Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

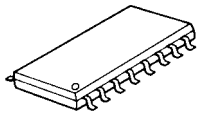
Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

SYNCHRONOUS SEPARATION WITH AFC

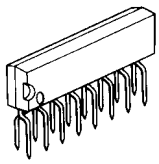
■ GENERAL DESCRIPTION

The **NJM2229** has functions of getting the horizontal and vertical synchronous signal from the composit video signal by the synchronous separation circuit. Also the **NJM2229** has a detective terminal of the input signal through the synchronous circuit.

■ PACKAGE OUTLINE



NJM2229M



NJM2229S

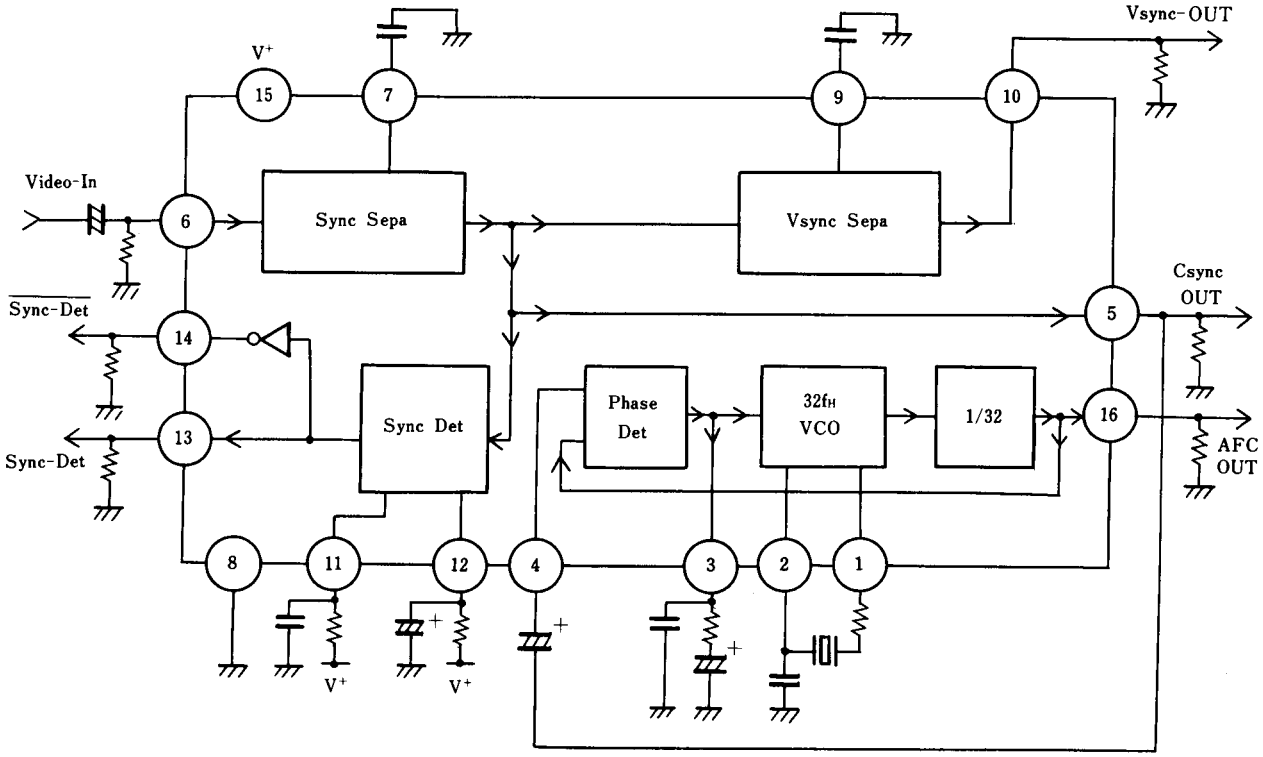
■ FEATURES

- Operating Voltage (+4.7V to +5.3V)
- Internal AFC circuit(Horizontal sync.signal)
- No adjustment of free run frequency.
- Internal detective circuit of sync.signal.
- Package Outline DMP16, ZIP-16
- Bipolar Technology

