

To our customers,

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## Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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To all our customers

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The semiconductor operations of Hitachi and Mitsubishi Electric were transferred to Renesas Technology Corporation on April 1st 2003. These operations include microcomputer, logic, analog and discrete devices, and memory chips other than DRAMs (flash memory, SRAMs etc.) Accordingly, although Mitsubishi Electric, Mitsubishi Electric Corporation, Mitsubishi Semiconductors, and other Mitsubishi brand names are mentioned in the document, these names have in fact all been changed to Renesas Technology Corp. Thank you for your understanding. Except for our corporate trademark, logo and corporate statement, no changes whatsoever have been made to the contents of the document, and these changes do not constitute any alteration to the contents of the document itself.

Note : Mitsubishi Electric will continue the business operations of high frequency & optical devices and power devices.

Renesas Technology Corp.  
Customer Support Dept.  
April 1, 2003

# M51403FP/GP

## PAL VIDEO CHROMA SIGNAL PROCESSOR

### DESCRIPTION

The M51403FP/GP is a semiconductor integrated circuit for processing video signals in a PAL system color liquid crystal (LC) television set.

This IC incorporates ACC, APC, VCXO, RGB matrix amplifier, color signal demodulator, picture quality control, killer circuit and ID circuit.

### FEATURES

- Low power dissipation
- PAL/SECAM dual system can be configured by combination with M51404AFP (SECAM chroma IC)
- 32-pin flat package

### APPLICATION

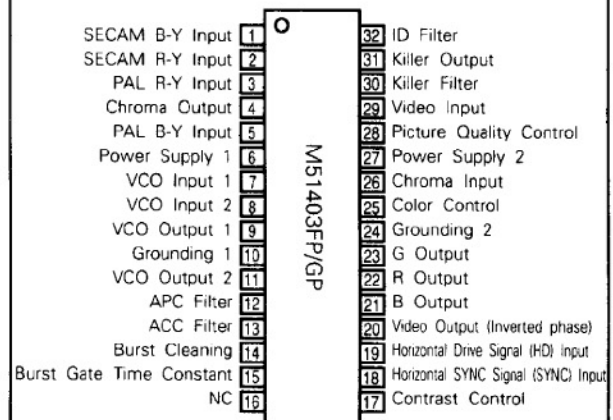
LCD, TV

### RECOMMENDED OPERATING CONDITION

Supply voltage range.....4.0 ~ 5.0V

Rated supply voltage.....4.5V

### PIN CONFIGURATION (TOP VIEW)

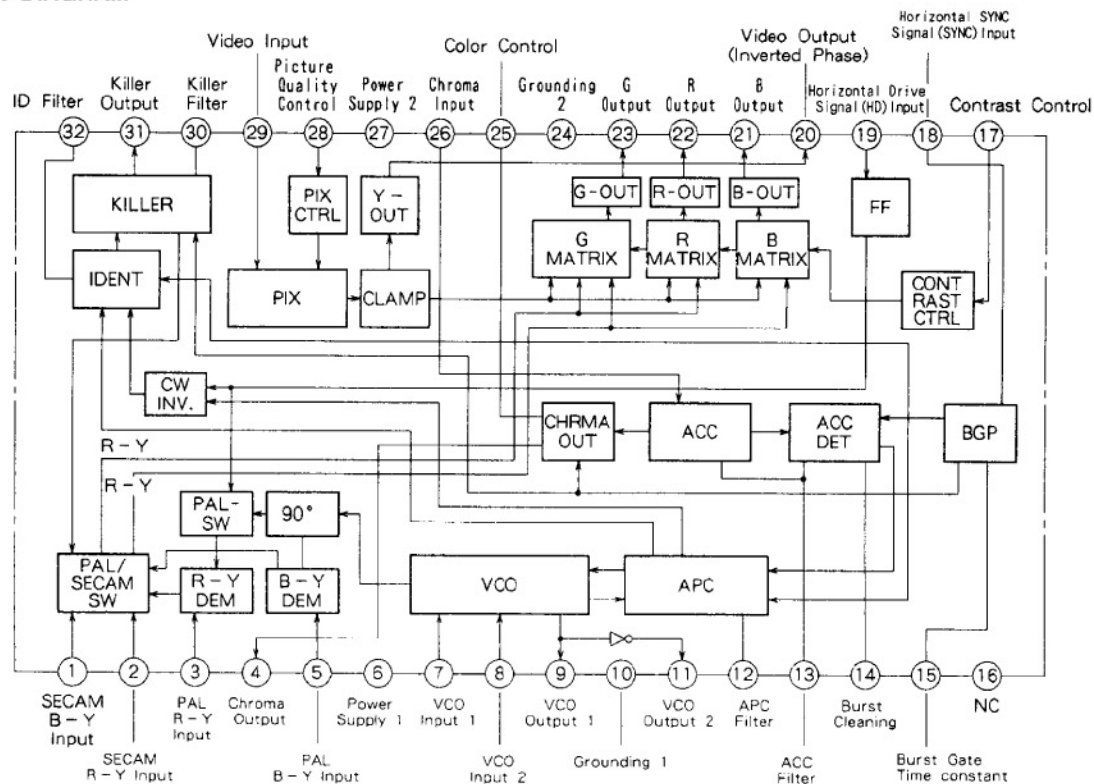


Outline 32P2W-A (FP)

