

VIDEO PICTURE ENHANCER

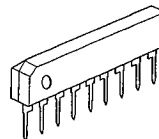
■ GENERAL DESCRIPTION

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

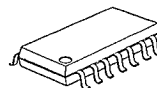
■ FEATURES

- 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.

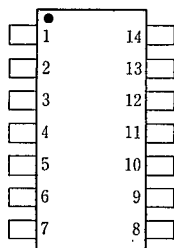
■ PIN CONFIGURATION



NJM2209S

PIN FUNCTION

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

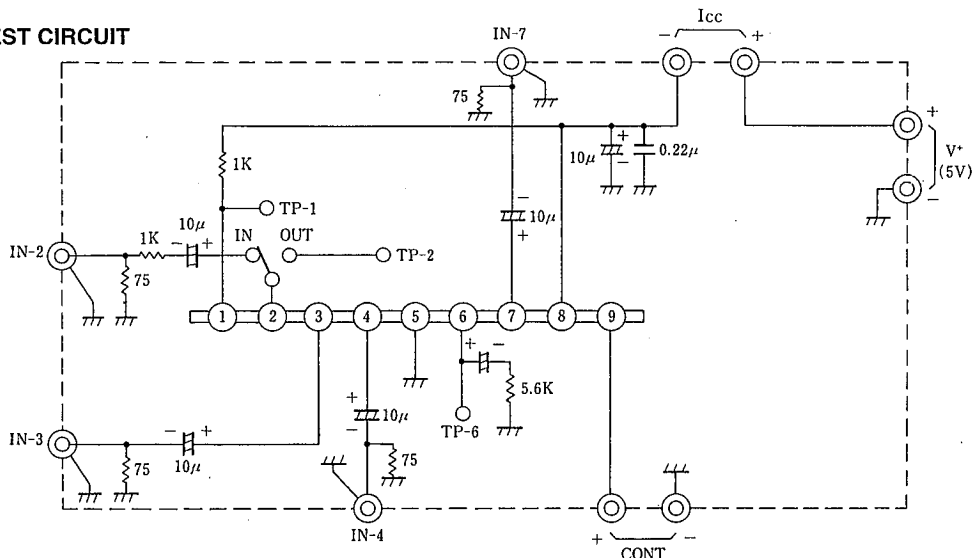


NJM2209M

PIN FUNCTION

- | | |
|------------------------|---------------------------|
| 1. Video Signal Output | 8. Frequency Compensation |
| 2. N.C. | 9. N.C. |
| 3. Differential Input | 10. Video Signal Input |
| 4. V ⁺ | 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)

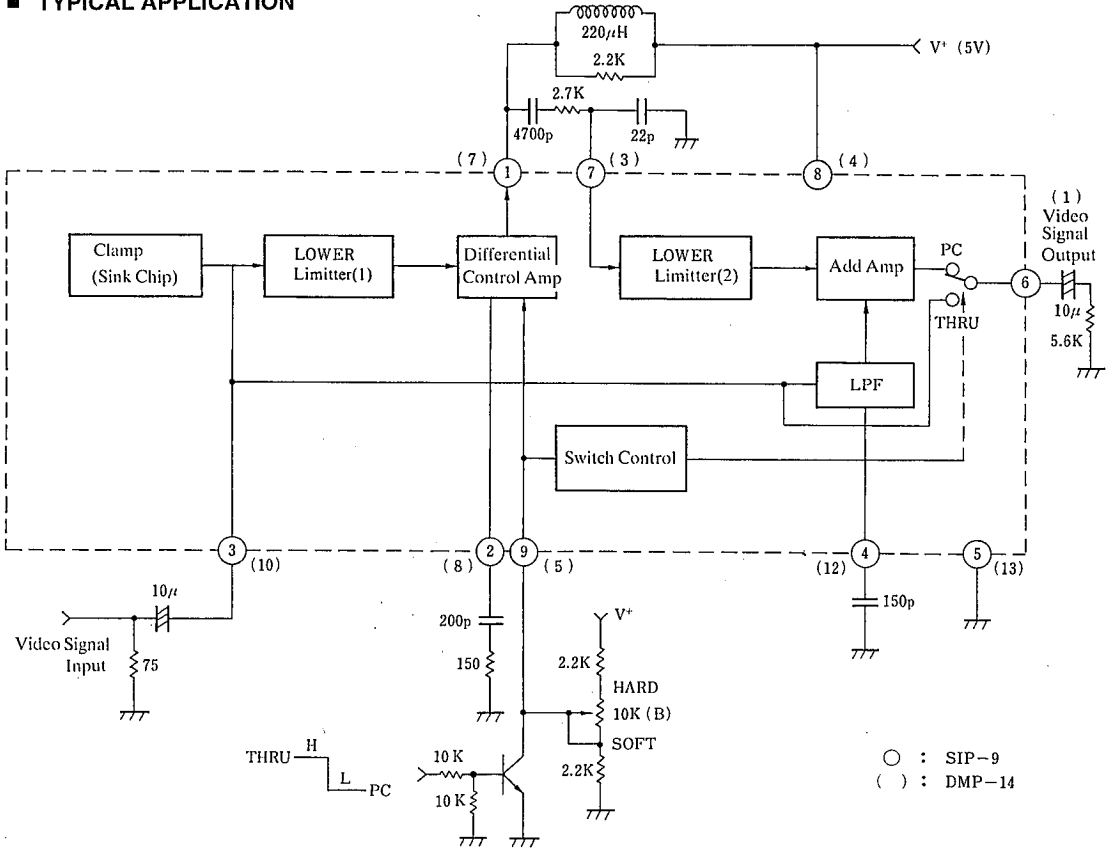
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V*	8	V
Power Dissipation	Pd	(DIP8) 500 (DMP8) 300	mW mW
Operating Temperature Range	Topr	-20~+75	°C
Storage Temperature Range	Tstg	-40~+125	°C

