

## 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 to +5.5V)
- By Differential From, Picture Enhance
- at Minimal External Components
- Internal Switch of Hirough/Picture Enhance
- Package Outline DMP14
- Bipolar Technology

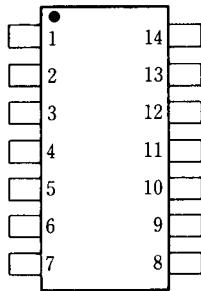
### ■ RECOMMENDED OPERATING CONDITION

- Operating Voltage 4.5 to 5.5V

### ■ APPLICATION

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

### ■ PIN CONFIGURATION

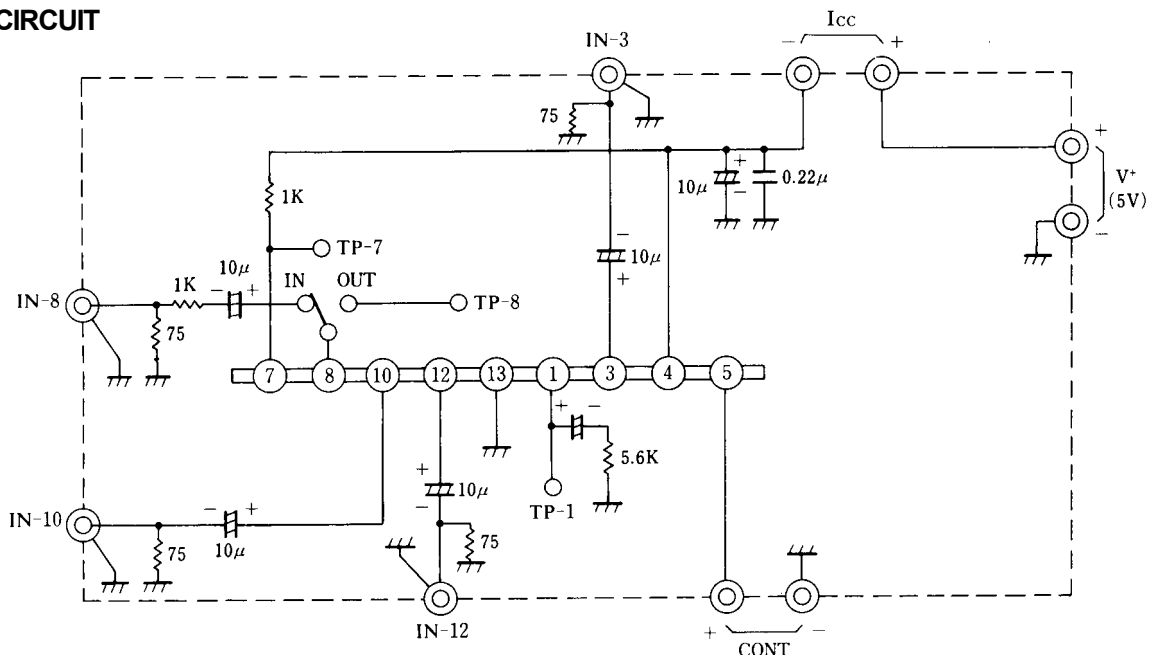


**NJM2209M**

#### 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



## ■ ABSOLUTE MAXIMUM RATINGS

(T<sub>a</sub>=25°C)

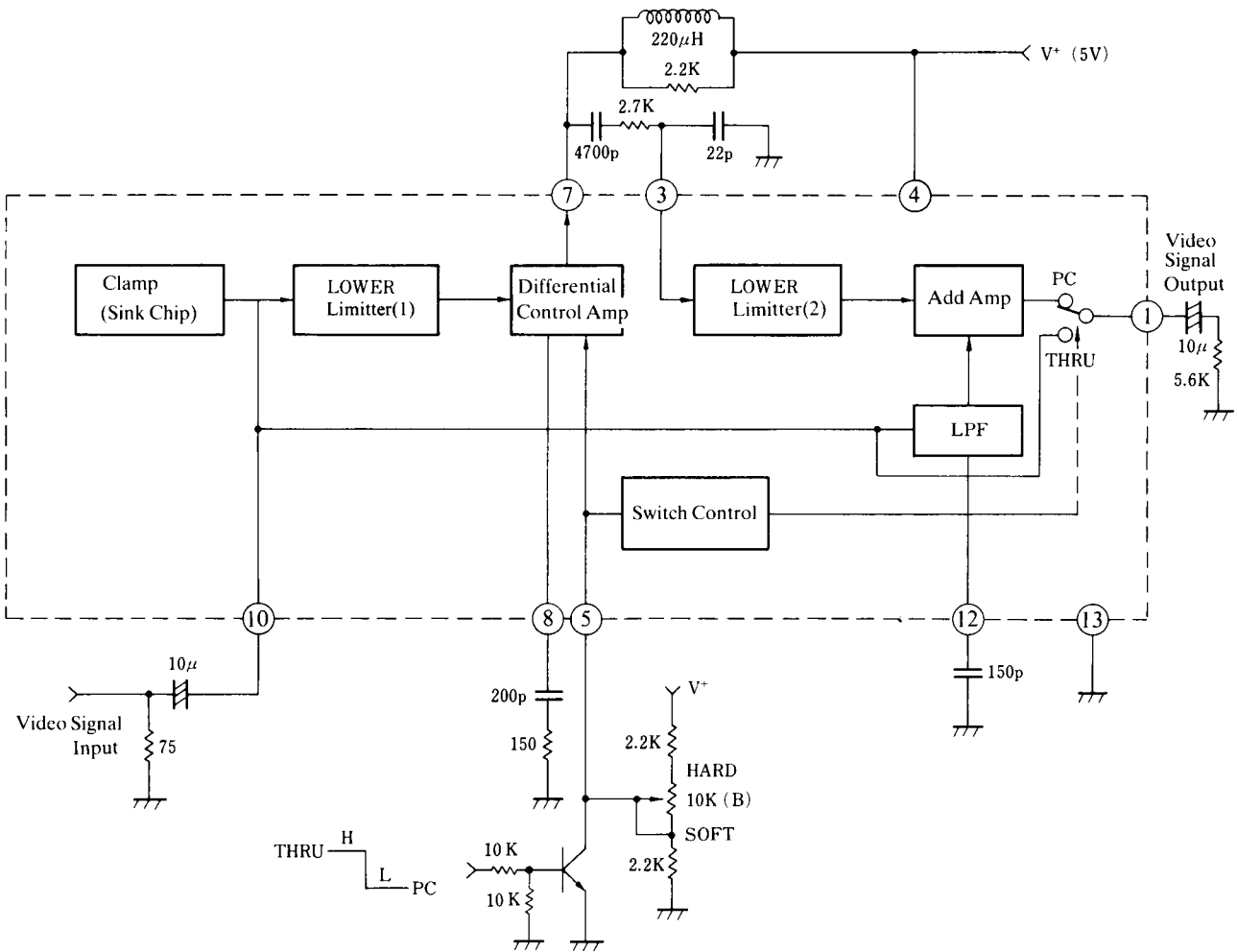
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V <sup>+</sup>	8	V
Power Dissipation	P <sub>D</sub>	(DMP8)300	mW mW
Operating Temperature Range	T <sub>opr</sub>	-20 to +75	°C
Storage Temperature Range	T <sub>stg</sub>	-40 to +125	°C

