

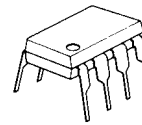
VIDEO SUB-CARRIER SIGNAL DOUBLER/TRIPLER

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

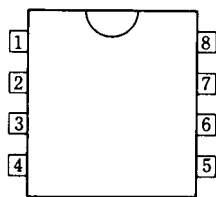
FEATURES

- Operating Voltage (+4V to +6V)
- Good input sensitivity $V_{IN}=120\text{mV MIN.}$
- Maximum 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

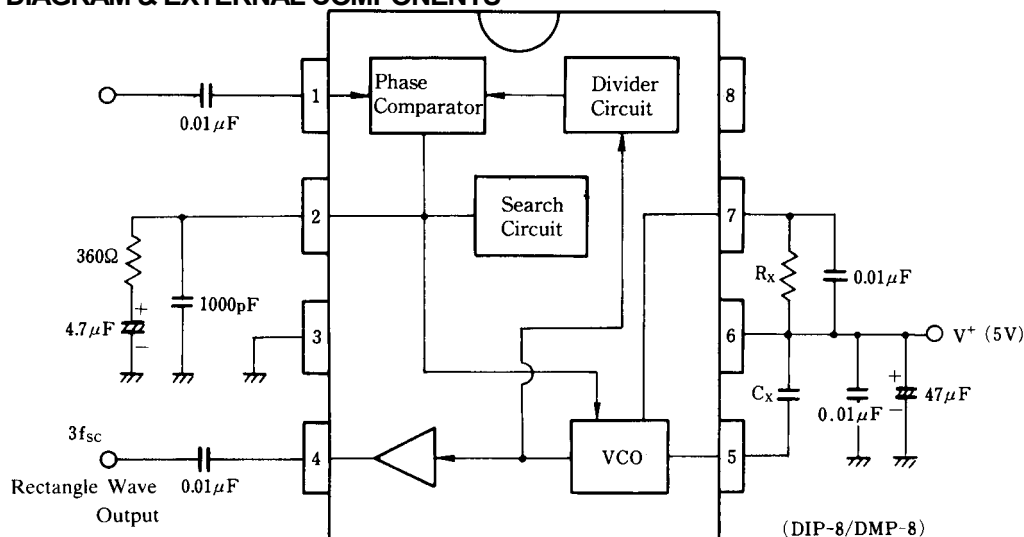


NJM2228D
NJM2228M

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 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	10p	22p	8p	15p
R_x	4.7k	4.6k	3.9k	4.6k

NJM2228

■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

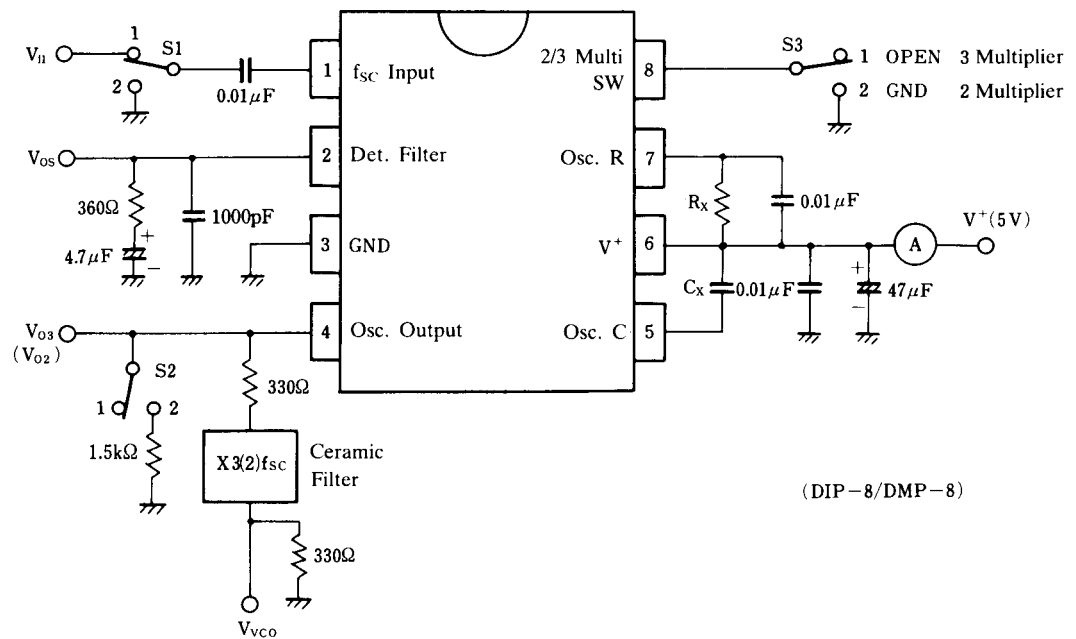
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V ⁺	8	V
Input Voltage	I _o	GND-0.3 to V ⁺ +0.3	V
Power Dissipation	P _D	(DIP8) 500 (DMP8) 300	mW mW
Operating Temperature Range	T _{opr}	-20 to +75	°C
Storage Temperature Range	T _{stg}	-40 to +125	°C

