

TOSHIBA Bipolar Linear Integrated Circuit Silicon Monolithic

# TA1218N, TA1218F

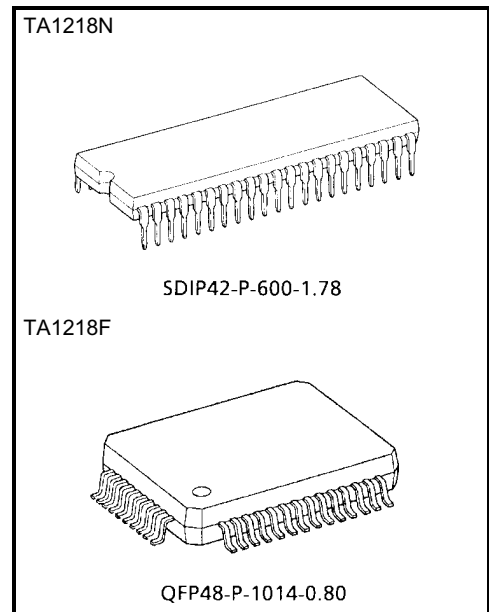
Audio/Video Switching IC for TVs

The TA1218N/F is an audio/video switching IC for TV sets. Conforming to I<sup>2</sup>C bus standards, it allows you to perform various switching operations through the bus lines by using a microcomputer. Thanks to its 2-channel outputs, the TA1218N/F can also be used for the PIP systems. Furthermore, since the presence of a signal on its sync signal output pin can be determined by a microcomputer, it is possible to check each input/output channel (self-diagnosis).

This IC has the same pin assignments as the TA1219AN (SDIP36), a 1-channel output version of the TA1218N/F, so these chips are pin compatible on pins 3 to 20 and 23 to 40.

## Features

- I<sup>2</sup>C bus control
- Video : 5-channel inputs and 2-channel outputs (2 channels conforming to S system)
- Audio : 5-channel inputs and 3-channel outputs
- Self-diagnostic function
- ADC inputs based on European 21-pin standards
- Switchable subaddress



Weight  
 SDIP42-P-600-1.78 : 4.13 g (typ.)  
 QFP48-P-1014-0.80 : 0.83 g (typ.)

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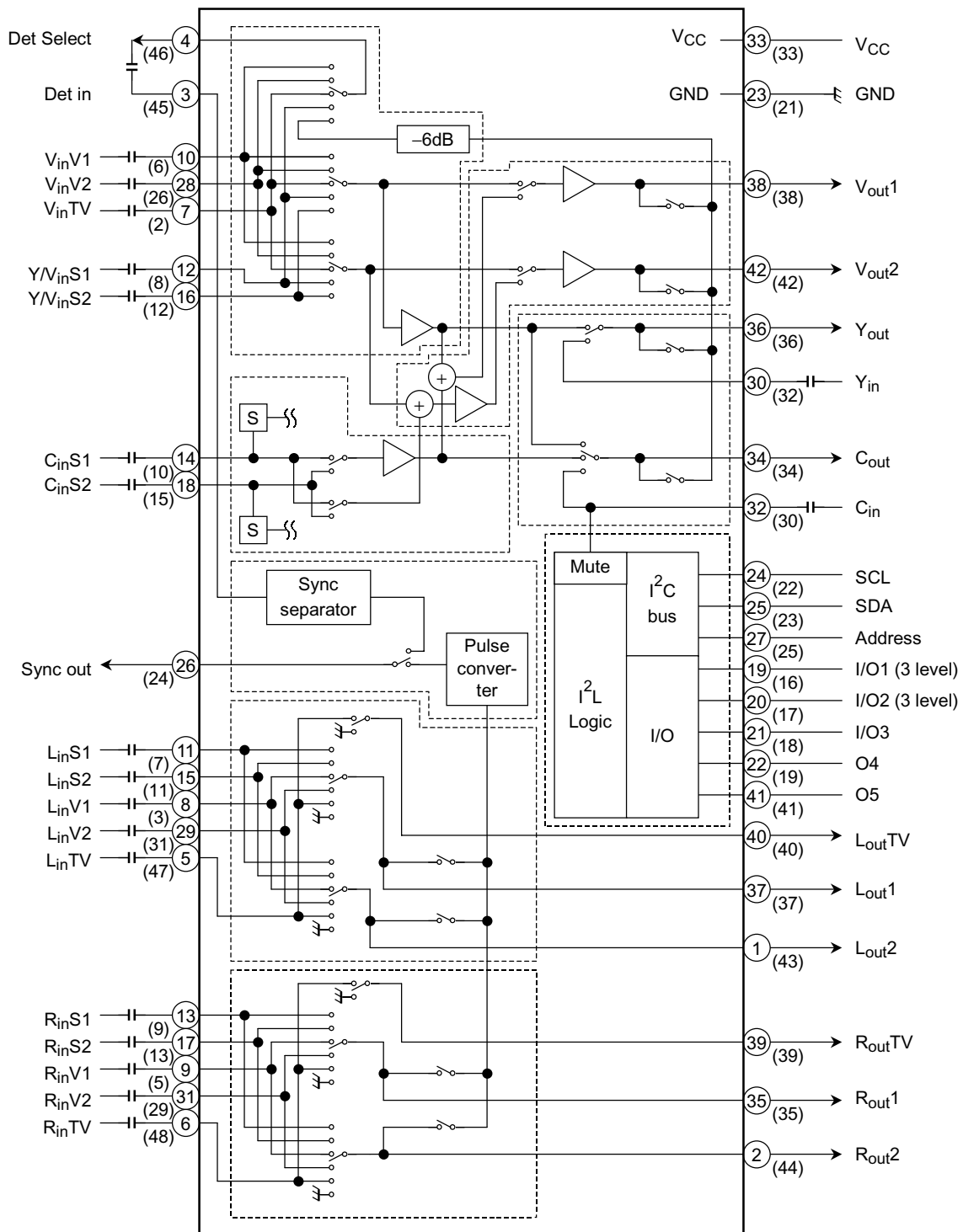
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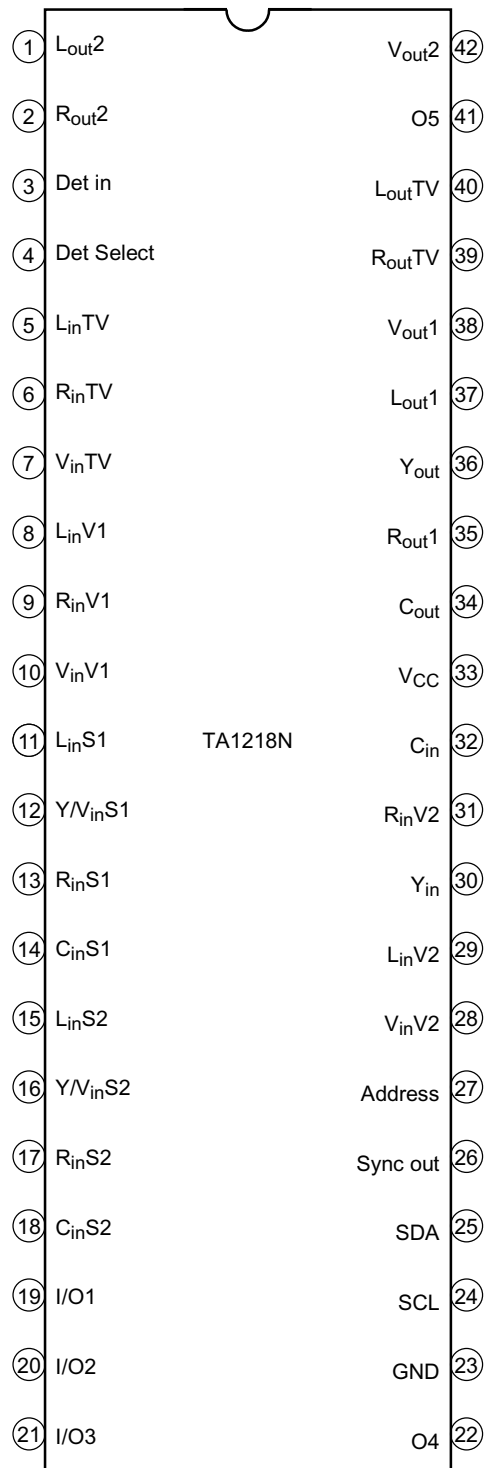
**Block Diagram**



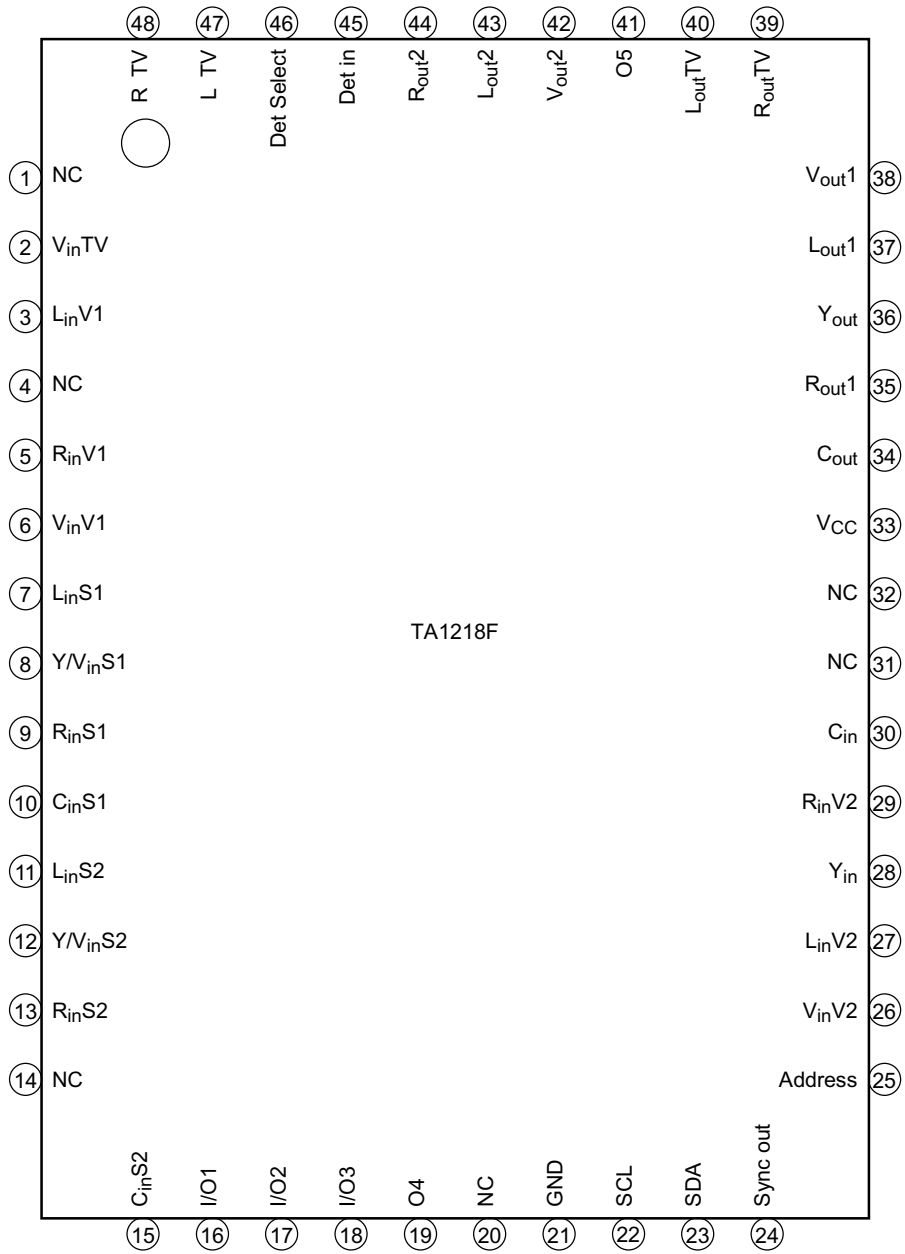
Note1: ( ) : The terminal number of TA1218F.

**Pin Assignment**

**TA1218N**



TA1218F



**Pin Description (( ): the pin number of TA1218F)**

| Pin No.   | Name              | Function   | Interface |
|-----------|-------------------|--|-----------|
| 1<br>(43) | L <sub>out2</sub> | <p>This pin is for output a sub-channel left audio signal. The signals fed into the chip via L<sub>in</sub>V1, L<sub>in</sub>V2, L<sub>in</sub>S1, L<sub>in</sub>S2, or L<sub>in</sub>TV is output from this pin. The output resistance of this pin is 45 Ω.</p> <p>Furthermore, the signal output from this pin is pulse-converted for use in self-diagnosis. The converted signal is output from Sync Out.</p> <p>This output can be muted in combination with R<sub>out2</sub> by bus control.</p>  |           |
| 2<br>(44) | R <sub>out2</sub> | <p>This pin is for output a sub-channel right audio signal. The signals fed into the chip via R<sub>in</sub>V1, R<sub>in</sub>V2, R<sub>in</sub>S1, R<sub>in</sub>S2, or R<sub>in</sub>TV is output from this pin. The output resistance of this pin is 45 Ω.</p> <p>Furthermore, the signal output from this pin is pulse-converted for use in self-diagnosis. The converted signal is output from Sync Out.</p> <p>This output can be muted in combination with L<sub>out2</sub> by bus control.</p> |           |
| 3<br>(45) | Det in            | <p>This pin is for input a sync separation signal. Input the signal from Det Select to this pin with capacitance coupling. The input resistance of this pin is 18 kΩ.</p> <p>The sync signal separated from Det Select is outputted from Sync Out for use in self-diagnosis.</p>   |           |
| 4<br>(46) | Det Select        | <p>This pin is for output a sync separation signal.</p> <p>Signals V<sub>in</sub>V1, V<sub>in</sub>V2, V<sub>in</sub>TV, Y/V<sub>in</sub>S1, V<sub>out</sub>1, V<sub>out</sub>2, Y<sub>out</sub>, or C<sub>out</sub> are outputted from this pin. The output resistance of this pin is 35 Ω.</p> <p>Input the signal from this pin to Det in with capacitance coupling.</p>  |           |

