

Description

LM321 is a low power, wide power range performance operational amplifier; The static current is only 430 μA per amplifier (5V) with high unit gain frequency and A voltage swing rate of 0.4V/ μs . Input common model circuit includes ground, so the device can operate in single - and dual-power applications. It can also comfortably drive large capacity loads.

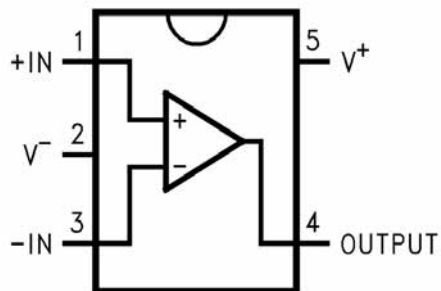
Features

- Low quiescent current
- Low input bias current
- Wide range of supply voltage
- High capacity load stability

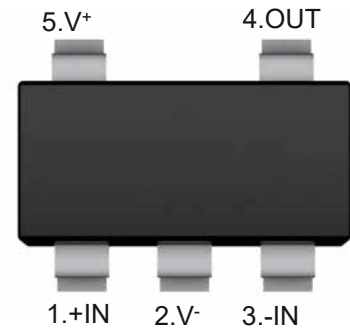
Applications

- Battery-Powered Equipment
- Smoke Detector and Sensor
- Micro Controller Applications

Pin arrangement diagram



SOT-23-5



Absolute Maximum Ratings (T_A=25°C)

Parameter	Symbol	Value	Units
Supply Voltage	V _{CC}	24 or ±12	V
Differential Input Voltage	V _{ID}	24	V
Input Voltage	V _{IN}	-0.3~V _{CC}	V
Power Dissipation	P _D	530	mW
Output Short Circuit to GND V≤15V, Ta=25°C	I _o	Continuous	
Input Current VIN<-0.3V	I _{IN}	50	mA
Junction Temperature	T _J	150	°C
Operating Temperature Range	T _{OPR}	0 to 70	°C
Storage Temperature Range	T _{STG}	-65 to 150	°C

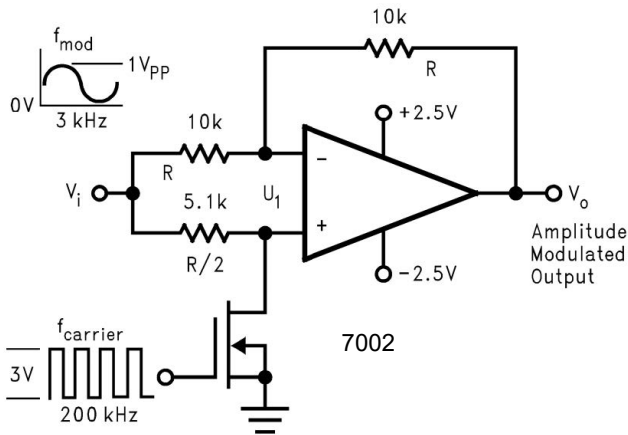
Electrical Characteristics

 At V_{CC}=5V, unless otherwise noted.