■ RECOMMENDED OPERATING CONDITION

- Operating Voltage 4.75 to 5.3V

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

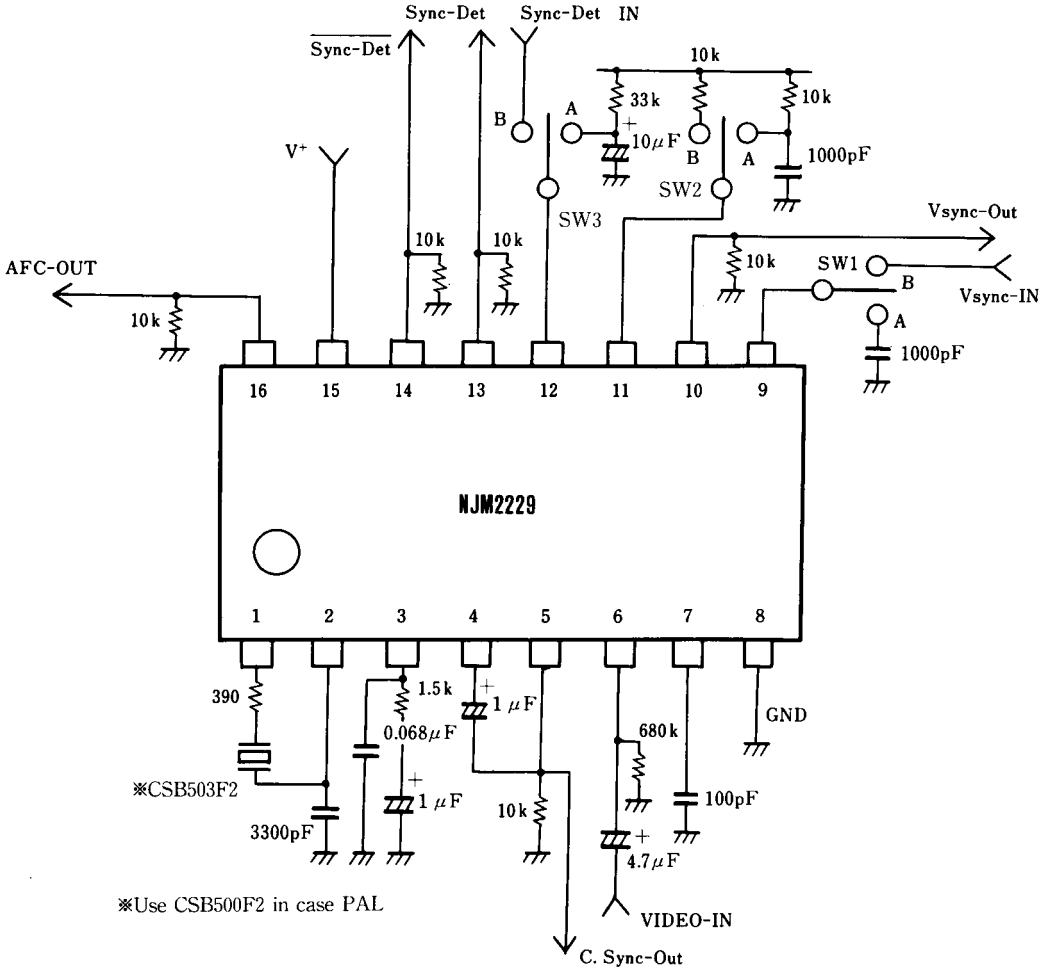
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	7	V
Power Dissipation	P_D	500	mW
Operating Temperature Range	T_{opr}	-20 to +75	°C
Storage Temperature Range	T_{stg}	-40 to +125	°C