32P2U-B (GP)

NC: No connection

### BLOCK DIAGRAM



# M51403FP/GP

## PAL VIDEO CHROMA SIGNAL PROCESSOR

### ABSOLUTE MAXIMUM RATINGS

| Symbol                      | Parameter                       | Ratings               | Unit  |
|-----------------------------|---------------------------------|-----------------------|-------|
| V <sub>CC</sub>             | Supply voltage                  | 5.0                   | V     |
| Surge                       | Surge withstand voltage (200pF) | ± 300*                | V     |
| V <sub>IN⑧</sub>            | Input amplitude at pin ⑧        | 500                   | mVp-p |
| I <sub>OUT⑪</sub>           | Outflow current at pin ⑪        | 800                   | mA    |
| I <sub>OUT⑫</sub>           | Outflow current at pin ⑫        | 900                   | mA    |
| V <sub>IN⑬</sub>            | Input voltage at pin ⑬          | V <sub>CC</sub> + 0.3 | V     |
| V <sub>IN⑭</sub>            | Input voltage at pin ⑭          | V <sub>CC</sub> + 0.3 | V     |
| I <sub>OUT①</sub><br>②<br>③ | Outflow current at ①, ②, ③      | 900                   | mA    |
| I <sub>OUT①①</sub>          | Outflow current at pin ①①       | 450                   | mA    |
| P <sub>d</sub>              | Internal power dissipation      | 600 (FP) 430 (GP)     | mW    |
| T <sub>opr</sub>            | Operating temperature           | -20~75                | °C    |
| T <sub>stg</sub>            | Storage temperature             | -40~125               | °C    |

\* : The voltage on pins ①, ②, ⑤ is ± 200 V.

