

## 47 $\mu$ F AC-Coupling Capacitor 3-Input 1-Output Video Driver with LPF

### GENERAL DESCRIPTION

The **NJM41050** is a 3-Input 1-Output general-purpose video switch. It includes 6dB amplifier and 75ohm driver circuit. The NJRC original Technology "ASC(Advanced SAG Correction)" realizes 47 $\mu$ F AC-Coupling Capacitor which enables to downsize mounting space.

### PACKAGE OUTLINE

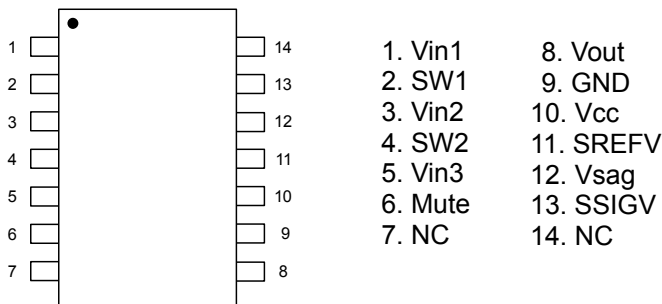


**NJM41050V**

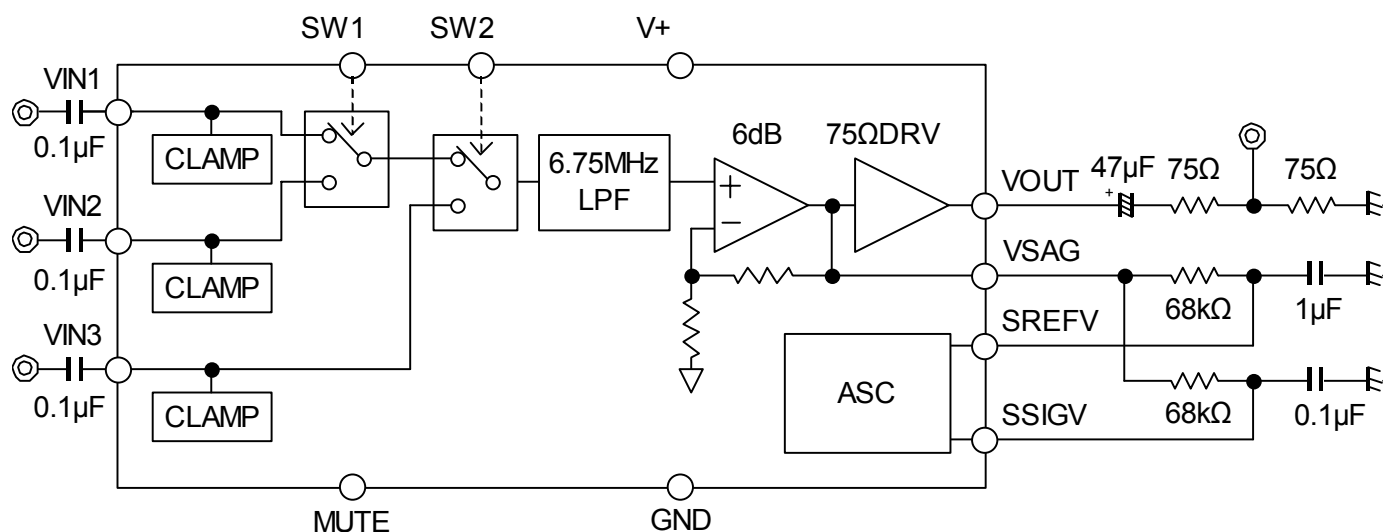
### FEATURES

- Operating Voltage 4.5 to 9.5V
  - Small output coupling capacitor 47 $\mu$ F
  - Operating temperature range -40 to +85 °C\*
  - 3-Input 1-Output Video Switch
  - 6dB Amplifier, 75 $\Omega$  Driver Circuit
  - Internal LPF 0dBtyp.at 6.75MHz  
-40dBtyp.at 27MHz
  - Internal MUTE Circuit
  - Bipolar Technology
  - Package SSOP14
- \* NJM41050VT : Wide operating temperature range type (-40 to +105°C)

### PIN CONFIGURATION



### BLOCK DIAGRAM



# NJM41050

## ■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETERS	SYMBOL	RATINGS	UNIT
Supply Voltage	V+	13.0	V
Power Dissipation	P <sub>D</sub>	500 (Note1)	mW
Operating Temperature Range	Topr	-40 to +85(Note2)	°C
Storage Temperature Range	Tstg	-40 to +150	°C

