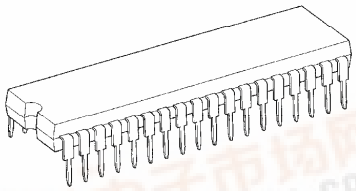
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

# TA1219AN

## AUDIO / VIDEO SWITCHING IC FOR TVs

The TA1219AN is an audio / video switching IC for TV sets.
Conforming to I²C bus standards, it allows you to perform various switching operations through the bus lines by using a microcomputer. 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 TA1218AN (SDIP42), a 2-channel output version of the TA1219AN, so these chips are pin compatible on pins 3 to 20 and 23 to 40 in TA1218AN.



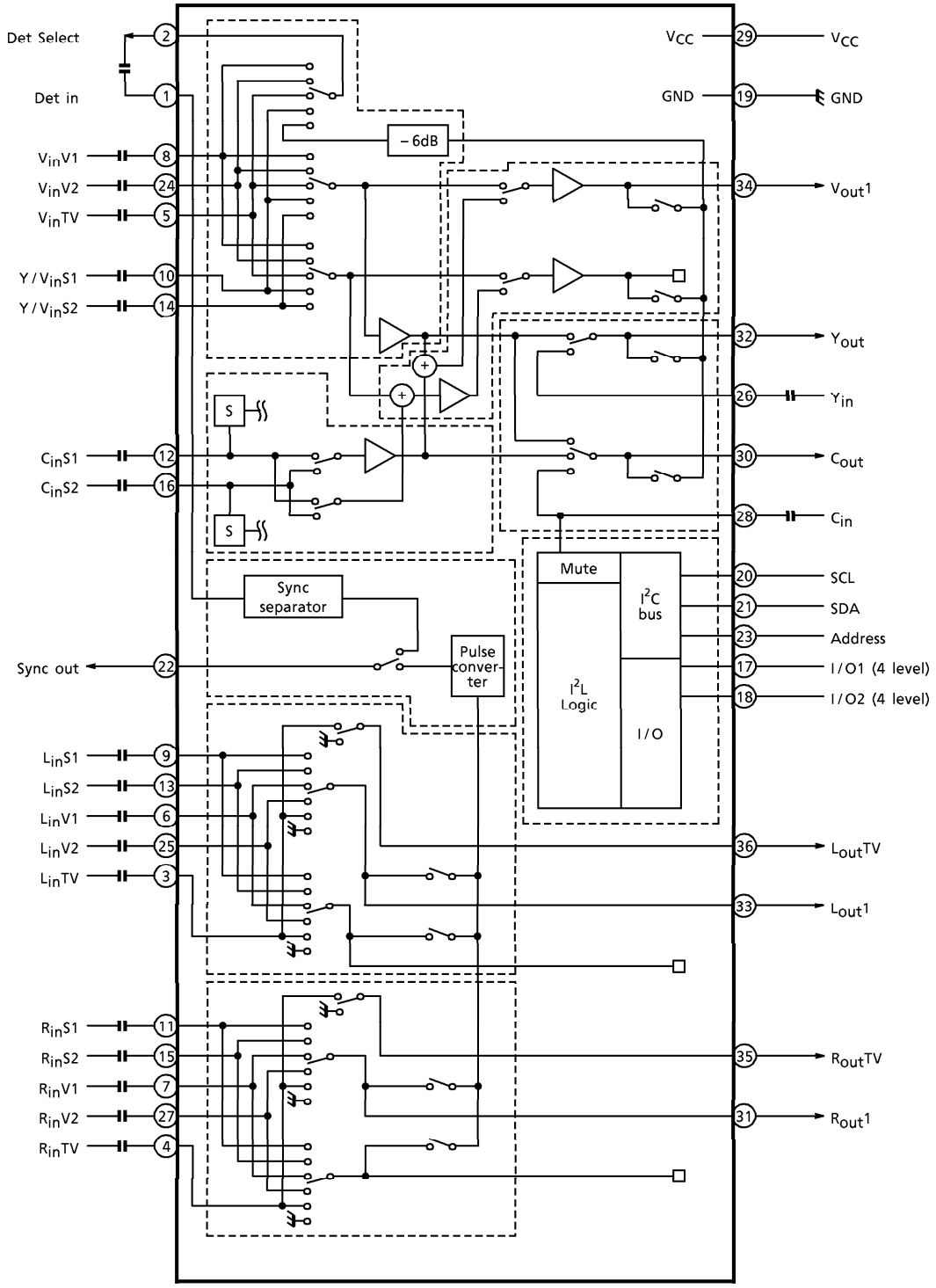
SDIP36-P-500-1.78

Weight : 2.98g (Typ.)

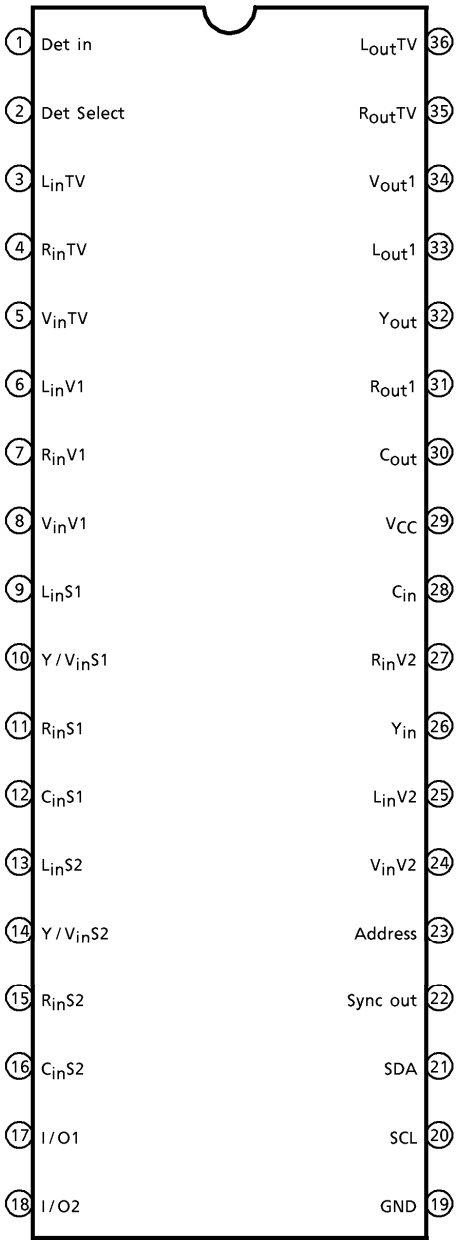
### FEATURES

- I²C bus control
- Video : 5-channel inputs and 1-channel outputs (2 channels conforming to S system)
- Audio : 5-channel inputs and 2-channel outputs
- Self-diagnostic function
- ADC inputs based on European 21-pin standards
- ADC inputs based on S1 / S2 terminal standards
- Switchable subaddress

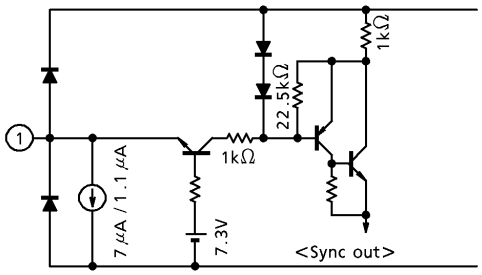
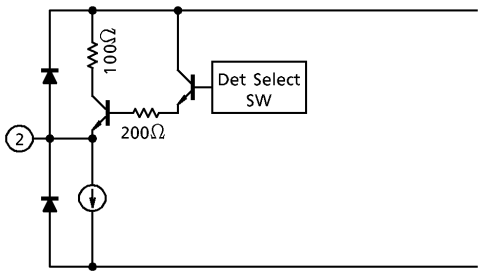
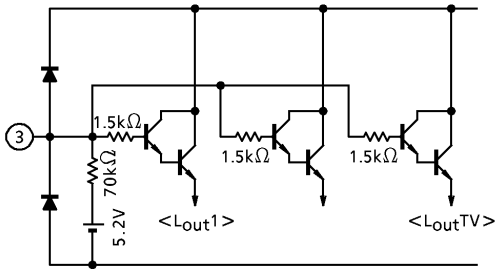
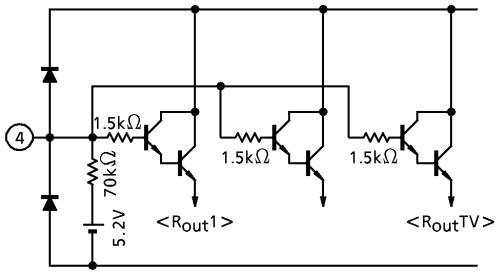
## BLOCK DIAGRAM

