

VIDEO PICTURE ENHANCER

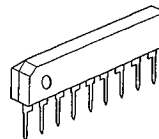
■ GENERAL DESCRIPTION

The NJM2209 is the video IC for quality improvement of the video picture to get high quality by rectifying the picture contour.

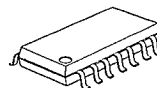
■ FEATURES

- Operating Voltage (+4.5V~+5.5V)
- By Differential Form, Picture Enhance
- at Minimal External Components
- Internal Switch of Hirsch / Picture Enhance
- Package Outline SIP9, DMP14
- Bipolar Technology

■ PACKAGE OUTLINE



NJM2209S



NJM2209M

■ RECOMMENDED OPERATING CONDITION

- Operating Voltage 4.5~5.5V

■ APPLICATION

- Upgrading of picture quality on VCR, personal computer and other video picture.

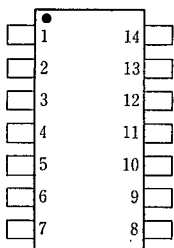
■ PIN CONFIGURATION



NJM2209S

PIN FUNCTION

- |                           |                        |
|---------------------------|------------------------|
| 1. Differential Output    | 6. Video Signal Output |
| 2. Frequency Compensation | 7. Differential Input  |
| 3. Video Signal Input     | 8. V <sup>+</sup>      |
| 4. Phase Delay            | 9. Control Input       |
| 5. GND                    |                        |

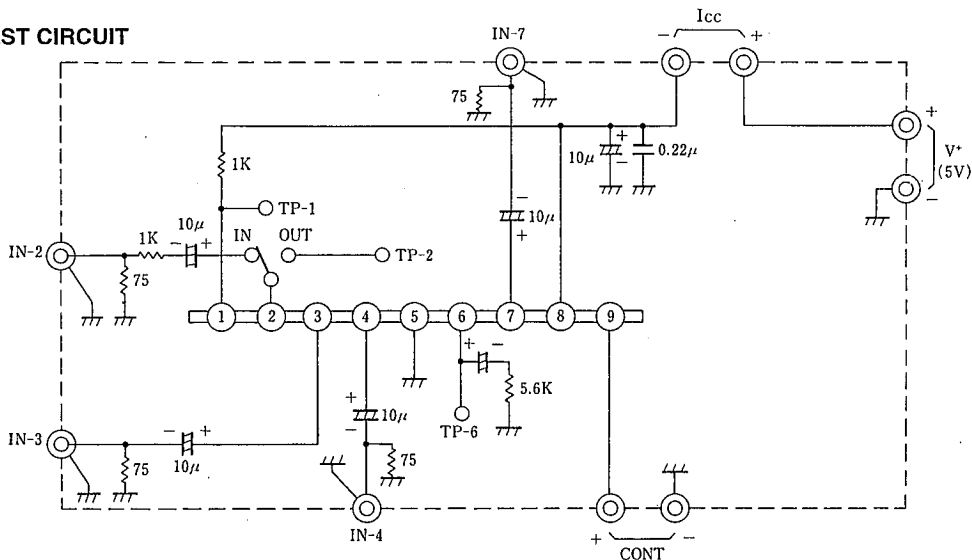


NJM2209M

PIN FUNCTION

- |                        |                           |
|------------------------|---------------------------|
| 1. Video Signal Output | 8. Frequency Compensation |
| 2. N.C.                | 9. N.C.                   |
| 3. Differential Input  | 10. Video Signal Input    |
| 4. V <sup>+</sup>      | 11. N.C.                  |
| 5. Control Input       | 12. Phase Delay           |
| 6. N.C.                | 13. GND                   |
| 7. Differential Output | 14. N.C.                  |

■ TEST CIRCUIT



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## ■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

