

## NTSC-M/PAL CONVERTOR

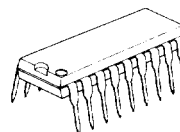
## ■ GENERAL DESCRIPTION

The NJM2218 is a signal processing IC for M/PAL Video signal.

It is possible to convert from NTSC signal to M/PAL signal.

The NJM2218 has functions of Video Sub-Carrier Doubler Block, Synchronous Signal AFC Block, Logic Block, Convert Block and Video Switch Block.

## ■ PACKAGE OUTLINE



NJM2218D

## ■ FEATURES

- 1chip NTSC-M/PAL convertor
- Internal AFC block
- Package Outline DIP18
- Operating Voltage (+4.5V~5.5V)
- Bipolar Technology

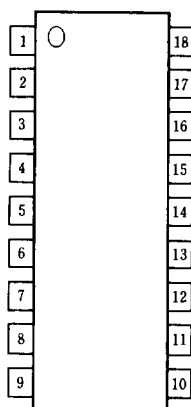
## ■ RECOMMENDED OPERATING CONDITION

- Operating Voltage  $V^+ = +4.5V \sim +5.5V$

## ■ APPLICATION

- TV, VCR

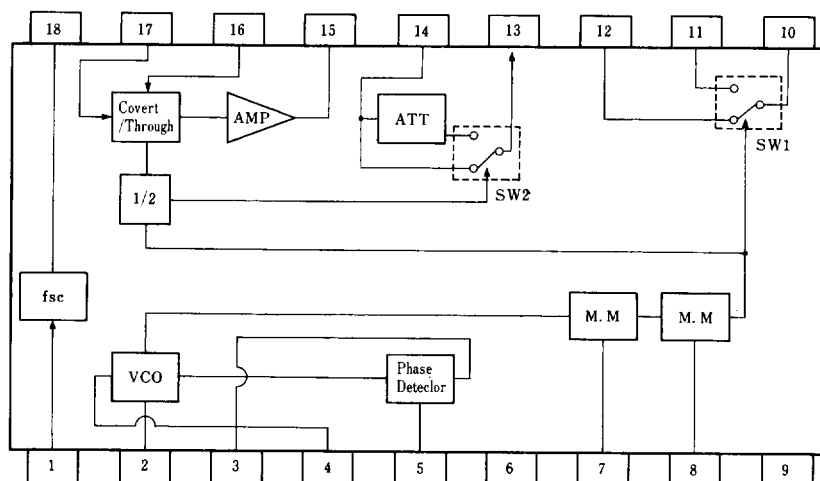
## ■ PIN CONFIGURATION



NJM2218D

- |                       |                            |
|-----------------------|----------------------------|
| 1)fsc Input           | 10)Switch 1                |
| 2)VCO Control         | 11)45deg Phase Shift Input |
| 3)COMP. SYNC' Input   | 12)NTSC Chroma Input       |
| 4)VCO Filter          | 13)M/PAL Output            |
| 5)Phase Detect Filter | 14)Switch 2 Input          |
| 6)V+                  | 15)Convert/Through Output  |
| 7)Mono Multi C/R(1)   | 16)Convert/Through Input   |
| 8)Mono Multi C/R(2)   | 17)BPF Output              |
| 9)GND                 | 18)2fsc Output             |

