

DUAL LOW-NOISE OPERATIONAL AMPLIFIERS (DUAL POWER SUPPLY TYPE)

DESCRIPTION

The M5218 are semiconductor integrated circuits designed for a low noise preamplifier in audio equipment and a general-purpose operational amplifier in other electronic equipment. Two low noise operational amplifier circuits displaying internal phase-compensated high gain and low distortion are contained in an 8-pin SIP, DIP or FP for application over a wide range as a general-purpose dual amplifier in general electronic equipment.

The devices have virtually the same characteristics as the 4557, 4558, 4559 and 741 operational amplifiers.

The units can also be used as a single power supply type and amplifier in portable equipment. It is also suitable as a headphone amplifier because of its high load current.

FEATURES

- High gain, low distortion
..... $G_{VO}=110\text{dB}$, $T_{HE}=0.0015\%$ (typ.)
- High slew rate, high f_T
..... $SR=2.2\text{V}/\mu\text{s}$, $f_T=7\text{MHz}$ (typ.)
- Low noise ($R_S=1\text{k}\Omega$) FLAT $V_{NI}=2\mu\text{Vrms}$ (typ.)
RIAA $V_{NI}=1\mu\text{Vrms}$ (typ.)
- Operation with low supply voltage
..... $V_{CC}\geq 4\text{V}(\pm 2\text{V})$
- High load current, high power dissipation
..... $I_{LP}=\pm 50\text{mA}$, $P_d=800\text{mW}$ (SIP)
 $P_d=625\text{mW}$ (DIP), $P_d=440\text{mW}$ (FP)

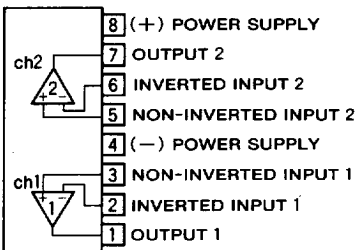
APPLICATION

General-purpose amplifier in stereo equipment, tape decks, and radio stereo cassette recorders; active filters, servo amplifiers, operational circuits in other general electronic equipment.

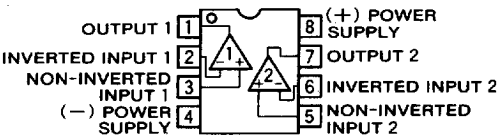
RECOMMENDED OPERATING CONDITION

- Supply voltage range $\pm 2\sim\pm 16\text{V}$
Rated supply voltage $\pm 15\text{V}$

PIN CONFIGURATION (TOP VIEW)

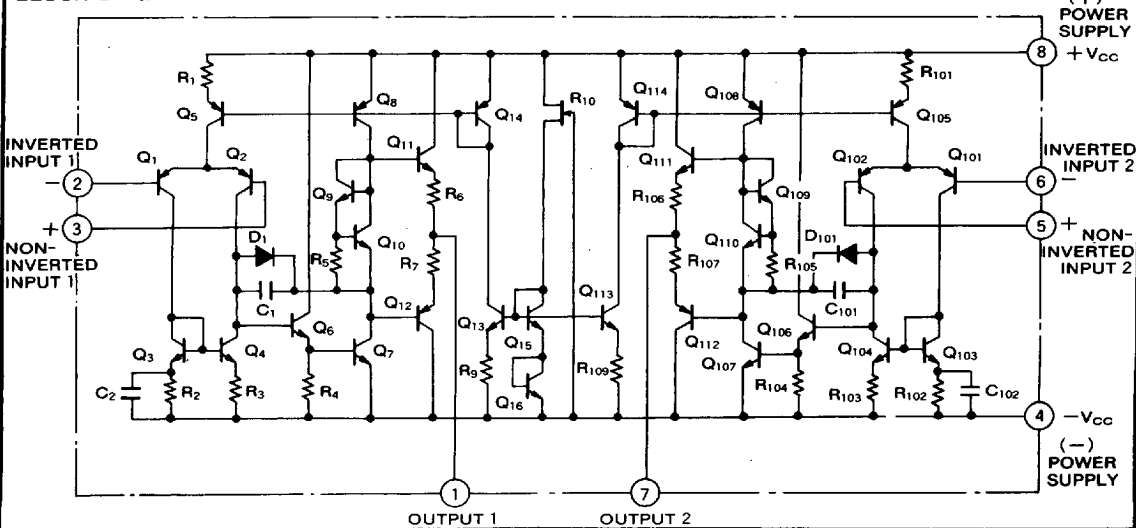


Outline 8P5 (AL)



Outline 8P4 (AP)
8P2S-A (AFP)