| Pin No.   | Name               | Function   | Interface |
|-----------|--------------------|--|-----------|
| 5<br>(47) | L <sub>in</sub> TV | <p>This pin is for input a left audio signal from the main demodulator in the TV set. The signal fed into this pin is presented to L<sub>out</sub>TV, L<sub>out</sub>1, and L<sub>out</sub>2.</p> <p>The input dynamic range of this pin is 6.5 V<sub>p-p</sub> and the input resistance is 70 kΩ.</p>   |           |
| 6<br>(48) | R <sub>in</sub> TV | <p>This pin is for input a right audio signal from the main demodulator in the TV set. The signal fed into this pin is presented to R<sub>out</sub>TV, R<sub>out</sub>1, and R<sub>out</sub>2.</p> <p>The input dynamic range of this pin is 6.5 V<sub>p-p</sub> and the input resistance is 70 kΩ.</p>  |           |
| 7<br>(2)  | V <sub>in</sub> TV | <p>This pin is for input a composite audio signal from the main demodulator in the TV set. The signal fed into this pin is presented to V<sub>out</sub>1, V<sub>out</sub>2, Y<sub>out</sub>, and C<sub>out</sub>. The same signal is also output from Det Select as a sync separation signal.</p> <p>The input dynamic range of this pin is 2.0 V<sub>p-p</sub> and the input resistance is 30 kΩ.</p> |           |
| 8<br>(3)  | L <sub>in</sub> V1 | <p>This pin is for input a left audio signal from an external source (V1 channel). This pin can also be used for PIP signal input. The signal fed into this pin is presented to L<sub>out</sub>1 and L<sub>out</sub>2.</p> <p>The input dynamic range of this pin is 6.5 V<sub>p-p</sub> and the input resistance is 70 Ω.</p>   |           |

| Pin No.   | Name                 | Function  | Interface |
|-----------|----------------------|---|-----------|
| 9<br>(5)  | R <sub>in</sub> V1   | <p>This pin is for input a right audio signal from an external source (V1 channel). This pin can also be used for PIP signal input. The signal fed into this pin is presented to R<sub>out1</sub> and R<sub>out2</sub>.</p> <p>The input dynamic range of this pin is 6.5 V<sub>p-p</sub> and the input resistance is 70 kΩ.</p>  |           |
| 10<br>(6) | V <sub>in</sub> V1   | <p>This pin is for input a composite video signal from an external source (V1 channel). This pin can also be used for PIP signal input. The signal fed into this pin is presented to V<sub>out1</sub>, V<sub>out2</sub>, Y<sub>out</sub>, and C<sub>out</sub>. The same signal is also output from Det Select as a sync separation signal.</p> <p>The input dynamic range of this pin is 2.0 V<sub>p-p</sub> and the input resistance is 30 kΩ.</p> |           |
| 11<br>(7) | L <sub>in</sub> S1   | <p>This pin is for input a left audio signal from an external source (S1 channel). The signal fed into this pin is presented to L<sub>out1</sub> and L<sub>out2</sub>.</p> <p>The input dynamic range of this pin is 6.5 V<sub>p-p</sub> and the input resistance is 70 kΩ.</p>   |           |
| 12<br>(8) | Y/V <sub>in</sub> S1 | <p>This pin is for input a luminance signal or composite video signal from an external source (S1 channel). The signal fed into this pin is presented to V<sub>out1</sub>, V<sub>out2</sub>, Y<sub>out</sub>, and C<sub>out</sub>. The same signal is also output from Det Select as a sync separation signal.</p> <p>The input dynamic range of this pin is 2.0 V<sub>p-p</sub> and the input resistance is 30 kΩ.</p>                             |           |

| Pin No.    | Name                 | Function  | Interface |
|------------|----------------------|---|-----------|
| 13<br>(9)  | R <sub>in</sub> S1   | <p>This pin is for input a right audio signal from an external source (S1 channel). The signal fed into this pin is presented to R<sub>out</sub>1 and R<sub>out</sub>2.</p> <p>The input dynamic range of this pin is 6.5 V<sub>p-p</sub> and the input resistance is 70 kΩ.</p>  |           |
| 14<br>(10) | C <sub>in</sub> S1   | <p>This pin is for input a chroma signal from an external source (S1 channel). It also functions as an S-mode select switch for the S1 channel. The S mode is selected when the pin voltage is 2.25 V or less. The signal fed into this pin is presented to C<sub>out</sub> directly and to V<sub>out</sub>1 and V<sub>out</sub>2 after being combined with the Y<sub>in</sub>S1 signal.</p> <p>The input dynamic range of this pin is 2.0 V<sub>p-p</sub> and the input resistance is 30 kΩ.</p> |           |
| 15<br>(11) | L <sub>in</sub> S2   | <p>This pin is for input a left audio signal from an external source (S2 channel). The signal fed into this pin is presented to L<sub>out</sub>1 and L<sub>out</sub>2.</p> <p>The input dynamic range of this pin is 6.5 V<sub>p-p</sub> and the input resistance is 70 kΩ.</p>   |           |
| 16<br>(12) | Y/V <sub>in</sub> S2 | <p>This pin is for input a luminance signal or composite audio signal from an external source (S2 channel). The signal fed into this pin is presented to V<sub>out</sub>1, V<sub>out</sub>2, Y<sub>out</sub>, and C<sub>out</sub>.</p> <p>The input dynamic range of this pin is 2.0 V<sub>p-p</sub> and the input resistance is 30 kΩ.</p>   |           |



| Pin No.    | Name               | Function  | Interface |
|------------|--------------------|---|-----------|
| 17<br>(13) | R <sub>in</sub> S2 | <p>This pin is for input a right audio signal from an external source (S2 channel). The signal fed into this pin is presented to R<sub>out</sub>1 and R<sub>out</sub>2.</p> <p>The input dynamic range of this pin is 6.5 V<sub>p-p</sub> and the input resistance is 70 kΩ.</p>  |           |
| 18<br>(15) | C <sub>in</sub> S2 | <p>This pin is for input a chroma signal from an external source (S2 channel). It also functions as an S-mode select switch for the S2 channel. The S mode is selected when the pin voltage is 2.25 V or less. The signal fed into this pin is presented to C<sub>out</sub> directly and to V<sub>out</sub>1 and V<sub>out</sub>2 after being combined with the Y<sub>in</sub>S2 signal.</p> <p>The input dynamic range of this pin is 2.0 V<sub>p-p</sub> and the input resistance is 30 kΩ.</p> |           |
| 19<br>(16) | I/O1               | <p>This is an ADC input/DAC output pin.</p> <p>The ADC is a 3-level detection type (2 bits). The threshold levels are 7.0 V and 2.25 V.</p> <p>The DAC (1 bit) is an open-collector output. Make sure that the current flowing into this pin is 2.0 mA or less.</p>   |           |
| 20<br>(17) | I/O2               | <p>This is an ADC input/DAC output pin.</p> <p>The ADC is a 3-level detection type (2 bits). The threshold levels are 7.0 V and 2.25 V.</p> <p>The DAC (1 bit) is an open-collector output. Make sure that the current flowing into this pin is 2.0 mA or less.</p>   |           |

| Pin No.    | Name | Function   | Interface |
|------------|------|--|-----------|
| 21<br>(18) | I/O3 | <p>This is an ADC input/DAC output pin.</p> <p>The ADC is a 2-level detection type (1 bit). The threshold level is 2.25 V.</p> <p>The DAC (1 bit) is an open-collector output. Make sure that the current flowing into this pin is 2.0 mA or less.</p> |           |
| 22<br>(19) | O4   | <p>This pin is for a 1 bit DAC output. This is an open-collector output. Make sure that the current flowing into this pin is 2.0 mA or less.</p>   |           |
| 23<br>(21) | GND  | This is the GND pin.   | —         |
| 24<br>(22) | SCL  | <p>This pin is for input an I<sup>2</sup>C bus clock. The input threshold level of this pin is 2.25 V.</p>   |           |
| 25<br>(23) | SDA  | <p>This is an I<sup>2</sup>C bus data input/output pin. The input threshold level of this pin is 2.25 V.</p> <p>Make sure that the current flowing into this pin is 3.0 mA or less.</p>  |           |

| Pin No.    | Name       | Function   | Interface |
|------------|------------|--|-----------|
| 26<br>(24) | Sync out   | <p>This pin is for output a self-diagnostic sync signal. The signal separated from <math>V_{inTV}</math>, <math>V_{inV1}</math>, <math>V_{inV2}</math>, <math>Y/V_{inS1}</math>, <math>V_{out1}</math>, <math>V_{out2}</math>, <math>Y_{out}</math>, or <math>C_{out}</math> is outputted from this pin. In addition, the signal derived from <math>L_{out1}</math>, <math>R_{out1}</math>, <math>L_{out2}</math>, or <math>R_{out2}</math> is also output from this pin for use in audio block diagnosis.</p> <p>This is an open-collector output.</p> <p>Make sure that the current flowing into this pin is 2.0 mA or less.</p> |           |
| 27<br>(25) | Address    | <p>This is for an <math>I^2C</math> bus slave address select switch. The threshold level of this pin is 2.25 V. The following lists the addresses :</p> <p>High : 92H (write), 93H (read)</p> <p>Low : 90H (write), 91H (read)</p>   |           |
| 28<br>(26) | $V_{inV2}$ | <p>This pin is for input a composite video signal from an external source (V2 channel). This pin can also be used for PIP signal input. The signal fed into this pin is presented to <math>V_{out1}</math>, <math>V_{out2}</math>, <math>Y_{out}</math>, and <math>C_{out}</math>. The same signal is also output from Det Select as a sync separation signal.</p> <p>The input dynamic range of this pin is 2.0 <math>V_{p-p}</math> and the input resistance is 30 kΩ.</p>   |           |
| 29<br>(27) | $L_{inV2}$ | <p>This pin is for input a left audio signal from an external source (V2 channel). This pin can also be used for PIP signal input. The signal fed into this pin is presented to <math>L_{out1}</math> and <math>L_{out2}</math>.</p> <p>The input dynamic range of this pin is 6.5 <math>V_{p-p}</math> and the input resistance is 70 kΩ.</p>   |           |

| Pin No.    | Name       | Function  | Interface |
|------------|------------|---|-----------|
| 30<br>(28) | $Y_{in}$   | <p>This pin is for input a luminance signal from an external comb filter. The signal fed into this pin is presented to <math>Y_{out}</math>.</p> <p>The input dynamic range of this pin is 5.5 V<sub>p-p</sub> and the input resistance is 60 k<math>\Omega</math>.</p>   |           |
| 31<br>(29) | $R_{inV2}$ | <p>This pin is for input a right audio signal from an external source (V2 channel). This pin can also be used for PIP signal input. The signal fed into this pin is presented to <math>R_{out1}</math> and <math>R_{out2}</math>.</p> <p>The input dynamic range of this pin is 6.5 V<sub>p-p</sub> and the input resistance is 70 k<math>\Omega</math>.</p>  |           |
| 32<br>(30) | $C_{in}$   | <p>This pin is for input a chroma signal from an external comb filter. The signal fed into this pin is presented to <math>C_{out}</math>.</p> <p>The input dynamic range of this pin is 5.5 V<sub>p-p</sub> and the input resistance is 60 k<math>\Omega</math>.</p> <p>This pin also functions as a audio mute switch. The entire audio output can be muted by pulling the voltage on this pin below 2.25 V.</p>                             |           |
| 33<br>(33) | $V_{CC}$   | <p>This is the power supply pin. Apply 9 V to this pin. The current consumption of this pin is 47 mA.</p>   | —         |
| 34<br>(34) | $C_{out}$  | <p>This pin is for output a chroma signal. The signal fed into <math>C_{in}</math>, <math>C_{inS1}</math>, <math>C_{inS2}</math>, <math>V_{inV1}</math>, <math>V_{inV2}</math>, <math>Y/V_{inS1}</math>, <math>Y/V_{inS2}</math>, or <math>V_{inTV}</math> is outputted from this pin. The output resistance of this pin is 25 <math>\Omega</math>.</p> <p>The same signal is also outputted from Det Select as a sync separation signal.</p> |           |

| Pin No.    | Name              | Function   | Interface |
|------------|-------------------|--|-----------|
| 35<br>(35) | R <sub>out1</sub> | <p>This pin is for output the main channel right audio signal. The signal fed into R<sub>in</sub>V1, R<sub>in</sub>V2, R<sub>in</sub>S1, R<sub>in</sub>S2, or R<sub>in</sub>TV is outputted from this pin. The output resistance of this pin is 45 Ω.</p> <p>Furthermore, the signal outputted from this pin is pulse-converted for use in self-diagnosis. The converted signal is outputted from Sync Out.</p> <p>This outputted can be muted independently of L<sub>out1</sub> by bus control.</p> |           |
| 36<br>(36) | Y <sub>out</sub>  | <p>This pin is for output a luminance signal. The signal fed into Y<sub>in</sub>, Y/V<sub>in</sub>S1, Y/V<sub>in</sub>S2, V<sub>in</sub>V1, V<sub>in</sub>V2, or V<sub>in</sub>TV is outputted from this pin. The output resistance of this pin is 25 Ω.</p> <p>The same signal is also outputted from Det Select as a sync separation signal.</p>   |           |
| 37<br>(37) | L <sub>out1</sub> | <p>This pin is for output the main channel left audio signal. The signal fed into L<sub>in</sub>V1, L<sub>in</sub>V2, L<sub>in</sub>S1, L<sub>in</sub>S2, or L<sub>in</sub>TV is outputted from this pin. The output resistance of this pin is 45 Ω.</p> <p>Furthermore, the signal outputted from this pin is pulse-converted for use in self-diagnosis. The converted signal is outputted from Sync Out.</p> <p>This output can be muted independently of R<sub>out1</sub> by bus control.</p>     |           |
| 38<br>(38) | V <sub>out1</sub> | <p>This pin is for output the main channel composite video signal. The signal fed into V<sub>in</sub>TV, V<sub>in</sub>V1, V<sub>in</sub>V2, V<sub>in</sub>S1, V<sub>in</sub>S2, Y<sub>in</sub>S1 + C<sub>in</sub>S1, or Y<sub>in</sub>S2 + C<sub>in</sub>S2 is outputted from this pin. The output resistance of this pin is 25 Ω.</p> <p>The same signal is also outputted from Det Select as a sync separation signal.</p>  |           |

| Pin No.    | Name               | Function   | Interface |
|------------|--------------------|--|-----------|
| 39<br>(39) | R <sub>outTV</sub> | <p>This pin is for output only the signal that is forwarded from R<sub>inTV</sub>. The output resistance of this pin is 45 Ω.</p> <p>This output can be muted in combination with L<sub>outTV</sub> by bus control.</p>  |           |
| 40<br>(40) | L <sub>outTV</sub> | <p>This pin is for output only the signal that is forwarded from L<sub>inTV</sub>. The output resistance of this pin is 45 Ω.</p> <p>This output can be muted in combination with R<sub>outTV</sub> by bus control.</p>  |           |
| 41<br>(41) | O5                 | <p>This is a 1 bit DAC output pin. This is an open-collector output. Make sure that the current flowing into this pin is 2.0 mA or less.</p>   |           |
| 42<br>(42) | V <sub>out2</sub>  | <p>This pin is for output a sub-channel composite video signal. The signal fed into V<sub>inTV</sub>, V<sub>inV1</sub>, V<sub>inV2</sub>, V<sub>inS1</sub>, V<sub>inS2</sub>, Y<sub>inS1</sub> + C<sub>inS1</sub>, or Y<sub>inS2</sub> + C<sub>inS2</sub> is outputted from this pin. The output resistance of this pin is 25 Ω.</p> <p>The same signal is also outputted from Det Select as a sync separation signal.</p> |           |

