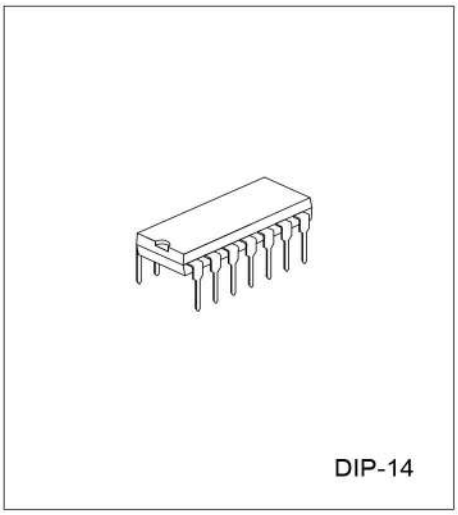
QUAD OPERATIONAL AMPLIFIERS



DESCRIPTION

The LM324N consistsoffourindependent,high gain internally frequency compensated operational amplifiers which were designed specifically to operate from a single power supply over a wide voltage range.

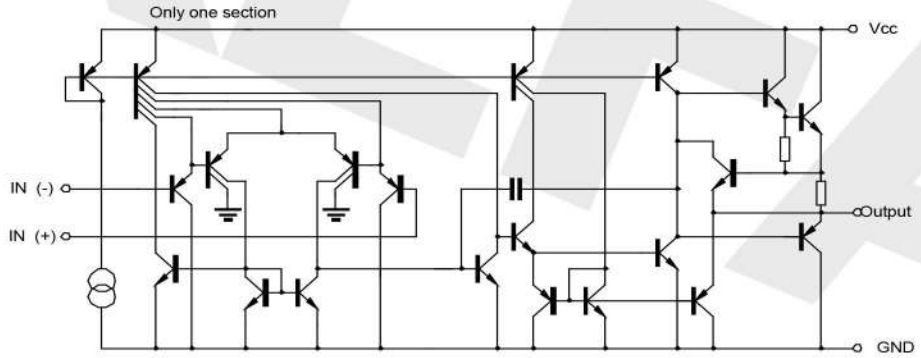
Operation from split power supplies is also possible so long as the difference between the two supplies 3 Volts to 32 volts.

Application areas include transducer amplifier, DC gain blocks and all the conventional OP amp circuits which now can be easily implemented in single power supply system.

FEATURES

*Internally frequency compensated for unity gain
*Large DC voltage gain :100dB
*Wide operating supply range(Vcc=3V~32V)
*Input common-mode voltage includes ground
*Large output voltage swing: From 0V to Vcc-1.5V
*Power drain suitable for battery operation

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS(Ta=25°C)

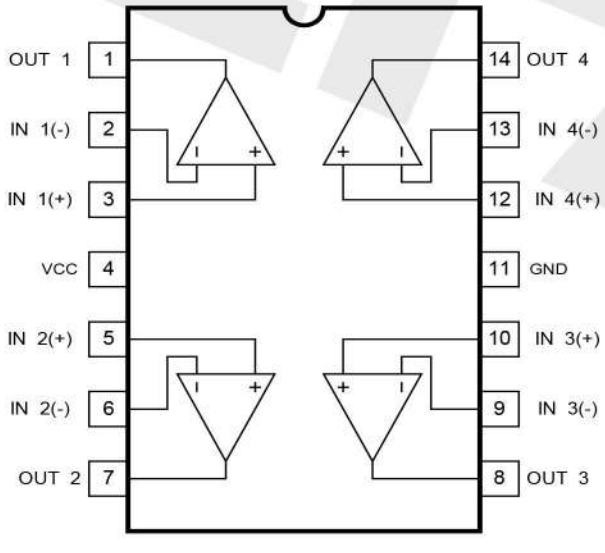
Characteristic	Symbol	Value	Unit
Supply Voltage	Vcc	32	V
Differential input voltage	$V_{i(diff)}$	32	V
Input Voltage	VI	-0.3~32V	V
PowerDissipation	Pd	720	mW
OperatingTemperature	Topr	-30 to+85	°C
StorageTemperature	Tstg	-55 to+125	°C

