M5260L, P, FP

DUAL HIGH-SPEED LOW-NOISE OPERATIONAL AMPLIFIERS (DOUBLE POWER SUPPLY TYPE)

DESCRIPTION

M5260 is a double-power-supply type semiconductor integrated circuit designed for operational amplifiers used in audio equipments (i.e. compact disk players), graphic devices (i.e. video disk players), office automation devices, or general electronic devices. This IC contains two circuits of operational amplifiers which provide the internally phase-compensated high gain, high speed, wide range, low noise characteristics.

This IC has the almost same characteristics as that of 4560 type operational amplifiers and can be used as general dual amplifiers in cnmmon electronic devices.

Since this IC can also be used by the single power source and can operate with low supply voltage, it is suitable for general amplifiers in portable equipments. Moreover, large load current can be applied so that it is suitable for headphone amplifiers as well.

FEATURES

- High gain and low distortion . . . . G_{VD} = 110dB
  THD = 0.0015% (typ.)
- High slew rate, high f_T . . . . SR = 4.0V/μsec
  f_T = 14MHz (typ.)
- Low noise (R_s = 1kΩ) FLAT . . . . V_{NI} = 1.8μVrms (typ.)
  RIAA . . . . V_{NI} = 0.9μVrms (typ.)
- Operation with low source voltage . . . . $V_{CC} \geq$ 4V (±2V)
- High load current, High power dissipation. . I_{LP} = ±50mA
  P_d = 800mW (SIP)
  P_d = 625mW (DIP)
  P_d = 440mW (Mini-flat)

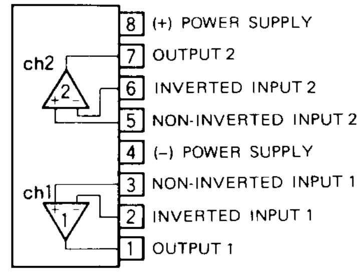
APPLICATION

General amplifiers for compact disk units, VCRs, video disk players, or OA equipments and various operational circuits in general electrical devices, servo amplifiers, and active filters

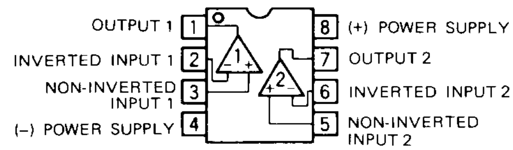
RECOMMENDED OPERATING CONDITIONS

Supply voltage range . . . . ±2 ~ ±16V
Rated supply voltage . . . . ±15V

PIN CONFIGURATION (TOP VIEW)

