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M52348FP

WIDE FREQUENCY BAND ANALOG SWITCH

DESCRIPTION

The M52348FP 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.

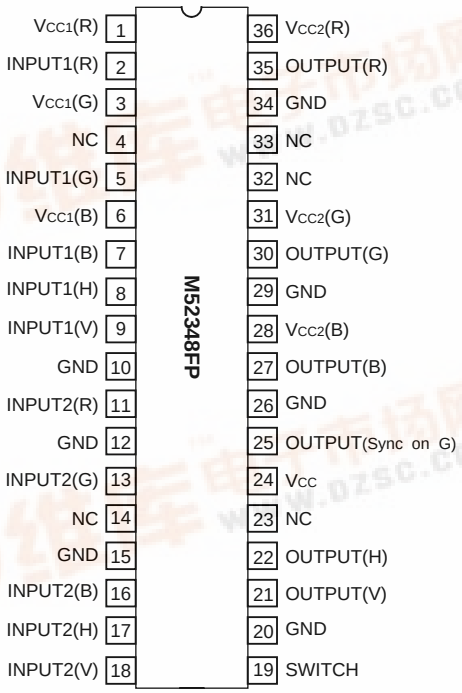
APPLICATION

CRT display, TV, VCR, etc.

RECOMMENDED OPERATING CONDITINO

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

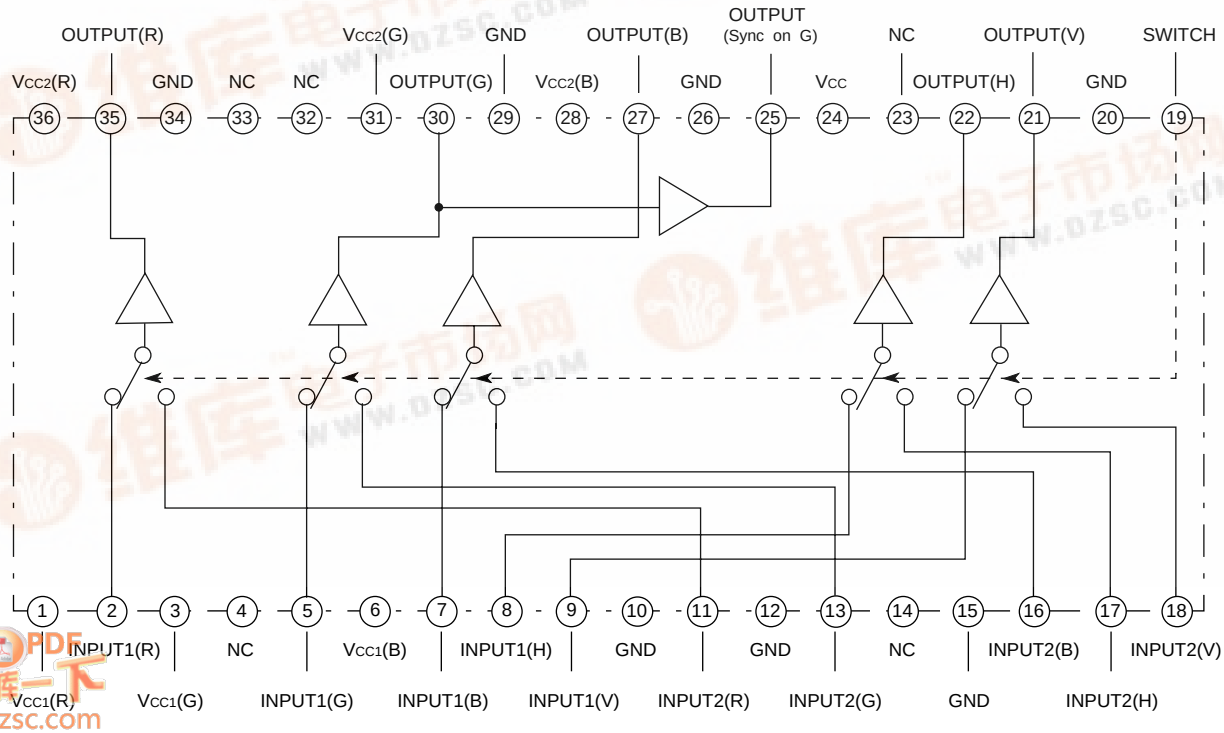
PIN CONFIGURATION (TOP VIEW)



