

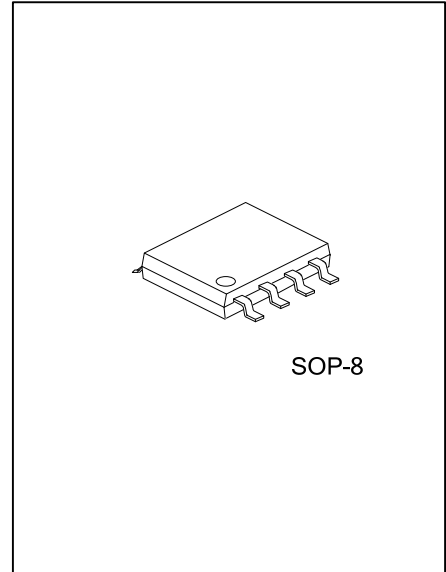


## LV822

Preliminary

CMOS IC

### LOW POWER, RAIL-TO-RAIL OUTPUT OPERATIONAL AMPLIFIER



#### DESCRIPTION

The UTC **LV822** brings performance and economy to low voltage / low power system. With a 5.5MHz unity-gain frequency and 2.3 V/ $\mu$ s slew rate, the quiescent current is only 250 $\mu$ A/amplifier (5V). It provides rail-to-rail output swing into heavy load (600 $\Omega$  Guarantees). The input common-mode voltage range includes ground, and the maximum input offset voltage is 3.5mV.

#### FEATURES

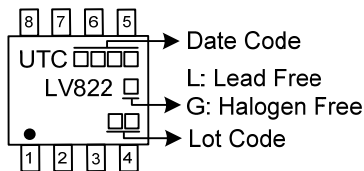
- \* Supply Voltage:2.5~5.5V
- \* Supply Current/Amplifier:0.35 mA (Max)
- \* Input Offset Voltage:3.5mV (Max)
- \* Rail-to-Rail Output
- \* Slew Rate: 2.3V/ $\mu$ s (Typ.)

#### ORDERING INFORMATION

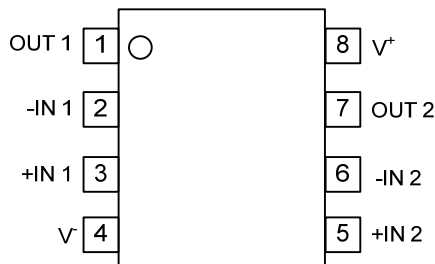
Ordering Number		Package	Packing
Lead Free	Halogen Free		
LV822L-S08-R	LV822G-S08-R	SOP-8	Tape Reel

<p>LV822G-S08-R</p> <ul style="list-style-type: none"> <li>(1)Packing Type</li> <li>(2)Package Type</li> <li>(3)Green Package</li> </ul>	<ul style="list-style-type: none"> <li>(1) R: Tape Reel</li> <li>(2) S08: SOP-8</li> <li>(3) G: Halogen Free and Lead Free, L: Lead Free</li> </ul>
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#### MARKING



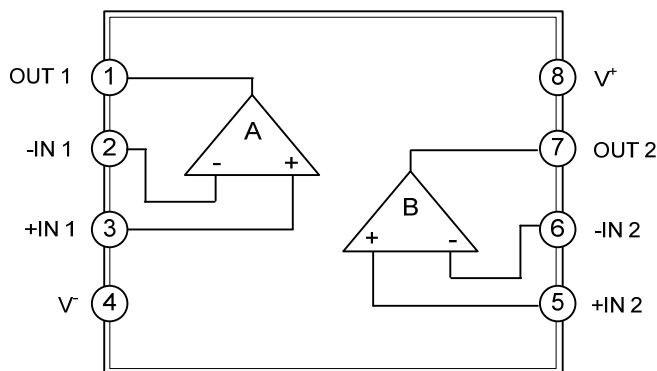
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	OUT 1	Output of 1 AMP
2	-IN 1	Inverting input of 1 AMP
3	+IN 1	Non-inverting input of 1 AMP
4	V <sup>-</sup>	Negative power supply
5	+IN 2	Non-inverting input of 2 AMP
6	-IN 2	Inverting input of 2 AMP
7	OUT 2	Output of 2 AMP
8	V <sup>+</sup>	Positive power supply

■ BLOCK DIAGRAM



### ■ ABSOLUTE MAXIMUM RATING (NOTE 1)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$(V^+ - V^-)$	5.5	V
Differential Input Voltage	$V_{ID}$	Supply Voltage	
Junction Temperature (Note 3)	$T_J$	+150	°C
Storage Temperature	$T_{STG}$	-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.

