

PRODUCT DESCRIPTION

The LM321 brings performance and economy to low power systems. With a high unity gain frequency and a guaranteed $0.4V/\mu s$ slew rate, the quiescent current is only $430\mu A$ /amplifier (5V). The input common mode range includes ground and therefore the device is able to operate in single supply applications as well as in dual supply applications. It is also capable of comfortably driving large capacitive loads. The LM321 is available in the SOT package. Overall the LM321 is a low power, wide supply range performance op amp that can be designed into a wide range of applications at an economical price without sacrificing valuable board space.

APPLICATIONS

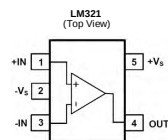
Chargers
Power supplies
Industrial: controls, instruments
Desktops
Communications infrastructure

FEATURES

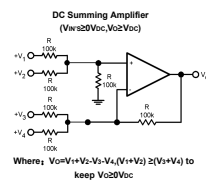
Gain-Bandwidth product: 1MHz
($V_{CC} = 5V$, $T_A = 25^\circ C$. Typical values unless specified).

Low supply current: $430\mu A$
Low input bias current: $45nA$
Wide supply voltage range
Operates on 24V or 12V Supplies
Stable with high capacitive loads
Small Packaging: LM321 Available in SOT-23-5L.

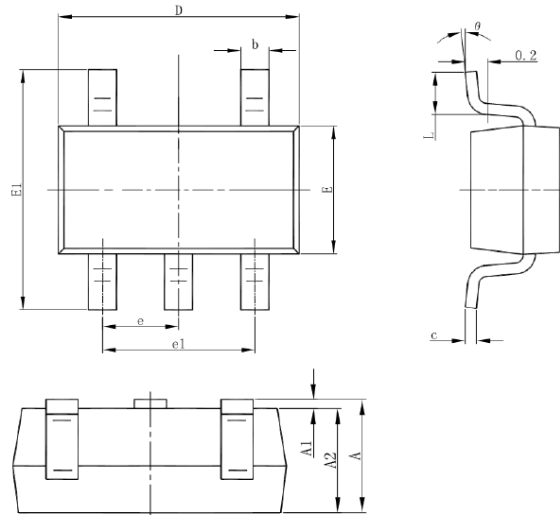
PIN CONFIGURATIONS



APPLICATION Circuit



SOT-23-5L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

ABSOLUTE MAXIMUM RATINGS

Supply Voltage, V_+ to V_-24V or 12V
Input Voltage..... - 0.3V to V_{CC}
Input Current ($V_{IN} < -0.3V$) 50mA
Output Short Circuit to GND ($V \leq 15V$, $T_A = 25^\circ C$) Continuous
Storage Temperature Range..... $-65^\circ C$ to $+150^\circ C$
Junction Temperature..... $150^\circ C$
Operating Temperature Range..... $0^\circ C$ to $+70^\circ C$
Lead Temperature Range (Soldering 10 sec)..... $260^\circ C$

NOTE:

Stresses above those listed under Absolute Maximum Ratings may cause permanent damage to the device. This is a stress rating only; functional operation of the device at these or any other conditions above those indicated in the operational section of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

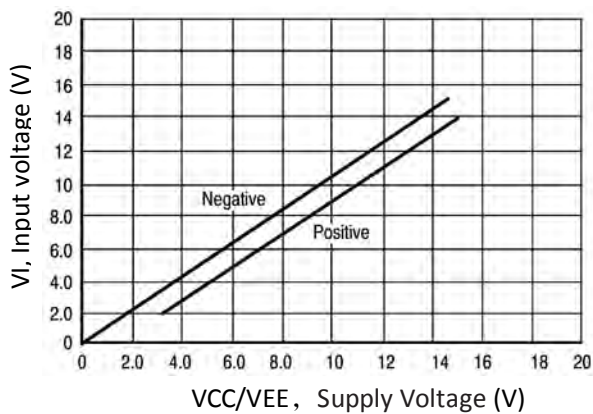
LM321

ELECTRICAL CHARACTERISTICS

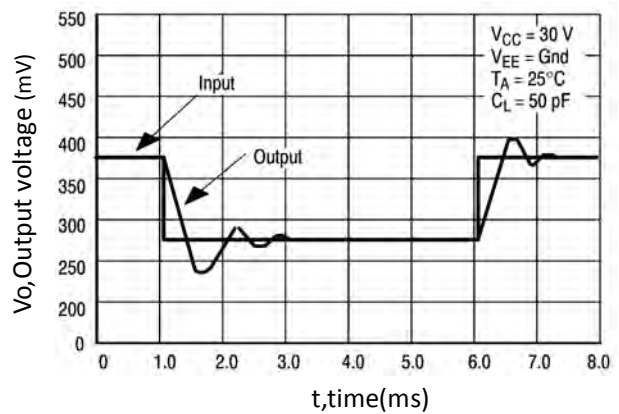
(Unless otherwise specified, all limits guaranteed for at $T_{amb}=25^{\circ}\text{C}$, $V_{cc}=5\text{V}$)