BLOCK DIAGRAM



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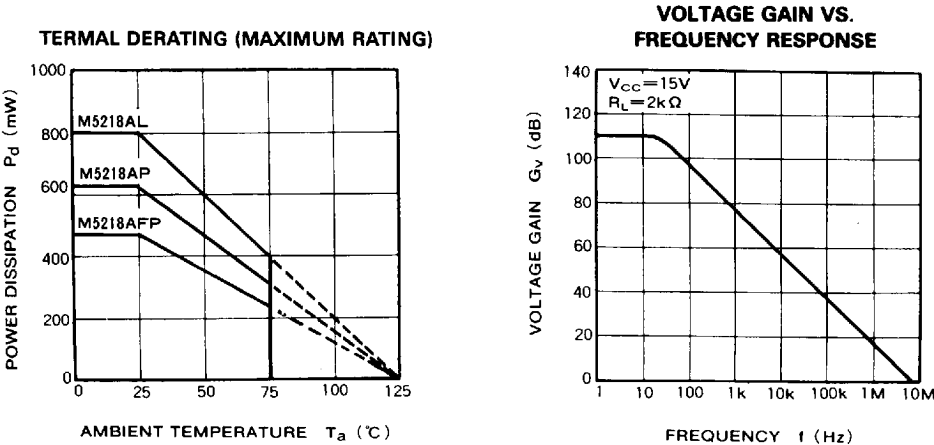
ABSOLUTE MAXIMUM RATINGS (Ta=25°C, unless otherwise noted)

Symbol	Parameter	Conditions	Ratings	Unit
VCC	Supply voltage		±18	V
ILP	Load current		±50	mA
Vid	Differential input voltage		±30	V
Vic	Common input voltage		±15	V
Pd	Power dissipation		800(SIP)/625(DIP)/440(FP)	mW
Kθ	Thermal dirating	Ta≥25°C	8(SIP)/6.25(DIP)/4.4(FP)	mW/°C
Topr	Ambient temperature		-20~+75	°C
Tstg	Storage temperature		-55~+125	°C

ELECTRICAL CHARACTERISTICS (Ta=25°C, VCC=±15V)

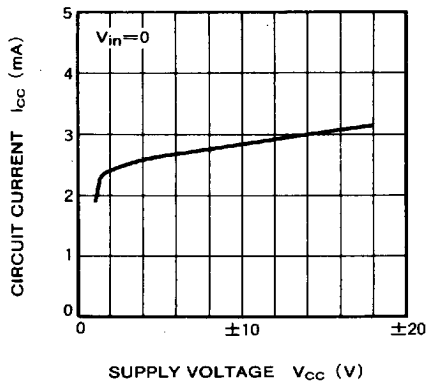
Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
ICC	Circuit current	Vin=0		3.0	6.0	mA
VIO	Input offset voltage	RS≤10kΩ		0.5	6.0	mV
IIO	Input offset current			5	200	nA
IIB	Input bias current				500	nA
RiIn	Input resistance		0.3	5		MΩ
GVO	Open loop voltage gain	RL≥2kΩ, VO=±10V	86	110		dB
VOM	Maximum output voltage	RL≥10kΩ	±12	±14		V
		RL≥2kΩ	±10	±13		
VCM	Common input voltage range		±12	±14		V
CMRR	Common mode rejection ratio	RS≤10kΩ	70	90		dB
SVRR	Sypply voltage	RS≤10kΩ		30	150	μV/V
Pd	Power dissipation			90	180	mW
SR	Slew rate	Gv=0dB, RL=2kΩ		2.2		V/μs
fT	Gain bandwidth product			7		MHz
VNI	Input referred noise voltage	RS=1kΩ, BW:10Hz~30kHz	2.0			μVrms

TYPICAL CHARACTERISTICS

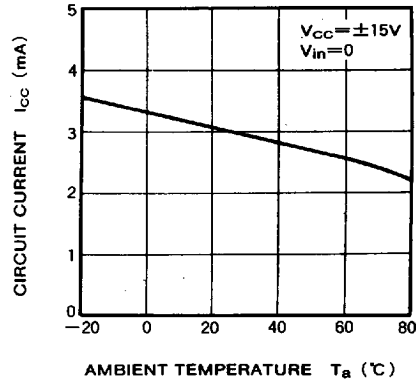


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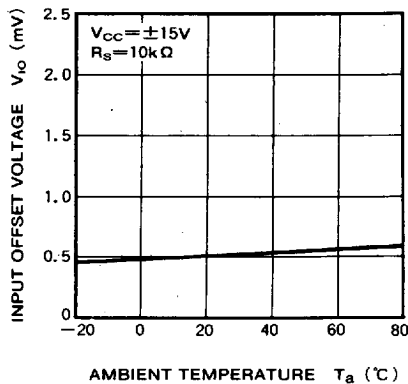
CIRCUIT CURRENT VS.
SUPPLY VOLTAGE



