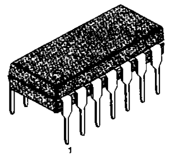
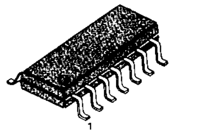
QUAD OPERATIONAL AMPLIFIERS

The KA248/KA348 is a true quad KA741. It consists of four independent, high-gain, internally compensated, low-power operational amplifiers which have been designed to provide functional characteristics identical to those of the familiar KA741 operational amplifier. In addition the total supply current for all four amplifiers is comparable to the Supply current of a single KA741 type OP Amp.
Other features include input offset currents and input bias current which are much less than those of a standard KA741. Also, excellent isolation between amplifiers has been achieved by independently biasing each amplifier and using layout techniques which minimize thermal coupling.

14 DIP



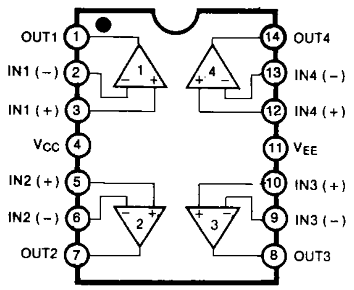
14 SOP



FEATURES

- KA741 OP Amp operating characteristics
- Low supply current drain
- Class AB output stage-no crossover distortion
- Pin compatible with the KA324 & KA3403
- Low input offset voltage- 1mV Type.
- Low input offset current-4nA Type.
- Low input bias current-30nA Type.
- Gain bandwidth product for KA348 (unity gain)-1.0MHz Type.
- High degree of isolation between amplifiers-120dB
- Overload protection for inputs and outputs

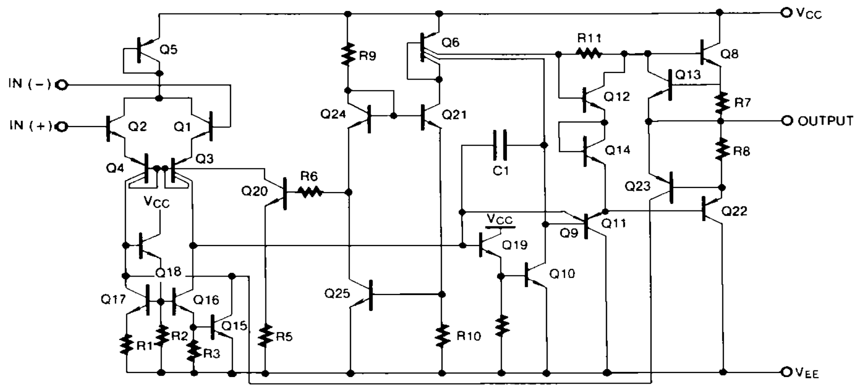
BLOCK DIAGRAM



ORDERING INFORMATION

Device	Package	Operating Temperature
KA348	14 DIP	0 ~ +70℃
KA348D	14 SOP	
KA248	14 DIP	-25 ~ +85℃
KA248D	14 SOP	

SCHEMATIC DIAGRAM (One Section Only)



Rev. B

FAIRCHILD SEMICONDUCTOR™

ABSOLUTE MAXIMUM RATINGS (T_A = 25℃)

Characteristic	Symbol	Value	Unit
Supply Voltage	V_{CC}	± 18	V
Differential Input Voltage	$V_{I(DIFF)}$	± 36	V
Input Voltage	V_I	± 18	V
Output Short Circuit Duration		Continuous	
Operating Temperature KA248	T_{OPR}	- 25 ~ +85	℃
KA348		0~ +70	℃
Storage Temperature	T_{STG}	- 65~ +150	℃

ELECTRICAL CHARACTERISTICS

(V_{CC} =15V, V_{EE}= -15V, T_A=25℃, unless otherwise specified)

Characteristic	Symbol	Test Conditions		KA248			KA348			Unit
				Min	Typ	Max	Min	Typ	Max	
Input Offset Voltage	V_{IO}	R_S≤ 10KΩ			1	6.0		1	6.0	mV
			NOTE 1			7.5			7.5	
Input Offset Current	I_{IO}				4	50		4	50	nA
			NOTE 1			125			100	
Input Bias Current	I_{BIAS}				30	200		30	200	nA
			NOTE 1			500			400	
Input Resistance	R_I			0.8	2.5		0.8	2.5		MΩ
Supply Current (all Amplifiers)	I_{CC}				2.4	4.5		2.4	4.5	mA
Large Signal Voltage Gain	G_V	R_L≥ 2KΩ		25	160		25	160		V/mV
			NOTE 1	15			15			
Channel Separation	CS	f = 1KHz to 20KHz			120			120		dB
Common Mode Input Voltage Range	$V_{I(R)}$	NOTE 1		± 12			± 12			V
Small Signal Bandwidth	BW	G_V = 1			1.0			1.0		MHz
Phase Margin	MPH	G_V = 1			60			60		Degress
Slew Rate	SR	G_V = 1			0.5			0.5		V/μ s
Output Short Circuit Current	I_{SC}				25			25		mA
Output Voltage Swing	$V_{O(P.P)}$	R_L≥ 10KΩ	NOTE 1	± 12	± 13		± 12	± 13		V
		R_L≥ 2KΩ		± 10	± 12		+0	± 12		
Common Mode Rejection Ratio	CMRR	R_S≥ 10KΩ	NOTE 1	70	90		70	90		dB
Power Supply Rejection Ratio	PSRR	R_S≥ 10KΩ	NOTE 1	77	96		77	96		dB

