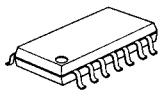
VIDEO PICTURE ENHANCER

■ GENERAL DESCRIPTION

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

■ PACKAGE OUTLINE



NJM2209M

■ FEATURES

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

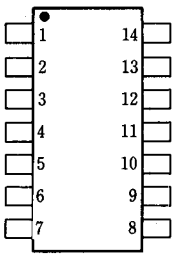
■ RECOMMENDED OPERATING CONDITION

- Operating Voltage 4.5~5.5V

■ APPLICATION

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

■ PIN CONFIGURATION

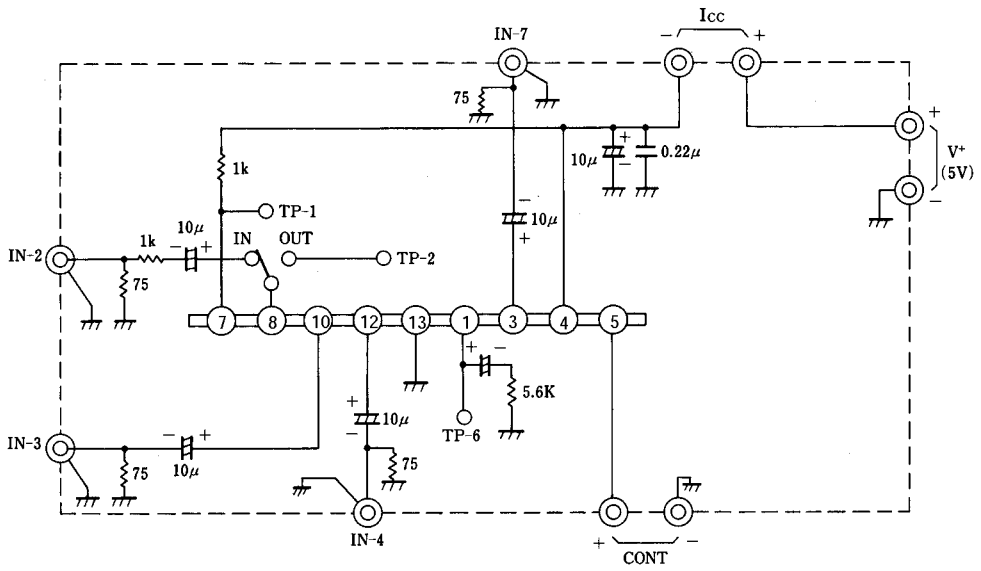


NJM2209M

PIN FUNCTION

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

■ TEST CIRCUIT



■ ABSOLUTE MAXIMUM RATINGS

(Ta=25℃)