(Note 1) At on a board of EIA/JEDEC specification. (114.3 x 76.2 x 1.6mm 2 layers, FR-4)

(Note 2) It has high operating temperature range product. (-40 to +105°C)

## ■ RECOMMENDED OPERATING CONDITION (Ta= 25 °C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Voltage	Vopr		+4.5	+5.0	+9.5	V

## ■ ELECTRICAL CHARACTERISTICS (Vcc= 5.0V, R<sub>L</sub>= 150Ω, Ta= 25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Current	I <sub>cc</sub>	No signal	-	15	22	mA
Supply Current at MUTE Mode	I <sub>save</sub>	MUTE mode	-	1.5	2.4	mA
Voltage Gain	G <sub>v</sub>	Vin=1MHz, 1.0Vp-p sin-signal	5.5	6.0	6.5	dB
Maximum Output Level	Vom	Vin=100kHz, sin-signal, THD=1%,	2.2	-	-	Vp-p
Low Pass Filter Characteristic	Gf6.75M	Vin=6.75MHz/1MHz, 1.0Vpp sin-signal	-1.0	0	+1.0	dB
	Gf27 M	Vin=27MHz/1MHz, 1.0Vpp sin-signal	-	-40	-24	dB
Channel Cross talk	CT	Vin=4.43MHz, 1.0Vp-p, Sine-wave	-	-80		dB
Differential Gain	DG	Vin=1.0Vp-p 10step video signal	-	0.5	-	%
Differential Phase	DP	Vin=1.0Vp-p 10step video signal	-	0.5	-	deg
SW Sink Current High Level	I <sub>thH</sub>	V=5V	-	-	300	μA
SW Sink Current Low Level	I <sub>thL</sub>	V=0.3V	-	-	5	μA
SW Voltage High Level	V <sub>thH</sub>	SW1, SW2, MUTE	2.0	-	V <sup>+</sup>	V
SW Voltage Low Level	V <sub>thL</sub>	SW1, SW2, MUTE	0	-	1.0	V

## ■ SWITCH FUNCTION

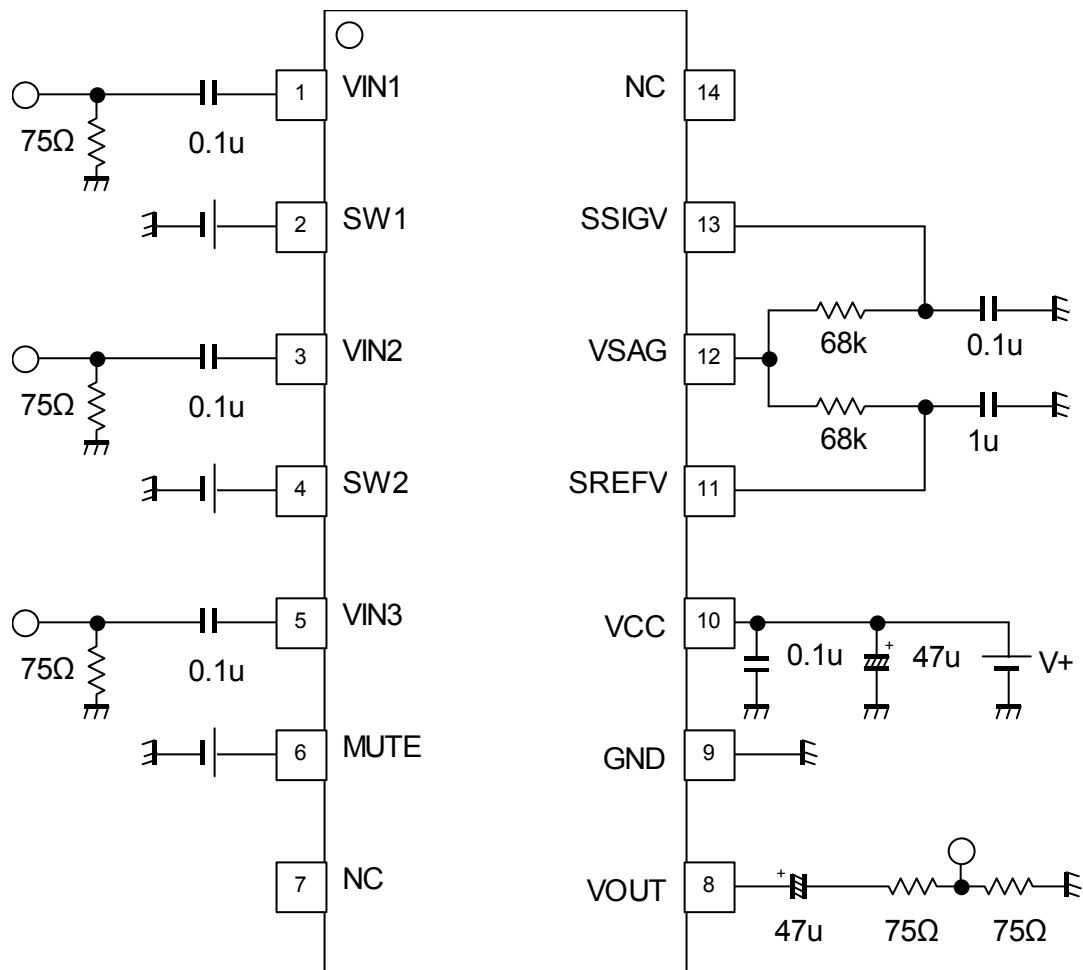
PIN	MODE	NOTE
SW1	H	IN2 output
	L	IN1 output
	OPEN	IN1 output

