

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.

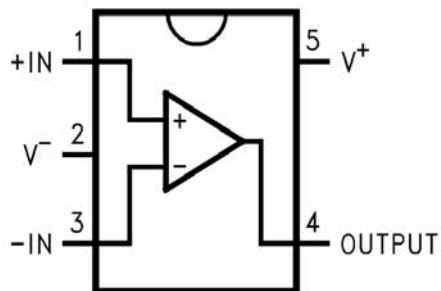
Features

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

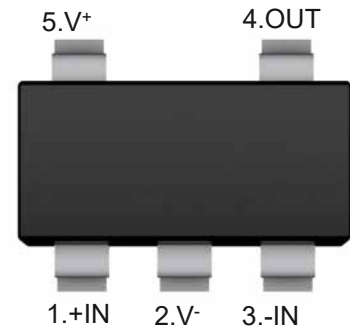
Applications

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

Pin arrangement diagram



SOT-23-5





LM321

Low Power Single Operational Amplifier

Absolute Maximum Ratings ($T_A=25^\circ\text{C}$)

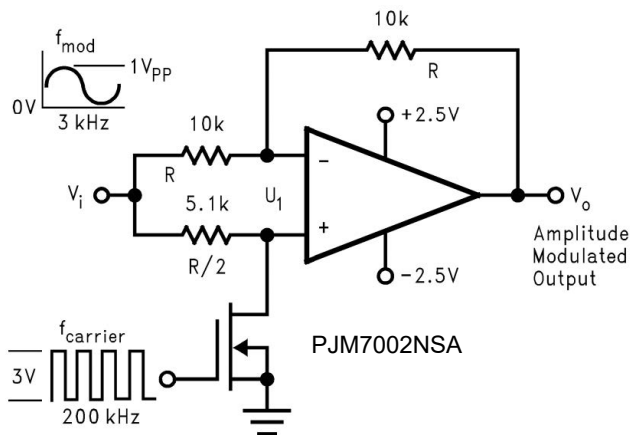
Parameter	Symbol	Value	Units
Supply Voltage	V_{CC}	24 or ± 12	V
Differential Input Voltage	V_{ID}	24	V
Input Voltage	V_{IN}	-0.3~ V_{CC}	V
Power Dissipation	P_D	530	mW
Output Short Circuit to GND $V \leq 15V, T_A=25^\circ\text{C}$	I_o	Continuous	
Input Current $V_{IN} < -0.3V$	I_{IN}	50	mA
Junction Temperature	T_J	150	$^\circ\text{C}$
Operating Temperature Range	T_{OPR}	0 to 70	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-65 to 150	$^\circ\text{C}$

Electrical Characteristics

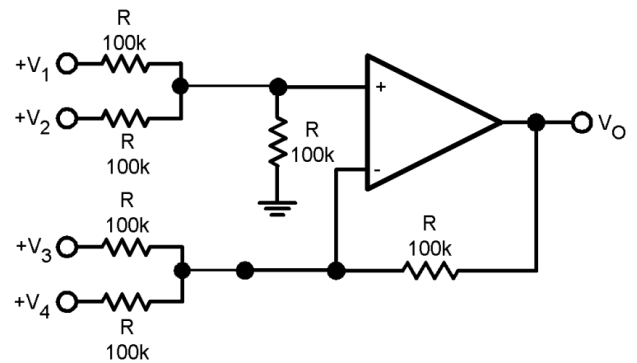
At $V_{CC}=5V$, unless otherwise noted.