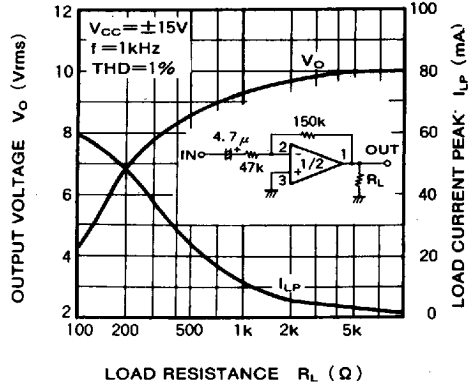
CIRCUIT CURRENT VS.
AMBIENT TEMPERATURE



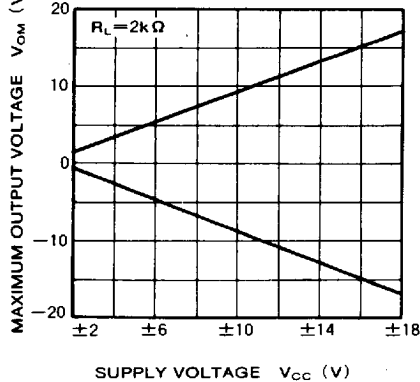
INPUT OFFSET VOLTAGE VS.
AMBIENT TEMPERATURE



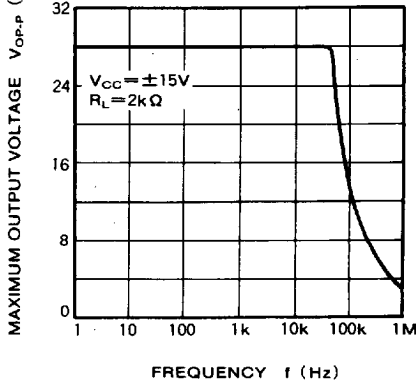
OUTPUT VOLTAGE / LOAD CURRENT
PEAK VS. LOAD RESISTANCE



MAXIMUM OUTPUT VOLTAGE
VS. SUPPLY VOLTAGE



MAXIMUM OUTPUT VOLTAGE
VS. FREQUENCY RESPONSE



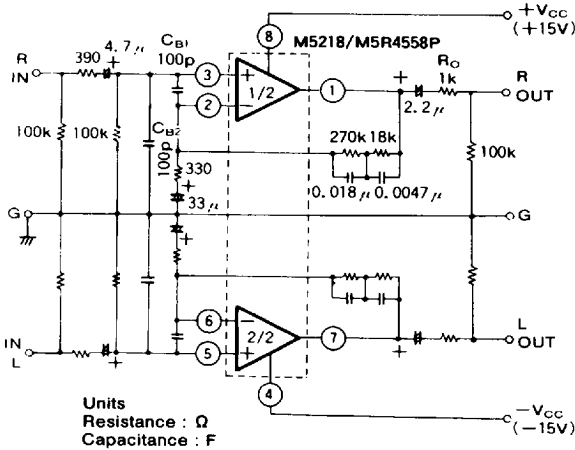
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APPLICATION EXAMPLES

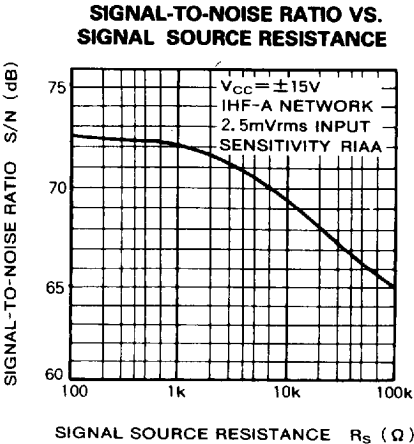
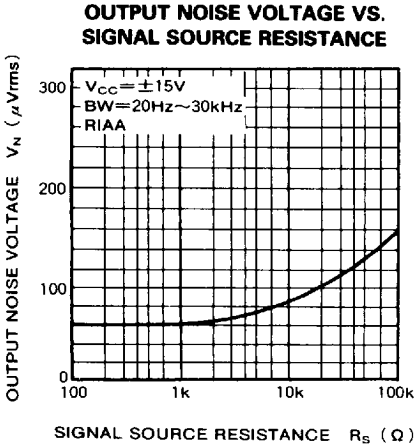
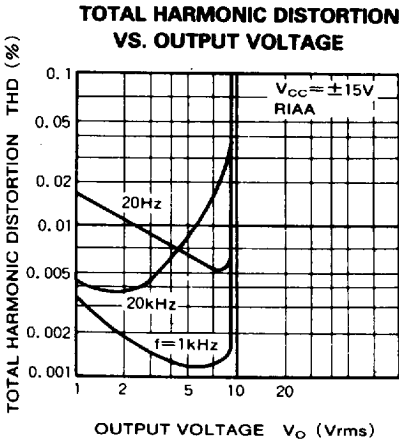
(1) Stereo Equalizer amplifier circuit



Left channel circuit constants are identical to those of right channel.
 C_{B1} , C_{B2} : Capacitors for buzz prevention, use if required.
 R_O : Resistor used to prevent parasitic oscillation for capacitive loads and current limiting with shorted and other abnormal load conditions.

