

FUJITSU

DUAL CONTROL AMPLIFIER

MB3110AOctober 1987
Edition 1.0

DUAL CONTROL AMPLIFIER

The Fujitsu MB3110A is a dual-channel amplifier with separate volume-and-balance controls for both A-and-B channels. Each channel consists of a 20 dB amplifier with symmetrical balance attenuation over a wide range and low distortion of audio frequencies. Thus, the MB3110A is an excellent choice for general-purpose audio work and media reproduction that requires high-fidelity processing. The amplifier circuits are designed to provide optimum performance with a bare minimum of external parts.

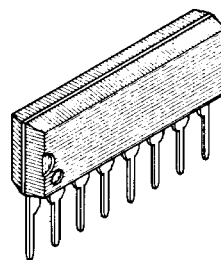
The MB3110A is housed in an 8-pin Single In-Line Package (SIP) that is especially useful where mounting space is limited or in applications where high-density populations are required.

- Voltage gain: 20 dB (typical)
- Input control voltage: 0V to V_{CC}
- Maximum volume attenuation: 80 dB (typical)
- Maximum balance attenuation: 80 dB (typical)
- Low noise: 80 μ V rms (typical)
- Maximum output voltage: 1.7V rms (typical)
- SIP package

ABSOLUTE MAXIMUM RATINGS — $T_A = 25^\circ\text{C}$ (see NOTE)

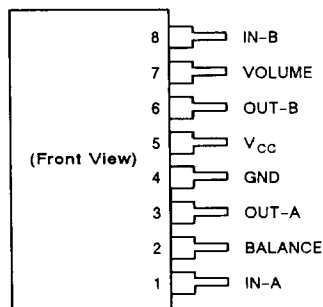
Rating	Symbol	Value	Unit
Power Supply Voltage	V_{CC}	16	V
Input Control Voltage	V_C	0 to V_{CC}	V
Power Dissipation	P_D	530 ($T_A \leq 65^\circ\text{C}$)	mW
Operating Temperature	T_A	-20 to $+75$	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55 to $+125$	$^\circ\text{C}$

NOTE: Permanent device damage may occur if the above Absolute Maximum Ratings are exceeded. Functional operation should be restricted to the conditions as detailed in the operational sections of this data sheet. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



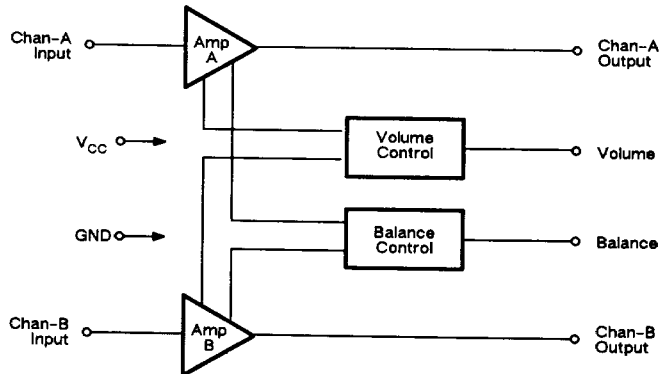
PLASTIC PACKAGE
SIP-08P-M03

PIN ASSIGNMENT



This device contains circuitry to protect the inputs against damage due to high static voltages or electric fields. However, it is advised that normal precautions be taken to avoid application of any voltage higher than maximum rated voltages to this high impedance circuit.

Fig. 1 — MB3110A BLOCK DIAGRAM



ELECTRICAL CHARACTERISTICS

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Value	Unit
Power Supply Voltage	V_{CC}	6 to 12	V
Load Resistance	R_L	≥ 32	Ω
Operating Temperature	T_A	-20 to +75	$^{\circ}\text{C}$

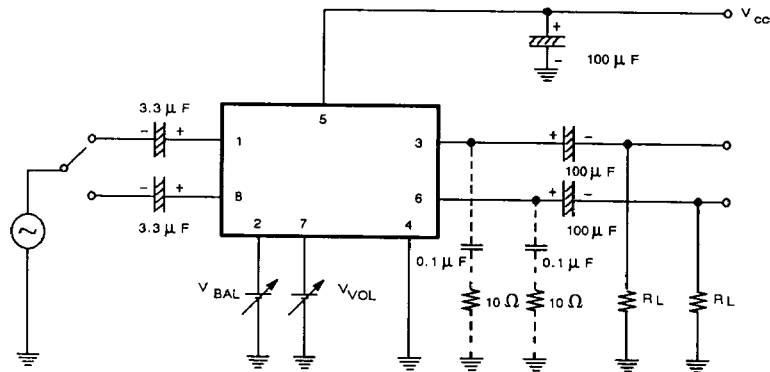
ELECTRICAL CHARACTERISTICS

AC CHARACTERISTICS ($V_{CC} = 9V$, $R_L = 100\Omega$, $f = 1kHz$, $V_{IN} = 50\text{ mV rms}$, and $T_A = 25^\circ C$ unless otherwise specified)

