

M52348SP

WIDE FREQUENCY BAND ANALOG SWITCH

DESCRIPTION

The M52348SP is an semiconductor IC for RGBHV interface that switches signals input from two types of image source and outputs them to CRT display etc. The synchronous signal meets the frequency band of 10 kHz to 200 kHz and is output with TTL. The IC adopts 250 MHz for the frequency band width of video signal, providing high resolution images. It is optimum as an IC for interface with various types of new media including high resolution CRT.

FEATURES

- Frequency band : RGB.....250MHz
 HV.....10Hz to 200kHz
 Input level : RGB.....0.7 V_{P-P} (typ.)
 HV TTL IN PUT
 3 to 5 V_{O-P} (bipolar)
- Only the G channel is equipped with output for sync-on-video.
- HV output adopts TTL format.

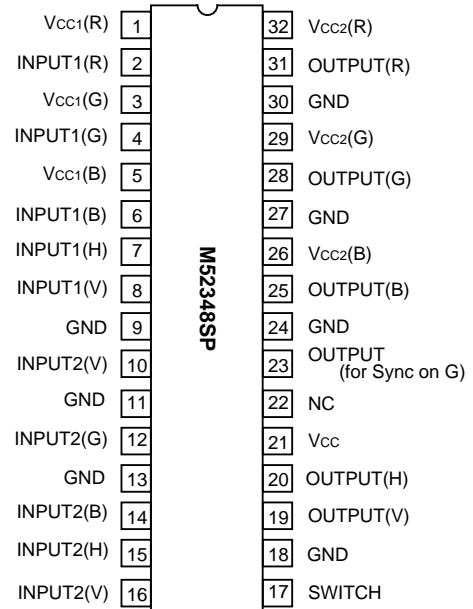
APPLICATION

CRT display, TV, VCR, etc.

RECOMMENDED OPERATING CONDITION

Supply voltage range.....4.5V to 5.5V
 Rated supply voltage.....5.0V

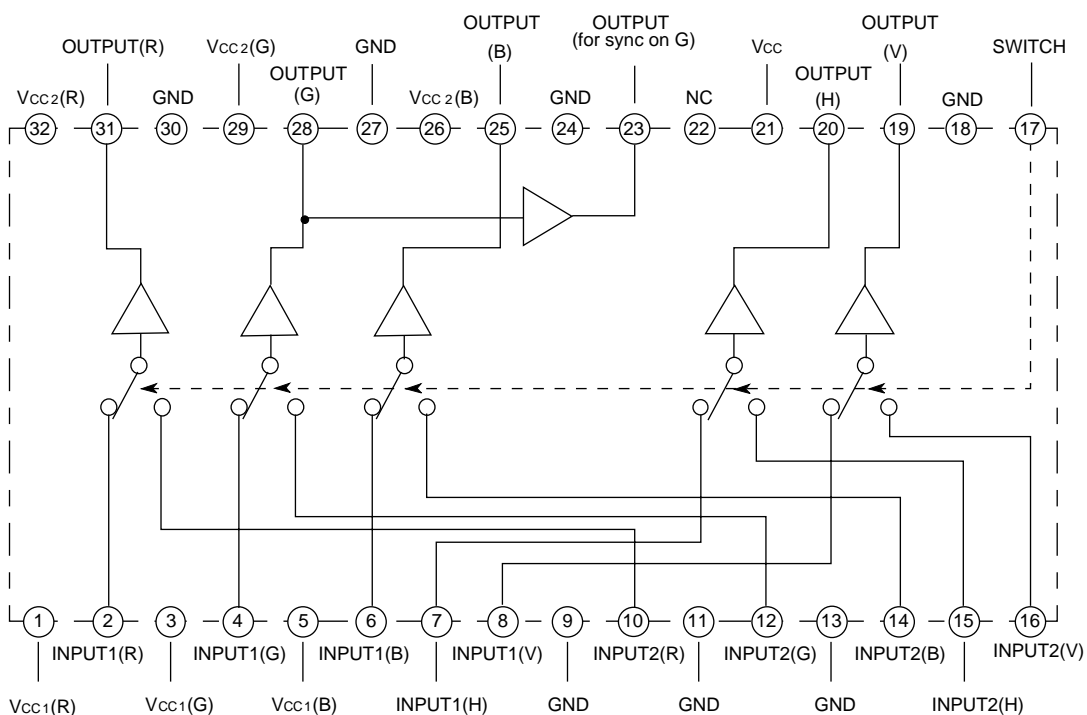
PIN CONFIGURATION (TOP VIEW)



Outline 32P4B

NC:NO CONNECTION

BLOCK DIAGRAM



M52348SP

WIDE FREQUENCY BAND ANALOG SWITCH

ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

| Symbol | Parameter | Ratings | Unit |
|-------------------|--|-------------|------|
| V _{CC} | Supply voltage | 7.0 | V |
| P _d | Power dissipation | 1603 | mW |
| T _{opr} | Operating temperature | -20 to +85 | °C |
| T _{stg} | Storage temperature | -40 to +150 | °C |
| V _{opr} | Recommended operating supply voltage | 5.0 | V |
| V _{opr'} | Recommended operating supply voltage range | 4.5 to 5.5 | V |
| S _{arge} | Electrostatic discharge | ±200 | V |

