

## VIDEO AMPLIFIER

## ■ GENERAL DESCRIPTION

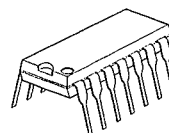
The NJM592 is a video amplifier of differential input and differential output.

The NJM592 is suitable for a preamplifier of memory equipment and video and pulse signal amplifier.

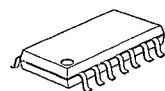
## ■ FEATURES

- Wide Frequency Range (40MHz, 90MHz typ.)
- Differential Input, Differential Output.
- With Gain Select Terminal
- Package Outline DIP 8 /14, DMP8/14, SSOP 8/14 .
- Bipolar Technology

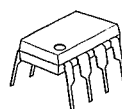
## ■ PACKAGE OUTLINE



NJM592D



NJM592M



NJM592DB



NJM592MB

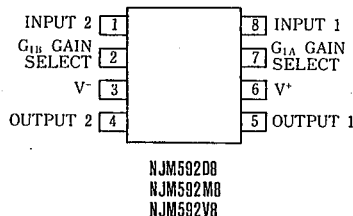
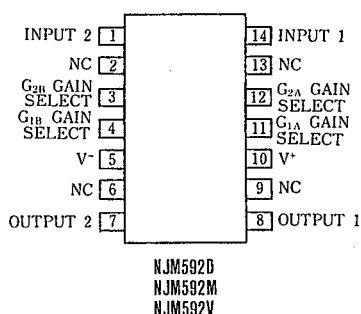


NJM592VB

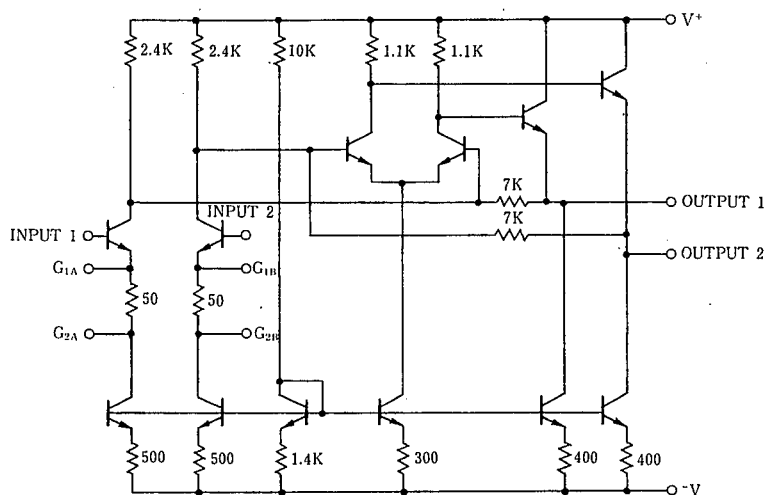


NJM592V

## ■ PIN CONFIGURATION



## ■ EQUIVALENT CIRCUIT



## ■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V <sup>+</sup> /V <sup>-</sup>	±8	V
Differential Input Voltage	V <sub>DIF</sub>	±5	V
Common Mode Input Voltage	V <sub>CM</sub>	±6	V
Output Current	I <sub>O</sub>	10	mA
Operating Temperature Range	T <sub>opr</sub>	-40 ~ +85	°C
Storage Temperature Range	T <sub>stg</sub>	-40 ~ +125	°C
Power Dissipation	P <sub>D</sub>	(DIP14) 500	mW
		(DMP14) 300	mW
		(SSOP14) 300	mW
		(DIP8) 500	mW
		(DMP8) 300	mW
		(SSOP8) 250	mW

■ ELECTRICAL CHARACTERISTICS

(Ta=25°C, V<sup>+</sup>=±6V, V<sub>CM</sub>=0)