Outline 36P2R-D

NC : NO CONNECTION

BLOCK DIAGRAM



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ABSOLUTE MAXIMUM RAGINGS (Ta=25˚C)

Symbol	Parameter	Ratings	Unit
V_{CC}	Supply voltage	7.0	V
Pd	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	Test conditions										SW	Limits			Unit
			Vcc	SW2 Rin1	SW5 Gin1	SW7 Bin1	SW8 Hin1	SW9 Vin1	SW11 Rin2	SW13 Gin2	SW16 Bin2	SW17 Hin2	SW18 Vin2	SW19 Swich	Min.	Typ.	Max.	
I_{CC1}	Circuit current 1 (no signal)	A	5	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 -	a OPEN	46	66	86	mA
RGB SW block																		
V_{DC1}	Output DC voltage 1	T.P.35 T.P.30 T.P.27	5	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.35 T.P.30 T.P.27	5	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.25	5	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.25	5	b -	b -	b -	b -	b -	b -	b -	b -	b -	b -	a OPEN	1.1	1.5	1.9	V
Vimax1	Maximum allowable input 1	T.P.2 T.P.5 T.P.7	5	abb SG1	bab SG1	bba SG1	b -	b -	b -	b -	b -	b -	b -	b GND	1.4	1.6	-	V_{P-P}
Vimax2	Maximum allowable input 2	T.P.11 T.P.13 T.P.16	5	b -	b -	b -	b -	b -	abb SG1	bab SG1	bba SG1	b -	b -	a OPEN	1.4	1.6	-	V_{P-P}
G_{V1}	Voltage gain 1	T.P.35 T.P.30 T.P.27	5	abb SG2	bab SG2	bba SG2	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.35 T.P.30 T.P.27	5	b -	b -	b -	b -	b -	abb SG2	bab SG2	bba SG2	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.25	5	b -	a SG2	b -	b -	b -	b -	b -	b -	b -	b -	b GND	-0.4	0.2	0.8	dB
G_{V4}	Voltage gain 4	T.P.25	5	b -	b -	b -	b -	b -	b -	a SG2	b -	b -	b -	a OPEN	-0.4	0.2	0.8	dB
F_{C1}	Frequency characteristics 1 (100MHz)	T.P.35 T.P.30 T.P.27	5	abb SG4	bab SG4	bba SG4	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 characteristics 2 (100MHz)	T.P.35 T.P.30 T.P.27	5	b -	b -	b -	b -	b -	abb SG4	bab SG4	bba SG4	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 characteristics 3 (100MHz)	T.P.35 T.P.30 T.P.27	5	abb SG5	bab SG5	bba SG5	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.35 T.P.30 T.P.27	5	b -	b -	b -	b -	b -	abb SG5	bab SG5	bba SG5	b -	b -	a OPEN	-3.0	1.5	1.0	dB

ELECTRICAL CHARACTERISTICS (cont.)