ELECTRICAL CHARACTERISTICS(Ta=25°C)

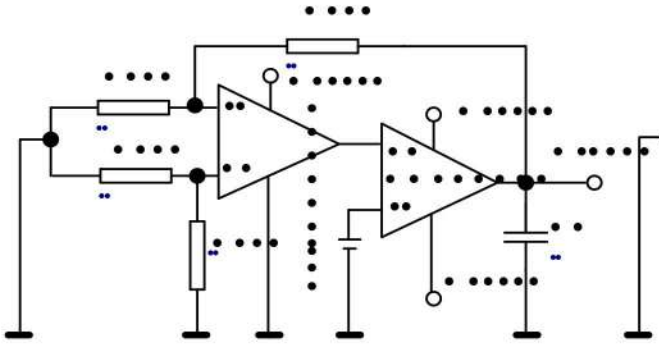
(Vcc=5.0V,All voltage referenced to GND unless otherwise specified)

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Input offset voltage	V_{IO}	V_{CM}=0 to Vcc-1.5 Vo(p)=1.4V,Rs=0		±2	±7	mV
Input offset current	I_{IO}			±5	±50	nA
InputBiascurrent	Ib			45	250	nA
Input Common-mode voltage range	$V_{I(R)}$	Vcc=30V	0		Vcc-1.5	V
Supply Current	Icc	R_L=∞,Vcc=30V		1.5	3	mA
		Vcc=5V		0.6	2	mA
Large signal Voltage Gain	Gv	Vcc=15V,R_L>2kΩ Vo(p)=1V to 11V	25	100		V/mV
Output voltage Swing	Vo		0	-	Vcc-1.5	V
Common-moderejectionRatio	CMRR		65	80		dB
Power supply rejection Ratio	PSRR		65	100		dB
ChannelSeparation	CS	f=1kHzto20kHz		120		dB
Short circuit to GND	Isc			40	60	mA
Output current	Isource	VI(+)=1V,VI(-)=0 Vcc=15V,Vo(p)=2V	20	40		mA
	Isink	VI(+)=0V,VI(-)=1V Vcc=15V,Vo(p)=2V	10	20		mA
Differential input voltage	VI(diff)				Vcc	V

