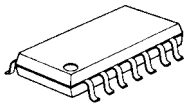
VIDEO PICTURE ENHANCER

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

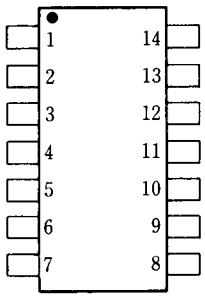
■ RECOMMENDED OPERATING CONDITION

- Operating Voltage 4.5 to 5.5V

■ APPLICATION

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

■ PIN CONFIGURATION

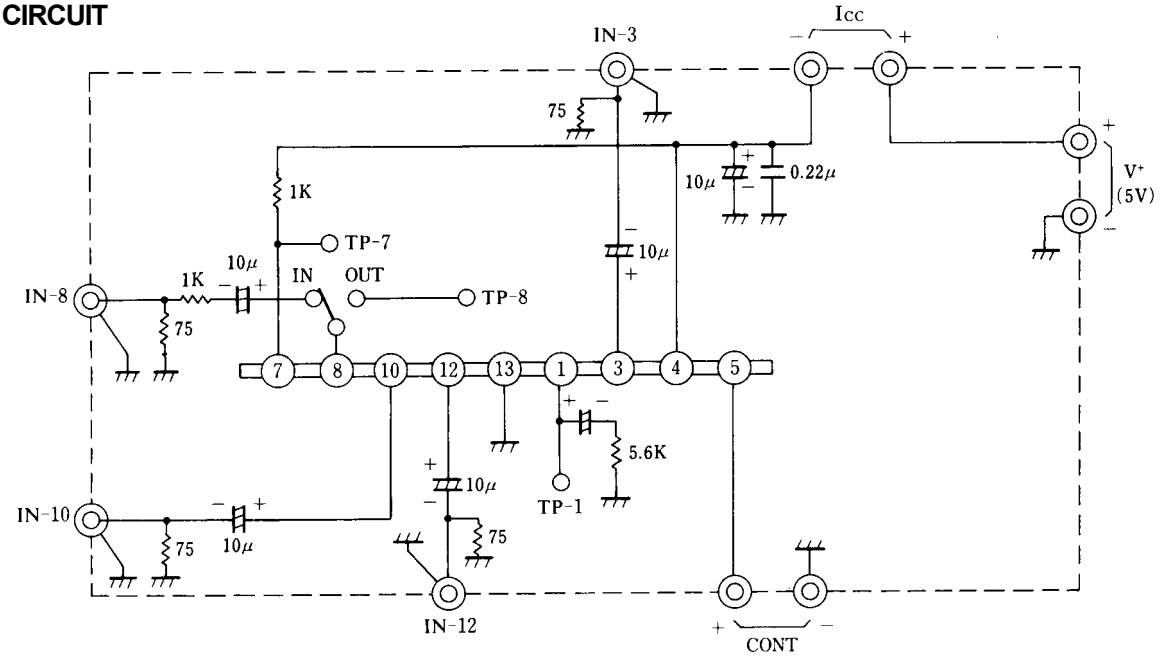


NJM2209M

PIN FUNCTION

1. Video Signal Output	8. Frequency Compensation
2. N.C.	9. N.C.
3. Differential Input	10. Video Signal Input
4. V^+	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_a=25°C)

