LM321MFX

LOW POWER SINGLE OPERATIONAL AMPLIFIER

GENERAL DESCRIPTION

These devices consist of two independent, high gain, internally frequency-compensated operational amplifiers designed operate from a single supply over a wide range of voltages. Operation from split supplies also is possible if the difference between the two supplies is 3V to 36V, and V_{CC} is at least 1.5V more positive than the input common-mode voltage, the low supply-current drain is independent of the magnitude of the power supply voltage.

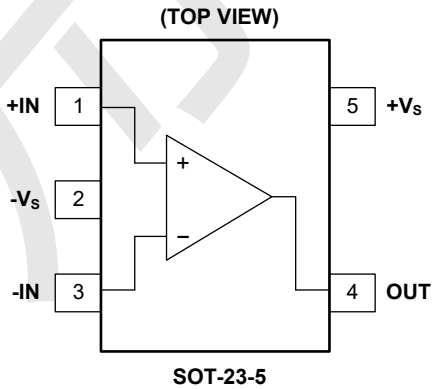
Features

- One internally compensated OP amps
- Wide power supply range: 3V to 36V
- Large output voltage swing: 0V to Vcc-1.5V
- Low input bias current
- Low input offset voltage and offset current
- Internally frequency compensated for unity gain
- Short Circuit Protected Outputs
- Input common-mode voltage range includes ground
- SOT-23-5L package s

Applications

- Multivibrators
- Oscillators
- Switcching Telephone
- Portable Systems

Pin Assignments



Absolute Maximum Ratings

Characteristics	Symbol	Rating	Unit
Power Supply Voltage (Single Supply)	V_{CC}	40	V
Power Supply Voltage (Split Supplies)	Vcc, Vss	±20	V
Input Differential Voltage Range	V_{IDR}	±20	V
Input Common Mode Voltage Range	V_{ICR}	-0.3 to V_{CC}	V
Output Short Circuit Duration	T_{SC}	Continuous	
Power Dissipation	PD	500	mW
Storage Temperature Range	T_{ST}	-55 to +165	°C
Operating Junction Temperature	T_{OPJ}	-40 to +125	°C
Junction Temperature Range	TJ	150	°C
Thermal Resistance from Junction to case	θ_{JC}	110	°C/W
Thermal Resistance from Junction to ambient	θ_{JA}	250	°C/W

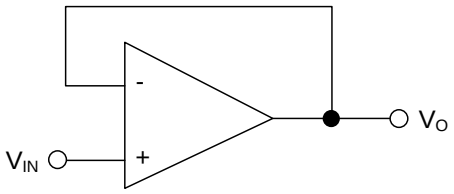
Electrical Characteristics

(V_{CC} = 5V, T_A=25°C, unless otherwise specified)

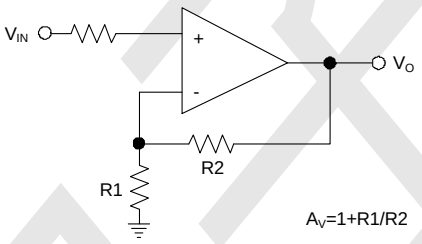
Characteristics	Symbol	Conditions (Note1)	Min	Typ	Max	Units
Input offset voltage**(Note2)**	V_{IO}	V_{CC}=5V to Max, V_{IC}=V_{ICR} min, V_O=1.4V	1	5	11	mV
Average temperature coefficient of input offset voltage	αV_{IO}		-	7	-	uV/°C
Input offset current	I_{IO}	V_O=1.4V	-	2	50	nA
Average temperature coefficient of input offset current	αI_{IO}		-	10	-	pA/°C
Input bias current	I_{IB}	I_{IN}+ or I_{IN}-	-	-20	-250	nA
Common-mode input voltage range	V_{ICR}	V_{CC}=5V to Max	0 to V_{CC}-1.5	-	-	V
High-level output voltage	V_{OH}	V_{CC}=Max, R_L=2KΩ	26	-	-	V
		V_{CC}=Max, R_L≧10KΩ	27	28	-	
Low-level output voltage	V_{OL}	R_L≧10KΩ	-	5	20	mV
Large-signal differential voltage amplification	A_{VD}	V_{CC}=15V, V_O=1V to 11V, RL≧2KΩ	25	100	-	V/mV
Common-mode rejection ratio	CMRR	V_{CC}=5V to Max, V_{IC}=V_{ICR} min.	65	80	-	dB
Supply voltage rejection ratio (△Vcc/△V_{IO})	K_{SVR}	V_{CC}=5V to Max	65	100	-	dB
Crosstalk attenuation	V_{OUT}	F=1KHz to 20KHz	-	120	-	dB
Output current	I_O	V_{CC}=15V, V_{ID}=1V, V_O=0V	-20	-30	-	mA
		V_{CC}=15V, V_{ID}= -1V, V_O=2V	10	20	-	
		V_{ID}= -1V, V_O=200mV	12	30	-	uA
Short-circuit output current	I_{OS}	V_{CC} =15V, V_O=0V	-	40	-	mA
Supply current	I_{CC}	V_O-2.5V, No Load	-	0.7	1.2	mA
		V_{CC}=Max, V_O=0.5V_{CC}, No Load	-	1	2	