ELECTRICAL CHARACTERISTICS (V_{CC}=5V, Ta=25°C)

| Symbol | Parameter | Test point | Power supply V _{CC} | Test conditions | | | | | | | | | | SW SW17 Swich | Limits | | | Unit | |
|--------------------|---|----------------------------------|---------------------------------|-----------------|-------------|-------------|-------------|-------------|--------------|--------------|--------------|--------------|--------------|---------------------|-----------|------|------|------|------|
| | | | | SW2 Rin1 | SW4 Gin1 | SW6 Bin1 | SW7 Hin1 | SW8 Vin1 | SW10 Rin2 | SW12 Gin2 | SW14 Bin2 | SW15 Hin2 | SW16 Vin2 | | Min. | Typ. | Max. | | |
| I _{CC1} | Circuit current 1 (no signal) | A | 5 | b - | b - | b - | b - | b - | b - | b - | b - | b - | b - | b - | b GND | 46 | 66 | 86 | mA |
| I _{CC1} | Circuit current 2 (no signal) | A | 5 | b - | b - | b - | b - | b - | b - | b - | b - | b - | b - | b - | a OPEN | 46 | 66 | 86 | mA |
| RGB SW block | | | | | | | | | | | | | | | | | | | |
| V _{DC1} | Output DC voltage 1 | T.P.31 T.P.28 T.P.25 | 5 | b - | b - | b - | b - | b - | b - | b - | b - | b - | b - | b - | b GND | 1.8 | 2.2 | 2.6 | V |
| V _{DC2} | Output DC voltage 2 | T.P.31 T.P.28 T.P.25 | 5 | b - | b - | b - | b - | b - | b - | b - | b - | b - | b - | b - | a OPEN | 1.8 | 2.2 | 2.6 | V |
| V _{DC3} | Output DC voltage 3 | T.P.23 | 5 | b - | b - | b - | b - | b - | b - | b - | b - | b - | b - | b - | b GND | 1.1 | 1.5 | 1.9 | V |
| V _{DC4} | Output DC voltage 4 | T.P.23 | 5 | b - | b - | b - | b - | b - | b - | b - | b - | b - | b - | b - | a OPEN | 1.1 | 1.5 | 1.9 | V |
| V _{imax1} | Maximum allow- able input 1 | T.P.2 T.P.4 T.P.6 | 5 | abb SG1 | bab SG1 | bba SG1 | b - | b - | b - | b - | b - | b - | b - | b - | b GND | 1.4 | 1.6 | - | VP-P |
| V _{imax2} | Maximum allow- able input 2 | T.P.10 T.P.12 T.P.14 | 5 | b - | b - | b - | b - | b - | abb SG1 | bab SG1 | bba SG1 | b - | b - | b - | a OPEN | 1.4 | 1.6 | - | VP-P |
| G _{V1} | Voltage gain 1 | T.P.31 T.P.28 T.P.25 | 5 | abb SG2 | bab SG2 | bba SG2 | b - | b - | b - | b - | b - | b - | b - | b - | b GND | -0.5 | 0.1 | 0.7 | dB |
| ΔG _{V1} | Relative voltage gain 1 | Takes ratio of the values above | | | | | | | | | | | | | | -0.6 | 0 | 0.6 | dB |
| G _{V2} | Voltage gain 2 | T.P.31 T.P.28 T.P.25 | 5 | b - | b - | b - | b - | b - | abb SG2 | bab SG2 | bba SG2 | b - | b - | b - | a OPEN | -0.5 | 0.1 | 0.7 | dB |
| ΔG _{V2} | Relative voltage gain 2 | Takes ratio of the values above. | | | | | | | | | | | | | | -0.6 | 0 | 0.6 | dB |
| G _{V3} | Voltage gain 3 | T.P.23 | 5 | b - | a SG2 | b - | b - | b - | b - | b - | b - | b - | b - | b - | b GND | -0.4 | 0.2 | 0.8 | dB |
| G _{V4} | Voltage gain 4 | T.P.23 | 5 | b - | b - | b - | b - | b - | b - | a SG2 | b - | b - | b - | b - | a OPEN | -0.4 | 0.2 | 0.8 | dB |
| F _{C1} | Frequency character- istics 1 (100MHz) | T.P.31 T.P.28 T.P.25 | 5 | abb SG4 | bab SG4 | bba SG4 | b - | b - | b - | b - | b - | b - | b - | b - | b GND | -0.1 | 0 | 1.0 | dB |
| ΔF _{C1} | Relative frequency characteristics 1 (100MHz) | Takes ratio of the values above | | | | | | | | | | | | | | -0.1 | 0 | 1.0 | dB |
| F _{C2} | Frequency character- istics 2 (100MHz) | T.P.31 T.P.28 T.P.25 | 5 | b - | b - | b - | b - | b - | abb SG4 | bab SG4 | bba SG4 | b - | b - | b - | a OPEN | -0.1 | 0 | 1.0 | dB |
| ΔF _{C2} | Relative frequency characteristics 2 (100MHz) | Takes ratio of the values above | | | | | | | | | | | | | | -0.1 | 0 | 1.0 | dB |
| F _{C3} | Frequency character- istics 3 (100MHz) | T.P.31 T.P.28 T.P.25 | 5 | abb SG5 | bab SG5 | bba SG5 | b - | b - | b - | b - | b - | b - | b - | b - | b GND | -3.0 | 1.5 | 1.0 | dB |
| F _{C4} | Relative frequency characteristics 4 (250MHz) | T.P.31 T.P.28 T.P.25 | 5 | b - | b - | b - | b - | b - | abb SG5 | bab SG5 | bba SG5 | b - | b - | b - | a OPEN | -3.0 | 1.5 | 1.0 | dB |