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units	
Input Offset Voltage	V_{OS}	$T_A=25^\circ\text{C}$	--	± 2	± 5	mV	
Input offset current	I_{OS}	$T_A=25^\circ\text{C}, I_{IN(+)} - I_{IN(-)}, V_{CM}=0V$	--	± 3	± 50	nA	
Input bias current	I_B	$T_A=25^\circ\text{C}, I_{IN(+)} \text{ or } I_{IN(-)}, V_{CM}=0V$	--	± 45	± 250	nA	
Common-mode input voltage range	V_{CM}	$T_A=25^\circ\text{C}, V^+=24V$	0	--	$V_{CC}-1.5$	V	
Supply current	I_S	$V_{CC}=24V, R_L = \infty$	--	0.7	2	mA	
		$V_{CC}=5V, R_L = \infty$	--	0.5	1.2		
Common Mode Rejection	CMRR	$V_{CM} = 0 \sim V_{CC}-1.5V, T_A=25^\circ\text{C}, DC$	65	90	--	dB	
Power Supply Rejection	PSRR	$V_{CC} = 5V \sim 24V, T_A=25^\circ\text{C}, DC$	65	100	--	dB	
Large signal voltage gain	A_V	$V_{CC} = 15V, T_A=25^\circ\text{C}, R_L \geq 2k\Omega (\text{for } V_O=1 \sim 11V)$	25	100	--	V/mV	
Output voltage swing	V_O	V_{OH}	$V_{CC} = 24V, R_L = 2k\Omega$	22	--	--	V
			$V_{CC} = 24V, R_L = 10k\Omega$	22	--	--	V
		V_{OL}	$V_{CC} = 5V, R_L = 10k\Omega$	--	5	20	mV
Output Current Sourcing	I_{SOURCE}	$V_{IN(+)} = 1V, V_{IN(-)} = 0V, V_{CC}=15V, V_O=2V, T_A=25^\circ\text{C}$	20	40	--	mA	
Output Current Sinking	I_{SINK}	$V_{IN(+)} = 0V, V_{IN(-)} = 1V, V_{CC}=15V, V_O=2V, T_A=25^\circ\text{C}$	10	15	--	mA	
		$V_{IN(+)} = 0V, V_{IN(-)} = 1V, V_{CC}=15V, V_O=200mV, T_A=25^\circ\text{C}$	12	50	--	μA	
Output Short Circuit to Ground	I_o	$V_{CC}=15V, T_A=25^\circ\text{C}$	--	40	60	mA	

Typical Applications

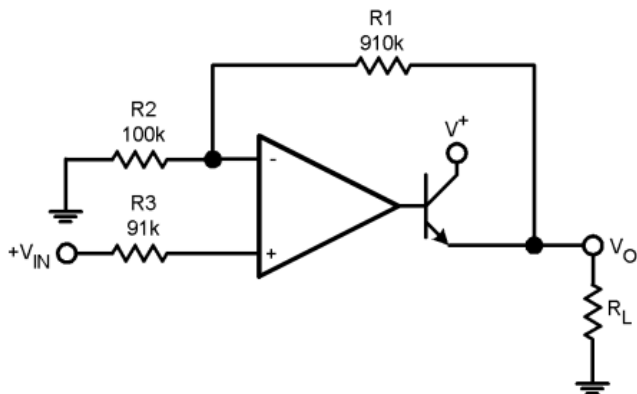


Amplitude modulator circuit



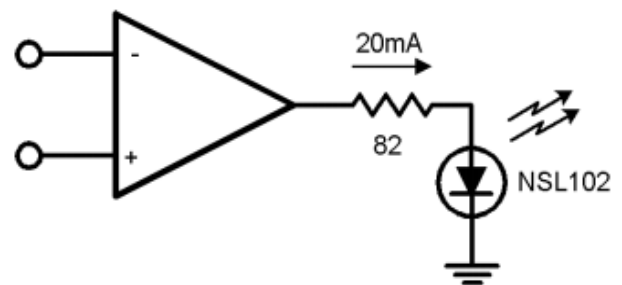
Note: $V_O = V_1 + V_2 - V_3 - V_4, (V_1 + V_2) \geq (V_3 + V_4)$ for $V_O \geq 0V_{DC}$