■ ELECTRICAL CHARACTERISTICS

(Ta=25°C, V^+=5V)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
Operating Current	Icc	-	20	26	mA
AFC Free-run Frequency	f_{OH}	15.534	15.734	15.934	KHz
AFC Pulse width	T_{HD}	3.7	3.9	4.1	µs
AFC Delay	T_{HA}	0.7	1.7	2.7	µs
AFC Lock Range	Δf_{HL}	+600 -900	+700 -1000	- -	Hz
AFC Capture Range	Δf_{HP}	+400 -700	+600 -900	- -	Hz
AFC Output Voltage High	V_{HAH}	4.0	4.2	-	V
AFC Output Voltage Low	V_{HAL}	-	0	0.1	V
Sync. Signal Detection Level	V_{HDS}	0.11	0.14	0.17	V
Sync. Signal Detection Delay time	V_{HDC}	0	0.57	1.5	µs
Sync. Signal Detection Output voltage High	V_{HDH}	4.0	4.2	-	V
Sync. Signal Detection Output voltage Low	V_{HDL}	-	0	0.1	V
V_{SYNC} Threshold Voltage High	V_{DSH}	2.4	2.5	2.6	V
V_{SYNC} Threshold Voltage Low	V_{DSL}	1.4	1.5	1.6	V
V_{SYNC} Output voltage High	V_{DH}	4.0	4.2	-	V
V_{SYNC} Output voltage Low	V_{DL}	-	0	0.1	V
V_{SYNC} Pulse Width	T_{VD}	212	272	332	µs
V_{SYNC} Delay Time	T_{VDT}	9.6	12.3	15	µs
Sync. Detection Lock Voltage High	V_{LH}	2.53	2.68	2.83	V
Sync. Detection Lock Voltage Low	V_{LL}	1.25	1.40	1.55	V
Sync. Detection Capture High	V_{CH}	2.07	2.22	2.37	V
Sync. Detection Capture Low	V_{CL}	1.57	1.72	1.87	V
Sync. Detection Output voltage High	V_{DEH}	4.0	4.2	-	V
Sync. Detection Output voltage Low	V_{DEL}	-	0	0.1	V
$\overline{\text{Sync. Detection Output voltage High}}$	$V_{\overline{DEH}}$	4.0	4.2	-	V
$\overline{\text{Sync. Detection Output voltage Low}}$	$V_{\overline{DEL}}$	-	0	0.1	V