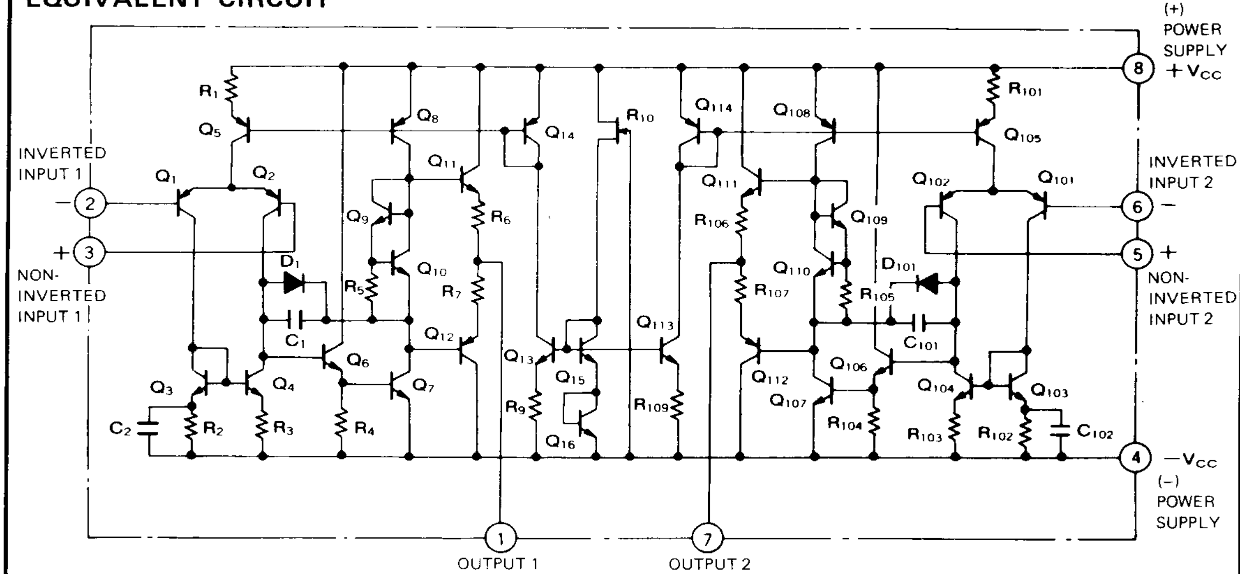


Outline 8P5 (M5260L)



Outline 8P4 (M5260P)
8P2S (M5260FP)

EQUIVALENT CIRCUIT



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DUAL HIGH-SPEED LOW-NOISE OPERATIONAL AMPLIFIERS (DOUBLE POWER SUPPLY TYPE)

ABSOLUTE MAXIMUM RATINGS (Ta=25℃, otherwise noted)

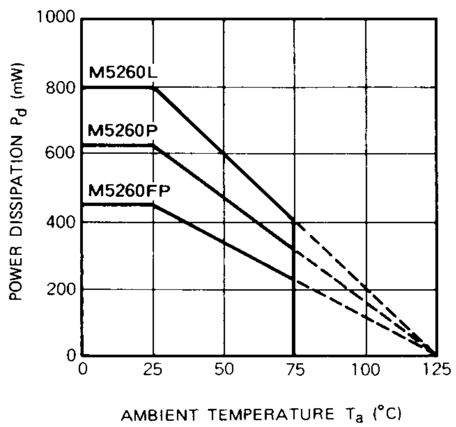
Symbol	Parameter	Conditions	Ratings	Unit
V_{CC}	Supply voltage		±18	V
I_{LP}	Load current		±50	mA
V_{id}	Differential input voltage		±30	V
V_{IC}	Common input voltage		±15	V
P_d	Power dissipation		800(SIP)/625(DIP)/440(FP)	mW
K_θ	Thermal derating	Ta≧25℃	8(SIP)/6.25(DIP)/4.4(FP)	mW/℃
Topr	Operating temperature		−20～+75	℃
Tstg	Storage temperature		−55～+125	℃

ELECTRICAL CHARACTERISTICS (Ta=25℃, V_{CC}=±15V)

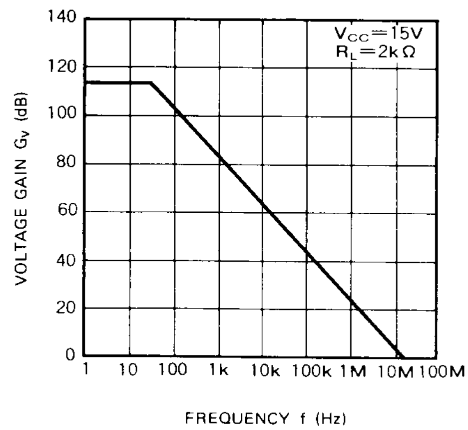
Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
I_{CC}	Circuit current	V_{in}=0		4.0	8.0	mA
V_{IO}	Input offset voltage	R_S≦10kΩ		0.5	6.0	mV
I_{IO}	Input offset current			5	200	nA
I_{IB}	Input bias current				500	nA
R_{in}	Input resistance		0.3	5		MΩ
G_{VO}	Open loop voltage gain	R_L≧2kΩ, V_O=±10V	86	110		dB
V_{OM}	Maximum output voltage	R_L≧10kΩ	±12	±14		V
		R_L≧2kΩ	±10	±13		
V_{CM}	Common input voltage range		±12	±14		V
CMRR	Common mode rejection ratio	R_S≦10kΩ	70	90		dB
SVRR	Supply voltage rejection ratio	R_S≦10kΩ		30	150	μV/V
P_d	Power dissipation			90	180	mW
SR	Slew rate	G_V=0dB, R_L=2kΩ		4.0		V/μs
f_T	Gain band width product			14		MHz
V_{NI}	Input-referred noise voltage	R_S=1kΩ, BW : 10Hz～30kHz		1.8		μVrms

