



ULV8521

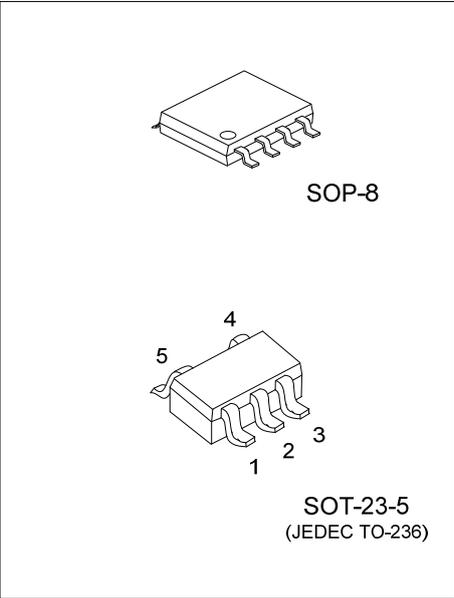
CMOS IC

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

DESCRIPTION

The UTC **ULV8521** (single) is low cost, voltage feedback amplifier. The device consuming only 12μA quiescent current per amplifier, while can operate from 2.1V to 5.5V single supply. It provides rail-to-rail input with a wide input common mode voltage range and rail-to-rail output voltage swing.

The UTC **ULV8521** is designed into a wide range of applications, such as buffering ASIC, battery-powered instrumentation, safety monitoring, portable systems, and transducer interface circuits in low power systems. The device offers a gain-bandwidth product of 170kHz. It's well suited for piezoelectric sensors, integrators and photodiode amplifiers.



FEATURES

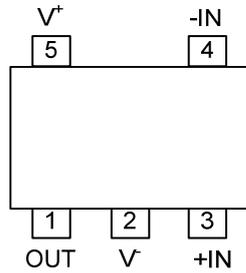
- * Supply Voltage: 2.1~5.5V
- * Low Supply Current/Amplifier: 12μA (Typ.)
- * Input Offset Voltage: 5.5mV (Max.)
- * Rail-to-Rail Output and Input
- * Slew Rate: 0.08V/μs (Typ.)

ORDERING INFORMATION

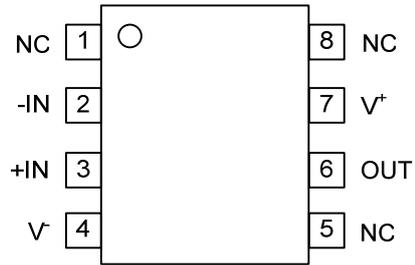
Ordering Number		Package	Packing
Lead Free	Halogen Free		
ULV8521L-AE5-R	ULV8521G-AE5-R	SOT-23-5	Tape Reel
ULV8521L-S08-R	ULV8521G-S08-R	SOP-8	Tape Reel

<p>ULV8521G-AE5-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel (2) AE5: SOT-23-5, S08: SOP-8 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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■ PIN CONFIGURATION



SOT-23-5

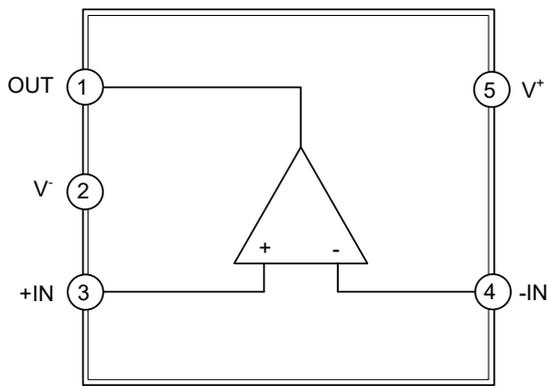


SOP-8

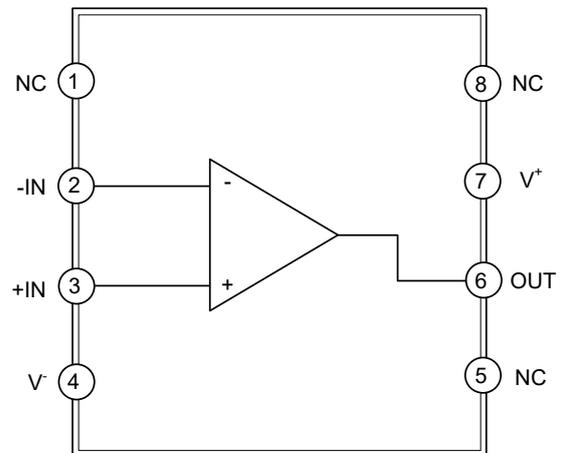
■ PIN DESCRIPTION

PIN NO.		PIN NAME	DESCRIPTION
SOT-23-5	SOP-8		
1	6	OUT	Output pin
2	4	V ⁻	Negative power supply
3	3	+IN	Non-invert input
4	2	-IN	Invert input
5	7	V ⁺	Positive power supply
-	1, 5, 8	NC	No connect