Parameter		Conditions		value			Units
				Min	Typ	Max	
Input Offset Voltage					±2	±5	mV
Input Bias Current		IIN(+) or IIN(-),VCM=0V			±45	±250	nA
Input Offset Current		IIN(+) - IIN(-),VCM=0V			±3	±50	nA
Input Common-Mode Voltage Range		Ta=25°C,V+=24V		0		Vcc -1.5	V
Supply Current		Iout=0	Vcc =24V		1	2	mA
			Vcc =5V		0.5	1.2	mA
Large Signal Voltage Gain		Vcc =15V,Ta=25°C,RL≥2kΩ(Vo=1~11V)		25	100		V/mV
Common Mode Rejection Ratio		DC,Ta=25°C,VCM=0~Vcc-1.5V		65	90		dB
Power Supply Rejection Ratio		DC,Ta=25°C,Vcc =5~24V		65	100		dB
Output Current Sourcing		VIN(+)=1V,VIN(-)=0V,Vcc=15V,Vo=2V		20	40		mA
Output Current Sinking		VIN(-)=1V,VIN(+)=0V,Vcc=15V,Vo=2V		10	15		mA
		VIN(-)=1V,VIN(+)=0V,Vcc=15V,Vo=200mV12			50		μA
Output Short Circuit to Ground		Vcc=15V			40	60	mA
Slew Rate		V+ = 15V, RL = 2kΩ, VIN = 0.5 to 5V CL = 100pF			0.4		V/μs
Output voltage swing	VOH	Vcc=24V	RL=2kΩ	22			V
		Vcc=24V	RL=10kΩ	22			V
	VOL	Vcc=5V, RL=10kΩ				5	20

RATING AND CHARACTERISTIC CURVES (LM321)

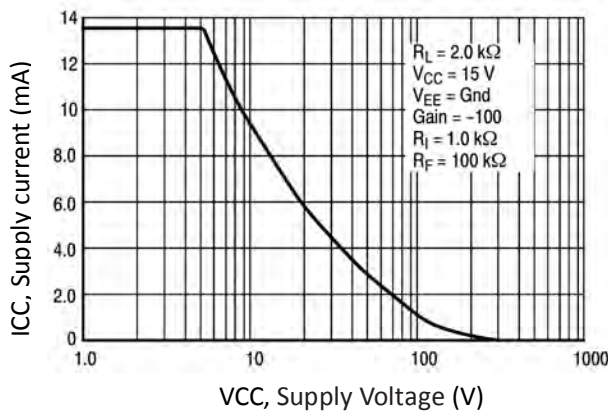


Input voltage range

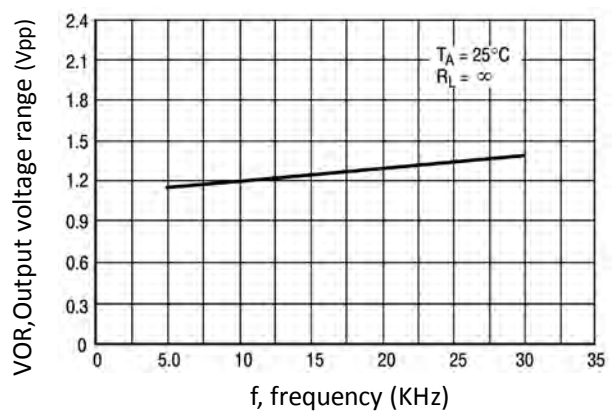


Small signal voltage follower impulse response

(same direction)