TYPICAL CHARACTERISTICS

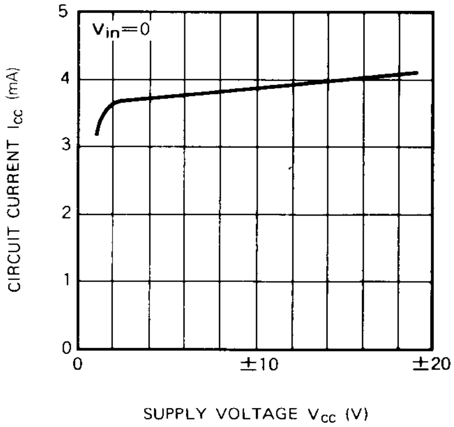
THERMAL DERATING (MAXIMUM RATING)



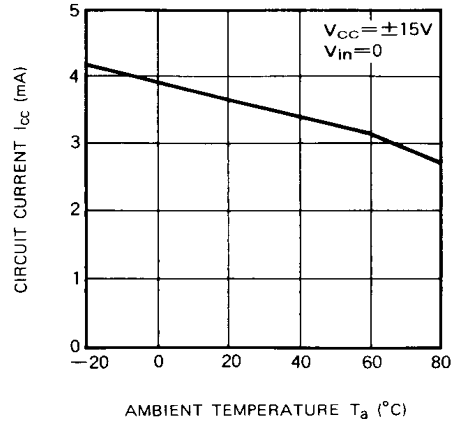
VOLTAGE GAIN VS. FREQUENCY RESPONSE



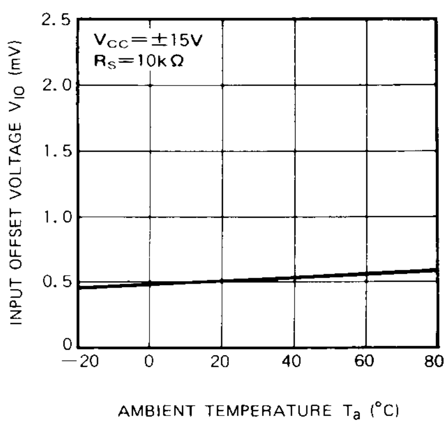
CIRCUIT CURRENT VS. SUPPLY VOLTAGE



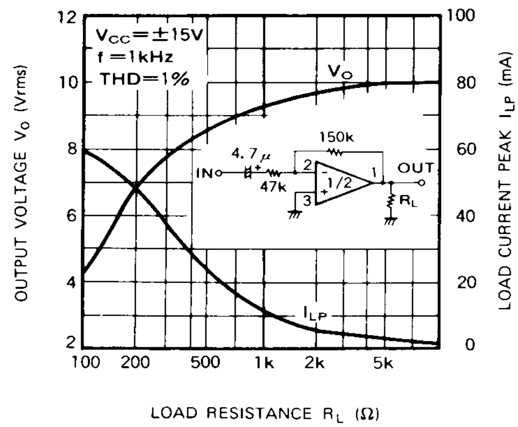
CIRCUIT CURRENT VS. AMBIENT TEMPERATURE



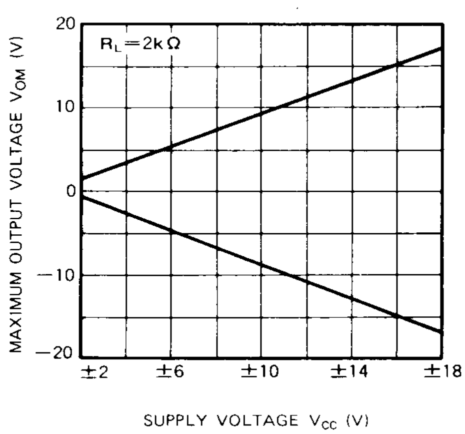
INPUT OFFSET VOLTAGE VS. AMBIENT TEMPERATURE