■ BLOCK DIAGRAM



SOT-23-5



SOP-8

■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage, V^+ to V^-	V_S	6	V
Common-Mode Input Voltage	V_{CM}	$V^- - 0.3 \sim V^+ + 0.3$	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

($V_S=+5V$, $R_L=500k\Omega$, and $V_{OUT}=V_S / 2$, $T_A=25^\circ C$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Current/Amplifier	I_Q	$I_{OUT}=0$		12	32	μA
Power Supply Rejection Ratio	PSRR	$V_S=+2.5V \sim +5.5V$, $V_{CM}=0.5V$	65	90		dB
Input Offset Voltage	V_{OS}	$V_{CM}=V_S/2$		1.5	5.5	mV
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	$V_S=5.5V$, $V_{CM}=-0.1V \sim 4V$	70	90		dB
		$V_S=5.5V$, $V_{CM}=-0.1V \sim 5.6V$	60	80		dB
Large Signal Voltage Gain	A_V	$R_L=500k\Omega$, $V_O=0.015V \sim 4.985V$	90	110		dB
		$R_L=100k\Omega$, $V_O=0.1V \sim 4.9V$	88	108		dB
Output Voltage	V_O	$R_L=500k\Omega$ V_{OH}	4.990	4.998		V
		$R_L=500k\Omega$ V_{OL}		5	10	mV
Short-Circuit Current	I_{SC}	Sourcing	61	82		mA
		Sinking	60	72		mA
Slew Rate	SR	$R_L=100k\Omega$		0.08		V/ μs
Gain-Bandwidth Product	GBW			170		kHz
Input Voltage Noise Density	e_n	f=1kHz		92		nV/\sqrt{Hz}
		f=10kHz		51		nV/\sqrt{Hz}