## Bus Data Specifications

### Data Structure

(1) Write

|   |                               |          |   |        |   |        |   |        |   |   |
|---|-------------------------------|----------|---|--------|---|--------|---|--------|---|---|
| S | Slave address<br>(90H or 92H) | W<br>(0) | A | Data 1 | A | Data 2 | A | Data 3 | A | P |
|---|-------------------------------|----------|---|--------|---|--------|---|--------|---|---|

(2) Read

|   |                               |          |   |        |   |   |
|---|-------------------------------|----------|---|--------|---|---|
| S | Slave address<br>(91H or 93H) | R<br>(1) | A | Data 4 | A | P |
|---|-------------------------------|----------|---|--------|---|---|

Note2: Slave address is switched by the voltage applied to pin 27 (address). Switched to 90H when low (GND); switched to 92H when high (V<sub>CC</sub>) during write mode.

### Contents of Data

| Mode                 | Data No.        | Contents of Data                              |  |                                      |                    |                  |                        |                     |                   |
|----------------------|-----------------|---|--|--------------------------------------|--------------------|------------------|------------------------|---------------------|-------------------|
| Write                | Data 1<br>[F0H] | B07   | B06                                      | B05                                  | B04                | B03              | B02                    | B01                 | B00               |
|                      |                 | Audio mute                                    |  |                                      |                    |                  | Forced TV<br>Audio     | YC output switching |                   |
|                      |                 | L <sub>out</sub> TV<br>R <sub>out</sub> TV    | L <sub>out</sub> 2<br>R <sub>out</sub> 2 | R <sub>out</sub> 1                   | L <sub>out</sub> 1 | Y <sub>out</sub> |                        | C <sub>out</sub>    |                   |
|                      | Data 2<br>[1FH] | B17   | B16                                      | B15                                  | B14                | B13              | B12                    | B11                 | B10               |
|                      |                 | Sync<br>detection<br>sensitivity<br>switching | Sync<br>output<br>switching              | Sync (diagnosis) detection switching |                    |                  | Input select (main)    |                     |                   |
|                      | Data 3<br>[07H] | B27   | B26                                      | B25                                  | B24                | B23              | B22                    | B21                 | B20               |
| DAC output switching |                 |   |  |                                      | Input select (sub) |                  |                        |                     |                   |
| O5                   |                 | O4  | I/O3                                     | I/O2                                 |                    |                  |                        | I/O1                |                   |
| Read                 | Data 4          | B37   | B36                                      | B35                                  | B34                | B33              | B32                    | B31                 | B30               |
|                      |                 | ADC input discrimination                      |  |                                      |                    |                  | S input discrimination |                     | Power-on<br>reset |
|                      |                 | I/O3  | I/O2<br>Hi                               | I/O2<br>Low                          | I/O1<br>Hi         | I/O1<br>Low      | C <sub>in</sub> S1     | C <sub>in</sub> S2  |                   |

Note3: Shown in [ ] are reset data.

Note4: The data contents marked by a slash (/) are an unused bit (data free).

## Main Video Select: Terminal 38 (38) Output Signal

| Mode  |               | Output Signal                             | S Input Discrimination |      | Bus Data            |     |     |
|-------|---------------|---|------------------------|------|---------------------|-----|-----|
|       |               |   |                        |      | Input Select (main) |     |     |
| Input | S/V           | V <sub>out1</sub>                         | CS1                    | CS2  | B12                 | B11 | B10 |
| S1    | V             | Y/V <sub>in</sub> S1                      | Low                    | *    | 0                   | 0   | 0   |
|       | S             | Y/V <sub>in</sub> S1 + C <sub>in</sub> S1 | Open                   |      |                     |     |     |
|       | FV            | Y/V <sub>in</sub> S1                      |                        |      |                     |     | 1   |
| S2    | V             | Y/V <sub>in</sub> S2                      | *                      | Low  | 0                   | 1   | 0   |
|       | S             | Y/V <sub>in</sub> S2 + C <sub>in</sub> S2 |                        | Open |                     |     |     |
|       | FV<br>(Note5) | Y/V <sub>in</sub> S2                      |                        |      |                     |     | 1   |
| V1    | V             | V <sub>in</sub> V1                        | *                      | *    | 1                   | 0   | 1   |
| V2    | V             | V <sub>in</sub> V2                        | *                      | *    | 1                   | 1   | 0   |
| TV    | V             | V <sub>in</sub> TV                        | *                      | *    | 1                   | 1   | 1   |

Do not use [100] for the input select data.

Note5: FV: Forced Video Mode.

## Main L/R Select: Terminal 37 and 35 (37 and 35) Output Signal

| Mode  | Main L/R Output Signal |                    | Bus Data        |                     |     |     |
|-------|------------------------|--------------------|-----------------|---------------------|-----|-----|
|       |                        |                    | Forced TV Voice | Input Select (main) |     |     |
| Input | L <sub>out1</sub>      | R <sub>out1</sub>  | B03             | B12                 | B11 | B10 |
| S1    | L <sub>in</sub> S1     | R <sub>in</sub> S1 | 0               | 0                   | 0   | *   |
| S2    | L <sub>in</sub> S2     | R <sub>in</sub> S2 |                 | 0                   | 1   | *   |
| V1    | L <sub>in</sub> V1     | R <sub>in</sub> V1 |                 | 1                   | 0   | 1   |
| V2    | L <sub>in</sub> V2     | R <sub>in</sub> V2 |                 | 1                   | 1   | 0   |
| TV    | L <sub>in</sub> TV     | R <sub>in</sub> TV |                 | 1                   | 1   | 1   |
| TV    | L <sub>in</sub> TV     | R <sub>in</sub> TV | 1               | *                   | *   | *   |

Do not use [100] for the input select data.



## Sub (PIP) Video Select: Terminal 42 (42) Output Signal

| Mode  |     | Output Signal                             | S Input Discrimination |   | Bus Data           |     |      |   |
|-------|-----|---|------------------------|---|--------------------|-----|------|---|
|       |     |   |                        |   | Input Select (sub) |     |      |   |
| INPUT | S/V | V <sub>out2</sub>                         |                        |   | B22                | B21 | B20  |   |
| S1    | V   | Y/V <sub>in</sub> S1                      | Low                    | * | 0                  | 0   | 0    |   |
|       | S   | Y/V <sub>in</sub> S1 + C <sub>in</sub> S1 | Open                   |   |                    |     | 1    |   |
|       | FV  | Y/V <sub>in</sub> S1                      |                        |   |                    |     | 0    |   |
| S2    | V   | Y/V <sub>in</sub> S2                      | *                      | * | 0                  | 1   | 0    |   |
|       | S   | Y/V <sub>in</sub> S2 + C <sub>in</sub> S2 |                        |   |                    |     | Open | 1 |
|       | FV  | Y/V <sub>in</sub> S2                      |                        |   |                    |     |      | 0 |
| V1    | V   | V <sub>in</sub> 1                         | *                      | * | 1                  | 1   | 1    |   |
| V2    | V   | V <sub>in</sub> 2                         | *                      | * | 1                  | 1   | 0    |   |
| TV    | V   | V <sub>in</sub> TV                        | *                      | * | 1                  | 1   | 1    |   |

Do not use [100] for the input select data.

## Sub L/R Select: Terminal 37 and 35 (37 and 35) Output Signal

| Mode  | SUB L/R Output Signal |                    | Bus Data        |                    |     |     |
|-------|-----------------------|--------------------|-----------------|--------------------|-----|-----|
|       |                       |                    | Forced TV Voice | Input Select (sub) |     |     |
| Input | L <sub>out2</sub>     | R <sub>out2</sub>  | B03             | B22                | B21 | B20 |
| S1    | L <sub>in</sub> S1    | R <sub>in</sub> S1 | 0               | 0                  | 0   | *   |
| S2    | L <sub>in</sub> S2    | R <sub>in</sub> S2 |                 | 0                  | 1   | *   |
| V1    | L <sub>in</sub> V1    | R <sub>in</sub> V1 |                 | 1                  | 0   | 1   |
| V2    | L <sub>in</sub> V2    | R <sub>in</sub> V2 |                 | 1                  | 1   | 0   |
| TV    | L <sub>in</sub> TV    | R <sub>in</sub> TV |                 | 1                  | 1   | 1   |
| TV    | L <sub>in</sub> TV    | R <sub>in</sub> TV | 1               | *                  | *   | *   |

Do not use [100] for the input select data.

## Y Output Select: Terminal 30 (32) Output Signal

| Mode  |                 | Y Output Signal      | Main V Select Mode<br>(see table 2-2.) |         | Bus Data           |
|-------|-----------------|----------------------|--|---------|--------------------|
| Input | Through         | Y <sub>out</sub>     |  |         | Y Output Switching |
|       |                 |                      |  |         | B01                |
| S1    | Y <sub>in</sub> | Y <sub>in</sub>      | S1                                     | V or FV | 0                  |
|       | V through       | Y/V <sub>in</sub> S1 |  | S       | 1                  |
|       | Y through       | Y/V <sub>in</sub> S1 |  |         | *                  |
| S2    | Y <sub>in</sub> | Y <sub>in</sub>      | S2                                     | V or FV | 0                  |
|       | V through       | Y/V <sub>in</sub> S2 |  | S       | 1                  |
|       | Y through       | Y/V <sub>in</sub> S2 |  |         | *                  |
| V1    | Y <sub>in</sub> | Y <sub>in</sub>      | V1                                     | V       | 0                  |
|       | V through       | V <sub>in</sub> V1   |  | 1       |                    |
| V2    | Y <sub>in</sub> | Y <sub>in</sub>      | V2                                     | V       | 0                  |
|       | V through       | V <sub>in</sub> V2   |  | 1       |                    |
| TV    | Y <sub>in</sub> | Y <sub>in</sub>      | TV                                     | V       | 0                  |
|       | V through       | V <sub>in</sub> TV   |  | 1       |                    |

## C Output Select: Terminal 34 (34) Output Signal

| Mode  |                 | Y Output Signal      | Main V Select Mode<br>(see table 2-2.) |         | Bus Data           |
|-------|-----------------|----------------------|--|---------|--------------------|
| Input | Through         | C <sub>out</sub>     |  |         | C Output Switching |
|       |                 |                      |  |         | B00                |
| S1    | C <sub>in</sub> | C <sub>in</sub>      | S1                                     | V or FV | 0                  |
|       | V through       | Y/V <sub>in</sub> S1 |  | S       | 1                  |
|       | C through       | C <sub>in</sub> S1   |  |         | *                  |
| S2    | C <sub>in</sub> | C <sub>in</sub>      | S2                                     | V or FV | 0                  |
|       | V through       | Y/V <sub>in</sub> S2 |  | S       | 1                  |
|       | C through       | C <sub>in</sub> S2   |  |         | *                  |
| V1    | C <sub>in</sub> | C <sub>in</sub>      | V1                                     | V       | 0                  |
|       | V through       | V <sub>in</sub> V1   |  | 1       |                    |
| V2    | C <sub>in</sub> | C <sub>in</sub>      | V2                                     | V       | 0                  |
|       | V through       | V <sub>in</sub> V2   |  | 1       |                    |
| TV    | C <sub>in</sub> | C <sub>in</sub>      | TV                                     | V       | 0                  |
|       | V through       | V <sub>in</sub> TV   |  | 1       |                    |

## Sync Detection Select: Terminal 4 (46) Output Signal

| Mode         |                    | Detection Select     | Sync Output        | Bus Data       |                          |     |     |
|--------------|--------------------|----------------------|--------------------|----------------|--------------------------|-----|-----|
|              |                    | Det Select           | Sync Out           | Sync Switching | Sync Detection Switching |     |     |
|              |                    |                      |                    | B16            | B15                      | B14 | B13 |
| Video Input  | TV                 | V <sub>in</sub> TV   | Sync               | 0              | 0                        | 1   | 1   |
|              | V1                 | V <sub>in</sub> V1   |                    |                |                          | 0   | 1   |
|              | V2                 | V <sub>in</sub> V2   |                    |                |                          | 1   | 0   |
|              | S1                 | Y/V <sub>in</sub> S1 |                    |                |                          | 0   | 0   |
| Video Output | V <sub>out</sub> 1 | V <sub>out</sub> 1   | Sync               | 0              | 1                        | 1   | 1   |
|              | V <sub>out</sub> 2 | V <sub>out</sub> 2   |                    |                |                          | 0   | 1   |
|              | Y <sub>out</sub>   | Y <sub>out</sub>     |                    |                |                          | 1   | 0   |
|              | C <sub>out</sub>   | C <sub>out</sub>     |                    |                |                          | 0   | 0   |
| Audio Output | R <sub>out</sub> 1 | ★                    | R <sub>out</sub> 1 | 1              | *                        | 1   | 1   |
|              | L <sub>out</sub> 1 | ★                    | L <sub>out</sub> 1 |                |                          | 0   | 1   |
|              | R <sub>out</sub> 2 | ★                    | R <sub>out</sub> 2 |                |                          | 1   | 0   |
|              | L <sub>out</sub> 2 | ★                    | L <sub>out</sub> 2 |                |                          | 0   | 0   |

For Det Select marked by ★, the video input or video output corresponding to data B15, B14, and B13 is selected.