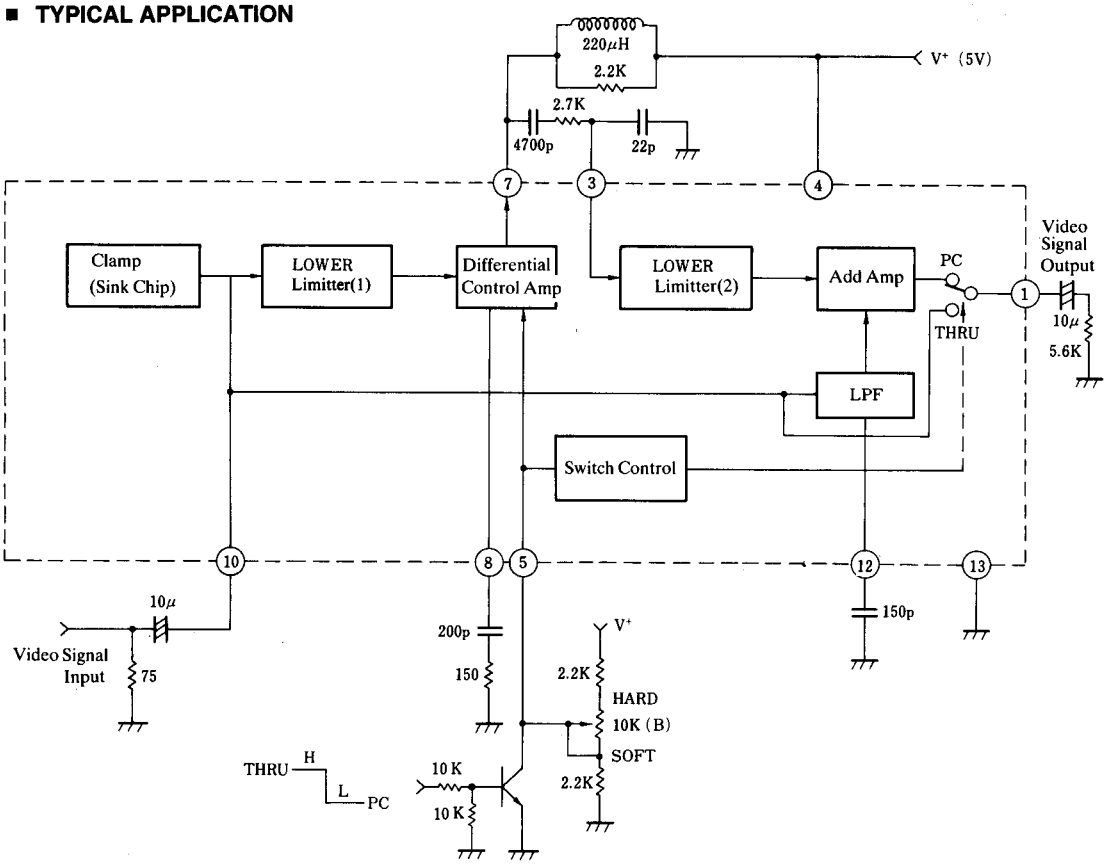
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	8	V
Power Dissipation	P_D	(DMP8) 300	mW
Operating Temperature Range	T_{opr}	−20～+75	℃
Storage Temperature Range	T_{stg}	−40～+125	℃

■ ELECTRICAL CHARACTERISTICS

(V^+=5V, Ta=25℃, 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
Limitter Level (1)		LIM1	3	2	—	SYNC level>0.35V,Input Video Signal	0.23	0.27	0.31	V
Limitter 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,0.1Vrms.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	3pin 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
	10pin input	G_3	3	6	2.8V	$1V_{p-p}$ Video Signal Input $G=20\text{Log}_{10}V_{OUT}/V_{IN}$ (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 $-40dB=20\log_{10}V_{OUT}/V_{IN}$	0.2	0.3	0.4	V
Differential Gain(Note 1)		DG_{PC}	3	6	2.8V	DGDP Tester Video Signal $1V_{p-p}$(Stair Step)	—	1	3	%
Differential Gain(Note 2)		DG_T	3	6	0V		—	0	3	%
1PIN Voltage(Note 1)		V_{6PC}		6	2.8V		—	1.8	—	V
1PIN 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.

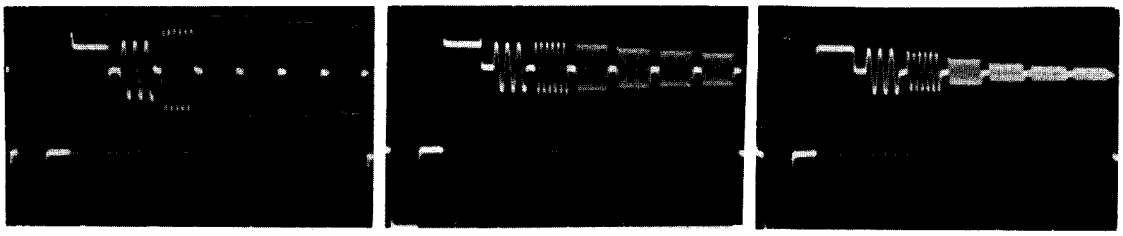
The compensating (enhanced) ratio is decided by pin 5 voltage and so the original signal comes when pin 5 voltage is zero.

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 pin12. 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 1MΩ resistance between INPUT and GND pin for clamp type input since the minute current causes an unstable pin voltage.