- Applies to both single-supply and split-supply operation. Continuous short circuit operation at elevated ambient temperature can result in exceeding the maximum allowed junction temperature of 150°C. Output currents in excess of 45mA over long term may adversely affect reliability.
- The maximum power dissipation is a function of  $T_{J(max)}$ ,  $\theta_{JA}$ , and  $T_A$ . The maximum allowable power dissipation at any ambient temperature is  $P_D = (T_{J(max)} - T_A) / \theta_{JA}$ . All numbers apply for packages soldered directly into a PC board.

### ■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V^+ - V^-$	2.5 ~ 5.5	V
Operating Free-Air Temperature	$T_{OPR}$	-40 ~ +125	°C

### ■ ELECTRICAL CHARACTERISTICS

( $T_A = 25^\circ\text{C}$ ,  $V^+ = 2.5 \sim 5\text{V}$ ,  $V^- = 0\text{V}$ ,  $V_{IC} = 1 \sim 2\text{V}$ ,  $V_O = V^+ / 2\text{V}$  and  $R_L > 1\text{M}\Omega$ .)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT		
Supply Current/Amplifier	$I_Q$			0.28	0.35	mA		
Power Supply Rejection Ratio	PSRR	$1.7\text{V} \leq V^+ \leq 4\text{V}$ , $V^- = 1\text{V}$ , $V_O = 0\text{V}$ , $V_{IC} = 0\text{V}$	70	85		dB		
Input Offset Voltage	$V_{OS}$			1	3.5	mV		
Input Bias Current	$I_B$			40		nA		
Input Offset Current	$I_{OS}$			1		nA		
Common-Mode Voltage Range	$V_{CM}$		-0.2		$V^+ - 0.8$	V		
Common Mode Rejection Ratio	CMRR	$0\text{V} \leq V_{IC} \leq 4.0\text{V}$	70	90		dB		
Large Signal Voltage Gain	$A_V$	$R_L = 600\Omega$ , $V_O = V^+ / 2\text{V} \sim V^+ - 0.5\text{V}$	80	105		dB		
		$R_L = 600\Omega$ , $V_O = V^+ / 2\text{V} \sim 0.5\text{V}$	80	105		dB		
		$R_L = 2\text{k}\Omega$ , $V_O = V^+ / 2\text{V} \sim V^+ - 0.5\text{V}$	80	105		dB		
		$R_L = 2\text{k}\Omega$ , $V_O = V^+ / 2\text{V} \sim 0.5\text{V}$	80	105		dB		
Output Voltage	$V_O$	$R_L = 600\Omega$	$V_{OH}$	$V^+ - 0.25$	$V^+ - 0.15$		V	
			$V_{OL}$		0.17	0.250		V
		$R_L = 2\text{k}\Omega$	$V_{OH}$	$V^+ - 0.15$	$V^+ - 0.10$			V
			$V_{OL}$		0.10	0.15		V
Short-Circuit Current	$I_{SC}$	Sourcing, $V_O = 0\text{V}$	20	45		mA		
		Sinking, $V_O = V^+$	20	40		mA		
Slew Rate	SR			2.3		V/ $\mu\text{s}$		
Gain-Bandwidth Product	GBW			5.6		MHz		
Phase Margin	$\Phi_M$			55		Deg.		
Gain Margin	$G_M$			7		dB		
Input-Referred Voltage Noise	$e_n$	$f = 1\text{kHz}$ , $V_{IC} = 1\text{V}$		30		nV/ $\sqrt{\text{Hz}}$		
Input-Referred Current Noise	$i_n$	$f = 1\text{kHz}$		0.3		pA/ $\sqrt{\text{Hz}}$		
Total Harmonic Distortion	THD	$f = 1\text{kHz}$ , $A_V = -2$ , $R_L = 10\text{k}\Omega$ , $V_O = (V^+ - 0.9)V_{PP}$		0.01		%		

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