## Sync Detection Sensitivity Switching

| Mode        |      | Bus Data                        |
|-------------|------|---------------------------------|
|             |      | Detection Sensitivity Switching |
|             |      | B17                             |
| Sensitivity | High | 1                               |
|             | Low  | 0                               |

## Audio Mute

| Mode                                       |      | Bus Data   |     |     |     |
|--|------|------------|-----|-----|-----|
|  |      | Audio Mute |     |     |     |
| Output                                     | Mute | B07        | B06 | B05 | B04 |
| L <sub>out</sub> 1                         | off  | *          | *   | *   | 0   |
|  | on   |            |     |     | 1   |
| R <sub>out</sub> 1                         | off  | *          | *   | 0   | *   |
|  | on   |            |     | 1   |     |
| L <sub>out</sub> 2<br>R <sub>out</sub> 2   | off  | *          | 0   | *   | *   |
|  | on   |            | 1   |     |     |
| L <sub>out</sub> TV<br>R <sub>out</sub> TV | off  | 0          | *   | *   | *   |
|  | on   | 1          |     |     |     |

## DAC Output Switching

| Mode   |       | Bus Data             |     |     |     |     |
|--------|-------|----------------------|-----|-----|-----|-----|
|        |       | DAC Output Switching |     |     |     |     |
| Output | State | B27                  | B26 | B25 | B24 | B23 |
| I/O1   | Open  | *                    | *   | *   | *   | 0   |
|        | Low   |                      |     |     |     | 1   |
| I/O2   | Open  | *                    | *   | *   | 0   | *   |
|        | Low   |                      |     |     | 1   |     |
| I/O3   | Open  | *                    | *   | 0   | *   | *   |
|        | Low   |                      |     | 1   |     |     |
| O4     | Open  | *                    | 0   | *   | *   | *   |
|        | Low   |                      | 1   |     |     |     |
| O5     | Open  | 0                    | *   | *   | *   | *   |
|        | Low   | 1                    |     |     |     |     |

## Read Mode

### Power-On Reset Discrimination

| Mode  |     | Bus Data       |  |
|-------|-----|----------------|--|
|       |     | Power-On Reset |  |
|       |     | B30            |  |
| Reset | on  | 1              |  |
|       | off | 0              |  |

### S Input Discrimination

| Mode               |             | Bus Data               |         |
|--------------------|-------------|------------------------|---------|
|                    |             | S Input Discrimination |         |
|                    |             | Input                  | Voltage |
| C <sub>in</sub> S2 | High (open) | *                      | 1       |
|                    | Low         |                        | 0       |
| C <sub>in</sub> S1 | High (open) | 1                      | *       |
|                    | Low         | 0                      |         |

### ADC Input Discrimination

| Mode |      | Bus Data                 |         |     |     |     |
|------|------|--------------------------|---------|-----|-----|-----|
|      |      | ADC Input Discrimination |         |     |     |     |
|      |      | Input                    | Voltage | B37 | B36 | B35 |
| I/O1 | High |                          |         |     | 0   | 0   |
|      | Mid  | *                        | *       | *   | 1   |     |
|      | Low  |                          |         |     |     | 1   |
| I/O2 | High |                          | 0       | 0   | *   | *   |
|      | Mid  | *                        | 1       |     |     |     |
|      | Low  |                          |         | 1   |     |     |
| I/O3 | High | 0                        | *       | *   | *   | *   |
|      | Low  | 1                        |         |     |     |     |

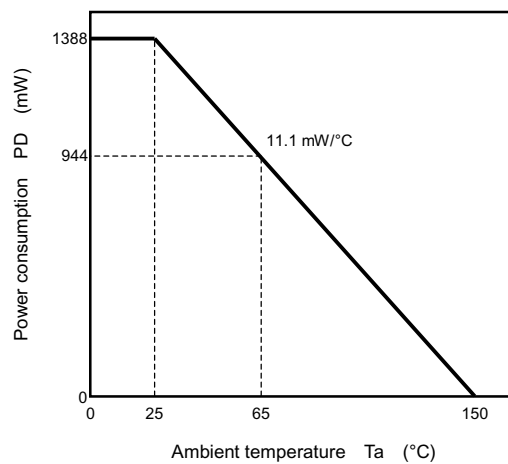
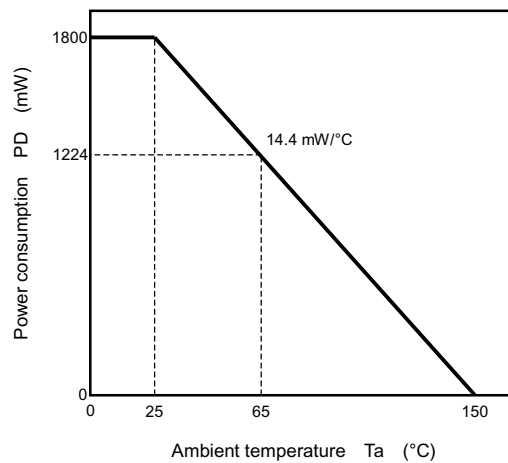


## Maximum Ratings

| Characteristics       |           | Symbol                | Rating     | Unit |
|-----------------------|-----------|-----------------------|------------|------|
| Supply voltage        |           | $V_{CC}$              | 14         | V    |
| Power dissipation     | N         | $P_{DMAX}$<br>(Note6) | 1800       | mW   |
|                       | F (Note7) |                       | 1388       |      |
| Operating temperature |           | $T_{opr}$             | -20 to 65  | °C   |
| Storage temperature   |           | $T_{stg}$             | -55 to 150 | °C   |

Note6: When using the device at temperatures above  $T_a = 25^\circ\text{C}$ , reduce the rated power dissipation by 14.4 mW at TA1218N or 11.1 mW TA1218F per degree of centigrade. (see the diagram below.)

Note7: This device is not proof enough against a strong E-M field by CRT which may cause function errors and/or poor characteristics. Keeping the distance from CRT to the device longer than 20 cm, or if cannot, placing shield metal over the device, is recommended in an application.



## Recommended Operating Conditions, ( ): The Terminal Number of TA1218F

| Characteristics                  | Test Condition  | Min | Typ. | Max | Unit              | Remark |
|----------------------------------|---|-----|------|-----|-------------------|--------|
| Supply voltage                   | 33 (33)   | 8.1 | 9.0  | 9.9 | V                 | —      |
| Composite signal input amplitude | 7, 10, 12, 16, 28<br>(2, 6, 8, 12, 26)  | —   | 1.0  | —   | V <sub>p-p</sub>  | 100IRE |
| Y input amplitude                | 12, 16 (8, 8)   | —   | 1.0  | —   | V <sub>p-p</sub>  | 100IRE |
| Comb Y input amplitude           | 30 (32)   | —   | 2.0  | —   | V <sub>p-p</sub>  | —      |
| Chroma input amplitude           | 14, 18 (10, 15)   | —   | 286  | —   | mV <sub>p-p</sub> | Burst  |
| Comb chroma input amplitude      | 32 (30)   | —   | 572  | —   | mV <sub>p-p</sub> | Burst  |
| Audio input amplitude            | 5, 6, 8, 9, 11, 13, 15, 17, 29, 31<br>(3, 5, 7, 9, 11, 13, 29, 31, 47,<br>48) | —   | —    | 6.0 | V <sub>p-p</sub>  | —      |

## Electrical Characteristics

(referenced to V<sub>CC</sub> = 9 V at Ta = 25°C unless otherwise specified)

### Current Consumption

| Pin No. |    | Pin Name        | Symbol          | Test Circuit | Min | Typ. | Max | Unit |
|---------|----|-----------------|-----------------|--------------|-----|------|-----|------|
| N       | F  |                 |                 |              |     |      |     |      |
| 33      | 33 | V <sub>CC</sub> | I <sub>CC</sub> | —            | 30  | 47   | 64  | mA   |



**Pin Voltage**

| Pin No. |    | Pin Name            | Symbol | Test Circuit | Min | Typ. | Max | Unit |
|---------|----|---------------------|--------|--------------|-----|------|-----|------|
| N       | F  |                     |        |              |     |      |     |      |
| 1       | 43 | L <sub>out2</sub>   | V1     | —            | 3.7 | 4.0  | 4.3 | V    |
| 2       | 44 | R <sub>out2</sub>   | V2     | —            | 3.7 | 4.0  | 4.3 | V    |
| 3       | 45 | Det in              | V3     | —            | 6.3 | 6.6  | 6.9 | V    |
| 4       | 46 | Det Select          | V4     | —            | 3.4 | 3.7  | 4.0 | V    |
| 5       | 47 | L <sub>inTV</sub>   | V5     | —            | 5.0 | 5.2  | 5.4 | V    |
| 6       | 48 | R <sub>inTV</sub>   | V6     | —            | 5.0 | 5.2  | 5.4 | V    |
| 7       | 2  | V <sub>inTV</sub>   | V7     | —            | 5.0 | 5.2  | 5.4 | V    |
| 8       | 3  | L <sub>inV1</sub>   | V8     | —            | 5.0 | 5.2  | 5.4 | V    |
| 9       | 5  | R <sub>inV1</sub>   | V9     | —            | 5.0 | 5.2  | 5.4 | V    |
| 10      | 6  | V <sub>inV1</sub>   | V10    | —            | 5.0 | 5.2  | 5.4 | V    |
| 11      | 7  | L <sub>inS1</sub>   | V11    | —            | 5.0 | 5.2  | 5.4 | V    |
| 12      | 8  | Y/V <sub>inS1</sub> | V12    | —            | 5.0 | 5.2  | 5.4 | V    |
| 13      | 9  | R <sub>inS1</sub>   | V13    | —            | 5.0 | 5.2  | 5.4 | V    |
| 14      | 10 | C <sub>inS1</sub>   | V14    | —            | 5.0 | 5.2  | 5.4 | V    |
| 15      | 11 | L <sub>inS2</sub>   | V15    | —            | 5.0 | 5.2  | 5.4 | V    |
| 16      | 12 | Y/V <sub>inS2</sub> | V16    | —            | 5.0 | 5.2  | 5.4 | V    |
| 17      | 13 | R <sub>inS2</sub>   | V17    | —            | 5.0 | 5.2  | 5.4 | V    |
| 18      | 15 | C <sub>inS2</sub>   | V18    | —            | 5.0 | 5.2  | 5.4 | V    |
| 23      | 21 | GND                 | V23    | —            | —   | 0    | —   | V    |
| 28      | 26 | V <sub>inV2</sub>   | V28    | —            | 5.0 | 5.2  | 5.4 | V    |
| 29      | 27 | L <sub>inV2</sub>   | V29    | —            | 5.0 | 5.2  | 5.4 | V    |
| 30      | 28 | Y <sub>in</sub>     | V30    | —            | 5.0 | 5.2  | 5.4 | V    |
| 31      | 29 | R <sub>inV2</sub>   | V31    | —            | 5.0 | 5.2  | 5.4 | V    |
| 32      | 30 | C <sub>in</sub>     | V32    | —            | 5.0 | 5.2  | 5.4 | V    |
| 33      | 33 | V <sub>CC</sub>     | V33    | —            | —   | 9.0  | —   | V    |
| 34      | 34 | C <sub>out</sub>    | V34    | —            | 3.5 | 3.8  | 4.1 | V    |
| 35      | 35 | R <sub>out1</sub>   | V35    | —            | 3.7 | 4.0  | 4.3 | V    |
| 36      | 36 | Y <sub>out</sub>    | V36    | —            | 3.5 | 3.8  | 4.1 | V    |
| 37      | 37 | L <sub>out1</sub>   | V37    | —            | 3.7 | 4.0  | 4.3 | V    |
| 38      | 38 | V <sub>out1</sub>   | V38    | —            | 4.1 | 4.4  | 4.7 | V    |
| 39      | 39 | R <sub>outTV</sub>  | V39    | —            | 3.7 | 4.0  | 4.3 | V    |
| 40      | 40 | L <sub>outTV</sub>  | V40    | —            | 3.7 | 4.0  | 4.3 | V    |
| 42      | 42 | V <sub>out2</sub>   | V42    | —            | 4.1 | 4.4  | 4.7 | V    |