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WIDE FREQUENCY BAND ANALOG SWITCH

ELECTRICAL CHARACTERISTICS (cont.)

| Symbol | Parameter | Test point | Power supply Vcc | Test conditions | | | | | | | | | | SW SW17 Switch | Limits | | | Unit | |
|---------------|---------------------------------------|----------------------------|---------------------|-----------------|-------------|-------------|---------------|---------------|--------------|--------------|--------------|---------------|---------------|----------------------|------------------|------|------|------|------|
| | | | | SW2 Rin1 | SW4 Gin1 | SW6 Bin1 | SW7 Hin1 | SW8 Vin1 | SW10 Rin2 | SW12 Gin2 | SW14 Bin2 | SW15 Hin2 | SW16 Vin2 | | Min. | Typ. | Max. | | |
| C.T.I.1 | Crosstalk 1 between 2 inputs (10MHz) | T.P.31 T.P.28 T.P.25 | 5 | abb SG3 | bab SG3 | bba SG3 | b - | b - | b - | b - | b - | b - | b - | b - | GND ↓ OPEN | - | -60 | -50 | dB |
| C.T.I.2 | Crosstalk 2 between 2 inputs (10MHz) | T.P.31 T.P.28 T.P.25 | 5 | b - | b - | b - | b - | b - | abb SG3 | bab SG3 | bba SG3 | b - | b - | b - | OPEN ↓ GND | - | -60 | -50 | dB |
| C.T.I.3 | Crosstalk 3 between 2 inputs (100MHz) | T.P.31 T.P.28 T.P.25 | 5 | abb SG4 | bab SG4 | bba SG4 | b - | b - | b - | b - | b - | b - | b - | b - | GND ↓ OPEN | - | -40 | -35 | dB |
| C.T.I.4 | Crosstalk 4 between 2 inputs (100MHz) | T.P.31 T.P.28 T.P.25 | 5 | b - | b - | b - | b - | b - | abb SG4 | bab SG4 | bba SG4 | b - | b - | b - | OPEN ↓ GND | - | -40 | -35 | dB |
| C.T.C.1 | Crosstalk 1 between channels (10MHz) | T.P.31 T.P.28 T.P.25 | 5 | abb SG3 | bab SG3 | bba SG3 | b - | b - | b - | b - | b - | b - | b - | b - | b GND | - | -50 | -40 | dB |
| C.T.C.2 | Crosstalk 2 between channels (10MHz) | T.P.31 T.P.28 T.P.25 | 5 | b - | b - | b - | b - | b - | abb SG3 | bab SG3 | bba SG3 | b - | b - | b - | a OPEN | - | -50 | -40 | dB |
| C.T.C.3 | Crosstalk 3 between channels (100MHz) | T.P.31 T.P.28 T.P.25 | 5 | abb SG4 | bab SG4 | bba SG4 | b - | b - | b - | b - | b - | b - | b - | b - | b GND | - | -30 | -25 | dB |
| C.T.C.4 | Crosstalk 4 between channels (100MHz) | T.P.31 T.P.28 T.P.25 | 5 | b - | b - | b - | b - | b - | abb SG4 | bab SG4 | bba SG4 | b - | b - | b - | a OPEN | - | -30 | -25 | dB |
| Tr1 | Pulse characteristics 1 | T.P.31 T.P.28 T.P.25 | 5 | a SG6 | a SG6 | a SG6 | b - | b - | b - | b - | b - | b - | b - | b - | b GND | - | 1.6 | 2.5 | nsec |
| Tf1 | | T.P.31 T.P.28 T.P.25 | 5 | a SG6 | a SG6 | a SG6 | b - | b - | b - | b - | b - | b - | b - | b - | b GND | - | 1.6 | 2.5 | nsec |
| Tr2 | Pulse characteristics 2 | T.P.31 T.P.28 T.P.25 | 5 | b - | b - | b - | b - | b - | a SG6 | a SG6 | a SG6 | b - | b - | b - | a OPEN | - | 1.6 | 2.5 | nsec |
| Tf2 | | T.P.31 T.P.28 T.P.25 | 5 | b - | b - | b - | b - | b - | a SG6 | a SG6 | a SG6 | b - | b - | b - | a OPEN | - | 1.6 | 2.5 | nsec |
| HV SW portion | | | | | | | | | | | | | | | | | | | |
| VOH1 | High-level output voltage 1 | T.P.19 T.P.20 | 5 | b - | b - | b - | c 5.0V | c 5.0V | b - | b - | b - | b - | b - | b - | b GND | 4.5 | 5.0 | - | V |
| VOH2 | High-level output voltage 2 | T.P.19 T.P.20 | 5 | b - | b - | b - | b - | b - | b - | b - | b - | c 5.0V | c 5.0V | a OPEN | 4.5 | 5.0 | - | V | |
| VOL1 | Low-level output voltage 1 | T.P.19 T.P.20 | 5 | b - | b - | b - | c 0V | c 0V | b - | b - | b - | b - | b - | b - | b GND | - | 0.2 | 5.0 | V |
| VOL2 | Low level output voltage 2 | T.P.19 T.P.20 | 5 | b - | b - | b - | b - | b - | b - | b - | b - | c 0V | c 0V | a OPEN | - | 0.2 | 5.0 | V | |
| Vith1 | Input threshold voltage 1 | T.P.7 T.P.8 | 5 | b - | b - | b - | c Variable | c Variable | b - | b - | b - | b - | b - | b - | b GND | 2.0 | 2.5 | 3.0 | V |
| Vith2 | Input threshold voltage 2 | T.P.15 T.P.16 | 5 | b - | b - | b - | b - | b - | b - | b - | b - | c Variable | c Variable | a OPEN | 2.0 | 2.5 | 3.0 | V | |
| Trd1 | Rising delay time 1 | T.P.19 T.P.20 | 5 | b - | b - | b - | a SG7 | a SG7 | b - | b - | b - | b - | b - | b - | b GND | - | 100 | 150 | nsec |
| Trd2 | Rising delay time 2 | T.P.19 T.P.20 | 5 | b - | b - | b - | b - | b - | b - | b - | b - | a SG7 | a SG7 | a OPEN | - | 100 | 150 | nsec | |
| Tfd1 | Falling delay time 1 | T.P.19 T.P.20 | 5 | b - | b - | b - | a SG7 | a SG7 | b - | b - | b - | b - | b - | b - | b GND | - | 50 | 100 | nsec |
| Tfd2 | Falling delay time 2 | T.P.19 T.P.20 | 5 | b - | b - | b - | b - | b - | b - | b - | b - | a SG7 | a SG7 | a OPEN | - | 50 | 100 | nsec | |
| Vsth1 | Switching threshold voltage 1 | T.P.17 | 5 | a SG1 | a SG1 | a SG1 | a SG7 | a SG7 | b - | b - | b - | b - | b - | c | 0.5 | 1.5 | 2.0 | V | |
| Vsth2 | Switching threshold voltage 2 | T.P.17 | 5 | b - | b - | b - | b - | b - | a SG1 | a SG1 | a SG1 | a SG7 | a SG7 | c | 0.5 | 1.5 | 2.0 | V | |

