

# KA8405

## 3-INPUT SWITCH

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The KA8405 is a monolithic integrated circuit designed for the 3-input switch in a VCR or a TV system.

### FEATURES

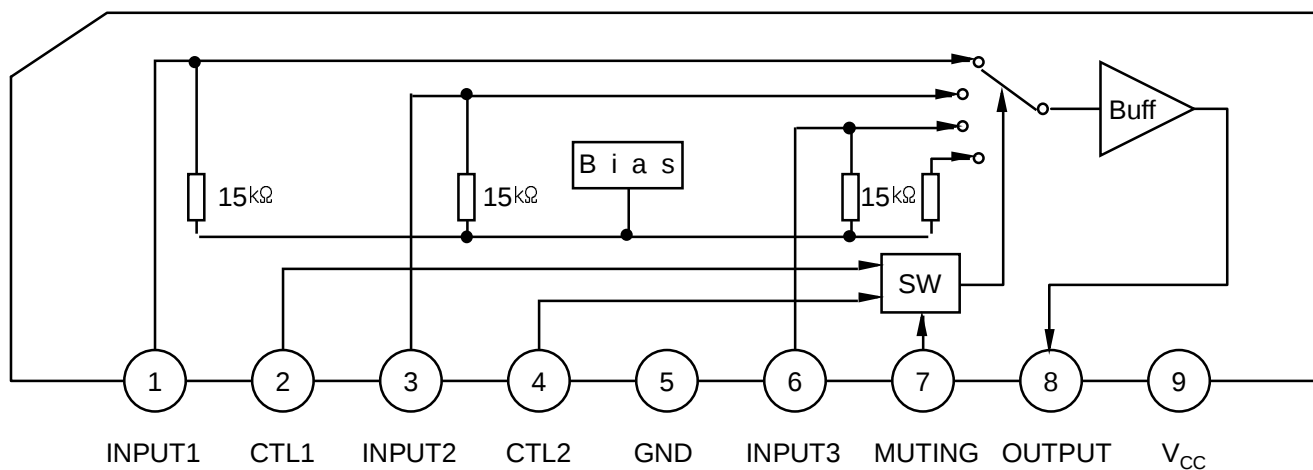
- Suitable for video and audio signal
- Low current operation ( 5.6mA typ )
- Very low level crosstalk ( - 70dB typ )

9- SIP

### ORDERING INFORMATION

| Device | Package | Operating Temperature |
|--------|---------|-----------------------|
| KA8405 | 9-SIP   | - 10 °C ~ + 75 °C     |

### BLOCK DIAGRAM



## TRUTH TABLE

| CTL1 | CTL2 | MUTING | OUTPUT    |
|------|------|--------|-----------|
| H    | L    | L      | INPUT 1   |
| L    | H    | L      | INPUT 2   |
| L    | L    | L      | INPUT 3   |
| H    | H    | L      | Undefined |
| *    | *    | H      | NONE      |

\* Don't care

## PIN DESCRIPTIONS

| PIN NO | FUNCTION           | DC VOLTAGE                          | IN / OUT CIRCUIT |
|--------|--------------------|-------------------------------------|------------------|
| 1      | INPUT1             | 6.1V                                |                  |
| 2      | CONTROL<br>INPUT 1 | Logic Low<br>Logic High<br>(Note 6) |                  |
| 3      | INPUT2             | 6.1V                                | SAME AS PIN 1    |
| 4      | CONTROL<br>INPUT 2 | Logic Low<br>Logic High (Note 6)    | SAME AS PIN 2    |
| 5      | GND                |                                     |                  |
| 6      | INPUT 3            | 6.1V                                | SAME AS PIN 1    |
| 7      | MUTING             | Logic Low, Logic High (Note 6)      | SAME AS PIN 2    |
| 8      | OUTPUT             | 5.3V                                |                  |
| 9      | Vcc                | 9.0V                                |                  |