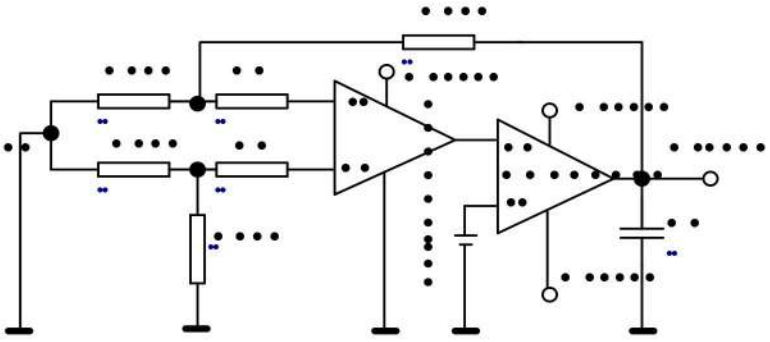
PIN CONFIGURATION



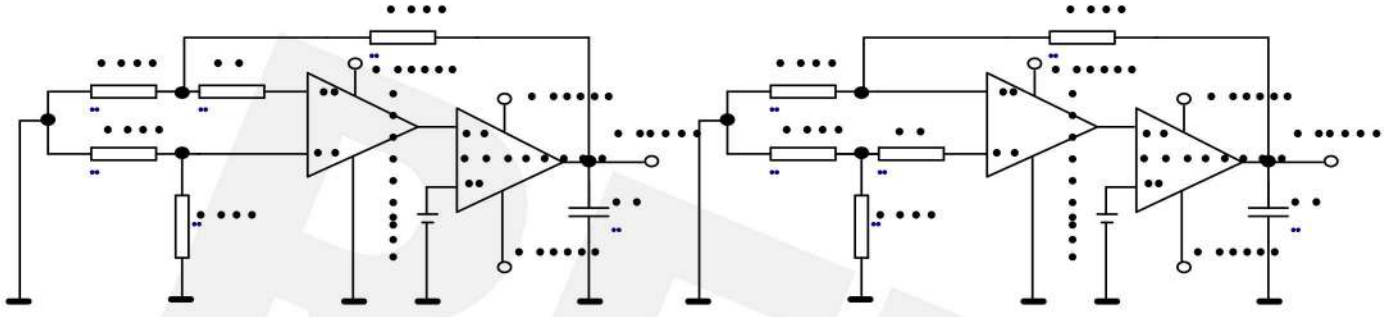
Test Circuit (Note: NULL Amplifier)