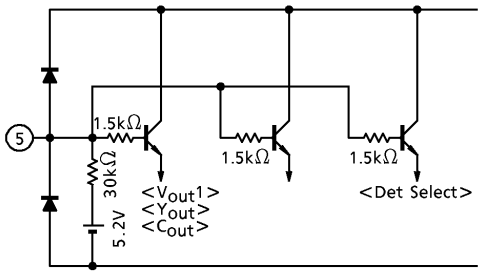
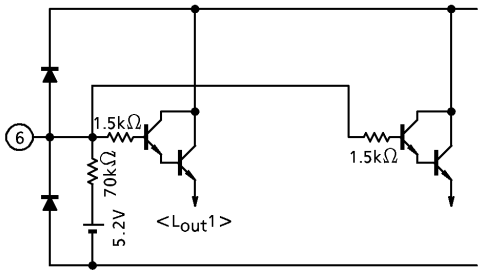
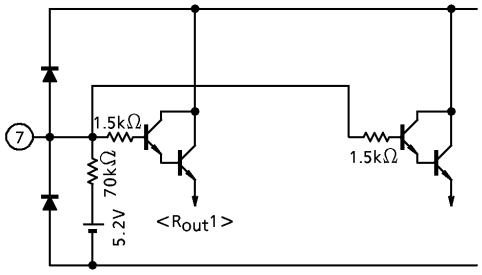
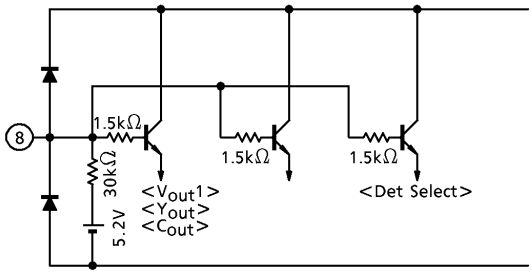


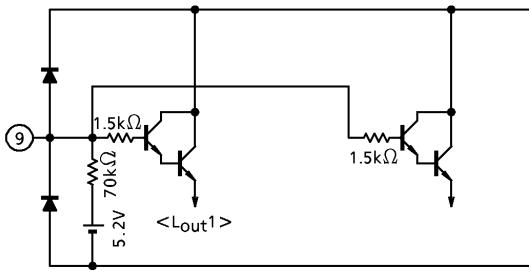
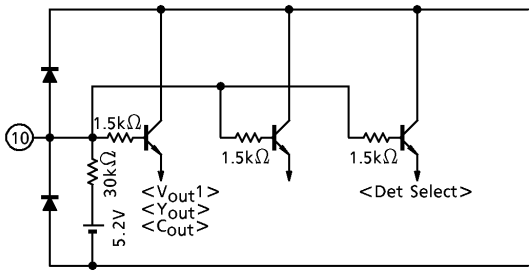
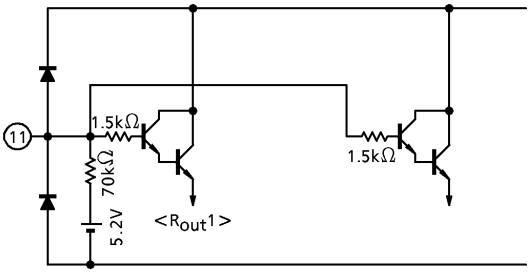
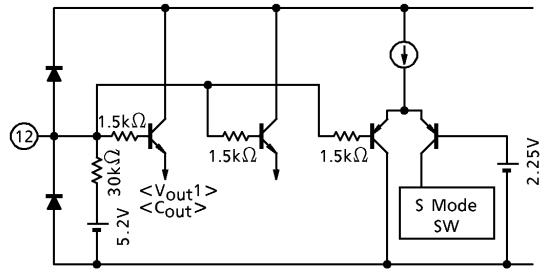
**PIN ASSIGNMENT**

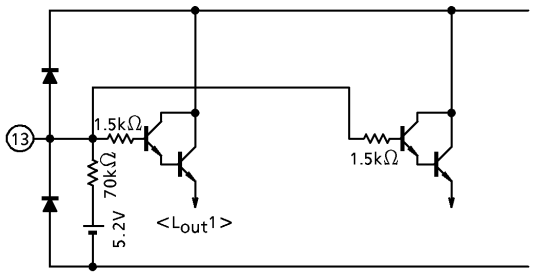
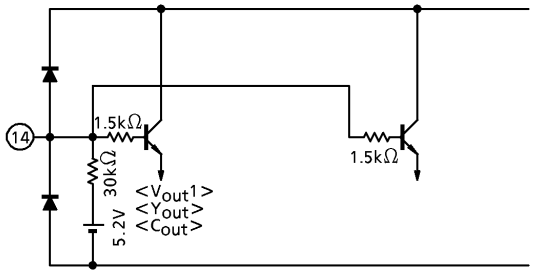
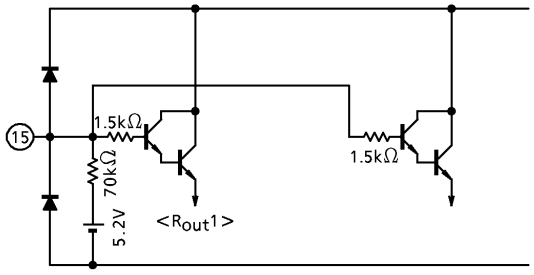
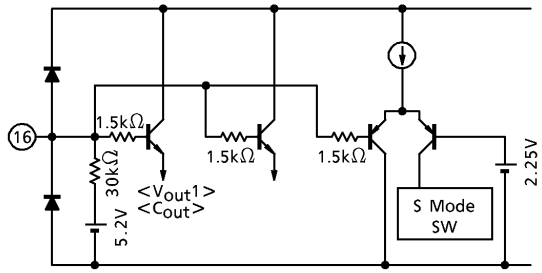


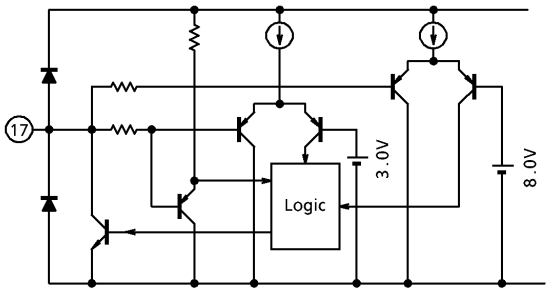
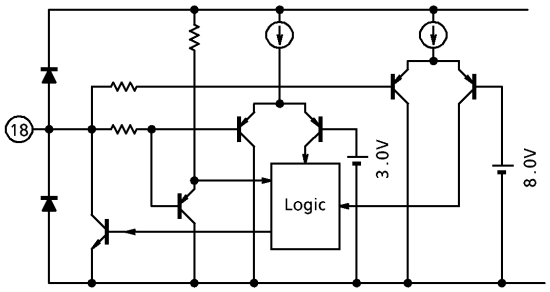
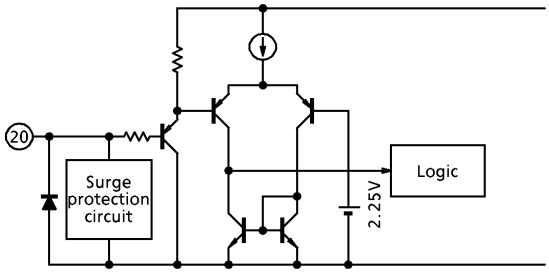
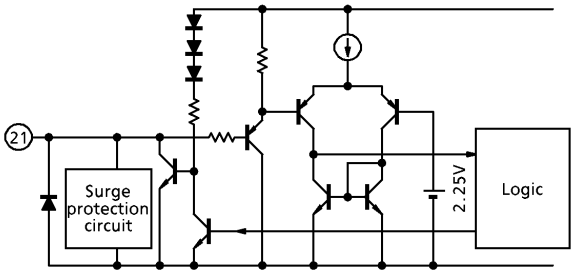
**PIN DESCRIPTION**