NOTE 1

KA348: 0 ≥ T_A ≥ +70℃
KA248: -25 ≥ T_A ≥ +85℃

TYPICAL PERFORMANCE CHARACTERISTICS

Fig. 1 SUPPLY CURRENT

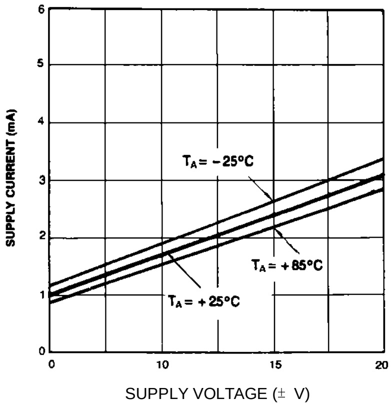


Fig. 2 VOLTAGE SWING

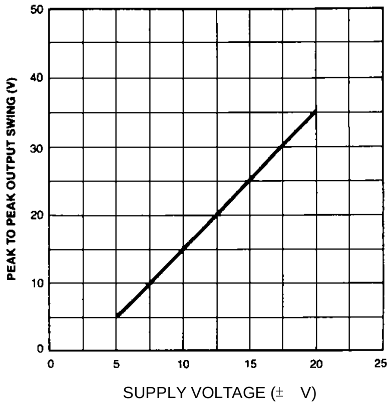


Fig. 3 SOURCE CURRENT LIMIT

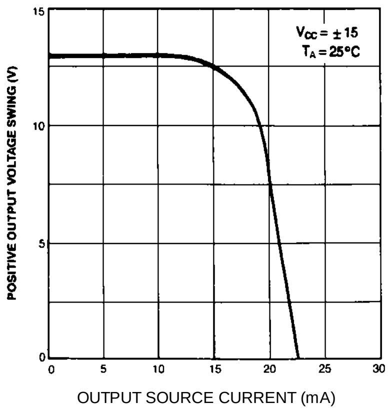


Fig. 4 SINK CURRENT LIMIT

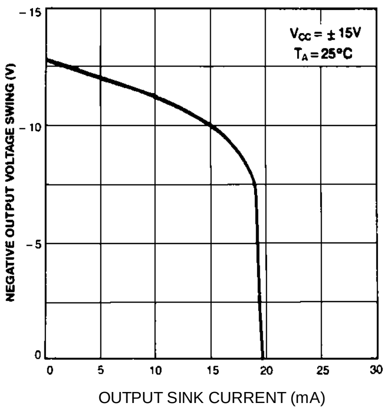


Fig. 5 OUTPUT IMPEDANCE

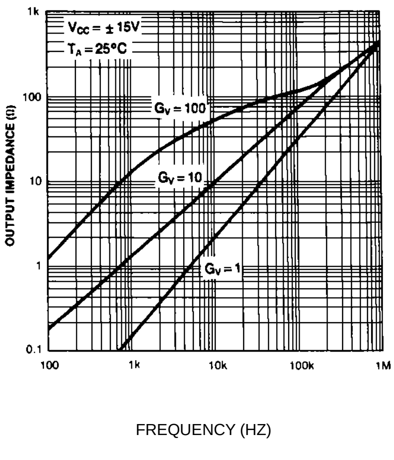


Fig. 6 COMMON-MODE REJECTION RATIO

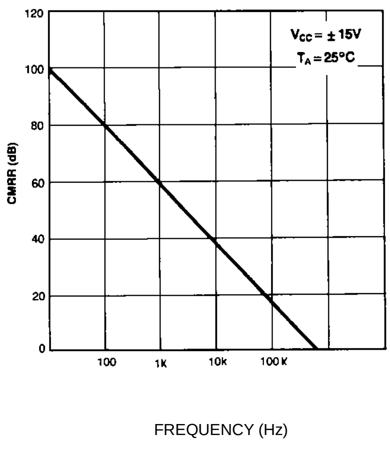


Fig. 7 OPEN LOOP FREGUENCV RESPONSE

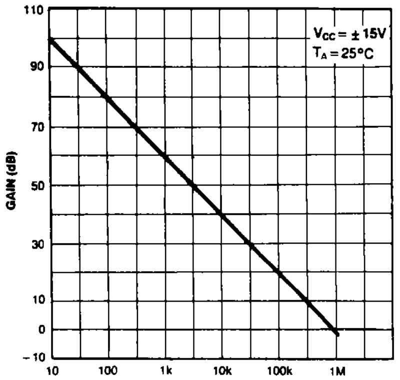


Fig. 8 BODE PLOT

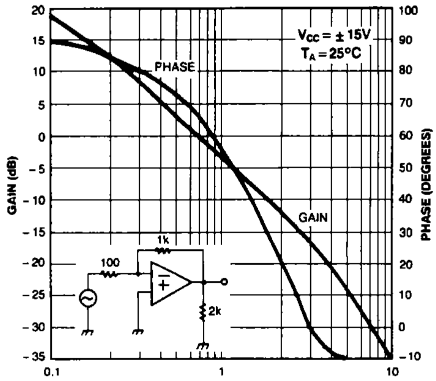