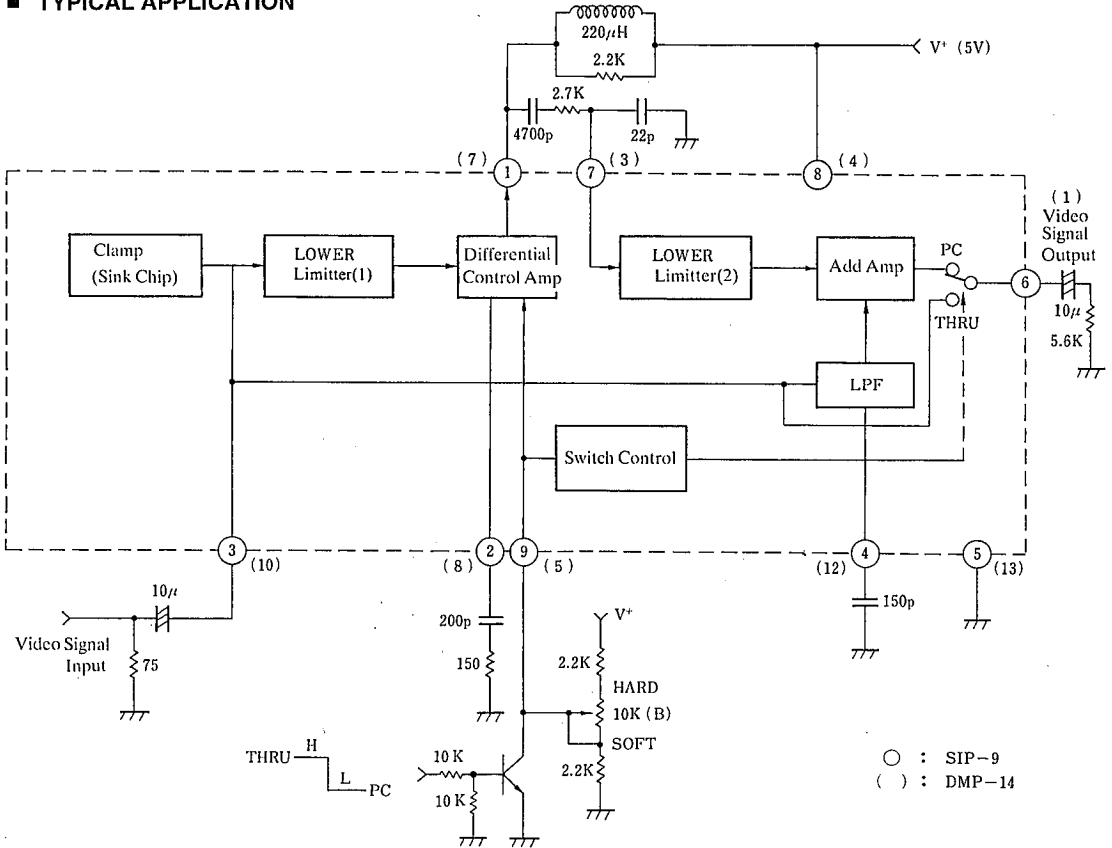
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V*	8	V
Power Dissipation	Pd	(DIP8) 500 (DMP8) 300	mW mW
Operating Temperature Range	T <sub>opr</sub>	-20~+75	°C
Storage Temperature Range	T <sub>stg</sub>	-40~+125	°C

## ■ ELECTRICAL CHARACTERISTICS

(V\*=5V, Ta=25°C, Refer to Test Circuit))

