

## TV VIDEO MODULATOR

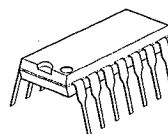
### ■ GENERAL DESCRIPTION

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 compatible 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

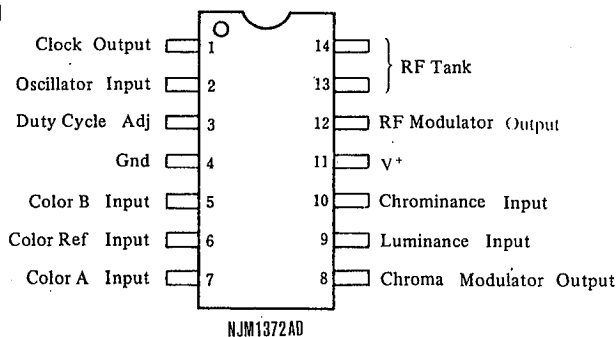


NJM1372AD

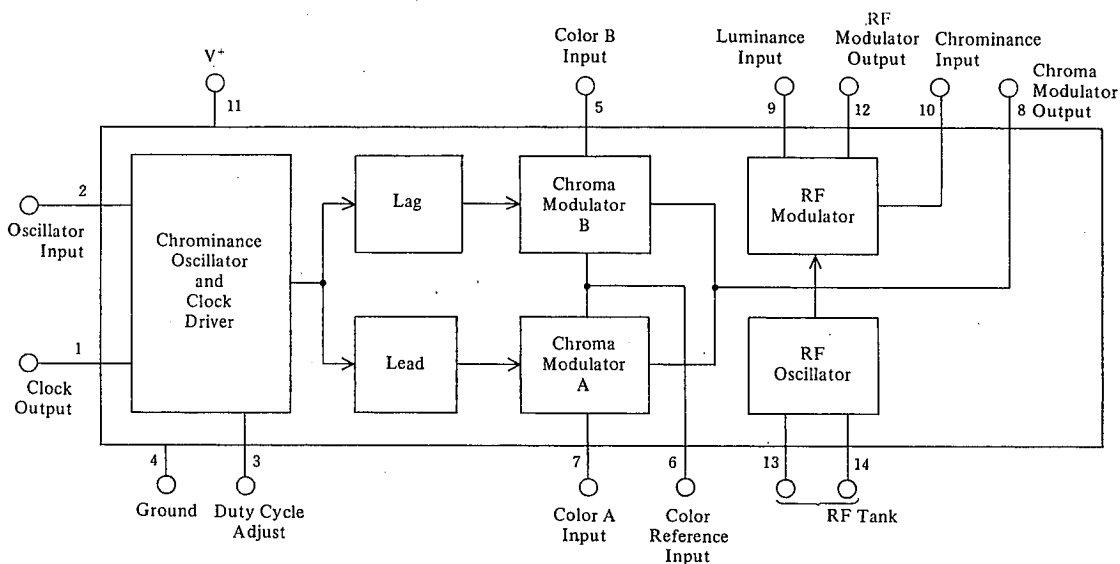
### ■ FEATURES

- 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



### ■ BLOCK DIAGRAM



## ■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V+	8	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

(Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Voltage	V+		4.75	5.0	5.25	V
Operating Current	I <sub>CC</sub>		—	25	—	mA

### Chroma Oscillator/Clock Driver (TC1)

Output Voltage	V <sub>OL</sub>		—	—	0.4	V
Output Voltage	V <sub>OH</sub>		2.4	—	—	V
Rise Time	t <sub>r</sub>	V <sub>i</sub> =0.4 → 2.4V	—	—	50	ns
Fall Time	t <sub>f</sub>	V <sub>i</sub> =2.4 → 0.4V	—	—	50	ns
Duty Cycle Adjustment Range	V <sub>aj</sub>	THreshold Voltage V <sub>i</sub> =1.4V	40	—	60	%
Inherent Duty Cycle	V <sub>OD</sub>		—	50	—	%