APPLICATION CIRCUIT

Volgate Follower

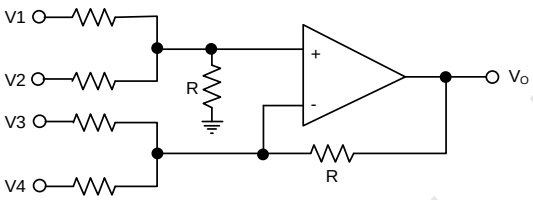


Non Inverting DC Amplifier



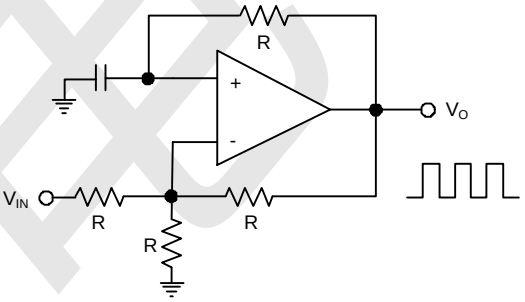
A_V=1+R1/R2

DC Summing Amplifier

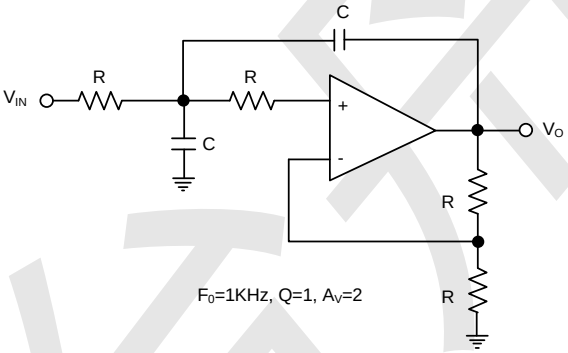


V_O=V1+V2-V3-V4
Where (V1+V2)≧(V3+V4)
To Keep V_O≧0V

Square-wave Oscillator

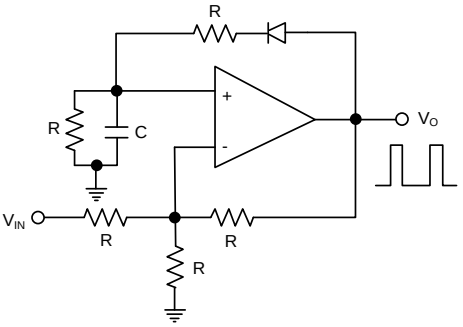


DC Coupled Low-Pass RC Active Filter

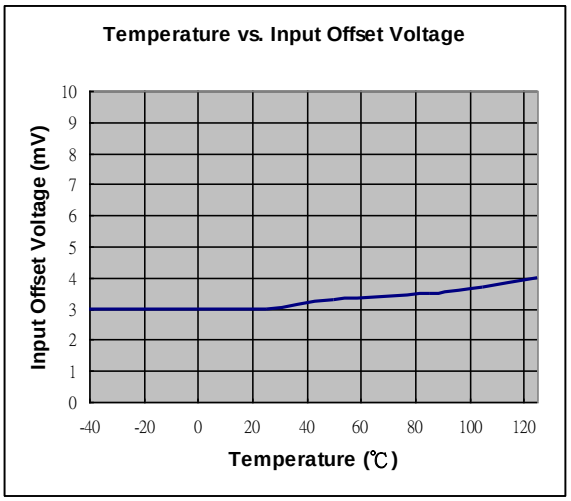


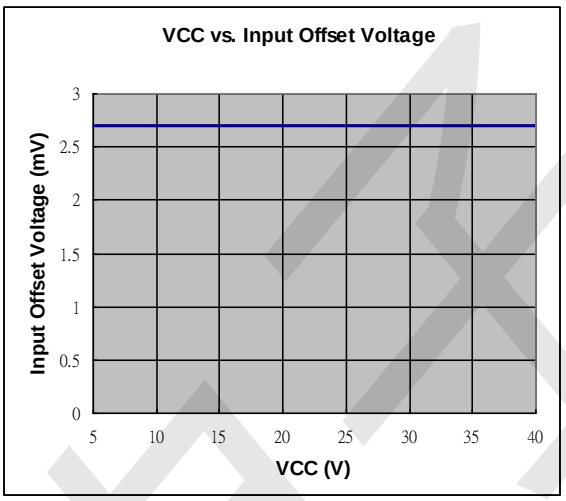
F_0=1KHz, Q=1, A_V=2

