

VIDEO SUB-CARRIER SIGNAL DOUBLER/TRIPLER

■ GENERAL DESCRIPTION

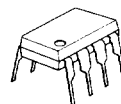
The NJM2228 is a doubler/trippler oscillator based on video sub-carrier frequency using PLL circuit technique.

The NJM2228 is suit to standard clock generator of CCD clock and onscreen display.

■ FEATURES

- Operating Voltage (+4V~+6V)
- Good input sensitivity $V_{IN}=120\text{mV MIN.}$
- Maximum oscillation frequency 20MHz.
- Switch function of doubler / tripler
- Package Outline DIP8, DMP8, SIP8
- Bipolar Technology

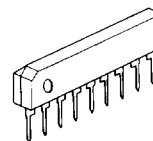
■ PACKAGE OUTLINE



NJM2228D



NJM2228M

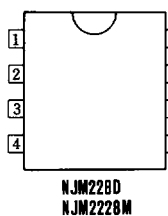


NJM2228S

■ APPLICATION

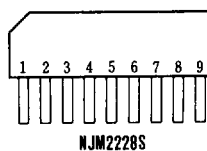
- VCR Video Camera AV-TV Video Disc Player

■ PIN CONFIGURATION



PIN FUNCTION

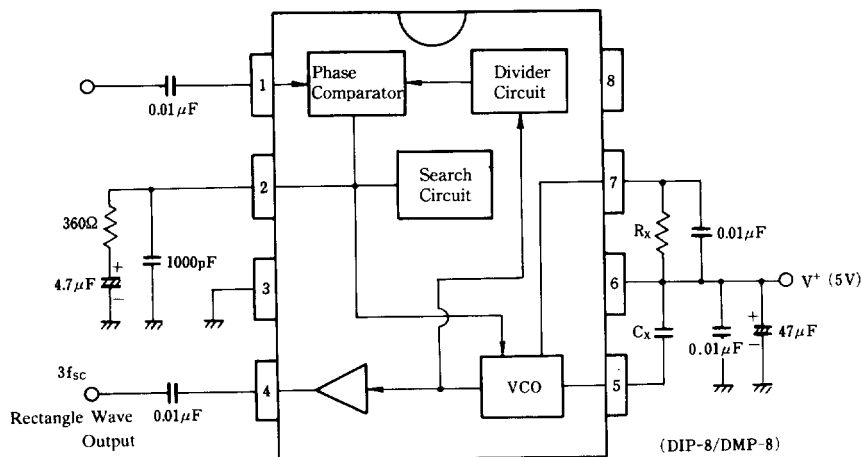
1. f_{sc} Input
2. Detection Filter
3. GND
4. Oscillator Output
5. Oscillator C
6. V^+
7. Oscillator R
8. 2/3 Switch



PIN FUNCTION

1. f_{sc} Input
2. Detection Filter
3. GND 1
4. Oscillator Output
5. GND 2
6. Oscillator C
7. V^+
8. Oscillator R
9. 2/3 Switch

■ BLOCK DIAGRAM & EXTERNAL COMPONENTS



There is stray capacity assembled on PC board, and so select R_x , C_x to the value which pin 2 voltage (search voltage at VCO locked) becomes about 2V. $C_x > 5\text{pF}$, $5.6\text{k} > R_x > 3.3\text{k}\Omega$.

	NTSC		PAL	
	3 multiplier	2 multiplier	3 multiplier	2 multiplier
C_x	10 p	22 p	8 p	15 p
R_x	4.7 k	4.6 k	3.9 k	4.6 k

■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V*	8	V
Input Voltage	I _o	GND - 0.3 ~ V* + 0.3	V
Power Dissipation	P _D	(DIP8) 500	mW
		(DMP8) 300	mW
		(SIP8) 500	mW
Operating Temperature Range	T _{opr}	-20 ~ +75	°C
Storage Temperature Range	T _{stg}	-40 ~ +125	°C

