Low Power Single Op Amp

General Description

The LM321 brings performance and economy to low power systems. With a high unity gain frequency and a guaranteed0.4V/μs slew rate, the quiescent current is only 430μA/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 SOT23-5 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.

Features

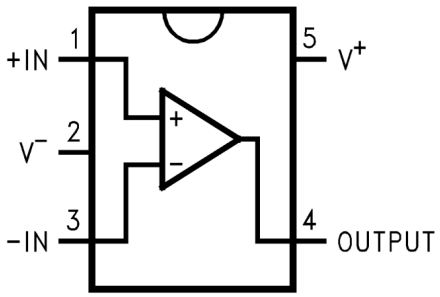
- (VCC = 5V, TA = 25˚C. Typical values unless specified).
- Gain-Bandwidth product 1MHz
- Low supply current 430μA
- Low input bias current 45nA
- Wide supply voltage range
- Stable with high capacitive loads

Applications

- Chargers
- Power supplies
- Industrial: controls, instruments
- Desktops
- Communications infrastructure

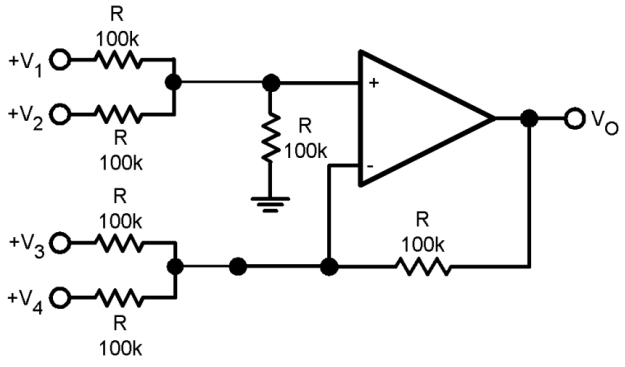
Connection Diagram

SOT23-5



Application Circuit

DC Summing Amplifier
($V_{IN's} \geq 0V_{DC}, V_O \geq V_{DC}$)



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

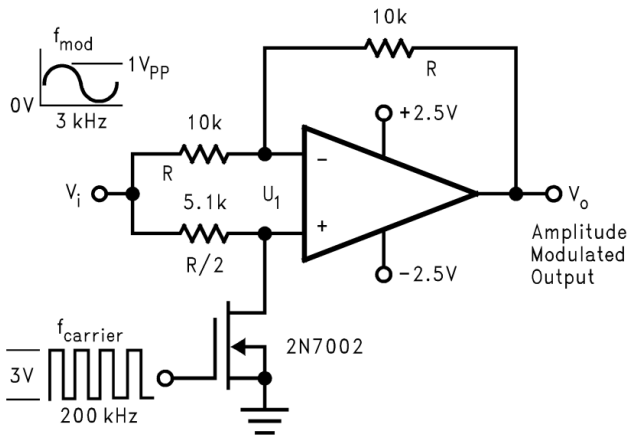
Absolute Maximum Ratings (Unless otherwise specified, all limits guaranteed for at Tamb=25℃)

Parameter	value	Units
Supply Voltage	24 or ±12	V
Differential Input Voltage	24	V
Input Voltage	-0.3 ~ VCC	V
Output Short Circuit to GND（V≤15V、Ta=25℃）	Continuous	
Input Current（VIN<-0.3V）	50	mA
Junction Temperature	150	℃
Temperature Range	0 ~ 70	℃
Storage Temperature Range	-65 ~ 150	℃

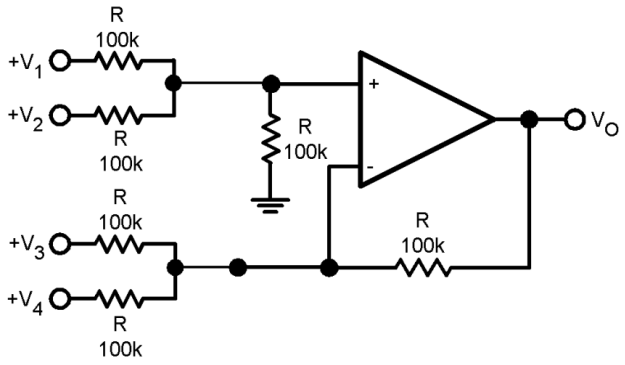
Electrical Characteristics (Unless otherwise specified, all limits guaranteed for at Tamb=25℃, Vcc=5V)

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℃， 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℃，RL≥2kΩ（Vo=1~11V）		25	100		V/mV
Common Mode Rejection Ratio		DC，Ta=25℃，VCM=0~Vcc-1.5V		65	90		dB
Power Supply Rejection Ratio		DC，Ta=25℃，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=200mV		12	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	mV

