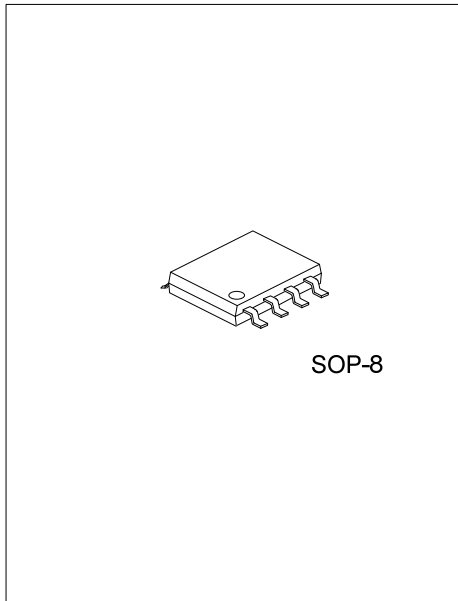




## ULV8552

CMOS IC

### ZERO-DRIFT, SINGLE-SUPPLY, RAIL-TO-RAIL INPUT/OUTPUT CMOS OPERATIONAL AMPLIFIERS



#### DESCRIPTION

The UTC **ULV8552** has ultralow offset, drift, and bias current. The UTC **ULV8552** is dual amplifiers featuring rail-to-rail input and output swings. Single supply as low as 2.7V and up to 5V may be used.

With an offset voltage of only 1µV. The UTC **ULV8552** is perfectly suited for applications in which error sources cannot be tolerated. Position and pressure sensors and strain gage amplifiers benefit greatly from nearly zero drift. The rail-to-rail input and output swings provided by the UTC **ULV8552** make both high-side and low-side sensing easy.

#### FEATURES

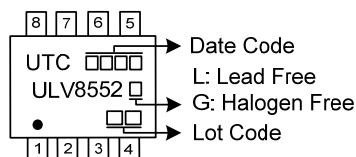
- \* Single-supply operation: 2.7V~5.0V
- \* Low offset voltage: 1µV
- \* Rail-to-rail input and output swing
- \* No external capacitors required

#### ORDERING INFORMATION

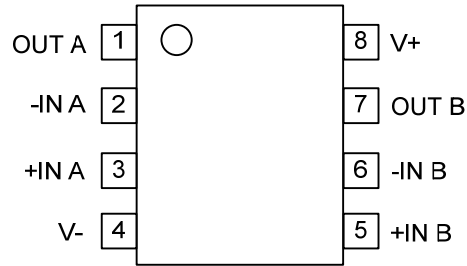
Ordering Number		Package	Packing
Lead Free	Halogen Free		
ULV8552L-S08-R	ULV8552G-S08-R	SOP-8	Tape Reel

<p>ULV8552G-S08-R</p> <ul style="list-style-type: none"> <li>(1) Packing Type</li> <li>(2) Package Type</li> <li>(3) Green Package</li> </ul>	<ul style="list-style-type: none"> <li>(1) R: Tape Reel</li> <li>(2) S08: SOP-8</li> <li>(3) G: Halogen Free and Lead Free, L: Lead Free</li> </ul>
---	---

#### MARKING



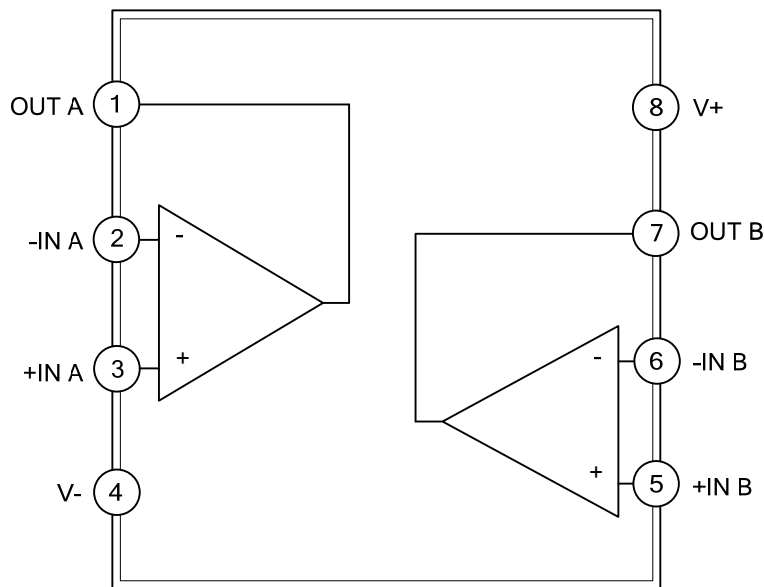
■ PIN CONFIGURATION



■ PIN DESCRIPTION

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

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING (T<sub>A</sub>=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V <sub>CC</sub>	6	V
Input Voltage	V <sub>IN</sub>	GND - 0.3 ~ V <sub>S</sub> + 0.3	V
Differential Input Voltage (Note 2)	V <sub>ID</sub>	±5	V
Junction Temperature Range	T <sub>J</sub>	+150	°C
Operating Temperature Range	T <sub>OPR</sub>	-40 ~ +125	°C
Storage Temperature Range	T <sub>STG</sub>	-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. Differential input voltage is limited to ±5.0 V or the supply voltage, whichever is less.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ <sub>JA</sub>	158	°C/W
Junction to Case	θ <sub>JC</sub>	43	°C/W

