# TV VIDEO MODULATOR

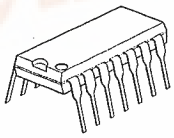
## ■ GENERAL DESCRIPTION

The NJM1372A is an integrated circuit to be used to generate an RF TV signal from baseband color-difference and luminance signals.

The NJM1372A contains a chroma subcarrier oscillator, lead and lag network, a quasi-quadrature suppressed carrier DSB chroma modulator, an RF oscillator and modulator, and a TTL compaible clock driver with adjustable duty cycle.

This device may also be used as a general-purpose modulator with a variety of video signal generating devices such as video games, test equipment, video type recorders, etc.

## ■ PACKAGE OUTLINE

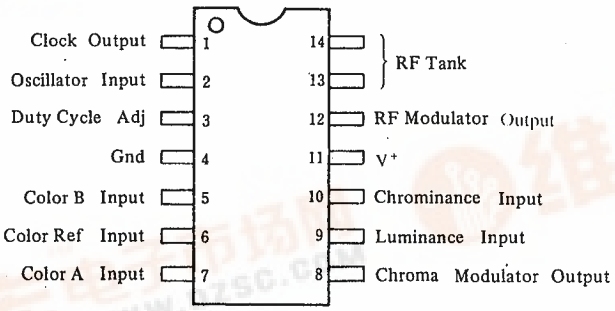


NJM1372AD

## ■ FEATURES

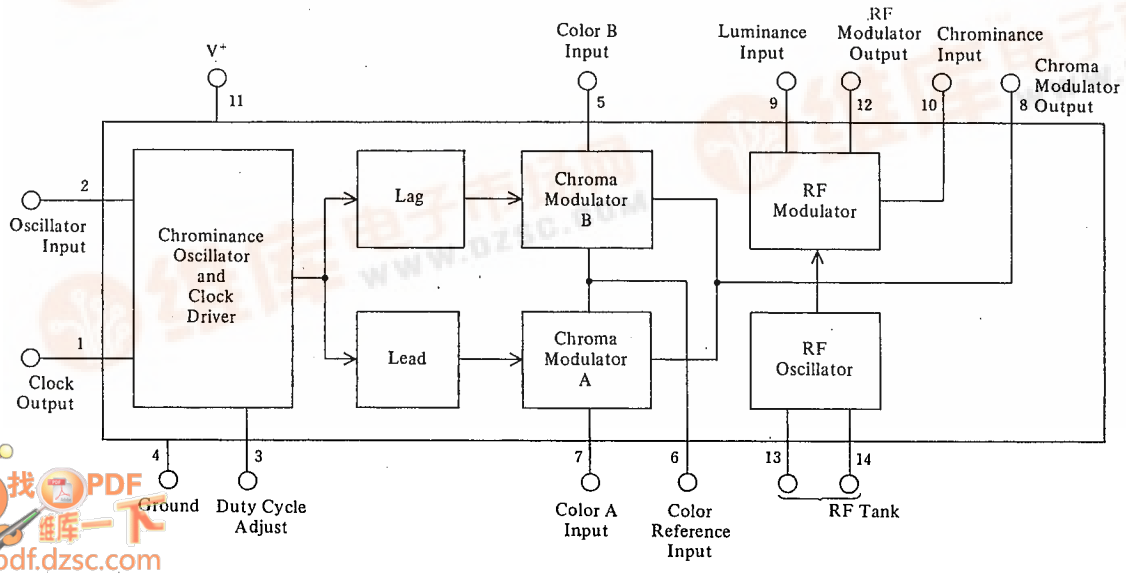
- Operating Voltage (+4.75V～+5.25V)
- Acts by Digital Control Signal
- Minimal External Components
- Composite Video Signal Generation Capability
- Low Power Dissipation
- Linear Chroma Modulators for High Versatility
- Ground-Referenced Video Prevents Over-modulation
- Package Outline DIP-14
- Bipolar Technology

## ■ PIN CONFIGURATION




NJM1372AD

## ■ BLOCK DIAGRAM



## ■ ABSOLUTE MAXIMUM RATINGS

(Ta=25℃)

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---|---|---|---|
| Supply Voltage | $V^+$ | 8 | V |
| Power Dissipation | $P_D$ | 700 | mW |
| Operating Temperature Range | $T_{opr}$ | −20～+75 | ℃ |
| Storage Temperature Range | $T_{stg}$ | −40～+125 | ℃ |