Symbol	Parameter	Test point	Power supply	Test conditions										SW	Limits			Unit
			Vcc	SW2 Rin1	SW5 Gin1	SW7 Bin1	SW8 Hin1	SW9 Vin1	SW11 Rin2	SW13 Gin2	SW16 Bin2	SW17 Hin2	SW18 Vin2	SW19 Swich	Min.	Typ.	Max.	
C.T.I.1	Crosstalk 1 between 2 inputs (10MHz)	T.P.35 T.P.30 T.P.27	5	abb SG3	bab SG3	bba SG3	b -	b -	b -	b -	b -	b -	b -	GND ↓ OPEN	-	-60	-50	dB
C.T.I.2	Crosstalk 2 between 2 inputs (10MHz)	T.P.35 T.P.30 T.P.27	5	b -	b -	b -	b -	b -	abb SG3	bab SG3	bba SG3	b -	b -	OPEN ↓ GND	-	-60	-50	dB
C.T.I.3	Crosstalk 3 between 2 inputs (100MHz)	T.P.35 T.P.30 T.P.27	5	abb SG4	bab SG4	bba SG4	b -	b -	b -	b -	b -	b -	b -	GND ↓ OPEN	-	-40	-35	dB
C.T.I.4	Crosstalk 4 between 2 inputs (100MHz)	T.P.35 T.P.30 T.P.27	5	b -	b -	b -	b -	b -	abb SG4	bab SG4	bba SG4	b -	b -	OPEN ↓ GND	-	-40	-35	dB
C.T.C.1	Crosstalk 1 between channels (10MHz)	T.P.35 T.P.30 T.P.27	5	abb SG3	bab SG3	bba SG3	b -	b -	b -	b -	b -	b -	b -	b GND	-	-50	-40	dB
C.T.C.2	Crosstalk 2 between channels (10MHz)	T.P.35 T.P.30 T.P.27	5	b -	b -	b -	b -	b -	abb SG3	bab SG3	bba SG3	b -	b -	a OPEN	-	-50	-40	dB
C.T.C.3	Crosstalk 3 between channels (100MHz)	T.P.35 T.P.30 T.P.27	5	abb SG4	bab SG4	bba SG4	b -	b -	b -	b -	b -	b -	b -	b GND	-	-30	-25	dB
C.T.C.4	Crosstalk 4 between channels (100MHz)	T.P.35 T.P.30 T.P.27	5	b -	b -	b -	b -	b -	abb SG4	bab SG4	bba SG4	b -	b -	a OPEN	-	-30	-25	dB
Tr1	Pulse characteristics 1	T.P.35 T.P.30 T.P.27	5	a SG6	a SG6	a SG6	b -	b -	b -	b -	b -	b -	b -	b GND	-	1.6	2.5	nsec
Tf1		T.P.35 T.P.30 T.P.27	5	a SG6	a SG6	a SG6	b -	b -	b -	b -	b -	b -	b -	b GND	-	1.6	2.5	nsec
Tr2	Pulse characteristics 2	T.P.35 T.P.30 T.P.27	5	b -	b -	b -	b -	b -	a SG6	a SG6	a SG6	b -	b -	a OPEN	-	1.6	2.5	nsec
Tf2		T.P.35 T.P.30 T.P.27	5	b -	b -	b -	b -	b -	a SG6	a SG6	a SG6	b -	b -	a OPEN	-	1.6	2.5	nsec
HV SW portion																		
V_{OH1}	High-level output voltage 1	T.P.21 T.P.22	5	b -	b -	b -	c 5.0V	c 5.0V	b -	b -	b -	b -	b -	b GND	4.5	5.0	-	V
V_{OH2}	High-level output voltage 2	T.P.21 T.P.22	5	b -	b -	b -	b -	b -	b -	b -	b -	c 5.0V	c 5.0V	a OPEN	4.5	5.0	-	V
V_{OL1}	Low-level output voltage 1	T.P.21 T.P.22	5	b -	b -	b -	c 0V	c 0V	b -	b -	b -	b -	b -	b GND	-	0.2	5.0	V
V_{OL2}	Low level output voltage 2	T.P.21 T.P.22	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.8 T.P.9	5	b -	b -	b -	c Vari-able	c Vari-able	b -	b -	b -	b -	b -	b GND	2.0	2.5	3.0	V
Vith2	Input threshold voltage 2	T.P.17 T.P.18	5	b -	b -	b -	b -	b -	b -	b -	b -	c Vari-able	c Vari-able	a OPEN	2.0	2.5	3.0	V
Trd1	Rising delay time 1	T.P.21 T.P.22	5	b -	b -	b -	a SG7	a SG7	b -	b -	b -	b -	b -	b GND	-	100	150	nsec
Trd2	Rising delay time 2	T.P.21 T.P.22	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.21 T.P.22	5	b -	b -	b -	a SG7	a SG7	b -	b -	b -	b -	b -	b GND	-	50	100	nsec
Tfd2	Falling delay time 2	T.P.21 T.P.22	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.19	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.19	5	b -	b -	b -	b -	b -	a SG1	a SG1	a SG1	a SG7	a SG7	c	0.5	1.5	2.0	V

ELECTORICAL 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.

I_{CC1}, I_{CC2} Circuit current 1, circuit current 2 (no signal)

The conditions shall be as provided in the Electrical Characteristics Table. When SW19 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 I_{CC2}).

V_{DC1}, V_{DC2} Output DC voltage 1, output DC voltage 2

When SW19 is assigned to GND (or OPEN), and no signal is input, measure T.P.35 (T.P.30, T.P.27) output DC voltage. Specify the voltage to be V_{DC}1 (or V_{DC}2).

V_{DC3}, V_{DC4}, Output DC voltage 3, output DC voltage 4

Measure the output DC voltage of T.P.25 in the same manner as in V_{DC1} and V_{DC2}, and specify the voltage to be V_{DC3} (V_{DC4}).

