

VIDEO SYNCHRONOUS DETECTOR

■ GENERAL DESCRIPTION

The NJM2220/2230 discriminate existence and fineness of video signal. It is applicable to VCR, TV, Video camera, Hi-Fi VCR, on screen display and others.

■ FEATURES

- Operating Voltage (+4.5V~+13V)
- Package Outline DMP8, SIP9
- Bipolar Technology

■ RECOMMENDED OPERATING CONDITION

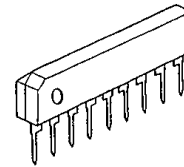
- Operating voltage: $V^+ = 4.75 \sim 10V$

■ APPLICATION

- Video camera, other video equipment

■ PIN CONFIGURATION

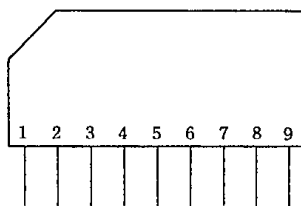
■ PACKAGE OUTLINE



NJM2220S



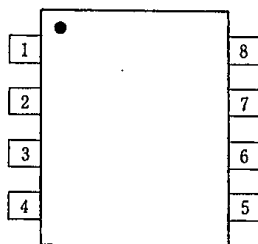
NJM2230M



NJM2220S

PIN FUNCTION

1. M.M Time Constant set
2. SYNC Input (Comp, N, V SYNC)
3. SYNC Output
4. SSG SYNC Input
5. GND
6. SYNC DET, Judgement Control
7. SYNC DET
8. M.M Smoothing
9. V^+ 5~10V



NJM2230M

PIN FUNCTION

1. M.M Time Constant Set
2. SYNC Input (Comp, H, V SYNC)
3. SYNC Output
4. SSG SYNC Input
5. GND
6. SYNC DET, Judgement Control
7. M.M Smoothing
8. V^+ 5~10V

■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V*	12	V
Power Dissipation	P _D	(SIP9) 500 (DMP8) 300	mW mW
Operating Temperature Range	T _{opr}	-20~+75	°C
Storage Temperature Range	T _{stg}	-40~+125	°C

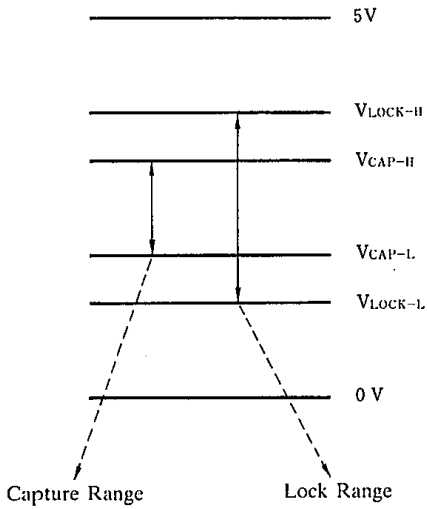
■ ELECTRICAL CHARACTERISTICS

(V*=5V, Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Current	I _{CC}		—	8	11	mA
Schmitt Circuit CAP Voltage	H side	V _{CAP-H} (Note 1)	2.07	2.22	2.37	V
	L side	V _{CAP-L} (Note 1)	1.57	1.72	1.87	V
Schmitt Circuit LOCK Voltage	H side	V _{LOCK-H} (Note 1)	2.53	2.68	2.83	V
	L side	V _{LOCK-L} (Note 1)	1.25	1.40	1.55	V
Mono-Multi Output Width	W _{MM}	(Note 2)	—	25	—	μsec
Input Threshold Level	2P	V _{TH-2}	1.0	1.5	2.0	V
	4P	V _{TH-4}	1.0	1.5	2.0	V
	6P	V _{TH-6}	—	0.8	1.4	V
Output Voltage Pin 7	H side	V _{7-H}	4.9	5.0	—	V
	L side	V _{7-L}	—	0.1	0.3	V
Output Voltage Pin 6	H side	V _{6-H}	3.6	4.0	—	V
	L side	V _{6-L}	—	—	0.1	V
Output Voltage Pin 3	H side	V _{3-H}	4.9	5.0	—	V
	L side	V _{3-L}	—	0.1	0.3	V
M.M Smoothed D.C. Voltage	V _B (V ₇)	Pin 2=2V	2.9	3.2	3.5	V

