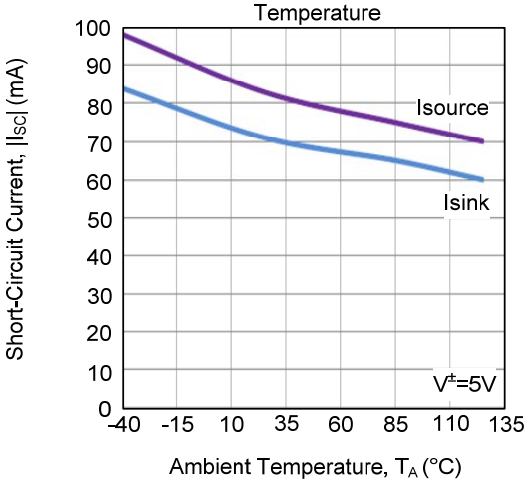
Slew Rate vs. Temperature



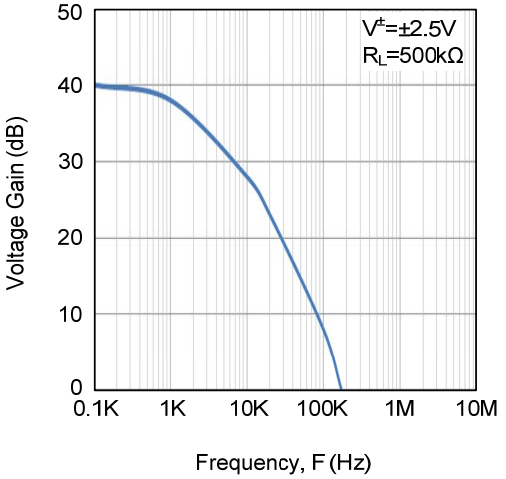
Large Signal Voltage Gain vs. Temperature



Output Short Circuit Current vs. Temperature



Voltage Gain vs. Frequency



Phase Shift vs. Frequency