

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 $+125^{\circ}$ 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.

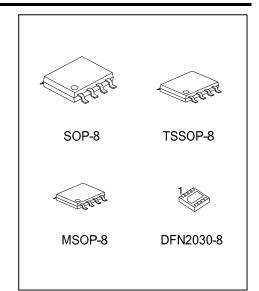
FEATURES

- * 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	Deskare	Decking	
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	

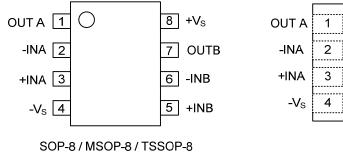
ULV8542G-A-S08-R (1)Packing Type (2)Package Type (3)Input Offset Voltage (4)Green Package	 R: Tape Reel S08: SOP-8, SM1: MSOP-8, P08: TSSOP-8 K08-2030: DFN2030-8 Refer to ELECTRICAL CHARACTERISTICS G: Halogen Free and Lead Free, L: Lead Free 	
(4)Green Package	(4) G: Halogen Free and Lead Free, L: Lead Free	

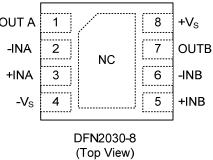


MARKING

PACKAGE	MARKING		
SOP-8 / MSOP-8	8 7 6 5 UTC □□□□ → Date Code ULV8542 → G: Halogen Free ● □□ → Lot Code		
TSSOP-8	$\begin{array}{c c} & & & & \\ \hline 1 & & & & \\ \hline 0 & & & \\ \hline 2 & & & \\ \hline 2 & & & \\ \hline 1 & & & \\ \hline 0 & & & \\ \hline 2 & & & \\ \hline 1 & & & \\ \hline 0 & & & \\ \hline 2 & & & \\ \hline 1 & & & \\ \hline 0 & & & \\ \hline 7 & & \\ \hline 1 & & \\ $		
DFN2030-8	ULV 8542 •□□□□ > Date Code		

■ PIN CONFIGURATION



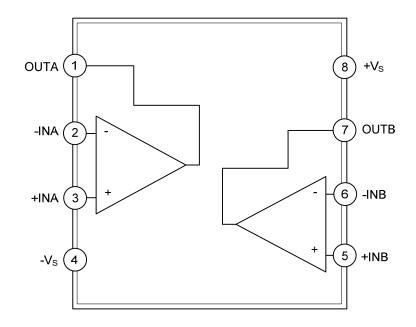


■ PIN DESCRIPTION

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	
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

$(V_S = +5V, R_L = 100k\Omega \text{ connected te})$	o Vs/2,and	V _{OUT} =V _S /2, T _A =25°C, unless otherwi	se speci	fied)		
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
INPUT CHARACTERISTICS						
Input Offect Veltage	Vos	ULV8542			±3.5	mV
Input Offset Voltage		ULV8542-A			±1.6	mV
Input Offset Voltage Drift	$\Delta V_{OS} / \Delta_T$			2.7		μV/°C
Input Bias Current	IB			0.5		pА
Input Offset Current	los			0.5		pА
Common-Mode Voltage Range	V _{CM}	V _S =5.5V	-0.1		5.6	V
Common Made Dejection Datio		V _S =5.5V, V _{CM} =- 0.1V ~ 4V	72	88		dB
Common-Mode Rejection Ratio	CMRR	V _S =5.5V, V _{CM} =-0.1V ~ 5.6V	60	78		dB
	^	R _L =5KΩ, V _O =0.1V ~ 4.9V	80	90		dB
Open-Loop Voltage Gain	A _{OL}	R _L =100KΩ, V _O =0.035V ~ 4.965V	85	94		dB
OUTPUT CHARACTERISTICS		_	_			
Output Voltage Swing from Rail	Vo	R _L =100KΩ		0.008		V
Output Current	IOUT		20	23		mA
POWER SUPPLY						
Operating Voltage Range	Vs		2.1		5.5	V
Power Supply Rejection Ratio	PSRR	V _S =+2.5V ~ +5.5V V _{CM} =(-V _S)+0.5V	76	92		dB
Quiescent Current / Amplifier	lq	I _{OUT} =0		70	120	μA
DYNAMIC PERFORMANCE (CL	=100pF)					
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	t _{OR}	V _{IN} · Gain=V _S		2.6		μs
NOISE PERFORMANCE						
Voltage Noise Density	e _N	f=1kHz		27		nV/√Hz
		f=10kHz		20		nV/ \sqrt{Hz}



TYPICAL APPLICATION CIRCUIT

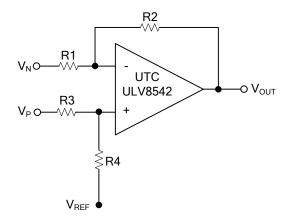


Figure 1. Differential Amplifier

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

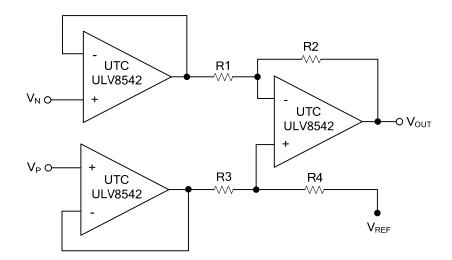


Figure 2. Instrumentation Amplifier

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.)

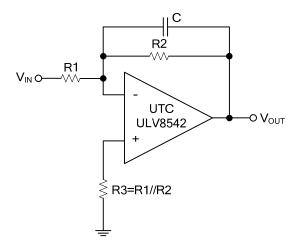


Figure 3. Low Pass Active Filter

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

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