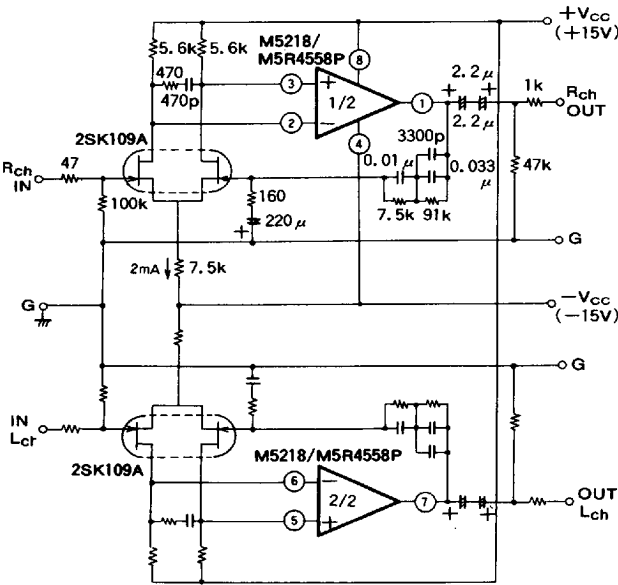
TYPICAL CHARACTERISTICS ($V_{CC} = \pm 15V$, RIAA)

- $G_V = 35.6dB (f = 1kHz)$
- $V_{NI} = 1 \mu Vrms (R_S = 1k\Omega, BW = 20Hz \sim 30kHz)$
- Signal-to-noise = 72.5dB (IHF-A network, shorted input, 2.5mVrms input sensitivity)
- THD = 0.0015% ($f = 1kHz, V_O = 3Vrms$)



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(2) High S / N stereo DC ICL equalizer

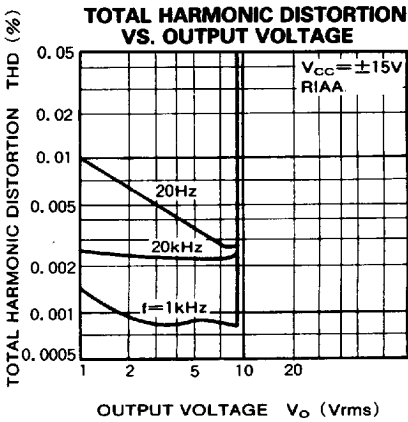


Left channel circuit constants are identical to those of right channel.

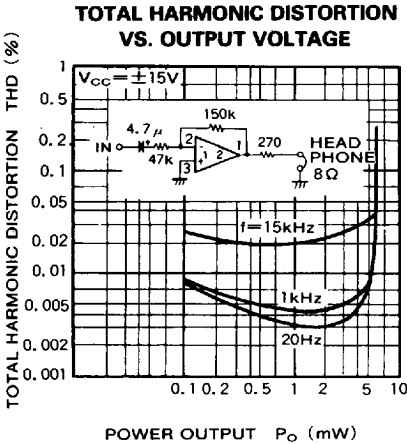
Units Resistance : Ω
Capacitance : F

TYPICAL CHARACTERISTICS ($V_{CC} = \pm 15V$, RIAA)

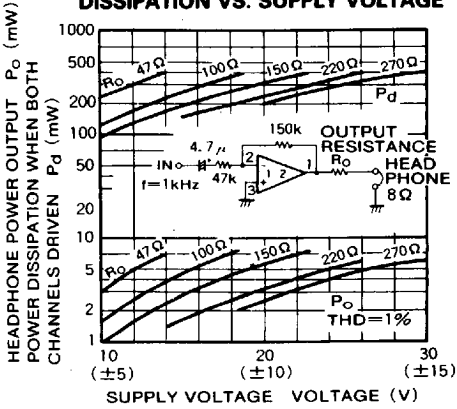
- Signal-to-noise = 72.5dB (IHF-A network, shorted input, 2.5mVrms input sensitivity)
- $V_{NI} = 0.77 \mu V_{rms}$ ($R_S = 5.1k\Omega$, BW = 5Hz ~ 100kHz)
- $G_V = 35.6dB$ ($f = 1kHz$)



(3) Headphone amplifier



(Output resistance R_O is made the parameter)
POWER OUTPUT / POWER DISSIPATION VS. SUPPLY VOLTAGE



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