

VIDEO AMPLIFIER

■ GENERAL DESCRIPTION

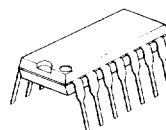
The NJM592 is a video amplifier of differential input and differential output.

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

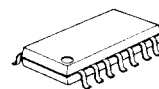
■ FEATURES

- Operating Voltage ($\pm 3V \sim \pm 8V$)
- 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

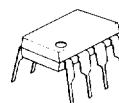
■ PACKAGE OUTLINE



NJM592D



NJM592M



NJM592DB



NJM592MB

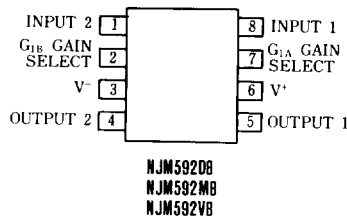
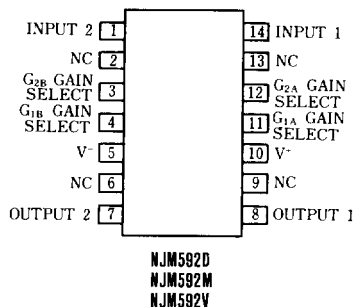


NJM592VB



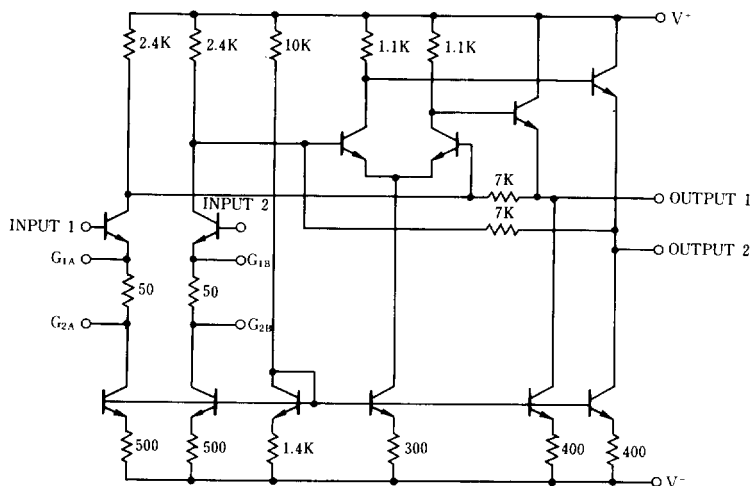
NJM592V

■ PIN CONFIGURATION



5

■ EQUIVALENT CIRCUIT





■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V _V /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}	− 20 ~ +75	°C
Storage Temperature Range	T _{stg}	− 40 ~ +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

(Ta=25°C, V⁺=±6V, V_{CM}=0)

PARAMETER	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Differential Voltage Gain1 (note 1)	R _I = 2kΩ, V _{OUT} = 3V _{PP}	250	400	600	V/V
Differential Voltage Gain2 (note 2, 4)		80	100	120	
Bandwidth Gain1 (note 1)		—	40	—	MHz
Bandwidth Gain2 (note 2, 4)		—	90	—	
Rise Time Gain1 (note 1)	V _{OUT} = 1V _{PP}	—	10.5	—	ns
Rise Time Gain2 (note 2, 4)		—	4.5	—	
Propagation Delay Gain1 (note 1)	V _{OUT} = 1V _{PP}	—	7.5	—	ns
Propagation Delay Gain2 (note 2, 4)		—	6.0	—	
Input Resistance Gain1 (note 1)		—	4.0	—	kΩ
Input Resistance Gain2 (note 2, 4)		—	30	—	
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)	V _{CM} = ±1V, f < 100kHz	60	86	—	dB
Common Mode Rejection Ratio Gain2 (note 4)	V _{CM} = ±1V, f = 5MHz	—	60	—	
Supply Voltage Rejection Ratio Gain2 (note 4)	ΔV ⁺ /V ⁺ = ±0.5V	50	70	—	dB
Output Offset Voltage Gain1 (note 1)	R _L = ∞	—	—	1.5	V
Output Offset Voltage Gain2 (note 2, 4)	R _L = ∞	—	—	1.5	
Output Offset Voltage Gain3 (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
Operating Current	R _L = ∞	—	18	24	mA