Note 6 : Logic Low &lt; 2.7V, Logic High &gt; 3.7V

## ABSOLUTE MAXIMUM RATINGS

| Characteristic            | Symbol             | Value                                  | Unit            |
|---------------------------|--------------------|----------------------------------------|-----------------|
| Supply Voltage            | V <sub>ccmax</sub> | 14                                     | V               |
| Signal Level At Input Pin | V <sub>input</sub> | 5                                      | V <sub>pp</sub> |
|                           | V <sub>ct1</sub>   | $V_{cc} - 0.2 < V_{cc} < V_{cc} + 0.2$ | V               |
| Power Dissipation         | P <sub>dmax</sub>  | 500                                    | mW              |
| Operating Temperature     | T <sub>opr</sub>   | - 20 ~ 75                              | °C              |
| Storage Temperature       | T <sub>stg</sub>   | - 40 ~ 125                             | °C              |

ELECTRICAL CHARACTERISTICS ( V<sub>cc</sub> = 9V, T<sub>a</sub> = 25 °C)

| Characteristic           | Symbol           | Test Conditions                                                                                            | Min   | Typ   | Max  | Unit            |
|--------------------------|------------------|------------------------------------------------------------------------------------------------------------|-------|-------|------|-----------------|
| Supply Voltage           | V <sub>cc</sub>  | Note 1                                                                                                     | 8.0   | 9.0   | 10.0 | V               |
| Total current            | I <sub>cc</sub>  | SW1 ~ SW6 = "2"                                                                                            | 4.2   | 5.6   | 8.2  | mA              |
| Frequency Characteristic | GF1              | V <sub>i</sub> = 2.5V <sub>pp</sub> , 20Hz / 100KHz<br>V <sub>o</sub> ( 20Hz ) / V <sub>o</sub> ( 100KHz ) | - 0.5 | 0     | 0.5  | dB              |
|                          | GF2              | V <sub>i</sub> = 2.5V <sub>pp</sub> , 20Hz / 100KHz<br>V <sub>o</sub> ( 20Hz ) / V <sub>o</sub> ( 100KHz ) |       |       |      |                 |
| Insertion Loss           | GL               | V <sub>i</sub> = 2.5V <sub>pp</sub> 100KHz, V <sub>o</sub> / V <sub>i</sub>                                | - 0.5 | - 0.3 | 0    | dB              |
| Distortion               | THD              | V <sub>i</sub> = 2.5V <sub>pp</sub> , 1KHz                                                                 | 0     | 0.2   | 0.5  | %               |
| Differential Gain        | DG               | V <sub>i</sub> = Input Waveform 1 (Note 2)                                                                 | -     | 0.5   | -    | %               |
| Differential Phase       | DP               | V <sub>i</sub> = Input Waveform 1 (Note 2)                                                                 | -     | 0.5   | -    | deg             |
| Output Offset Voltage    | V <sub>os</sub>  | Note 3                                                                                                     | - 50  | 0     | + 50 | mV              |
| Cross - Talk             | C <sub>R1</sub>  | V <sub>i</sub> = 2.0pp 4.43MHz                                                                             | -     | - 70  | - 60 | dB              |
| SW Control Voltage       | V <sub>CON</sub> | Note 4                                                                                                     | 2.7   | 3.2   | 3.7  | V               |
| Muting Capacity          | C <sub>TM</sub>  |                                                                                                            |       | - 50  | - 40 | dB              |
| Video Output Level       | V <sub>OUT</sub> | V <sub>i</sub> = 2.0pp 100KHz, V <sub>o</sub>                                                              | 1.89  | 1.93  | 2.00 | V <sub>pp</sub> |
| Input Impedance          | R <sub>i</sub>   |                                                                                                            |       | 15    |      | kΩ              |
| Output Impedance         | R <sub>o</sub>   |                                                                                                            |       | 10    |      | Ω               |

Note 1 : Supply Voltage means a recommended operation range but spec data guarantee.