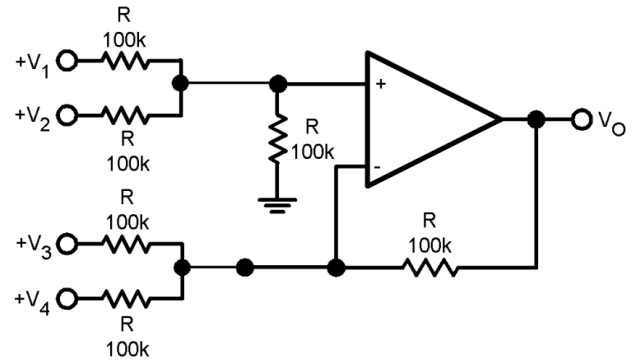
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units	
Input Offset Voltage	V _{OS}	Ta=25°C	--	±2	±5	mV	
Input offset current	I _{OS}	Ta=25°C, I _{IN(+)} - I _{IN(-)} , V _{CM} =0V	--	±3	±50	nA	
Input bias current	I _B	Ta=25°C, I _{IN(+)} or I _{IN(-)} , V _{CM} =0V	--	±45	±250	nA	
Common-mode input voltage range	V _{CM}	Ta=25°C, V ⁺ =24V	0	--	V _{CC} -1.5	V	
Supply current	I _S	V _{CC} =24V, R _L =∞	--	0.7	2	mA	
		V _{CC} =5V, R _L =∞	--	0.5	1.2		
Common Mode Rejection	CMRR	V _{CM} = 0~V _{CC} -1.5V, Ta=25°C, DC	65	90	--	dB	
Power Supply Rejection	PSRR	V _{CC} = 5V~24V, Ta=25°C, DC	65	100	--	dB	
Large signal voltage gain	A _V	V _{CC} = 15V, Ta=25°C, R _L ≥ 2kΩ(for V _o =1~11V)	25	100	--	V/mV	
Output voltage swing	V _O	V _{OH}	V _{CC} = 24V, R _L = 2 kΩ	22	--	--	V
			V _{CC} = 24V, R _L =10 kΩ	22	--	--	V
		V _{OL}	V _{CC} = 5V, R _L =10 kΩ	--	5	20	mV
Output Current Sourcing	I _{SOURCE}	V _{IN(+)} =1V, V _{IN(-)} =0V, V _{CC} =15V, V _O =2V, Ta=25°C	20	40	--	mA	
Output Current Sinking	I _{SINK}	V _{IN(+)} =0V, V _{IN(-)} =1V, V _{CC} =15V, V _O =2V, Ta=25°C	10	15	--	mA	
		V _{IN(+)} =0V, V _{IN(-)} =1V, V _{CC} =15V, V _O =200mV, Ta=25°C	12	50	--	μA	
Output Short Circuit to Ground	I _o	V _{CC} =15V, Ta=25°C	--	40	60	mA	



Typical Applications

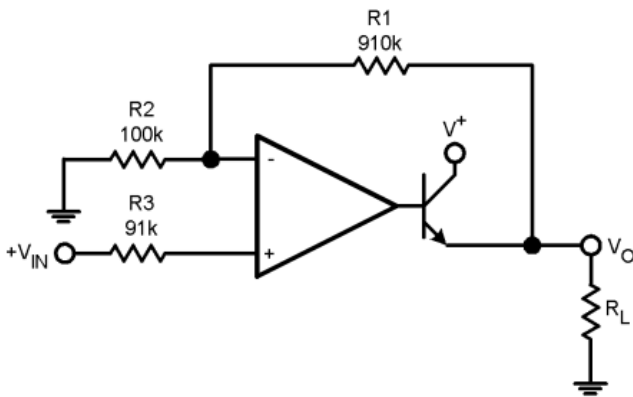


Amplitude modulator circuit



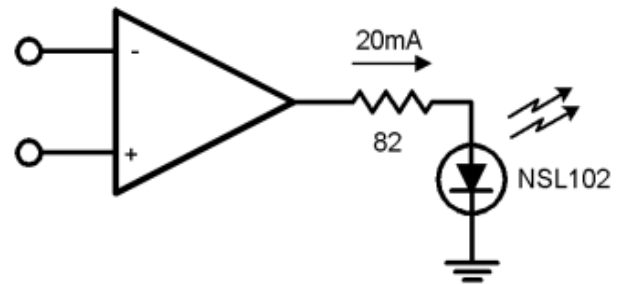
Note: $V_o = V_1 + V_2 - V_3 - V_4, (V_1 + V_2) \geq (V_3 + V_4)$ for $V_o \geq 0V_{DC}$