### ELECTRICAL CHARACTERISTICS (T<sub>a</sub> = 25°C, unless otherwise noted)

| Symbol                  | Parameter                                | Test No. | Test method  | Limits |      |      | Unit             |
|-------------------------|--|----------|--|--------|------|------|------------------|
|                         |  |          | The numbers in circle below indicate Pin Nos.  | Min.   | Typ. | Max. |                  |
| I <sub>CC</sub>         | circuit current                          | 1        | Measure the inflow current when 4.5 V <sub>DC</sub> of voltage is applied to pin ⑧, ⑨.   | 15     | 20   | 27   | mA               |
| Video Section           |  |          |  |        |      |      |                  |
| Y <sub>max</sub>        | Maximum output                           | 2        | Input 100kHz sine wave of 0.3 V <sub>p-p</sub> to pin ⑧, and measure the output amplitude at pin ⑪ when the voltage at pin ⑭ is 4.5 V <sub>DC</sub> .  | 1.8    | 2.2  | 2.7  | V <sub>p-p</sub> |
| G <sub>Y</sub>          | Video amplifier gain                     | 3        | Input 100kHz sine wave of 0.3 V <sub>p-p</sub> to pin ⑧, and when the voltage at pin ⑭ is changed to 2.0, 0.5 and 0 V <sub>DC</sub> , measure each output amplitude at pin ⑪ to calculate the ratio between the measured amplitude and input amplitude.  | 11     | 14.3 | 16   | dB               |
| Y <sub>CTST</sub> (2.0) | Contrast control characteristics         | 4        | Input 100kHz sine wave of 0.3 V <sub>p-p</sub> to pin ⑧, and when the voltage at pin ⑭ is changed to 2.0, 0.5 and 0 V <sub>DC</sub> , measure each output amplitude at pin ⑪ to calculate the measured amplitude to Test 3 output amplitude ratio.   | 0.5    | 3.0  | 5.0  | dB               |
| Y <sub>CTST</sub> (2.5) |  |          |  | -8.0   | -4.8 | -3.0 | dB               |
| Y <sub>CTST</sub> (0)   |  |          |  | -50    | -19  | -14  | dB               |
| Y <sub>TONE</sub> (4.5) | Picture quality control characteristics  | 5        | Input 1.5 MHz sine wave of 0.3 V <sub>p-p</sub> to pin ⑧, and when the voltage at pin ⑭ is 1.0 V <sub>DC</sub> , and the voltage at pin ⑮ is changed to 2.25, 4.5 and 0 V <sub>DC</sub> , measure each output amplitude at pin ⑪ to calculate the ratio of the measured amplitude to the output amplitude when the voltage at pin ⑮ is 2.25V <sub>DC</sub> .           | -4.0   | -2.6 | -1.5 | dB               |
| Y <sub>TONE</sub> (0)   |  |          |  | 4.0    | 5.7  | 7.0  | dB               |
| Y <sub>FREQ</sub>       | Frequency characteristics                | 6        | Input 200kHz and 2 MHz sine waves of 0.3 V <sub>p-p</sub> to pin ⑧, and when the voltage at pin ⑮ and ⑭ are 2.25 and 1.0 V <sub>DC</sub> respectively, measure the output amplitude at pin ⑪ to calculate the ratio between the measured amplitude and output amplitude at 2 MHz in relation to 200 kHz.   | -9.5   | -6.2 | -3.5 | dB               |
| Chroma Section          |  |          |  |        |      |      |                  |
| C <sub>max</sub>        | Maximum output                           | 7        | Input a sine wave of 0 dB to pin ⑧, and measure the output amplitude at pin ⑪ when the voltage at pin ⑭, ⑮ are 4.5 V <sub>DC</sub> .   | 1.5    | 2.0  | 2.5  | V <sub>p-p</sub> |
| G <sub>C</sub>          | Chroma maximum gain                      | 8        | Input a sine wave of -26 dB to pin ⑧, and when the voltage at pins ⑭, ⑮ are 4.5 V <sub>DC</sub> , measure the output amplitude at pin ⑪ to calculate the ratio between the measured amplitude and input amplitude.   | 45     | 52   | 57   | dB               |
| C <sub>ACC</sub> (+6)   | ACC control characteristics              | 9        | Input sine wave of 0, +6, -20 dB to pin ⑧, and when the voltage at pin ⑭, ⑮ are 1.0 and 0.3 V <sub>DC</sub> respectively, measure each output amplitude at pin ⑪ to calculate the ratio between the measured amplitude and output amplitude at 0 dB input.   | 0      | 0.1  | 2.0  | dB               |
| C <sub>ACC</sub> (-20)  |  |          |  | -6.0   | -1.8 | 0    | dB               |
| C <sub>KLR</sub>        | Killer operation input                   | 10       | Input PAL simple chroma signal of 0 dB to pin ⑧, reduce the amplitude, measure the input amplitude when the voltage at pin ⑭ exceeds 2.9 V, and calculate the ratio of the measured amplitude to the input amplitude at 0 dB.  |        | -48  | -40  | dB               |
| D <sub>KLR</sub>        | Killer color residual                    | 11       | Input a sine wave of 0 dB to pin ⑧, and measure the output amplitude at pin ⑪ when the voltage at pin ⑭, ⑮ are 1.0 and 0.3 V <sub>DC</sub> respectively.   | 0      | 10   | 30   | mVp-p            |
| C <sub>SAT</sub> (4.5)  | Color saturation control characteristics | 12       | Input a sine wave of 0 dB to pin ⑧, and when the voltage at pin ⑭ is 1.0 V <sub>DC</sub> , and the voltage at pin ⑮ is changed to 4.5, 1.0, 0.5, 0.3 and 0.1 V <sub>DC</sub> , measure each output amplitude at pin ⑪ to calculate the ratio between the measured amplitude and the output amplitude when the voltage at pin ⑮ is 0.3V <sub>DC</sub> (To be continued) | 1.5    | 3.5  | 6.0  | dB               |
| C <sub>SAT</sub> (1.0)  |  |          |  | 1.5    | 3.5  | 6.0  | dB               |
| C <sub>SAT</sub> (0.5)  |  |          |  | 1.0    | 3.0  | 5.5  | dB               |
| C <sub>SAT</sub> (0.1)  |  |          |  | -16    | -13  | -10  | dB               |

