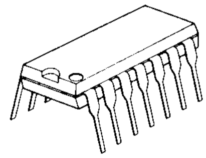
VIDEO AMPLIFIER

■ GENERAL DESCRIPTION

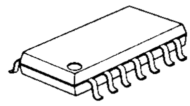
The **NJM592** is a video amplifier of differential input and differential output.

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

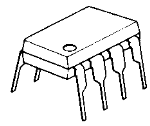
■ PACKAGE OUTLINE



NJM592D



NJM592M



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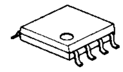

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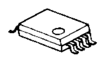
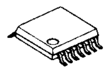


NJM592V8

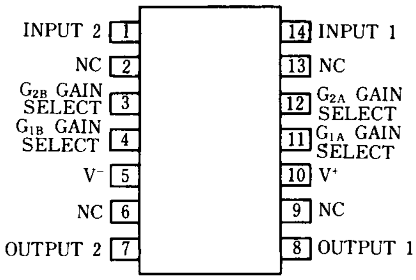


NJM592V

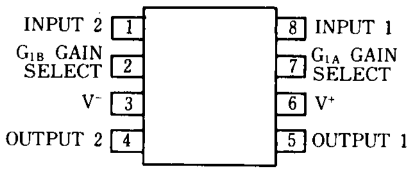
■ FEATURES

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

■ PIN CONFIGURATION

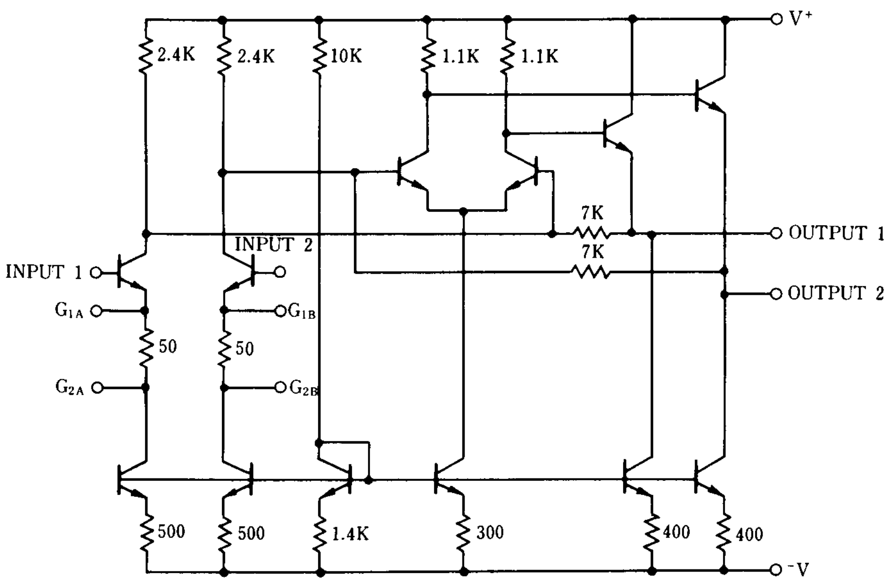


NJM592D
NJM592M
NJM592V



NJM592D8
NJM592M8
NJM592V8

■ EQUIVALENT CIRCUIT



■ ABSOLUTE MAXIMUM RATINGS

(T_a=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+/V^-	±8	V
Differential Input Voltage	V_{DIEF}	±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°C, V^+=±6V, V_{CM}=0)