(): Apply to 2230M

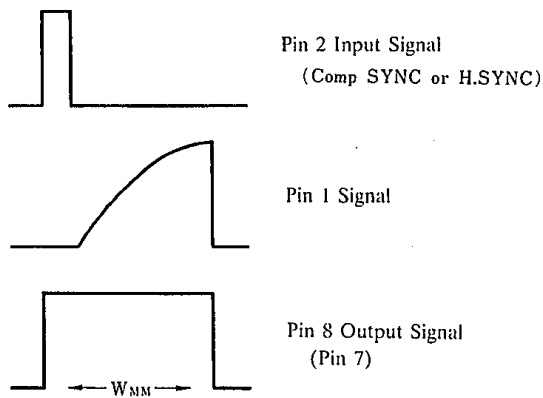
(Note 1)



ITEM	V _{CAP-L}	V _{LOCK-H}	V _{CAP-H}	V _{LOCK-L}
Pin 8 Voltage (Pin 7)	0	→ 5	→ 0	
Pin 6 Voltage	L	→ H	→ L	→ H
Pin 7 Voltage	H	→ L	→ H	→ L

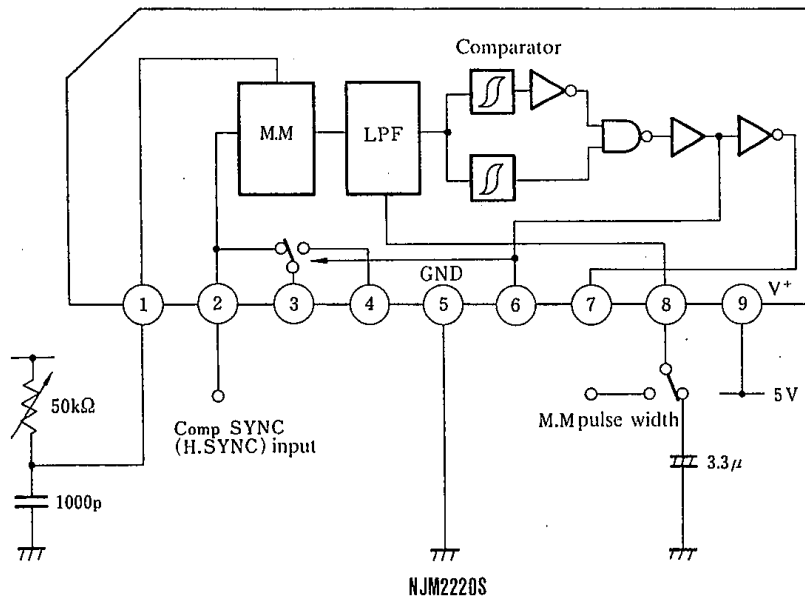
Measure Pin 8 (Pin 7) DC voltage at a moment when Pin 6 output voltage turns state.

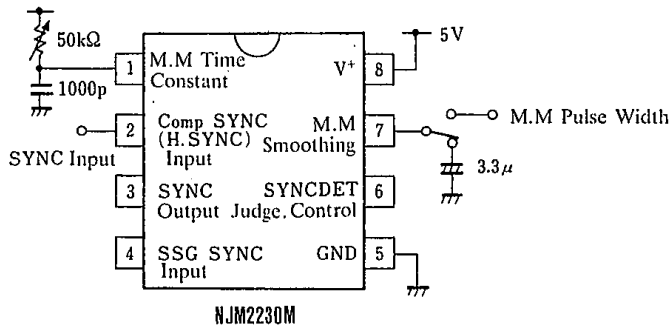
(Note 2)