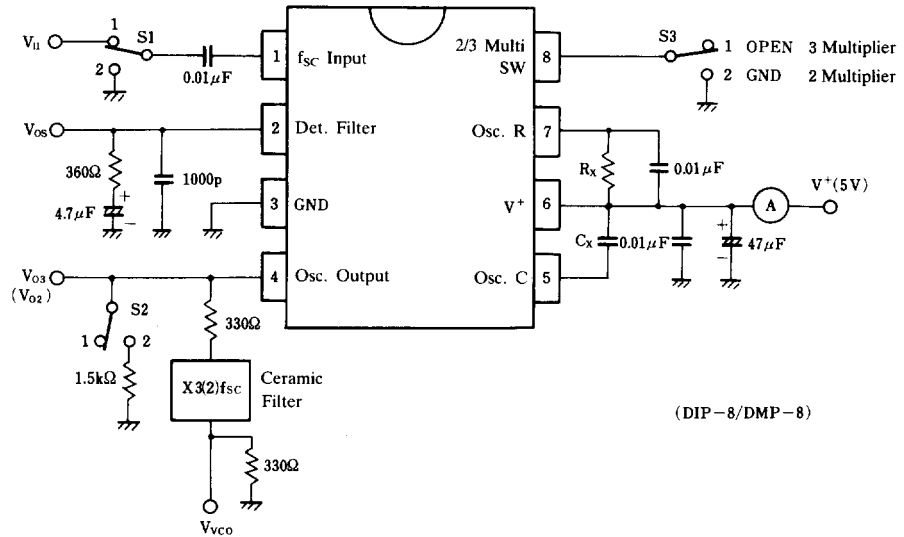
■ ELECTRICAL CHARACTERISTICS

(V*=5V, Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Voltage	V*		4.7	5.0	5.3	V
Operating Current	I _{cc}	S1=1, S2=1, input Vi1 : 3.58MHz Count Current	7	10	13	mA
(3 Multiplier Oscillator)		(S3=1 apply below abbreviation)				
Input Voltage Swing Range	V _{fsc3}	S1=1, S2=1, input Vi1 : 3.58 or 4.43MHz (sine wave), guaranteed Vi1 voltage range.	0.12	1.0	2.0	Vp-p
Input Sensitivity	V _{is3}	S1=1, S2=1, input Vi1 : 3.58 or 4.43MHz (sine wave), actually tested minimum Vi1 voltage.	—	0.05	—	Vp-p
VCO Oscillation Swing	V _{o3}	S1=1, S2=2, input Vi1 : 3.58MHz, 1.0Vp-p. V _{o3} Oscillation Swing	0.7	0.9	1.1	Vp-p
fsc Leakage	L _{fsc3}	S1=1, S2=2, input Vi1 : 3.58MHz, V _{o3} (fsc level/3fsc level)	—	-50	—	dB
3fsc Output Duty	D _{3fsc}	S1=1, S2=2, input Vi1 : 3.58MHz, 1.0Vp-p, V _{os} output signal duty.	45	50	55	%
(2 Multiplier Oscillator)		(S3=2 apply below)				
Input Voltage Swing Range	V _{fsc2}	S1=1, S2=1, input Vi1 : 3.58 or 4.43MHz (sine wave), guaranteed Vi1 voltage range.	0.12	1.0	2.0	Vp-p
Input Sensitivity	V _{is2}	S1=1, S2=1, input Vi1 : 3.58 or 4.43MHz (sine wave), actually tested minimum Vi1 voltage.	—	0.05	—	Vp-p
VCO Oscillation Swing	V _{o2}	S1=1, S2=2, input Vi1 : 3.58MHz, 1.0Vp-p, V _{o2} Oscillation Swing	0.7	0.9	1.1	Vp-p
fsc Leakage	L _{fsc2}	S1=1, S2=2, input Vi1 : 3.58MHz, 1.0Vp-p, V _{o2} (fsc level/2fsc level)	—	-50	—	dB
2fsc Output Duty	D _{2fsc}	S1=1, S2=2, input Vi1 : 3.58MHz, 1.0Vp-p, V _{os} Output signal duty.	45	50	55	%



■ TEST CIRCUIT



(note 1): R_x , C_x accuracy: less than $\pm 1\%$.

(note 2): C_x is not considered pin 5 stray capacitance. VCO free-run frequency is affected by stray capacitance of P.C board, socket and others.

(note 3): The NJM2228 is produced by high frequency wafer process and some of pin may be weak against surge voltage.

(note 4): Pin 2 filter must be connected to ground.



■ TYPICAL CHARACTERISTICS

