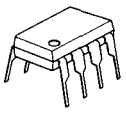
VIDEO SUB-CARRIER SIGNAL DOUBLER/TRIPLER

■ GENERAL DESCRIPTION

The NJM2228 is a doubler/tripler 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.

■ PACKAGE OUTLINE



NJM2228D

NJM2228M

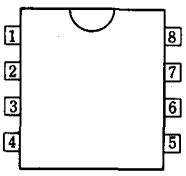
■ FEATURES

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

■ APPLICATION

- VCR Video Camera AV-TV Video Disc Player

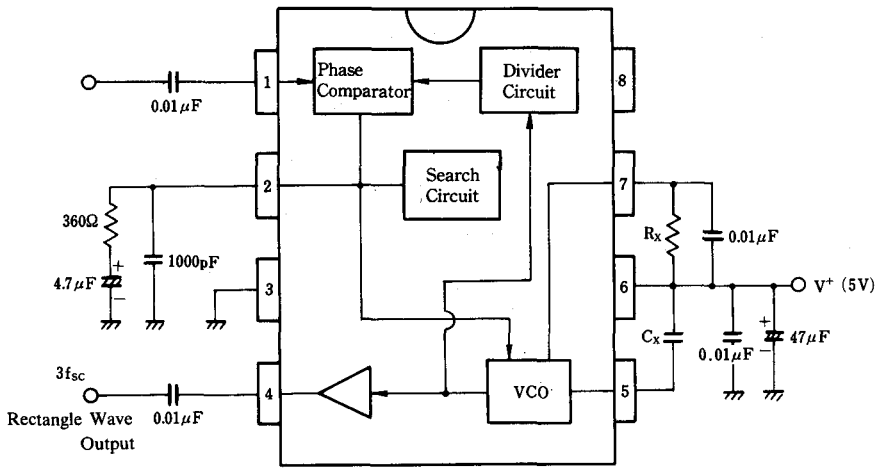
■ PIN CONFIGURATION



NJM2228D
NJM2228M

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

■ BLOCK DIAGRAM & EXTERNAL COMPONENTS



There is stray capacity assembled on PC board, and so select Rx, Cx to the value which pin 2 voltage (search voltage at VCO locked) becomes about 2V. Cx>5pF, 5.6k>Rx>3.3kΩ.

	NTSC		PAL	
	3 multiplier	2 multiplier	3 multiplier	2 multiplier
Cx	10p	22p	8p	15p
Rx	4.7k	4.6k	3.9k	4.6k

■ ABSOLUTE MAXIMUM RATINGS

(Ta=25℃)

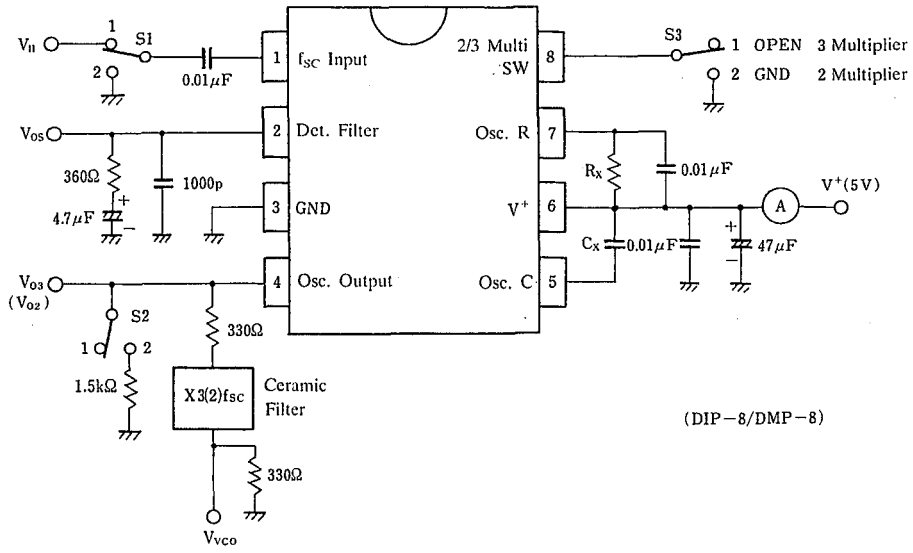
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	8	V
Input Voltage	Io	GND−0.3～V^++0.3	V
Power Dissipation	P_D	(DIP8) 500	mW
		(DMP8) 300	mW
Operating Temperature Range	Topr	−20～+75	℃
Storage Temperature Range	Tstg	−40～+125	℃

■ ELECTRICAL CHARACTERISTICS

(V^+=5V, Ta=25℃)

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 abbriviation)				
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, Vos 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): Rx, Cx accuracy: less than ±1%.

(note 2): Cx 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.

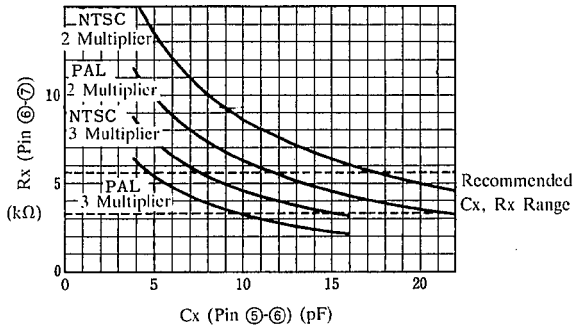
(note 4): Pin 2 filter must be connected to ground.

5

■ TYPICAL CHARACTERISTICS

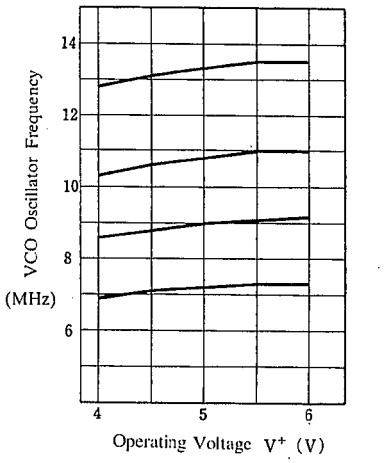
VCO Oscillator Frequency

(Vos = 2V, Ta = 25°C)



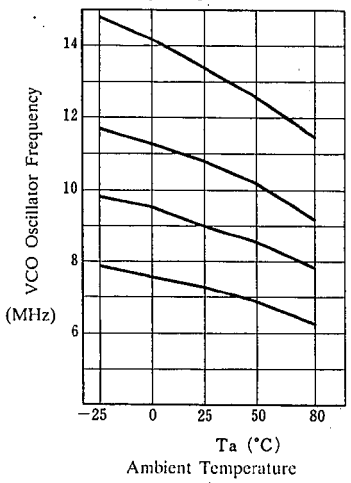
VCO Oscillator Frequency

(No input signal, Vos = 2.0V, Ta = 25°C)



VCO Oscillator Frequency

(No input signal, Vos = 2.0V)



5

MEMO