

ULV8542

1.1MHz RAIL-TO-RAIL I/O CMOS DUAL AMPS

DESCRIPTION

The UTC **ULV8542** is a low cost rail to rail input and output dual OP AMP, Features in a wide input common-mode voltage range and output voltage swing. The minimum operating supply voltage down to 2.1V and the maximum recommended supply voltage is 5.5V. The operating temperature range extended -40°C to +125°C.

UTC **ULV8542** suit for piezoelectric sensors, integrators, and photodiode amplifiers based on very low input bias currents of 0.5pA. Rail-to-rail inputs and outputs are useful to design buffering ASIC in single-supply systems.

The common applications for this device especially in very low power systems such as safety monitoring, portable equipment.

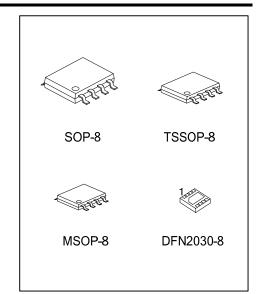
FEATURES

- * Low Cost
- * Operating voltage range: 2.1V ~ 5.5V
- * Low offset voltage ULV8542: ±3.5mV (Max.) ULV8542-A: ±1.6mV (Max.)
- * Very low input bias currents: 0.5pA
- * Rail-to-Rail Input and Output
- * Unity Gain Stable
- * Gain Bandwidth Product: 1.1MHz

ORDERING INFORMATION

Ordering Number		Deskere	De alvia a	
Lead Free	Halogen Free	Package	Packing	
ULV8542L-S08-R	ULV8542G-S08-R	SOP-8	Tape Reel	
ULV8542L-SM1-R	ULV8542G-SM1-R	MSOP-8	Tape Reel	
ULV8542L-P08-R	ULV8542G-P08-R	TSSOP-8	Tape Reel	
ULV8542L-K08-2030-R	ULV8542G-K08-2030-R	DFN2030-8	Tape Reel	
ULV8542L-A-S08-R	ULV8542G-A-S08-R	SOP-8	Tape Reel	
ULV8542L-A-SM1-R	ULV8542G-A-SM1-R	MSOP-8	Tape Reel	
ULV8542L-A-P08-R	ULV8542G-A-P08-R	TSSOP-8	Tape Reel	
ULV8542L-A-K08-2030-R	ULV8542G-A-K08-2030-R	DFN2030-8	Tape Reel	

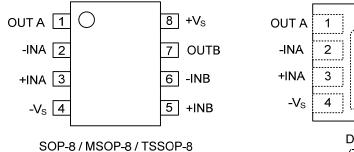
ULV8542 <u>G-A-S08-R</u> (1)Packing Type (2)Package Type (3)Input Offset Voltage (4)Green Package	 R: Tape Reel S08: SOP-8, SM1: MSOP-8, P08: TSSOP-8 K08-2030: DFN2030-8 Refer to ELECTRICAL CHARACTERISTICS G: Halogen Free and Lead Free, L: Lead Free 	
(4)Green Package	(4) G: Halogen Free and Lead Free, L: Lead Free	

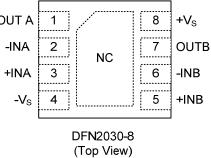


MARKING

PACKAGE	MARKING
SOP-8 / MSOP-8	8 7 6 5 UTC □□□□ L: Lead Free ULV8542 □ → G: Halogen Free ● □□ ↓ Lot Code 1 2 3 4
TSSOP-8	$ \begin{array}{c} 1 \\ \bullet \\ UTC \\ \hline \hline$
DFN2030-8	ULV 8542 •□□□□ • Date Code

■ PIN CONFIGURATION



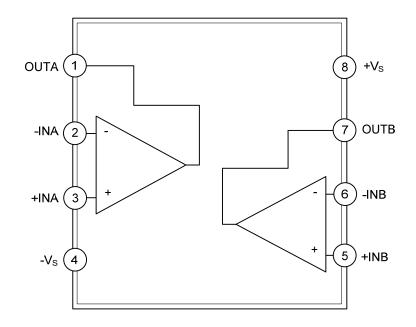


■ PIN DESCRIPTION

PIN	I NO.				
SOP-8 MSOP-8 TSSOP-8	DFN2030-8	PIN NAME	DESCRIPTION		
1	1	OUTA	Output pin of A AMP		
2	2	-INA	Invert input pin of A AMP		
3	3	+INA	Non-invert input of A AMP		
4	4	-Vs	Negative supply		
5	5	+INB	Non-invert input of B AMP		
6	6	-INB	Invert input pin of B AMP		
7	7	OUTB	Output pin of B AMP		
8	8	+Vs	Positive supply		
-	Exposed Pad	NC	Connect exposed pad to -V _S .		