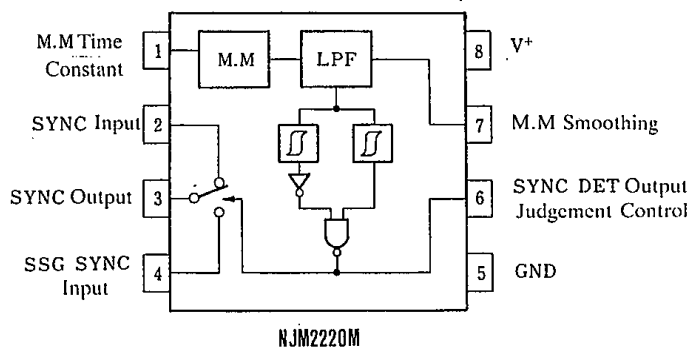
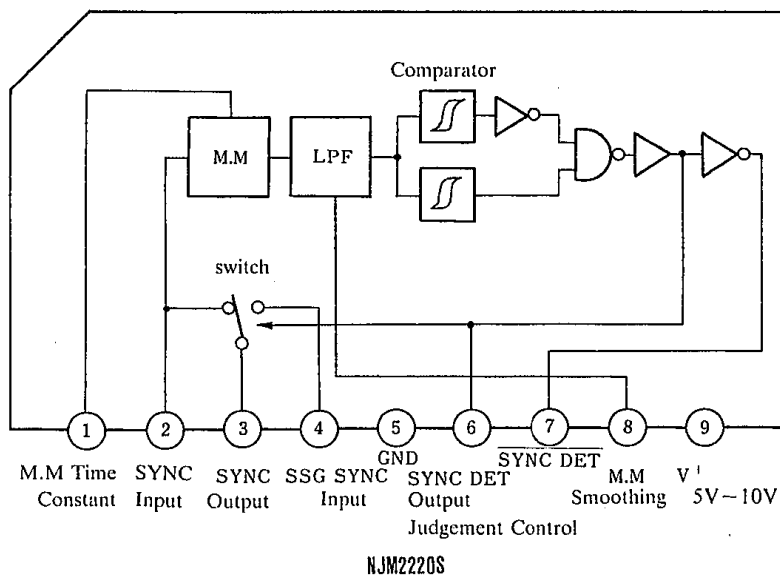
Adjust Pin 8 (Pin 7) DC Voltage to 2V (at $V^+ = 5V$) by varying Pin 1 outer resistor, and test Pin 8 output pulse width after taking off Pin 8 outer capacitor.

■ TEST CIRCUIT



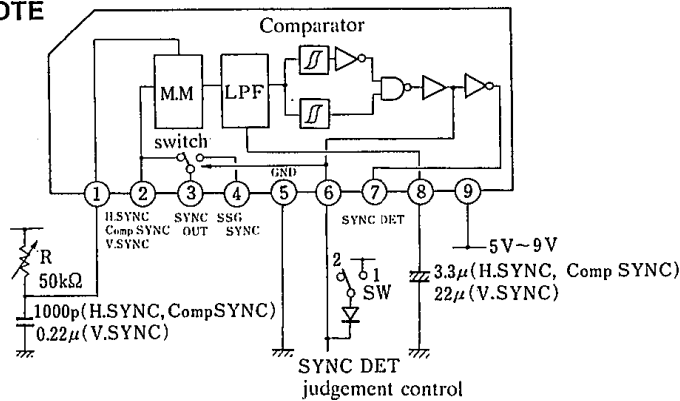


■ OPERATIVE PRINCIPLE



- M.M: Varies duty ratio of output signal depended on input synchronous signal condition (irregular, on signal).
- LPF: Converts M.M. output signal to DC level. The more larger the duty ratio is, DC level is clamped at $V^+/2+0.7$ (V).
- Comparator: Outputs discriminating signal of input signal by DC level of LPF output. Stabilized output signal can be obtained due to that the hysteresis is given to the output.
- Switch: Makes exchanging operation of SYNC Input and SSG SYNC Input signal by discriminating signal from comparator or Pin 6 signal of SYNC DET Output Judgement Control.