(note 1): Gain select pins G_{1A} and G_{1B} connected together. (Gain1)

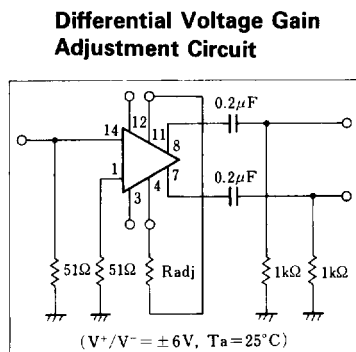
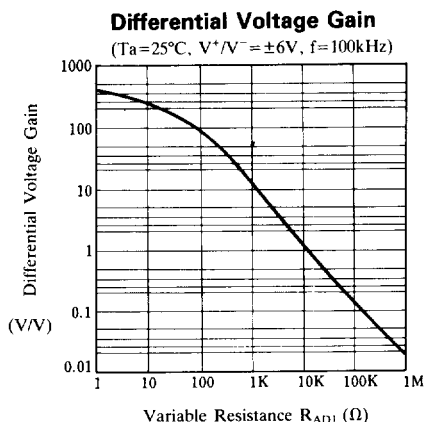
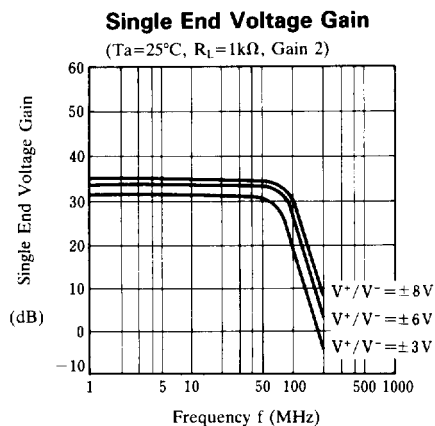
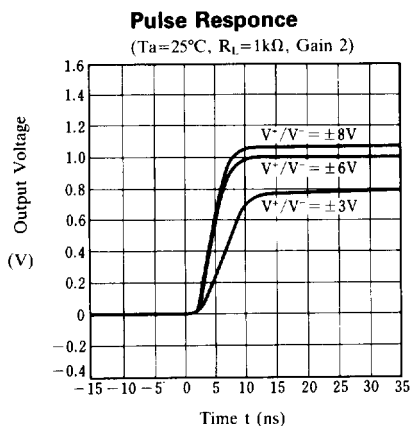
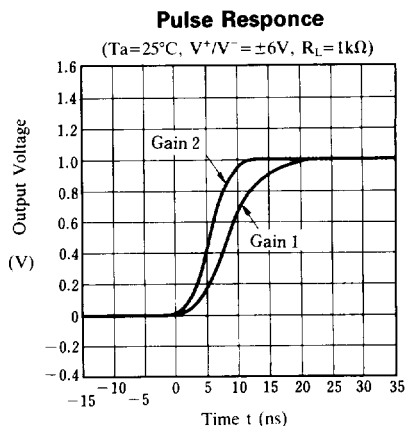
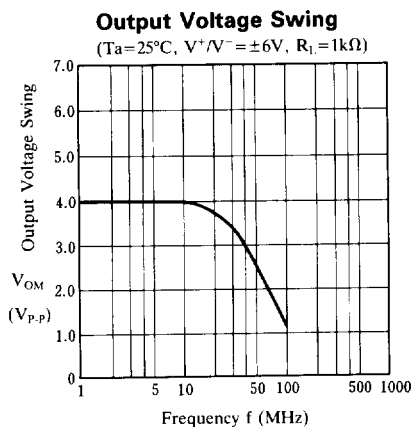
(note 2): Gain select pins G_{2A} and G_{2B} connected together. (Gain2)

(note 3): All gain select pins open.