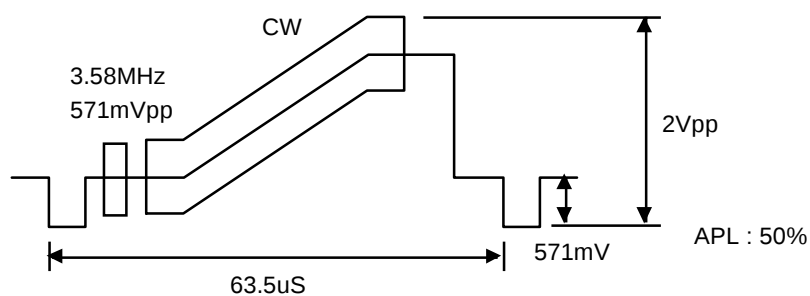
Note 2 : Not set system guaranteed but IC test program guaranteed

Note 3 : In SW1=SW2=SW3=2, SW4=1 → SW5=SW6=2 etc., read the difference of output DC voltage.

Note 4 : Guaranteed switching level (Active & Non-active)

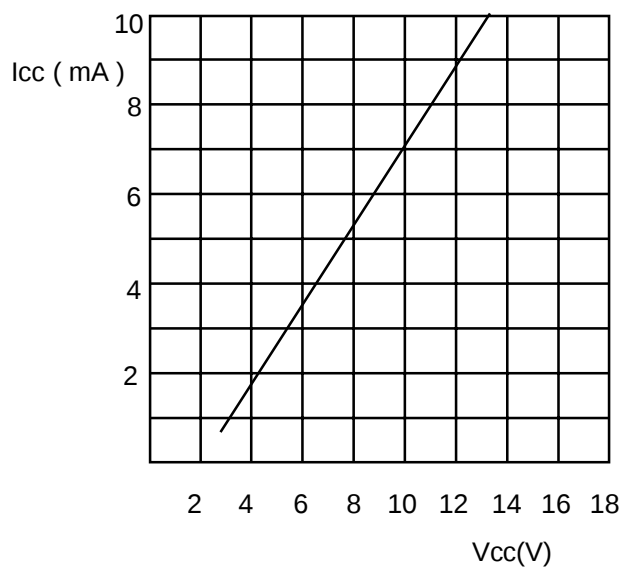
Note 5 : Specifications are subject to change without notice.

## INPUT WAVEFORM 1

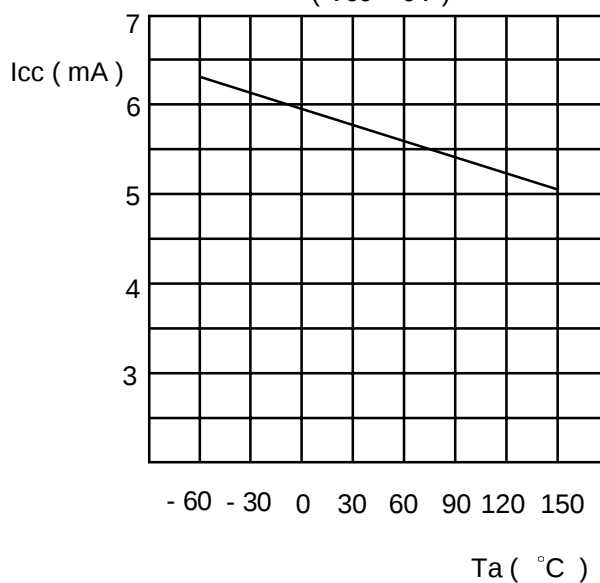


## CHARACTERISTICS GRAPH

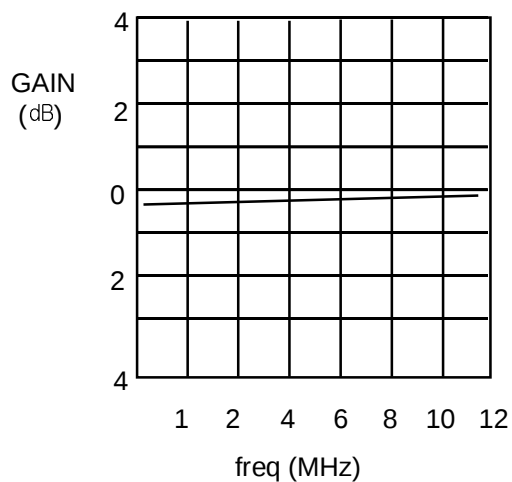
$V_{CC}$  vs  $I_{CC}$   
( $T_a = 25^\circ\text{C}$ )