■ 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 _{CC}			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 _{p-p} Sine Wave Input	0.21	0.25	0.29	V	
Control Amp Gain	H	G _H	2	1	2.8V	f=100kHz, 0.1V _{rms} Sine Wave Input G=20 log ₁₀ V _{out} /V _{IN} (dB)	-2	-0.9	0	dB
	M	G _M	2	1	1.3V		-12	-10	-8	dB
	L	G _L	2	1	0.45V		—	—	-28	dB
Add Amp Gain	7 pin input	G ₇	7	6	2.8V	f=100kHz, 200mV _{p-p} Sine Wave G=20 log ₁₀ V _{OUT} /V _{IN} (dB)	-1.6	-0.6	0.4	dB
	3 pin input	G ₃	3	6	2.8V	1V _{p-p} Video Signal Input G=20 Log ₁₀ V _{OUT} /V _{IN} (dB)	-1	0	+1	dB
Switch Cross Talk	C _{SW}	4	6	2.8→0V	f=2MHz, 1V _{p-p} Sine Wave C _{SW} =20 log ₁₀ V(0V)/V(2.8V) (dB)	—	-50	—	dB	
Through Gain	G _T	3	6	0V	1V _{p-p} Video Signal Input G _T =20 log ₁₀ V _{OUT} /V _{IN} (dB)	-1	0	1	dB	
Switch Control Threshold Voltage	V _{TH}	4	6		f=100kHz, 1V _{p-p} Sine Wave Input -40dB=20log ₁₀ V _{OUT} /V _{IN}	0.2	0.3	0.4	V	
Differential Gain(Note 1)	DG _{PC}	3	6	2.8V	DGDP Tester	—	1	3	%	
Differential Gain(Note 2)	DG _T	3	6	0V	Video Signal 1V _{p-p} (Stair Step)	—	0	3	%	
6 PIN Voltage(Note 1)	V _{6PC}		6	2.8V		—	1.8	—	V	
6 PIN Voltage(Note 2)	V _{6T}		6	0V		—	2.0	—	V	

■ TYPICAL APPLICATION



■ PRINCIPLES OF OPERATION, BI BLOCK DIAGRAM

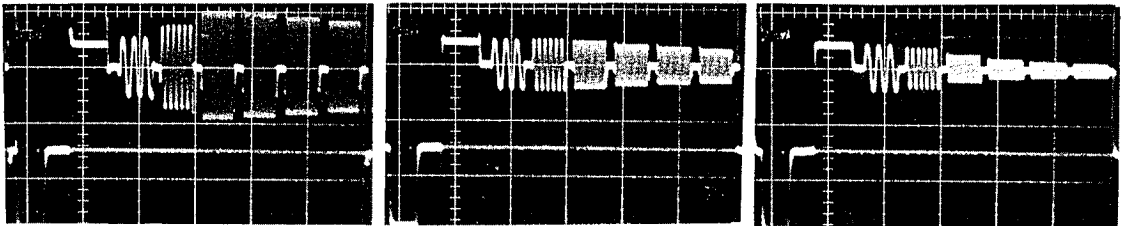
The NJM2209 is a video signal IC which converts an input video signal to a compensated video signal of the picture outline by adding an input signal through a differential amplifier to the original input signal.

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

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