■ TYPICAL APPLICATION NOTE

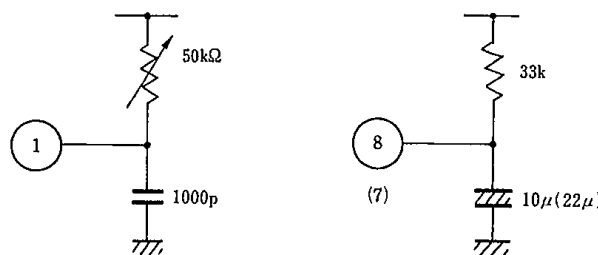


■ TERMINAL FUNCTION

PIN NO.	EXPLANATION
1	Connect resistor and capacitor for M.M. time constant. (Value of R, C is changed by a kind of Pin 2 SYNC Input signal.)
2	Input synchronous signal (Comp SYNC, H.SYNC or V.SYNC) separated from video signal.
3	It outputs Pin 2 or Pin 4 signal by Pin 2 signal condition. <ul style="list-style-type: none"> • Pin 2 input signal; normal → Output Pin 2 input signal. • Pin 2 input signal; abnormal → Output Pin 4 input signal.
4	Input artificial synchronous signal generated by SSG (Sync. Signal Generator).
5	GND
6	It outputs DC voltage (H or L state) by Pin 2 signal condition. When outer SW is turned to 1, Pin 2 input signal is forced to flow out from Pin 3. <ul style="list-style-type: none"> • Pin 2 input signal; normal → H state • Pin 2 input signal; abnormal → L state
7	It outputs DC voltage (H or L state) by Pin 2 signal condition. <ul style="list-style-type: none"> • Pin 2 input signal; normal → L state • Pin 2 input signal; abnormal → H state
8 (7)	Connect capacitor for smoothing M.M. (Value depends on Pin 2 input signal). Adjust Pin 1 attached volume to the level that Pin 8 voltage becomes 2V ($V^+=5V$) with Pin 2 signal If $V^+ > 5V$, then $V_{8(7)} = 2/5V^+ (V)$
9(8)	$V^+ : 5 \sim 10V$

(Note) In some application, it happens that still search or tracking is large off the point and unordinary SYNC or lack of SYNC occurs. If it is not desirable, you can do in SYNC condition by using Pin 6 as control input terminal. Also recommend sensitivity adjustment of outer device change, by it error detection of unordinary SYNC will lapse.

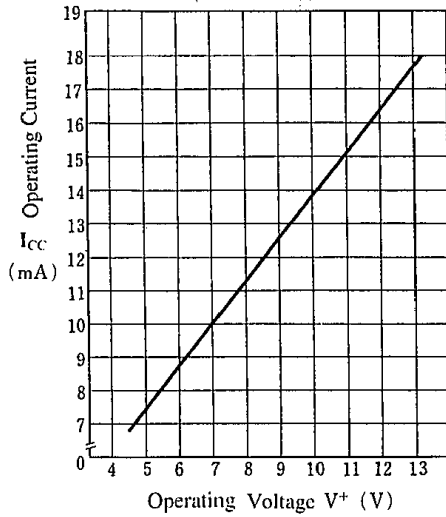
It makes volume to low value, in other word it makes time constant of M.M. to low value. In this case synchronous peak voltage at Pin 8 (Pin 7) becomes lower and so makes to 2V ($V^+=5V$) by putting resistor in to V^+ .
(Adjust to 2V by Pin 1 resistor attached.)



