FUJITSU

WIDE BAND VIDEO AMPLIFIER

MB3501

July 1988
Edition 2.0

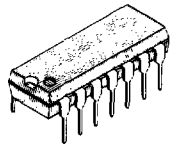
WIDE BAND VIDEO AMPLIFIER

The MB3501 is a monolithic differential input, differential output, wideband video amplifier. Owing to adoption of feedback circuitry, wide bandwidth and gain stability are achieved. Adjustable gain from 10 to 400 are obtained by external resistor without external frequency compensation.

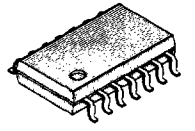
The MB3501 is most suitable for sense-amplifier of magnetic memory equipment, video amplifier and pulse amplifier.

The MB3501 is compatible with μA733.

- Supply Voltage: ±6V
- Wide Bandwidth: 150MHz
- Selectable Gain: 10 to 400
- Frequency Compensation is not required.
- 14-pin DIP Package (Suffix: -P)
  14-pin Flat Package (Suffix: -PF)

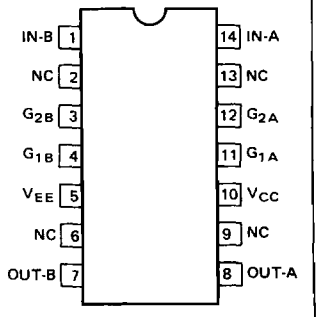


PLASTIC PACKAGE
DIP-14P-M02



PLASTIC PACKAGE
FPT-14P-M01

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.

ABSOLUTE MAXIMUM RATINGS (see NOTE)

Rating	Symbol	Value	Unit
Positive Supply Voltage	V_{CC}	+8	V
Negative Supply Voltage	V_{EE}	−8	V
Input Voltage	V_{IN}	+1.5 to −5	V
Output Current	I_O	10	mA
Power Dissipation	P_D	500	mW
Storage Temperature	T_{STG}	−55 to +125	°C

NOTE: Permanent device damage may occur if 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.

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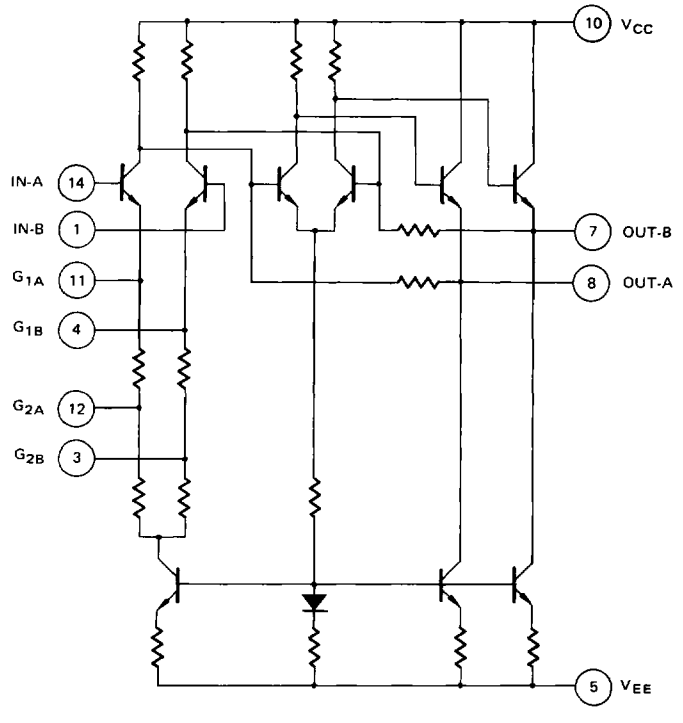
Fig. 1 – MB3501 EQUIVALENT CIRCUIT



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RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Value	Unit
Positive Supply Voltage	V_{CC}	+6±5%	V
Negative Supply Voltage	V_{EE}	-6±5%	V
Operating Temperature	T_A	-20 to +75	°C

DC CHARACTERISTICS

(V_{CC} = 6V, V_{EE} = -6V, T_A = 25°C)