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

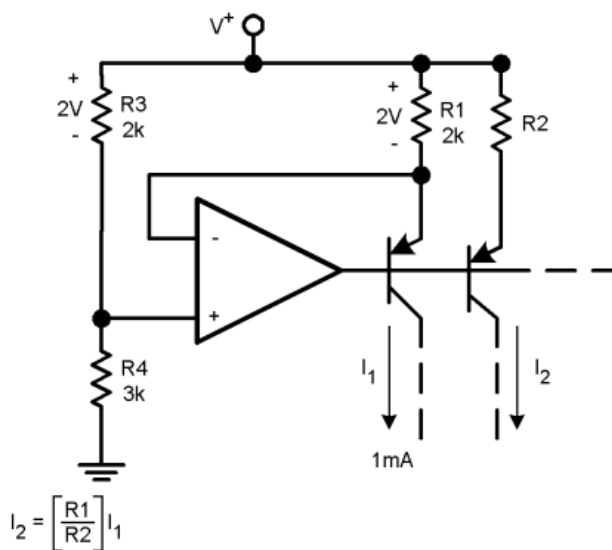


$V_O = 0V_{DC}$ for $V_{IN} = 0V_{DC}, A_V = 10$

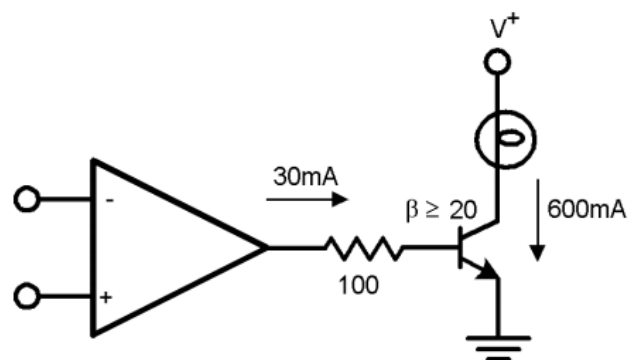
Power Amplifier



LED Driver



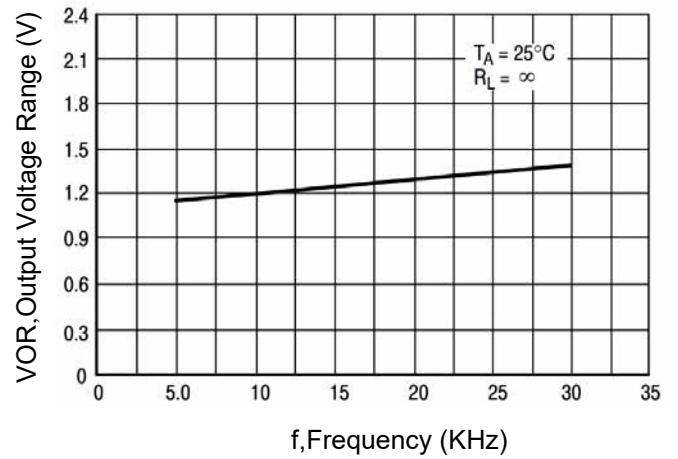
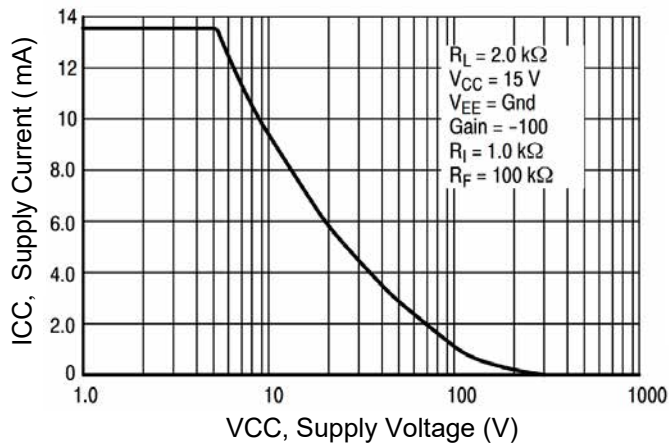
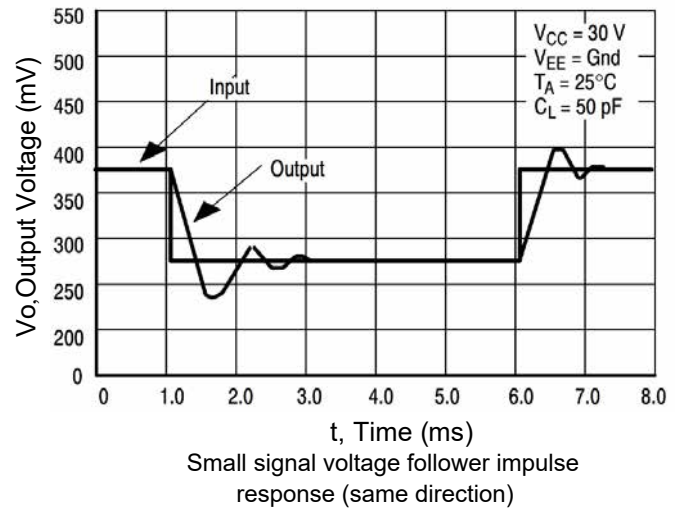
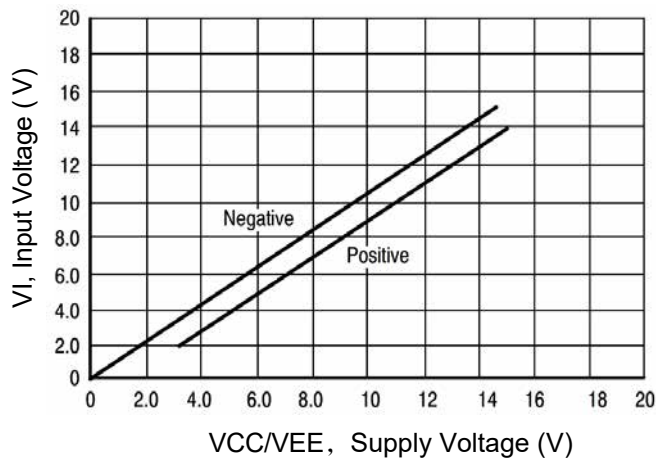
Fixed current source