ELECTRICAL CHARACTERISTICS TEST

METHOD

Note) Omitted because the signal input pins and SW No. have been described in the Electrical Characteristics Table. SWA shall take side a unless otherwise noted.

Icc1, Icc2 Circuit current 1, circuit current 2 (no signal)

The conditions shall be as provided in the Electrical Characteristics Table. When SW17 is assigned to GND (or OPEN), and SWA is placed on side b, take measurements in ampere meter A and specify the value to be Icc1 (or Icc2).

Vdc1, Vdc2 Output DC voltage 1, output DC voltage 2

When SW17 is assigned to GND (or OPEN), and no signal is input, measure T.P.31 (T.P.28, T.P.25) output DC voltage. Specify the voltage to be VDC1 (or VDC2).

Vdc3, Vdc4, Output DC voltage 3, output DC voltage 4

Measure the output DC voltage of T.P.23 in the same manner as in VDC1 and VDC2, and specify the voltage to be VDC3 (VDC4).

Vimax1, Vimax2, maximum allowable input 1, maximum allowable input 2

Assign SW17 to GND and input SG1 into pin ② only. Gradually increasing the SG1 amplitude, read the amplitude of the input signal when the output waveform of T.P.31 is strained. The value is specified to be Vimax1. In the same manner, measure Vimax 1 in response to inputs into pin ④ and pin ⑥ only.

Then assign SW17 to OPEN, measure the values at inputs into pins ⑩, ⑫, and ⑭ only. Then specify the values to be Vimax2.

