

## VIDEO AMPLIFIER

### ■ GENERAL DESCRIPTION

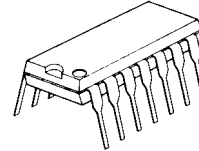
The **NJM592** is a video amplifier of differential input and differential output.

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

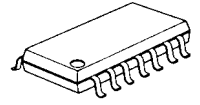
### ■ FEATURES

- Wide Frequency Range (40MHz, 90MHz typ.)
- Differential Input, Differential Output.
- With Gain Select Terminal
- Package Outline DIP8/14, DMP8/14, SSOP8/14.
- Bipolar Technology

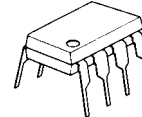
### ■ PACKAGE OUTLINE



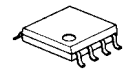
**NJM592D**



**NJM592M**



**NJM592D8**



**NJM592M8**

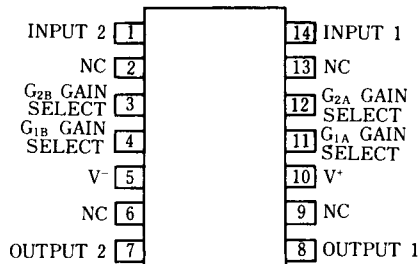


**NJM592V8**

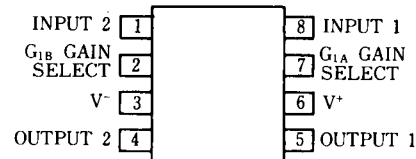


**NJM592V**

### ■ PIN CONFIGURATION

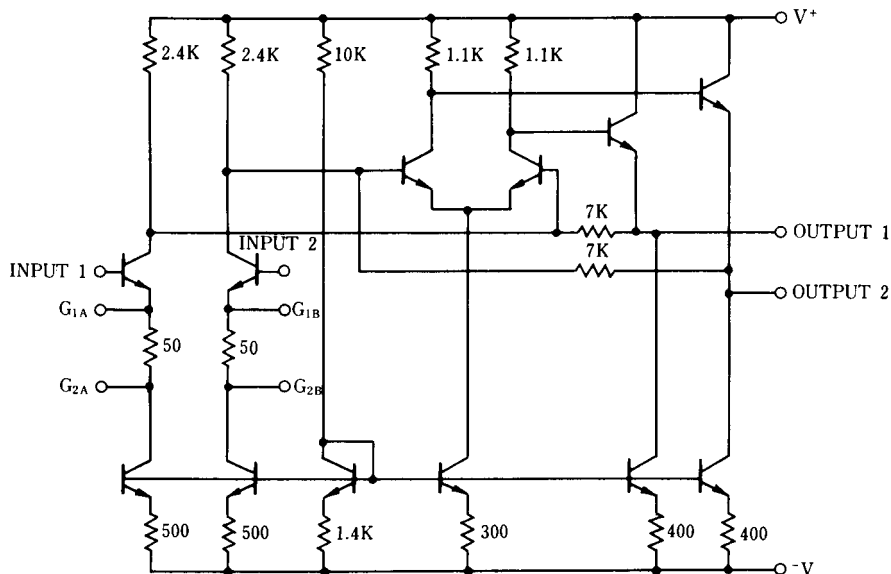


**NJM592D**  
**NJM592M**  
**NJM592V**



**NJM592D8**  
**NJM592M8**  
**NJM592V8**

### ■ EQUIVALENT CIRCUIT



# NJM592

## ■ ABSOLUTE MAXIMUM RATINGS

( $T_a=25^\circ\text{C}$ )

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V^+V^-$	$\pm 8$	V
Differential Input Voltage	$V_{DIEF}$	$\pm 5$	V
Common Mode Input Voltage	$V_{CM}$	$\pm 6$	V
Output Current	$I_O$	10	mA
Operating Temperature Range	$T_{opr}$	-40 to +85	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-40 to +125	$^\circ\text{C}$
Power Dissipation	$P_D$	(DIP14) 500	mW
		(DMP14) 300	mW
		(SSOP14) 300	mW
		(DIP8) 500	mW
		(DMP8) 300	mW
		(SSOP8) 250	mW

## ■ ELECTRICAL CHARACTERISTICS

( $T_a=25^\circ\text{C}$ ,  $V^{\pm}=\pm 6\text{V}$ ,  $V_{\text{CM}}=0$ )