Lamp Driver



Typical characteristic curve





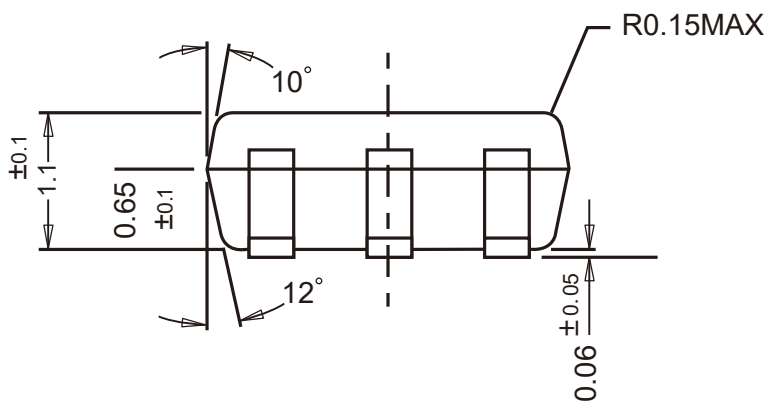
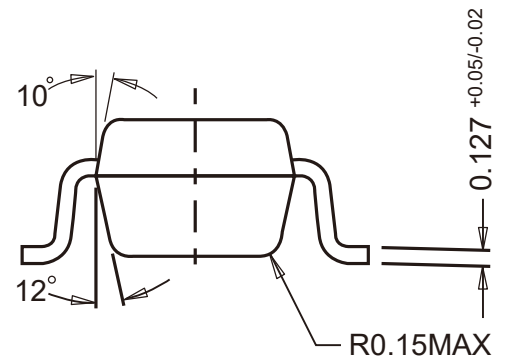
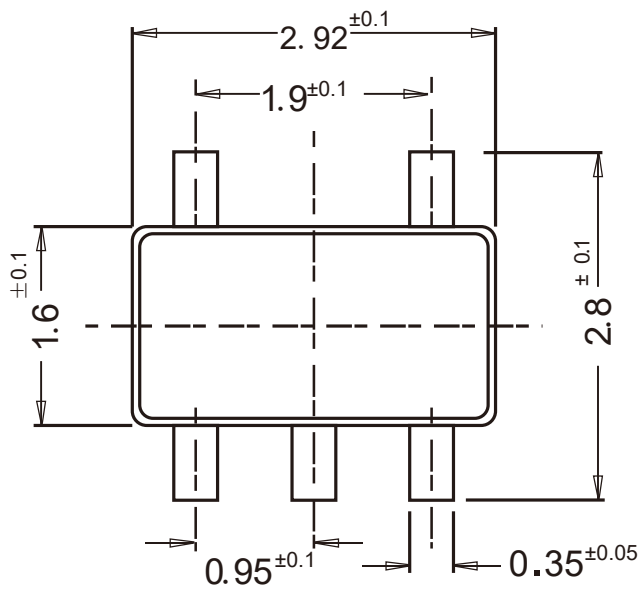
LM321

Low Power Single Operational Amplifier

Package Outline

SOT-23-5

Dimensions in mm



Ordering Information

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