

LM324

LINEAR INTEGRATED CIRCUIT

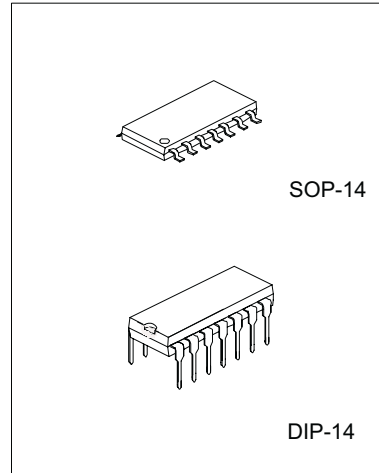
QUAD OPERATIONAL AMPLIFIERS

DESCRIPTION

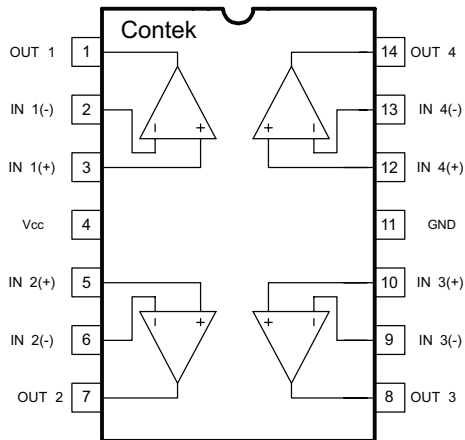
The Contek LM324 consists of four independent, high gain internally frequency compensated operational amplifiers which are designed specifically to operate from a single power supply over a wide voltage range. Operation from split power supplies is also possible. Application areas include transducer 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($V_{cc}=3V\sim 32V$).
- *Input common-mode voltage includes ground.
- *Large output voltage swing: From 0V to $V_{cc}-1.5V$.
- *Power drain suitable for battery operation.



PIN CONFIGURATIONS



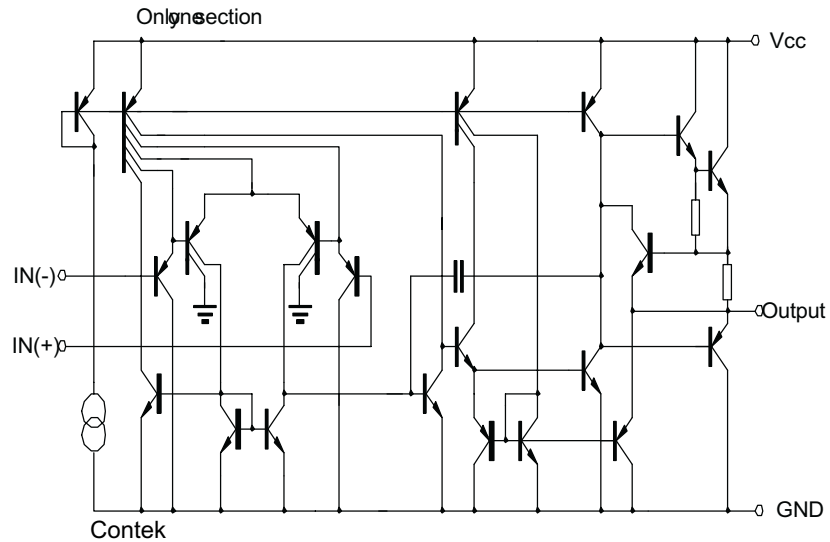
Contek Microelectronics Co.,Ltd.

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BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS (Ta=25 C)

PARAMETER	SYMBOL	VALUE	UNIT
Supply Voltage	Vcc	18	V
Differential Input Voltage	VIDiff)	32	V
Input Voltage	VI	-0.3~32V	V
Power Dissipation	Pd	570	mW
Operating Temperature	Topr	0 to +70	C
Storage Temperature	Tstg	-65 to 150	C



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ELECTRICAL CHARACTERISTICS ($T_a=25\text{ }^\circ\text{C}$)

($V_{cc}=5.0\text{V}$, All voltage referenced to GND unless otherwise specified)