Gv1, ΔGv1, voltage gain 1, relative voltage gain 1

Gv2, ΔGv2, voltage gain 2, relative voltage gain 2

1. The conditions shall be as provided in the Electrical Characteristics Table.
2. Assign SW17 to GND and input SG2 into pin 2 only. When this is the case, read the amplitude of T.P.31 output and specify the value as VOR1.
3. Calculate voltage gain GV1 by the following formula:

$$GV1=20\text{LOG} \frac{V_{OR1}}{0.7} \frac{[VP-P]}{[VP-P]} \text{ (dB)}$$

4. In the same manner, find voltage gain GV1 in response to inputs into pin ④ and pin ⑥ only.
5. Calculate the difference in voltage gain between channels to find relative voltage gain ΔGV1.
6. In the same manner, find GV2 and ΔGV2.

Gv3, ΔGv4 Voltage gain 3, voltage gain 4

1. The conditions shall be as provided in the Electrical Characteristics Table.

2. When this is the case, measure the output amplitude of T.P.23.
3. As in the case of Gv1, ΔGv1, Gv2 and ΔGv2, find Gv3 and Gv4.

Fc1, ΔFc1 frequency characteristics 1, relative frequency characteristics 1 (100 MHz)

Fc2, ΔFc2 frequency characteristics 2, relative frequency characteristics 2 (100 MHz)

1. The conditions shall be as provided in the Electrical Characteristics Table. This measurement shall use active probe.
2. Assign SW17 to GND and input SG2 into pin 2 only. When this is the case, specify the output amplitude of T.P.31 to be VOR1. In the same manner, specify the output to be VOR2 with SG4 input.
3. In this case, calculate frequency characteristics Fc1 by the following formula:

$$Fc1 = 20\text{LOG} \frac{V_{OR2}}{V_{OR1}} \frac{[VP-P]}{[VP-P]} \text{ (dB)}$$

4. In response to inputs into pin ④ and pin ⑥ only, find frequency characteristics Fc1 in the same manner.
5. Calculate the difference in frequency characteristics between channels to find relative frequency characteristics ΔFc1.
6. Assign SW17 to OPEN. In the same manner, find Fc2 and ΔFc2.

Fc3, Fc4 Frequency characteristics 3, frequency characteristics 4 (250 MHz)

In the same manner as finding Fc1, ΔFc1, Fc2 and ΔFc2, find Fc3 and Fc4 in response to input signal SG5.

C.T.I.1 Crosstalk 1 between 2 inputs

C.T.I.2 Crosstalk 2 between 2 inputs (10 MHz)

1. The conditions shall be as provided in the Electrical Characteristics Table. This measurement shall take active probe.
2. Assign SW17 to GND and input SG3 into pin ② only. Measure the output amplitude of T.P.31 at that time and specify the value to be VOR3.
3. Assign SW17 to ONPEN, measure the output amplitude of T.P.31 at that time and specify the value to be VOR3'.
4. When this is the case, calculate crosstalk C.T.L1 between 2 inputs by the following formula:

$$C.T.I.1 = 20\text{LOG} \frac{V_{OR3'}}{V_{OR3}} \frac{[VP-P]}{[VP-P]} \text{ (dB)}$$

5. In the same manner, find crosstalk between 2 inputs in response to inputs into pin ④ and pin ⑥ only.
6. Assign SW17 to OPEN and then input SG3 into pin ⑩ only. Measure the output amplitude of T.P.31 at that time and specify the value to be VOR4'.
7. Assign SW17 to GND and then measure the output amplitude of T.P.31 at that time. Specify the value to be VOR4'.

WIDE FREQUENCY BAND ANALOG SWITCH

8. When this is the case, calculate crosstalk C.T.I.2 between 2 inputs by the following formula:

$$C.T.I.2 = 20\text{LOG} \frac{V_{OR4'} [V_{P-P}]}{V_{OR4} [V_{P-P}]} \quad (\text{dB})$$

9. As in the same manner, find crosstalk between 2 pints in response to input into pin ⑫ and pin ⑭ only.

C.T.I.3 Crosstalk 3 between 2 inputs

C.T.I.4 Crosstalk 4 between 2 inputs (100 MHz)

Specify input signal to be SG4. In the same manner as in C.T.I.1 and C.T.I.2, find crosstalk C.T.I.3/C.T.I.4 between 2 inputs.

C.T.C.1 Crosstalk 1 between channels

C.T.C.2 Crosstalk 2 between channels (10 MHz)

1. The conditions shall be as provided in the Electrical Characteristics Table. This measurement shall take active probe.
2. Assign SW17 to GND and input signal SG3 into pin ② only. Specify the output amplitude of T.P.31 to be VOR5 at that time.
3. In the same status, measure the output amplitude of T.P.28 and T.P.25 and specify the values to be VOG5 and VOB5.
4. When this is the case, calculate crosstalk C.T.C1 between channels by the following formula:

$$C.T.C.1 = 20\text{LOG} \frac{V_{OG5 \text{ or } V_{OB5}} [V_{P-P}]}{V_{OR5} [V_{P-P}]} \quad (\text{dB})$$

