



**UM2122**

Preliminary

*LINEAR INTEGRATED CIRCUIT*

**ULTRA LOW NOISE DUAL OPERATIONAL AMPLIFIER**

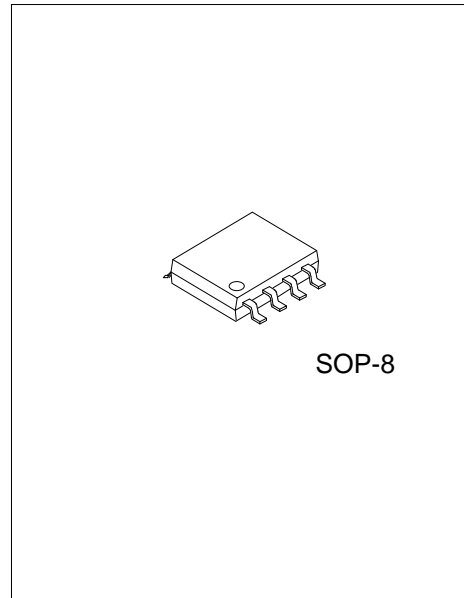
■ **DESCRIPTION**

The UTC **UM2122** is an ultra low noise dual operational amplifier built using an advanced bipolar process. It can be operated at a very low supply voltage ( $\pm 2V$ ), while maintaining a low saturation output voltage.

The features of ultra low noise, low operating voltage, and low saturation voltage are suitable for microphone amplifier of digital audio items such as portable MD, DAT, and others.

■ **FEATURES**

- \* Operating Voltage:  $\pm 2.0V \sim \pm 8.0V$
- \* Ultra Low Noise Voltage:  $1.5nV/\sqrt{Hz}$  (typ.) @  $f=1kHz$ .
- \* Low Saturation Output Voltage:  $0.3V$  (typ.)
- \* Bipolar Technology

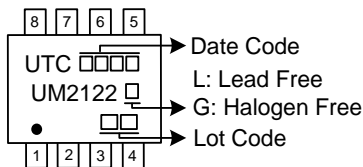


■ **ORDERING INFORMATION**

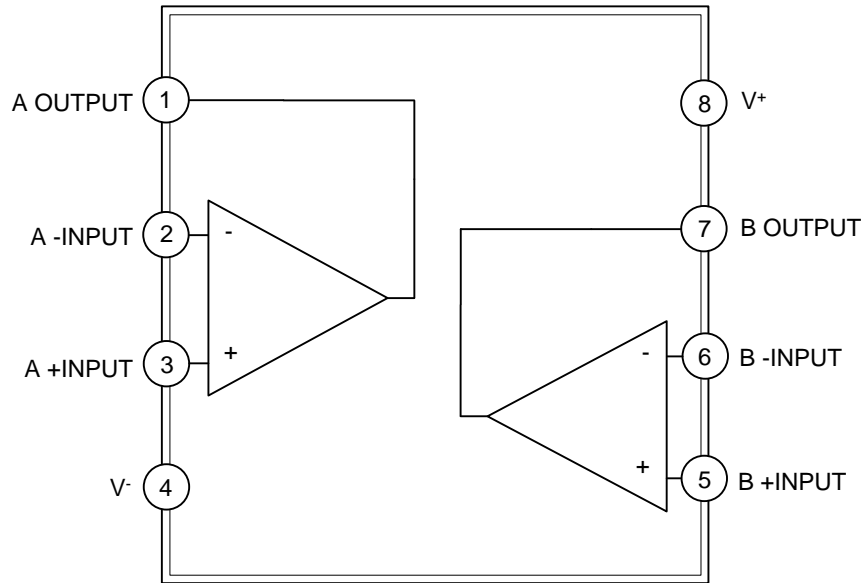
Ordering Number		Package	Packing
Lead Free	Halogen Free		
UM2122L-S08-R	UM2122G-S08-R	SOP-8	Tape Reel

<p>UM2122G-S08-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) R: Tape Reel</p> <p>(2) S08: SOP-8</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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■ **MARKING**



