VIDEO AMPLIFIER

■ GENERAL DESCRIPTION

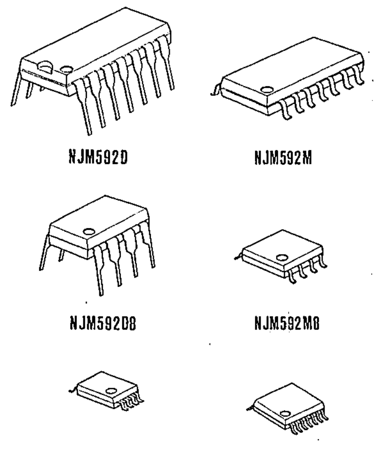
The NJM592 is a video amplifier of differential input and differential output.

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

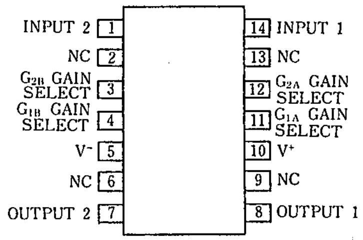
■ FEATURES

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

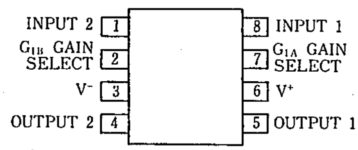
■ PACKAGE OUTLINE



■ PIN CONFIGURATION

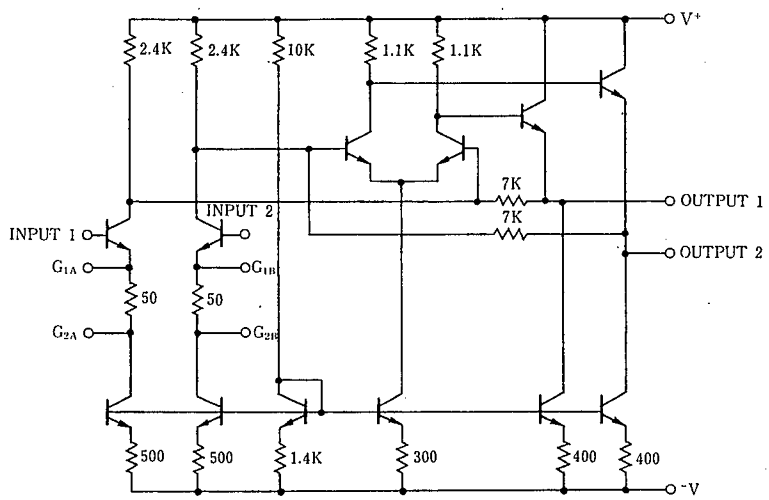


NJM592D
NJM592M
NJM592V



NJM592D8
NJM592M8
NJM592V8

■ EQUIVALENT CIRCUIT



■ ABSOLUTE MAXIMUM RATINGS (Ta=25℃)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+/V^-	±8	V
Differential Input Voltage	V_{DIFF}	±5	V
Common Mode Input Voltage	V_{CM}	±6	V
Output Current	I_O	10	mA
Operating Temperature Range	T_{opr}	−40～+85	℃
Storage Temperature Range	T_{stg}	−40～+125	℃
Power Dissipation	P_D	(DIP14) 500	mW
		(DMP14) 300	mW
		(SSOP14) 300	mW
		(DIP8) 500	mW
		(DMP8) 300	mW
		(SSOP8) 250	mW

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■ ELECTRICAL CHARACTERISTICS

($Ta=25^{\circ}C$, $V^{+}=\pm6V$, $V_{CM}=0$)

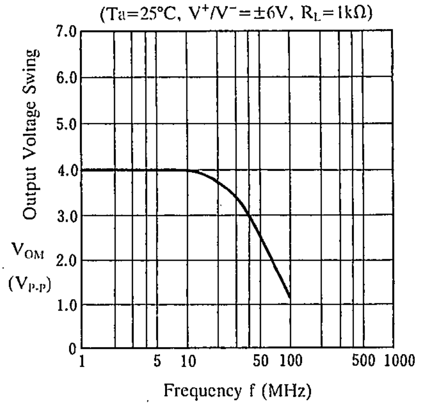
PARAMETER	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Differential Voltage Gain1 (note 1) Differential Voltage Gain2 (note 2, 4)	$R_L=2k\Omega$, $V_{OUT}=3V_{P-P}$	250 80	400 100	600 120	V/V
Bandwidth Gain1 (note 1) Bandwidth Gain2 (note 2,4)		— —	40 90	— —	MHz
Rise Time Gain1 (note 1) Rise Time Gain2 (note 2,4)	$V_{OUT}=1V_{P-P}$	— —	10.5 4.5	— —	ns
Propagation Delay 1 Gain1 (note 1) Propagation Delay 2 Gain2 (note 2,4)	$V_{OUT}=1V_{P-P}$	— —	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)	$V_{CM}=\pm1V$, f<100kHz $V_{CM}=\pm1V$, f=5MHz	60 —	86 60	— —	dB
Supply Voltage Rejection Ratio Gain2 (note	$\Delta V^{+}/V^{-}=\pm0.5V$	50	70	—	dB
Output Offset Voltage Gain1 (note 1) Output Offset Voltage Gain2 (note 2,4) Output Offset Voltage Gain3 (note,3)	$R_L=\infty$ $R_L=\infty$ $R_L=\infty$	— — —	— — 0.35	1.5 1.5 0.75	V
Output Common Mode Voltage	$R_L=\infty$	2.4	2.9	3.4	V
Output Voltage Swing	$R_L=2K\Omega$	3.0	4.0	—	V
Output Resistance		—	20	—	Ω
Operating Current	$R_L=\infty$	—	18	24	mA