PARAMETER	SYMBOL	SIGNAL PIN	TEST PIN	CONT. VOLTAGE	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Operating Current	I <sub>CC</sub>			2.8V	No Input Signal	—	7.5	10	mA	
Limiter Level (1)	LIM1	3	2	—	SYNC level>0.35V, Input Video Signal	0.23	0.27	0.31	V	
Limiter Level (2)	LIM2	7	6	—	f=100kHz, 1V <sub>p-p</sub> Sine Wave Input	0.21	0.25	0.29	V	
Control Amp Gain	H	G <sub>H</sub>	2	1	2.8V	f=100kHz, 0.1V <sub>rms</sub> Sine Wave Input G=20 log <sub>10</sub> V <sub>out</sub> /V <sub>IN</sub> (dB)	-2	-0.9	0	dB
	M	G <sub>M</sub>	2	1	1.3V		-12	-10	-8	dB
	L	G <sub>L</sub>	2	1	0.45V		—	—	-28	dB
Add Amp Gain	7 pin input	G <sub>7</sub>	7	6	2.8V	f=100kHz, 200mV <sub>p-p</sub> Sine Wave G=20 log <sub>10</sub> V <sub>OUT</sub> /V <sub>IN</sub> (dB)	-1.6	-0.6	0.4	dB
	3 pin input	G <sub>3</sub>	3	6	2.8V	1V <sub>p-p</sub> Video Signal Input G=20 Log <sub>10</sub> V <sub>OUT</sub> /V <sub>IN</sub> (dB)	-1	0	+1	dB
Switch Cross Talk	C <sub>SW</sub>	4	6	2.8→0V	f=2MHz, 1V <sub>p-p</sub> Sine Wave C <sub>SW</sub> =20 log <sub>10</sub> V(0V)/V(2.8V) (dB)	—	-50	—	dB	
Through Gain	G <sub>T</sub>	3	6	0V	1V <sub>p-p</sub> Video Signal Input G <sub>T</sub> =20 log <sub>10</sub> V <sub>OUT</sub> /V <sub>IN</sub> (dB)	-1	0	1	dB	
Switch Control Threshold Voltage	V <sub>TH</sub>	4	6		f=100kHz, 1V <sub>p-p</sub> Sine Wave Input -40dB=20log <sub>10</sub> V <sub>OUT</sub> /V <sub>IN</sub>	0.2	0.3	0.4	V	
Differential Gain(Note 1)	DG <sub>PC</sub>	3	6	2.8V	DGDP Tester Video Signal 1V <sub>p-p</sub> (Stair Step)	—	1	3	%	
Differential Gain(Note 2)	DG <sub>T</sub>	3	6	0V		—	0	3	%	
6 PIN Voltage(Note 1)	V <sub>6PC</sub>		6	2.8V		—	1.8	—	V	
6 PIN Voltage(Note 2)	V <sub>6T</sub>		6	0V		—	2.0	—	V	

## ■ TYPICAL APPLICATION



## ■ PRINCIPLES OF OPERATION, BI BLOCK DIAGRAM

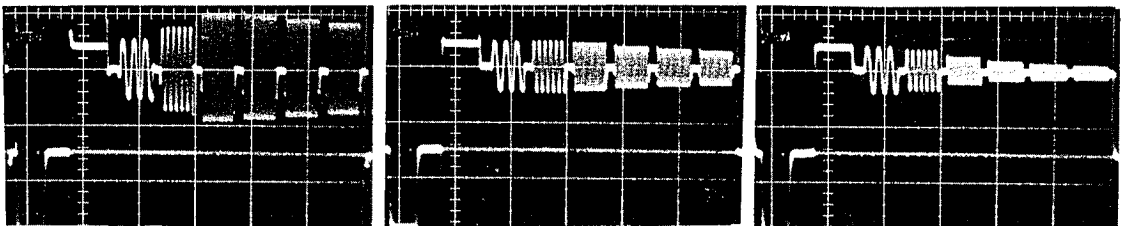
The NJM2209 is a video signal IC which converts an input video signal to a compensated video signal of the picture outline by adding an input signal through a differential amplifier to the original input signal.

The compensating (enhanced) ratio is decided by pin 9 voltage and so the original signal comes when pin 9 voltage is zero.

A peaking frequency compensation of the internal differential amplifier is changed by C,R attached to pin 2 and L,R to pin 1.

The compensation signal and the original video signal are delayed the phase by low pass filter. These are done by a capacitor attached to pin 4. The compensated ratio is originally settled by the coupling condenser between pin 1 and pin 7.

Example (Multi-Burst Enhancer)  
HARD MID SOFT



## MEMO

[CAUTION]

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