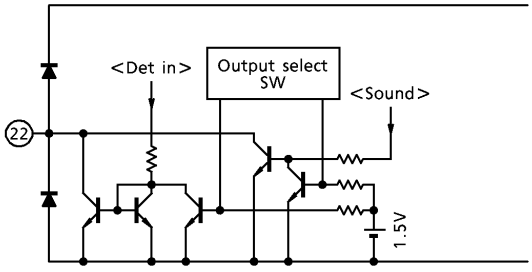
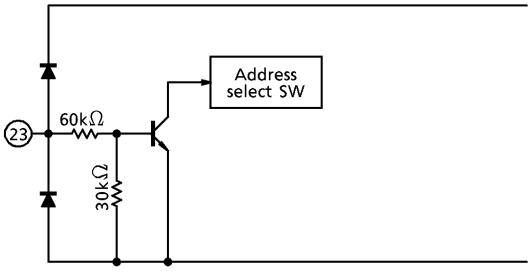
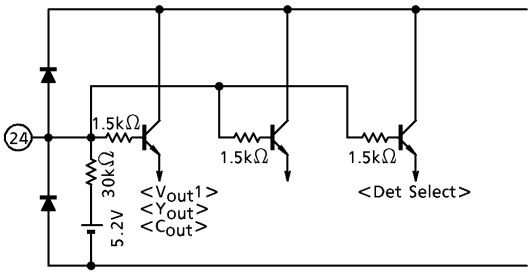
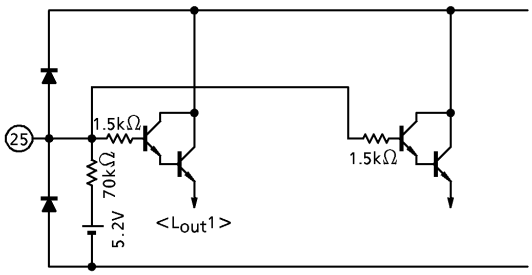
| PIN No. | NAME | FUNCTION | INTERFACE CIRCUIT |
|---|---|---|---|
| 1 | Det in | This pin is for input a sync separation signal. Input the signal from Det Select to this pin with capacitance coupling. The input resistance of this pin is 18kΩ.<br>The sync signal separated from Det Select is outputted from Sync Out for use in self-diagnosis. |  |
| 2 | Det Select | This pin is for output a sync separation signal.<br>Signals $V_{in}V1$, $V_{in}V2$, $V_{in}TV$, $Y/V_{in}S1$, $V_{out}1$, $Y_{out}$ or $C_{out}$ are outputted from this pin. The output resistance of this pin is 35Ω.<br>Input the signal from this pin to Det in with capacitance coupling. |  |
| 3 | $L_{in}TV$ | 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 $L_{out}TV$ and $L_{out}1$.<br>The input dynamic range of this pin is $6.5V_{p-p}$ and the input resistance is 70kΩ. |  |
| 4 | $R_{in}TV$ | 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 $R_{out}TV$ and $R_{out}1$.<br>The input dynamic range of this pin is $6.5V_{p-p}$ and the input resistance is 70kΩ. |  |

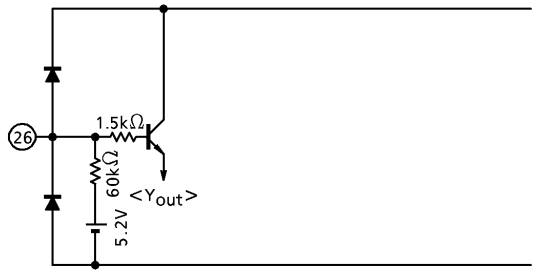
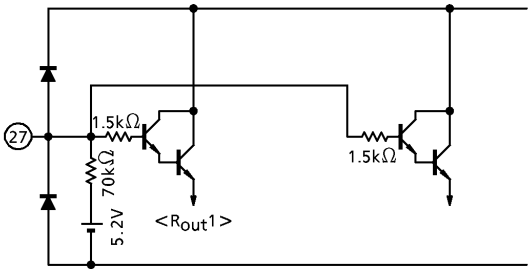
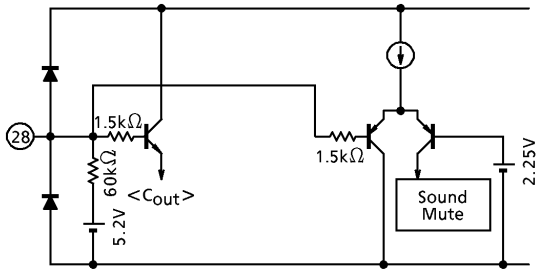
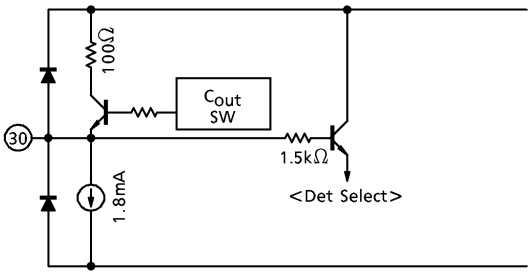
| PIN No. | NAME | FUNCTION | INTERFACE CIRCUIT |
|---|---|---|---|
| 5 | $V_{in}TV$ | This pin is for input a composite audio signal from the main demodulator in the TV set. The signal fed into this pin is presented to $V_{out}1$, $Y_{out}$ and $C_{out}$. The same signal is also output from Det Select as a sync separation signal.<br>The input dynamic range of this pin is $2.0V_{p-p}$ and the input resistance is 30kΩ. |  |
| 6 | $L_{in}V1$ | 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 $L_{out}1$. The input dynamic range of this pin is $6.5V_{p-p}$ and the input resistance is 70Ω. |  |
| 7 | $R_{in}V1$ | 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 $R_{out}1$. The input dynamic range of this pin is $6.5V_{p-p}$ and the input resistance is 70kΩ. |  |
| 8 | $V_{in}V1$ | 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 $V_{out}1$, $Y_{out}$ and $C_{out}$. The same signal is also output from Det Select as a sync separation signal.<br>The input dynamic range of this pin is $2.0V_{p-p}$ and the input resistance is 30kΩ. |  |

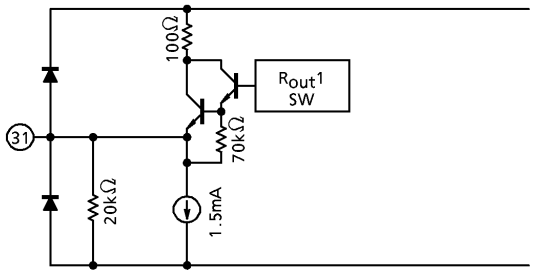
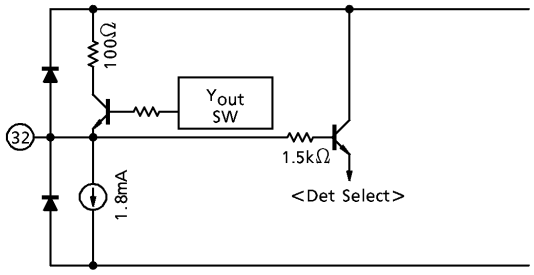
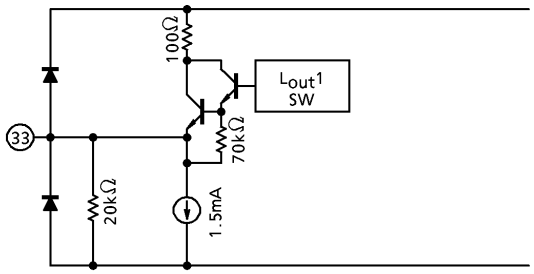
| PIN No. | NAME | FUNCTION | INTERFACE CIRCUIT |
|---|---|---|---|
| 9 | $L_{in}S1$ | This pin is for input a left audio signal from an external source (S1 channel). The signal fed into this pin is presented to $L_{out}1$.<br>The input dynamic range of this pin is $6.5V_{p-p}$ and the input resistance is 70kΩ. |  |
| 10 | $Y/V_{in}S1$ | 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 $V_{out}1$, $Y_{out}$ and $C_{out}$. The same signal is also output from Det Select as a sync separation signal.<br>The input dynamic range of this pin is $2.0V_{p-p}$ and the input resistance is 30kΩ. |  |
| 11 | $R_{in}S1$ | This pin is for input a right audio signal from an external source (S1 channel). The signal fed into this pin is presented to $R_{out}1$.<br>The input dynamic range of this pin is $6.5V_{p-p}$ and the input resistance is 70kΩ. |  |
| 12 | $C_{in}S1$ | 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 DC opened. The signal fed into this pin is presented to $C_{out}$ directly and to $V_{out}1$ after being combined with the $Y_{in}S1$ signal.<br>The input dynamic range of this pin is $2.0V_{p-p}$ and the input resistance is 30kΩ. |  |