**DC Characteristics**

| Characteristics                 | Measured Pin         | Symbol | Test Circuit | Min. | Typ. | Max. | Unit | Remark  |
|---------------------------------|----------------------|--------|--------------|------|------|------|------|---|
| Input pin<br>Input resistance   | Det in               | R3     | —            | 10   | 18   | 30   | kΩ   | Measure a change ΔI in the current flowing into each pin when the voltage is raised by 0.5V. Then calculate the input resistance value R.<br><br>R = 0.5 V/ΔI [Ω] |
|                                 | V <sub>in</sub> TV   | R7     | —            | 20   | 30   | 40   | kΩ   |   |
|                                 | V <sub>in</sub> V1   | R10    | —            | 20   | 30   | 40   | kΩ   |   |
|                                 | V <sub>in</sub> V2   | R28    | —            | 20   | 30   | 40   | kΩ   |   |
|                                 | Y/V <sub>in</sub> S1 | R12    | —            | 20   | 30   | 40   | kΩ   |   |
|                                 | Y/V <sub>in</sub> S2 | R16    | —            | 20   | 30   | 40   | kΩ   |   |
|                                 | C <sub>in</sub> S1   | R14    | —            | 20   | 30   | 40   | kΩ   |   |
|                                 | C <sub>in</sub> S2   | R18    | —            | 20   | 30   | 40   | kΩ   |   |
|                                 | Y <sub>in</sub>      | R30    | —            | 40   | 60   | 80   | kΩ   |   |
|                                 | C <sub>in</sub>      | R32    | —            | 40   | 60   | 80   | kΩ   |   |
|                                 | L <sub>in</sub> TV   | R5     | —            | 49   | 70   | 100  | kΩ   |   |
|                                 | R <sub>in</sub> TV   | R6     | —            | 49   | 70   | 100  | kΩ   |   |
|                                 | L <sub>in</sub> V1   | R8     | —            | 49   | 70   | 100  | kΩ   |   |
|                                 | R <sub>in</sub> V1   | R9     | —            | 49   | 70   | 100  | kΩ   |   |
|                                 | L <sub>in</sub> V2   | R29    | —            | 49   | 70   | 100  | kΩ   |   |
|                                 | R <sub>in</sub> V2   | R31    | —            | 49   | 70   | 100  | kΩ   |   |
|                                 | L <sub>in</sub> S1   | R11    | —            | 49   | 70   | 100  | kΩ   |   |
|                                 | R <sub>in</sub> S1   | R13    | —            | 49   | 70   | 100  | kΩ   |   |
|                                 | L <sub>in</sub> S2   | R15    | —            | 49   | 70   | 100  | kΩ   |   |
|                                 | R <sub>in</sub> S2   | R17    | —            | 49   | 70   | 100  | kΩ   |   |
| Output pin<br>Output resistance | Det Select           | R4     | —            | 17   | 35   | 53   | Ω    | Measure a voltage change ΔV on each pin when a current of 100 μA flows into the pin. Then calculate the output resistance value R.<br><br>R = ΔV/100 μA [Ω]       |
|                                 | V <sub>out</sub> 1   | R38    | —            | 13   | 25   | 50   | Ω    |   |
|                                 | V <sub>out</sub> 2   | R42    | —            | 13   | 25   | 50   | Ω    |   |
|                                 | Y <sub>out</sub>     | R36    | —            | 13   | 25   | 50   | Ω    |   |
|                                 | C <sub>out</sub>     | R34    | —            | 13   | 25   | 50   | Ω    |   |
|                                 | L <sub>out</sub> TV  | R40    | —            | 20   | 45   | 90   | Ω    |   |
|                                 | R <sub>out</sub> TV  | R39    | —            | 20   | 45   | 90   | Ω    |   |
|                                 | L <sub>out</sub> 1   | R37    | —            | 20   | 45   | 90   | Ω    |   |
|                                 | R <sub>out</sub> 1   | R35    | —            | 20   | 45   | 90   | Ω    |   |
|                                 | L <sub>out</sub> 2   | R1     | —            | 20   | 45   | 90   | Ω    |   |
| R <sub>out</sub> 2              | R2                   | —      | 20           | 45   | 90   | Ω    |      |   |
| S mode discrimination voltage   | C <sub>in</sub> S1   | VthC1  | —            | 1.75 | 2.25 | 2.75 | V    | Voltage on pin 14 (10) at which data B31 changes.   |
|                                 | C <sub>in</sub> S2   | VthC2  | —            | 1.75 | 2.25 | 2.75 | V    | Voltage on pin 18 (15) at which data B32 changes.   |
| External mute ON voltage        | C <sub>in</sub>      | VthM   | —            | 1.75 | 2.25 | 2.75 | V    | Voltage on pin 32 (30) at which voice is muted.   |
| Address switching voltage       | Address              | VthA   | —            | 1.75 | 2.25 | 2.75 | V    | Voltage on pin 27 (25) at which the slave address changes.  |

| Characteristics                  | Measured Pin | Symbol | Test Circuit | Min. | Typ. | Max. | Unit | Remark   |
|----------------------------------|--------------|--------|--------------|------|------|------|------|--|
| ADC input discrimination voltage | I/O1         | Vth1L  | —            | 1.75 | 2.25 | 2.75 | V    | Mid-Low threshold level of I/O1 input (pin 19 (16)). |
|                                  | I/O1         | Vth1M  | —            | 6.5  | 7.0  | 7.5  | V    | Hig-Mid threshold level of I/O1 input (pin 19 (16)). |
|                                  | I/O2         | Vth2L  | —            | 1.75 | 2.25 | 2.75 | V    | Mid-Low threshold level of I/O2 input (pin 20 (17)). |
|                                  | I/O2         | Vth2M  | —            | 6.5  | 7.0  | 7.5  | V    | Hig-Mid threshold level of I/O2 input (pin 20 (17)). |
|                                  | I/O3         | Vth3   | —            | 1.75 | 2.25 | 2.75 | V    | Hig-Low threshold level of I/O1 input (pin 21).      |

**AC Characteristics**

| Characteristics                          | Select Mode          | Symbol  | Test Circuit | Min. | Typ. | Max. | Unit             | Test Method  |
|--|----------------------|---------|--------------|------|------|------|------------------|--|
| V <sub>out1</sub><br>Input dynamic range | V <sub>in</sub> TV   | VDR7V1  | —            | 1.5  | 2.0  | —    | V <sub>p-p</sub> | (1) Apply a 15 kHz sine wave to each input pin.<br><br>(2) In each select mode, measure an input amplitude at which the output waveform on pin 38 (38) begins to be distorted.   |
|  | V <sub>in</sub> V1   | VDR10V1 | —            | 1.5  | 2.0  | —    | V <sub>p-p</sub> |  |
|  | V <sub>in</sub> V2   | VDR28V1 | —            | 1.5  | 2.0  | —    | V <sub>p-p</sub> |  |
|  | Y/V <sub>in</sub> S1 | VDR12V1 | —            | 1.5  | 2.0  | —    | V <sub>p-p</sub> |  |
|  | C <sub>in</sub> S1   | VDR14V1 | —            | 1.5  | 2.0  | —    | V <sub>p-p</sub> |  |
|  | Y/V <sub>in</sub> S2 | VDR16V1 | —            | 1.5  | 2.0  | —    | V <sub>p-p</sub> |  |
|  | C <sub>in</sub> S2   | VDR18V1 | —            | 1.5  | 2.0  | —    | V <sub>p-p</sub> |  |
| V <sub>out1</sub><br>Gain                | V <sub>in</sub> TV   | G7V1    | —            | 5.5  | 6.0  | 6.5  | dB               | (1) Apply a 15 kHz, 1.0 V <sub>p-p</sub> sine wave to each input pin.<br><br>(2) In each select mode, find the gain between input and output.  |
|  | V <sub>in</sub> V1   | G10V1   | —            | 5.5  | 6.0  | 6.5  | dB               |  |
|  | V <sub>in</sub> V2   | G28V1   | —            | 5.5  | 6.0  | 6.5  | dB               |  |
|  | Y/V <sub>in</sub> S1 | G12V1   | —            | 5.5  | 6.0  | 6.5  | dB               |  |
|  | C <sub>in</sub> S1   | G14V1   | —            | 5.5  | 6.0  | 6.5  | dB               |  |
|  | Y/V <sub>in</sub> S2 | G16V1   | —            | 5.5  | 6.0  | 6.5  | dB               |  |
|  | C <sub>in</sub> S2   | G18V1   | —            | 5.5  | 6.0  | 6.5  | dB               |  |
| V <sub>out1</sub><br>Frequency response  | V <sub>in</sub> TV   | F7V1    | —            | 10   | —    | —    | MHz              | (1) Apply a 1.0 V <sub>p-p</sub> sine wave to each input pin.<br><br>(2) In each select mode, measure a frequency at which the output amplitude on pin 38 (38) is 3dB down from the 15 kHz applied level.              |
|  | V <sub>in</sub> V1   | F10V1   | —            | 10   | —    | —    | MHz              |  |
|  | V <sub>in</sub> V2   | F28V1   | —            | 10   | —    | —    | MHz              |  |
|  | Y/V <sub>in</sub> S1 | F12V1   | —            | 10   | —    | —    | MHz              |  |
|  | C <sub>in</sub> S1   | F14V1   | —            | 10   | —    | —    | MHz              |  |
|  | Y/V <sub>in</sub> S2 | F16V1   | —            | 10   | —    | —    | MHz              |  |
|  | C <sub>in</sub> S2   | F18V1   | —            | 10   | —    | —    | MHz              |  |
| V <sub>out1</sub><br>Crosstalk           | V <sub>in</sub> TV   | CT7V1   | —            | 55   | 60   | —    | dB               | (1) Apply a 3.58 MHz, 1.0 V <sub>p-p</sub> sine wave to each input pin.<br><br>(2) In each select mode, compare signal output from the selected pin with leakage components from nonselected pins to find a crosstalk. |
|  | V <sub>in</sub> V1   | CT10V1  | —            | 55   | 60   | —    | dB               |  |
|  | V <sub>in</sub> V2   | CT28V1  | —            | 55   | 60   | —    | dB               |  |
|  | Y/V <sub>in</sub> S1 | CT12V1  | —            | 55   | 60   | —    | dB               |  |
|  | C <sub>in</sub> S1   | CT14V1  | —            | 55   | 60   | —    | dB               |  |
|  | Y/V <sub>in</sub> S2 | CT16V1  | —            | 55   | 60   | —    | dB               |  |
|  | C <sub>in</sub> S2   | CT18V1  | —            | 55   | 60   | —    | dB               |  |
| V <sub>out2</sub><br>Input dynamic range | V <sub>in</sub> TV   | VDR7V2  | —            | 1.5  | 2.0  | —    | V <sub>p-p</sub> | (1) Apply a 15 kHz sine wave to each input pin.<br><br>(2) In each select mode, measure an input amplitude at which the output waveform on pin 42 (42) begins to be distorted.   |
|  | V <sub>in</sub> V1   | VDR10V2 | —            | 1.5  | 2.0  | —    | V <sub>p-p</sub> |  |
|  | V <sub>in</sub> V2   | VDR28V2 | —            | 1.5  | 2.0  | —    | V <sub>p-p</sub> |  |
|  | Y/V <sub>in</sub> S1 | VDR12V2 | —            | 1.5  | 2.0  | —    | V <sub>p-p</sub> |  |
|  | C <sub>in</sub> S1   | VDR14V2 | —            | 1.5  | 2.0  | —    | V <sub>p-p</sub> |  |
|  | Y/V <sub>in</sub> S2 | VDR16V2 | —            | 1.5  | 2.0  | —    | V <sub>p-p</sub> |  |
|  | C <sub>in</sub> S2   | VDR18V2 | —            | 1.5  | 2.0  | —    | V <sub>p-p</sub> |  |

| Characteristics                         | Select Mode          | Symbol | Test Circuit | Min. | Typ. | Max. | Unit             | Test Method  |
|---|----------------------|--------|--------------|------|------|------|------------------|--|
| V <sub>out2</sub><br>Gain               | V <sub>in</sub> TV   | G7V2   | —            | 5.5  | 6.0  | 6.5  | dB               | (1) Apply a 15 kHz, 1.0 V <sub>p-p</sub> sine wave to each input pin.<br>(2) In each select mode, find the gain between input and output.  |
|   | V <sub>in</sub> V1   | G10V2  | —            | 5.5  | 6.0  | 6.5  | dB               |  |
|   | V <sub>in</sub> V2   | G28V2  | —            | 5.5  | 6.0  | 6.5  | dB               |  |
|   | Y/V <sub>in</sub> S1 | G12V2  | —            | 5.5  | 6.0  | 6.5  | dB               |  |
|   | C <sub>in</sub> S1   | G14V2  | —            | 5.5  | 6.0  | 6.5  | dB               |  |
|   | Y/V <sub>in</sub> S2 | G16V2  | —            | 5.5  | 6.0  | 6.5  | dB               |  |
|   | C <sub>in</sub> S2   | G18V2  | —            | 5.5  | 6.0  | 6.5  | dB               |  |
| V <sub>out2</sub><br>Frequency response | V <sub>in</sub> TV   | F7V2   | —            | 10   | —    | —    | MHz              | (1) Apply a 1.0 V <sub>p-p</sub> sine wave to each input pin.<br>(2) In each select mode, measure a frequency at which the output amplitude on pin 42 (42) is 3dB down from the 15 kHz applied level.              |
|   | V <sub>in</sub> V1   | F10V2  | —            | 10   | —    | —    | MHz              |  |
|   | V <sub>in</sub> V2   | F28V2  | —            | 10   | —    | —    | MHz              |  |
|   | Y/V <sub>in</sub> S1 | F12V2  | —            | 10   | —    | —    | MHz              |  |
|   | C <sub>in</sub> S1   | F14V2  | —            | 10   | —    | —    | MHz              |  |
|   | Y/V <sub>in</sub> S2 | F16V2  | —            | 10   | —    | —    | MHz              |  |
|   | C <sub>in</sub> S2   | F18V2  | —            | 10   | —    | —    | MHz              |  |
| V <sub>out2</sub><br>Crosstalk          | V <sub>in</sub> TV   | CT7V2  | —            | 55   | 60   | —    | dB               | (1) Apply a 3.58 MHz, 1.0 V <sub>p-p</sub> sine wave to each input pin.<br>(2) In each select mode, compare signal output from the selected pin with leakage components from nonselected pins to find a crosstalk. |
|   | V <sub>in</sub> V1   | CT10V2 | —            | 55   | 60   | —    | dB               |  |
|   | V <sub>in</sub> V2   | CT28V2 | —            | 55   | 60   | —    | dB               |  |
|   | Y/V <sub>in</sub> S1 | CT12V2 | —            | 55   | 60   | —    | dB               |  |
|   | C <sub>in</sub> S1   | CT14V2 | —            | 55   | 60   | —    | dB               |  |
|   | Y/V <sub>in</sub> S2 | CT16V2 | —            | 55   | 60   | —    | dB               |  |
|   | C <sub>in</sub> S2   | CT18V2 | —            | 55   | 60   | —    | dB               |  |
| Y <sub>out</sub><br>Input dynamic range | V <sub>in</sub> TV   | VDR7Y  | —            | 1.5  | 2.0  | —    | V <sub>p-p</sub> | (1) Apply a 15 kHz sine wave to each input pin.<br>(2) In each select mode, measure an input amplitude at which the output waveform on pin 36 (36) begins to be distorted.   |
|   | V <sub>in</sub> V1   | VDR10Y | —            | 1.5  | 2.0  | —    | V <sub>p-p</sub> |  |
|   | V <sub>in</sub> V2   | VDR28Y | —            | 1.5  | 2.0  | —    | V <sub>p-p</sub> |  |
|   | Y/V <sub>in</sub> S1 | VDR12Y | —            | 1.5  | 2.0  | —    | V <sub>p-p</sub> |  |
|   | Y/V <sub>in</sub> S2 | VDR16Y | —            | 1.5  | 2.0  | —    | V <sub>p-p</sub> |  |
|   | Y <sub>in</sub>      | VDR30Y | —            | 5.0  | 5.5  | —    | V <sub>p-p</sub> |  |
| Y <sub>out</sub><br>Gain                | V <sub>in</sub> TV   | G7Y    | —            | 5.5  | 6.0  | 6.5  | dB               | (1) Apply a 15 kHz, 1.0 V <sub>p-p</sub> sine wave to each input pin.<br>(2) In each select mode, find the gain between input and output.  |
|   | V <sub>in</sub> V1   | G10Y   | —            | 5.5  | 6.0  | 6.5  | dB               |  |
|   | V <sub>in</sub> V2   | G28Y   | —            | 5.5  | 6.0  | 6.5  | dB               |  |
|   | Y/V <sub>in</sub> S1 | G12Y   | —            | 5.5  | 6.0  | 6.5  | dB               |  |
|   | Y/V <sub>in</sub> S2 | G16Y   | —            | 5.5  | 6.0  | 6.5  | dB               |  |
|   | Y <sub>in</sub>      | G30Y   | —            | -0.5 | 0    | 0.5  | dB               |  |