PARAMETER	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Differential Voltage Gain1 (note 1) Differential Voltage Gain2 (note 2, 4)	R <sub>L</sub> =2kΩ, V <sub>OUT</sub> =3V <sub>P-P</sub>	250 80	400 100	600 120	V/V
Bandwidth Gain1 (note 1) Bandwidth Gain2 (note 2, 4)		— —	40 90	— —	MHz
Rise Time Gain1 (note 1) Rise Time Gain2 (note 2, 4)	V <sub>OUT</sub> =1V <sub>P-P</sub>	— —	10.5 4.5	— —	ns
Propagation Delay 1 Gain1 (note 1) Propagation Delay 2 Gain2 (note 2, 4)	V <sub>OUT</sub> =1V <sub>P-P</sub>	— —	7.5 6.0	— —	ns
Input Resistance Gain1 (note 1) Input Resistance Gain2 (note 2, 4)		— —	4.0 30	— —	kΩ
Input Capacitance Gain2 (note 2, 4)		—	2.0	—	pF
Input Offset Current		—	0.4	5.0	μA
Input Bias Current		—	9.0	30	μA
Input Noise Voltage	BW=1kHz~10MHz	—	12	—	μVrms
Input Voltage Range		—	—	±1.0	V
Common Mode Rejection Ratio Gain2 (note 4) Common Mode Rejection Ratio Gain2 (note 4)	V <sub>CM</sub> =±1V, f<100kHz V <sub>CM</sub> =±1V, f=5MHz	60 —	86 60	— —	dB
Supply Voltage Rejection Ratio Gain2 (note 4)	ΔV <sup>+</sup> /V <sup>+</sup> =±0.5V	50	70	—	dB
Output Offset Voltage Gain1 (note 1) Output Offset Voltage Gain2 (note 2, 4) Output Offset Voltage Gain3 (note 3)	R <sub>L</sub> =∞ R <sub>L</sub> =∞ R <sub>L</sub> =∞	— — —	— — 0.35	1.5 1.5 0.75	V
Output Common Mode Voltage	R <sub>L</sub> =∞	2.4	2.9	3.4	V
Output Voltage Swing	R <sub>L</sub> =2KΩ	3.0	4.0	—	V
Output Resistance		—	20	—	Ω
Operating Current	R <sub>L</sub> =∞	—	18	24	mA

(note 1): Gain select pins G<sub>1A</sub> and G<sub>1B</sub> connected together. (Gain1)

(note 2): Gain select pins G<sub>2A</sub> and G<sub>2B</sub> connected together. (Gain2)

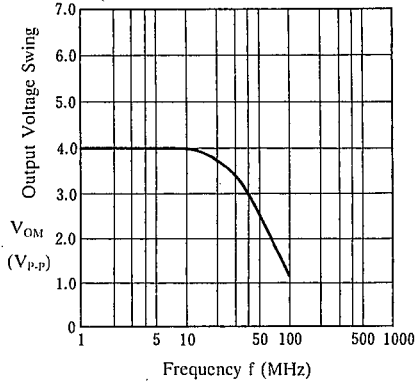
(note 3): All gain select pins open.

(note 4): Apply to only 14 pin package.

## TYPICAL CHARACTERISTICS

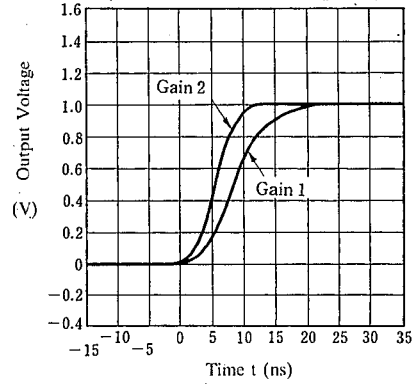
### Output Voltage Swing

( $T_a=25^\circ\text{C}$ ,  $V^+/V^-=\pm 6\text{V}$ ,  $R_L=1\text{k}\Omega$ )