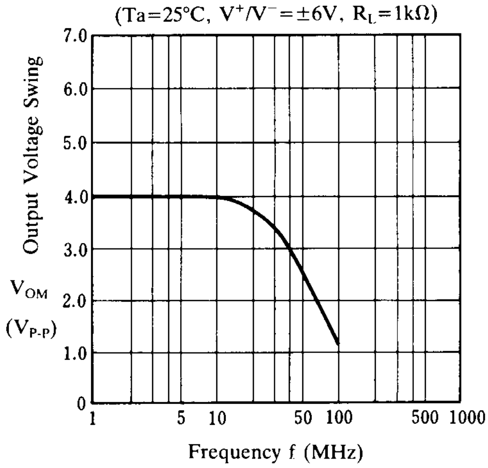
PARAMETER	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Differential Voltage Gain 1 (note 1)	R_1=2kΩ, V_{OUT}=3V_{P-P}	250	400	600	V/V
Differential Voltage Gain 2 (note 2, 4)		80	100	120	
Bandwidth (note 1)		-	40	-	MHz
Bandwidth 2 Gain 2 (note 2, 4)		-	90	-	
Rise Time Gain 1 (note 1)	V_{OUT} =1V_{P-P}	-	10.5	-	ns
Rise Time Gain 2 (note 2, 4)		-	4.5	-	
Propagation Delay 1 Gain 1 (note 1)	V_{OUT} =1V_{P-P}		7.5	-	ns
Propagation Delay 2 Gain 2 (note 2, 4)		-	6.0	-	
Input Resistance Gain 1 (note1)		-	4.0	-	kΩ
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 Radio Gain 2 (note 4)	V_{CM}=±1V, f<100kHz	60	86	-	dB
Common Mode Rejection Radio Gain 2 (note 4)	V_{CM}=±1V, f=5MHz	-	60	-	
Supply Voltage Rejection Radio Gain 2 (note ▪)	$\Delta V^+/V=\pm0.5V$	50	70	-	dB
Output Offset Voltage Gain 1 (note 1)	R_L=∞	-	-	1.5	V
Output Offset Voltage Gain 2 (note2, 4)	R_L=∞	-	-	1.5	
Output Offset Voltage Gain 3 (note 3)	R_L=∞	-	0.35	0.75	
Output Common Mode Voltage	R_L=∞	2.4	2.9	3.4	V
Output Voltage Swing	R_L=2kΩ	3.0	4.0	-	V
Output Resistance		-	20	-	Ω
Output Current	R_L=∞	-	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

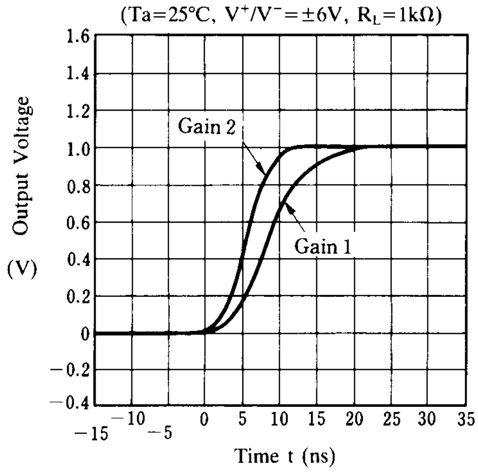
Output Voltage Swing

(Ta=25°C, V+/V−=±6V, RL=1kΩ)



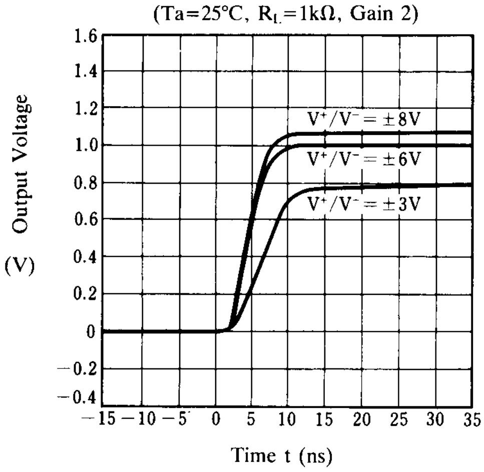
Pulse responce

(Ta=25°C, V+/V−=±6V, RL=1kΩ)



