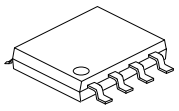
ULV2362 **Preliminary** ***CMOS IC***

HIGH-PERFORMANCE LOW-VOLTAGE OPERATIONAL AMPLIFIERS



SOP-8

■ DESCRIPTION

The UTC **ULV2362** is a high-performance dual operational amplifier. This device can be operated at a very low supply voltage (±1V), while maintaining a wide output swing. The UTC **ULV2362** offers a dramatically improved dynamic range of signal conditioning in low-voltage system. The UTC **ULV2362** also provides higher performance than other general-purpose operational amplifier by combining higher unity-gain bandwidth and faster slew rate. With its low distortion and low-noise performance, it is well suited for audio applications.

■ FEATURES

* Low Supply-Voltage Operation: V_{CC}=±1V (Min.)
* Wide Bandwidth: 7MHz (Typ.) at V_{CC}=±2.5V
* High Slew Rate: 3V/μs (Typ.) at V_{CC}=±2.5V
* Low Noise: 8nV/$\sqrt{Hz}$ (Typ.) at f=1kHz
* Wide Output Voltage Swing: ±2.4V (Typ.) at V_{CC}=±2.5V, R_L=10 kΩ

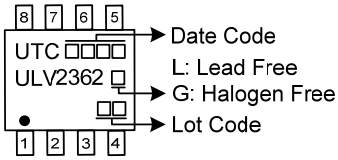
■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
ULV2362L-S08-R	ULV2362G-S08-R	SOP-8	Tape Reel

ULV2362G-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



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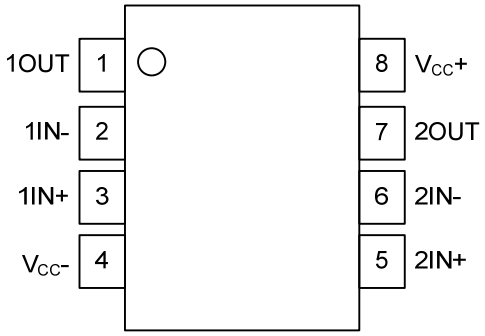
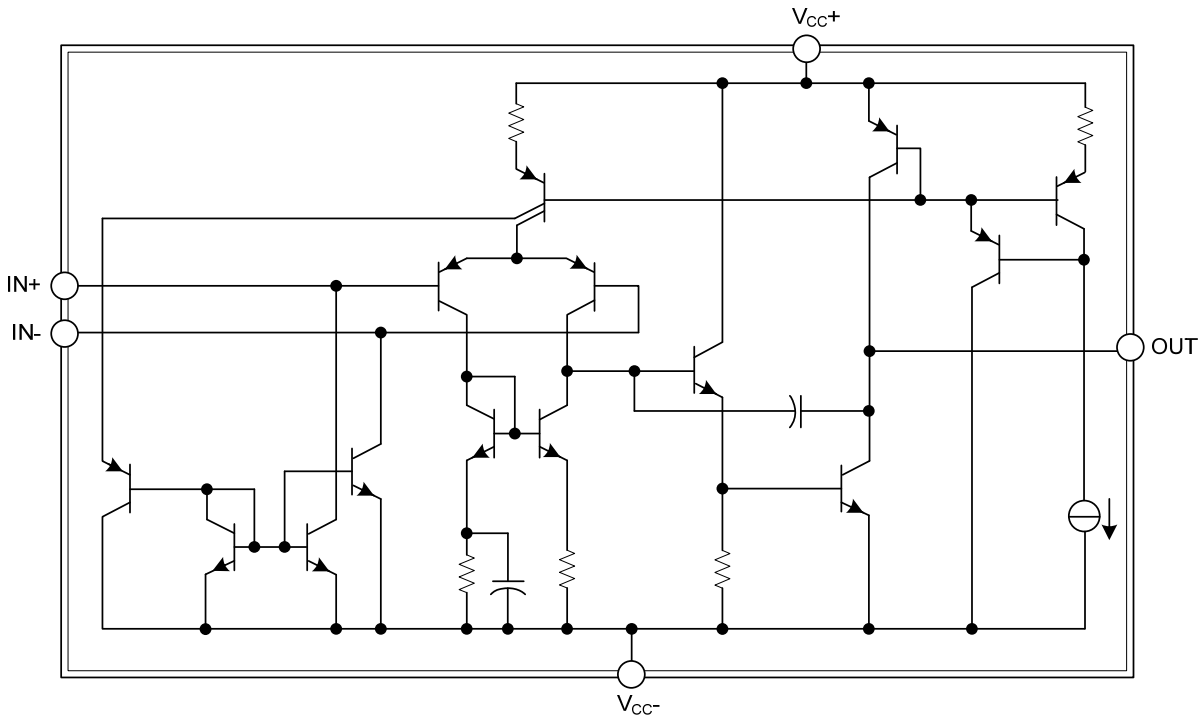
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	1OUT	Channel one output
2	1IN-	Negative channel one input
3	1IN+	Positive channel one input
4	V_{CC}-	The lowest voltage
5	2IN+	Positive channel two input
6	2IN-	Negative channel two input
7	2OUT	Channel two output
8	V_{CC}+	Supply Voltage