| Characteristics                         | Select Mode          | Symbol | Test Circuit | Min. | Typ. | Max. | Unit             | Test Method  |
|---|----------------------|--------|--------------|------|------|------|------------------|--|
| Y <sub>out</sub><br>Frequency response  | V <sub>in</sub> TV   | F7Y    | —            | 10   | —    | —    | MHz              | (1) Apply a 1.0 V <sub>p-p</sub> sine wave to each input pin.<br>(2) In each select mode, measure a frequency at which the output amplitude on pin 36 (36) is 3dB down from the 15 kHz applied level.              |
|   | V <sub>in</sub> V1   | F10Y   | —            | 10   | —    | —    | MHz              |  |
|   | V <sub>in</sub> V2   | F28Y   | —            | 10   | —    | —    | MHz              |  |
|   | Y/V <sub>in</sub> S1 | F12Y   | —            | 10   | —    | —    | MHz              |  |
|   | Y/V <sub>in</sub> S2 | F16Y   | —            | 10   | —    | —    | MHz              |  |
|   | Y <sub>in</sub>      | F30Y   | —            | 10   | —    | —    | MHz              |  |
| Y <sub>out</sub><br>Crosstalk           | V <sub>in</sub> TV   | CT7Y   | —            | 55   | 60   | —    | dB               | (1) Apply a 3.58 MHz, 1.0 V <sub>p-p</sub> sine wave to each input pin.<br>(2) In each select mode, compare signal output from the selected pin with leakage components from nonselected pins to find a crosstalk. |
|   | V <sub>in</sub> V1   | CT10Y  | —            | 55   | 60   | —    | dB               |  |
|   | V <sub>in</sub> V2   | CT28Y  | —            | 55   | 60   | —    | dB               |  |
|   | Y/V <sub>in</sub> S1 | CT12Y  | —            | 55   | 60   | —    | dB               |  |
|   | Y/V <sub>in</sub> S2 | CT16Y  | —            | 55   | 60   | —    | dB               |  |
|   | Y <sub>in</sub>      | CT30Y  | —            | 55   | 60   | —    | dB               |  |
| C <sub>out</sub><br>Input dynamic range | V <sub>in</sub> TV   | VDR7C  | —            | 1.5  | 2.0  | —    | V <sub>p-p</sub> | (1) Apply a 15 kHz sine wave to each input pin.<br>(2) In each select mode, measure an input amplitude at which the output waveform on pin 34 (34) begins to be distorted.   |
|   | V <sub>in</sub> V1   | VDR10C | —            | 1.5  | 2.0  | —    | V <sub>p-p</sub> |  |
|   | V <sub>in</sub> V2   | VDR28C | —            | 1.5  | 2.0  | —    | V <sub>p-p</sub> |  |
|   | Y/V <sub>in</sub> S1 | VDR12C | —            | 1.5  | 2.0  | —    | V <sub>p-p</sub> |  |
|   | C <sub>in</sub> S1   | VDR14C | —            | 1.5  | 2.0  | —    | V <sub>p-p</sub> |  |
|   | Y/V <sub>in</sub> S2 | VDR16C | —            | 1.5  | 2.0  | —    | V <sub>p-p</sub> |  |
|   | C <sub>in</sub> S2   | VDR18C | —            | 1.5  | 2.0  | —    | V <sub>p-p</sub> |  |
|   | C <sub>in</sub>      | VDR32C | —            | 5.0  | 5.5  | —    | V <sub>p-p</sub> |  |
| C <sub>out</sub><br>Gain                | V <sub>in</sub> TV   | G7C    | —            | 5.5  | 6.0  | 6.5  | dB               | (1) Apply a 15 kHz, 1.0 V <sub>p-p</sub> sine wave to each input pin.<br>(2) In each select mode, find the gain between input and output.  |
|   | V <sub>in</sub> V1   | G10C   | —            | 5.5  | 6.0  | 6.5  | dB               |  |
|   | V <sub>in</sub> V2   | G28C   | —            | 5.5  | 6.0  | 6.5  | dB               |  |
|   | Y/V <sub>in</sub> S1 | G12C   | —            | 5.5  | 6.0  | 6.5  | dB               |  |
|   | C <sub>in</sub> S1   | G14C   | —            | 5.5  | 6.0  | 6.5  | dB               |  |
|   | Y/V <sub>in</sub> S2 | G16C   | —            | 5.5  | 6.0  | 6.5  | dB               |  |
|   | C <sub>in</sub> S2   | G18C   | —            | 5.5  | 6.0  | 6.5  | dB               |  |
|   | C <sub>in</sub>      | G32C   | —            | -0.5 | 0    | 0.5  | dB               |  |

| Characteristics                        | Select Mode          | Symbol | Test Circuit | Min. | Typ. | Max. | Unit | Test Method  |
|--|----------------------|--------|--------------|------|------|------|------|--|
| C <sub>out</sub><br>Frequency response | V <sub>in</sub> TV   | F7C    | —            | 10   | —    | —    | MHz  | (1) Apply a 1.0 V <sub>p-p</sub> sine wave to each input pin.<br>(2) In each select mode, measure a frequency at which the output amplitude on pin 34 is 3dB down from the 15 kHz applied level.                   |
|  | V <sub>in</sub> V1   | F10C   | —            | 10   | —    | —    | MHz  |  |
|  | V <sub>in</sub> V2   | F28C   | —            | 10   | —    | —    | MHz  |  |
|  | Y/V <sub>in</sub> S1 | F12C   | —            | 10   | —    | —    | MHz  |  |
|  | C <sub>in</sub> S1   | F14C   | —            | 10   | —    | —    | MHz  |  |
|  | Y/V <sub>in</sub> S2 | F16C   | —            | 10   | —    | —    | MHz  |  |
|  | C <sub>in</sub> S2   | F18C   | —            | 10   | —    | —    | MHz  |  |
|  | C <sub>in</sub>      | F32C   | —            | 10   | —    | —    | MHz  |  |
| C <sub>out</sub><br>Crosstalk          | V <sub>in</sub> TV   | CT7C   | —            | 55   | 60   | —    | dB   | (1) Apply a 3.58 MHz, 1.0 V <sub>p-p</sub> sine wave to each input pin.<br>(2) In each select mode, compare signal output from the selected pin with leakage components from nonselected pins to find a crosstalk. |
|  | V <sub>in</sub> V1   | CT10C  | —            | 55   | 60   | —    | dB   |  |
|  | V <sub>in</sub> V2   | CT28C  | —            | 55   | 60   | —    | dB   |  |
|  | Y/V <sub>in</sub> S1 | CT12C  | —            | 55   | 60   | —    | dB   |  |
|  | C <sub>in</sub> S1   | CT14C  | —            | 55   | 60   | —    | dB   |  |
|  | Y/V <sub>in</sub> S2 | CT16C  | —            | 55   | 60   | —    | dB   |  |
|  | C <sub>in</sub> S2   | CT18C  | —            | 55   | 60   | —    | dB   |  |
|  | C <sub>in</sub>      | CT32C  | —            | 55   | 60   | —    | dB   |  |
| Det select<br>Input dynamic range      | V <sub>in</sub> TV   | VDR7D  | —            | 5.0  | 5.5  | —    | V    | (1) Apply a 15 kHz sine wave to each input pin.<br>(2) In each select mode, measure an input amplitude at which the output waveform on pin 4 (46) begins to be distorted.  |
|  | V <sub>in</sub> V1   | VDR10D | —            | 5.0  | 5.5  | —    | V    |  |
|  | V <sub>in</sub> V2   | VDR28D | —            | 5.0  | 5.5  | —    | V    |  |
|  | Y/V <sub>in</sub> S1 | VDR12D | —            | 5.0  | 5.5  | —    | V    |  |
|  | V <sub>out</sub> 1   | VDR38D | —            | 1.5  | 2.0  | —    | V    |  |
|  | V <sub>out</sub> 2   | VDR42D | —            | 1.5  | 2.0  | —    | V    |  |
|  | Y <sub>out</sub>     | VDR36D | —            | 1.2  | 1.8  | —    | V    |  |
|  | C <sub>out</sub>     | VDR34D | —            | 1.2  | 1.8  | —    | V    |  |
| Det select<br>Gain                     | V <sub>in</sub> TV   | G7D    | —            | -0.5 | 0    | 0.5  | dB   | (1) Apply a 15 kHz, 1.0 V <sub>p-p</sub> sine wave to each input pin.<br>(2) In each select mode, find the gain between input and output.  |
|  | V <sub>in</sub> V1   | G10D   | —            | -0.5 | 0    | 0.5  | dB   |  |
|  | V <sub>in</sub> V2   | G28D   | —            | -0.5 | 0    | 0.5  | dB   |  |
|  | Y/V <sub>in</sub> S1 | G12D   | —            | -0.5 | 0    | 0.5  | dB   |  |
|  | V <sub>out</sub> 1   | G38D   | —            | -0.1 | 0    | 0.1  | dB   |  |
|  | V <sub>out</sub> 2   | G42D   | —            | -0.1 | 0    | 0.1  | dB   |  |
|  | Y <sub>out</sub>     | G36D   | —            | -0.1 | 0    | 0.1  | dB   |  |
|  | C <sub>out</sub>     | G34D   | —            | -0.1 | 0    | 0.1  | dB   |  |

| Characteristics                          | Select Mode        | Symbol  | Test Circuit | Min. | Typ. | Max. | Unit             | Test Method   |
|--|--------------------|---------|--------------|------|------|------|------------------|---|
| L <sub>out1</sub><br>Input dynamic range | L <sub>in</sub> TV | VDR5L1  | —            | 6.0  | 6.5  | —    | V <sub>p-p</sub> | (1) Apply a 1 kHz sine wave to each input pin.<br><br>(2) In each select mode, measure an input amplitude at which the output waveform on pin 37 (37) begins to be distorted.                                       |
|  | L <sub>in</sub> V1 | VDR8L1  | —            | 6.0  | 6.5  | —    | V <sub>p-p</sub> |   |
|  | L <sub>in</sub> V2 | VDR29L1 | —            | 6.0  | 6.5  | —    | V <sub>p-p</sub> |   |
|  | L <sub>in</sub> S1 | VDR11L1 | —            | 6.0  | 6.5  | —    | V <sub>p-p</sub> |   |
|  | L <sub>in</sub> S2 | VDR15L1 | —            | 6.0  | 6.5  | —    | V <sub>p-p</sub> |   |
| L <sub>out1</sub><br>Gain                | L <sub>in</sub> TV | G5L1    | —            | -0.5 | 0    | 0.5  | dB               | (1) Apply a 1 kHz, 1.0 V <sub>p-p</sub> sine wave to each input pin.<br><br>(2) In each select mode, find the gain between input and output.  |
|  | L <sub>in</sub> V1 | G8L1    | —            | -0.5 | 0    | 0.5  | dB               |   |
|  | L <sub>in</sub> V2 | G29L1   | —            | -0.5 | 0    | 0.5  | dB               |   |
|  | L <sub>in</sub> S1 | G11L1   | —            | -0.5 | 0    | 0.5  | dB               |   |
|  | L <sub>in</sub> S2 | G15L1   | —            | -0.5 | 0    | 0.5  | dB               |   |
| L <sub>out1</sub><br>Frequency response  | L <sub>in</sub> TV | F5L1    | —            | 0.1  | 2.0  | —    | MHz              | (1) Apply a 1.0 V <sub>p-p</sub> sine wave to each input pin.<br><br>(2) In each select mode, measure a frequency at which the output amplitude on pin 37 is 3dB down from the 1 kHz applied level.                 |
|  | L <sub>in</sub> V1 | F8L1    | —            | 0.1  | 2.0  | —    | MHz              |   |
|  | L <sub>in</sub> V2 | F29L1   | —            | 0.1  | 2.0  | —    | MHz              |   |
|  | L <sub>in</sub> S1 | F11L1   | —            | 0.1  | 2.0  | —    | MHz              |   |
|  | L <sub>in</sub> S2 | F15L1   | —            | 0.1  | 2.0  | —    | MHz              |   |
| L <sub>out1</sub><br>Crosstalk           | L <sub>in</sub> TV | CT5L1   | —            | 70   | 100  | —    | dB               | (1) Apply a 1 kHz, 1.0 V <sub>p-p</sub> sine wave to each input pin.<br><br>(2) In each select mode, compare signal output from the selected pin with leakage components from nonselected pins to find a crosstalk. |
|  | L <sub>in</sub> V1 | CT8L1   | —            | 70   | 100  | —    | dB               |   |
|  | L <sub>in</sub> V2 | CT29L1  | —            | 70   | 100  | —    | dB               |   |
|  | L <sub>in</sub> S1 | CT11L1  | —            | 70   | 100  | —    | dB               |   |
|  | L <sub>in</sub> S2 | CT15L1  | —            | 70   | 100  | —    | dB               |   |
| L <sub>out1</sub><br>Mute attenuation    | L <sub>in</sub> TV | M5L1    | —            | 70   | 100  | —    | dB               | (1) Apply a 1 kHz, 1.0 V <sub>p-p</sub> sine wave to each input pin.<br><br>(2) In each select mode, compare the output amplitudes on pin 37 (37) when mute is turned on and turned off to find mute attenuation.   |
|  | L <sub>in</sub> V1 | M8L1    | —            | 70   | 100  | —    | dB               |   |
|  | L <sub>in</sub> V2 | M29L1   | —            | 70   | 100  | —    | dB               |   |
|  | L <sub>in</sub> S1 | M11L1   | —            | 70   | 100  | —    | dB               |   |
|  | L <sub>in</sub> S2 | M15L1   | —            | 70   | 100  | —    | dB               |   |