Parameter	Symbol	Conditions (Note)	Values				Unit
			V_{VOL} (V)	Min	Typ	Max	
Power Supply Current	I_{CC}	$V_{IN} = OV$	9.0	—	8	14	mA
Voltage Gain	A_{VO}	—	9.0	18	20	22	dB
Volume Attenuation	A_{VMC}	—	4.0	8.5	10	11.5	dB
Maximum Volume Attenuation	A_{VMM}	—	0	70	80	—	dB
Balance Attenuation at Center Position	A_{BLC}	$V_{BAL} = 4.5V$	9.0	0.5	2.5	4.0	dB
Maximum Balance Attenuation	A_{BLM}	$V_{BAL} = OV/9V$	9.0	70	80	—	dB
Channel Balance	CB	—	9.0	-1	0	+1	dB
Channel Separation	CS	—	9.0	—	60	—	dB
Total Harmonic Distortion	THD	—	9.0	—	0.1	0.5	%
Maximum Output Voltage	V_{OM}	THD=1%	9.0	1.2	1.7	—	Vrms
Output Noise Voltage	V_{NO}	$R_g = \infty$, BW = 20 to 20kHz	0	—	80	200	μV_{rms}
Input Resistance	R_{IN}	—	9.0	15	20	—	k Ω
Volume Control Input Current	I_{7H}	—	9.0	90	150	250	μA
High-level Balance Control Current	I_{2H}	$V_{BAL} = 9.0V$	9.0	36	60	100	μA
Low-level Balance Control Current	I_{2L}	$V_{BAL} = OV$	9.0	-100	-60	-36	μA

NOTE: Balance control pin is open unless otherwise specified.

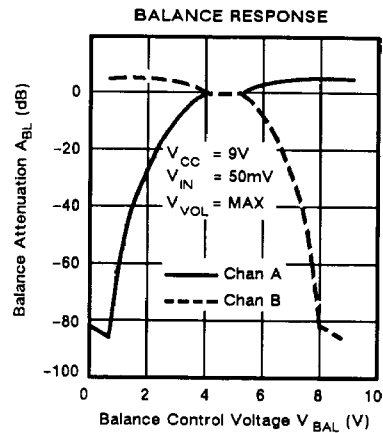
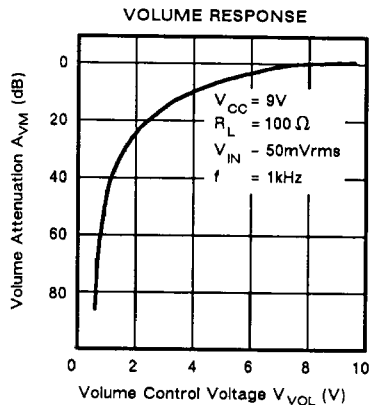
Fig. 2 — TEST CIRCUIT



Notes:

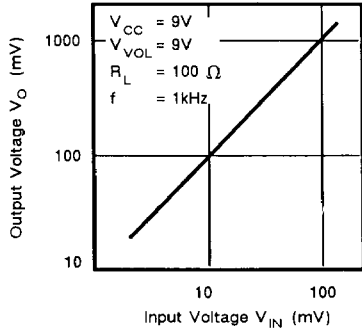
1. When measuring THD and V_{NO} , a bandpass filter with a bandwidth of 20Hz-to-20kHz is required; when measuring CS, a bandpass filter with a center frequency (f_c) of 1 kHz is required.
2. Dotted-line components are used to inhibit parasitic oscillations.

TYPICAL PERFORMANCE CHARACTERISTICS

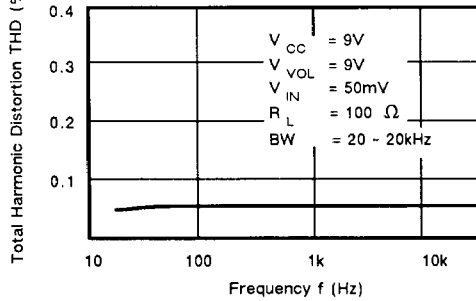


TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

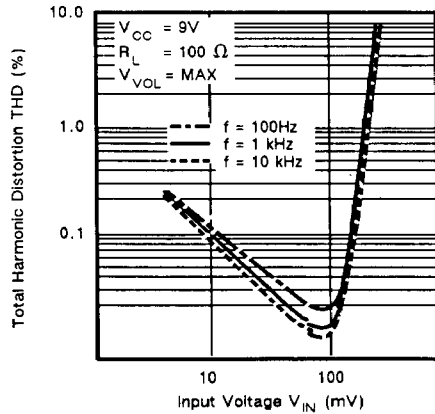
OUTPUT VOLTAGE vs INPUT VOLTAGE



TOTAL HARMONIC DISTORTION vs FREQUENCY



TOTAL HARMONIC DISTORTION vs INPUT VOLTAGE





MB3110A

PACKAGE DIMENSIONS

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