Parameter	Symbol	Condition	Test Circuit	Value			Unit
				Min	Typ	Max	
Output Low Voltage	V_{OL}	ΔV_I = 200mV	Figs 2, 3		0.4	1.0	V
Output High Voltage	V_{OH}	ΔV_I = 200mV	Figs 2, 3	4.8	5.2		V
Output Voltage	V_O	*1	Fig. 4	1.6	2.7	3.9	V
Output Offset Voltage	V_{OFF}	*1	Fig. 4		0.35	1.4	V
Input Offset Current	I_{IO}		Fig. 4		0.4		μA
Input Bias Current	I_I		Fig. 4		9	30	μA
Output Sink Current	I_{SINK}	ΔV_I = 200mV			3.6		mA
Supply Current	I_{CC}	*1	Fig. 4		17	27	mA

AC CHARACTERISTICS

(V_{CC} = 6V, V_{EE} = -6V, T_A = 25°C)

Parameter	Symbol	Condition	Test Circuit	Value			Unit
				Min	Typ	Max	
Voltage Gain	AV_1	f = 1kHz, R_L = 1kΩ*2	Fig. 5	250	400	600	
	AV_2	f = 1kHz, R_L = 1kΩ*3	Fig. 5	80	100	120	
	AV_3	f = 1kHz, R_L = 1kΩ*4	Fig. 5	9	11	14	
Frequency Bandwidth	BW_1	R_S = 50Ω, R_L = 1kΩ*2	Fig. 6		50		MHz
	BW_2	R_S = 50Ω, R_L = 1kΩ*3	Fig. 6	80	110		MHz
	BW_3	R_S = 50Ω, R_L = 1kΩ*4	Fig. 6		150		MHz
Recovery Time	t_{REC}	R_S = 50Ω, R_L = 1kΩ, ΔV_I = 100mV			20		ns
Common Mode Gain	CMG	f ≤ 100kHz*3			-60		dB

Notes: *1 Inputs pins ground.
*2 Pins 4 and 11 connected together.
*3 Pins 3 and 12 connected together.
*4 Gain select pins open.

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TEST CIRCUIT

Fig. 2 – V_{OL}, V_{OH}

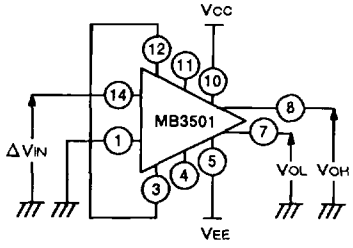


Fig. 3 – V_{OL}, V_{OH}

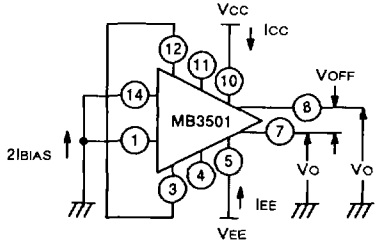


Fig. 4 – V_O, V_{OFF}, I_I

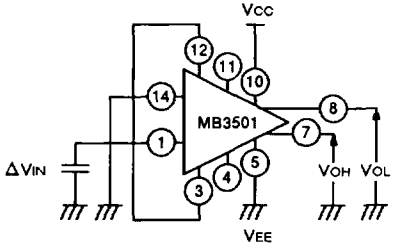


Fig. 5 – AV

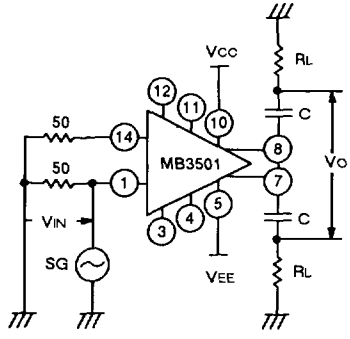
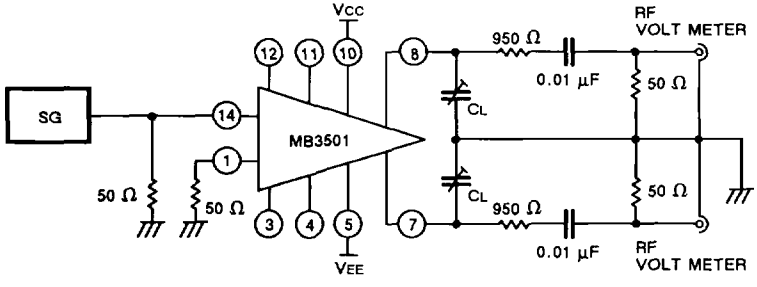