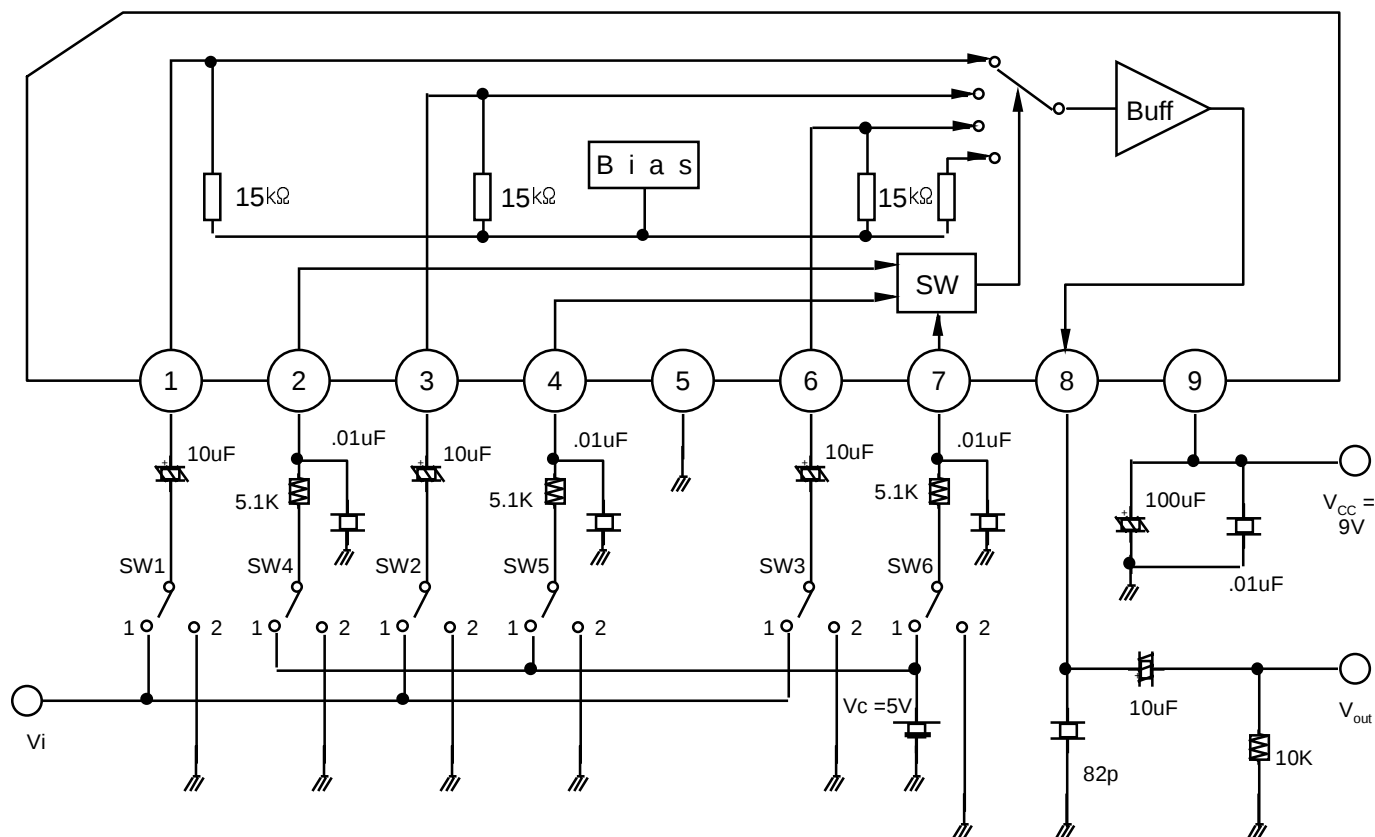
$T_a$  vs  $I_{CC}$   
( $V_{CC} = 9\text{V}$ )



