

VIDEO AMPLIFIER

■ GENERAL DESCRIPTION

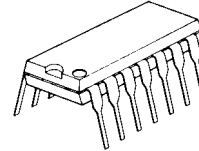
The **NJM592** is a video amplifier of differential input and differential output.

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

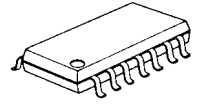
■ FEATURES

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

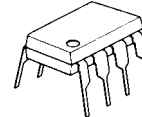
■ PACKAGE OUTLINE



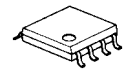
NJM592D



NJM592M



NJM592D8



NJM592M8

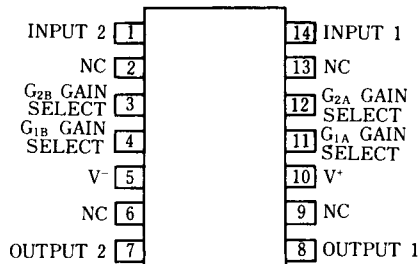


NJM592V8

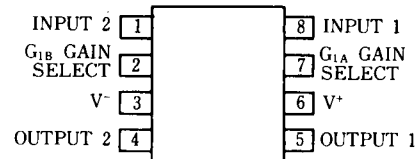


NJM592V

■ PIN CONFIGURATION

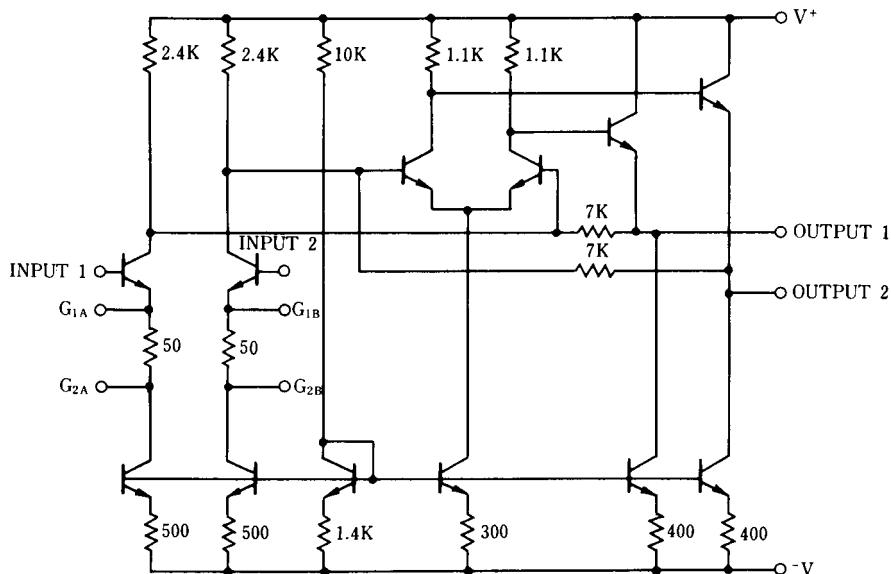


NJM592D
NJM592M
NJM592V



NJM592D8
NJM592M8
NJM592V8

■ EQUIVALENT CIRCUIT



NJM592

■ ABSOLUTE MAXIMUM RATINGS

(T_a=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V ⁺ /V	±8	V
Differential Input Voltage	V _{DIF}	±5	V
Common Mode Input Voltage	V _{CM}	±6	V
Output Current	I _O	10	mA
Operating Temperature Range	T _{opr}	-40 to +85	°C
Storage Temperature Range	T _{stg}	-40 to +125	°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 Ω
Input Resistance Gain 2 (note 2, 4)		-	30	-	
Input Capacitance Gain 2 (note2, 4)		-	2.0	-	pF
Input Offset Current		-	0.4	5.0	μA
Input Bias Current		-	9.0	30	μA
Input Noise Voltage	BW=1kHz to 10MHz	-	12	-	μVrms
Input Voltage Range		-	-	± 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	-	Ω
Output Current	$R_L=\infty$	-	18	24	mA