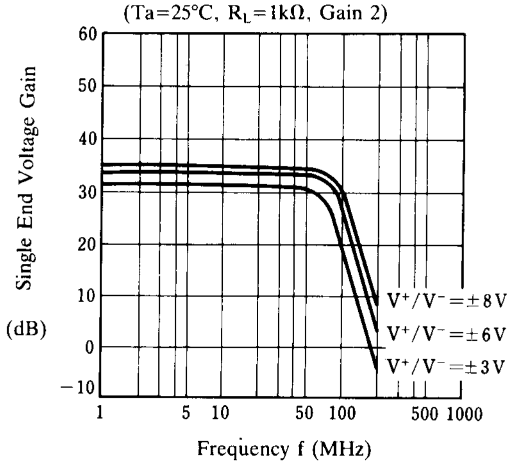
Pulse Response

(Ta=25°C, RL=1kΩ, Gain 2)



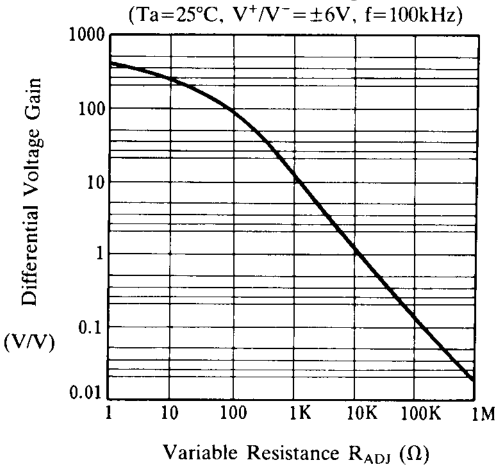
Single End Voltage Gain

(Ta=25°C, RL=1kΩ, Gain 2)

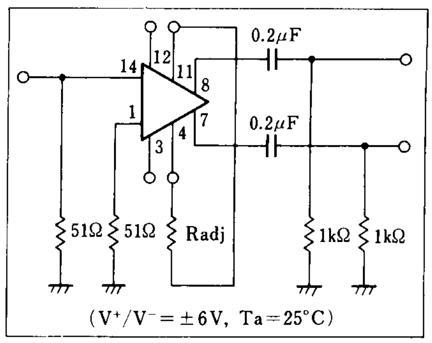


Differential Voltage Gain

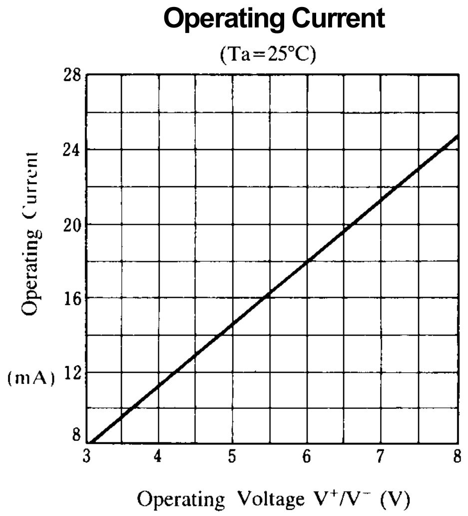
(Ta=25°C, V+/V−=±6V, f=100kHz)