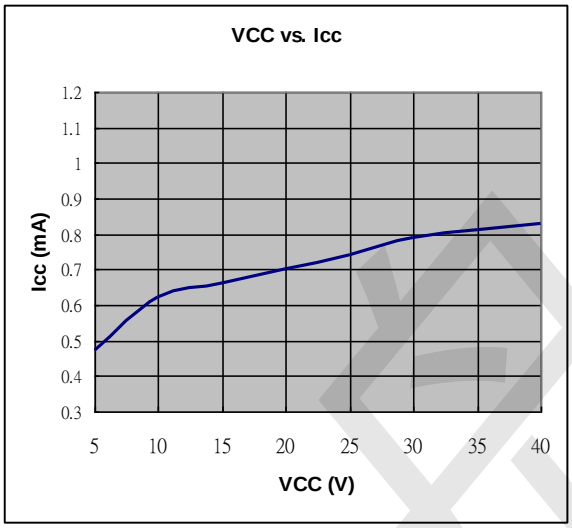
Pulse Generator

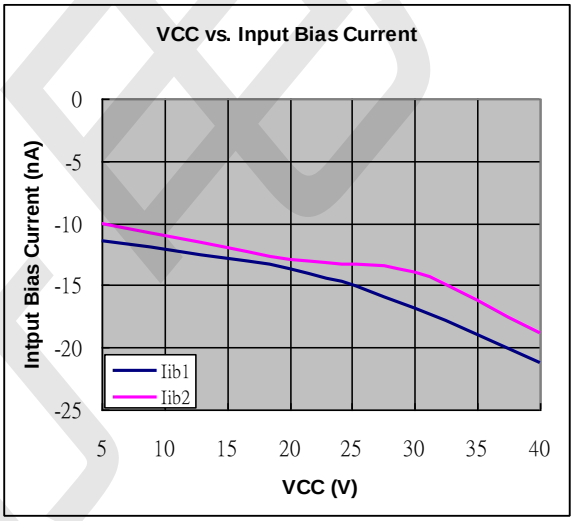


TypicalwPerformancewcharacteristics



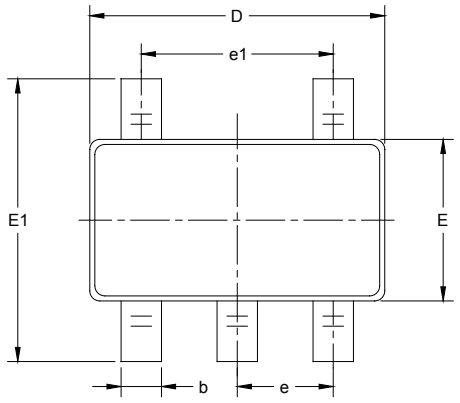


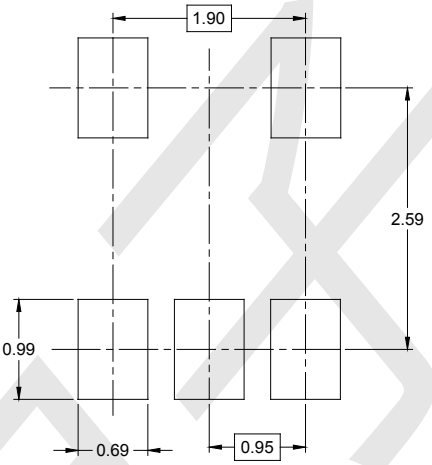




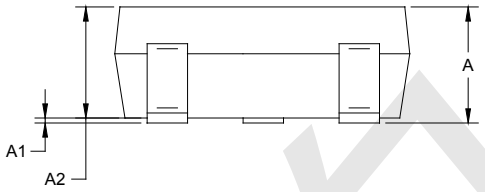
Package Information

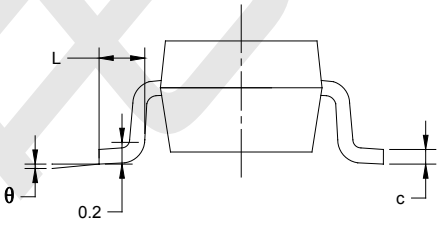
SOT-23-5





RECOMMENDED LAND PATTERN (Unit: mm)





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	1.900 BSC		0.075 BSC	
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°