■ ELECTRICAL CHARACTERISTICS

(V⁺=5V, 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=1, 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=1, input Vi1 : 3.58MHz, 1.0V _{p-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, 1.0V _{p-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, 1.0V _{p-p} , V _{O2} (fsc level/2fsc level)	-	-50	-	dB
2fsc Output Duty	D _{2fsc}	S1=1, S2=2, input Vi1 : 3.58MHz, 1.0V _{p-p} , V _{O2} Output signal duty.	45	50	55	%

■ TEST CIRCUIT



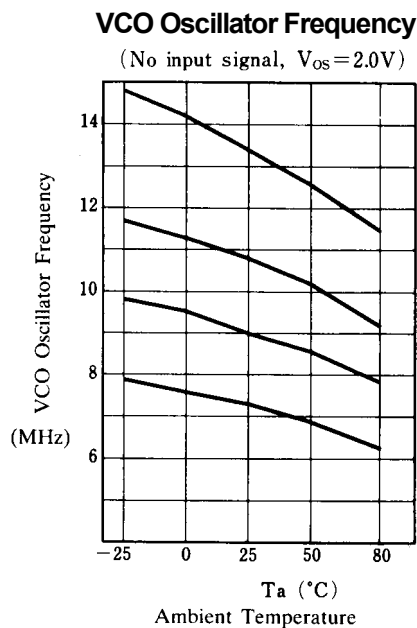
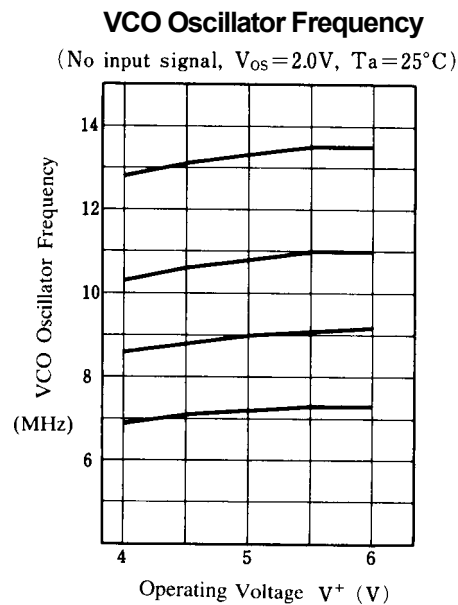
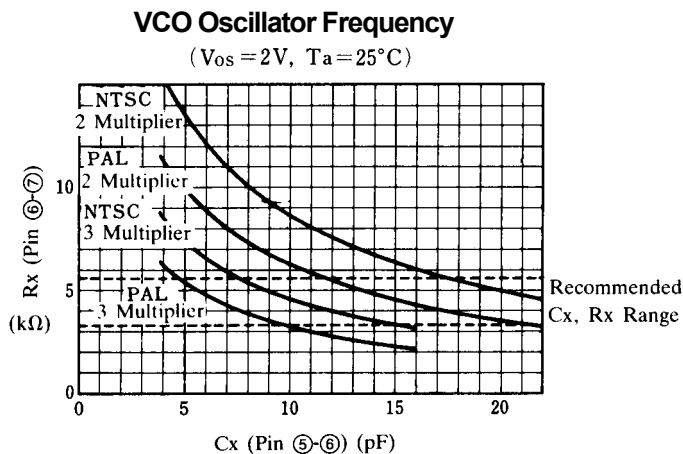
(note 1): R_x , C_x accuracy: less than $\pm 1\%$

(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



[CAUTION]

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