



Description

The LMV321-1(Single) is low cost, voltage feedback amplifiers. These devices can operate from 2.1V to 5.5V single supply, and consume only 65 μ A quiescent current per amplifier. They provide rail-to-rail input with a wide input common mode voltage range and rail-to-rail output voltage swing. This feature makes LMV321-1 appropriate for buffering ASIC.

The LMV321-1 offer a gain-bandwidth product of 1.5MHz and an ultra-low input bias current of 10pA. They are well suited for piezoelectric sensors, integrators and photo diode amplifiers.

The LMV321-1 is designed into a wide range of applications, such as portable systems, safety monitoring, battery-powered instrumentation, and portable systems.

Features

- Low Cost
- Supply Voltage Range: 2.1V to 5.5V
- Low Supply Current : 65 μ A/Amp (TYP)
- Low Offset Voltage: $\pm$ 0.8mV (TYP)
- Unity-Gain Stable
- Gain-Bandwidth Product : 1.5MHz (TYP)
- Slew Rate: 0.6V/ μ s (TYP)
- Rail-to-Rail Input and Output
- Input Voltage Range: -0.1V to 5.6V with $V_S = 5.5V$
- Operating Temperature: -40 $^{\circ}$ C~+125 $^{\circ}$ C

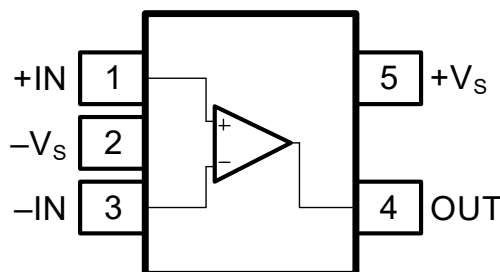
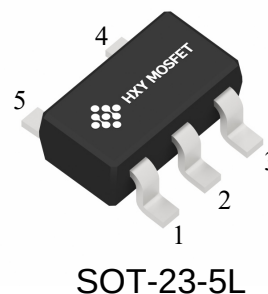
Applications

- Active filter
- Electronic instrumentation
- General Purpose Portable Devices
- General Purpose Low Voltage

Ordering Information

Product Model	Package Type	Brand	Packing	Packing Qty
LMV321-1	SOT-23-5L	HXY MOSFET	Tape	3000Pcs/Reel

Pin Configuration





Absolute Maximum Ratings

Over operating free-air temperature range (unless otherwise noted) ⁽¹⁾

PARAMETER	MIN	MAX	UNIT
Supply Voltage, $V_s=(V^+) - (V^-)$	2.1	6	V
Signal Input Voltage	$(V^-)-0.1$	$(V^+)-1$	V
Signal Output Voltage ⁽²⁾	$(V^-)-0.3$	$(V^+)+0.3$	V
Signal Input Current	-10	+10	mA
Signal Output Current	-70	+70	mA
Maximum Junction Temperature		+150	°C
Storage Temperature Range	-65	+150	°C

Note 1: Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. Exposure to any Absolute Maximum Rating condition for extended periods may affect device reliability and lifetime.

Note 2: Output terminals are diode-clamped to the power-supply rails. Output signals that can swing more than 0.5V beyond the supply rails should be current-limited to $\pm 60\text{mA}$ or less.

ESD Ratings

SYMBOL	PARAMETER		VALUE	UNIT
V_{ESD}	Electrostatic discharge	Human-body model (HBM)	± 4500	V

Recommended Operating Conditions

Over operating free-air temperature range (unless otherwise noted)

PARAMETER		MIN	TYP	MAX	UNIT
Supply Voltage, $V_s=(V^+) - (V^-)$	Signal-supply	2.1		5.5	V
	Dual-supply	± 1.05		± 2.75	V
Operating Temperature Range		-40	+25	+125	°C