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

Assign SW19 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.35 is strained. The value is specified to be Vimax1. In the same manner, measure Vimax 1 in response to inputs into pin ⑤ and pin ⑦ only.

Then assign SW19 to OPEN, measure the values at inputs into pins ⑪, ⑬, and ⑯ only. Then specify the values to be Vimax2.

G_{V1},ΔG_{V1}, voltage gain 1, relative voltage gain 1

G_{V2}, ΔG_{V2}, voltage gain 2, relative voltage gain 2

1. The conditions shall be as provided in the Electrical Characteristics Table.
2. Assign SW19 to GND and input SG2 into pin 2 only. When this is the case, read the amplitude of T.P.35 output and specify the value as V_{OR1}.
3. Calculate voltage gain GV1 by the following formula:

$$G_{V1}=20\mathrm{LOG}\ \frac{V_{OR1}\ [V_{P\text{-}P}]}{0.7\ [V_{P\text{-}P}]}\ (\mathrm{dB})$$

4. In the same manner, find voltage gain G_{V1} in response to inputs into pin ⑤ and pin ⑦ only.
5. Calculate the difference in voltage gain between channels to find relative voltage gain ΔG_{V1}.
6. In the same manner, find G_{V2} and ΔG_{V2}.

G_{V3}, ΔG_{V4} 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.25.
3. As in the case of G_{V1}, ΔG_{V1}, G_{V2} and ΔG_{V2}, find G_{V3} and G_{V4}.

F_{C1}, ΔF_{C1} frequency characteristics 1, relative frequency characteristics 1 (100 MHz)

F_{C2}, ΔF_{C2} 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 SW19 to GND and input SG2 into pin 2 only. When this is the case, specify the output amplitude of T.P.35 to be V_{OR1}.
   In the same manner, specify the output to be V_{OR2} with SG4 input.
3. In this case, calculate frequency characteristics F_{C1} by the following formula:

$$F_{C1} = 20\mathrm{LOG}\ \frac{V_{OR2}\ [V_{P\text{-}P}]}{V_{OR1}\ [V_{P\text{-}P}]}\ (\mathrm{dB})$$

4. In response to inputs into pin ⑤ and pin ⑦ only, find frequency characteristics Fc1 in the same manner.
5. Calculate the difference in frequency characteristics between channels to find relative frequency characteristicsΔFc1.
6. Assign SW19 to OPEN. In the same manner, find F_{C2} and ΔF_{C2}.

F_{C3}, F_{C4} Frequency characteristics 3, frequency characteristics 4 (250 MHz)

In the same manner as finding F_{C1}, ΔF_{C1}, F_{C2} andΔF_{C2}, find F_{C3} and F_{C4} 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 SW19 to GND and input SG3 into pin ② only. Measure the output amplitude of T.P.35 at that time and specify the value to be V_{OR3}.
3. Assign SW19 to ONPEN, measure the output amplitude of T.P.35 at that time and specify the value to be $V_{OR3'}$.
4. When this is the case, calculate crosstalk C.T.L1 between 2 inputs by the following formula:

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

5. In the same manner, find crosstalk between 2 inputs in response to inputs into pin ⑤ and pin ⑦ only.
6. Assign SW19 to OPEN and then input SG3 into pin ⑪ only. Measure the output amplitude of T.P.35 at that time and specify the value to be $V_{OR4'}$.
7. Assign SW19 to GND and then measure the output amplitude of T.P.35 at that time. Specify the value to be $V_{OR4'}$.

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

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

9. As in the same manner, find crosstalk between 2 pints in response to input into pin ⑬ and pin ⑯ 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 SW19 to GND and input signal SG3 into pin ② only. Specify the output amplitude of T.P.35 to be V_{OR5} at that time.
3. In the same status, measure the output amplitude of T.P.30 and T.P.27and specify the values to be V_{OG5} and V_{OB5}.
4. When this is the case, calculate crosstalk C.T.C1 between channels by the following formula:

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

5. In the same manner, find crosstalk between channels in response to inputs into pin ⑤ and pin ⑦ only.
6. Assign SW19 to OPEN and then input signal SG3 into pin ⑪ only. Specify the output amplitude of T.P.35 to be V_{OR6} at that time.
7. In the same status, measure the output amplitude of T.P.30 and T.P.27. Specify the values to be V_{OG6} and V_{OB6}.
8. When this is the case, calculate crosstalk C.T.C.2 between channels by the following formula:

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

9. As in the same manner, find crosstalk between channels in response to inputs into pin ⑬ and pin ⑯ only.

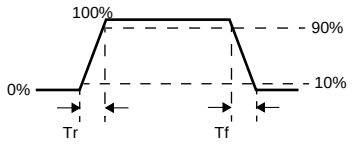
C.T.C.3 Crosstalk 3 between channels

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 SW19 to GND (or OPEN).
2. With active probe, measure rising Tri and falling Tfi 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:



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

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

V_{OH1}, V_{OH2} High-level output voltage 1 and high-level output voltage 2

The conditions shall be as provided in the Electrical Characteristics Table. Assign SW19 to GND (or OPEN), apply 5V to the input pin and measure the output voltage. Specify the value to be V_{OH1} (V_{OH2}).

V_{OL1}, V_{OL2} Low-level output voltage 1 and low-level output voltage 2

The conditions shall be as provided in the Electrical Characteristics Table. Assign SW19 to GND (or OPEN), apply 0V to the input pin and measure the output voltage. Specify the value to be V_{OL1} (V_{OL2}).

Vith1 Input threshold voltage 1

Vith2 Input threshold voltage 2

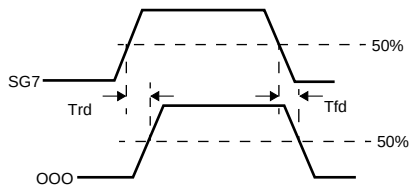
The conditions shall be as provided in the Electrical Characteristics Table. Assign SW19 to GND (or OPEN). Gradually increasing the voltage of input pin from 0V, measure the input voltage when the output voltage is Hi (4.5V or more). Specify the value to be Vith1 (Vith2).

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 SW19 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.

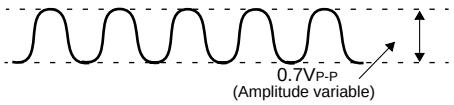
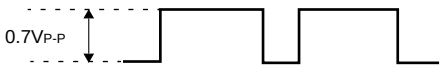
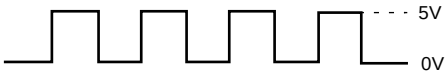


Vsth1 Switching threshold voltage 1

Vsth2 Switching threshold voltage 2

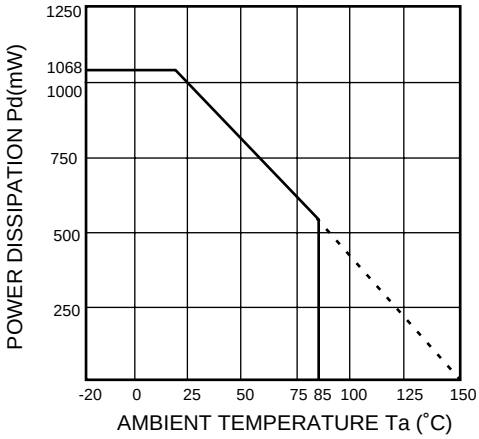
1. The conditions shall be as provided in the Electrical Characteristics Table. Input SG7 into pins ②, ⑤ and ⑦. Input SG7 into pins ⑧ and ⑨. Do not input signal into other pins.
2. Apply a voltage of 0V to pin ⑲ and check each of TP21, TP22, TP25, TP27, TP30 and TP35 for output of signal.
3. Gradually increasing the voltage at pin ⑲, specify the output at pin ⑲ to be Vsth1 when the signal is not output from the above pins.
4. As in the same manner, input SG1 into pins ⑪, ⑬ and ⑯ and input SG7 into pins ⑰ and ⑱. Do not input signal into other pins.
5. Apply a voltage of 5V to pin ⑲ and check each of TP21, TP22, TP25, TP27, TP30 and TP35 for output of signal.
6. Gradually decreasing the voltage at pin ⑲, specify the output at pin ⑲ to be Vsth2 when the signal is not output from the above pins.