Fig. 6 – BW



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TYPICAL CHARACTERISTICS CURVES

Fig. 7 – SINGLE VOLTAGE GAIN vs. FREQUENCY

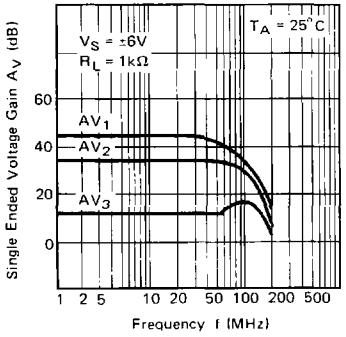


Fig. 8 – SINGLE ENDED VOLTAGE GAIN vs. FREQUENCY

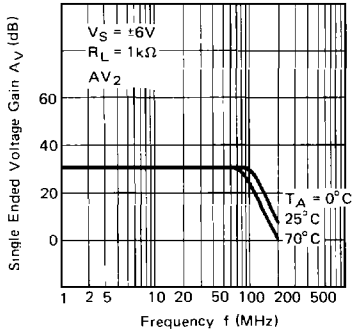


Fig. 9 – SINGLE ENDED VOLTAGE GAIN vs. FREQUENCY

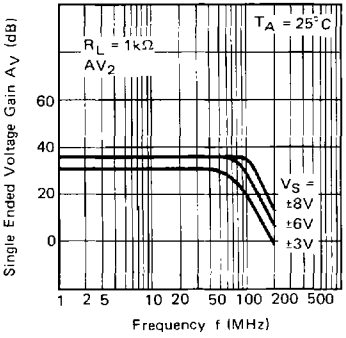


Fig. 10 – PHASE SHIFT vs. FREQUENCY

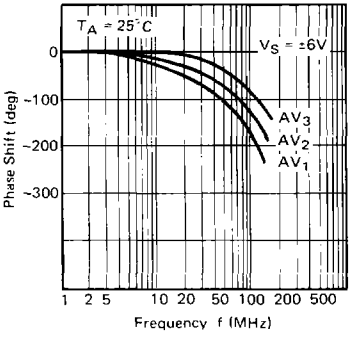


Fig. 11 – RECOVERY TIME vs. DIFFERENTIAL INPUT VOLTAGE

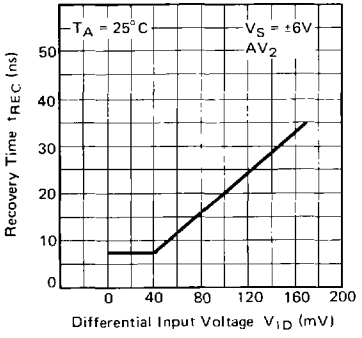
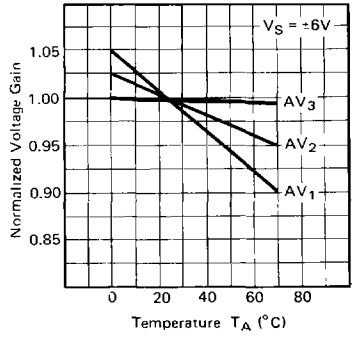


Fig. 12 – NORMALIZED VOLTAGE GAIN vs. TEMPERATURE



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TYPICAL CHARACTERISTICS CURVES (continued)

Fig. 13 – NORMALIZED VOLTAGE GAIN vs. SUPPLY VOLTAGE

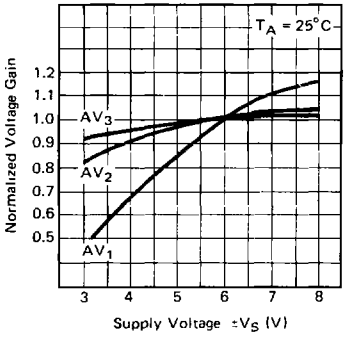


Fig. 14 – COMMON MODE GAIN vs. FREQUENCY

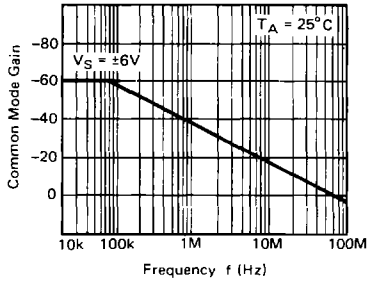
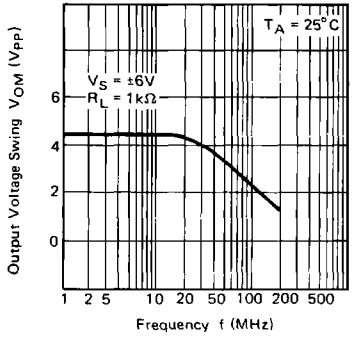