Electrical Characteristics

(At $T_A=+25^{\circ}\text{C}$, $V_S=5\text{V}$, $R_L=10\text{k}\Omega$ connected to $V_S/2$, and $V_{OUT}=V_S/2$, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
POWER SUPPLY						
Operating Voltage Range	V_S		2.1		5.5	V
Quiescent Current/Amplifier	I_Q			80		μA
Power-Supply Rejection Ratio	PSRR	$V_S=2.5\text{V}$ to 5.5V , $V_{CM}=(V_-)+0.5\text{V}$	60			dB
INPUT						
Input Offset Voltage	V_{OS}	$V_{CM}=V_S/2$, LMV321	-5	± 0.8	+5	mV
Input Offset Voltage Average Drift	$V_{OS\ TC}$	$T_A=-40^{\circ}\text{C}\sim+125^{\circ}\text{C}$		± 3.8		$\mu\text{V}/^{\circ}\text{C}$
Input Bias Current	I_B			± 10		pA
Input Offset Current	I_{OS}			± 10		pA
Common-Mode Voltage Range	V_{CM}		$(V_-)-0.1$		$(V_+)-1$	V
Common-Mode Rejection Ratio	CMRR	$V_S=5.5\text{V}$, $V_{CM}=-0.1\text{V}$ to 4V	56			dB
OUTPUT						
Open-Loop Voltage Gain	A_{OL}	$R_L=2\text{k}\Omega$, $V_O=0.15\text{V}$ to 4.85V	70			dB
		$R_L=10\text{k}\Omega$, $V_O=0.05\text{V}$ to 4.95V	75			dB
Output Swing From Rail		$R_L=2\text{k}\Omega$		30		mV
		$R_L=10\text{k}\Omega$		5		mV
Output Current Source	I_{OUT}			70		mA
FREQUENCY RESPONSE						
Slew Rate	SR			0.6		$\text{V}/\mu\text{s}$
Gain-Bandwidth Product	GBP			1.5		MHz
Phase Margin	PM			60		$^{\circ}$
Setting Time, 0.1%	t_s			10		μs
Overload Recovery Time		$V_{IN}\cdot\text{Gain}\geq V_S$		5		μs
NOISE						
Input Voltage Noise Density	e_n	$f=1\text{KHz}$		50		$\text{nV}/\sqrt{\text{Hz}}$
		$f=10\text{KHz}$		25		$\text{nV}/\sqrt{\text{Hz}}$