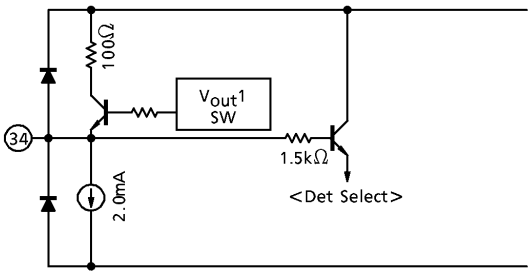
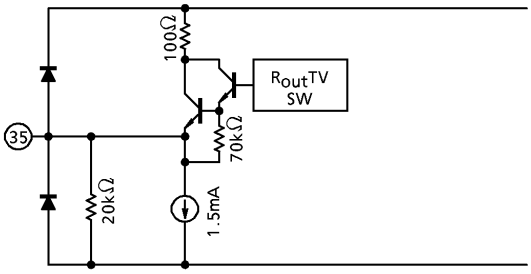
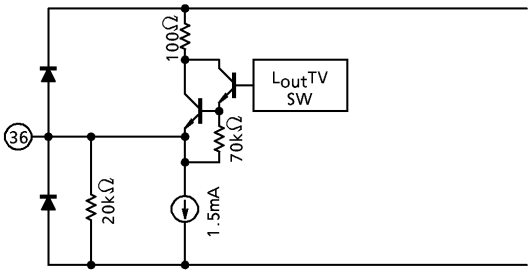
| PIN No. | NAME | FUNCTION | INTERFACE CIRCUIT |
|---|---|---|---|
| 13 | $L_{in}S2$ | This pin is for input a left audio signal from an external source (S2 channel). The signal fed into this pin is presented to $L_{out}1$.<br>The input dynamic range of this pin is $6.5V_{p-p}$ and the input resistance is 70kΩ. |  |
| 14 | $Y/V_{in}S2$ | This pin is for input a luminance signal or composite aoudio signal from an external source (S2 channel). The signal fed into this pin is presented to $V_{out}1$, $Y_{out}$ and $C_{out}$.<br>The input dynamic range of this pin is $2.0V_{p-p}$ and the input resistance is 30kΩ. |  |
| 15 | $R_{in}S2$ | This pin is for input a right audio signal from an external source (S2 channel). The signal fed into this pin is presented to $R_{out}1$.<br>The input dynamic range of this pin is $6.5V_{p-p}$ and the input resistance is 70kΩ. |  |
| 16 | $C_{in}S2$ | 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 DC opened. The signal fed into this pin is presented to $C_{out}$ directly and to $V_{out}1$ after being combined with the $Y_{in}S2$ signal.<br>The input dynamic range of this pin is $2.0V_{p-p}$ and the input resistance is 30kΩ. |  |

| PIN No. | NAME | FUNCTION | INTERFACE CIRCUIT |
|---|---|---|---|
| 17 | I/O1 | This is an ADC input/DAC output pin.<br>The ADC is a 4-level detection type (2 bits). The threshold levels are 8.0V, 3.0V, and 0.75V.<br>The DAC (1bit) is an open-collector output. Make sure that the current flowing into this pin is 2.0mA or less. |  |
| 18 | I/O2 | This is an ADC input/DAC output pin.<br>The ADC is a 4-level detection type (2 bits). The threshold levels are 8.0V, 3.0V, and 0.75V.<br>The DAC (1bit) is an open-collector output. Make sure that the current flowing into this pin is 2.0mA or less. |  |
| 19 | GND | This is the GND pin. | — |
| 20 | SCL | This pin is for input an $I^2C$ bus clock. The input threshold level of this pin is 2.25V. |  |
| 21 | SDA | This is an $I^2C$ bus data input/output pin. The input threshold level of this pin is 2.25V.<br>Make sure that the current flowing into this pin is 3.0mA or less. |  |

| PIN No. | NAME | FUNCTION | INTERFACE CIRCUIT |
|---|---|---|---|
| 22 | Sync out | This pin is for output a self-diagnostic sync signal. The signal separated from $V_{in}$TV $V_{in}$V1, $V_{in}$V2, Y / $V_{in}$S1, $V_{out}$1, $Y_{out}$ or $C_{out}$ is outputted from this pin. In addition, the signal derived from $L_{out}$1 or $R_{out}$1 is also output from this pin for use in audio block diagnosis. This is an open-collector output. Make sure that the current flowing into this pin is 2.0mA or less. |   |
| 23 | Address | This is for an I²C bus slave address select switch. The threshold level of this pin is 2.25V. The following lists the addresses :<br>High : 92H (Write), 93H (Read)<br>Low : 90H (Write), 91H (Read) |   |
| 24 | $V_{in}$V2 | 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 $V_{out}$1, $Y_{out}$, and $C_{out}$. The same signal is also output from Det Select as a sync separation signal. The input dynamic range of this pin is 2.0$V_{p-p}$ and the input resistance is 30kΩ. |   |
| 25 | $L_{in}$V2 | 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 $L_{out}$1. The input dynamic range of this pin is 6.5$V_{p-p}$ and the input resistance is 70kΩ. |   |

| PIN No. | NAME | FUNCTION | INTERFACE CIRCUIT |
|---|---|---|---|
| 26 | $Y_{in}$ | This pin is for input a luminance signal from an external comb filter. The signal fed into this pin is presented to $Y_{out}$.<br>The input dynamic range of this pin is $5.5V_{p-p}$ and the input resistance is 60kΩ. |  |
| 27 | $R_{in}V2$ | 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 $R_{out}1$.<br>The input dynamic range of this pin is $6.5V_{p-p}$ and the input resistance is 70kΩ. |  |
| 28 | $C_{in}$ | This pin is for input a chroma signal from an external comb filter. The signal fed into this pin is presented to $C_{out}$.<br>The input dynamic range of this pin is $5.5V_{p-p}$ and the input resistance is 60kΩ.<br>This pin also functions as a audio mute switch. The entire audio output can be muted by pulling the voltage on this pin below 2.25V. |  |
| 29 | $V_{CC}$ | This is the power supply pin. Apply 9V to this pin. The current consumption of this pin is 47mA. | — |
| 30 | $C_{out}$ | This pin is for output a chroma signal. The signal fed into $C_{in}$, $C_{in}S1$, $C_{in}S2$, $V_{in}V1$, $V_{in}V2$, $Y/V_{in}S1$, $Y/V_{in}S2$, or $V_{in}TV$ is outputted from this pin. The output resistance of this pin is 25Ω.<br>The same signal is also outputted from Det Select as a sync separation signal. |  |

| PIN No. | NAME | FUNCTION | INTERFACE CIRCUIT |
|---|---|---|---|
| 31 | $R_{out}1$ | This pin is for output the main channel right audio signal. The signal fed into $R_{in}V1$, $R_{in}V2$, $R_{in}S1$, $R_{in}S2$, or $R_{in}TV$ is outputted from this pin. The output resistance of this pin is 45Ω. Furthermore, the signal outputted from this pin is pulse-converted for use in self-diagnosis. The converted signal is outputted from Sync Out. This outputted can be muted independently of $L_{out}1$ by bus control. |  |
| 32 | $Y_{out}$ | This pin is for output a luminance signal. The signal fed into $Y_{in}$, $Y/V_{in}S1$, $Y/V_{in}S2$, $V_{in}V1$, $V_{in}V2$, or $V_{in}TV$ is outputted from this pin. The output resistance of this pin is 25Ω. The same signal is also outputted from Det Select as a sync separation signal. |  |
| 33 | $L_{out}1$ | This pin is for output the main channel left audio signal. The signal fed into $L_{in}V1$, $L_{in}V2$, $L_{in}S1$, $L_{in}S2$, or $L_{in}TV$ is outputted from this pin. The output resistance of this pin is 45Ω. Furthermore, the signal outputted from this pin is pulse-converted for use in self-diagnosis. The converted signal is outputted from Sync Out. This output can be muted independently of $R_{out}1$ by bus control. |  |

| PIN No. | NAME | FUNCTION | INTERFACE CIRCUIT |
|---|---|---|---|
| 34 | $V_{out}1$ | This pin is for output the main channel composite video signal. The signal fed into $V_{in}TV$, $V_{in}V1$, $V_{in}V2$, $V_{in}S1$, $V_{in}S2$, $Y_{in}S1 + C_{in}S1$, or $Y_{in}S2 + C_{in}S2$ is outputted from this pin. The output resistance of this pin is 25Ω.<br>The same signal is also outputted from Det Select as a sync separation signal. |  |
| 35 | $R_{out}TV$ | This pin is for output only the signal that is forwarded from $R_{in}TV$. The output resistance of this pin is 45Ω. This output can be muted in combination with $L_{out}TV$ by bus control. |  |
| 36 | $L_{out}TV$ | This pin is for output only the signal that is forwarded from $L_{in}TV$. The output resistance of this pin is 45Ω. This output can be muted in combination with $R_{out}TV$ by bus control. |  |

**BUS DATA SPECIFICATIONS**

Data structure

(1) Write

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

(2) Read

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

* Slave address is switched by the voltage applied to pin 27 (address). Switched to 90H when low (GND) ; switched to 92H when high ($V_{CC}$) during write mode.