## ■ ELECTRICAL CHARACTERISTICS

(Ta=25℃)

| PARAMETER | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| Operating Voltage | $V^+$ | | 4.75 | 5.0 | 5.25 | V |
| Operating Current | $I_{CC}$ | | — | 25 | — | mA |
| **Chroma Oscillator/Clock Driver (TC1)** | | | | | | |
| Output Voltage | $V_{OL}$ | | — | — | 0.4 | V |
| Output Voltage | $V_{OH}$ | | 2.4 | — | — | V |
| Rise Time | tr | $V_1$=0.4 → 2.4V | — | — | 50 | ns |
| Fall Time | tf | $V_1$=2.4 → 0.4V | — | — | 50 | ns |
| Duty Cycle Adjustment Range | $V_{adj}$ | THreshold Voltage $V_1$=1.4V | 40 | — | 60 | % |
| Inherent Duty Cycle | $V_{OD}$ | | — | 50 | — | % |
| **Chroma Modulator (TC1)** | | | | | | |
| Input Common Voltage Range | | Pin 5, 6, 7 | 0.8 | — | 2.3 | V |
| Oscillator Feedthrough | CL | Pin 8 | — | 15 | 31 | mV |
| Modulation Angle | $C\theta$ | $\theta_8(V_7=2.0V)-\theta_8(V_5=2.0V)$ | 85 | 100 | 115 | degree |
| Conversion Gain | $G_{CC}$ | $V_8/(V_7-V_6)$;$V_8/(V_5-V_6)$ | — | 0.8 | — | $V_{p-p}/V$ |
| Input Current | $I_i$ | Pin 5, 6, 7 | — | — | −20 | μA |
| Input Resistance | $R_i$ | Pin 5, 6, 7 | 100 | — | — | kΩ |
| Input Capacitance | $C_i$ | Pin 5, 6, 7 | — | — | 5 | pF |
| Chroma Modulator Linearity | $L_{cm}$ | Pin 8; $V_5$=1 → 2 V:$V_7$=1 → 2V | — | 4.0 | — | % |
| **RF Modulator (Test Circuit 2)** | | | | | | |
| Luma, Input Dynamic Range | | Pin 9 (TC2) | 0 | — | 1.5 | V |
| RF Output Voltage | $V_{RF}$ | f=67.25MHz, $V_9$=1.0V (TC1) | — | 30 | — | mVrms |
| Luma Conversion Gain | $G_{LV}$ | ($\Delta V_{12}/\Delta V_9$:$V_9$=0.1 → 1.0V) (TC2) | — | 0.7 | — | V/V |
| Chroma Conversion Gain | $G_{CV}$ | ($\Delta V_{12}/\Delta V_{10}$:$V_{10}$=1.5$V_{PP}$, $V_9$=1.0V) (TC2) | — | 0.9 | — | V/V |
| Chroma Linearity | $L_C$ | Pin 12 $V_{10}$=1.5$V_{PP}$ (TC2) | — | 1.0 | — | % |
| Luma Linearity | $L_L$ | Pin 12 $V_9$=0 → 1.5V (TC2) | — | 2.0 | — | % |
| Input Current | $I_i$ | Pin 9 | — | — | −20 | μA |
| Input Resistance | $R_i$ | Pin 10 | — | 800 | — | Ω |
| Input Resistance | $R_i$ | Pin 9 | 100 | — | — | kΩ |
| Input Capacitance | $C_i$ | Pin 9, 10 | — | — | 5 | pF |
| Output Current | $I_o$ | Pin 12 (TC2) | — | 0.9 | — | mA |
| Residual 920kHz | B | Pin 12 $V_9$=1V (TC1) | — | 50 | — | dB |
| | | $V_C$=300mV/3.58MHz; $V_S$=250mV/4.5MHz | | | | |