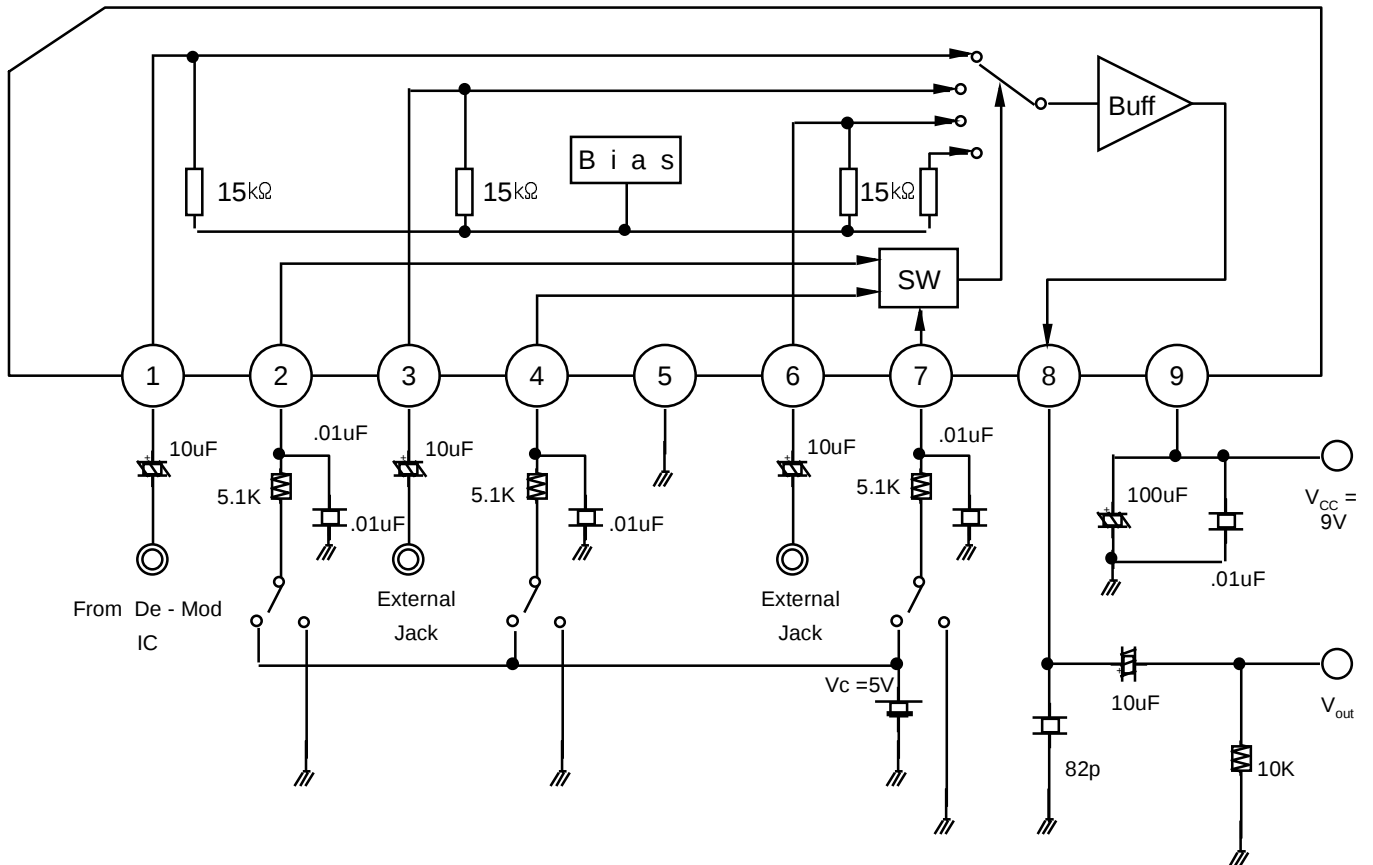
## FREQUENCY RESPONSE



## TEST CIRCUIT

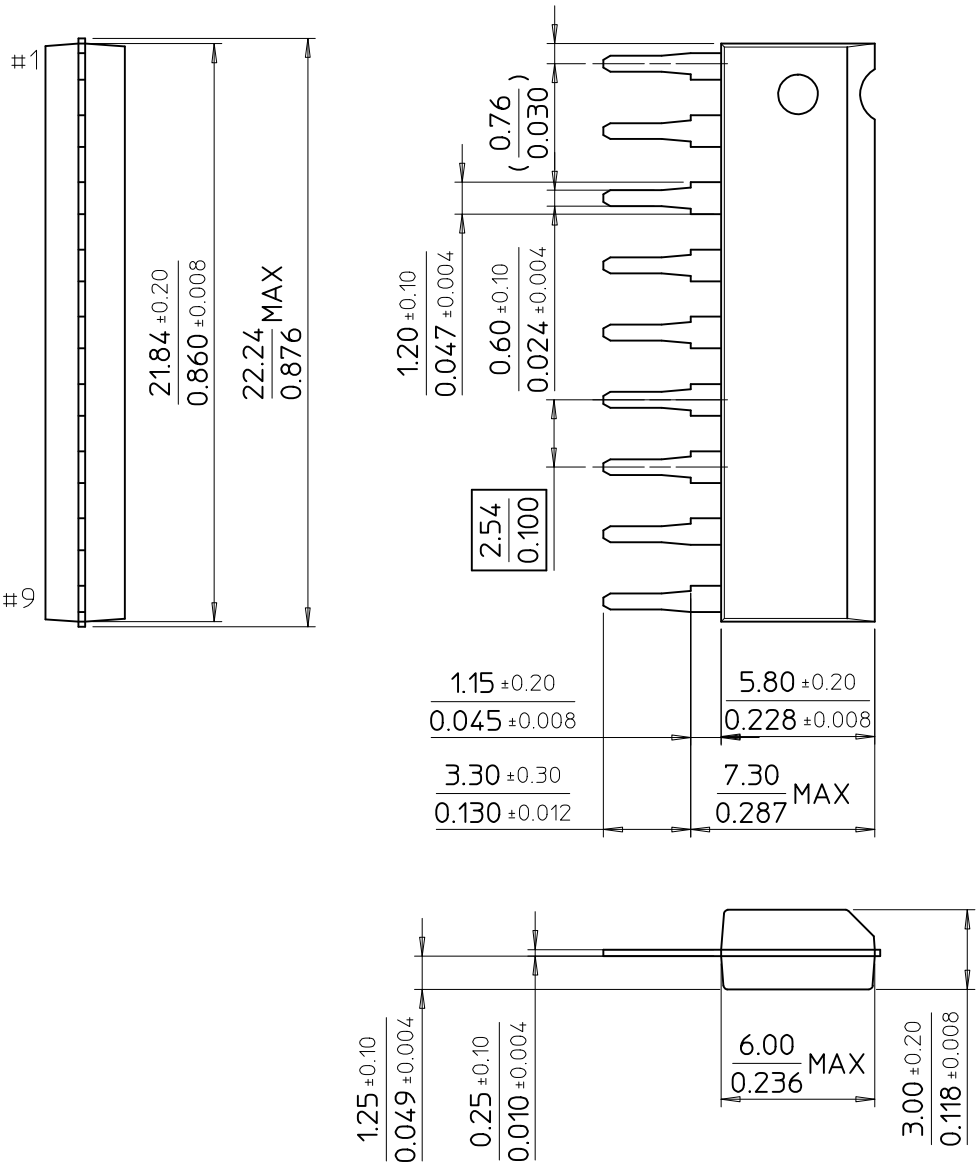


## APPLICATION CIRCUIT



# 9-SIP

Dimensions in Milimeters/Inches



SAMSUNG ELECTRONICS CO.,LTD.