| Characteristics                          | Select Mode        | Symbol  | Test Circuit | Min. | Typ. | Max. | Unit             | Test Method   |
|--|--------------------|---------|--------------|------|------|------|------------------|---|
| R <sub>out1</sub><br>Input dynamic range | R <sub>in</sub> TV | VDR6R1  | —            | 6.0  | 6.5  | —    | V <sub>p-p</sub> | (1) Apply a 1 kHz sine wave to each input pin.<br><br>(2) In each select mode, measure an input amplitude at which the output waveform on pin 35 (35) begins to be distorted.                                       |
|  | R <sub>in</sub> V1 | VDR9R1  | —            | 6.0  | 6.5  | —    | V <sub>p-p</sub> |   |
|  | R <sub>in</sub> V2 | VDR31R1 | —            | 6.0  | 6.5  | —    | V <sub>p-p</sub> |   |
|  | R <sub>in</sub> S1 | VDR13R1 | —            | 6.0  | 6.5  | —    | V <sub>p-p</sub> |   |
|  | R <sub>in</sub> S2 | VDR17R1 | —            | 6.0  | 6.5  | —    | V <sub>p-p</sub> |   |
| R <sub>out1</sub><br>Gain                | R <sub>in</sub> TV | G6R1    | —            | -0.5 | 0    | 0.5  | dB               | (1) Apply a 1 kHz, 1.0 V <sub>p-p</sub> sine wave to each input pin.<br><br>(2) In each select mode, find the gain between input and output.  |
|  | R <sub>in</sub> V1 | G9R1    | —            | -0.5 | 0    | 0.5  | dB               |   |
|  | R <sub>in</sub> V2 | G31R1   | —            | -0.5 | 0    | 0.5  | dB               |   |
|  | R <sub>in</sub> S1 | G13R1   | —            | -0.5 | 0    | 0.5  | dB               |   |
|  | R <sub>in</sub> S2 | G17R1   | —            | -0.5 | 0    | 0.5  | dB               |   |
| R <sub>out1</sub><br>Frequency response  | R <sub>in</sub> TV | F6R1    | —            | 0.1  | 2.0  | —    | MHz              | (1) Apply a 1.0 V <sub>p-p</sub> sine wave to each input pin.<br><br>(2) In each select mode, measure a frequency at which the output amplitude on pin 35 (35) is 3dB down from the 1 kHz applied level.            |
|  | R <sub>in</sub> V1 | F9R1    | —            | 0.1  | 2.0  | —    | MHz              |   |
|  | R <sub>in</sub> V2 | F31R1   | —            | 0.1  | 2.0  | —    | MHz              |   |
|  | R <sub>in</sub> S1 | F13R1   | —            | 0.1  | 2.0  | —    | MHz              |   |
|  | R <sub>in</sub> S2 | F17R1   | —            | 0.1  | 2.0  | —    | MHz              |   |
| R <sub>out1</sub><br>Crosstalk           | R <sub>in</sub> TV | CT6R1   | —            | 70   | 100  | —    | dB               | (1) Apply a 1 kHz, 1.0 V <sub>p-p</sub> sine wave to each input pin.<br><br>(2) In each select mode, compare signal output from the selected pin with leakage components from nonselected pins to find a crosstalk. |
|  | R <sub>in</sub> V1 | CT9R1   | —            | 70   | 100  | —    | dB               |   |
|  | R <sub>in</sub> V2 | CT31R1  | —            | 70   | 100  | —    | dB               |   |
|  | R <sub>in</sub> S1 | CT13R1  | —            | 70   | 100  | —    | dB               |   |
|  | R <sub>in</sub> S2 | CT17R1  | —            | 70   | 100  | —    | dB               |   |
| R <sub>out1</sub><br>Mute attenuation    | R <sub>in</sub> TV | M6R1    | —            | 70   | 100  | —    | dB               | (1) Apply a 1 kHz, 1.0 V <sub>p-p</sub> sine wave to each input pin.<br><br>(2) In each select mode, compare the output amplitudes on pin 35 (35) when mute is turned on and turned off to find mute attenuation.   |
|  | R <sub>in</sub> V1 | M9R1    | —            | 70   | 100  | —    | dB               |   |
|  | R <sub>in</sub> V2 | M31R1   | —            | 70   | 100  | —    | dB               |   |
|  | R <sub>in</sub> S1 | M13R1   | —            | 70   | 100  | —    | dB               |   |
|  | R <sub>in</sub> S2 | M17R1   | —            | 70   | 100  | —    | dB               |   |

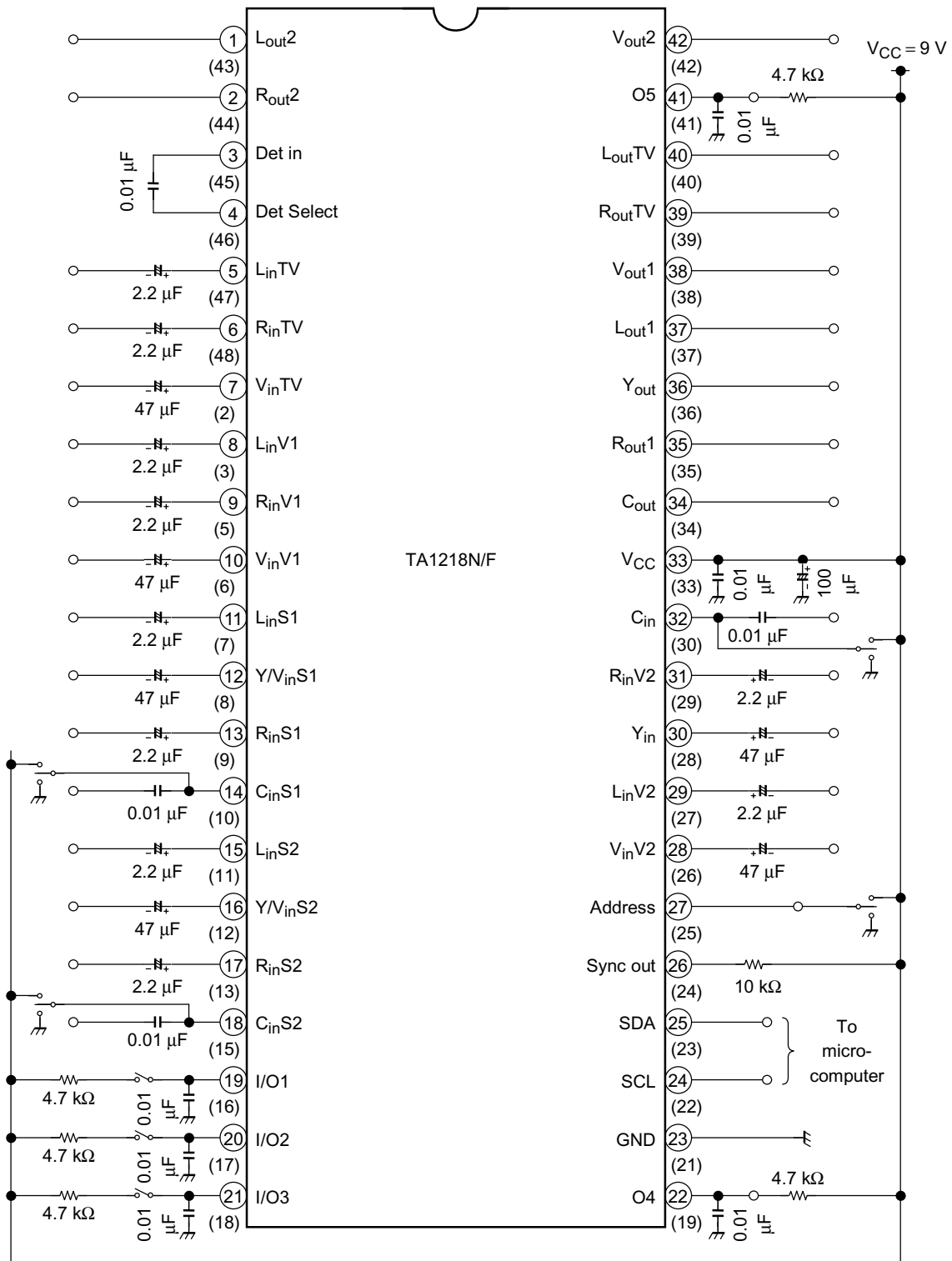
| Characteristics                          | Select Mode        | Symbol  | Test Circuit | Min. | Typ. | Max. | Unit             | Test Method   |
|--|--------------------|---------|--------------|------|------|------|------------------|---|
| L <sub>out2</sub><br>Input dynamic range | L <sub>in</sub> TV | VDR5L2  | —            | 6.0  | 6.5  | —    | V <sub>p-p</sub> | (1) Apply a 1 kHz sine wave to each input pin.<br><br>(2) In each select mode, measure an input amplitude at which the output waveform on pin 1 begins to be distorted.   |
|  | L <sub>in</sub> V1 | VDR8L2  | —            | 6.0  | 6.5  | —    | V <sub>p-p</sub> |   |
|  | L <sub>in</sub> V2 | VDR29L2 | —            | 6.0  | 6.5  | —    | V <sub>p-p</sub> |   |
|  | L <sub>in</sub> S1 | VDR11L2 | —            | 6.0  | 6.5  | —    | V <sub>p-p</sub> |   |
|  | L <sub>in</sub> S2 | VDR15L2 | —            | 6.0  | 6.5  | —    | V <sub>p-p</sub> |   |
| L <sub>out2</sub><br>Gain                | L <sub>in</sub> TV | G5L2    | —            | -0.5 | 0    | 0.5  | dB               | (1) Apply a 1 kHz, 1.0 V <sub>p-p</sub> sine wave to each input pin.<br><br>(2) In each select mode, find the gain between input and output.  |
|  | L <sub>in</sub> V1 | G8L2    | —            | -0.5 | 0    | 0.5  | dB               |   |
|  | L <sub>in</sub> V2 | G29L2   | —            | -0.5 | 0    | 0.5  | dB               |   |
|  | L <sub>in</sub> S1 | G11L2   | —            | -0.5 | 0    | 0.5  | dB               |   |
|  | L <sub>in</sub> S2 | G15L2   | —            | -0.5 | 0    | 0.5  | dB               |   |
| L <sub>out2</sub><br>Frequency response  | L <sub>in</sub> TV | F5L2    | —            | 0.1  | 2.0  | —    | MHz              | (1) Apply a 1.0 V <sub>p-p</sub> sine wave to each input pin.<br><br>(2) In each select mode, measure a frequency at which the output amplitude on pin 1 is 3dB down from the 1 kHz applied level.                  |
|  | L <sub>in</sub> V1 | F8L2    | —            | 0.1  | 2.0  | —    | MHz              |   |
|  | L <sub>in</sub> V2 | F29L2   | —            | 0.1  | 2.0  | —    | MHz              |   |
|  | L <sub>in</sub> S1 | F11L2   | —            | 0.1  | 2.0  | —    | MHz              |   |
|  | L <sub>in</sub> S2 | F15L2   | —            | 0.1  | 2.0  | —    | MHz              |   |
| L <sub>out2</sub><br>Crosstalk           | L <sub>in</sub> TV | CT5L2   | —            | 70   | 100  | —    | dB               | (1) Apply a 1 kHz, 1.0 V <sub>p-p</sub> sine wave to each input pin.<br><br>(2) In each select mode, compare signal output from the selected pin with leakage components from nonselected pins to find a crosstalk. |
|  | L <sub>in</sub> V1 | CT8L2   | —            | 70   | 100  | —    | dB               |   |
|  | L <sub>in</sub> V2 | CT29L2  | —            | 70   | 100  | —    | dB               |   |
|  | L <sub>in</sub> S1 | CT11L2  | —            | 70   | 100  | —    | dB               |   |
|  | L <sub>in</sub> S2 | CT15L2  | —            | 70   | 100  | —    | dB               |   |
| L <sub>out2</sub><br>Mute attenuation    | L <sub>in</sub> TV | M5L2    | —            | 70   | 100  | —    | dB               | (1) Apply a 1 kHz, 1.0 V <sub>p-p</sub> sine wave to each input pin.<br><br>(2) In each select mode, compare the output amplitudes on pin 1 (43) when mute is turned on and turned off to find mute attenuation.    |
|  | L <sub>in</sub> V1 | M8L2    | —            | 70   | 100  | —    | dB               |   |
|  | L <sub>in</sub> V2 | M29L2   | —            | 70   | 100  | —    | dB               |   |
|  | L <sub>in</sub> S1 | M11L2   | —            | 70   | 100  | —    | dB               |   |
|  | L <sub>in</sub> S2 | M15L2   | —            | 70   | 100  | —    | dB               |   |