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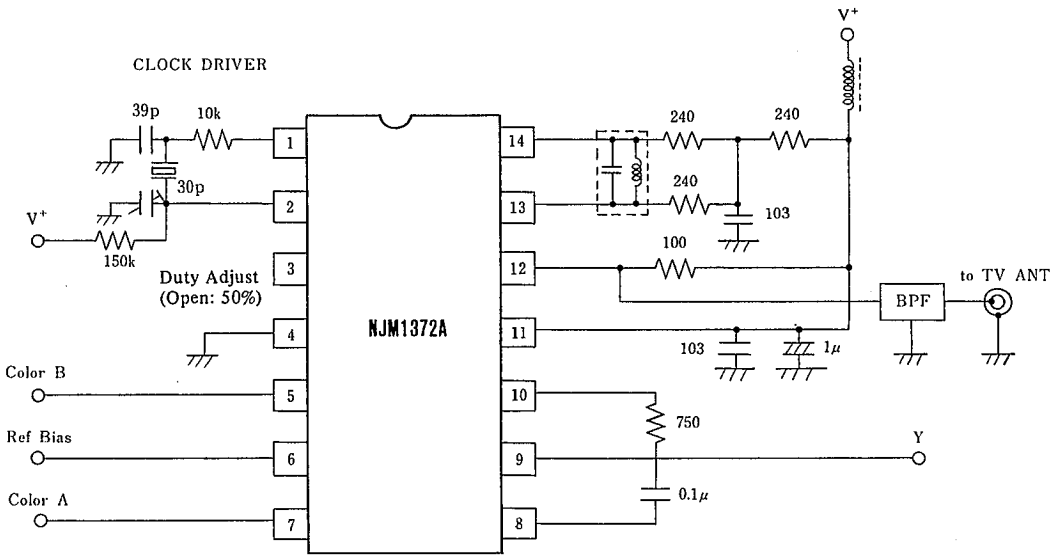
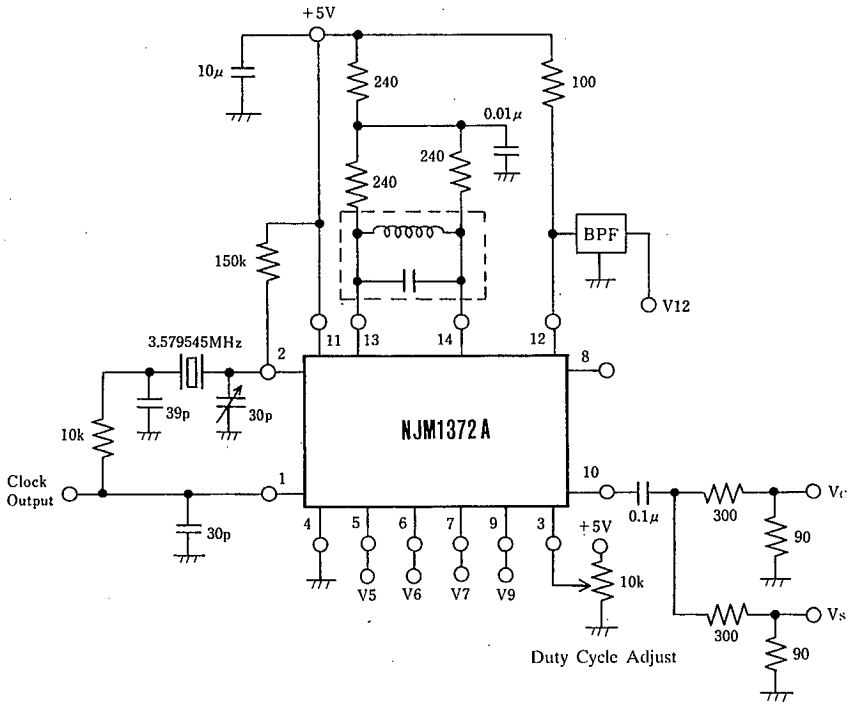
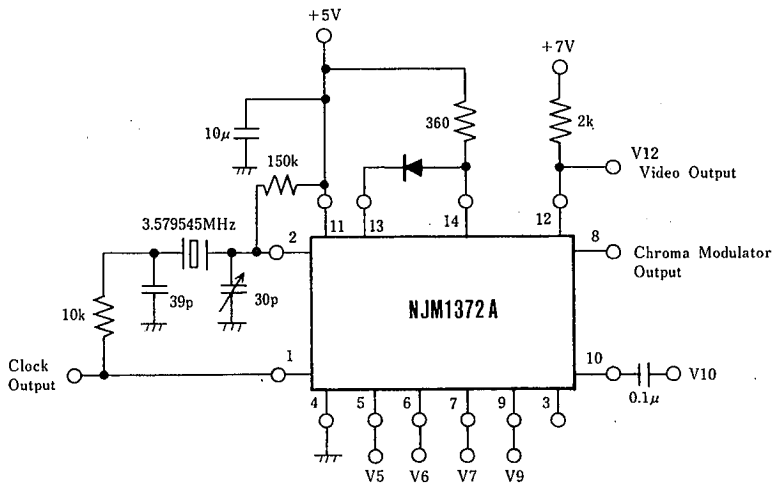
## ■ TYPICAL APPLICATION CIRCUIT



## TEST CIRCUIT 1




## TEST CIRCUIT 2



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