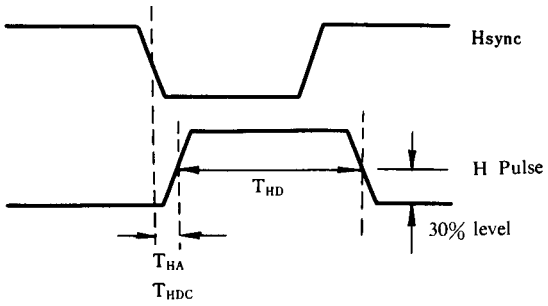
■ TEST CIRCUIT

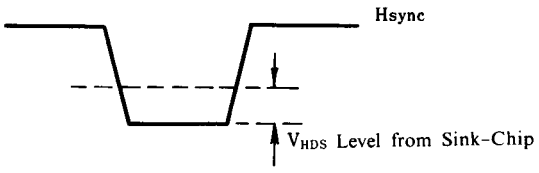


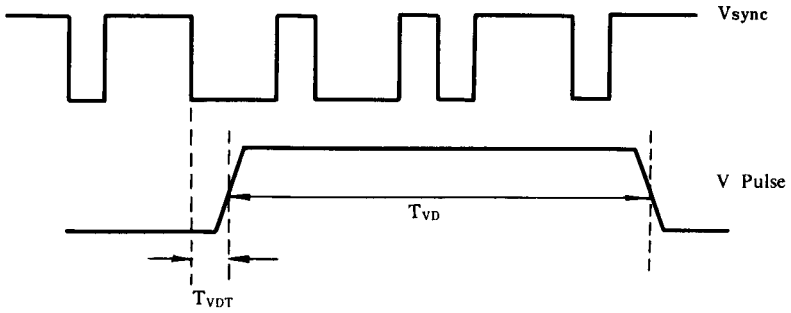
■ ELECTRICAL PARAMETER TEST METHOD

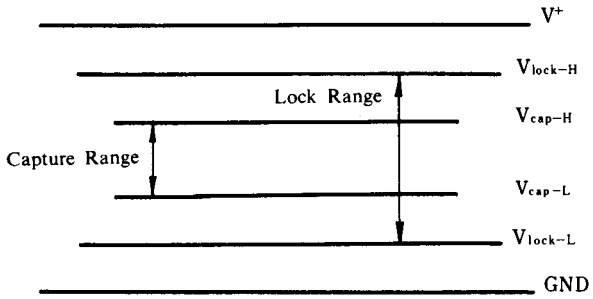
Test circuit

PARAMETER	SW-1	SW-2	SW-3	TEST CONDITION.
Operating Current	A	A	A	No input signal. DC current at Pin 15.
AFC Free-run Frequency	A	A	A	No input signal. Video-IN terminal to GND. Frequency at Pin 16.
AFC pulse Width	A	A	A	No input signal. Output Pulse width at Pin 16. (Note 1)
AFC Output Delay Time	A	A	A	Input 2Vp-p video signal on Video-IN terminal. Delay time between input and AFC output signal. (Note 1)
AFC Lock Range	A	A	A	Operating frequency range of AFC output when the input Pulse signal frequency with 5 μsec pulse width at Video-IN terminal changes.
AFC Capture Range	A	A	A	Frequency range when signal changes from AFC unlock condition to look.
AFC Output Voltage	A	A	A	Output voltage at Pin 16 in condition of load resistance R_L=10kΩ
Sync. Signal Detection level	A	A	A	Putting 2Vp-p video signal on Video-IN terminal and reducing it to the level that pin5 output waveform is beginning to change. V_{HDS} is the sink-chip level at that point. (Note 2)
Sync. Signal Detection Output Voltage	A	A	A	Output voltage at Pin5 with load resistance R_L=10kΩ.
Sync. Signal Detection Delay time	A	A	A	2Vp-p video signal at Video-IN terminal. Time difference between input(Pin5) and output(Pin6) waveform.
V_{SYNC} Threshold Voltage High	B	A	A	Gradually increase DC voltage from 2V to 3V at V_{SYNC}-IN terminal. DC input voltage when output voltage at Pin10 changes from Low to High state.
V_{SYNC} Threshold Voltage Low	B	A	A	Gradually decrease DC voltage from 3V to 1V at V_{SYNC}-IN terminal. DC input voltage when output voltage at Pin10 changes from High to Low state.
V_{SYNC} Output Voltage	B	A	A	Output voltage at Pin10 with load resistance R_L=10kΩ
V_{SYNC} Pulse Width	A	A	A	Putting 2Vp-p video signal on Video-IN terminal and measurring output pulse width at Pin10. (Note 3)
V_{SYNC} Delay Time	A	A	A	Putting 2Vp-p video signal on Video-IN terminal Delay time between output at Pin10 and V_{SYNC} at Pin6. (Note 3)
Sync. Detection Lock Voltage High	A	B	B	Increase DC voltage from 2V to 4V put on Sync-Det-IN terminal and measure its DC voltage when output voltage at Pin13 changes from HIGH to Low. (Note 4)
Sync. Detection Lock Voltage Low	A	B	B	Decrease DC voltage from 2V to 1V put on Sync-Det-IN terminal and measure its DC voltage when output voltage at Pin13 changes from HIGH to Low. (Note 4)
Sync. Detection Capture High	A	B	B	Decrease DC voltage from 3V to 1V put on Sync-Det-IN terminal and measure its DC voltage when output voltage at Pin13 changes from Low to HIGH. (Note 4)
Sync. Detection Capture Low	A	B	B	Increase DC voltage from 1V to 2V put on Sync-Det-IN terminal and measure its DC voltage when output voltage at Pin13 changes from Low to HIGH. (Note 4)
Sync. Detection Output Voltage	A	B	B	Output voltage at Pin13 with load resistance R_L=10kΩ.
$\overline{\text{Sync. Detection Output Voltage}}$	A	B	B	Output voltage at Pin14 with load resistance R_L=10kΩ.