Contents of data

| MODE | DATA No. | CONTENTS OF DATA | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Write | Data 1 [F0H] | B07 | B06 | B05 | B04 | B03 | B02 | B01 | B00 |
| | | Audio mute | | | | Forced TV Audio | | YC output switching | |
| | | $L_{out}TV$ $R_{out}TV$ | | $R_{out}1$ | $L_{out}1$ | | | $Y_{out}$ | $C_{out}$ |
| | Data 2 [1FH] | B17 | B16 | B15 | B14 | B13 | B12 | B11 | B10 |
| | | Sync detection sensitivity switching | Sync output switching | Sync (diagnosis) detection switching | | | Input select (Main) | | |
| | Data 3 [07H] | B27 | B26 | B25 | B24 | B23 | B22 | B21 | B20 |
| | | DAC output switching | | | | | | | |
| | | | | | I/O2 | I/O1 | | | |
| Read | Data 4 | B37 | B36 | B35 | B34 | B33 | B32 | B31 | B30 |
| | | ADC input discrimination | | | | | S input discrimination | | Power-on reset |
| | | | I/O2 Hi | I/O2 Low | I/O1 Hi | I/O1 Low | $C_{in}S1$ | $C_{in}S2$ | |

(Note) Shown in [ ] are reset data.

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

Video select

| MODE | | OUTPUT SIGNAL | S INPUT DISCRIMINATION | | BUS DATA INPUT SELECT (MAIN) | | |
|---|---|---|---|---|---|---|---|
| INPUT | S / V | $V_{out}1$ | CS1 | CS2 | B12 | B11 | B10 |
| S1 | V | Y / $V_{in}$S1 | Low | * | 0 | 0 | 0 |
| | S | Y / $V_{in}$S1 + $C_{in}$S1 | Open | | | | |
| | FV | Y / $V_{in}$S1 | | | | | 1 |
| S2 | V | Y / $V_{in}$S2 | * | Low | 0 | 1 | 0 |
| | S | Y / $V_{in}$S2 + $C_{in}$S2 | | Open | | | |
| | FV | Y / $V_{in}$S2 | | | | | 1 |
| V1 | V | $V_{in}$V1 | * | * | 1 | 0 | 1 |
| V2 | V | $V_{in}$V2 | * | * | 1 | 1 | 0 |
| TV | V | $V_{in}$TV | * | * | 1 | 1 | 1 |

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

L / R select

| MODE | MAIN L / R OUTPUT SIGNAL | | BUS DATA FORCED TV VOICE | BUS DATA INPUT SELECT (MAIN) | | |
|---|---|---|---|---|---|---|
| INPUT | $L_{out}1$ | $R_{out}1$ | B03 | B12 | B11 | B10 |
| S1 | $L_{in}$S1 | $R_{in}$S1 | 0 | 0 | 0 | * |
| S2 | $L_{in}$S2 | $R_{in}$S2 | | 0 | 1 | * |
| V1 | $L_{in}$V1 | $R_{in}$V1 | | 1 | 0 | 1 |
| V2 | $L_{in}$V2 | $R_{in}$V2 | | 1 | 1 | 0 |
| TV | $L_{in}$TV | $R_{in}$TV | | 1 | 1 | 1 |
| TV | $L_{in}$TV | $R_{in}$TV | 1 | * | * | * |

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

Y output select

| MODE | | Y OUTPUT SIGNAL | MAIN V SELECT MODE (SEE TABLE 2-2.) | | BUS DATA Y OUTPUT SWITCHING |
|---|---|---|---|---|---|
| INPUT | THROUGH | $Y_{out}$ | | | B01 |
| S1 | $Y_{in}$ | $Y_{in}$ | S1 | V or FV | 0 |
| | V through | $Y/V_{in}S1$ | | | 1 |
| | Y through | $Y/V_{in}S1$ | | S | * |
| S2 | $Y_{in}$ | $Y_{in}$ | S2 | V or FV | 0 |
| | V through | $Y/V_{in}S2$ | | | 1 |
| | Y through | $Y/V_{in}S2$ | | S | * |
| V1 | $Y_{in}$ | $Y_{in}$ | V1 | V | 0 |
| | V through | $V_{in}V1$ | | | 1 |
| V2 | $Y_{in}$ | $Y_{in}$ | V2 | V | 0 |
| | V through | $V_{in}V2$ | | | 1 |
| TV | $Y_{in}$ | $Y_{in}$ | TV | V | 0 |
| | V through | $V_{in}TV$ | | | 1 |

C output select

| MODE | | Y OUTPUT SIGNAL | MAIN V SELECT MODE (SEE TABLE 2-2.) | | BUS DATA C OUTPUT SWITCHING |
|---|---|---|---|---|---|
| INPUT | THROUGH | $C_{out}$ | | | B00 |
| S1 | $C_{in}$ | $C_{in}$ | S1 | V or FV | 0 |
| | V through | $Y/V_{in}S1$ | | | 1 |
| | C through | $C_{in}S1$ | | S | * |
| S2 | $C_{in}$ | $C_{in}$ | S2 | V or FV | 0 |
| | V through | $Y/V_{in}S2$ | | | 1 |
| | C through | $C_{in}S2$ | | S | * |
| V1 | $C_{in}$ | $C_{in}$ | V1 | V | 0 |
| | V through | $V_{in}V1$ | | | 1 |
| V2 | $C_{in}$ | $C_{in}$ | V2 | V | 0 |
| | V through | $V_{in}V2$ | | | 1 |
| TV | $C_{in}$ | $C_{in}$ | TV | V | 0 |
| | V through | $V_{in}TV$ | | | 1 |

Sync detection select

| MODE | | DETECTION SELECT | SYNC OUTPUT | BUS DATA | | | |
|---|---|---|---|---|---|---|---|
| | | | | SYNC SWITCHING | SYNC DETECTION SWITCHING | | |
| | | DET SELECT | SYNC OUT | B16 | B15 | B14 | B13 |
| Video Input | TV | $V_{in}$TV | Sync | 0 | 0 | 1 | 1 |
| | V1 | $V_{in}$V1 | | | | 0 | 1 |
| | V2 | $V_{in}$V2 | | | | 1 | 0 |
| | S1 | Y / $V_{in}$S1 | | | | 0 | 0 |
| Video Output | $V_{out}1$ | $V_{out}1$ | Sync | 0 | 1 | 1 | 1 |
| | △ | — | | | | 0 | 1 |
| | $Y_{out}$ | $Y_{out}$ | | | | 1 | 0 |
| | $C_{out}$ | $C_{out}$ | | | | 0 | 0 |
| Audio Output | $R_{out}1$ | ★ | $R_{out}1$ | 1 | * | 1 | 1 |
| | $L_{out}1$ | ★ | $L_{out}1$ | | | 0 | 1 |
| | △ | ★ | $R_{out}2$ | | | 1 | 0 |
| | △ | ★ | $L_{out}2$ | | | 0 | 0 |

(Note 1) For Det Select marked by ★, the video input or video output corresponding to data B15, B14, and B13 is selected.

(Note 2) Don't use the data marked by △.