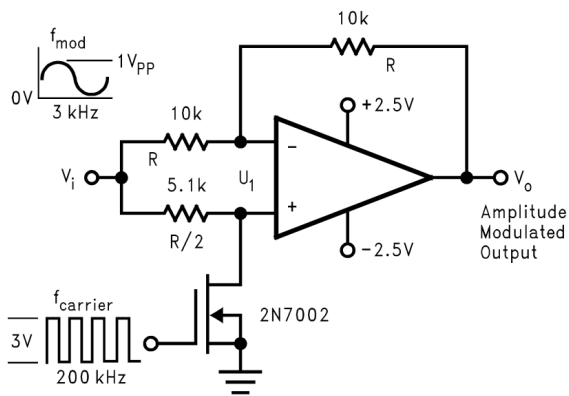


Supply current (static power consumption)

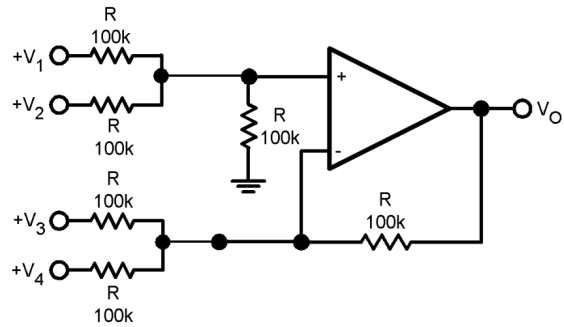


Large signal frequency response

LM321



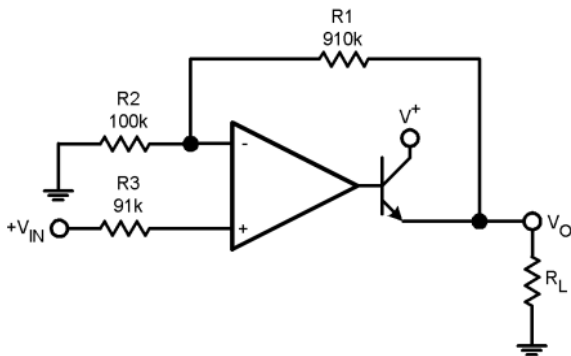
Amplitude Modulator Circuit



Where: $V_o = V_1 + V_2 - V_3 - V_4$, $(V_1 + V_2) \geq (V_3 + V_4)$ to keep $V_o \geq 0V_{DC}$

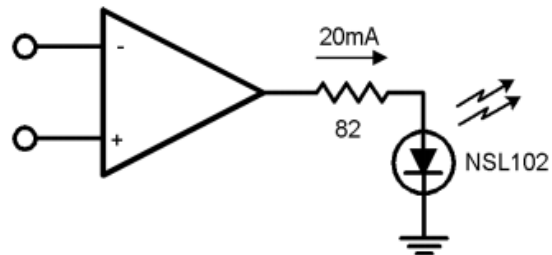
DC Summing Amplifier

($V_{IN's} \geq 0V_{DC}$, $V_o \geq V_{DC}$)

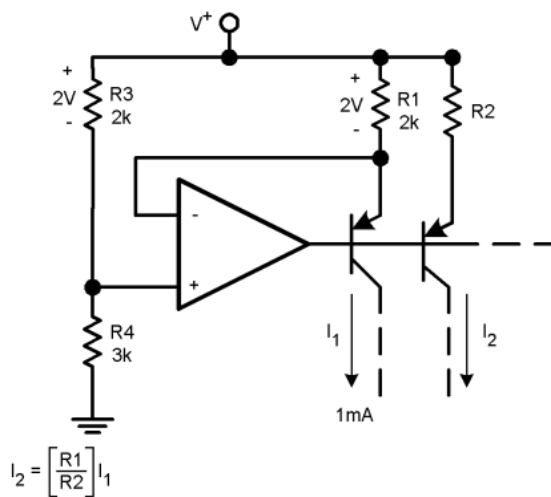


$V_o = 0V_{DC}$ for $V_{IN} = 0V_{DC}$, $A_v = 10$

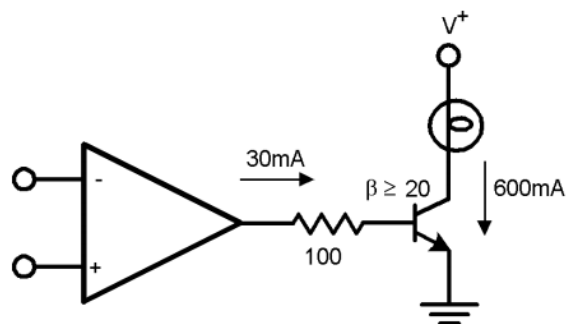
Power Amplifier



LED Driver



Fixed Current Sources



Lamp Driver