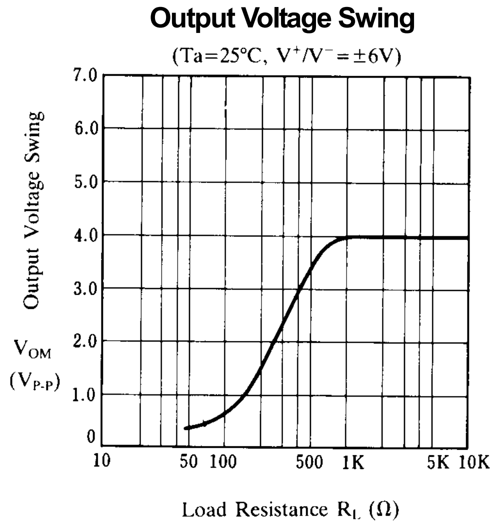


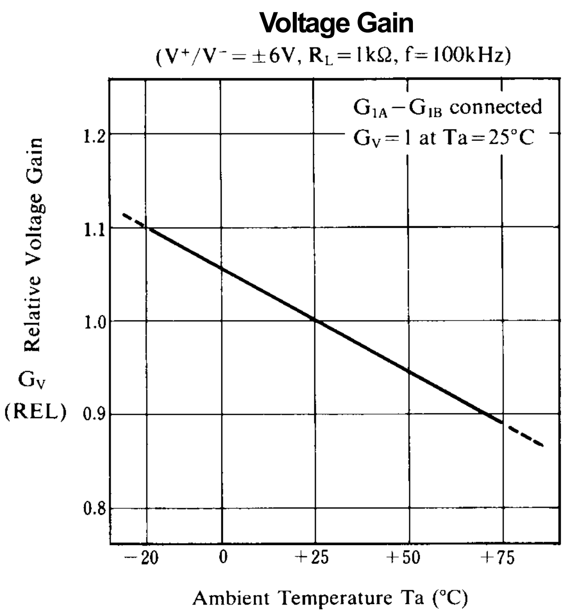
Differential Voltage Gain Adjustment Circuit



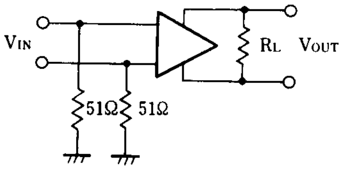
■ TYPICAL CHARACTERISTICS

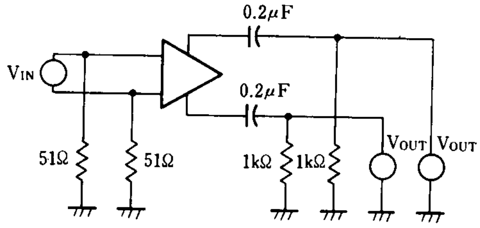






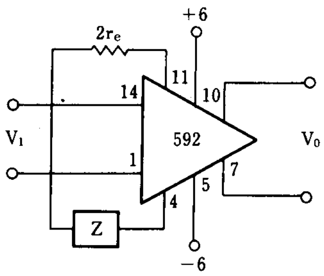
■ TEST CIRCUIT





■ TYPICAL APPLICATION

Basic Circuit



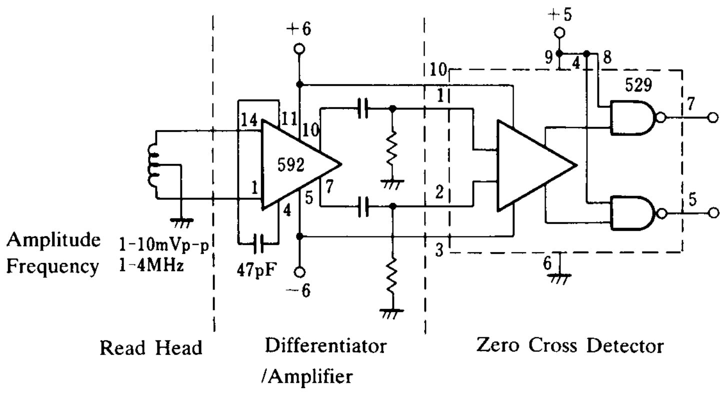
$$\frac{V_0\ (s)}{V_I\ (s)} \cong \frac{1.4\times10^4}{Z(s)+2r_e}$$

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

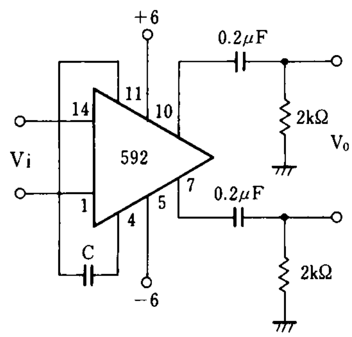
Filter Network

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

Disk/Tape Phase Modulated Readback Systems



Differentiation with High Comon Mode Noise Rejection



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

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