## PAL VIDEO CHROMA SIGNAL PROCESSOR

## ELECTRICAL CHARACTERISTICS (cont.)

| Symbol                | Parameter                              | Test No. | Test method   | Limits |      |      | Unit              |
|-----------------------|--|----------|---|--------|------|------|-------------------|
|                       |  |          |   | Min.   | Typ. | Max. |                   |
| CCTRL(4.5)            | Color control characteristics          | 13       | Input a sine wave of 0 dB to pin ⑤, and when the voltage at pin ①, ② are 4.5 V <sub>CC</sub> , measure the amplitude at pin ④; it shall be CCTRL(4.5).  | 0.8    | 1.2  | 1.6  | V <sub>P-P</sub>  |
| CCTRL(2.0)            |  |          | In the same manner, measure the output amplitude at pin ④ when the voltage at pin ⑤ is 2.0 and 0.5 V <sub>CC</sub> to calculate the ratio between the measured amplitude and CCTRL(4.5); the amplitude shall be CCTRL(2.0) and CCTRL(0.5) respectively.         | -6     | -2.8 | 0    | dB                |
| CCTRL(0.5)            |  |          |   | -20    | -17  | -14  | dB                |
| Δf <sub>VCO</sub>     | VCO free run frequency                 | 14       | Input only SYNC to pin ⑤ and measure the oscillation frequency at pin ① to calculate the difference from 4.433619 MHz. (No input at pin ②)  | -950   | 0    | +950 | Hz                |
| Δf <sub>VCOpull</sub> | APC pull-in range                      | 15       | Input a sine wave of 0 dB to pin ⑤ and change the frequency. Measure the input frequency at which the voltage at pin ⑤ change from "H" to "L." (The center frequency shall be 4.433619 MHz.)  | +200   | +300 |      | Hz                |
|                       |  |          |   |        | -300 | -200 |                   |
| DB                    | B demodulator sensitivity              | 16       | Input a sine wave of 0 dB to pin ⑤ and measure the output amplitude at pin ① when the voltages at pin ②, ③ are 1.0 and 0.3 V <sub>CC</sub> respectively.  | 0.4    | 0.7  | 1.2  | V <sub>P-P</sub>  |
| R (R/B)               | Demodulated output voltage ratio       | 17       | Input a sine wave of 0 dB to pin ⑤ and measure the output amplitude at pin ②, ③ when the voltages at pin ①, ④ are 1.0 and 0.3 V <sub>CC</sub> respectively to calculate the ratio between the measured amplitude and the output amplitude in Test No. 16 above. | 0.40   | 0.57 | 0.70 | -                 |
| R (G/B)               |  |          |   | 0.25   | 0.35 | 0.45 | -                 |
| DieakB                | Demodulated output carrier leak        | 18       | Input a sine wave of 0 dB to pin ⑤ and measure the output amplitude at pin ①, ②, ③ for the element of 8.9 MHz when the voltages at pins ④, ⑤ are 1.0 and 0 V <sub>CC</sub> respectively.  | 0      | 8    | 25   | mV <sub>P-P</sub> |
| DieakR                |  |          |   | 0      | 8    | 30   | mV <sub>P-P</sub> |
| DieakG                |  |          |   | 0      | 8    | 25   | mV <sub>P-P</sub> |
| R <sub>DC</sub>       | PAL/SECAM output DC voltage difference | 19       | Measure each DC voltage difference at pin ①, ②, ③ when pin ⑤ is grounded with V <sub>CC</sub> at 10K Ω with noinput at pins ④ and ⑤.  | 0      | 19   | 50   | mV <sub>DC</sub>  |
| G <sub>DC</sub>       |  |          | * 4.5 V <sub>CC</sub> for voltage at pin ① and ③  | 0      | 6    | 50   | mV <sub>DC</sub>  |
| B <sub>DC</sub>       |  |          |   | 0      | 10   | 50   | mV <sub>DC</sub>  |
| V <sub>31KLR-H</sub>  | "H" voltage at killer pin              | 20       | Input only SYNC and measure each DC voltage at pin ⑤ when pin ④ is connected through 10k Ω to "GND (L)," and it is connected to "V <sub>CC</sub> (H)" in the same manner. (No input at pin ②)   | 3.3    | 3.7  | 4.5  | V <sub>DC</sub>   |
| V <sub>31KLR-L</sub>  | "L" voltage at killer pin              | 20       |   | 0      | 0.1  | 0.3  | V <sub>DC</sub>   |
| V <sub>CONT</sub>     | Voltage at no signal input             | 21       | Measure output DC voltage at pin ② when no signal is input.   | 2.7    | 3.1  | 3.7  | V                 |
| G <sub>CO</sub>       | Luminance amplifier gain               | 22       | Input 100 kHz sine wave of 0.1 V <sub>P-P</sub> to pin ⑤ and measure the output amplitude at pin ② to calculate the ratio between the measured amplitude and input amplitude.   | 11.0   | 14.0 | 17.0 | dB                |
| G <sub>max</sub>      | Maximum output                         | 23       | Input 100 kHz sine wave of 0.5 V <sub>P-P</sub> to pin ⑤ and measure the output amplitude at pin ②.   | 1.7    | 2.5  | 3.0  | V <sub>P-P</sub>  |
| SB                    | SECAM demodulated luminance            | 24       | Input 100 kHz sine wave of 0.3 V <sub>P-P</sub> to pin ①, ② when pin ④ is connected through 10 K Ω to "V <sub>CC</sub> " with pin ⑤ = 1.0 V <sub>CC</sub> and pin ③ = 0 V <sub>CC</sub> , and measure the output amplitude at pin ②.                            | 0.7    | 1.0  | 1.3  | V <sub>P-P</sub>  |
| SR (R/B)              | SECAM demodulated output voltage ratio | 25       | Measure the output amplitude at pin ②, ③ under the conditions in Test No. 24 above, and calculate the ratio between the measured amplitude and output amplitude in Test.  | 0.55   | 0.67 | 0.80 | -                 |
| SR (G/B)              |  |          |   | 0.45   | 0.55 | 0.65 | -                 |