| Characteristics                            | Select Mode        | Symbol  | Test Circuit | Min. | Typ. | Max. | Unit             | Test Method   |
|--|--------------------|---------|--------------|------|------|------|------------------|---|
| R <sub>out2</sub><br>Input dynamic range   | R <sub>in</sub> TV | VDR6R2  | —            | 6.0  | 6.5  | —    | V <sub>p-p</sub> | (1) Apply a 1 kHz sine wave to each input pin.<br><br>(2) In each select mode, measure an input amplitude at which the output waveform on pin 2 (44) begins to be distorted.  |
|  | R <sub>in</sub> V1 | VDR9R2  | —            | 6.0  | 6.5  | —    | V <sub>p-p</sub> |   |
|  | R <sub>in</sub> V2 | VDR31R2 | —            | 6.0  | 6.5  | —    | V <sub>p-p</sub> |   |
|  | R <sub>in</sub> S1 | VDR13R2 | —            | 6.0  | 6.5  | —    | V <sub>p-p</sub> |   |
|  | R <sub>in</sub> S2 | VDR17R2 | —            | 6.0  | 6.5  | —    | V <sub>p-p</sub> |   |
| R <sub>out2</sub><br>Gain                  | R <sub>in</sub> TV | G6R2    | —            | -0.5 | 0    | 0.5  | dB               | (1) Apply a 1 kHz, 1.0 V <sub>p-p</sub> sine wave to each input pin.<br><br>(2) In each select mode, find the gain between input and output.  |
|  | R <sub>in</sub> V1 | G9R2    | —            | -0.5 | 0    | 0.5  | dB               |   |
|  | R <sub>in</sub> V2 | G31R2   | —            | -0.5 | 0    | 0.5  | dB               |   |
|  | R <sub>in</sub> S1 | G13R2   | —            | -0.5 | 0    | 0.5  | dB               |   |
|  | R <sub>in</sub> S2 | G17R2   | —            | -0.5 | 0    | 0.5  | dB               |   |
| R <sub>out2</sub><br>Frequency response    | R <sub>in</sub> TV | F6R2    | —            | 0.1  | 2.0  | —    | MHz              | (1) Apply a 1.0 V <sub>p-p</sub> sine wave to each input pin.<br><br>(2) In each select mode, measure a frequency at which the output amplitude on pin 2 (44) is 3dB down from the 1 kHz applied level.             |
|  | R <sub>in</sub> V1 | F9R2    | —            | 0.1  | 2.0  | —    | MHz              |   |
|  | R <sub>in</sub> V2 | F31R2   | —            | 0.1  | 2.0  | —    | MHz              |   |
|  | R <sub>in</sub> S1 | F13R2   | —            | 0.1  | 2.0  | —    | MHz              |   |
|  | R <sub>in</sub> S2 | F17R2   | —            | 0.1  | 2.0  | —    | MHz              |   |
| R <sub>out2</sub><br>Crosstalk             | R <sub>in</sub> TV | CT6R2   | —            | 70   | 100  | —    | dB               | (1) Apply a 1 kHz, 1.0 V <sub>p-p</sub> sine wave to each input pin.<br><br>(2) In each select mode, compare signal output from the selected pin with leakage components from nonselected pins to find a crosstalk. |
|  | R <sub>in</sub> V1 | CT9R2   | —            | 70   | 100  | —    | dB               |   |
|  | R <sub>in</sub> V2 | CT31R2  | —            | 70   | 100  | —    | dB               |   |
|  | R <sub>in</sub> S1 | CT13R2  | —            | 70   | 100  | —    | dB               |   |
|  | R <sub>in</sub> S2 | CT17R2  | —            | 70   | 100  | —    | dB               |   |
| R <sub>out2</sub><br>Mute attenuation      | R <sub>in</sub> TV | M6R2    | —            | 70   | 100  | —    | dB               | (1) Apply a 1 kHz, 1.0 V <sub>p-p</sub> sine wave to each input pin.<br><br>(2) In each select mode, compare the output amplitudes on pin 2 (44) when mute is turned on and turned off to find mute attenuation.    |
|  | R <sub>in</sub> V1 | M9R2    | —            | 70   | 100  | —    | dB               |   |
|  | R <sub>in</sub> V2 | M31R2   | —            | 70   | 100  | —    | dB               |   |
|  | R <sub>in</sub> S1 | M13R2   | —            | 70   | 100  | —    | dB               |   |
|  | R <sub>in</sub> S2 | M17R2   | —            | 70   | 100  | —    | dB               |   |
| L <sub>out</sub> TV<br>Input dynamic range | L <sub>in</sub> TV | VDR5LTV | —            | 6.0  | 6.5  | —    | V <sub>p-p</sub> | While applying a 1 kHz sine wave to pin 5 (47), measure an input amplitude at which the output waveform on pin 40 (40) begins to be distorted.  |

| Characteristics                    | Select Mode | Symbol  | Test Circuit | Min. | Typ. | Max. | Unit      | Test Method  |
|------------------------------------|-------------|---------|--------------|------|------|------|-----------|--|
| $L_{outTV}$<br>Gain                | $L_{inTV}$  | G5LTV   | —            | -0.5 | 0    | 0.5  | dB        | While applying a 1 kHz, 1.0 $V_{p-p}$ sine wave to pin 5 (47), find the gain between pins 5 (47) and 40 (40).  |
| $L_{outTV}$<br>Frequency response  | $L_{inTV}$  | F5LTV   | —            | 0.1  | 2.0  | —    | MHz       | While applying a 1.0 $V_{p-p}$ sine wave to pin 5, measure a frequency at which the output waveform on pin 40 (40) is 3dB down from the 1 kHz applied level.                                     |
| $L_{outTV}$<br>Crosstalk           | $L_{inTV}$  | CT5LTV  | —            | 70   | 100  | —    | dB        | (1) Apply a 1 kHz, 1.0 $V_{p-p}$ sine wave to each input pin.<br>(2) Compare the output amplitude when $L_{inTV}$ is selected with leakage components from nonselected pins to find a crosstalk. |
|                                    | $L_{inV1}$  | CT8LTV  | —            | 70   | 100  | —    | dB        |  |
|                                    | $L_{inV2}$  | CT29LTV | —            | 70   | 100  | —    | dB        |  |
|                                    | $L_{inS1}$  | CT11LTV | —            | 70   | 100  | —    | dB        |  |
|                                    | $L_{inS2}$  | CT15LTV | —            | 70   | 100  | —    | dB        |  |
| $L_{outTV}$<br>Mute attenuation    | $L_{inTV}$  | M5LTV   | —            | 70   | 100  | —    | dB        | While applying a 1 kHz, 1.0 $V_{p-p}$ sine wave to pin 5, compare the output amplitudes on pin 40 (40) when mute is turned on and turned off to find mute attenuation.                           |
| $R_{outTV}$<br>Input dynamic range | $R_{inTV}$  | VDR6RTV | —            | 6.0  | 6.5  | —    | $V_{p-p}$ | While applying a 1 kHz sine wave to pin 6 (48), measure an input amplitude at which the output waveform on pin 39 (39) begins to be distorted.   |
| $R_{outTV}$<br>Gain                | $R_{inTV}$  | G6RTV   | —            | -0.5 | 0    | 0.5  | dB        | While applying a 1 kHz, 1.0 $V_{p-p}$ sine wave to pin 6 (48), find the gain between pins 6 (48) and 39 (39).  |
| $R_{outTV}$<br>Frequency response  | $R_{inTV}$  | F6RTV   | —            | 0.1  | 2.0  | —    | MHz       | While applying a 1.0 $V_{p-p}$ sine wave to pin 6, measure a frequency at which the output waveform on pin 39 (39) is 3dB down from the 1 kHz applied level.                                     |

| Characteristics                        | Select Mode       | Symbol  | Test Circuit | Min. | Typ. | Max. | Unit | Test Method   |
|--|-------------------|---------|--------------|------|------|------|------|---|
| R <sub>outTV</sub><br>Crosstalk        | R <sub>inTV</sub> | CT6RTV  | —            | 70   | 100  | —    | dB   | (1) Apply a 1 kHz, 1.0 V <sub>p-p</sub> sine wave to each input pin.<br>(2) Compare the output amplitude when R <sub>inTV</sub> is selected with leakage components from nonselected pins |
|  | R <sub>inV1</sub> | CT9RTV  | —            | 70   | 100  | —    | dB   |   |
|  | R <sub>inV2</sub> | CT31RTV | —            | 70   | 100  | —    | dB   |   |
|  | R <sub>inS1</sub> | CT13RTV | —            | 70   | 100  | —    | dB   |   |
|  | R <sub>inS2</sub> | CT17RTV | —            | 70   | 100  | —    | dB   |   |
| R <sub>outTV</sub><br>Mute attenuation | R <sub>inTV</sub> | M6RTV   | —            | 70   | 100  | —    | dB   | While applying a 1 kHz, 1.0 V <sub>p-p</sub> sine wave to pin 6 (48), compare the output amplitudes on pin 39 (39) when mute is turned on and turned off to find mute attenuation.        |

Application Circuit

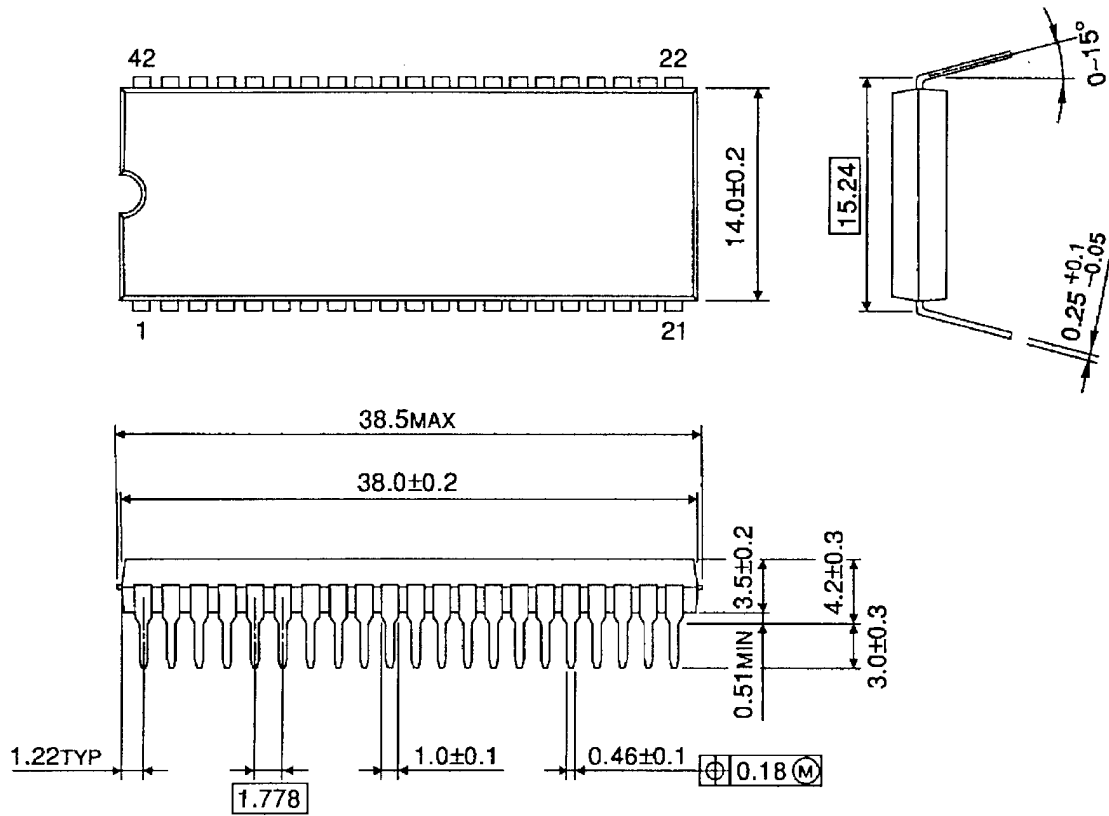


Note8: ( ) : The terminal of TA1218F.

Package Dimensions

SDIP42-P-600-1.78

Unit : mm

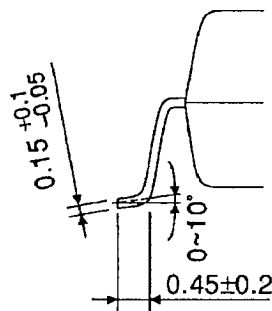
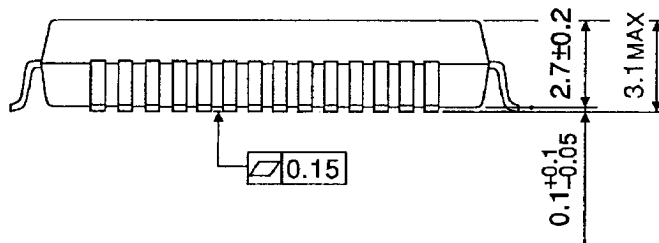
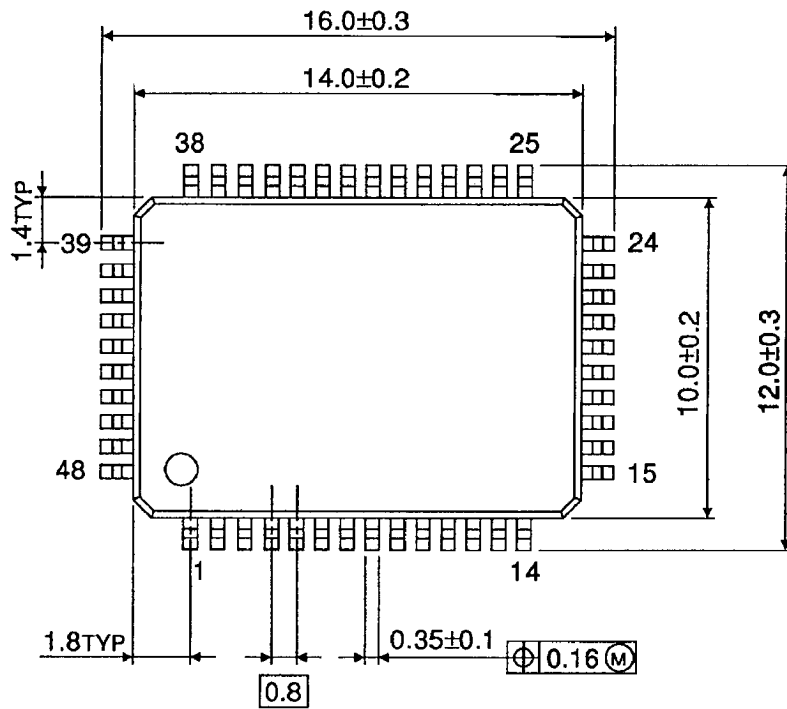


Weight: 4.13 g (typ.)

**Package Dimensions**

QFP48-P-1014-0.80

Unit : mm



Weight: 0.83 g (typ.)