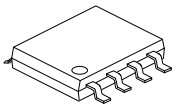
ULV8552

CMOS IC

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



SOP-8

■ 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

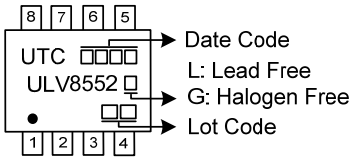
■ ORDERING INFORMATION

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

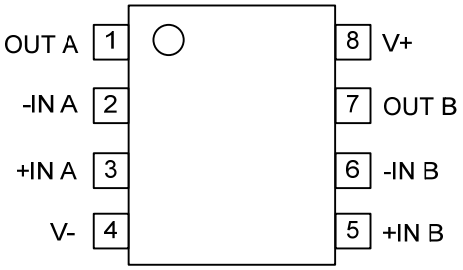
ULV8552G-S08-R

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

■ MARKING



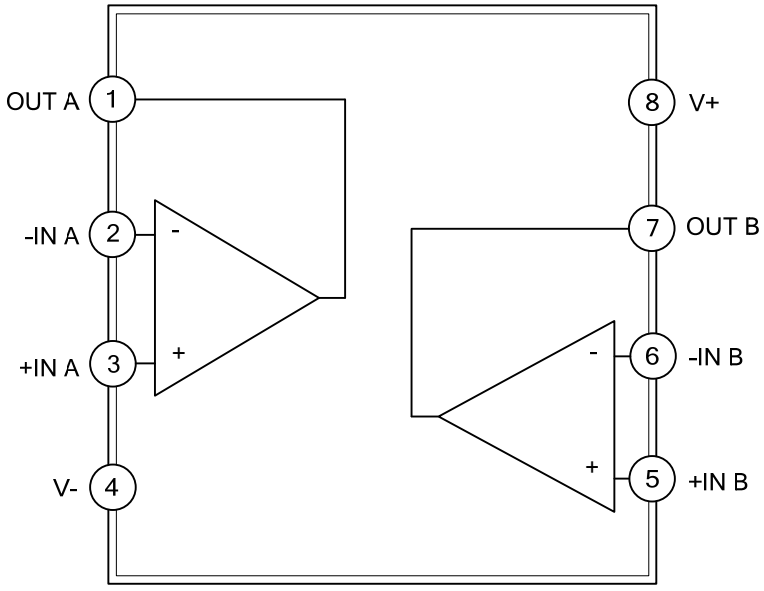
■ PIN CONFIGURATION



■ 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_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	6	V
Input Voltage	V_{IN}	GND - 0.3 ~ V_S + 0.3	V
Differential Input Voltage (Note 2)	V_{ID}	±5	V
Junction Temperature Range	T_J	+150	°C
Operating Temperature Range	T_{OPR}	-40 ~ +125	°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. 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_{JA}	158	°C/W
Junction to Case	θ_{JC}	43	°C/W

■ ELECTRICAL CHARACTERISTICS

(V_S=5.0V, V_{CM}=2.5V, V_O=2.5V, T_A=25°C unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
INPUT CHARACTERISTICS						
Offset Voltage	V_{OS}			1	20	μV
Input Bias Current	I_B			10		pA
Input Offset Current	I_{OS}			20		pA
Input Voltage Range	V_I		0		5	V
Common-Mode Rejection Ratio	CMRR	V_{CM}=0V~+5V	100	120		dB
Large Signal Voltage Gain (Note)	A_{VO}	R_L=10kΩ, V_O=0.3V~4.7V	98	125		dB
OUTPUT CHARACTERISTICS						
Output Voltage High	V_{OH}	R_L=100kΩ to Ground	4.97	4.99		V
		R_L=10kΩ to Ground	4.95	4.98		V
Output Voltage Low	V_{OL}	R_L=100kΩ to V+		1	10	mV
		R_L=10kΩ to V+		10	30	mV
Output Short-Circuit Limit Current	I_{SC}		±25	±65		mA
Output Current	I_O			±30		mA
POWER SUPPLY						
Power Supply Rejection Ratio	PSRR	V_S=2.7V~5.5V	98	110		dB
Supply Current/Amplifier	I_{SY}	V_O=0V		650	1000	μA
DYNAMIC PERFORMANCE						
Slew Rate	SR	R_L=10kΩ		0.33		V/μs
Overload Recovery Time				0.05		ms
Gain Bandwidth Product	GBP			1.2		MHz
NOISE PERFORMANCE						
Voltage Noise	$e_{n\ p-p}$	0Hz~10Hz		1.0		μV p-p
		0Hz~1Hz		0.32		μV p-p
Voltage Noise Density	e_n	f=1kHz		42		nV/$\sqrt{Hz}$
Current Noise Density	i_n	f=10Hz		2		fA/$\sqrt{Hz}$

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°C, unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
INPUT CHARACTERISTICS						
Offset Voltage	V_{OS}			1	20	μV
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~+2.7V	100	120		dB
Large Signal Voltage Gain (Note)	A_{VO}	R_L=10kΩ, V_O=0.3V~2.4V	98	125		dB
OUTPUT CHARACTERISTICS						
Output Voltage High	V_{OH}	R_L=100kΩ to Ground	2.67	2.69		V
		R_L=10kΩ to Ground	2.65	2.68		V
Output Voltage Low	V_{OL}	R_L=100kΩ to V+		1	10	mV
		R_L=10kΩ to V+		10	20	mV
Output Short-Circuit Limit Current	I_{SC}		±10	±20		mA
Output Current	I_O			±10		mA
POWER SUPPLY						
Power Supply Rejection Ratio	PSRR	V_S=2.7V~5.5V	98	110		dB
Supply Current/Amplifier	I_{SY}	V_O=0V		600	900	μA
DYNAMIC PERFORMANCE						
Slew Rate	SR	R_L=10kΩ		0.4		V/μs
Overload Recovery Time				0.05		ms
Gain Bandwidth Product	GBP			1		MHz
NOISE PERFORMANCE						
Voltage Noise	$e_{n\ p-p}$	0Hz~10Hz		1.6		μV 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.