# M51403FP/GP

## PAL VIDEO CHROMA SIGNAL PROCESSOR

### SWITCH CONDITIONS IN TEST CIRCUIT

| Test No. | Pin Voltage (V <sub>DC</sub> ) |                 |     |                  |     | S              |                |                 |                 |                 |                 |                 |                   |                   |                 | W   |  |  |  |  |
|----------|--------------------------------|-----------------|-----|------------------|-----|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------|-------------------|-----------------|-----|--|--|--|--|
|          | ⑪                              | ⑫               | ⑬   | ⑭                | ⑮   | S <sub>1</sub> | S <sub>3</sub> | S <sub>17</sub> | S <sub>19</sub> | S <sub>25</sub> | S <sub>26</sub> | S <sub>28</sub> | S <sub>29-1</sub> | S <sub>29-2</sub> | S <sub>30</sub> |     |  |  |  |  |
| 1        | 2.7                            | 2.25            | 4.5 | 2.25             |     | OFF            | OFF            | OFF             | OFF             | OFF             | ON              | OFF             | ON                | OFF               | OFF             |     |  |  |  |  |
| 2        | 4.5                            | 0               | 4.5 | 2.25             |     | OFF            | ON             | OFF             | ON              | ON              | ON              | OFF             | ON                | OFF               | OFF             |     |  |  |  |  |
| 3        | 1.0                            | 0               | 4.5 | 2.25             |     | OFF            | ON             | OFF             | ON              | ON              | ON              | OFF             | ON                | OFF               | OFF             |     |  |  |  |  |
| 4        | 2.0<br>0.5<br>0                | 0               | 4.5 | 2.25             |     | OFF            | ON             | OFF             | ON              | ON              | ON              | OFF             | ON                | OFF               | OFF             |     |  |  |  |  |
| 5        | 1.0                            | 0               | 4.5 | 2.25<br>4.5<br>0 |     | OFF            | ON             | OFF             | ON              | ON              | ON              | OFF             | ON                | OFF               | OFF             |     |  |  |  |  |
| 6        | 1.0                            | 0               | 4.5 | 2.25             |     | OFF            | ON             | OFF             | ON              | ON              | ON              | OFF             | ON                | OFF               | OFF             |     |  |  |  |  |
| 7        | 4.5                            | 4.5             | 4.5 | 2.25             | 2.9 | 0              | OFF            | OFF             | OFF             | OFF             | OFF             | OFF             | OFF               | OFF               | OFF             | ON  |  |  |  |  |
| 8        | 4.5                            | 4.5             | 4.5 | 2.25             | 2.9 | 0              | OFF            | OFF             | OFF             | OFF             | OFF             | OFF             | OFF               | OFF               | OFF             | ON  |  |  |  |  |
| 9        | 1.0                            | 0.3             | 4.5 | 2.25             | 2.9 | 0              | OFF            | OFF             | OFF             | OFF             | OFF             | OFF             | OFF               | OFF               | OFF             | ON  |  |  |  |  |
| 10       | 1.0                            | 0.3             | 4.5 | 2.25             | 2.9 | 0              | OFF            | OFF             | OFF             | OFF             | OFF             | OFF             | OFF               | OFF               | OFF             | ON  |  |  |  |  |
| 11       | 1.0                            | 0.3             | 4.5 | 2.25             | 2.9 | 4.5            | OFF            | OFF             | OFF             | OFF             | OFF             | OFF             | OFF               | OFF               | OFF             | ON  |  |  |  |  |
| 13       | 4.5                            | 4.5<br>2.0<br>0 | 4.5 | 2.25             | 2.9 | 0              | OFF            | OFF             | OFF             | OFF             | OFF             | OFF             | OFF               | OFF               | OFF             | ON  |  |  |  |  |
| 14       | 1.0                            | 0.3             | 4.5 | 2.25             | 2.9 |                | OFF            | OFF             | OFF             | OFF             | OFF             | ON              | OFF               | OFF               | OFF             | OFF |  |  |  |  |
| 15       | 1.0                            | 0.3             | 4.5 | 2.25             | 2.9 |                | OFF            | OFF             | OFF             | OFF             | OFF             | OFF             | OFF               | OFF               | OFF             | OFF |  |  |  |  |
| 16       | 1.0                            | 0.3             | 4.5 | 2.25             | 2.9 | 0              | OFF            | OFF             | OFF             | OFF             | OFF             | OFF             | OFF               | OFF               | OFF             | ON  |  |  |  |  |
| 17       | 1.0                            | 0.3             | 4.5 | 2.25             | 2.9 | 0              | OFF            | OFF             | OFF             | OFF             | OFF             | OFF             | OFF               | OFF               | OFF             | ON  |  |  |  |  |
| 18       | 1.0                            | 0               | 4.5 | 2.25             | 2.9 | 0              | OFF            | OFF             | OFF             | OFF             | OFF             | OFF             | OFF               | OFF               | OFF             | ON  |  |  |  |  |
| 19       | 4.5                            | 4.5             | 4.5 | 4.5              | 4.5 | 0              | OFF            | OFF             | OFF             | OFF             | OFF             | OFF             | OFF               | OFF               | OFF             | ON  |  |  |  |  |
| 20       | 1.0                            |                 | 4.5 | 2.25             | 2.9 | 4.5            | OFF            | OFF             | OFF             | OFF             | OFF             | OFF             | OFF               | OFF               | OFF             | ON  |  |  |  |  |
| 21       | 1.0                            | 0               | 4.5 | 2.25             |     |                | OFF            | ON              | OFF             | ON              | ON              | ON              | OFF               | ON                | OFF             | OFF |  |  |  |  |
| 22       | 1.0                            | 0               | 4.5 | 2.25             |     |                | OFF            | ON              | OFF             | ON              | ON              | ON              | OFF               | ON                | OFF             | OFF |  |  |  |  |
| 23       | 1.0                            | 0               | 4.5 | 2.25             |     |                | OFF            | ON              | OFF             | ON              | ON              | ON              | OFF               | ON                | OFF             | OFF |  |  |  |  |
| 24       | 1.0                            | 0.3             | 4.5 | 2.25             | 2.9 | 4.5            | ON             | ON              | OFF             | OFF             | OFF             | OFF             | OFF               | OFF               | OFF             | ON  |  |  |  |  |
| 25       | 1.0                            | 0.3             | 4.5 | 2.25             | 2.9 | 4.5            | ON             | ON              | OFF             | OFF             | OFF             | OFF             | OFF               | OFF               | OFF             | ON  |  |  |  |  |