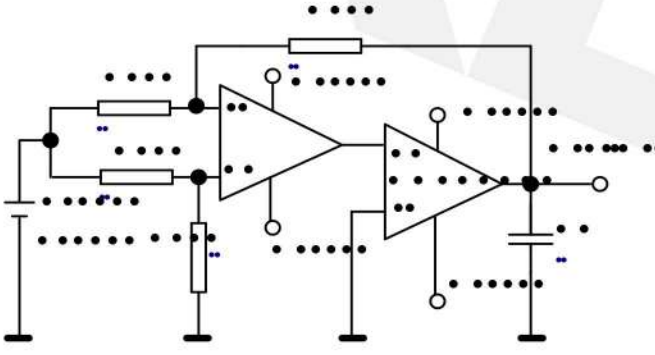
Input Offset Voltage Test Circuit



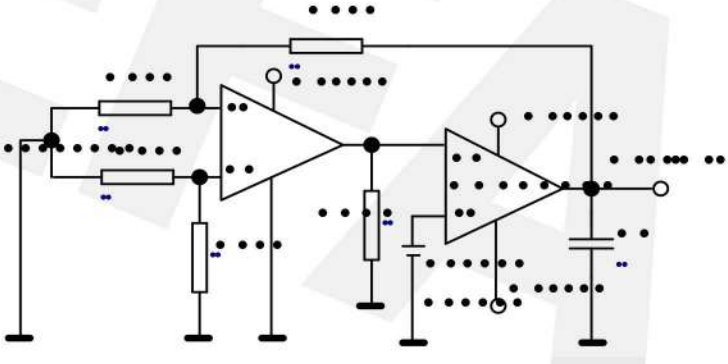
Input Offset Current Test Circuit



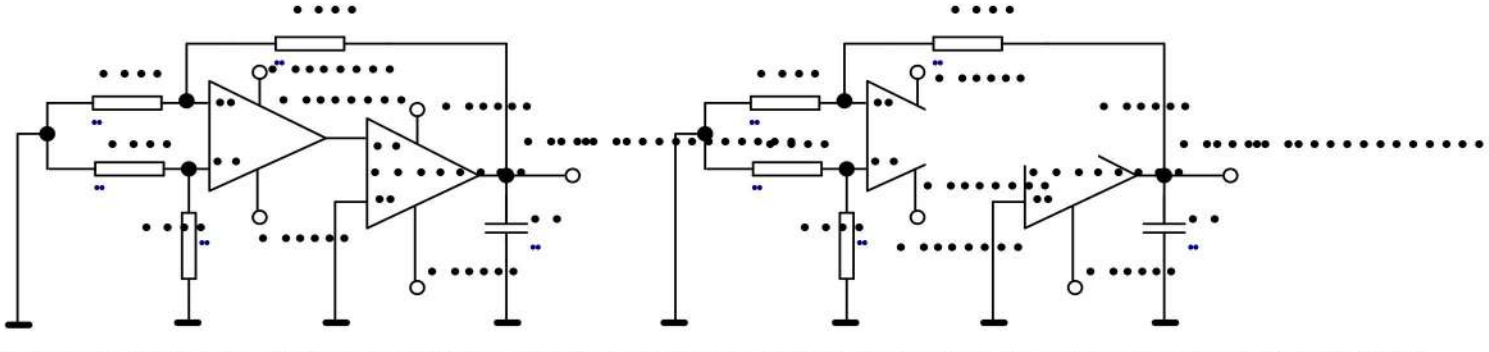
Input Bias Current Test Circuit



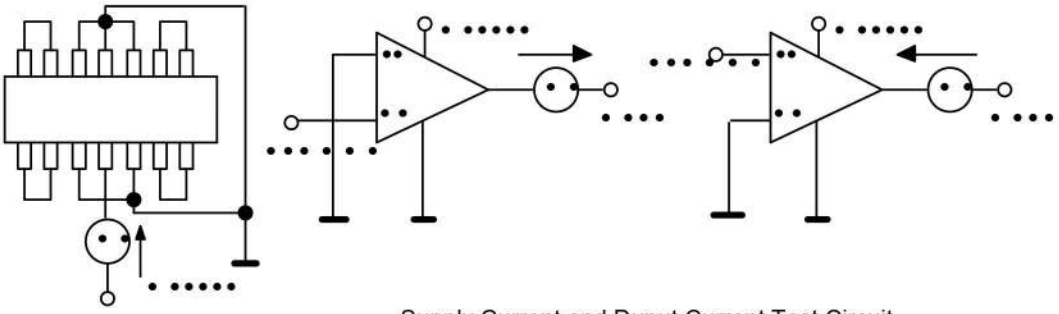
Common-mode Rejection Ratio Test Circuit



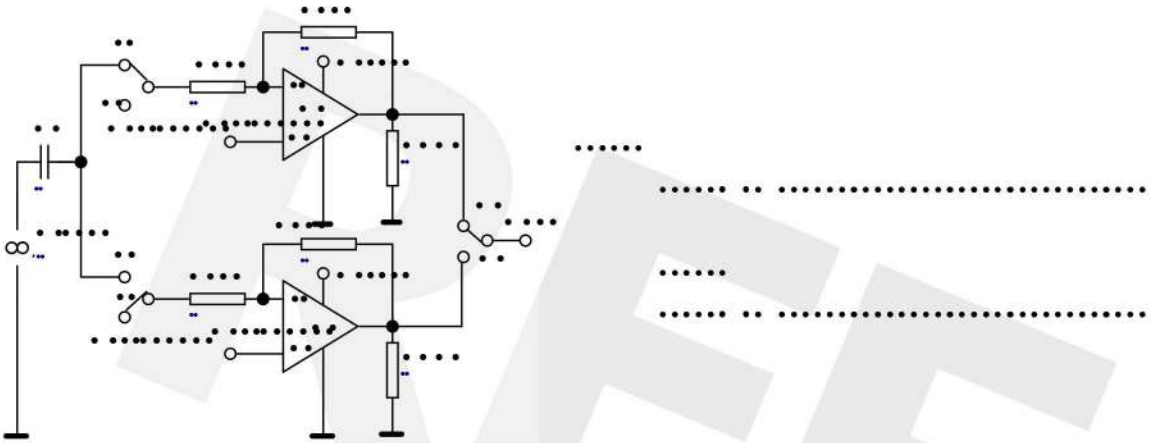
Voltage Gain Test Circuit



Power Supply Rejection Ratio Test Circuit



Supply Current and Duput Current Test Circuit



Channel Separation Test Circuit