

# Superimpose Monolithic IC MM1166

## Outline

This is a superimpose IC that supports S-VHS, with 1 circuit for Y signals and 1 circuit for C signals, with built-in character level and border level. The level is suppressed to eliminate the problem of spike noise generated when switching between input video signal and character signal.

## Features

1. Supports S-VHS
2. Built-in character and border levels
3. Frequency response            Y : 10MHz    C : 5MHz
4. Input/output signal                1V<sub>P-P</sub>
5. Operating power supply voltage range    4.5~5.5V

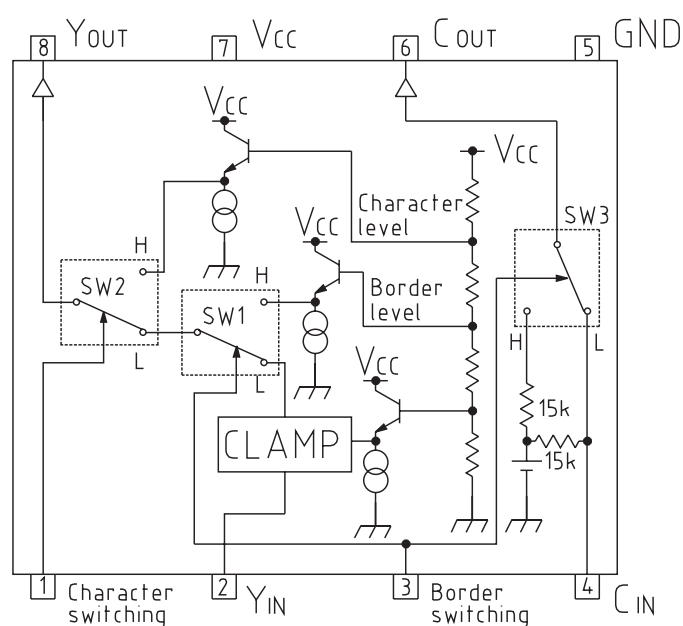
## Package

SOP-8C (MM1166XF)

## Applications

1. TV
2. VCR
3. VCR with camera

## Block Diagram



Pin Description

| Pin no. | Pin name            | Internal equivalent circuit diagram | Pin Description  |
|---------|---------------------|-------------------------------------|--|
| 1       | Character switching |                                     | Input pin for pulse that switches input signal and character signal<br>High : character level output |
| 2       | Y <sub>IN</sub>     |                                     | Luminance signal input pin   |
| 3       | Border switching    |                                     | Input pin for pulse that switches input signal and border signal<br>High : border level output       |
| 4       | C <sub>IN</sub>     |                                     | Chroma signal input pin  |
| 5       | GND                 |                                     | GND  |
| 6       | C <sub>OUT</sub>    |                                     | Chroma signal output pin   |
| 7       | V <sub>CC</sub>     |                                     | Power supply pin   |
| 8       | Y <sub>OUT</sub>    |                                     | Luminance signal output pin  |

**Absolute Maximum Ratings** (Ta=25°C)

| Item                  | Symbol               | Ratings  | Units |
|-----------------------|----------------------|----------|-------|
| Storage temperature   | T <sub>STG</sub>     | -40~+125 | °C    |
| Operating temperature | T <sub>OPR</sub>     | -20~+75  | °C    |
| Power supply voltage  | V <sub>CC</sub> max. | 7        | V     |
| Allowable loss        | P <sub>d</sub>       | 300      | mW    |

**Electrical Characteristics** (Except where noted otherwise, Ta=25°C, V<sub>CC</sub>=5.0V, pulse level 0V, SG1~SG2: no signal, SWA, B : 1)