PARAMETER	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Differential Voltage Gain 1 (note 1)	$R_1=2\text{k}\Omega$ , $V_{\text{OUT}}=3V_{\text{P-P}}$	250	400	600	V/V
Differential Voltage Gain 2 (note 2, 4)		80	100	120	
Bandwidth (note 1)		-	40	-	MHz
Bandwidth 2 Gain 2 (note 2, 4)		-	90	-	
Rise Time Gain 1 (note 1)	$V_{\text{OUT}}=1V_{\text{P-P}}$	-	10.5	-	ns
Rise Time Gain 2 (note 2, 4)		-	4.5	-	
Propagation Delay 1 Gain 1 (note 1)	$V_{\text{OUT}}=1V_{\text{P-P}}$	-	7.5	-	ns
Propagation Delay 2 Gain 2 (note 2, 4)		-	6.0	-	
Input Resistance Gain 1 (note1)		-	4.0	-	k $\Omega$
Input Resistance Gain 2 (note 2, 4)		-	30	-	
Input Capacitance Gain 2 (note2, 4)		-	2.0	-	pF
Input Offset Current		-	0.4	5.0	$\mu\text{A}$
Input Bias Current		-	9.0	30	$\mu\text{A}$
Input Noise Voltage	BW=1kHz to 10MHz	-	12	-	$\mu\text{Vrms}$
Input Voltage Range		-	-	$\pm 1.0$	V
Common Mode Rejection Ratio Gain 2 (note 4)	$V_{\text{CM}}=\pm 1\text{V}$ , $f<100\text{kHz}$	60	86	-	dB
Common Mode Rejection Ratio Gain 2 (note 4)	$V_{\text{CM}}=\pm 1\text{V}$ , $f=5\text{MHz}$	-	60	-	
Supply Voltage Rejection Ratio Gain 2 (note *)	$\Delta V^{\pm}/V=\pm 0.5\text{V}$	50	70	-	dB
Output Offset Voltage Gain 1 (note 1)	$R_L=\infty$	-	-	1.5	V
Output Offset Voltage Gain 2 (note2, 4)	$R_L=\infty$	-	-	1.5	
Output Offset Voltage Gain 3 (note 3)	$R_L=\infty$	-	0.35	0.75	
Output Common Mode Voltage	$R_L=\infty$	2.4	2.9	3.4	V
Output Voltage Swing	$R_L=2\text{k}\Omega$	3.0	4.0	-	V
Output Resistance		-	20	-	$\Omega$
Output Current	$R_L=\infty$	-	18	24	mA