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 |
| $L_{out}1$ | off | * | * | * | 0 |
| | on | | | | 1 |
| $R_{out}1$ | off | * | * | 0 | * |
| | on | | | 1 | |
| $L_{out}TV$ $R_{out}TV$ | off | 0 | * | * | * |
| | on | 1 | | | |

DAC output switching

| MODE | | BUS DATA | |
|---|---|---|---|
| | | DAC OUTPUT SWITCHING | |
| OUTPUT | STATE | B24 | B23 |
| I/O1 | Open | * | 0 |
| | Low | | 1 |
| I/O2 | 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 | B32 | B31 |
| $C_{in}S2$ | High (Open) | * | 1 |
| | Low | | 0 |
| $C_{in}S1$ | High (Open) | 1 | * |
| | Low | 0 | |

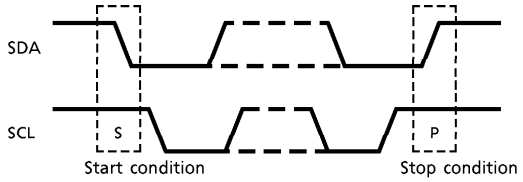
ADC input discrimination

| MODE | | BUS DATA | | | | |
|---|---|---|---|---|---|---|
| | | ADC INPUT DISCRIMINATION | | | | |
| INPUT | VOLTAGE | B37 | B36 | B35 | B34 | B33 |
| I/O1 | High | * | * | * | 0 | 0 |
| | Mid | | | | 1 | 0 |
| | Low | | | | 0 | 1 |
| | Bottom | | | | 1 | 1 |
| I/O2 | High | * | 0 | 0 | * | * |
| | Mid | | 1 | 0 | | |
| | Low | | 0 | 1 | | |
| | Bottom | | 1 | 1 | | |

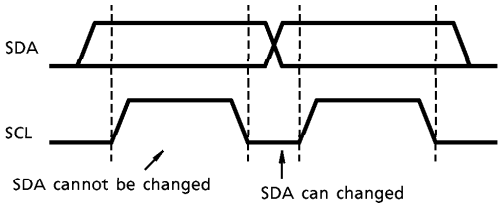
**I²C BUS CONTROLLED FORMAT SUMMARY**

Bus controlled format of TA1219AN is based on I²C BUS control format of Philips.

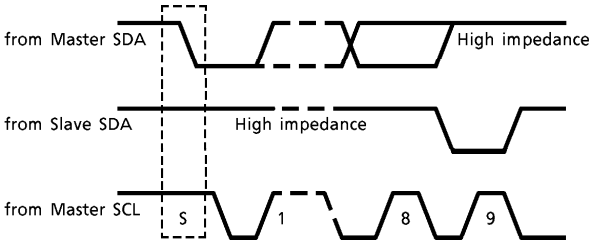
(1) Start and stop condition




(2) Bit transfer




(3) Acknowledge

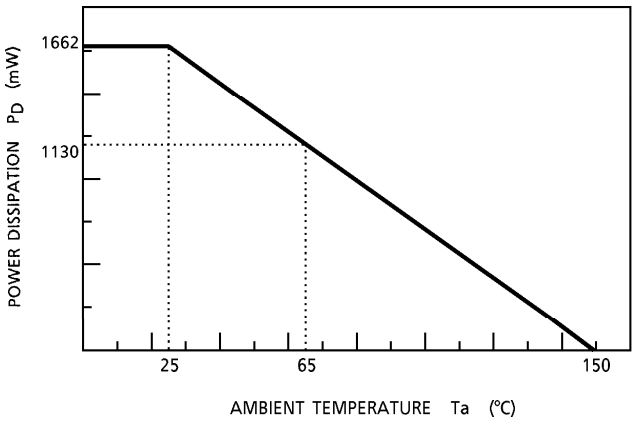



Purchase of TOSHIBA I²C components conveys a license under the Philips I²C Patent Rights to use these components in an I²C system, provided that the system conforms to the I²C Standard Specification as defined by Philips.

**MAXIMUM RATINGS**

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|---|---|---|---|
| Supply Voltage | $V_{CC}$ | 14 | V |
| Power Dissipation | $P_{DMAX}$ | 1662 (Note) | mW |
| Operating Temperature | $T_{opr}$ | −20~65 | °C |
| Storage Temperature | $T_{stg}$ | −55~150 | °C |

(Note) When using the device at temperatures above Ta = 25°C, reduce the rated power dissipation by 13.3mW per degree of centigrade. (See the diagram below.)




**RECOMMENDED OPERATING CONDITIONS**

| CHARACTERISTIC | PIN No. | MIN. | TYP. | MAX. | UNIT | REMARK |
|---|---|---|---|---|---|---|
| Supply Voltage | 29 | 8.1 | 9.0 | 9.9 | V | — |
| Composite Signal Input Amplitude | 5, 8, 10, 14, 24 | — | 1.0 | — | $V_{p-p}$ | 100IRE |
| Y Input Amplitude | 10, 14 | — | 1.0 | — | $V_{p-p}$ | 100IRE |
| Comb Y Input Amplitude | 26 | — | 2.0 | — | $V_{p-p}$ | — |
| Chroma Input Amplitude | 12, 16 | — | 286 | — | $mV_{p-p}$ | Burst |
| Comb Chroma Input Amplitude | 28 | — | 572 | — | $mV_{p-p}$ | Burst |
| Audio Input Amplitude | 3, 4, 6, 7, 9, 11, 13, 15, 25, 27 | — | — | 6.0 | $V_{p-p}$ | — |

**ELECTRICAL CHARACTERISTICS**
(Referenced to $V_{CC}$ = 9V at Ta = 25°C unless otherwise specified.)
Current consumption

| PIN No. | PIN NAME | SYMBOL | TEST CIR-CUIT | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|---|
| 29 | $V_{CC}$ | $I_{CC}$ | — | 30 | 47 | 64 | mA |

Pin voltage

| PIN No. | PIN NAME | SYMBOL | TEST CIR-CUIT | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|---|
| 1 | Det in | V1 | — | 6.3 | 6.6 | 6.9 | V |
| 2 | Det Select | V2 | — | 3.4 | 3.7 | 4.0 | V |
| 3 | $L_{in}$TV | V3 | — | 5.0 | 5.2 | 5.4 | V |
| 4 | $R_{in}$TV | V4 | — | 5.0 | 5.2 | 5.4 | V |
| 5 | $V_{in}$TV | V5 | — | 5.0 | 5.2 | 5.4 | V |
| 6 | $L_{in}$V1 | V6 | — | 5.0 | 5.2 | 5.4 | V |
| 7 | $R_{in}$V1 | V7 | — | 5.0 | 5.2 | 5.4 | V |
| 8 | $V_{in}$V1 | V8 | — | 5.0 | 5.2 | 5.4 | V |
| 9 | $L_{in}$S1 | V9 | — | 5.0 | 5.2 | 5.4 | V |
| 10 | Y / $V_{in}$S1 | V10 | — | 5.0 | 5.2 | 5.4 | V |
| 11 | $R_{in}$S1 | V11 | — | 5.0 | 5.2 | 5.4 | V |
| 12 | $C_{in}$S1 | V12 | — | 5.0 | 5.2 | 5.4 | V |
| 13 | $L_{in}$S2 | V13 | — | 5.0 | 5.2 | 5.4 | V |
| 14 | Y / $V_{in}$S2 | V14 | — | 5.0 | 5.2 | 5.4 | V |
| 15 | $R_{in}$S2 | V15 | — | 5.0 | 5.2 | 5.4 | V |
| 16 | $C_{in}$S2 | V16 | — | 5.0 | 5.2 | 5.4 | V |
| 19 | GND | V19 | — | — | 0 | — | V |
| 24 | $V_{in}$V2 | V24 | — | 5.0 | 5.2 | 5.4 | V |
| 25 | $L_{in}$V2 | V25 | — | 5.0 | 5.2 | 5.4 | V |
| 26 | $Y_{in}$ | V26 | — | 5.0 | 5.2 | 5.4 | V |
| 27 | $R_{in}$V2 | V27 | — | 5.0 | 5.2 | 5.4 | V |
| 28 | $C_{in}$ | V28 | — | 5.0 | 5.2 | 5.4 | V |
| 29 | $V_{CC}$ | V29 | — | — | 9.0 | — | V |
| 30 | $C_{out}$ | V30 | — | 3.5 | 3.8 | 4.1 | V |
| 31 | $R_{out}$1 | V31 | — | 3.7 | 4.0 | 4.3 | V |
| 32 | $Y_{out}$ | V32 | — | 3.5 | 3.8 | 4.1 | V |
| 33 | $L_{out}$1 | V33 | — | 3.7 | 4.0 | 4.3 | V |
| 34 | $V_{out}$1 | V34 | — | 4.1 | 4.4 | 4.7 | V |
| 35 | $R_{out}$TV | V35 | — | 3.7 | 4.0 | 4.3 | V |
| 36 | $L_{out}$TV | V36 | — | 3.7 | 4.0 | 4.3 | V |