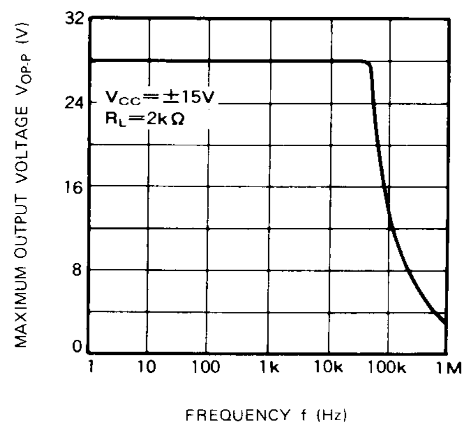
OUTPUT VOLTAGE LOAD CURRENT PEAK VS. LOAD RESISTANCE



MAXIMUM OUTPUT VOLTAGE VS. SUPPLY VOLTAGE

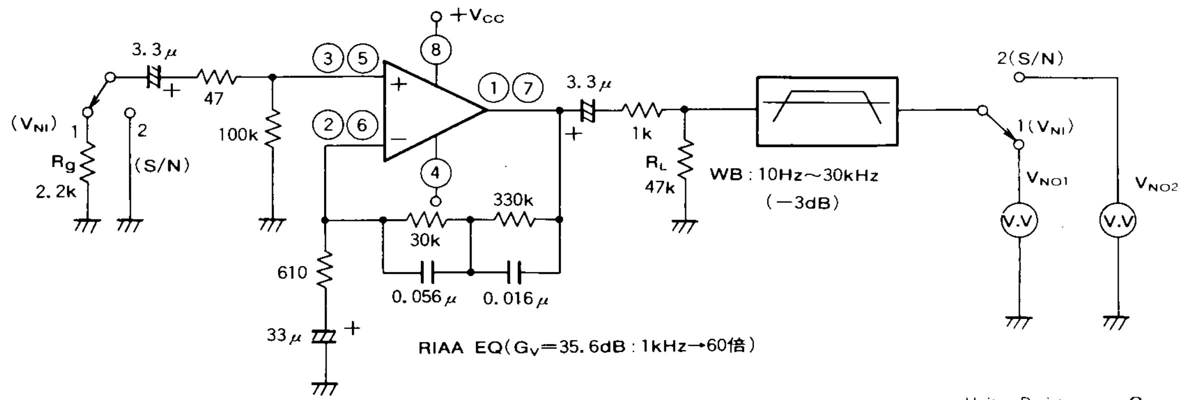


MAXIMUM OUTPUT VOLTAGE VS. FREQUENCY RESPONSE



DUAL HIGH-SPEED LOW-NOISE OPERATIONAL AMPLIFIERS (DOUBLE POWER SUPPLY TYPE)

V_{NI}, S/N

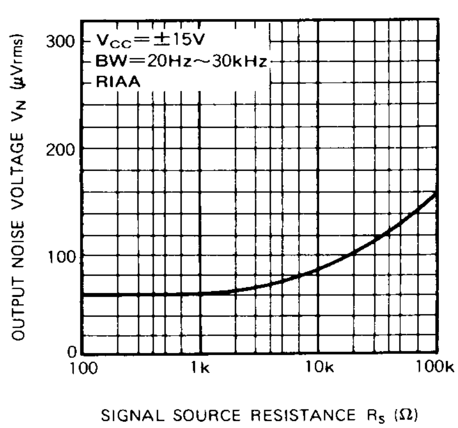


Unit Resistance: Ω
Capacitance: F

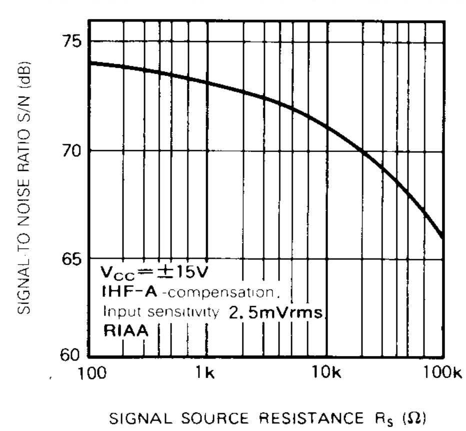
1. $V_{NI}=V_{NO1}/60$ [μVrms]
2. $S/N=20\log(2.5mVrms\ V_{NO2}/60)$ [dB]

* A DC voltmeter to be used for the S/N measurement should be the IHF-A network filter (i.e. National noise meter VP-9690) built-in type.