\* Normally S5 should be OFF.

### Input Pulse Pin Threshold

|            |       |  |
|------------|-------|--|
| HD pulse   | Pin ⑪ |  |
| Sync PULSE | Pin ⑫ |  |

NOTE: When a pulse is input with the HD pulse polarity facing downward "┐":

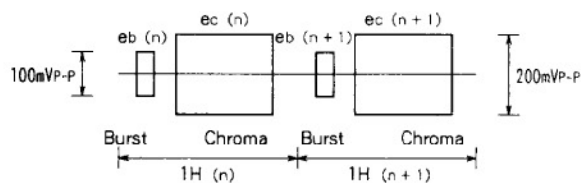
\* Fall position: This position should be within the fly-back period and ahead of the burst signal.

\* Rise position: This position should be within the fly-back period and not come into contact with the image.

### ELECTRICAL CHARACTERISTICS TEST METHOD

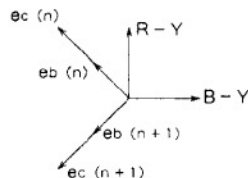
NOTE1. "Sine wave of 0dB" in the chroma section above refers to 4.43MHz, 100mV<sub>P-P</sub>.

NOTE2. PAL simple chroma signal (0dB)

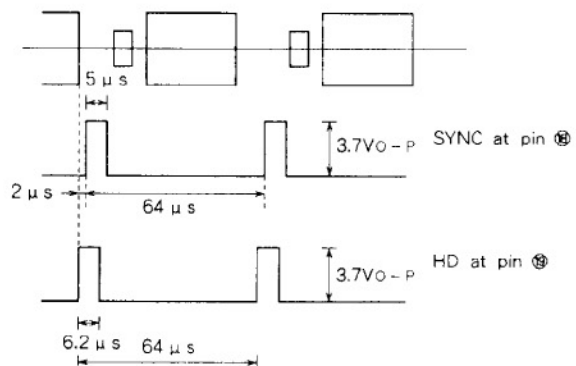


$$f_{sb}(n) = f_{sc}(n) = 4.433619\text{MHz (Same phase)}$$

The phase relation of the above signal is as shown on the right. The phase relation of  $ec(n)$  and  $ec(n+1)$  to the burst may not always be as shown in the figure above: the test items for the phase relation in particular should be variable.