DC CHARACTERISTICS

| CHARACTERISTIC | MEASURED PIN | SYMBOL | TEST CIR-CUIT | MIN. | TYP. | MAX. | UNIT | REMARK |
|---|---|---|---|---|---|---|---|---|
| Input Pin Input Resistance | Det in | R1 | — | 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. R = 0.5V / ΔI [Ω] |
| | $V_{in}$TV | R5 | — | 20 | 30 | 40 | kΩ | |
| | $V_{in}$V1 | R8 | — | 20 | 30 | 40 | kΩ | |
| | $V_{in}$V2 | R24 | — | 20 | 30 | 40 | kΩ | |
| | Y / $V_{in}$S1 | R10 | — | 20 | 30 | 40 | kΩ | |
| | Y / $V_{in}$S2 | R14 | — | 20 | 30 | 40 | kΩ | |
| | $C_{in}$S1 | R12 | — | 20 | 30 | 40 | kΩ | |
| | $C_{in}$S2 | R16 | — | 20 | 30 | 40 | kΩ | |
| | $Y_{in}$ | R26 | — | 40 | 60 | 80 | kΩ | |
| | $C_{in}$ | R28 | — | 40 | 60 | 80 | kΩ | |
| | $L_{in}$TV | R3 | — | 49 | 70 | 100 | kΩ | |
| | $R_{in}$TV | R4 | — | 49 | 70 | 100 | kΩ | |
| | $L_{in}$V1 | R6 | — | 49 | 70 | 100 | kΩ | |
| | $R_{in}$V1 | R7 | — | 49 | 70 | 100 | kΩ | |
| | $L_{in}$V2 | R25 | — | 49 | 70 | 100 | kΩ | |
| | $R_{in}$V2 | R27 | — | 49 | 70 | 100 | kΩ | |
| | $L_{in}$S1 | R9 | — | 49 | 70 | 100 | kΩ | |
| | $R_{in}$S1 | R11 | — | 49 | 70 | 100 | kΩ | |
| | $L_{in}$S2 | R13 | — | 49 | 70 | 100 | kΩ | |
| | $R_{in}$S2 | R15 | — | 49 | 70 | 100 | kΩ | |
| Output Pin Output Resistance | Det Select | R2 | — | 17 | 35 | 53 | Ω | Measure a voltage change ΔV on each pin when a current of 100μA flows into the pin. Then calculate the output resistance value R. R = ΔV / 100μA [Ω] |
| | $V_{out}$1 | R34 | — | 13 | 25 | 50 | Ω | |
| | $Y_{out}$ | R32 | — | 13 | 25 | 50 | Ω | |
| | $C_{out}$ | R30 | — | 13 | 25 | 50 | Ω | |
| | $L_{out}$TV | R36 | — | 20 | 45 | 90 | Ω | |
| | $R_{out}$TV | R35 | — | 20 | 45 | 90 | Ω | |
| | $L_{out}$1 | R33 | — | 20 | 45 | 90 | Ω | |
| | $R_{out}$1 | R31 | — | 20 | 45 | 90 | Ω | |
| S Mode Discrimination Voltage | $C_{in}$S1 | VthC1 | — | 1.75 | 2.25 | 2.75 | V | Voltage on pin 12 at which data B31 changes. |
| | $C_{in}$S2 | VthC2 | — | 1.75 | 2.25 | 2.75 | V | Voltage on pin 16 at which data B32 changes. |
| External Mute ON Voltage | $C_{in}$ | VthM | — | 1.75 | 2.25 | 2.75 | V | Voltage on pin 28 at which voice is muted. |

| CHARACTERISTIC | MEASURED PIN | SYMBOL | TEST CIR-CUIT | MIN. | TYP. | MAX. | UNIT | REMARK |
|---|---|---|---|---|---|---|---|---|
| Address Switching Voltage | address | VthA | — | 1.75 | 2.25 | 2.75 | V | Voltage on pin 23 at which the slave address changes. |
| ADC Input Discrimination Voltage | I/O1 | VthI1L | — | 0.55 | 0.75 | 0.95 | V | Low-Bottom threshold level of I/O1 input (pin 17). |
| | I/O1 | VthI1M | — | 2.5 | 3.0 | 3.5 | V | Mid-Low threshold level of I/O1 input (pin 17). |
| | I/O1 | VthI1H | — | 7.5 | 8.0 | 8.5 | V | High-Mid threshold level of I/O1 input (pin 17). |
| | I/O2 | VthI2L | — | 0.55 | 0.75 | 0.95 | V | Low-Bottom threshold level of I/O2 input (pin 18). |
| | I/O2 | VthI2M | — | 2.5 | 3.0 | 3.5 | V | Mid-Low threshold level of I/O2 input (pin 18). |
| | I/O2 | VthI2H | — | 7.5 | 8.0 | 8.5 | V | High-Mid threshold level of I/O1 input (pin 18). |

AC CHARACTERISTICS

| CHARACTERISTIC | SELECT MODE | SYMBOL | TEST CIR-CUIT | MIN. | TYP. | MAX. | UNIT | TEST METHOD |
|---|---|---|---|---|---|---|---|---|
| $V_{out}1$ Input Dynamic Range | $V_{in}TV$ | VDR5V1 | — | 1.5 | 2.0 | — | $V_{p-p}$ | (1) Apply a 15kHz sine wave to each input pin. (2) In each select mode, measure an input amplitude at which the output waveform on pin 34 begins to be distorted. |
| | $V_{in}V1$ | VDR8V1 | — | 1.5 | 2.0 | — | $V_{p-p}$ | |
| | $V_{in}V2$ | VDR24V1 | — | 1.5 | 2.0 | — | $V_{p-p}$ | |
| | $Y/V_{in}S1$ | VDR10V1 | — | 1.5 | 2.0 | — | $V_{p-p}$ | |
| | $C_{in}S1$ | VDR12V1 | — | 1.5 | 2.0 | — | $V_{p-p}$ | |
| | $Y/V_{in}S2$ | VDR14V1 | — | 1.5 | 2.0 | — | $V_{p-p}$ | |
| | $C_{in}S2$ | VDR16V1 | — | 1.5 | 2.0 | — | $V_{p-p}$ | |
| $V_{out}1$ Gain | $V_{in}TV$ | G5V1 | — | 5.5 | 6.0 | 6.5 | dB | (1) Apply a 15kHz, 1.0$V_{p-p}$ sine wave to each input pin. (2) In each select mode, find the gain between input and output. |
| | $V_{in}V1$ | G8V1 | — | 5.5 | 6.0 | 6.5 | dB | |
| | $V_{in}V2$ | G24V1 | — | 5.5 | 6.0 | 6.5 | dB | |
| | $Y/V_{in}S1$ | G10V1 | — | 5.5 | 6.0 | 6.5 | dB | |
| | $C_{in}S1$ | G12V1 | — | 5.5 | 6.0 | 6.5 | dB | |
| | $Y/V_{in}S2$ | G14V1 | — | 5.5 | 6.0 | 6.5 | dB | |
| | $C_{in}S2$ | G16V1 | — | 5.5 | 6.0 | 6.5 | dB | |
| $V_{out}1$ Frequency Response | $V_{in}TV$ | F5V1 | — | 10 | — | — | MHz | (1) Apply a 1.0$V_{p-p}$ sine wave to each input pin. (2) In each select mode, measure a frequency at which the output amplitude on pin 34 is 3dB down from the 15kHz applied level. |
| | $V_{in}V1$ | F8V1 | — | 10 | — | — | MHz | |
| | $V_{in}V2$ | F24V1 | — | 10 | — | — | MHz | |
| | $Y/V_{in}S1$ | F10V1 | — | 10 | — | — | MHz | |
| | $C_{in}S1$ | F12V1 | — | 10 | — | — | MHz | |
| | $Y/V_{in}S2$ | F14V1 | — | 10 | — | — | MHz | |
| | $C_{in}S2$ | F16V1 | — | 10 | — | — | MHz | |
| $V_{out}1$ Crosstalk | $V_{in}TV$ | CT5V1 | — | 55 | 60 | — | dB | (1) Apply a 3.58MHz, 1.0$V_{p-p}$ sine wave to each input pin. (2) In each select mode, compare signal output from the selected pin with leakage components from nonselected pins to find a crosstalk. |
| | $V_{in}V1$ | CT8V1 | — | 55 | 60 | — | dB | |
| | $V_{in}V2$ | CT24V1 | — | 55 | 60 | — | dB | |
| | $Y/V_{in}S1$ | CT10V1 | — | 55 | 60 | — | dB | |
| | $C_{in}S1$ | CT12V1 | — | 55 | 60 | — | dB | |
| | $Y/V_{in}S2$ | CT14V1 | — | 55 | 60 | — | dB | |
| | $C_{in}S2$ | CT16V1 | — | 55 | 60 | — | dB | |
| $Y_{out}$ Input Dynamic Range | $V_{in}TV$ | VDR5Y | — | 1.5 | 2.0 | — | $V_{p-p}$ | (1) Apply a 15kHz sine wave to each input pin. (2) In each select mode, measure an input amplitude at which the output waveform on pin 32 begins to be distorted. |
| | $V_{in}V1$ | VDR8Y | — | 1.5 | 2.0 | — | $V_{p-p}$ | |
| | $V_{in}V2$ | VDR24Y | — | 1.5 | 2.0 | — | $V_{p-p}$ | |
| | $Y/V_{in}S1$ | VDR10Y | — | 1.5 | 2.0 | — | $V_{p-p}$ | |
| | $Y/V_{in}S2$ | VDR14Y | — | 1.5 | 2.0 | — | $V_{p-p}$ | |
| | $Y_{in}$ | VDR26Y | — | 5.0 | 5.5 | — | $V_{p-p}$ | |