## ■ ELECTRICAL CHARACTERISTICS

(V<sup>+</sup>=5V, T<sub>a</sub>=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	10	8	-	SYNC level>0.35V, Input Video Signal	0.23	0.27	0.31	V	
Limiter Level (2)	LIM2	3	1	-	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>	8	7	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>	8	7	1.3V		-12	-10	-8	dB
	L	G <sub>L</sub>	8	7	0.45V		-	-	-28	dB
Add Amp Gain	3 pin input	G <sub>7</sub>	3	1	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
	10 pin input	G <sub>3</sub>	10	1	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>	12	1	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>	10	1	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>	12	1		f=100kHz, 1V <sub>P-P</sub> Sine Wave Input -40dB=20 log <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>	10	1	2.8V	DGDP Tester Video Signal 1V <sub>P-P</sub> (Stair Step)	-	1	3	%	
Differential Gain (Note 2)	DG <sub>T</sub>	10	1	0V		-	0	3	%	
1 PIN Voltage (Note 1)	V <sub>6PC</sub>		1	2.8V		-	1.8	-	V	
1 PIN Voltage (Note 2)	V <sub>6T</sub>		1	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.

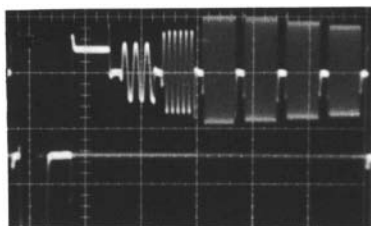
The compensating (enhanced) ratio is decided by pin 5 voltage and so the original signal comes when pin 5 voltage is zero.

A peaking frequency compensation of the internal differential amplifier is changed by C,R attached to pin 8 and L,R to pin 7.

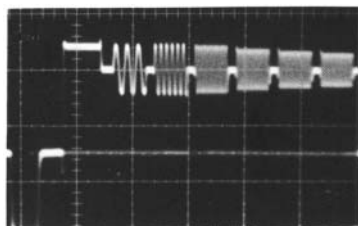
The compensation signal and the original video signal are delayed the phase by low pass filter. These are done by a capacitor attached to pin 12. The compensated ratio is originally settled by the coupling condenser between pin 7 and pin 3.

Example (Multi-Burst Enhancer)

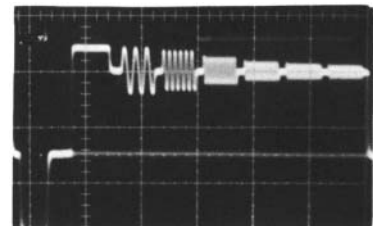
HARD



MID

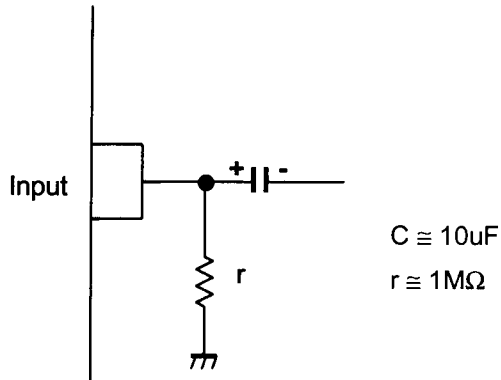


SOFT



## ■ APPLICATION

This IC requires  $1M\Omega$  resistance between INPUT and GND pin for clamp type input since the minute current causes an unstable pin voltage.



[CAUTION]

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