| Item                           | Symbol           | Measurement circuit | Measurement conditions                                    | Min. | Typ. | Max. | Units |
|--------------------------------|------------------|---------------------|---|------|------|------|-------|
| Operating power supply voltage | V <sub>CC</sub>  |                     |   | 4.5  | 5.0  | 5.5  | V     |
| Consumption current            | I <sub>CC</sub>  |                     |   |      | 6.5  | 9.0  | mA    |
| <b>Y subsystem</b>             |                  |                     |   |      |      |      |       |
| Voltage gain                   | G <sub>v1</sub>  | TP5A                | SG1 : Sweep signal 1V <sub>P-P</sub> , 0.1MHz             | -0.5 | 0    | +0.5 | dB    |
| Frequency characteristic       | F <sub>c1</sub>  |                     | SG1 : Sweep signal 1V <sub>P-P</sub><br>10MHz/0.1MHz      | -1.0 | 0    | 1.0  | dB    |
| Differential gain              | D <sub>G</sub>   | TP5B                | SG1 : Staircase wave 1V <sub>P-P</sub><br>APL=10, 50, 90% | -3.0 | 1.0  | 3.0  | %     |
| Differential phase             | D <sub>P</sub>   |                     | -3.0  | 1.0  | 3.0  | deg  |       |
| Character level                | V <sub>CH</sub>  | TP5A                | SG1 : Staircase wave 1V <sub>P-P</sub> *1                 | 70   | 75   | 80   | IRE   |
| Edge level                     | V <sub>ED</sub>  |                     | SG1 : Staircase wave 1V <sub>P-P</sub> *1                 | 5    | 10   | 15   | IRE   |
| <b>C subsystem</b>             |                  |                     |   |      |      |      |       |
| Voltage gain                   | G <sub>v2</sub>  | TP7                 | SG2 : Sine wave 1V <sub>P-P</sub> , 0.1MHz                | -0.5 | 0    | +0.5 | dB    |
| Frequency characteristic       | F <sub>c2</sub>  |                     | SG2 : Sine wave 1V <sub>P-P</sub> , 5MHz/0.1MHz           | -1.0 | 0    | 1.0  | dB    |
| <b>Crosstalk *2</b>            |                  |                     |   |      |      |      |       |
| Y → C                          | C <sub>T1</sub>  | TP7                 | SG1 : Sine wave 1V <sub>P-P</sub> , 4.43MHz SWB : 2       |      | -65  | -55  | dB    |
| C → Y                          | C <sub>T2</sub>  | TP5A                | SG2 : Sine wave 1V <sub>P-P</sub> , 4.43MHz SWA : 2       |      | -65  | -55  | dB    |
| <b>SW input voltage</b>        |                  |                     |   |      |      |      |       |
| Character input H              | V <sub>IH1</sub> | TP5A                | SG1 : Staircase wave 1V <sub>P-P</sub> *3                 | 2.1  |      |      | V     |
| Character input L              | V <sub>IL1</sub> |                     | SG1 : Staircase wave 1V <sub>P-P</sub> *4                 |      |      | 0.7  | V     |
| Edge input H                   | V <sub>IH2</sub> |                     | SG1 : Staircase wave 1V <sub>P-P</sub> *5                 | 2.1  |      |      | V     |
| Edge input L                   | V <sub>IL2</sub> |                     | SG1 : Staircase wave 1V <sub>P-P</sub> *6                 |      |      | 0.7  | V     |

\*1 Input a 1V<sub>P-P</sub> staircase wave to SG1, and pulses as shown in Figure 1 to TP1 and TP3, and measure TP5A.

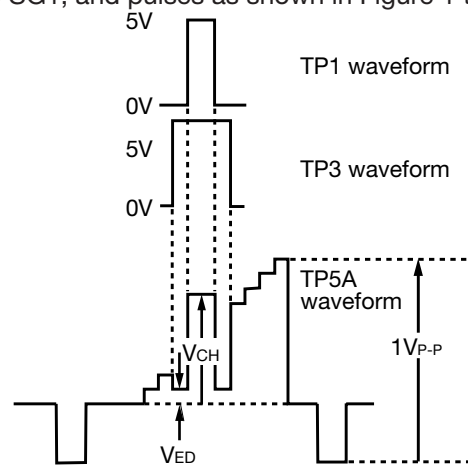


Figure 1 TP1, TP3, TP5A waveforms

\*2 Given input signal as V1 and output signal as V2, C<sub>T</sub> is obtained as follows.

$$C_T = 20 \log \frac{V_2}{V_1} \text{ dB}$$

\*3 Character switching pin (Pin 1) high level voltage

\*4 Character switching pin (Pin 1) low level voltage

\*5 Border switching pin (Pin 3) high level voltage

\*6 Border switching pin (Pin 3) low level voltage

Measuring Circuit