BLOCK DIAGRAM





■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage, Vs to -Vs	Vs	7	V
Common-Mode Input Voltage	V _{CM}	(-V _S)-0.5 ~ (+V _S)+0.5	V
Junction Temperature	TJ	+150	°C
Operating Temperature Range	T _{OPR}	-40 ~ +125	°C
Storage Temperature Range	T _{STG}	-65 ~ +150	°C

Note: 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.

ELECTRICAL CHARACTERISTICS

(Vs=+5V, RL=100k Ω connected to Vs / 2, and Vout=Vs / 2, TA=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
INPUT CHARACTERISTICS						
Input Offset Voltage	Vos	ULV8542			±3.5	mV
		ULV8542-A			±1.6	mV
Input Offset Voltage Drift	$\Delta Vos/\Delta T$			2.7		µV/°C
Input Bias Current	Iв			0.5		pА
Input Offset Current	los			0.5		pА
Common-Mode Voltage Range	Vсм	Vs=5.5V	-0.1		5.6	V
Common Mode Dejection Datio	CMRR	Vs=5.5V, Vcm=- 0.1V ~ 4V	72	88		dB
Common-Mode Rejection Ratio	CINIKK	Vs=5.5V, Vcm=-0.1V ~ 5.6V	60	78		dB
Open Leen Veltage Cein	A	R∟=5KΩ, V₀=0.1V ~ 4.9V	80	90		dB
Open-Loop Voltage Gain	Aol	R∟=100KΩ, V₀=0.035V ~ 4.965V	85	94		dB
OUTPUT CHARACTERISTICS				-		
Output Voltage Swing from Rail	Vo	R∟=100KΩ		0.008		V
Output Current	Іоит		20	23		mA
POWER SUPPLY						
Operating Voltage Range	Vs		2.1		5.5	V
Power Supply Rejection Ratio	PSRR	Vs=+2.5V ~ +5.5V	76	92		dB
		V _{CM} =(-V _S)+0.5V	. 0			
Quiescent Current / Amplifier	la	Iout=0		70	120	μA
DYNAMIC PERFORMANCE (CL						r
Gain-Bandwidth Product	GBP			1.1		MHz
Slew Rate	SR	G=+1, 2V Output Step		0.8		V/µs
Settling Time to 0.1%	ts	G=+1, 2 V Output Step		5.3		μs
Overload Recovery Time	tor	V _{IN} · Gain=Vs		2.6		μs
NOISE PERFORMANCE						
Voltage Noise Density	eN	f=1kHz		27		nV/ \sqrt{Hz}
		f=10kHz		20		nV/√Hz



TYPICAL APPLICATION CIRCUIT

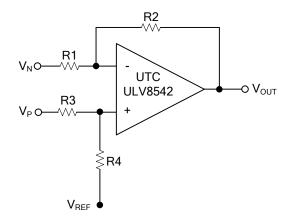


Figure 1. Differential Amplifier

Note: Figure 1 is the differential amplifier. $V_{OUT}=(V_P-V_N)\times R2/R1+Vref$ (when R4/R3=R2/R1).

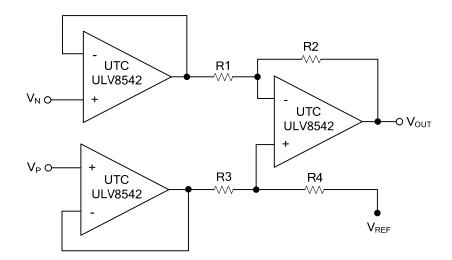


Figure 2. Instrumentation Amplifier

Note: The circuit in Figure 2 performs the same function as that in Figure 1 but with the high input impedance.



TYPICAL APPLICATION CIRCUIT (Cont.)

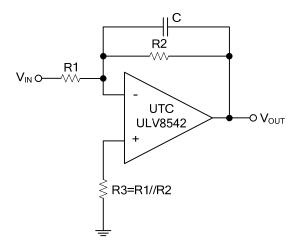
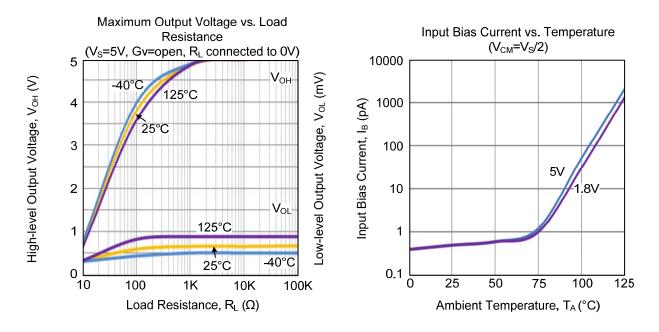


Figure 3. Low Pass Active Filter

Note: Figure 3 is the low pass filter. It's DC gain is -R2/R1 and the -3dB corner frequency is $1/2\pi R_2 C$.



TYPICAL CHARACTERISTICS



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.