### INPUT SIGNAL



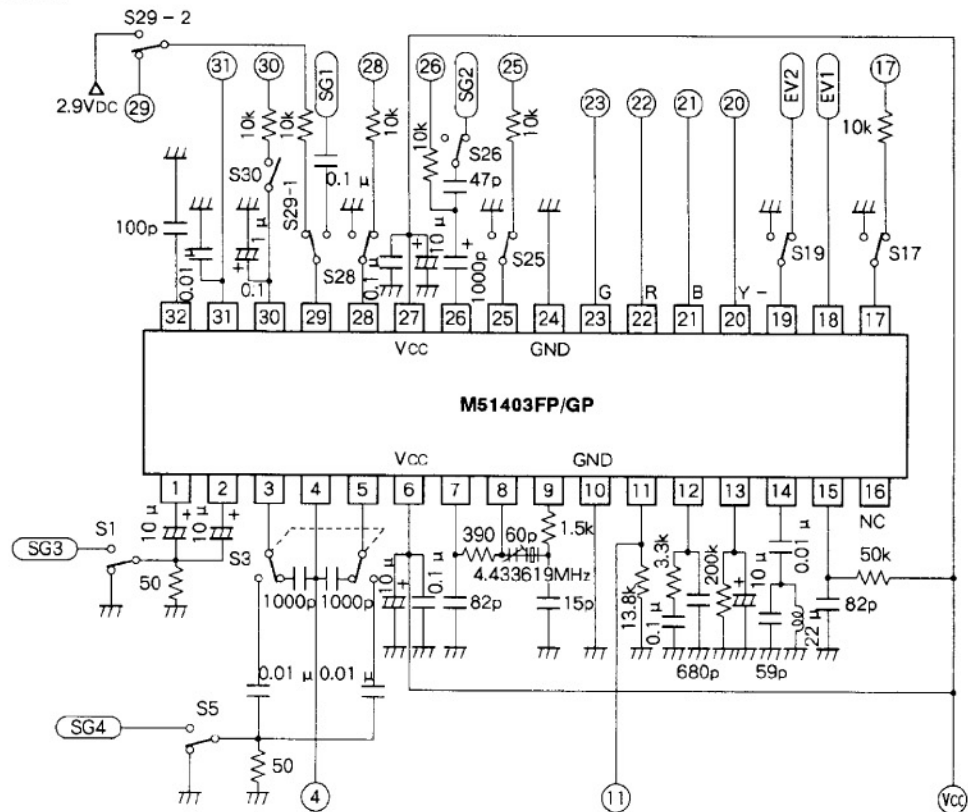
The above timing is standard: there is an allowance of 1.5  $\mu$ s after SYNC fall and 12  $\mu$ s before SYNC fall in HD rise, and 2 to 7.5  $\mu$ s in HD width.

The input amplitude should be 1.7V<sub>0-P</sub>~V<sub>cc</sub>.