5. In the same manner, find crosstalk between channels in response to inputs into pin ④ and pin ⑥ only.
6. Assign SW17 to OPEN and then input signal SG3 into pin ⑩ only. Specify the output amplitude of T.P.31 to be VOR6 at that time.
7. In the same status, measure the output amplitude of T.P.28 and T.P.25. Specify the values to be VOG6 and VOB6.
8. When this is the case, calculate crosstalk C.T.C.2 between channels by the following formula:

$$C.T.C.2 = 20\text{LOG} \frac{V_{OG6 \text{ or } V_{OB6}} [V_{P-P}]}{V_{OR6} [V_{P-P}]} \quad (\text{dB})$$

9. As in the same manner, find crosstalk between channels in response to inputs into pin ⑫ and pin ⑭ only.

C.T.C.3 Crosstalk 3 between channels

C.T.C.4 Crosstalk 4 between channels (100 MHz)

Specify input signal to be SG4. In the same manner as in C.T.C.1 and C.T.C.2, find crosstalk C.T.C.3/C.T.C.4 between 2 channels.

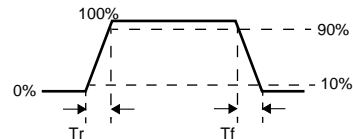
Tr1, Tf1, Tr2, Tf2 Pulse characteristics 1 and pulse characteristics 2

1. The conditions shall be as provided in the Electrical Characteristics Table. Assign SW17 to GND (or OPEN).

2. With active probe, measure rising Tr1 and falling Tf1 for 10% to 90% of the input pulse.

3. With active probe, measure rising Tro and falling Tfo for 10% to 90% of the output pulse.

4. The pulse characteristics Tr1 and Tf1 (Tr2 and Tf2) are as follows:



$$Tr1(Tr2) = \sqrt{(Tro)^2 - (Tri)^2} \quad (\text{nsec})$$

$$Tf1(Tf2) = \sqrt{(Tfo)^2 - (Tfi)^2} \quad (\text{nsec})$$

VOH1, VOH2 High-level output voltage 1 and high-level output voltage 2

The conditions shall be as provided in the Electrical Characteristics Table. Assign SW17 to GND (or OPEN), apply 5V to the input pin and measure the output voltage. Specify the value to be VOH1 (VOH2).

VOL1, VOL2 Low-level output voltage 1 and low-level output voltage 2

The conditions shall be as provided in the Electrical Characteristics Table. Assign SW17 to GND (or OPEN), apply 0V to the input pin and measure the output voltage. Specify the value to be VOL1 (VOL2).

Vith1 Input threshold voltage 1

Vith2 Input threshold voltage 2

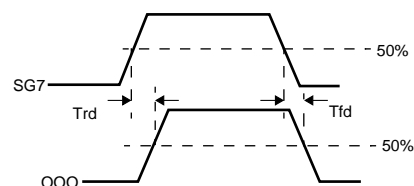
The conditions shall be as provided in the Electrical Characteristics Table. Assign SW17 to GND (or OPEN). Gradually increasing the voltage of input pin from 0V, measure the input voltage when the output voltage is Hi (4.5V or more). Specify the value to be Vith1 (Vith2).

Trd1, Trd2 Rising delay time 1 and rising delay time 2

Tfd1, Tfd2 Falling delay time 1 and falling delay time 2

The conditions shall be as provided in the Electrical Characteristics Table. Assign SW17 to GND (or OPEN), input SG7 into the input pin and measure the output waveform.

Rising delay time Trd1 (Trd2) and falling delay time Tfd1 (Tfd2) shall be found according to the following diagram.



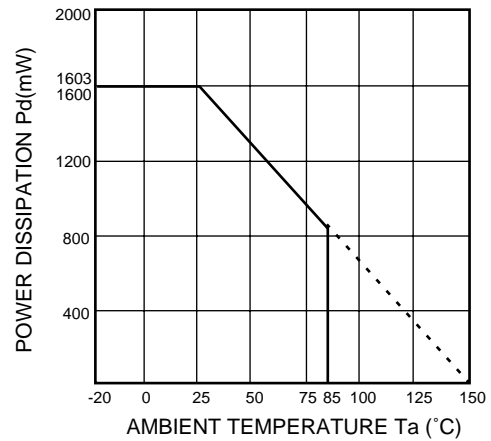
Vsth1 Switching threshold voltage 1

Vsth2 Switching threshold voltage 2

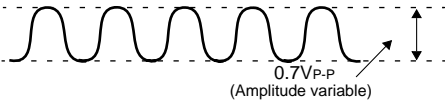
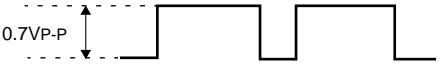
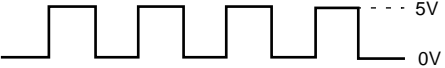
1. The conditions shall be as provided in the Electrical Characteristics Table. Input SG7 into pins ②, ④ and ⑥. Input SG7 into pins ⑦ and ⑧. Do not input signal into other pins.
2. Apply a voltage of 0V to pin ⑰ and check each of TP19, TP20, TP23, TP25, TP28 and TP31 for output of signal.
3. Gradually increasing the voltage at pin ⑰, specify the output at pin ⑰ to be Vsth1 when the signal is not output from the above pins.
4. As in the same manner, input SG1 into pins ⑩, ⑫ and ⑭ and input SG7 into pins ⑮ and ⑯. Do not input signal into other pins.
5. Apply a voltage of 5V to pin ⑰ and check each of TP19, TP20, TP23, TP25, TP28 and TP31 for output of signal.
6. Gradually decreasing the voltage at pin ⑰, specify the output at pin ⑰ to be Vsth2 when the signal is not output from the above pins.