Fig. 15 – OUTPUT VOLTAGE SWING vs. FREQUENCY



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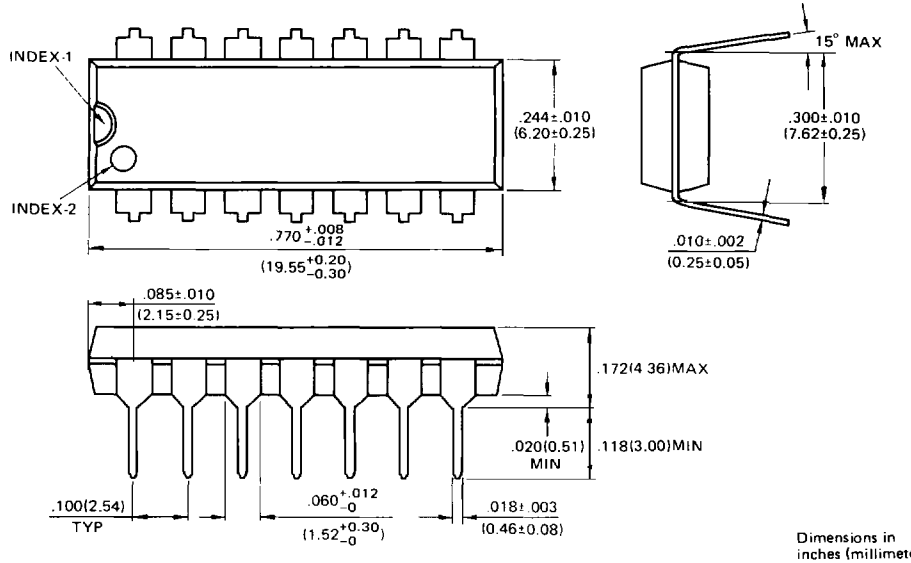
PACKAGE DIMENSIONS

14-LEAD PLASTIC DUAL-IN-LINE PACKAGE
(CASE No.: DIP-14P-M02)



Dimensions in
inches (millimeters)

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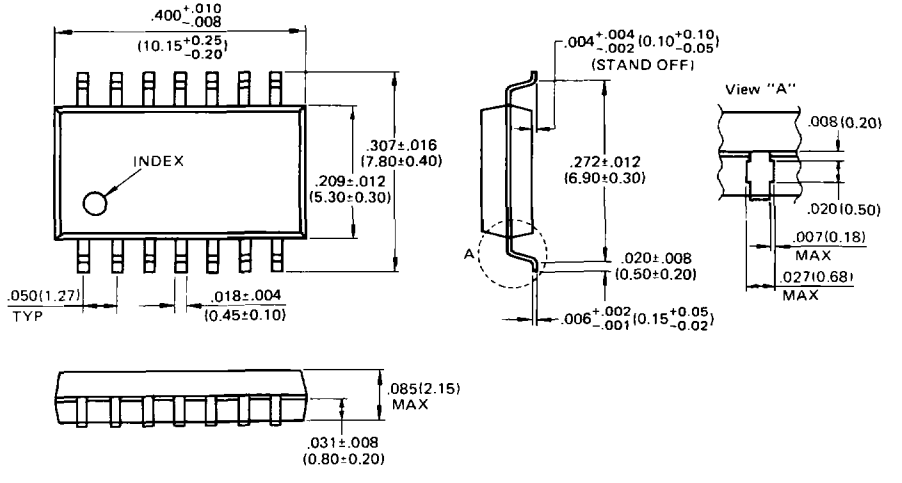
PACKAGE DIMENSIONS (continued)

14-LEAD PLASTIC FLAT PACKAGE
(CASE No.: FPT-14P-M01)



Dimensions in
inches (millimeters)

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