INPUT SIGNAL

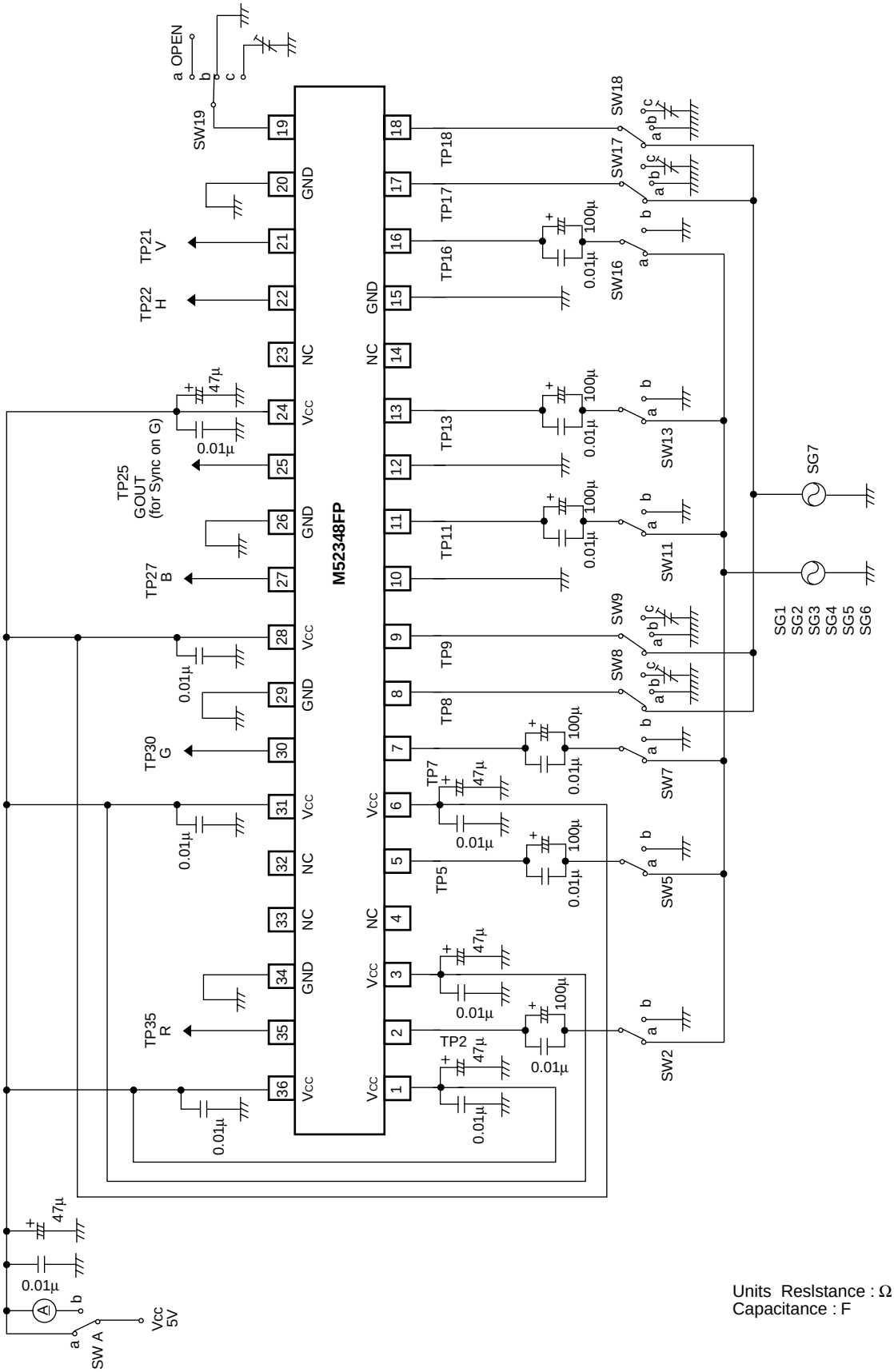
SG No.	signals
SG1	Sine wave (f=60 kHz, 0.7V_{P-P}, amplitude variable) 
SG2	Sine wave (f=1 MHz, amplitude 0.7V_{P-P})
SG3	Sine wave (f=10 MHz, amplitude 0.7V_{P-P})
SG4	Sine wave (f=100 MHz, amplitude 0.7V_{P-P})
SG5	Sine wave (f=250 MHz, amplitude 0.7V_{P-P})
SG6	Pulse of 0.7V_{P-P} in amplitude (f=60kHz,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

TYPICAL CHARACTERISTICS

THERMAL DERATING (MAXIMUM RATING)