Typical Applications



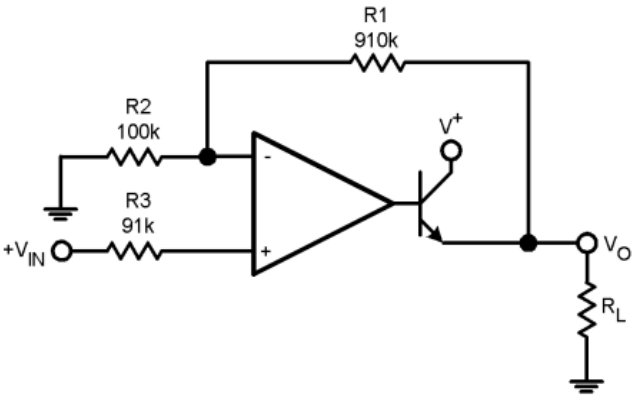
Amplitude Modulator Circuit



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

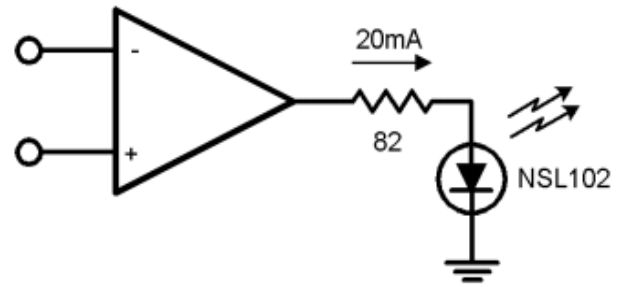
DC Summing Amplifie

(V_{IN}'s≥0V_{DC},V_O≥V_{DC})