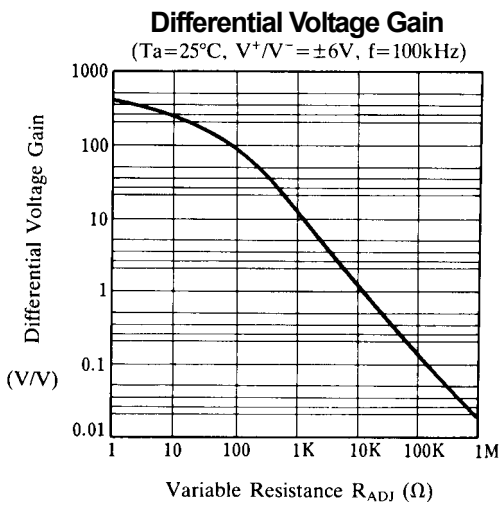
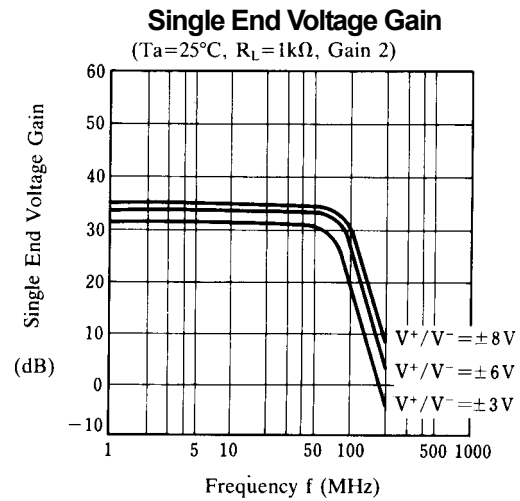
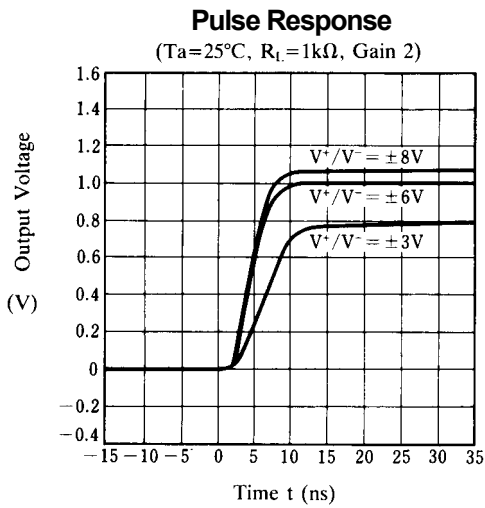
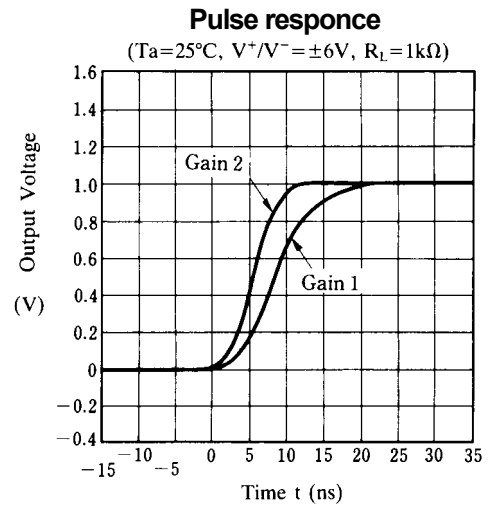
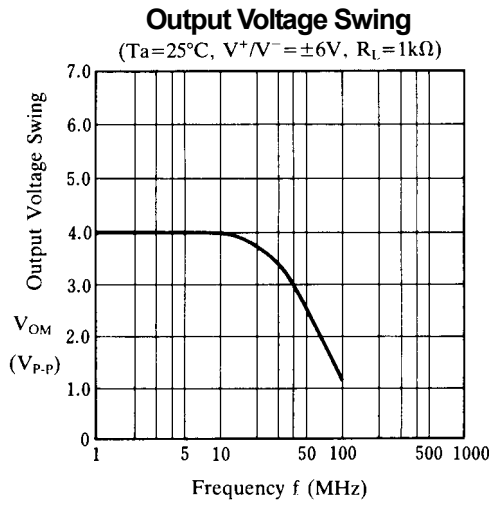
(note 1) : Gain select pins  $G_{1A}$  and  $G_{1B}$  connected together. (Gain 1)

(note 2) : Gain select pins  $G_{2A}$  and  $G_{2B}$  connected together. (Gain 2)

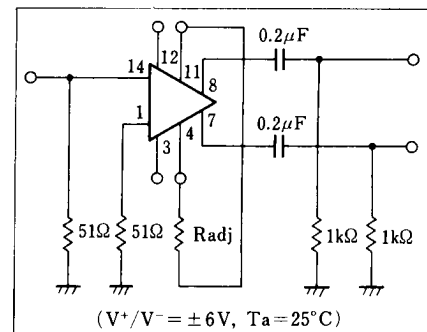
(note 3) : All gain select pins open.

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

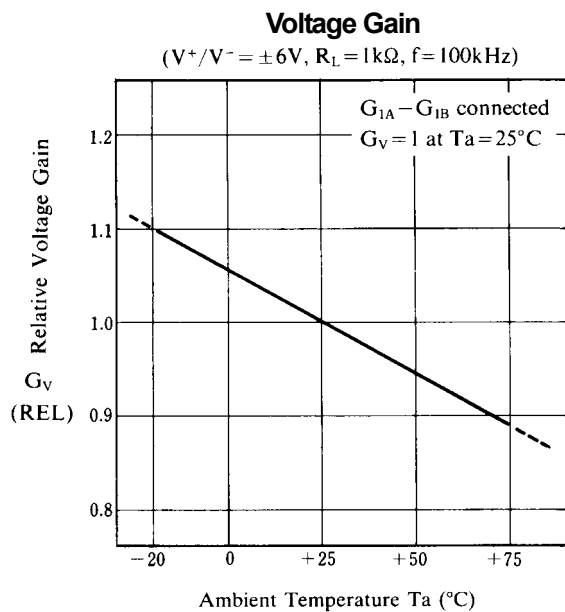
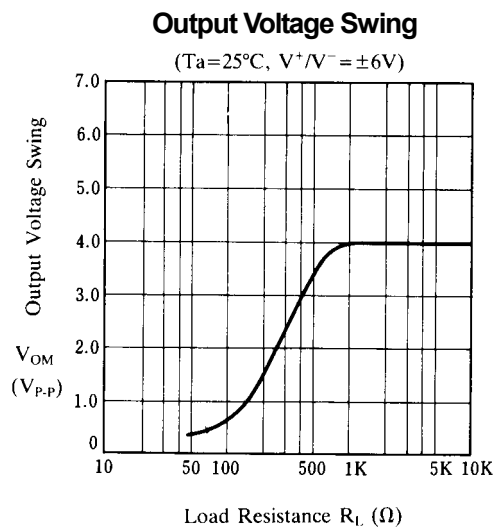
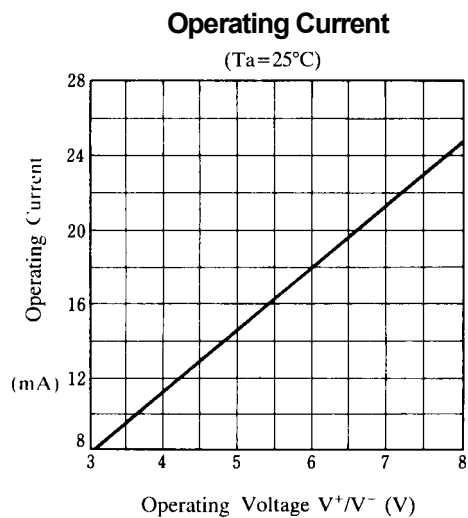
## ■ TYPICAL CHARACTERISTICS