OUTPUT NOISE VOLTAGE VS. SIGNAL SOURCE RESISTANCE



SIGNAL VS. NOISE VOLTAGE RATIO VERSUS SIGNAL SOURCE RESISTANCE

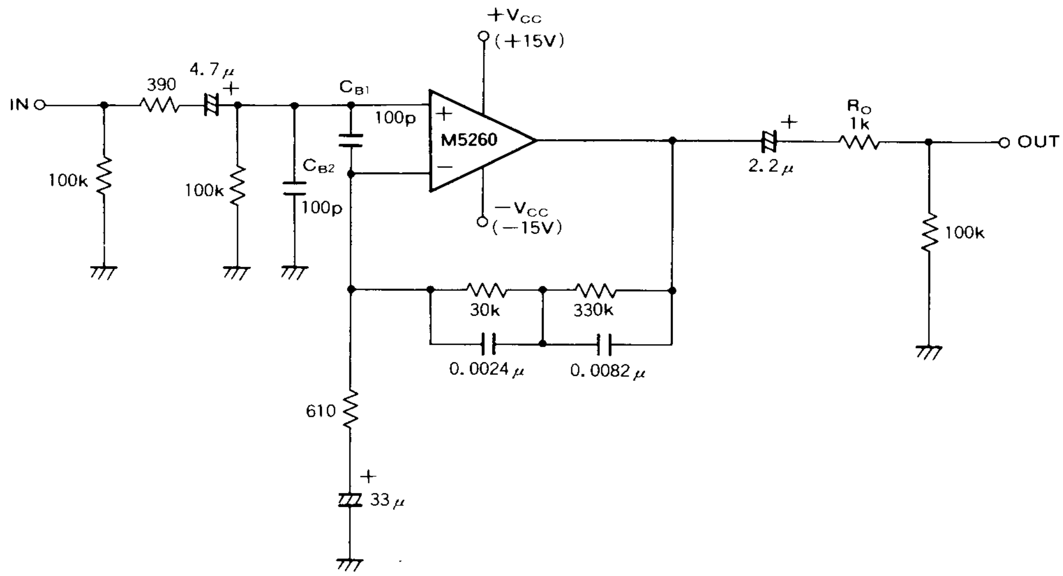


DUAL HIGH-SPEED LOW-NOISE OPERATIONAL AMPLIFIERS (DOUBLE POWER SUPPLY TYPE)

About the RIAA (Record Industry Association of America)

In case that any sound is recorded on a record disk, long wave length (low tone) may exceeds the width of the ditch of the record so that the wave length becomes more longer, the amplitude should be more compressed. Also, since higher frequency elements will be picked up more as the noise by the record needle, the SN ratio will be increased in recording sound such that when the frequency becomes higher, the more emphasis is applied (preemphasis). Therefore, when you play a record you will need an equalizer circuit, which provides the opposite frequency characteristics to the recording characteristics, to obtain flat output.

STERE EQUALIZER AMPLIFIER CIRCUIT



The circuit constant of L_{ch} is the same as that of R_{ch}.

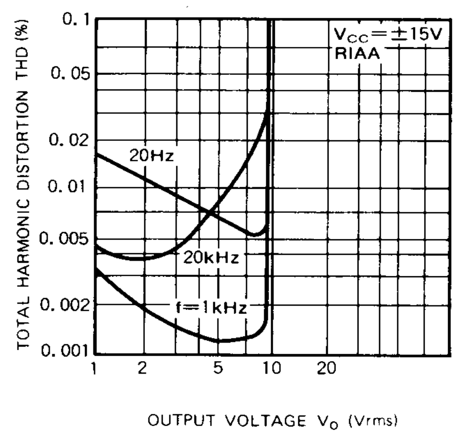
C_{B1}, C_{B2}: Capacitor for handling buzz. Use them if necessary.

R_O: Resistor used for controlling the current in case of abnormal current flow (i.e. short circuit at load end) or for preventing the parasitic oscillation for the capacitance load.

Typical characteristics (V_{CC} = ±15V, RIAA)

- G_V = 35.6dB (f = 1kHz)
- V_{NI} = 1μVrms (R_S = 1kΩ, BW = 20Hz to 30kHz)
- S/N = 74.0dB (IHF-A compensation, input short, input sensitivity 2.5mVrms)
- THD = 0.0015% (f = 1kHz, V_O = 3Vrms)

TOTAL HARMONIC DISTORTION VS. OUTPUT VOLTAGE



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