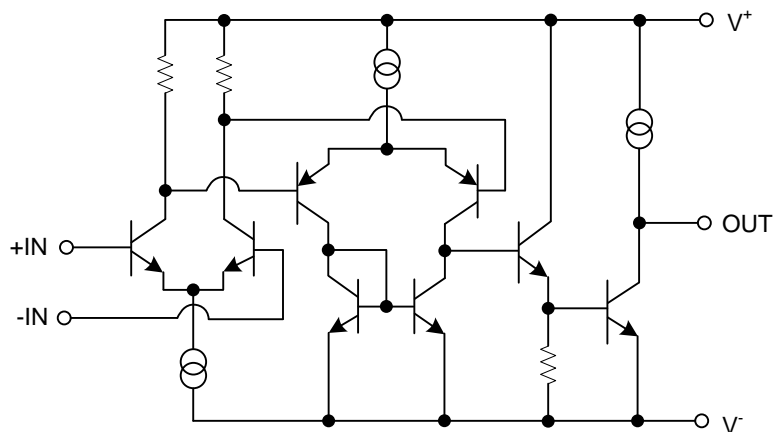
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	A OUTPUT	Output of A AMP
2	A -INPUT	Invert input of A AMP
3	A +INPUT	Non-invert input of A AMP
4	V <sup>-</sup>	Negative power supply
5	B +INPUT	Non-invert input of B AMP
6	B -INPUT	Invert input of B AMP
7	B OUTPUT	Output of B AMP
8	V <sup>+</sup>	Positive power supply

■ BLOCK DIAGRAM



■ **ABSOLUTE MAXIMUM RATING** ( $T_A=25^{\circ}\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V^+ / V^-$	$\pm 10$	V
Differential Input Voltage	$V_{ID}$	$\pm 0.5$	V
Input Voltage	$V_{IC}$	$\pm 10$ (Note 2)	V
Power Dissipation	$P_D$	300	mW
Operating Temperature Range	$T_{OPR}$	-40 ~ +85	$^{\circ}\text{C}$
Storage Temperature Range	$T_{STG}$	-40 ~ +150	$^{\circ}\text{C}$

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. When the supply voltage is less than  $\pm 10\text{V}$ , the absolute maximum input voltage is equal to the supply voltage.

■ **ELECTRICAL CHARACTERISTICS** ( $V^+=5\text{V}$   $T_A=25^{\circ}\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Operating Voltage	$V_{ope}$		$\pm 2.0$		$\pm 8.0$	V
Operating Current	$I_{CC}$	$V_{IN}=0\text{V}, R_L=\infty\Omega$		7.0	9.5	mA
Input Offset Voltage	$V_{IO}$	$R_S=500\Omega$		1.0	6.0	mV
Input Offset Current	$I_{IO}$			0.45	1.50	$\mu\text{A}$
Input Bias Current	$I_B$			3.6	8.0	$\mu\text{A}$
Large Signal Voltage Gain	$A_V$	$R_L \geq 10\text{k}\Omega$	80	100		dB
Input Common Mode Voltage Range	$V_{ICM}$		$\pm 0.7$	$\pm 1.0$		V
Common-Mode Rejection Ratio	CMR		60	74		dB
Supply Voltage Rejection Ratio	SVR		60	80		dB
Maximum Output Voltage	$V_{OM}$	$R_L \geq 2.5\text{k}\Omega$	$\pm 2.0$	$\pm 2.2$		V
Slew Rate	SR	$G_V=20\text{dB}, V_{IN}=\pm 0.1\text{V}$		2		$\text{V}/\mu\text{s}$
Gain Bandwidth Product	GB			12		MHz
Equivalent Input Noise Voltage 1	$e_{n1}$	$R_S=10\Omega, f=1\text{kHz}$		1.5		$\text{nV}/\sqrt{\text{Hz}}$
Equivalent Input Noise Voltage 2	$e_{n2}$	Figure1		0.56	0.75	$\mu\text{Vrms}$
Channel Separation	CS	$f=1\text{kHz}$		90		dB
Total Harmonic Distortion	THD	$V_O=1\text{Vrms}, f=1\text{kHz}, G_V=20\text{dB}, R_L=2.5\text{k}\Omega$		0.003		%

Note: Between 30 to 50dB voltage gain is recommended.

In case of voltage gain less than 30dB, phase compensation by external circuit is required.

The voltage follower circuit must not be used.

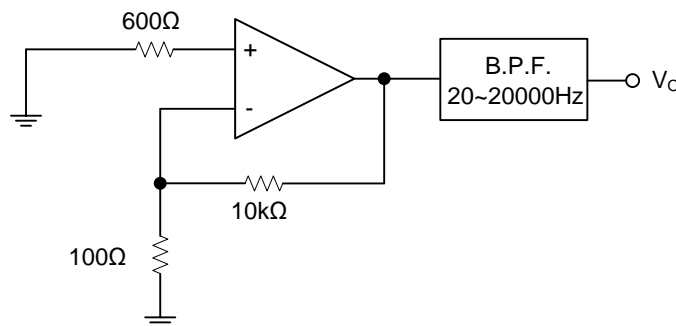


Figure1

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