### Differential Voltage Gain Adjustment Circuit

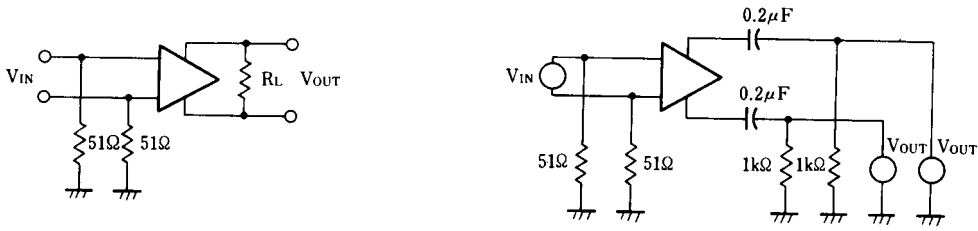


## ■ TYPICAL CHARACTERISTICS



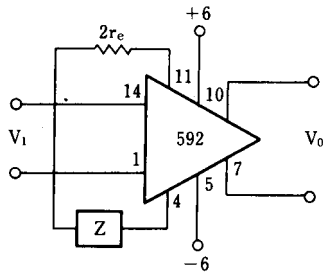
# NJM592

## TEST CIRCUIT



## TYPICAL APPLICATION

### Basic Circuit



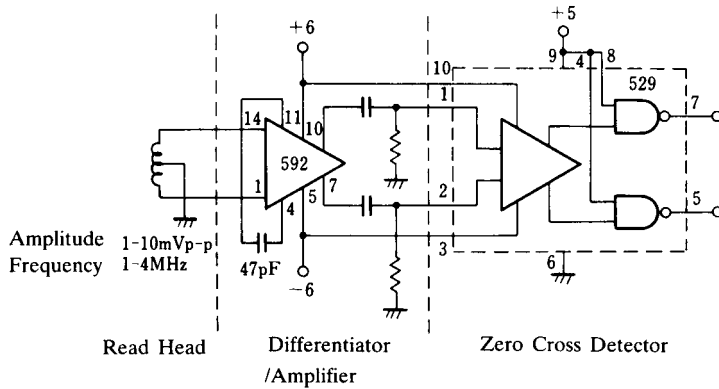
$$\frac{V_o(s)}{V_i(s)} \cong \frac{1.4 \times 10^4}{Z(s) + 2r_e}$$

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

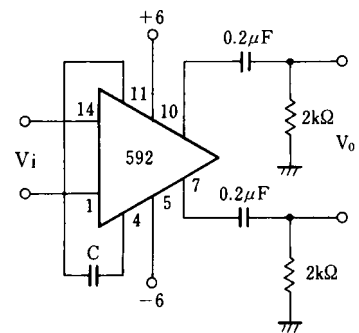
### Filter Network

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	$\frac{1.4 \times 10^4}{R} \left[ \frac{s^2 + 1/LC}{s^2 + 1/LC + s/RC} \right]$

### Disk/Tape Phase Modulated Readback Systems



### Differentiation with High Common Mode Noise Rejection



$$F_1 \ll 1/2\pi (32)C$$

$$V_o = 1.4 \times 10^4 C \frac{dV_i}{dT}$$

#### [CAUTION]

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