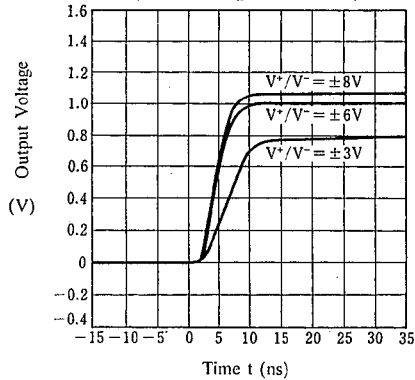
### Pulse Response

( $T_a=25^\circ\text{C}$ ,  $V^+/V^-=\pm 6\text{V}$ ,  $R_L=1\text{k}\Omega$ )



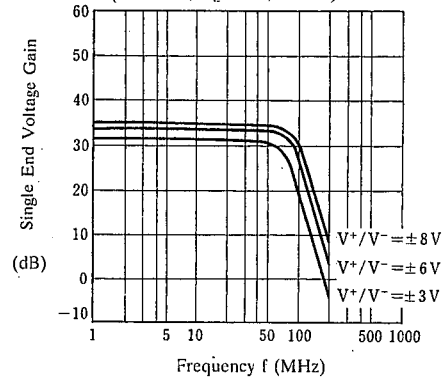
### Pulse Response

( $T_a=25^\circ\text{C}$ ,  $R_L=1\text{k}\Omega$ , Gain 2)



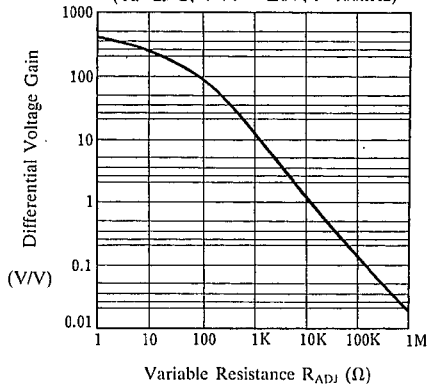
### Single End Voltage Gain

( $T_a=25^\circ\text{C}$ ,  $R_L=1\text{k}\Omega$ , Gain 2)

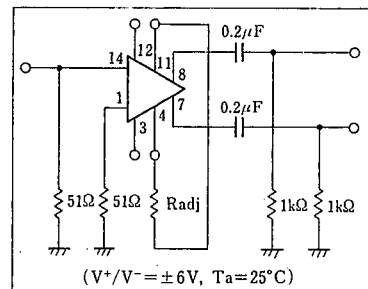


### Differential Voltage Gain

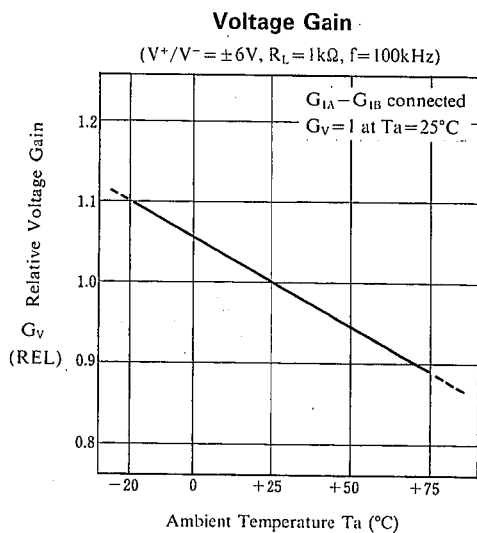
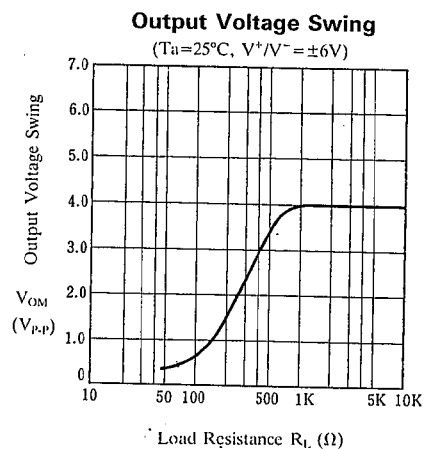
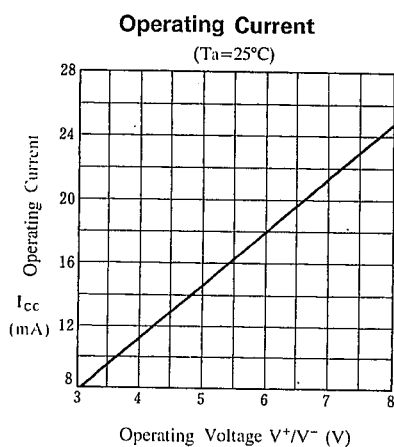
( $T_a=25^\circ\text{C}$ ,  $V^+/V^-=\pm 6\text{V}$ ,  $f=100\text{kHz}$ )