# M51403FP/GP

## PAL VIDEO CHROMA SIGNAL PROCESSOR

### TEST CIRCUIT

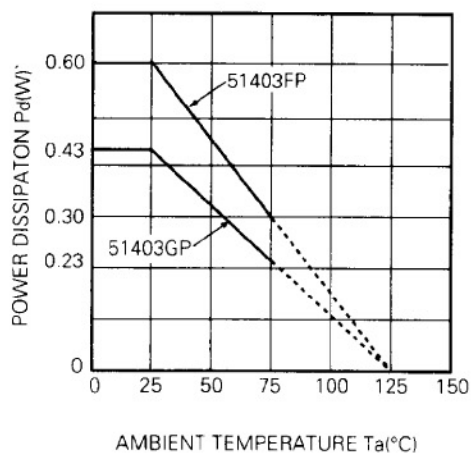


Units Resistance:  $\Omega$

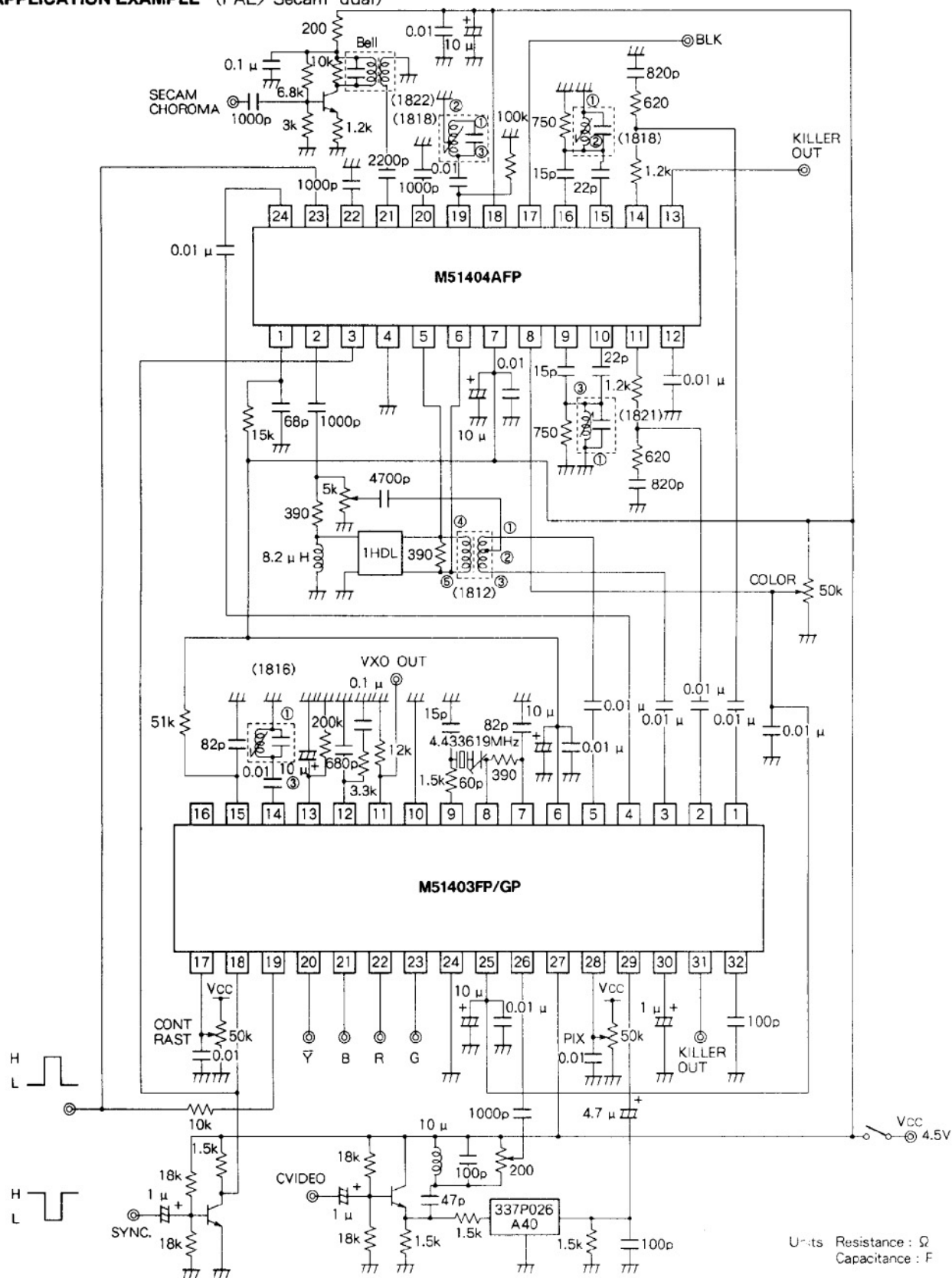
Capacitance: F

### TYPICAL CHARACTERISTICS

#### THERMAL DERATING (MAXIMUM RATING)



### APPLICATION EXAMPLE (PAL/Secam dual)



# M51403FP/GP

## PAL VIDEO CHROMA SIGNAL PROCESSOR

### DESCRIPTION OF PIN

| Pin No. | Name            | Peripheral circuit of pins |
|---------|-----------------|----------------------------|
| ①       | SECAM B-Y Input |                            |
| ②       | SECAM R-Y Input |                            |
| ③       | PAL R-Y Input   |                            |
| ⑤       | PAL B-Y Input   |                            |
| ④       | Chroma Output   |                            |
| ⑥       | Vcc1            |                            |
| ⑦       | VCO Input 1     |                            |
| ⑧       | VCO Input 2     |                            |
| ⑨       | VCO Output 1    |                            |

## M51403FP/GP

## PAL VIDEO CHROMA SIGNAL PROCESSOR

## DESCRIPTION OF PIN (cont.)

| Pin No. | Name           | Peripheral circuit of pins |
|---------|----------------|----------------------------|
| ⑩       | GND            |                            |
| ⑪       | VCO Output 2   |                            |
| ⑫       | APC Filter     |                            |
| ⑬       | ACC Filter     |                            |
| ⑭       | Burst Cleaning |                            |

## PAL VIDEO CHROMA SIGNAL PROCESSOR

## DESCRIPTION OF PIN (cont.)

| Pin No. | Name                                | Peripheral circuit of pins |
|---------|-------------------------------------|----------------------------|
| ⑮       | Burst Gate Time Constant            |                            |
| ⑯       | N.C.                                | —                          |
| ⑰       | Contrast Control                    |                            |
| ⑱       | Horizontal Sync Signal Input (SYNC) |                            |
| ⑲       | Horizontal Drive Signal Input (HD)  |                            |

# M51403FP/GP

## PAL VIDEO CHROMA SIGNAL PROCESSOR

### DESCRIPTION OF PIN (cont.)

| Pin No. | Name                             | Peripheral circuit of pins |
|---------|----------------------------------|----------------------------|
| ⑳       | VIDEO Output<br>(Inverted phase) |                            |
| ㉑       | B Output                         |                            |
| ㉒       | R Output                         |                            |
| ㉓       | G Output                         |                            |
| ㉔       | GND                              | —                          |
| ㉕       | Color Control                    |                            |
| ㉖       | Chroma Input                     |                            |
| ㉗       | Vcc2                             | —                          |
| ㉘       | Picture Quality Control          |                            |

# M51403FP/GP

## PAL VIDEO CHROMA SIGNAL PROCESSOR

### DESCRIPTION OF PIN (cont.)

| Pin No. | Name          | Peripheral circuit of pins |
|---------|---------------|----------------------------|
| ②⑨      | VIDEO Input   |                            |
| ③①      | Killer Filter |                            |
| ③①      | Killer Output |                            |
| ③②      | ID Filter     |                            |