PIN	MODE	NOTE
SW2	H	IN3 output
	L	IN1 or IN2 output
	OPEN	IN1 or IN2 output

PIN	MODE	NOTE
MUTE	H	ACTIVE
	L	MUTE
	OPEN	MUTE

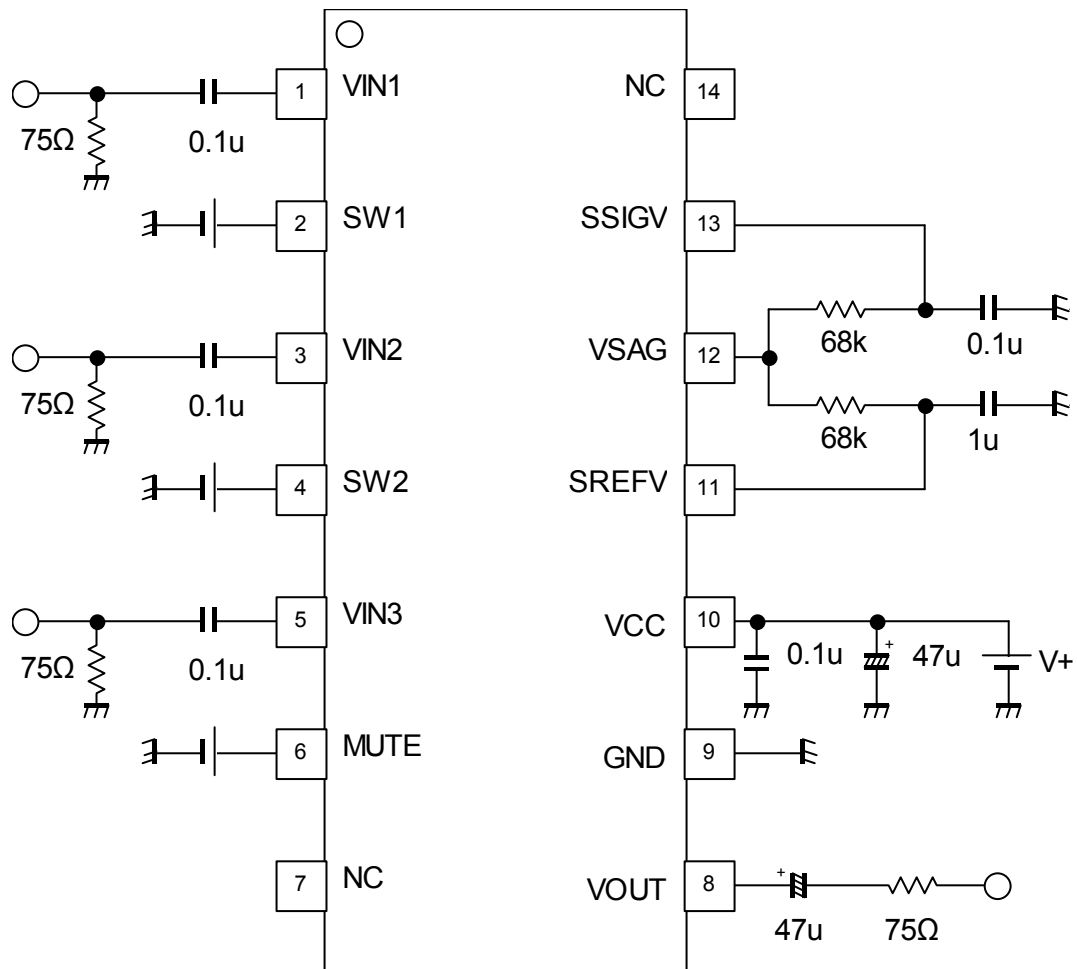
	SW1	SW2	MUTE
IN1 select	L(OPEN)	L(OPEN)	H
IN2 select	H	L(OPEN)	H
IN3 select	-	H	H
MUTE	-	-	L(OPEN)

