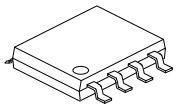
1.8V, 42μA, RAIL-TO-RAIL INPUT/OUTPUT, ZERO DRIFT OP-AMPS



SOP-8

■ DESCRIPTION

The dual UTC **ULV5532** CMOS operational amplifiers provide very low offset voltage and zero-drift over time and temperature.

The UTC **ULV5532** operate with a single supply voltage as low as 1.8V, while drawing 42μA per amplifier of quiescent current with a gain bandwidth product of 350kHz. It's unity gain stable, have no 1/f noise, have good Power Supply Rejection Ratio (PSRR) and Common Mode Rejection Ratio (CMRR), and feature rail-to-rail input and output swing.

■ FEATURES

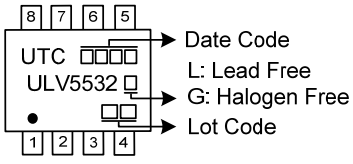
* Low Supply Current: 42 μA per Amplifier
* Low Offset Voltage: 100μV (Max)
* 0.1Hz to 10Hz Noise: 1.1μVPP
* Slew Rate: 0.16V/μs
* Bandwidth: 350kHz
* High Gain, 130dB High CMRR and PSRR
* Rail-to-rail Input and Output Swing

■ ORDERING INFORMATION

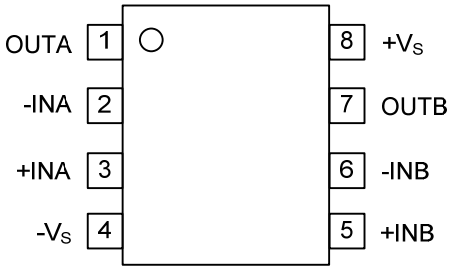
Ordering Number		Package	Packing
Lead Free	Halogen Free		
ULV5532L-S08-R	ULV5532G-S08-R	SOP-8	Tape Reel

ULV5532G-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



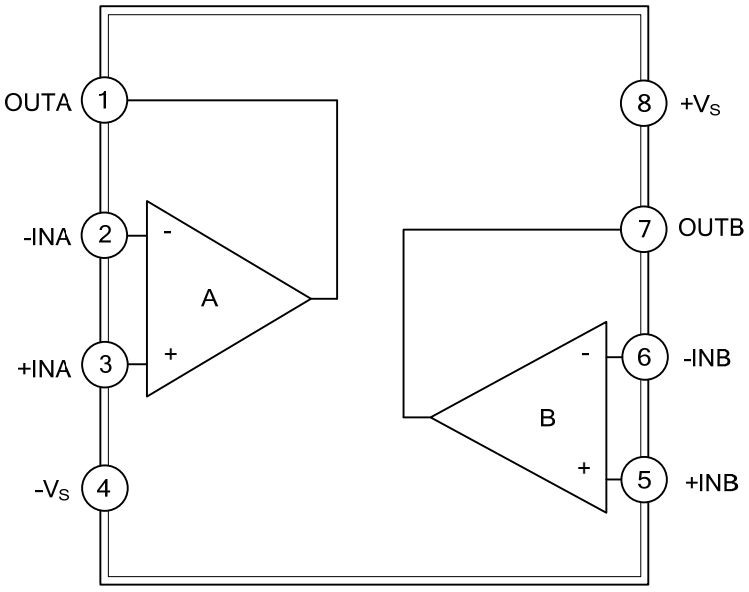
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	OUTA	Output pin of A AMP
2	-INA	Inverting input pin of A AMP
3	+INA	Non-inverting input of A AMP
4	$-V_S$	Negative power supply
5	+INB	Non-inverting input of B AMP
6	-INB	Inverting input pin of B AMP
7	OUTB	Output pin of B AMP
8	$+V_S$	Positive power supply

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

[Over operating free-air temperature range (unless otherwise specified.)]

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	6	V
Input Voltage	V_I	V^- - 0.2~ V^+ + 0.2	V
Input Current +IN, -IN (Note 2)		±20	mA
Output Short-Circuit Duration (Note 3)		Indefinite	
Current at Supply Pins		±50	mA
Maximum Junction Temperature	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. The inputs are protected by ESD protection diodes to each power supply. If the input extends more than 500mV beyond the power supply, the input current should be limited to less than 10mA.
3. A heat sink may be required to keep the junction temperature below the absolute maximum. This depends on the power supply voltage and how many amplifiers are shorted. Thermal resistance varies with the amount of PC board metal connected to the package. The specified values are for short traces connected to the leads.