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

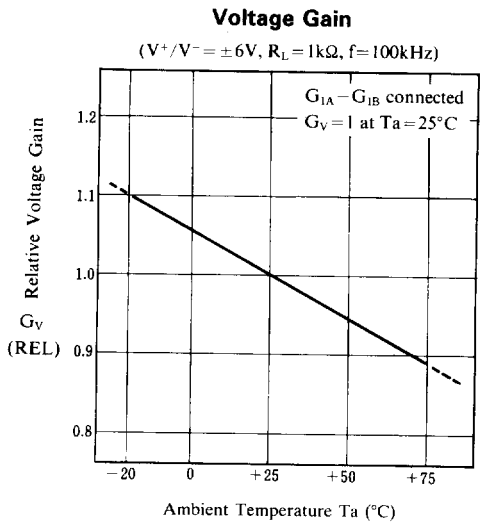
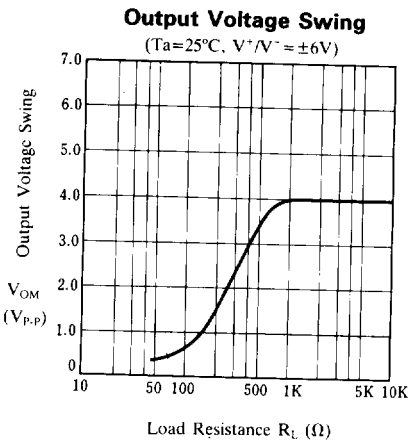
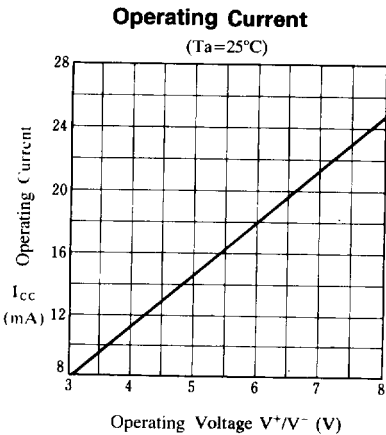


TYPICAL CHARACTERISTICS





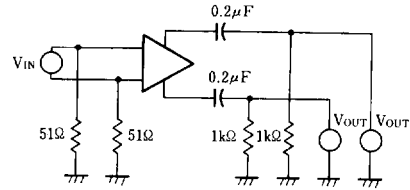
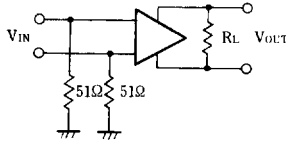
■ TYPICAL CHARACTERISTICS





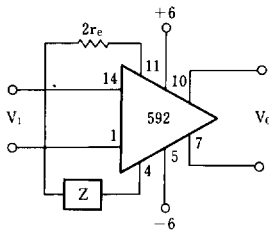
NJM592

■ TEST CIRCUIT



■ TYPICAL APPLICATION

Basic circuit



$$\frac{V_0(s)}{V_1(s)} \approx \frac{1.4 \times 10^4}{Z(s) + 2r_e}$$

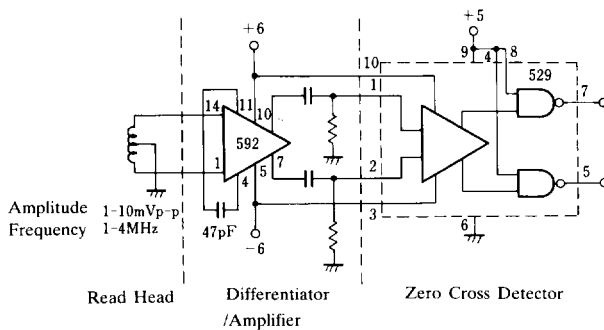
$$\approx \frac{1.4 \times 10^4}{Z(s) + 32}$$

Filter Network

Z NETWORK	FILTER TYPE	$\frac{V_0(s)}{V_1(s)}$ 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 $2 r_e (\approx 32\Omega)$

Disk/Tape Phase Modulated Readback Systems



Differentiation with High Common Mode Noise Rejection