TYPICAL CHARACTERISTICS

THERMAL DERATING (MAXIMUM RATING)



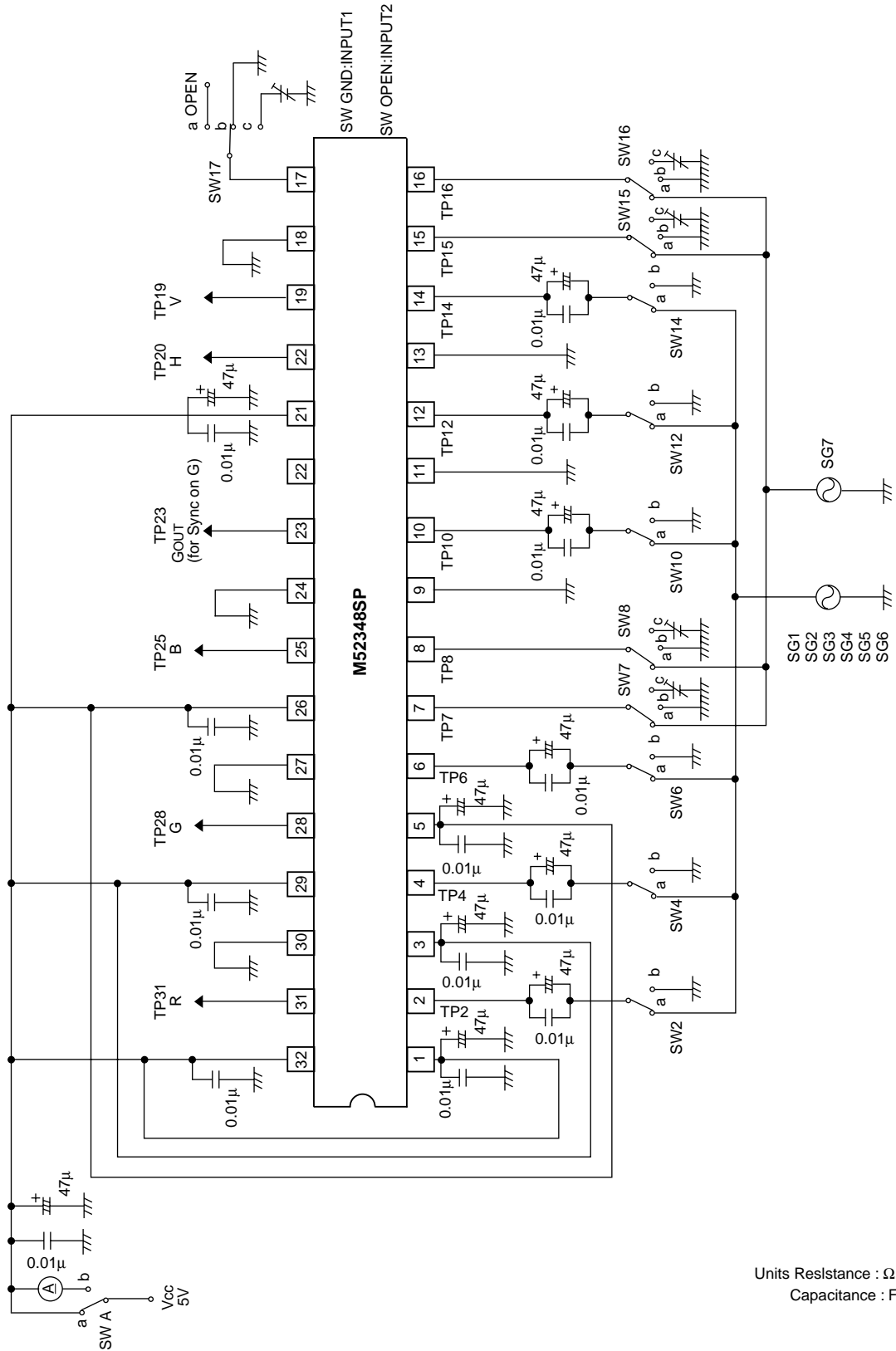
INPUT SIGNAL

| SG No. | signals |
|--------|---|
| SG1 | Sine wave (f=60 kHz, 0.7V _{P-P} , amplitude variable)  |
| SG2 | Sine wave (f=1 MHz, amplitude 0.7V _{P-P}) |
| SG3 | Sine wave (f=10 MHz, amplitude 0.7V _{P-P}) |
| SG4 | Sine wave (f=100 MHz, amplitude 0.7V _{P-P}) |
| SG5 | Sine wave (f=250 MHz, amplitude 0.7V _{P-P}) |
| SG6 | Pulse of 0.7V _{P-P} in amplitude (f=60kHz, duty 80%)  |
| SG7 | Square wave (Amplitude 5.0 V _{O-P} TTL, f=60 kHz, duty = 50%)  |