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

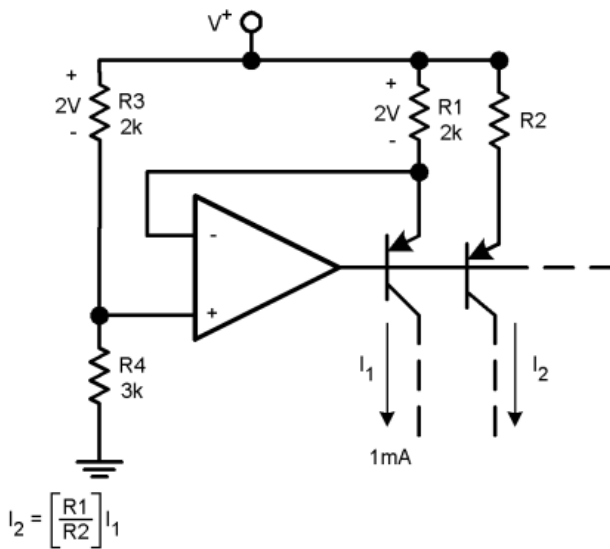


$V_o = 0V_{DC}$ for $V_{IN} = 0V_{DC}, A_v = 10$

Power Amplifier

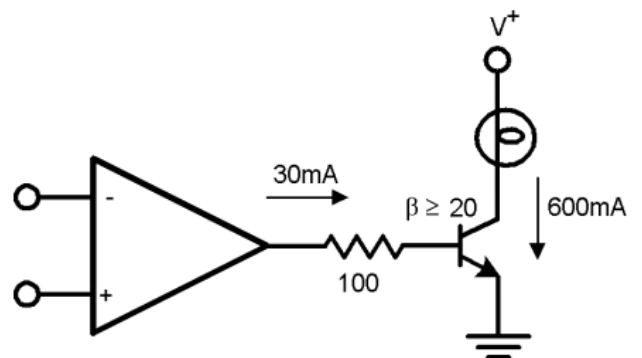


LED Driver



$$I_2 = \left[\frac{R_1}{R_2} \right] I_1$$

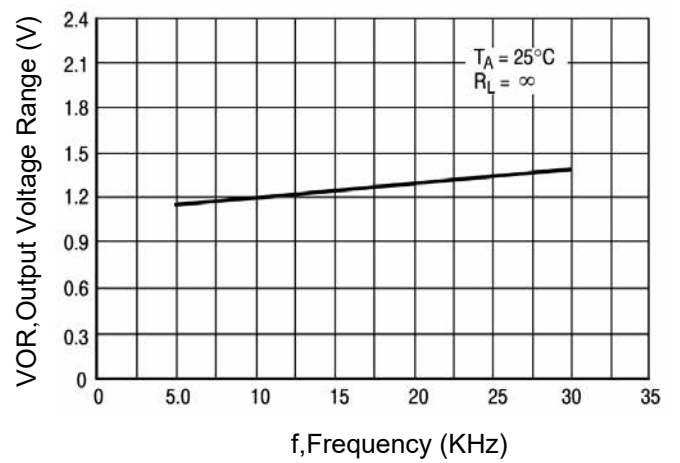
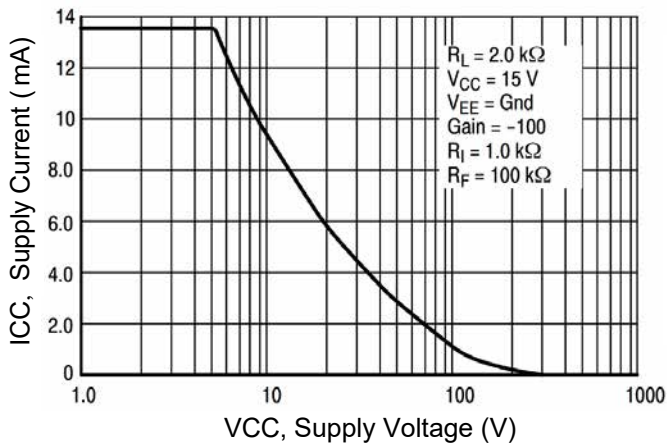
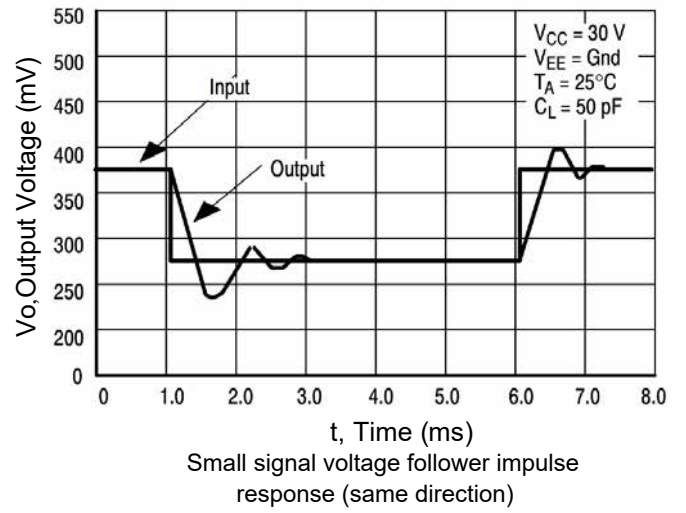
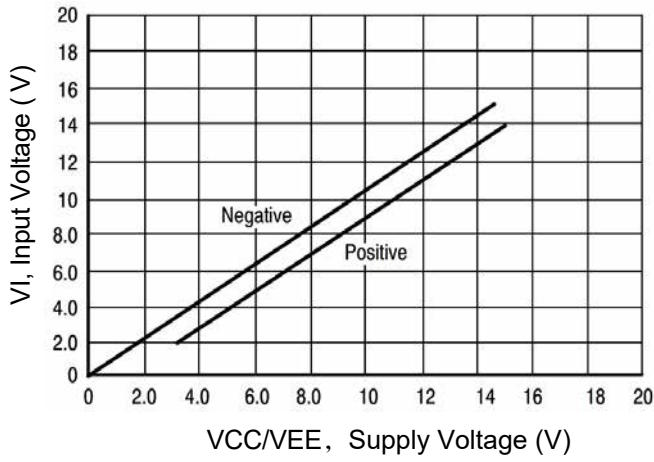
Fixed current source