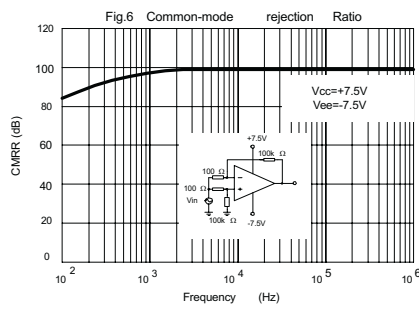
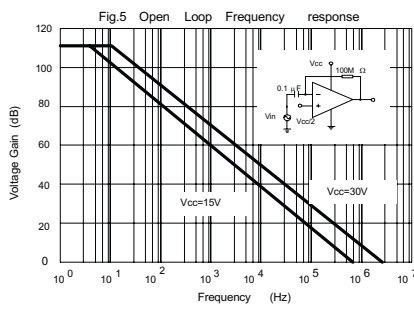
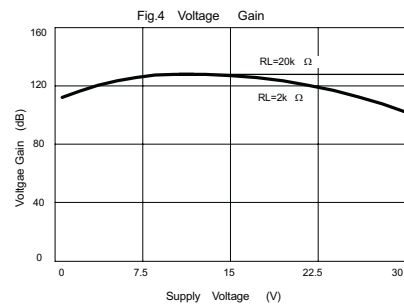
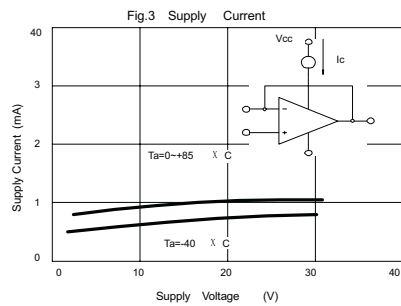
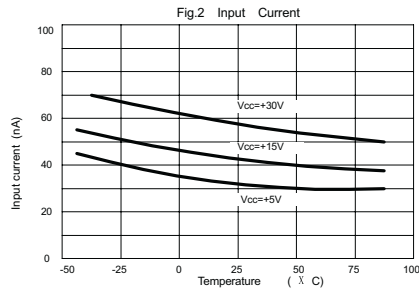
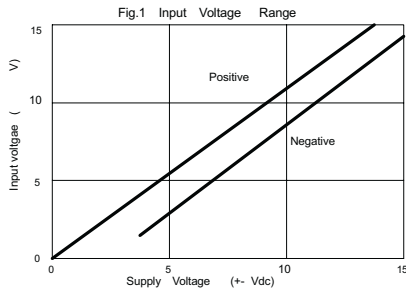
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP.	MAX	UNIT
Input Offset Voltage	V_{io}	$V_{CM}=0$ to $V_{cc}=-1.5$ $V_{o(p)}=1.4\text{V}, R_s=0$			7	mV
Input Offset Current	I_{io}				50	nA
Input Bias Current	I_b				250	nA
Input Common-Mode Voltage Range	$V_{i(R)}$	$V_{cc}=30\text{V}$	0	$V_{cc}-1.5$		V
Supply Current	I_{cc}	$R_L=$, $V_{cc}=30\text{V}$ $V_{cc}=5\text{V}$		1.0 0.7	3 1.2	mA mA
Large Signal Voltage Gain	G_v	$V_{cc}=15\text{V}, R_L>2\text{k}\Omega$ $V_{o(p)}=1\text{V}$ to 11V	25	100		V/mV
Output Voltage Swing	$V_{(OH)}$	$V_{cc}=30\text{V}, R_L=2\text{k}\Omega$	26			V
		$V_{cc}=30\text{V}, R_L=10\text{k}\Omega$	27	28		V
	$V_{(OL)}$	$V_{cc}=5, R_L>10\text{k}\Omega$		5	20	mV
Common-Mode Rejection Ratio	CMRR		65	75		dB
Power Supply Rejection Ratio	PSRR		65	100		dB
Channel Separation	CS	$f=1\text{kHz}$ to 20kHz		120		dB
Short Circuit to GND	I_{sc}			40	60	mA
Output Current	I_{source}	$V_{i(+)}=1\text{V}, V_{i(-)}=0$ $V_{cc}=15\text{V}, V_{o(p)}=2\text{V}$	20	40		mA
	I_{sink}	$V_{i(+)}=0\text{V}, V_{i(-)}=1\text{V}$ $V_{cc}=15\text{V}, V_{o(p)}=2\text{V}$	10	13		mA
		$V_{i(+)}=1\text{V}, V_{i(-)}=0$ $V_{cc}=15\text{V}, V_{o(p)}=200\text{V}$	12	45		μA
Differential Input Voltage	$V_{i(diff)}$				V_{cc}	V



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TYPICAL PERFORMANCE CHARACTERISTICS



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