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage (Note 2)	V_{CC+}	3.5	V
	V_{CC-}	-3.5	V
Differential Input Voltage (Note 3)	V_{ID}	±3.5	V
Input Voltage (any input) (Notes 2, 4)	V_I	$\pm V_{CC}$	V
Output Voltage	V_O	±3.5	V
Output Current	I_O	20	mA
Operating Virtual Junction Temperature	T_J	+150	°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. All voltage values, except differential voltages, are with respect to the midpoint between V_{CC+} and V_{CC-}.
3. Differential voltages are at IN+ with respect to IN−.
4. All input voltage values must not exceed V_{CC}.

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	±1 ~ ±2.5	V
Operating Free Air Temperature	T_A	-40 ~ +85	°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	97	°C/W

■ ELECTRICAL CHARACTERISTICS (V_{CC}=±1.5V, unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Offset Voltage	V_{IO}	V_O=0, V_{IC}=0		1	6	mV
Input Offset Current	I_{IO}	V_O=0, V_{IC}=0		5	100	nA
Input Bias Current	I_{IB}	V_O=0, V_{IC}=0		20	150	nA
Common-Mode Input Voltage	V_{IC}	$\|V_{IO}\|$≤7.5mV	±0.5			V
Maximum Positive-Peak Output Voltage	V_{OM+}	R_L=10kΩ	1.2	1.4		V
Maximum Negative-Peak Output Voltage	V_{OM-}	R_L=10kΩ	-1.2	-1.4		V
Supply Current (Per Amplifier)	I_{CC}	V_O=0, No load		2.5	4	mA
Large-Signal Differential Voltage Amplification	A_{VD}	V_O=±1V, R_L=10kΩ		55		dB
Common-Mode Rejection Ratio	CMRR	V_{IC}=±0.5V		75		dB
Supply-Voltage Rejection Ratio	k_{SVR}	V_{CC}=±1.5V ~ ±2.5V		80		dB

■ ELECTRICAL CHARACTERISTICS (V_{CC}=±2.5V, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Offset Voltage	V_{IO}	V_O=0, V_{IC}=0		1	6	mV
Input Offset Current	I_{IO}	V_O=0, V_{IC}=0		5	100	nA
Input Bias Current	I_{IB}	V_O=0, V_{IC}=0		20	150	nA
Common-Mode Input Voltage	V_{IC}	$\|V_{IO}\|$≤7.5mV	±1.5			V
Maximum Positive-Peak Output Voltage	V_{OM+}	R_L=10kΩ	2	2.4		V
Maximum Negative-Peak Output Voltage	V_{OM-}	R_L=10kΩ	-2	-2.4		V
Supply Current (Per Amplifier)	I_{CC}	V_O=0, No load		2.5	5	mA
Large-Signal Differential Voltage Amplification	A_{VD}	V_O=±1V, R_L=10kΩ		60		dB
Common-Mode Rejection Ratio	CMRR	V_{IC}=±0.5V		85		dB
Supply-Voltage Rejection Ratio	k_{SVR}	V_{CC}=±1.5V ~ ±2.5V		80		dB

■ OPERATING CHARACTERISTICS

V_{CC}=±1.5V, T_A=25°C

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Slew Rate	SR	A_V=1, V_I=±0.5V		2.5		V/μs
Unity-Gain Bandwidth	B_1	A_V=40, R_L=10kΩ, C_L=100pF		6		MHz
Equivalent Input Noise Voltage	V_n	R_S=100Ω, R_F=10kΩ, f=1kHz		9		nV/$\sqrt{Hz}$

V_{CC}=±2.5V, T_A=25°C

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Slew Rate	SR	A_V=1, V_I=±0.5V		3		V/μs
Unity-Gain Bandwidth	B_1	A_V=40, R_L=10kΩ, C_L=100pF		7		MHz
Equivalent Input Noise Voltage	V_n	R_S=100Ω, R_F=10kΩ, f=1kHz		8		nV/$\sqrt{Hz}$
Total Harmonic Distortion, Plus Noise	THD+N	A_V=1, V_O=±1.2V, R_L=10kΩ, f=3kHz		0.004		%

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