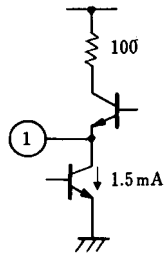
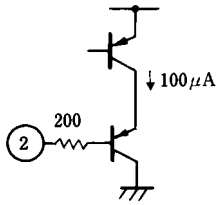
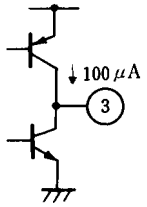
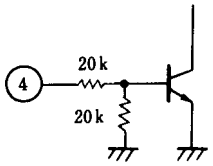
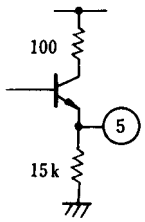

Hsync
H Pulse
T_{HD}
30% level
T_{HA}
T_{HDC}

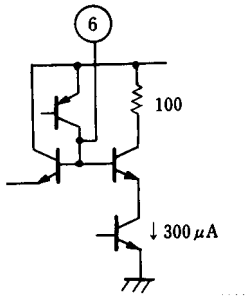
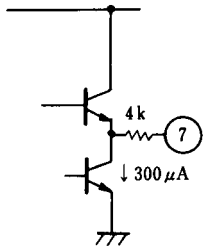
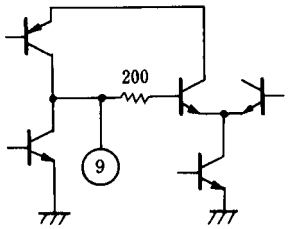
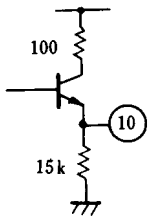

Hsync
V_{HDS} Level from Sink-Chip

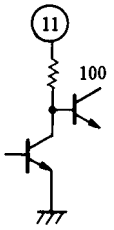
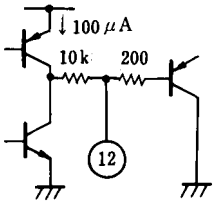
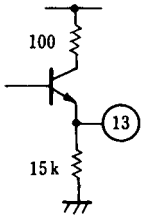
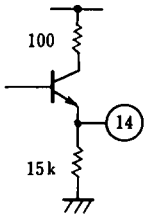
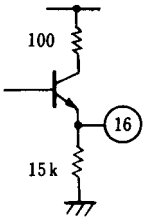

Vsync
V Pulse
T_{VD}
T_{VDT}


V^+
V_{lock-H}
Lock Range
V_{cap-H}
Capture Range
V_{cap-L}
V_{lock-L}
GND

■ PIN FUNCTION

PIN NO.	SYMBOL	FUNCTION	INSIDE EQUIVALENT CIRCUIT
1	VCO-OUT	Putting VCO output on ceramic resonator.	
2	VCO-FILTER	Deciding phase of ceramic resonator.	
3	AFC-FILTER	Low pass filter of AFC	
4	AFC-IN	Input terminal of AFC. Putting composite. Synchronous signal on it.	
5	C.SYNC-OUT	Sync. signal Detection output	

PIN NO.	SYMBOL	FUNCTION	INSIDE EQUIVALENT CIRCUIT
6	VIDEO-IN	Input composite video signal.	
7	L. P. F	Low pass filter for chorma singal.	
8	GND	Ground.	
9	SYNC-INTEGR	Integrating composite synchronous signal and putting verical synchronous reproducing circuit.	
10	VSYNC-OUT	Vertical synchronous output	

PIN NO.	SYMBOL	FUNCTION	INSIDE EQUIVALENT CIRCUIT
11	M. M-TC	Deciding time constant of M. M. V. (monomulti vibrator)	
12	M. M-INTER	Smoothing M. M. V. output.	
13	SYNCDET-OUT	Signal detective output.	
14	$\overline{\text{SYNCDET – OUT}}$	Inversed output of Pin13.	
15	V^+	Power supply.	
16	AFC-OUT	AFC output.	

[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.