Fig. 9 LARGE SIGNAL PULSE RESPONSE

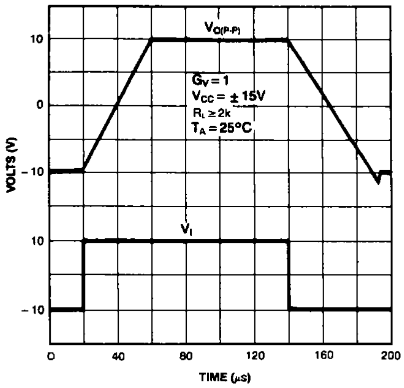


Fig. 10 SMALL SIGNAL PULSE RESPONSE

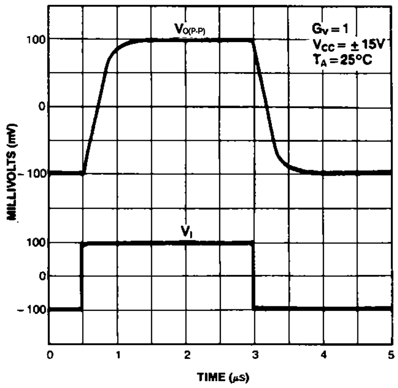


Fig. 11 UNDISTORTED OUTPUT VOLTAGE SWING

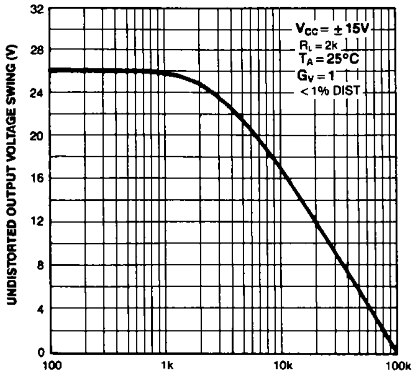


Fig. 12 INVERTING LARGE SIGNAL PULSE RESPONSE

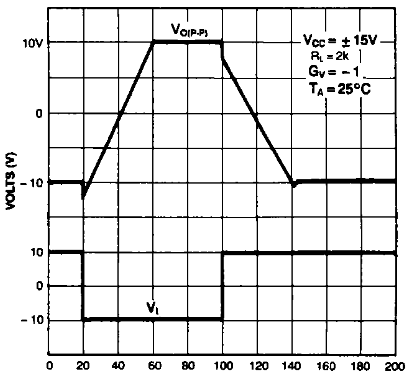


Fig. 13 INPUT NOISE VOLTAGE AND NOISE CURRENT

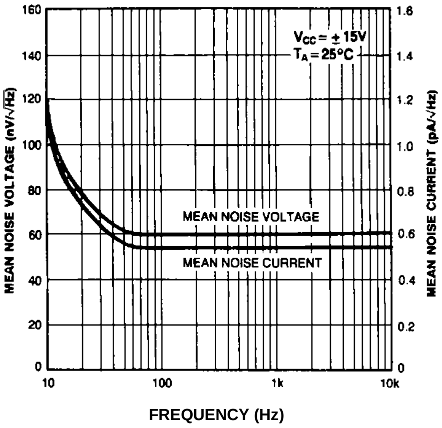


Fig. 14 POSITIVE COMMON MODE INPUT VOLTAGE LIMIT

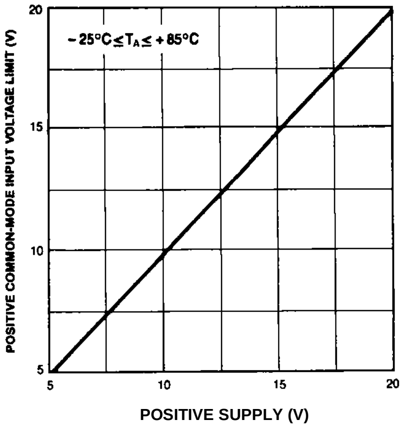
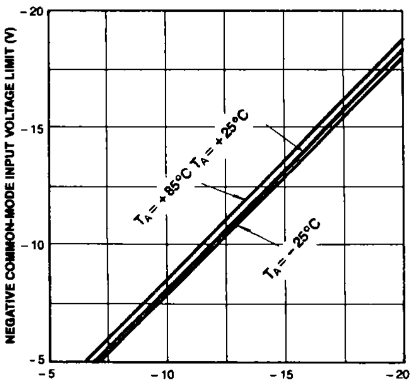


Fig. 15 NEGATIVE COMMON.MODE INPUT VOLTAGE LIMFY



NEGATIVE SUPPLY VOLTS(V)

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