■ TYPICAL APPLICATION CIRCUIT

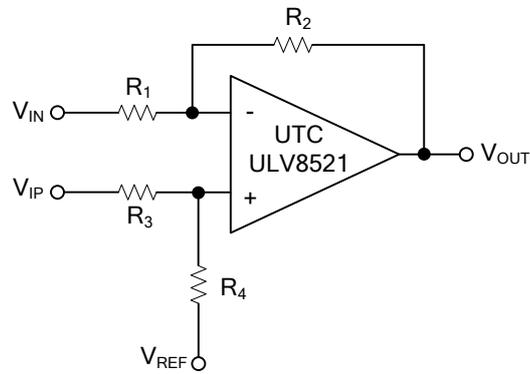


Figure 1: Differential Amplifier

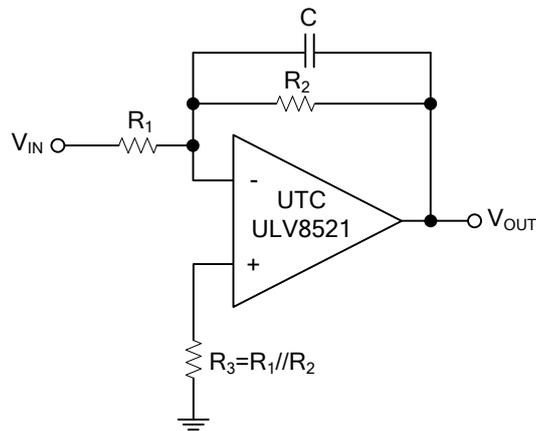
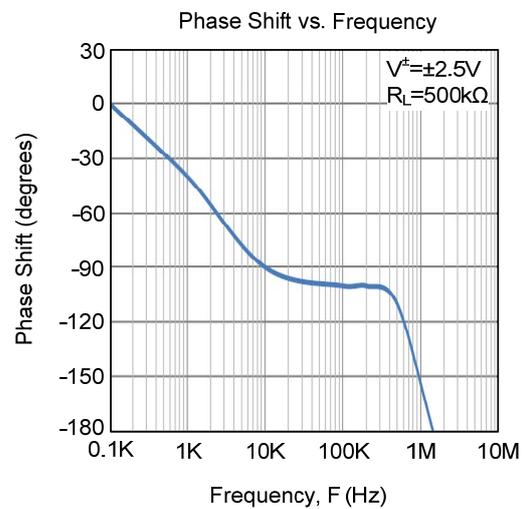
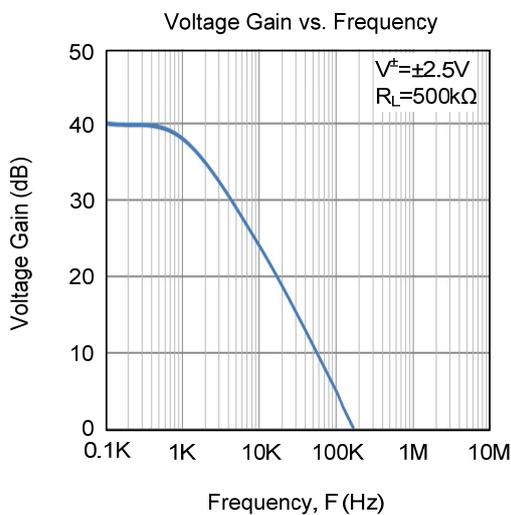
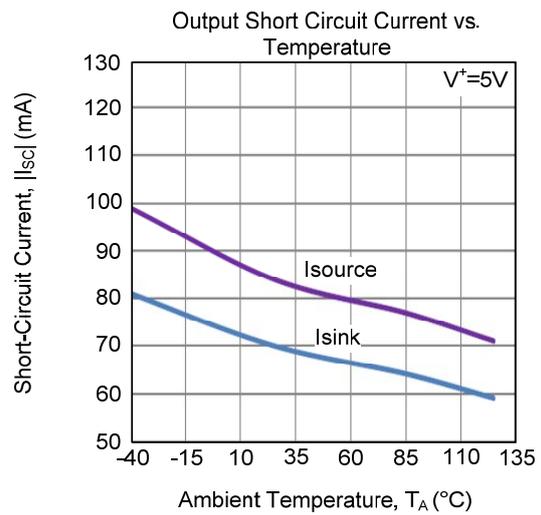
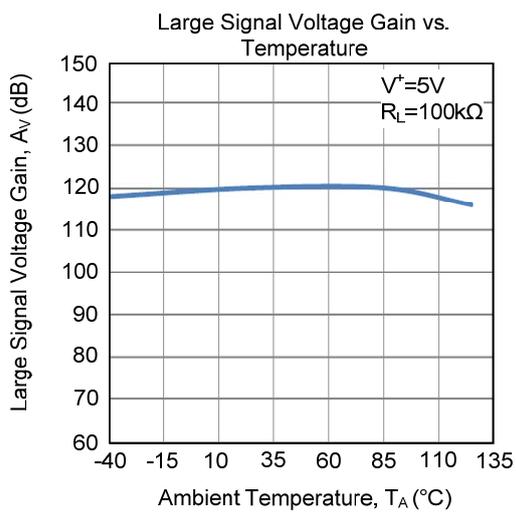
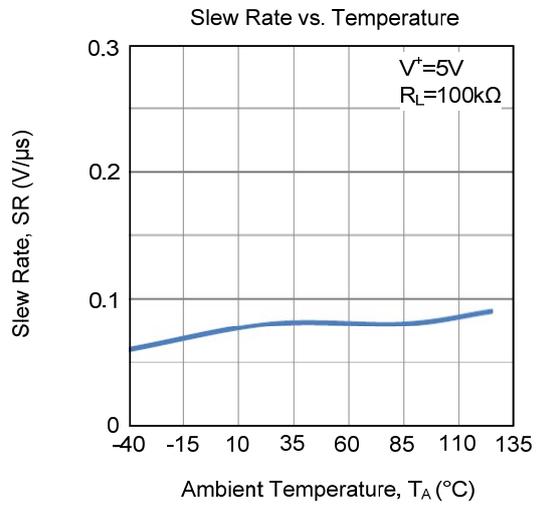
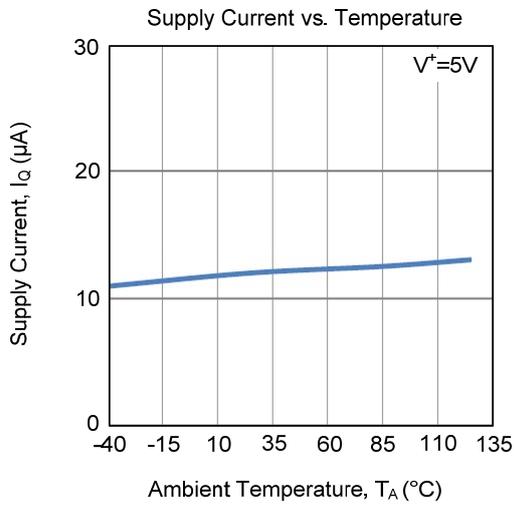


Figure 2: Active Low-Pass Filter

■ TYPICAL CHARACTERISTICS



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