## TEST CIRCUIT



# NJM41050

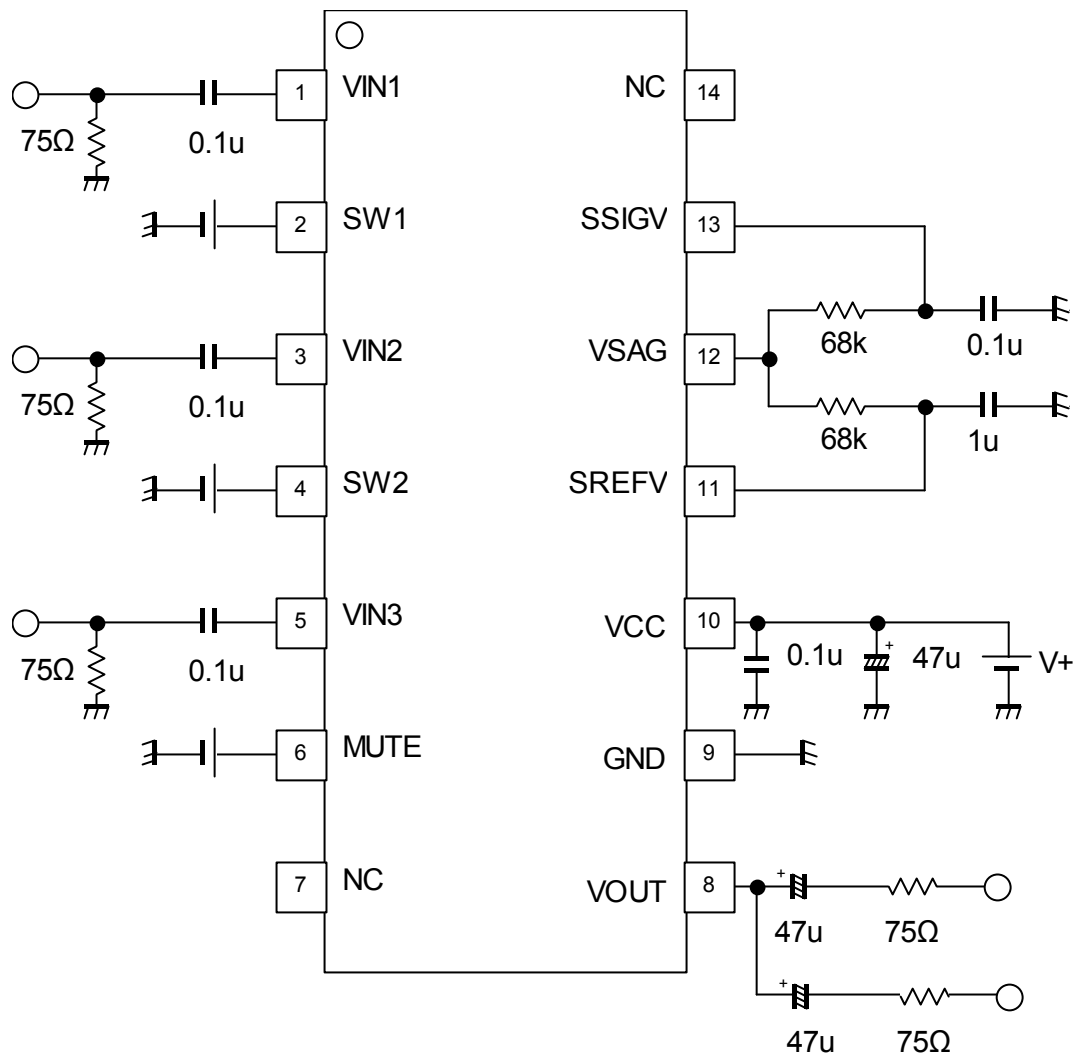
## APPLICATION CIRCUIT 1



## APPLICATION NOTE

NJM41050 has possibilities that decrease in the capacitance in low-frequency band when the ceramic capacitor is used(pin8). It is a possibility that the sag is generated when the ceramic capacitor decreases capacity. Please verify it in consideration of the capacity drop of the ceramic capacitor.