## ■ BLOCK DIAGRAM





## ■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

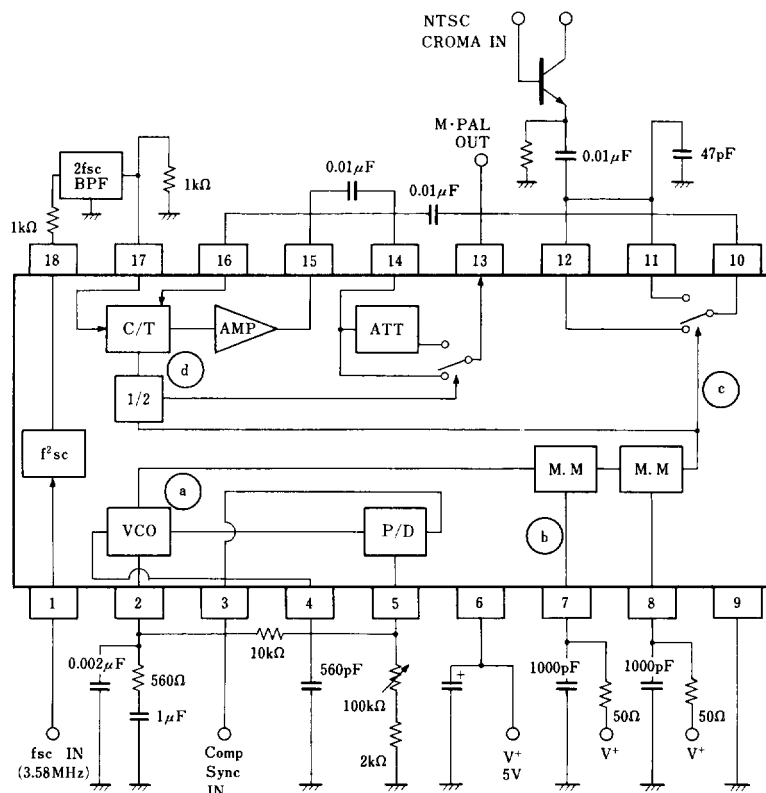
| PARAMETER                   | SYMBOL           | RATINGS    | UNIT |
|-----------------------------|------------------|------------|------|
| Supply Voltage              | V <sup>+</sup>   | +10        | V    |
| Power Dissipation           | P <sub>D</sub>   | 700        | mW   |
| Operating Temperature Range | T <sub>opr</sub> | -20 ~ +75  | °C   |
| Storage Temperature Range   | T <sub>stg</sub> | -40 ~ +125 | °C   |

## ■ ELECTRICAL CHARACTERISTICS

(V<sup>+</sup>=50V, Ta=25°C)

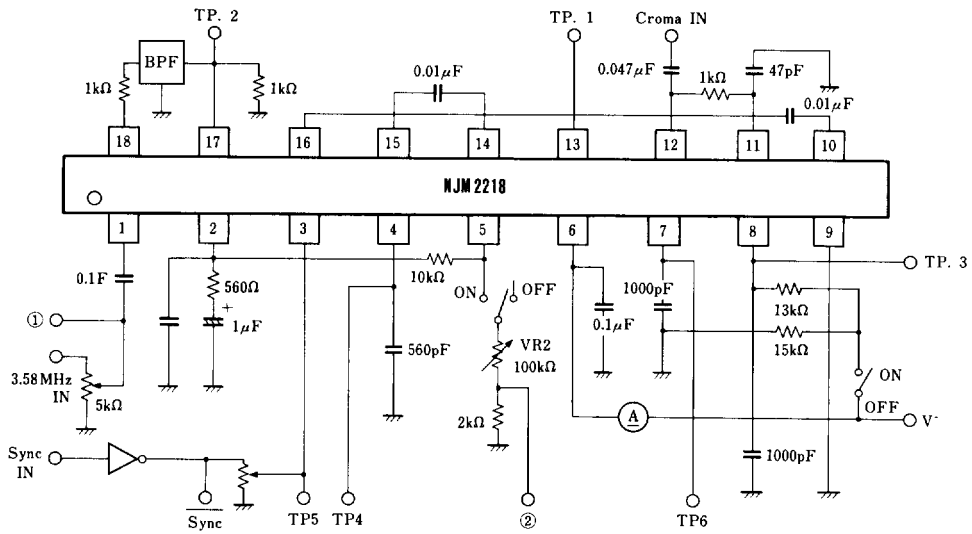
| PARAMETER                    |                    | SYMBOL            | MIN. | TYP. | MAX. | UNIT |
|------------------------------|--------------------|-------------------|------|------|------|------|
| Operating Current            |                    | I <sub>CC</sub>   | —    | 20   | 28   | mA   |
| Signal Doubler Gain          |                    | G <sub>2fsc</sub> | −1.4 | +0.6 | +2.6 | dB   |
| AFC Characteristic           | Free-Run Frequency | f f <sub>H</sub>  | 18.0 | 20.0 | —    | kHz  |
|                              |                    | f f <sub>L</sub>  | —    | 11.0 | 18.5 | kHz  |
|                              | Lock Range         | Δf <sub>L</sub>   | 3.0  | 5.0  | —    | kHz  |
|                              | Capture Range      | Δf <sub>C</sub>   | 0.8  | 1.3  | —    | kHz  |
| Mono Multi Characteristic    | Pulse Deley Time   | P <sub>Dt</sub>   | −0.7 | 3.0  | 13.0 | μs   |
|                              | Pulse Wide (1)     | P <sub>w1</sub>   | 7.0  | 9.0  | 11.0 | μs   |
|                              | Pulse Wide (2)     | P <sub>w2</sub>   | 8.0  | 10.0 | 12.0 | μs   |
| M/PAL Convert Characteristic | Offset Voltage     | Δv                | 0    | 20   | 80   | mV   |
|                              | Gain Difference    | ΔG                | 2.0  | 5.0  | 8.0  | dB   |
|                              | M/PAL Convert Gain | V                 | −3.0 | −1.0 | 1.0  | dB   |
| SyncThreshold Level          |                    | V <sub>S−TH</sub> | 0.7  | 1.4  | 2.0  | V    |