(note 1): Gain select pins G_{1A} and G_{1B} connected together. (Gain1)
(note 2): Gain select pins G_{2A} and G_{2B} connected together. (Gain2)
(note 3): All gain select pins open.
(note 4): Apply to only 14 pin package.

■ TYPICAL CHARACTERISTICS

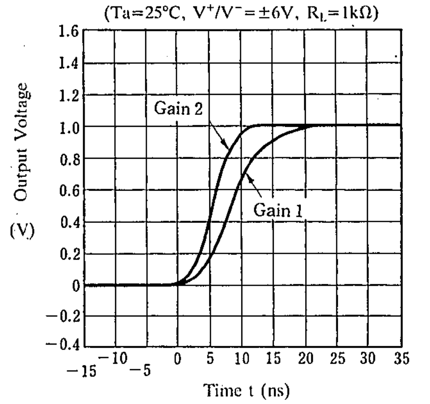
Output Voltage Swing

(Ta=25°C, $V^+/V^-=\pm6V$, $R_L=1k\Omega$)



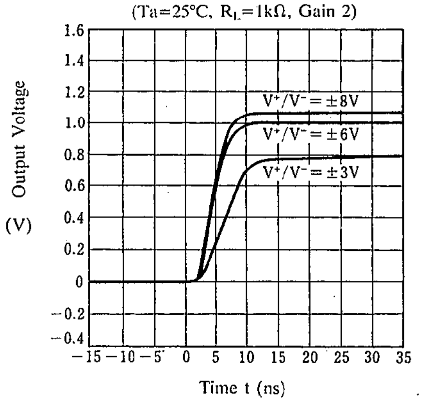
Pulse Responce

(Ta=25°C, $V^+/V^-=\pm6V$, $R_L=1k\Omega$)



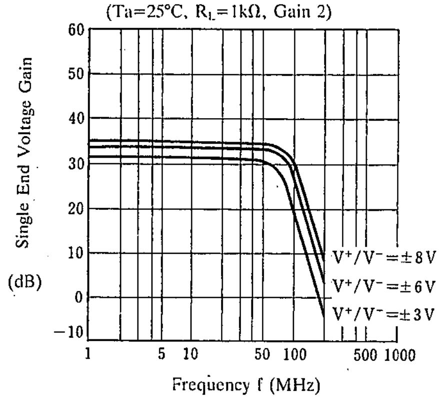
Pulse Responce

(Ta=25°C, $R_L=1k\Omega$, Gain 2)



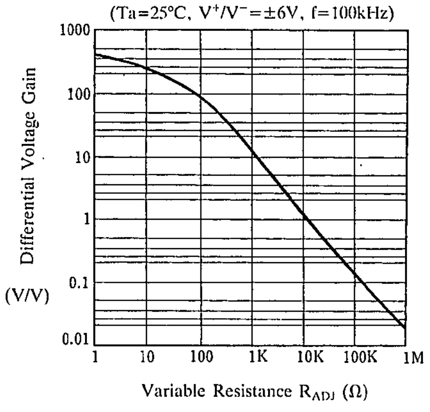
Single End Voltage Gain

(Ta=25°C, $R_L=1k\Omega$, Gain 2)

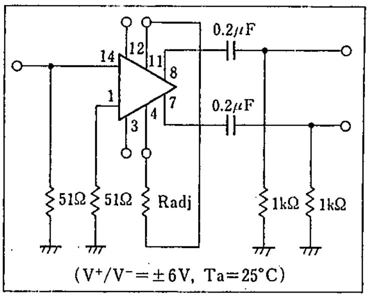


Differential Voltage Gain

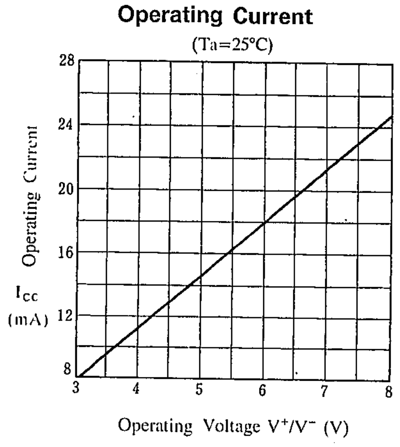
(Ta=25°C, $V^+/V^-=\pm6V$, f=100kHz)