■ ELECTRICAL CHARACTERISTICS

(V<sub>S</sub>=5.0V, V<sub>CM</sub>=2.5V, V<sub>O</sub>=2.5V, T<sub>A</sub>=25°C unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>INPUT CHARACTERISTICS</b>						
Offset Voltage	V <sub>OS</sub>			1	20	μV
Input Bias Current	I <sub>B</sub>			10		pA
Input Offset Current	I <sub>OS</sub>			20		pA
Input Voltage Range	V <sub>I</sub>		0		5	V
Common-Mode Rejection Ratio	CMRR	V <sub>CM</sub> =0V~+5V	100	120		dB
Large Signal Voltage Gain (Note)	A <sub>VO</sub>	R <sub>L</sub> =10kΩ, V <sub>O</sub> =0.3V~4.7V	98	125		dB
<b>OUTPUT CHARACTERISTICS</b>						
Output Voltage High	V <sub>OH</sub>	R <sub>L</sub> =100kΩ to Ground	4.97	4.99		V
		R <sub>L</sub> =10kΩ to Ground	4.95	4.98		V
Output Voltage Low	V <sub>OL</sub>	R <sub>L</sub> =100kΩ to V+		1	10	mV
		R <sub>L</sub> =10kΩ to V+		10	30	mV
Output Short-Circuit Limit Current	I <sub>SC</sub>		±25	±65		mA
Output Current	I <sub>O</sub>			±30		mA
<b>POWER SUPPLY</b>						
Power Supply Rejection Ratio	PSRR	V <sub>S</sub> =2.7V~5.5V	98	110		dB
Supply Current/Amplifier	I <sub>SY</sub>	V <sub>O</sub> =0V		650	1000	μA
<b>DYNAMIC PERFORMANCE</b>						
Slew Rate	SR	R <sub>L</sub> =10kΩ		0.33		V/μs
Overload Recovery Time				0.05		ms
Gain Bandwidth Product	GBP			1.2		MHz
<b>NOISE PERFORMANCE</b>						
Voltage Noise	e <sub>n p-p</sub>	0Hz~10Hz		1.0		μV p-p
		0Hz~1Hz		0.32		μV p-p
Voltage Noise Density	e <sub>n</sub>	f=1kHz		42		nV/ √Hz
Current Noise Density	i <sub>n</sub>	f=10Hz		2		fA/ √Hz

Note: Gain testing is dependent upon test bandwidth.

## ■ ELECTRICAL CHARACTERISTICS

( $V_S=2.7V$ ,  $V_{CM}=1.35V$ ,  $V_O=1.35V$ ,  $T_A=25^\circ C$ , unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>INPUT CHARACTERISTICS</b>						
Offset Voltage	$V_{OS}$			1	20	$\mu V$
Input Bias Current	$I_B$			10		pA
Input Offset Current	$I_{OS}$			10		pA
Input Voltage Range	$V_I$		0		2.7	V
Common-Mode Rejection Ratio	CMRR	$V_{CM}=0V\sim+2.7V$	100	120		dB
Large Signal Voltage Gain (Note)	$A_{VO}$	$R_L=10k\Omega$ , $V_O=0.3V\sim2.4V$	98	125		dB
<b>OUTPUT CHARACTERISTICS</b>						
Output Voltage High	$V_{OH}$	$R_L=100k\Omega$ to Ground	2.67	2.69		V
		$R_L=10k\Omega$ to Ground	2.65	2.68		V
Output Voltage Low	$V_{OL}$	$R_L=100k\Omega$ to V+		1	10	mV
		$R_L=10k\Omega$ to V+		10	20	mV
Output Short-Circuit Limit Current	$I_{SC}$		$\pm 10$	$\pm 20$		mA
Output Current	$I_O$			$\pm 10$		mA
<b>POWER SUPPLY</b>						
Power Supply Rejection Ratio	PSRR	$V_S=2.7V\sim5.5V$	98	110		dB
Supply Current/Amplifier	$I_{SY}$	$V_O=0V$		600	900	$\mu A$
<b>DYNAMIC PERFORMANCE</b>						
Slew Rate	SR	$R_L=10k\Omega$		0.4		V/ $\mu s$
Overload Recovery Time				0.05		ms
Gain Bandwidth Product	GBP			1		MHz
<b>NOISE PERFORMANCE</b>						
Voltage Noise	$e_{n\ p-p}$	0Hz~10Hz		1.6		$\mu V\ p-p$
Voltage Noise Density	$e_n$	f=1kHz		75		nV/ $\sqrt{Hz}$
Current Noise Density	$i_n$	f=10Hz		2		fA/ $\sqrt{Hz}$

Note: Gain testing is dependent upon test bandwidth.

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.