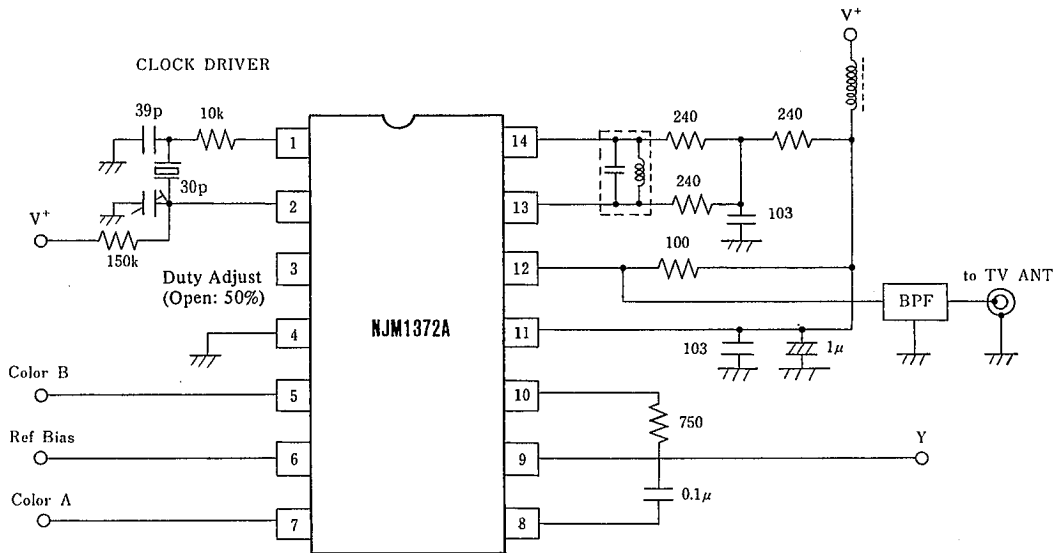
### Chroma Modulator (TC1)

Input Common Voltage Range		Pin 5, 6, 7	0.8	—	2.3	V
Oscillator Feedthrough	CL	Pin 8	—	15	31	mV
Modulation Angle	Cθ	θ <sub>k</sub> (V <sub>7</sub> =2.0V) - θ <sub>k</sub> (V <sub>5</sub> =2.0V)	85	100	115	degree
Conversion Gain	G <sub>CC</sub>	V <sub>8</sub> /(V <sub>7</sub> -V <sub>6</sub> ); V <sub>8</sub> /(V <sub>5</sub> -V <sub>6</sub> )	—	0.8	—	V <sub>p-p</sub> /V
Input Current	I <sub>i</sub>	Pin 5, 6, 7	—	—	-20	μA
Input Resistance	R <sub>i</sub>	Pin 5, 6, 7	100	—	—	kΩ
Input Capacitance	C <sub>i</sub>	Pin 5, 6, 7	—	—	5	pF
Chroma Modulator Linearity	L <sub>cm</sub>	Pin 8; V <sub>5</sub> =1 → 2V; V <sub>7</sub> =1 → 2V	—	4.0	—	%

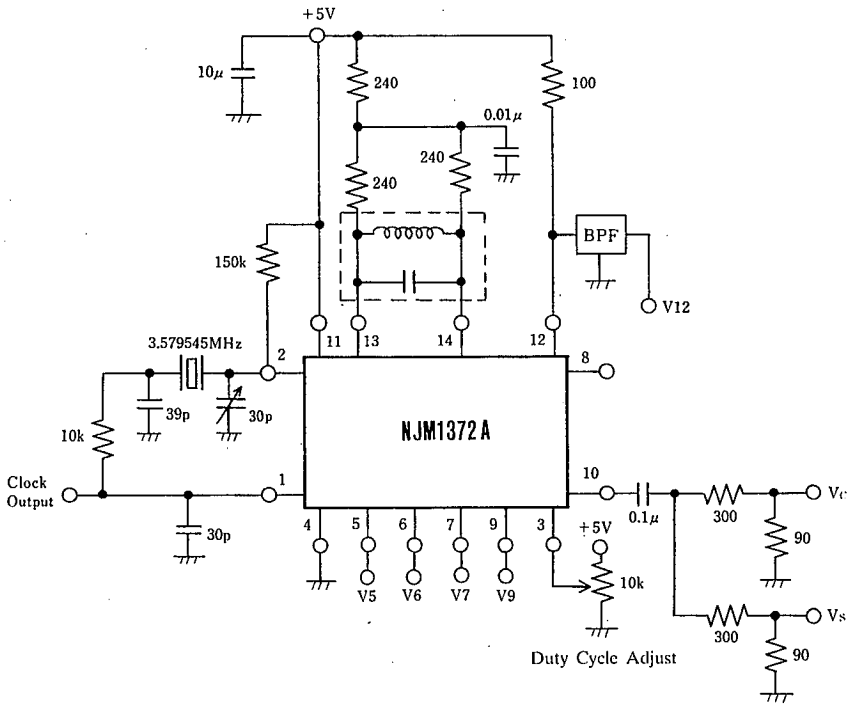
### RF Modulator (Test Circuit 2)