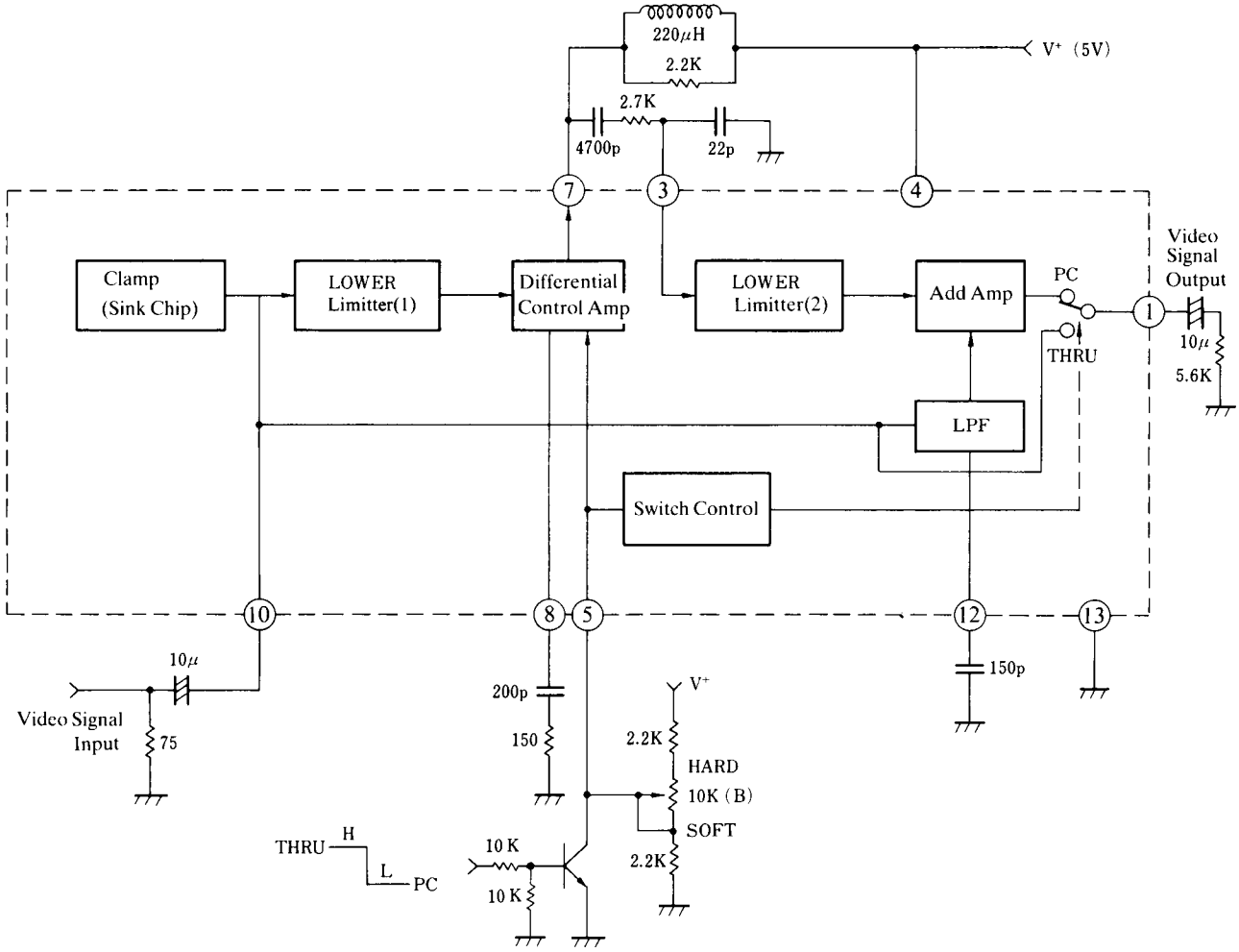
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	8	V
Power Dissipation	P_D	(DMP8)300 	mW mW
Operating Temperature Range	T_{opr}	-20 to +75	°C
Storage Temperature Range	T_{stg}	-40 to +125	°C

■ ELECTRICAL CHARACTERISTICS

(V^+=5V, T_a=25°C, Refer to Test Cricuit)

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	10	8	-	SYNC level>0.35V, Input Video Signal	0.23	0.27	0.31	V
Limitter Level (2)		LIM2	3	1	-	f=100kHz, $1V_{P-P}$ Sine Wave Input	0.21	0.25	0.29	V
Control Amp Gain	H	G_H	8	7	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	8	7	1.3V		-12	-10	-8	dB
	L	G_L	8	7	0.45V		-	-	-28	dB
Add Amp Gain	3 pin input	G_7	3	1	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
	10 pin input	G_3	10	1	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}	12	1	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	10	1	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}	12	1		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}	10	1	2.8V	DGDP Tester Video Signal $1V_{P-P}$ (Stair Step)	-	1	3	%
Differential Gain (Note 2)		DG_T	10	1	0V		-	0	3	%
1 PIN Voltage (Note 1)		V_{6PC}		1	2.8V		-	1.8	-	V
1 PIN Voltage (Note 2)		V_{6T}		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.

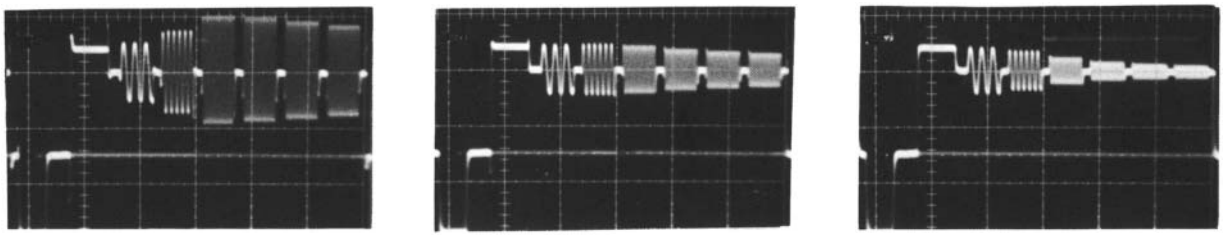
A peaking frequency compensation of the internal

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.

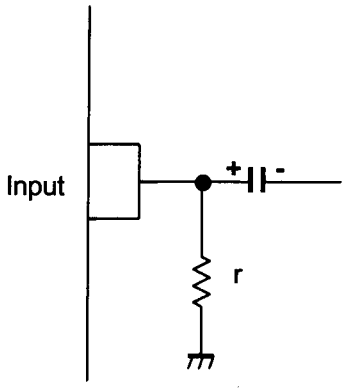
Example (Multi-Burst Enhancer)

HARD MID SOFT



■ APPLICATION

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



C ≅ 10uF

r ≅ 1MΩ