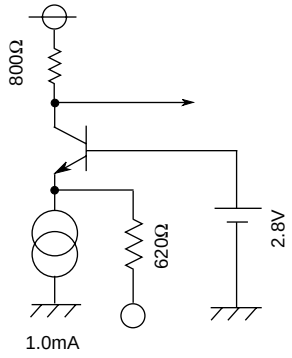
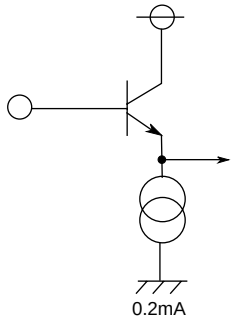
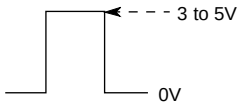
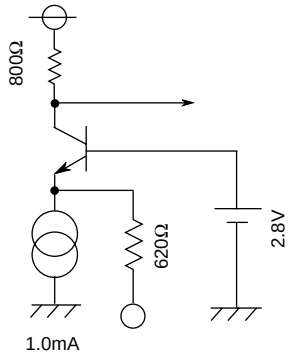


TEST CIRCUIT

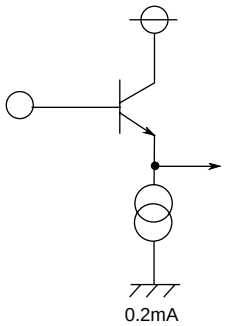
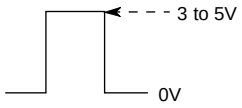
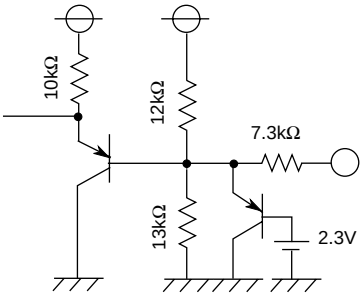
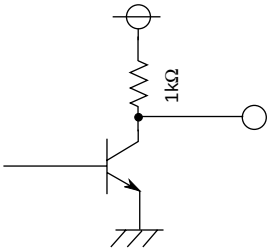
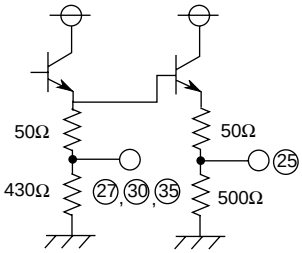


Units Reslstance : Ω
Capacitance : F

DESCRIPTION OF PIN

Pin No.	Name	Peripheral circuit of pins	DC voltage (V)	Description of function
① ③ ⑥	V_{CC1}(R) V_{CC1}(G) V_{CC1}(B)		5.0	
② ⑤ ⑦	INPUT1(R) INPUT1(G) INPUT1(B)		2.0	Input at low impedance.
⑧ ⑨	INPUT1(H) INPUT1(V)		-	Input pulse of 3V or more and 5V or less. 
⑩ ⑳ ⑫ ㉖ ⑮ ㉙ ㉞	GND		GND	
⑪ ⑬ ⑯	INPUT2(R) INPUT2(G) INPUT2(B)		2.0	Input at low impedance.

DESCRIPTION OF PIN (cont.)

Pin No.	Name	Peripheral circuit of pins	DC voltage (V)	Description of function
⑰ ⑱	INPUT2(H) INPUT2(V)		-	Input pulse of 3V or more and 5V or less. 
⑲	SWITCH		2.6	Enables switching between OPEN and GND.
㉑ ㉒	OUTPUT(V) OUTPUT(H)		-	Contains output resistance.
㉔	V_{CC1}(R) (H,V,SWITCH)	———	5.0	Apply the same voltage.
④⑭㉓ ㉜㉝	NC	———	-	
㉕ ㉗ ㉚ ㉟	OUTPUT (SYNC ONG) OUTPUT(B) OUTPUT(G) OUTPUT(R)		1.5 2.2	Contains output resistance.
㉘ ㉛ ㊱	V_{CC2}(B) V_{CC2}(G) V_{CC2}(R)	———	5.0	

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 ㉑ and ㉒) 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.