## ■ APPLICATION





■ TEST CIRCUIT





## ■ BLOCK EXPLANATION

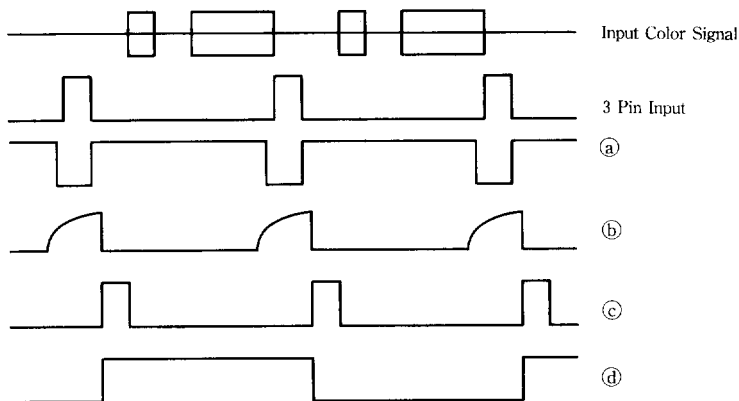
### • AFC, M/M BLOCK

3 Pin input is Positive Composite Sync Signal

2, 4, 5 Pins' external circuit can lock both oscillation of 15.75kHz and sync signal.

Internal temperature coefficient is 0ppm, so please use low drift external parts, especially the condensor (560pF) of 4Pin should be 0ppm/°C

## ■ TIMING CHART



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### • SIGNAL DOUBLER BLOCK

3.58 (fsc)×2=7.16MHz generator

1 Pin: 100~200mVp-p input pin

18 Pin: about +0.6dB (GAIN) output pin

### • SW1 BLOCK

12 Pin: NTSC COLOR SIGNAL (100~200mVp-p) input pin

10 Pin: 45deg Phase shift Color Burst Signal output pin

### • CONVERT/THROUGH, AMPLIFIER, ATT, SW2 BLOCK

16 Pin: NTSC Color Signal (Phase Shift Color Burst) input pin

17 Pin: 7.16MHz (fsc×2) input pin

M/PAL Signal is output from 13 Pin through the Amplifier and ATT Block.