M52348SP

WIDE FREQUENCY BAND ANALOG SWITCH

TEST CIRCUIT



M52348SP

WIDE FREQUENCY BAND ANALOG SWITCH

DESCRIPTION OF PIN

| Pin No. | Name | Peripheral circuit of pins | DC voltage (V) | Description of function |
|------------------------|-------------------------------------|----------------------------|----------------|---|
| ① ③ ⑤ | Vcc1(R) Vcc1(G) Vcc1(B) | _____ | 5.0 | |
| ② ④ ⑥ | INPUT1(R) INPUT1(G) INPUT1(B) | | 2.0 | Input at low impedance. |
| ⑦ ⑧ | INPUT1(H) INPUT1(V) | | - | Input pulse of 3V or more and 5V or less. |
| ⑨ ⑬ ⑪ ⑲ ⑬ ⑲ ⑮ | GND | _____ | GND | |
| ⑩ ⑫ ⑭ | INPUT2(R) INPUT2(G) INPUT2(B) | | 2.0 | Input at low impedance. |

M52348SP

WIDE FREQUENCY BAND ANALOG SWITCH

DESCRIPTION OF PIN (cont.)

| Pin No. | Name | Peripheral circuit of pins | DC voltage (V) | Description of function |
|------------------|---|----------------------------|----------------|---|
| ⑮ ⑯ | INPUT2(H) INPUT2(V) | | - | Input pulse of 3V or more and 5V or less. |
| ⑰ | SWITCH | | 2.6 | Enables switching between OPEN and GND. |
| ⑲ ⑳ | OUTPUT(V) OUTPUT(H) | | - | Contains output resistance. |
| ㉑ | Vcc1(R) (H,V,SWITCH) | _____ | 5.0 | Apply the same voltage. |
| ㉒ | NC | _____ | - | |
| ㉓ ㉔ ㉕ ㉖ | OUTPUT (SYNC ONG) OUTPUT(B) OUTPUT(G) OUTPUT(R) | | 1.5 2.2 | Contains output resistance. |
| ㉗ ㉘ ㉙ | Vcc2(B) Vcc2(G) Vcc2(R) | _____ | 5.0 | |

WIDE FREQUENCY BAND ANALOG SWITCH

CAUTIONS FOR USING THE IC

1. Standard video inputs for R, G and B are specified to be 0.7 V_{P-P}.
2. The H and V inputs are specified to be 5.0 VTTL.
3. Input signals into input pins at fully lowered impedance.
4. The H and V output pins (pins ⑱ and ⑳) are as shown in Figure 1. Resistance can be inserted into a portion between power supplies to improve the rising speed. However, set the R value to limit the current to 7.5 mA or less. In Figure 1, R is 2 kΩ or more.

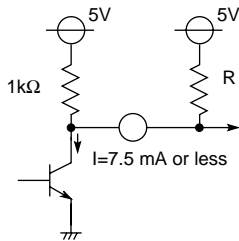


Fig. 1

5. The R, G and B output pins (pins ㉕, ㉖ and ㉗) are as shown in Figure 2. Pull-down resistance can be added to between GNDs according to the driving capability. However, set the R value to limit current I to 10 mA or less. In Figure 2, R is 500Ω or more.

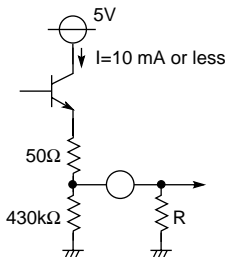


Fig. 2

6. The switch (pin ⑰) can be switched with GND and OPEN.

GND: Outputs signal from the INPUT 1 side.

OPEN: Outputs signal from the INPUT 2 side.

For switching by applying voltage as shown in Figure 3;

0 to 0.5V: Outputs signal from INPUT 1 side.

2 to 5V: Outputs signal from INPUT 2 side.

The applied voltage shall be less than V_{cc}.

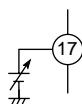


Fig. 3

CAUTIONS FOR MANUFACTURING BOARDS

Built-in wide band analog switch may cause oscillation due to the wiring shape on the board. Be careful for the following points.

- When inserting an output pull-down resistance, make wire between the output pin and the resistance as short as possible.
- Make the load capacitance of output pins as small as possible.
- Install the V_{cc}-GND bus controller capacitance near the pin.
- V_{cc} shall use a stable power supply. (Individual V_{cc} should use an independent power supply.)
- Insertion of a resistance of several tens of Ω between the output pin and the circuit at the next stage makes oscillation harder.
- GND should be as wide as possible. Basically, solid earth should be used.