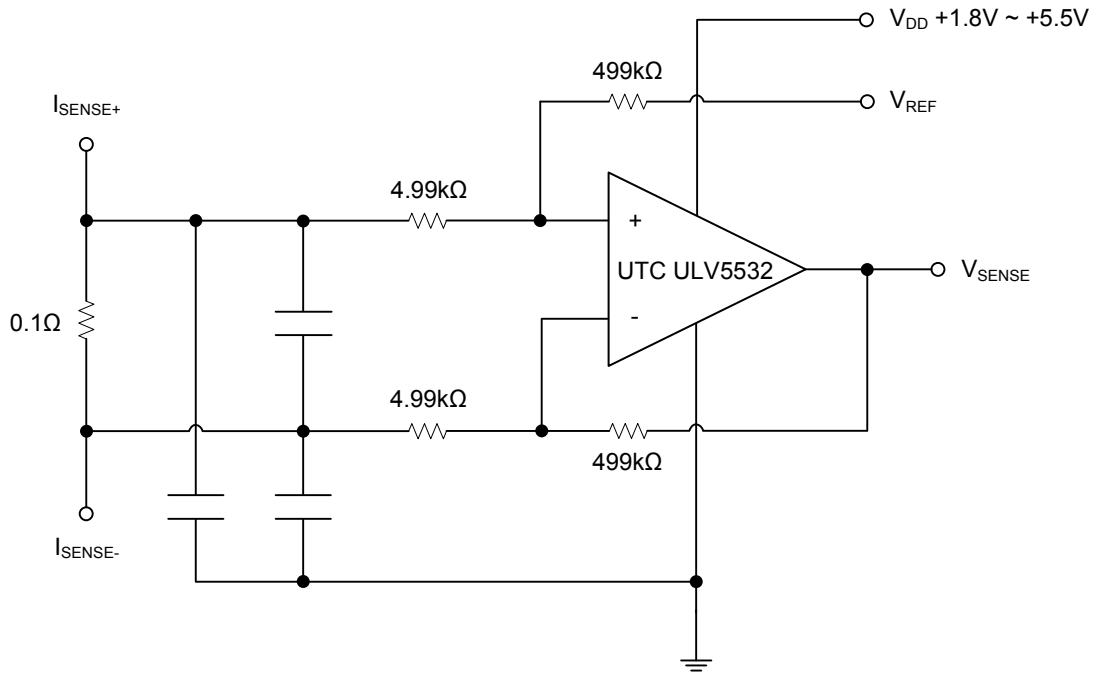
■ ELECTRICAL CHARACTERISTICS

(T_A=27°C, V_S=5V, R_L=10kΩ, V_{CM}=V_{DD}/2, unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage Range	V_S		1.8		5.5	V
Quiescent Current per Amplifier	I_Q			42	60	μA
Input Offset Voltage	V_{OS}	V_{CM}=2.5V	-100	1	100	μV
		V_{CM}=0.05~4.95V	-110		110	μV
		V_S=1.8V, V_{CM}=0.9V	-120		120	μV
vs Temperature	dV_{OS}/dT			0.008	0.05	μV/°C
vs Power Supply	PSRR	Vs = 3V~ 5V	90	120		dB
Input Voltage Noise	V_N	f=0.01Hz to 1Hz		0.4		μVpp
		f=0.1Hz to 10Hz		1.1		μVpp
Input Voltage Noise Density	e_n	f=1kHz		55		nV/√Hz
Input Capacitor	C_{IN}	Differential		3		pF
		Common-Mode		2		pF
Input Bias Current	I_B			±50		pA
Over Temperature				±800		pA
Input Offset Current	I_{OS}			±100		pA
Common-Mode Voltage Range	V_{CM}		(V-)-0.1		(V+)+0.1	V
Common-Mode Rejection Ratio	CMRR	V_{CM}=0.5 to 4.5V	90	120		dB
Output Voltage Swing from Rail	V_O	R_L=10kΩ		5	25	mV
Short-Circuit Current	I_{SC}			±52		mA
Unity Gain Bandwidth	GBWP	C_L=100pF		350		kHz
Slew Rate	SR	G=+1, C_L=100pF		0.23		V/μs
Overload Recovery Time	t_{OR}	G=-10		60		μs
Settling Time to 0.01%	t_S	C_L=100pF, G=+1, 5V Step		40		μs
Open-Loop Voltage Gain	A_{VOL}	(V-)+100mV<V_O<(V+)-100mV, R_L=100kΩ	94	120		dB

■ TYPICAL APPLICATION CIRCUIT

Bi-Directional Current Sense Amplifier



Thermistor Measurement