TYPICAL CHARACTERISTICS

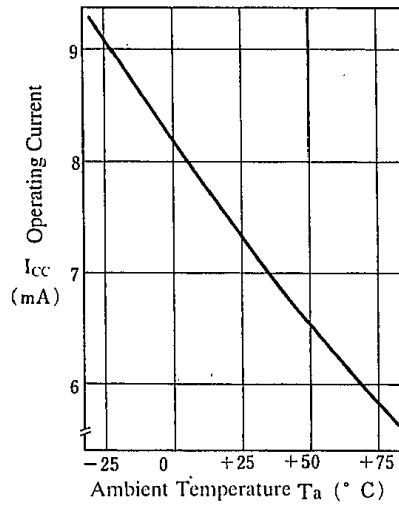
Operating Current

($T_a = 25^\circ\text{C}$)



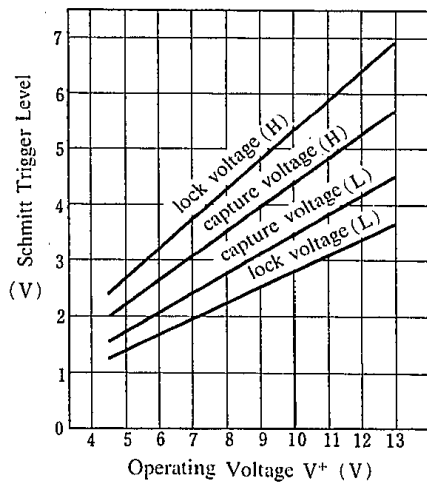
Operating Current

($V^+ = 5\text{V}$)



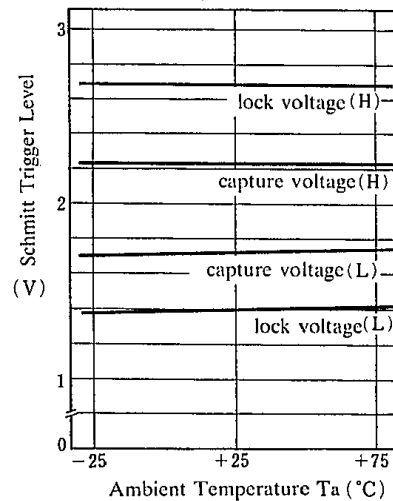
Schmitt Trigger Level

($T_a = 25^\circ\text{C}$)



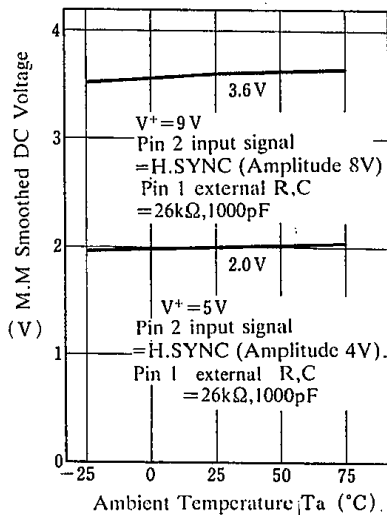
Schmitt Trigger Level

($V^+ = 5\text{V}$)



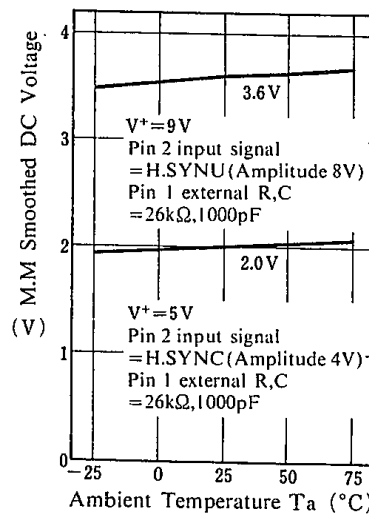
M.M Smoothed DC Voltage

(Carbon film resistor-polyster film Capacitor)



M.M Smoothed DC Voltage

(Metal film resistor - polyster film Capacitor)



MEMO

[CAUTION]

The specifications on this databook are only given for information, without any guarantee as regards either mistakes or omissions. The application circuits in this databook are described only to show representative usages of the product and not intended for the guarantee or permission of any right including the industrial rights.