Lamp Driver



Typical characteristic curve

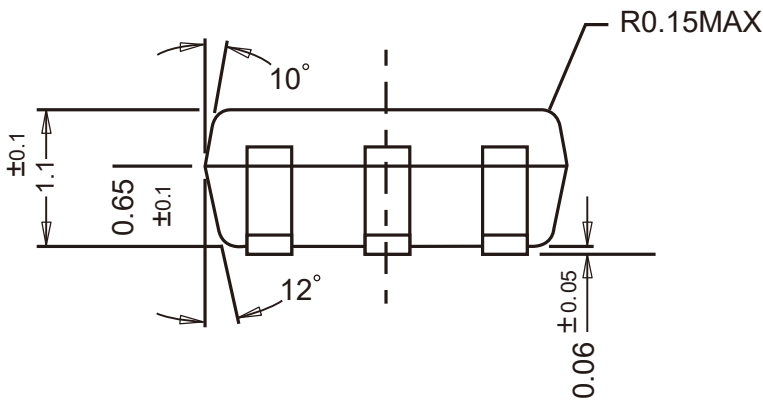
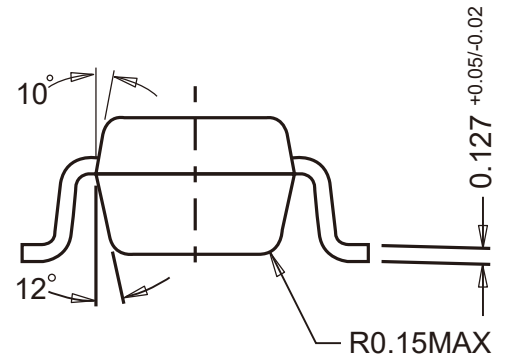
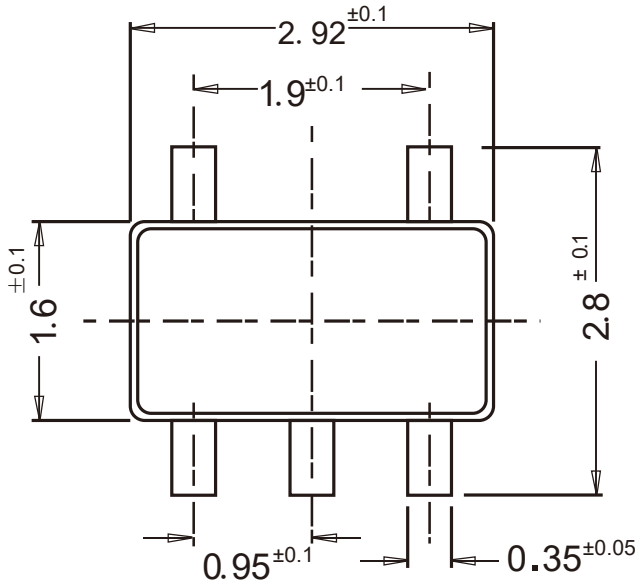




Package Outline

SOT-23-5

Dimensions in mm



Ordering Information

Device	Package	Shipping
LM321	SOT-23-5	3,000PCS/Reel&7inches

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