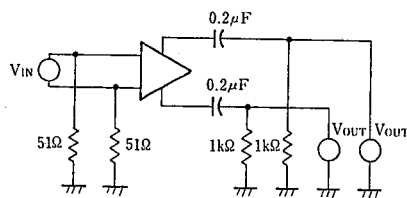
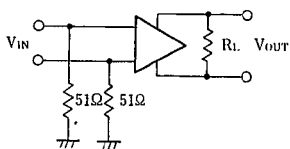
### Differential Voltage Gain Adjustment Circuit



## ■ TYPICAL CHARACTERISTICS

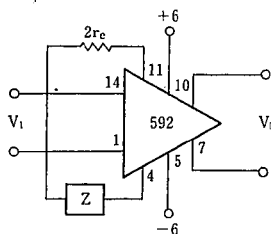


## ■ TEST CIRCUIT



## ■ TYPICAL APPLICATION

### Basic circuit



$$\frac{V_o(s)}{V_i(s)} \approx \frac{1.4 \times 10^4}{Z(s) + 2r_c}$$

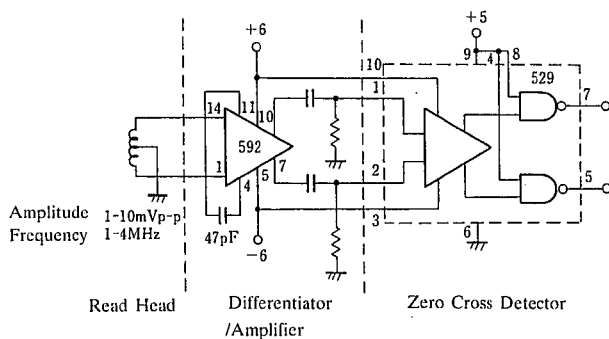
$$\approx \frac{1.4 \times 10^4}{Z(s) + 32}$$

### Filter Network

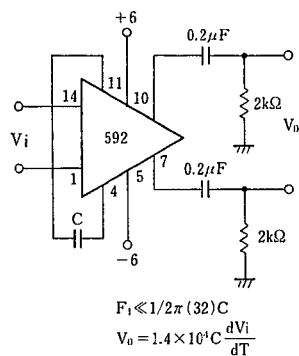
Z NETWORK	FILTER TYPE	$\frac{V_o(s)}{V_i(s)}$ TRANSFER FUNCTION
	LOW PASS	$\frac{1.0 \times 10^4}{L} \left[ \frac{1}{s + R/L} \right]$
	HIGH PASS	$\frac{1.4 \times 10^4}{R} \left[ \frac{s}{s + 1/RC} \right]$
	BAND PASS	$\frac{1.4 \times 10^4}{L} \left[ \frac{s}{s^2 + R/L s + 1/LC} \right]$
	BAND REJECT	$\frac{1.4 \times 10^4}{R} \left[ \frac{s^2 + 1/LC}{s^2 + 1/LC + s/RC} \right]$

(note): R includes  $2 r_c$  ( $\approx 32\Omega$ )

### Disk/Tape Phase Modulated Readback Systems



### Differentiation with High Common Mode Noise Rejection



## MEMO

**[CAUTION]**

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