Luma Input Dynamic Range		Pin 9	(TC2)	0	—	1.5	V
RF Output Voltage	V <sub>RF</sub>	f=67.25MHz, V <sub>9</sub> =1.0V	(TC1)	—	30	—	mVrms
Luma Conversion Gain	G <sub>LV</sub>	(ΔV <sub>i2</sub> /ΔV <sub>9</sub> ; V <sub>9</sub> =0.1 → 1.0V)	(TC2)	—	0.7	—	V/V
Chroma Conversion Gain	G <sub>CV</sub>	(ΔV <sub>i2</sub> /ΔV <sub>10</sub> ; V <sub>10</sub> =1.5V <sub>pp</sub> , V <sub>9</sub> =1.0V)	(TC2)	—	0.9	—	V/V
Chroma Linearity	L <sub>C</sub>	Pin 12 V <sub>10</sub> =1.5V <sub>pp</sub>	(TC2)	—	1.0	—	%
Luma Linearity	L <sub>L</sub>	Pin 12 V <sub>9</sub> =0 → 1.5V	(TC2)	—	2.0	—	%
Input Current	I <sub>i</sub>	Pin 9		—	—	-20	μA
Input Resistance	R <sub>i</sub>	Pin 10		—	800	—	Ω
Input Resistance	R <sub>i</sub>	Pin 9		100	—	—	kΩ
Input Capacitance	C <sub>i</sub>	Pin 9, 10		—	—	5	pF
Output Current	I <sub>o</sub>	Pin 12	(TC2)	—	0.9	—	mA
Residual 920kHz	B	Pin 12 V <sub>9</sub> =1V	(TC1)	—	50	—	dB
		V <sub>C</sub> =300mV/3.58MHz; V <sub>S</sub> =250mV/4.5MHz					

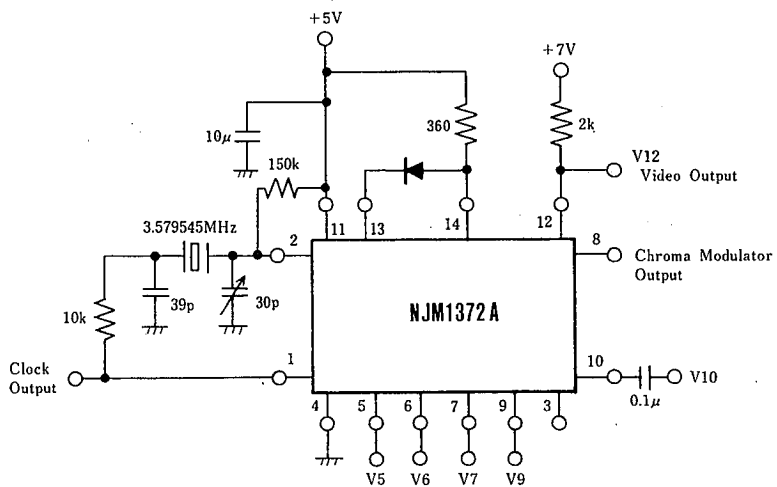
## ■ TYPICAL APPLICATION CIRCUIT



## TEST CIRCUIT 1



## TEST CIRCUIT 2



## MEMO

[CAUTION]

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