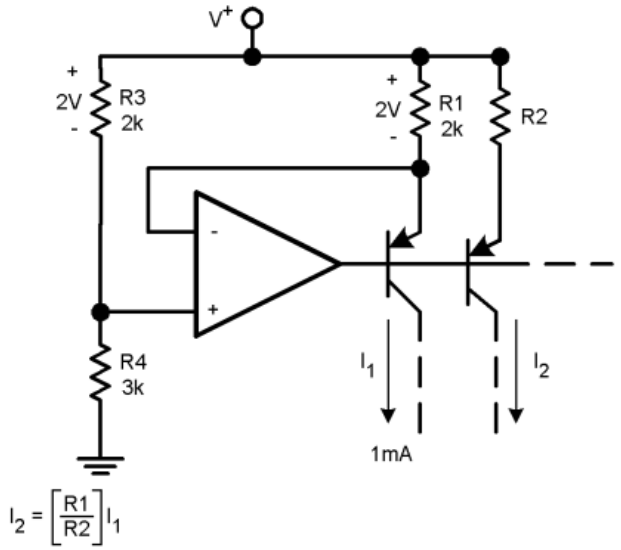


V_O=0V_{DC} for V_{IN}=0V_{DC}， A_V=10

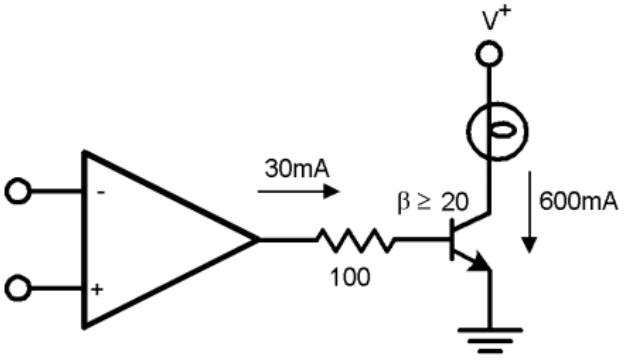
Power Amplifier



LED Driver

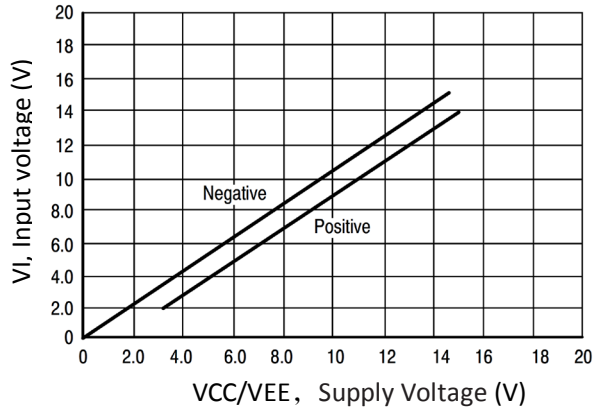


Fixed Current Sources

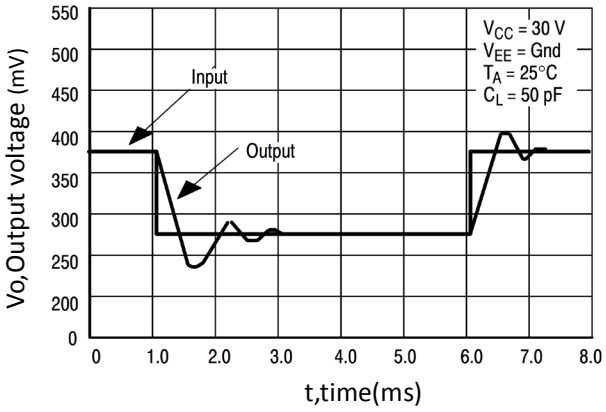


Lamp Driver

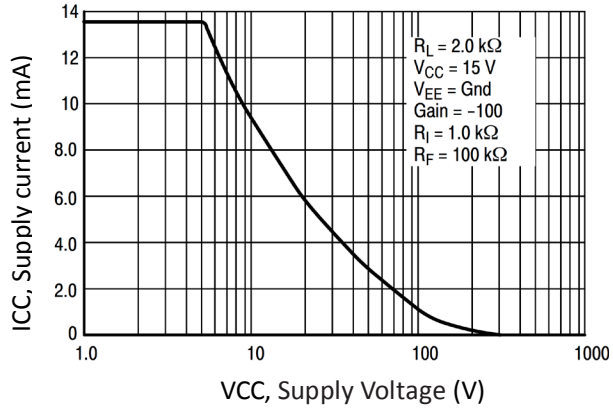
Typical Performance Characteristics



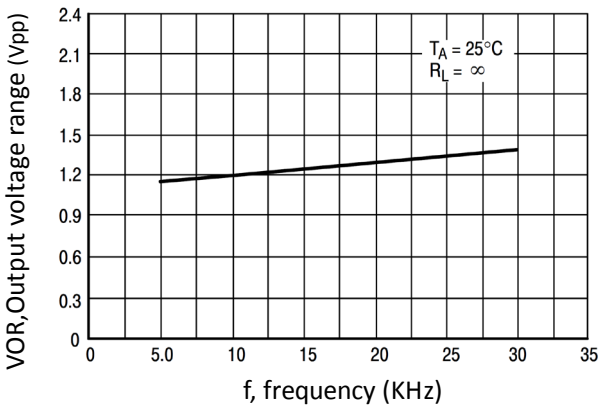
Input voltage range



Small signal voltage follower impulse response (same direction)

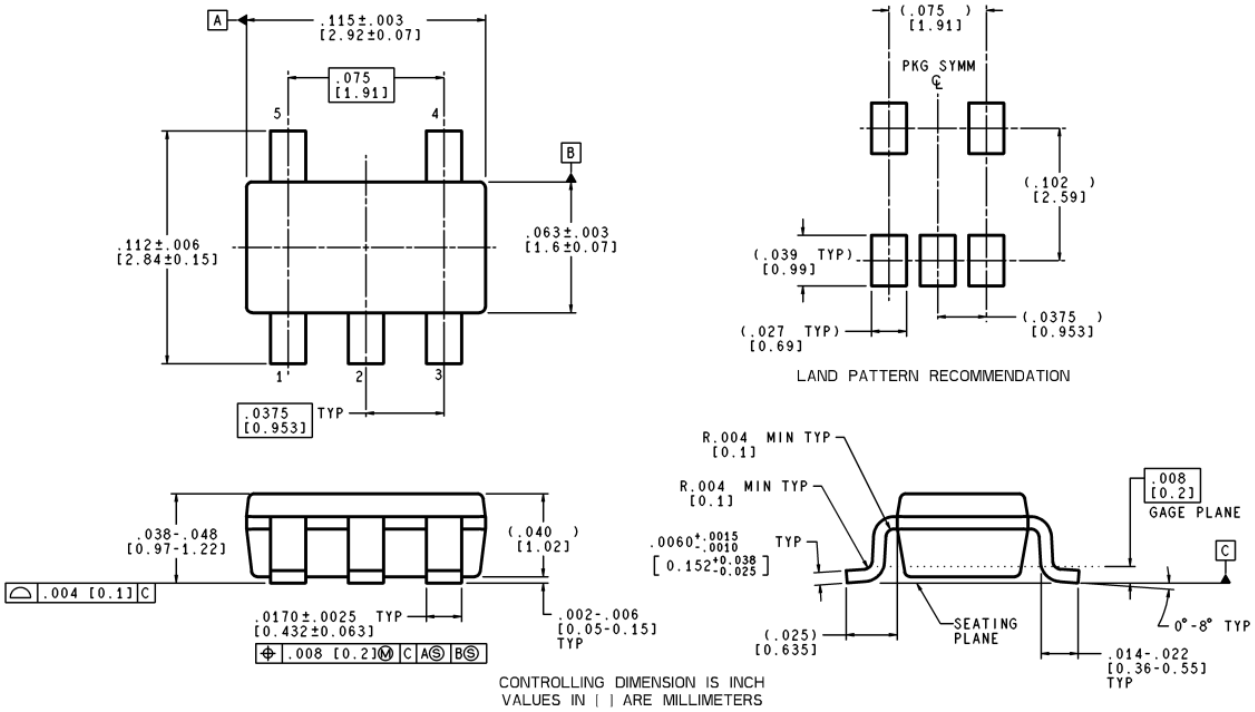


Supply current (static power consumption)



Large signal frequency response

Physical Dimensions



5-Pin SOT23

NS Package Number MF05A