Typical Application

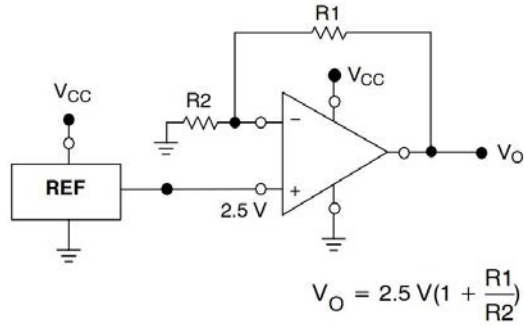


Figure 1. Reference Voltage

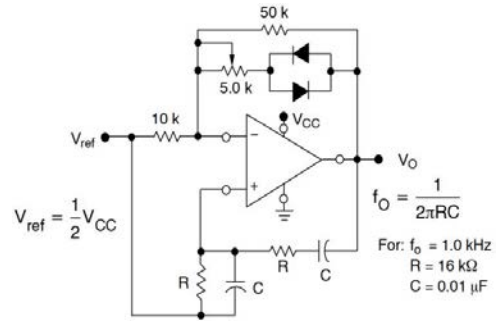


Figure 2. Wien Bridge Oscillator

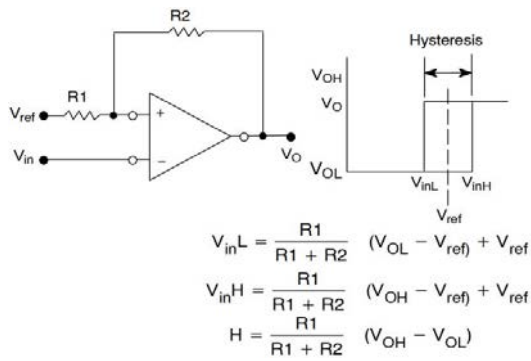


Figure 3. Lag Comparator

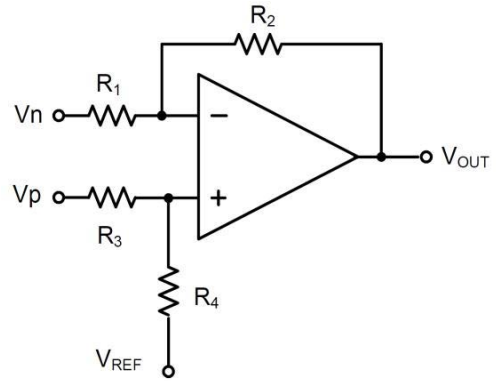


Figure 4. Differential Amplifier



Typical Characteristics

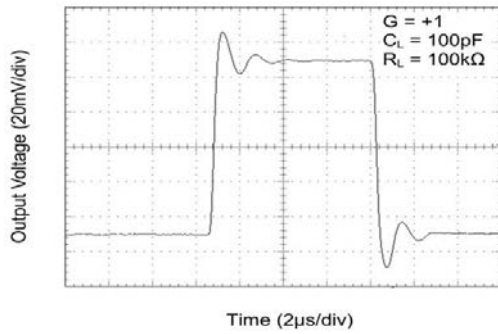


Figure 5. Small-Signal Step Response

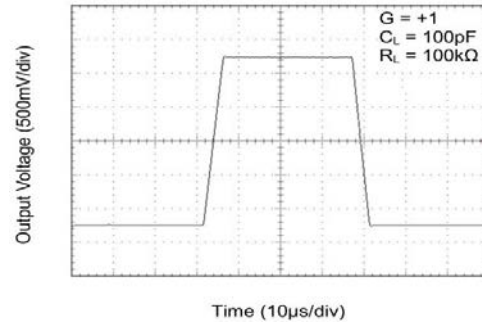


Figure 6. Large-Signal Step Response

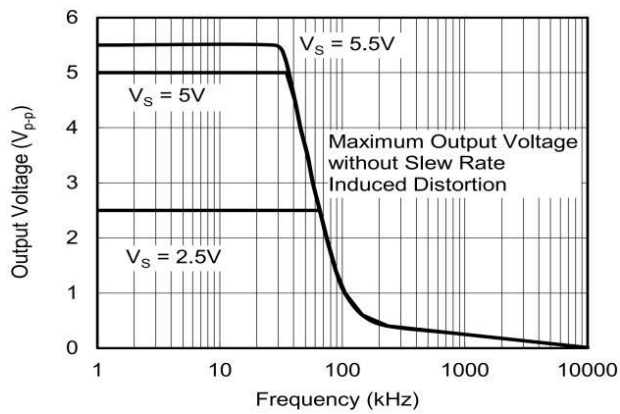


Figure 7. Maximum Output Voltage vs. Frequency

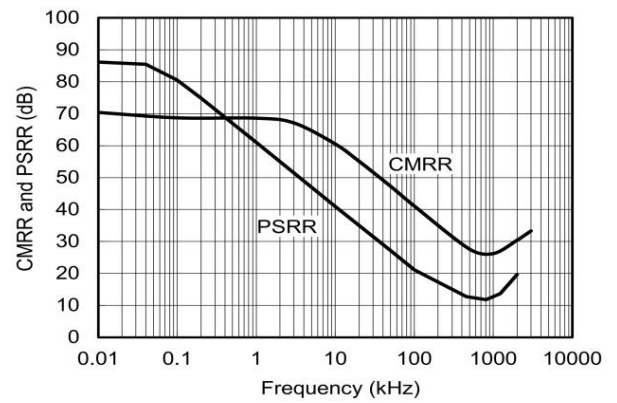
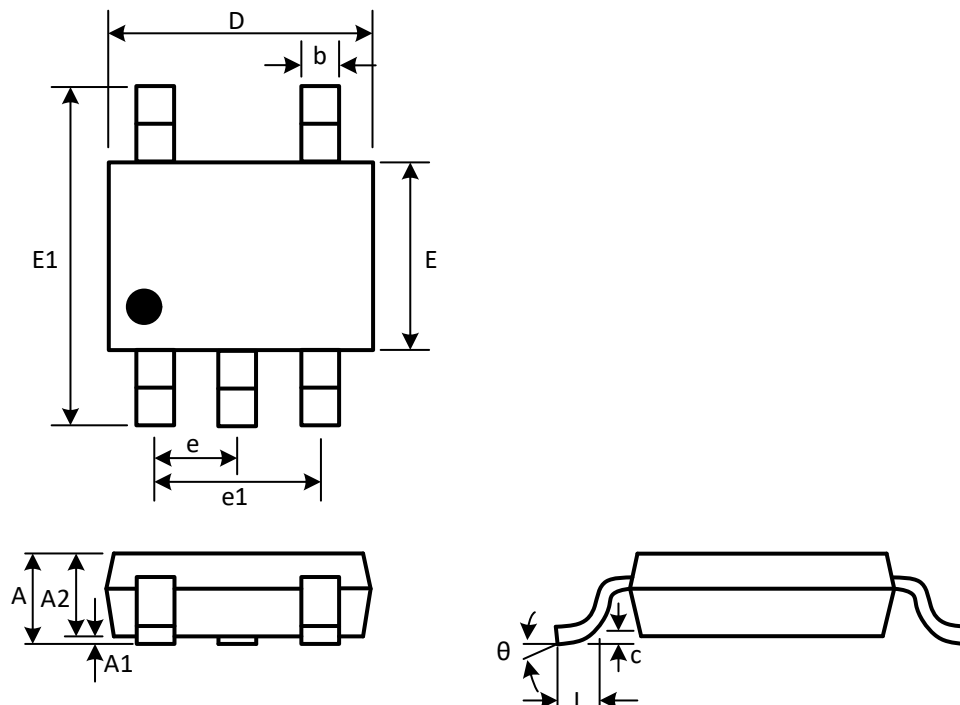


Figure 8. CMRR & PSRR vs. Frequency



Package Outline Dimensions
SOT-23-5L



(Unit: mm)

Symbol	Min	Max
A	1.050	1.250
A1	0.000	0.100
A2	1.050	1.150
b	0.300	0.500
c	0.100	0.200
D	2.820	3.020
e	0.950(BSC)	
e1	1.800	2.000
E	1.500	1.700
E1	2.650	2.950
L	0.300	0.600
θ	0°	8°



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