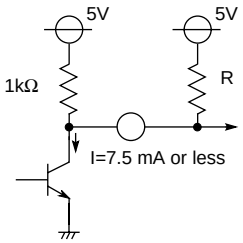


Fig. 1

5. The R, G and B output pins (pins ㉗, ㉚ and ㉟) 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.

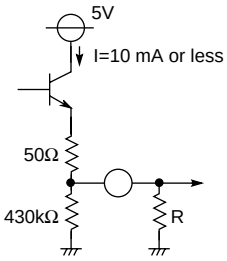


Fig. 2

6. The switch (pin ⑲) 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 Vcc.

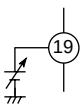


Fig. 3

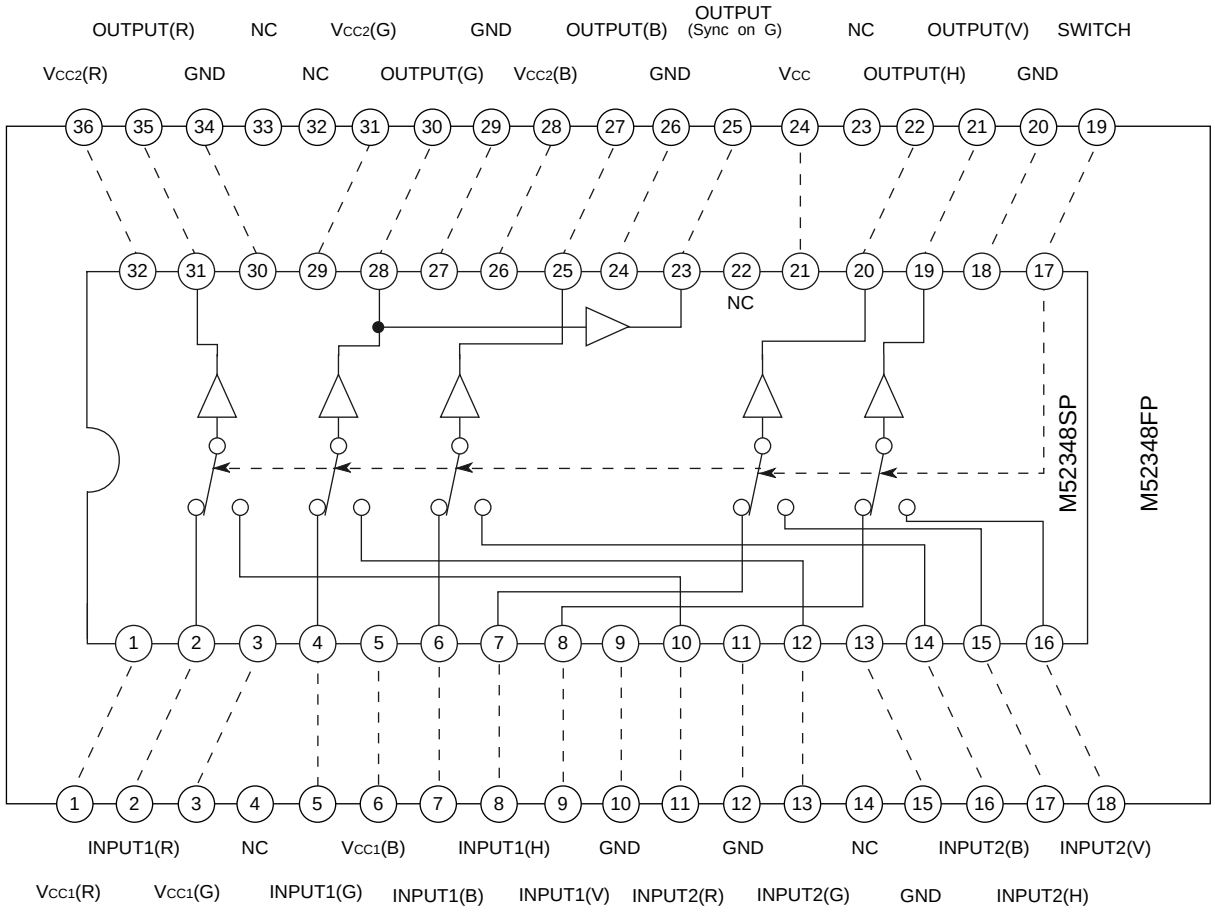
CAUTIONS FOR MANUFACTURING BOARDS

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 Vcc-GND bus controller capacitance near the pin.
- Vcc shall use a stable power supply. (Individual Vcc 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.

Pin configuration comparing of M52348FP and M52348SP

M52348FP is different from M52348SP in pin configuration,
but function characteristic is same.



Outside package
M52348FP : 36P2R - D
M52348SP : 32P4B