## APPLICATION CIRCUIT 2



### APPLICATION NOTE

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## ◆Clamp circuit

### 1. Operation of Sync-tip-clamp

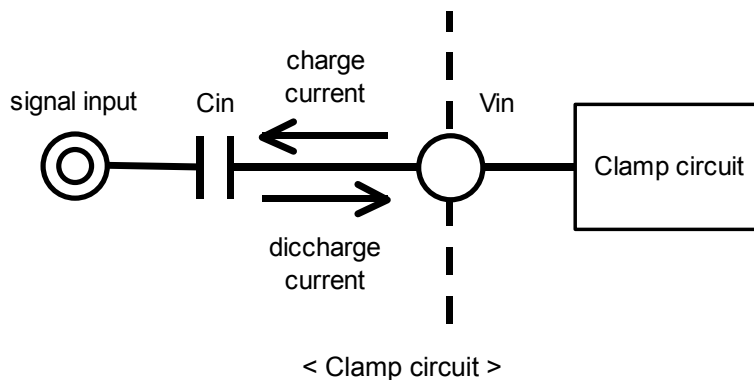
Input circuit will be explained. Sync-tip clamp circuit (below the clamp circuit) operates to keep a sync tip of the minimum potential of the video signal. Clamp circuit is a circuit of the capacitor charging and discharging of the external input  $C_{in}$ . It is charged to the capacitor to the external input  $C_{in}$  at sync tip of the video signal. Therefore, the potential of the sync tip is fixed.

And it is discharged charge by capacitor  $C_{in}$  at period other than the video signal sync tip. This is due to a small discharge current to the IC.

In this way, this clamp circuit is fixed sync tip of video signal to a constant potential from charging of  $C_{in}$  and discharging of  $C_{in}$  at every one horizontal period of the video signal.

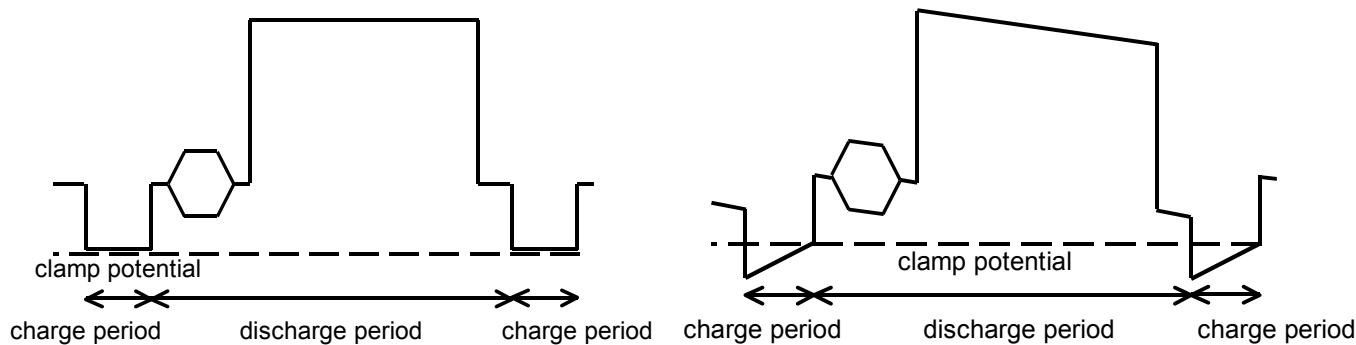
The minute current be discharged an electrical charge from the input capacitor at the period other than the sync tip of video signals. Decrease of voltage on discharge is dependent on the size of the input capacitor  $C_{in}$ .

If you decrease the value of the input capacitor, will cause distortion, called the H sag. Therefore, the input capacitor recommend on more than 0.1 $\mu$ F.



A.  $C_{in}$  is large

B.  $C_{in}$  is small (H sag experience)



< Waveform of input terminal >

### 2. Input impedance

The input impedance of the clamp circuit is different at the capacitor discharge period and the charge period.

The input impedance of the charging period is a few  $k\Omega$ . On the other hand, the input impedance of the discharge period is several  $M\Omega$ . Because is a small discharge-current through to the IC.

Thus the input impedance will vary depending on the operating state of the clamp circuit.

### 3. Impedance of signal source

Source impedance to the input terminal, please lower than  $200\Omega$ . A high source impedance, the signal may be distorted. If so, please to connect a buffer for impedance conversion.

[CAUTION]  
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