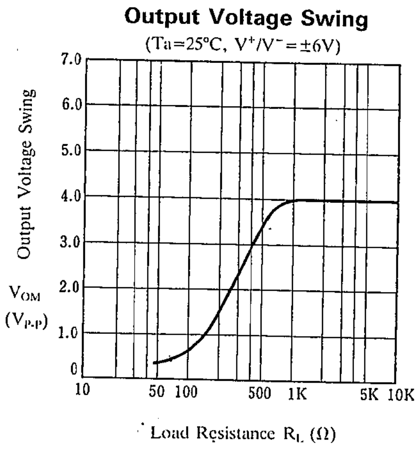


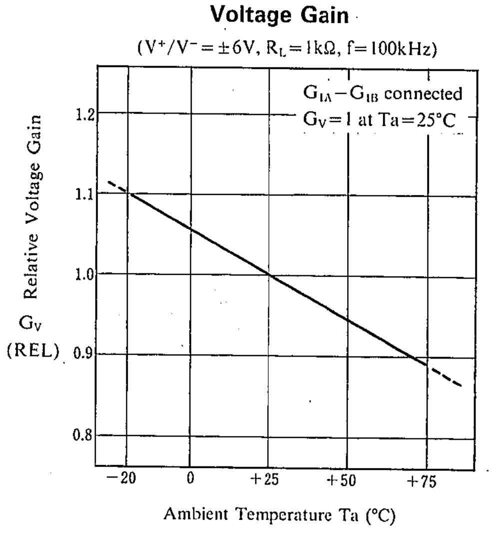
Differential Voltage Gain Adjustment Circuit



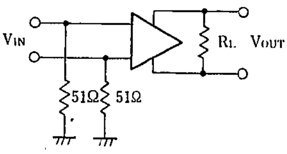
■ TYPICAL CHARACTERISTICS

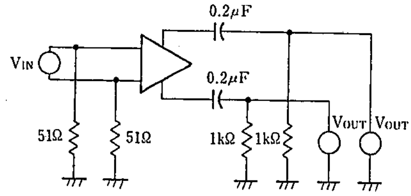






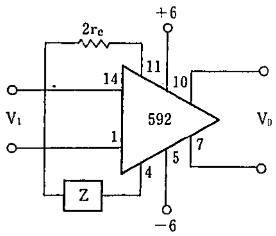
■ TEST CIRCUIT





■ TYPICAL APPLICATION

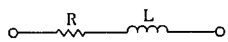
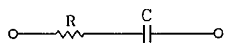
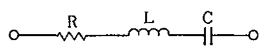
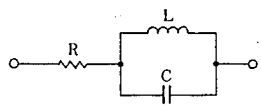
Basic circuit



$$\frac{V_0\ (s)}{V_1\ (s)} \cong \frac{1.4\times10^4}{Z(s)+2r_e}$$

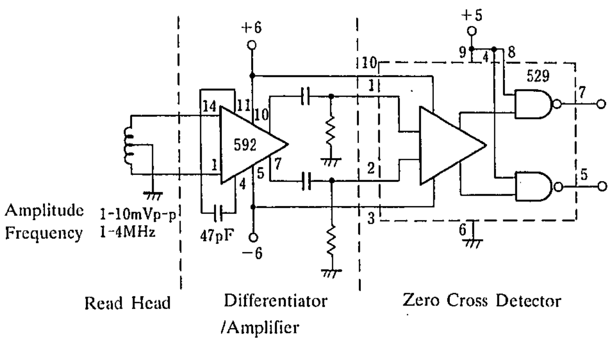
$$\cong \frac{1.4\times10^4}{Z(s)+32}$$

Filter Network

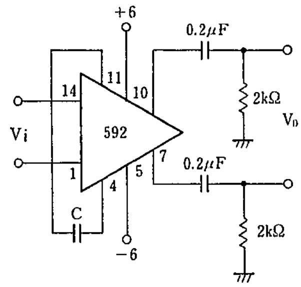
Z NETWORK	FILTER TYPE	$\frac{V_0(s)}{V_1(s)}$ TRANSFER FUNCTION
	LOW PASS	$\frac{1.0\times10^4}{L}\left[\frac{1}{s+R/L}\right]$
	HIGH PASS	$\frac{1.4\times10^4}{R}\left[\frac{s}{s+1/RC}\right]$
	BAND PASS	$\frac{1.4\times10^4}{L}\left[\frac{s}{s^2+R/L\,s+1/LC}\right]$
	BAND REJECT	$\frac{1.4\times10^4}{R}\left[\frac{s^2+1/LC}{s^2+1/LC+s/RC}\right]$

(note): R includes 2 r_e ($\approx$32Ω)

Disk/Tape Phase Modulated Readback Systems



Differentiation with High Common Mode Noise Rejection



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

$V_0 = 1.4\times10^4 C\frac{dVi}{dT}$

MEMO