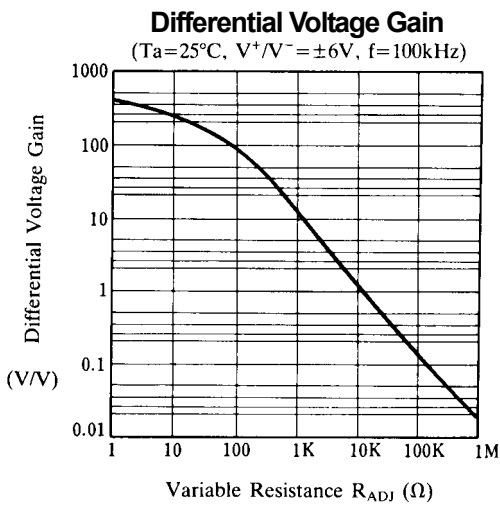
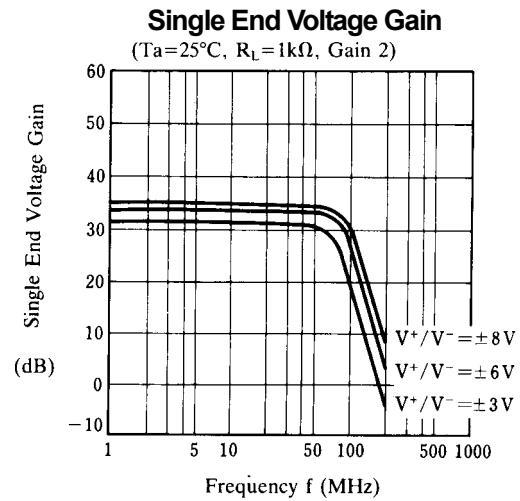
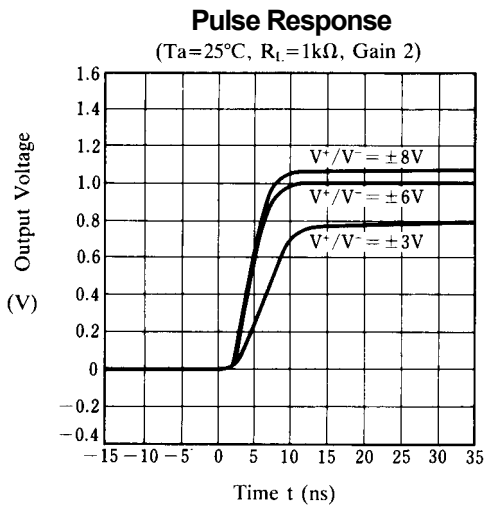
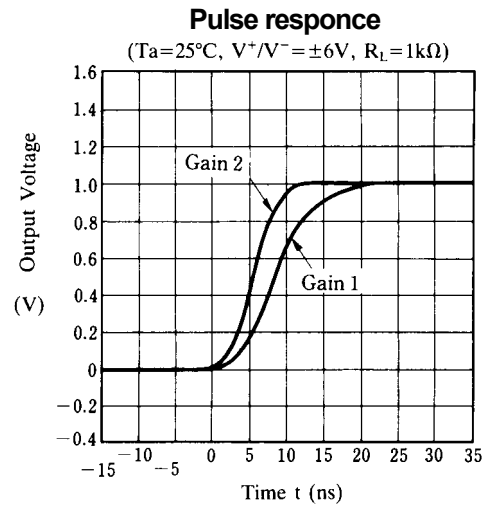
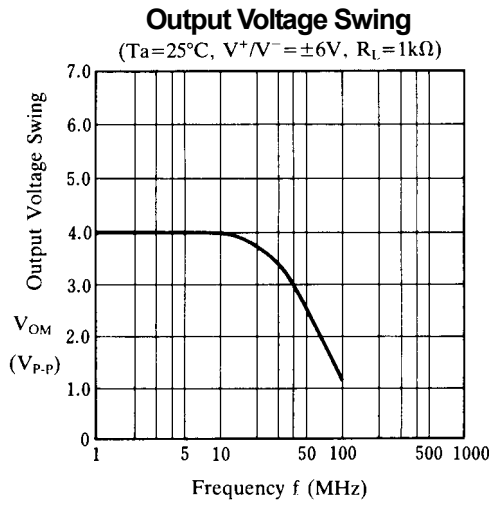
(note 1) : Gain select pins G_{1A} and G_{1B} connected together. (Gain 1)

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

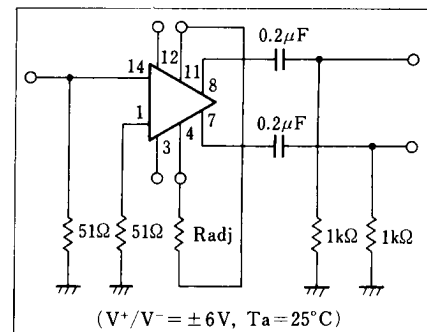
(note 3) : All gain select pins open.

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

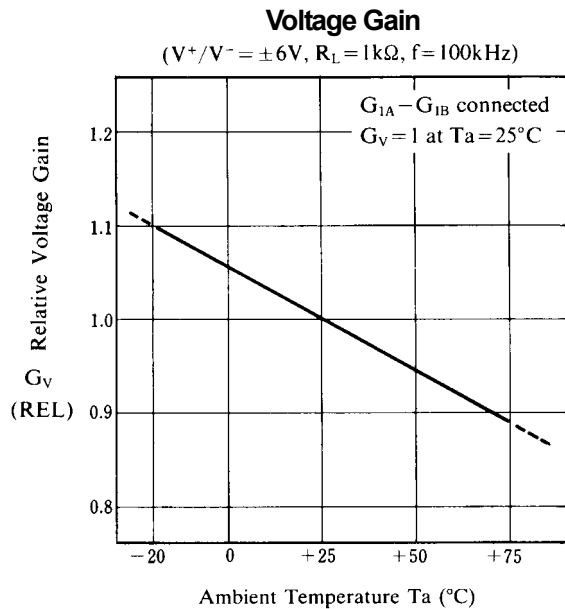
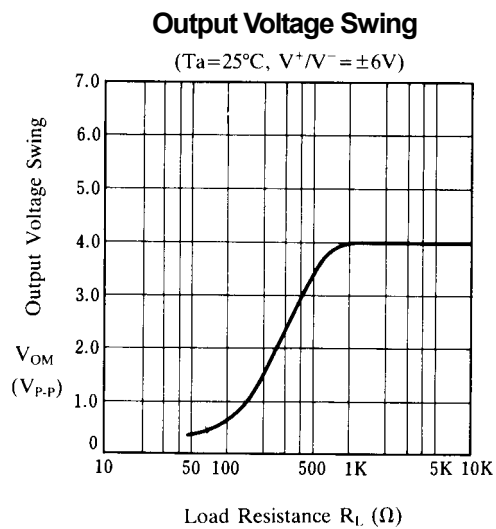
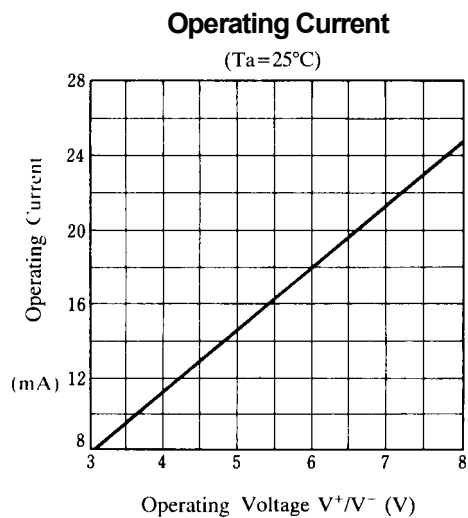
■ TYPICAL CHARACTERISTICS



Differential Voltage Gain Adjustment Circuit

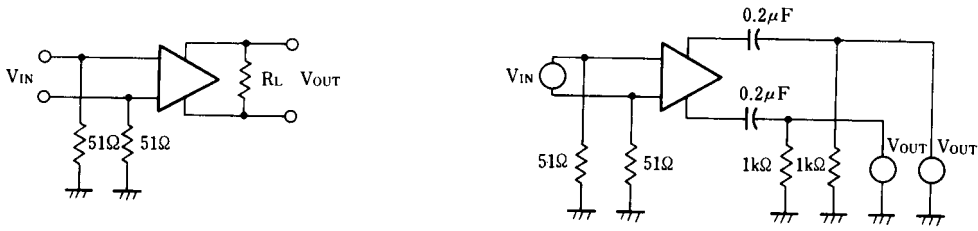


■ TYPICAL CHARACTERISTICS



NJM592

TEST CIRCUIT



TYPICAL APPLICATION

Basic Circuit

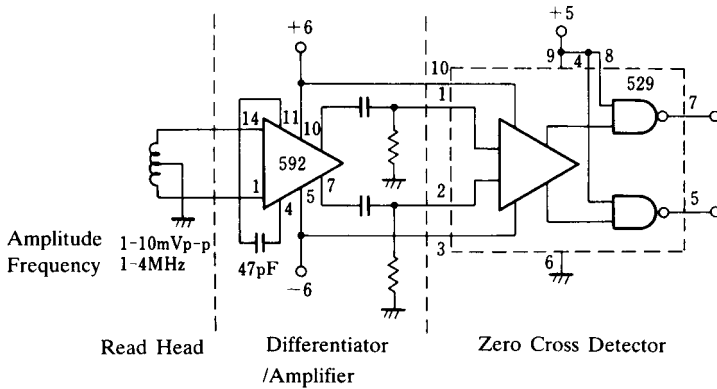
$$\frac{V_o(s)}{V_i(s)} \cong \frac{1.4 \times 10^4}{Z(s) + 2r_e}$$

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

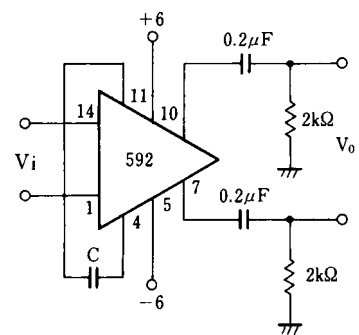
Filter Network

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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