| CHARACTERISTIC | SELECT MODE | SYMBOL | TEST CIR-CUIT | MIN. | TYP. | MAX. | UNIT | TEST METHOD |
|---|---|---|---|---|---|---|---|---|
| $Y_{out}$ Gain | $V_{in}TV$ | G5Y | — | 5.5 | 6.0 | 6.5 | dB | (1) Apply a 15kHz, 1.0$V_{p-p}$ sine wave to each input pin. (2) In each select mode, find the gain between input and output. |
| | $V_{in}V1$ | G8Y | — | 5.5 | 6.0 | 6.5 | dB | |
| | $V_{in}V2$ | G24Y | — | 5.5 | 6.0 | 6.5 | dB | |
| | $Y/V_{in}S1$ | G10Y | — | 5.5 | 6.0 | 6.5 | dB | |
| | $Y/V_{in}S2$ | G14Y | — | 5.5 | 6.0 | 6.5 | dB | |
| | $Y_{in}$ | G26Y | — | −0.5 | 0 | 0.5 | dB | |
| $Y_{out}$ Frequency Response | $V_{in}TV$ | F5Y | — | 10 | — | — | MHz | (1) Apply a 1.0$V_{p-p}$ sine wave to each input pin. (2) In each select mode, measure a frequency at which the output amplitude on pin 32 is 3dB down from the 15kHz applied level. |
| | $V_{in}V1$ | F8Y | — | 10 | — | — | MHz | |
| | $V_{in}V2$ | F24Y | — | 10 | — | — | MHz | |
| | $Y/V_{in}S1$ | F10Y | — | 10 | — | — | MHz | |
| | $Y/V_{in}S2$ | F14Y | — | 10 | — | — | MHz | |
| | $Y_{in}$ | F26Y | — | 10 | — | — | MHz | |
| $Y_{out}$ Crosstalk | $V_{in}TV$ | CT5Y | — | 55 | 60 | — | dB | (1) Apply a 3.58MHz, 1.0$V_{p-p}$ sine wave to each input pin. (2) In each select mode, compare signal output from the selected pin with leakage components from nonselected pins to find a crosstalk. |
| | $V_{in}V1$ | CT8Y | — | 55 | 60 | — | dB | |
| | $V_{in}V2$ | CT24Y | — | 55 | 60 | — | dB | |
| | $Y/V_{in}S1$ | CT10Y | — | 55 | 60 | — | dB | |
| | $Y/V_{in}S2$ | CT14Y | — | 55 | 60 | — | dB | |
| | $Y_{in}$ | CT26Y | — | 55 | 60 | — | dB | |
| $C_{out}$ Input Dynamic Range | $V_{in}TV$ | VDR5C | — | 1.5 | 2.0 | — | $V_{p-p}$ | (1) Apply a 15kHz sine wave to each input pin. (2) In each select mode, measure an input amplitude at which the output waveform on pin 30 begins to be distorted. |
| | $V_{in}V1$ | VDR8C | — | 1.5 | 2.0 | — | $V_{p-p}$ | |
| | $V_{in}V2$ | VDR24C | — | 1.5 | 2.0 | — | $V_{p-p}$ | |
| | $Y/V_{in}S1$ | VDR10C | — | 1.5 | 2.0 | — | $V_{p-p}$ | |
| | $C_{in}S1$ | VDR12C | — | 1.5 | 2.0 | — | $V_{p-p}$ | |
| | $Y/V_{in}S2$ | VDR14C | — | 1.5 | 2.0 | — | $V_{p-p}$ | |
| | $C_{in}S2$ | VDR16C | — | 1.5 | 2.0 | — | $V_{p-p}$ | |
| | $C_{in}$ | VDR28C | — | 5.0 | 5.5 | — | $V_{p-p}$ | |
| $C_{out}$ Gain | $V_{in}TV$ | G5C | — | 5.5 | 6.0 | 6.5 | dB | (1) Apply a 15kHz, 1.0$V_{p-p}$ sine wave to each input pin. (2) In each select mode, find the gain between input and output. |
| | $V_{in}V1$ | G8C | — | 5.5 | 6.0 | 6.5 | dB | |
| | $V_{in}V2$ | G24C | — | 5.5 | 6.0 | 6.5 | dB | |
| | $Y/V_{in}S1$ | G10C | — | 5.5 | 6.0 | 6.5 | dB | |
| | $C_{in}S1$ | G12C | — | 5.5 | 6.0 | 6.5 | dB | |
| | $Y/V_{in}S2$ | G14C | — | 5.5 | 6.0 | 6.5 | dB | |
| | $C_{in}S2$ | G16C | — | 5.5 | 6.0 | 6.5 | dB | |
| | $C_{in}$ | G28C | — | −0.5 | 0 | 0.5 | dB | |

| CHARACTERISTIC | SELECT MODE | SYMBOL | TEST CIR-CUIT | MIN. | TYP. | MAX. | UNIT | TEST METHOD |
|---|---|---|---|---|---|---|---|---|
| $C_{out}$ Frequency Response | $V_{in}TV$ | F5C | — | 10 | — | — | MHz | (1) Apply a $1.0V_{p-p}$ sine wave to each input pin. (2) In each select mode, measure a frequency at which the output amplitude on pin 30 is 3dB down from the 15kHz applied level. |
| | $V_{in}V1$ | F8C | — | 10 | — | — | MHz | |
| | $V_{in}V2$ | F24C | — | 10 | — | — | MHz | |
| | $Y/V_{in}S1$ | F10C | — | 10 | — | — | MHz | |
| | $C_{in}S1$ | F12C | — | 10 | — | — | MHz | |
| | $Y/V_{in}S2$ | F14C | — | 10 | — | — | MHz | |
| | $C_{in}S2$ | F16C | — | 10 | — | — | MHz | |
| | $C_{in}$ | F28C | — | 10 | — | — | MHz | |
| $C_{out}$ Crosstalk | $V_{in}TV$ | CT5C | — | 55 | 60 | — | dB | (1) Apply a 3.58MHz, $1.0V_{p-p}$ sine wave to each input pin. (2) In each select mode, compare signal output from the selected pin with leakage components from nonselected pins to find a crosstalk. |
| | $V_{in}V1$ | CT8C | — | 55 | 60 | — | dB | |
| | $V_{in}V2$ | CT24C | — | 55 | 60 | — | dB | |
| | $Y/V_{in}S1$ | CT10C | — | 55 | 60 | — | dB | |
| | $C_{in}S1$ | CT12C | — | 55 | 60 | — | dB | |
| | $Y/V_{in}S2$ | CT14C | — | 55 | 60 | — | dB | |
| | $C_{in}S2$ | CT16C | — | 55 | 60 | — | dB | |
| | $C_{in}$ | CT28C | — | 55 | 60 | — | dB | |
| Det Select Input Dynamic Range | $V_{in}TV$ | VDR5D | — | 5.0 | 5.5 | — | V | (1) Apply a 15kHz sine wave to each input pin. (2) In each select mode, measure an input amplitude at which the output waveform on pin 2 begins to be distorted. |
| | $V_{in}V1$ | VDR8D | — | 5.0 | 5.5 | — | V | |
| | $V_{in}V2$ | VDR24D | — | 5.0 | 5.5 | — | V | |
| | $Y/V_{in}S1$ | VDR10D | — | 5.0 | 5.5 | — | V | |
| | $V_{out1}$ | VDR34D | — | 1.5 | 2.0 | — | V | |
| | $V_{out2}$ | VDR38D | — | 1.5 | 2.0 | — | V | |
| | $C_{out}$ | VDR30D | — | 1.2 | 1.8 | — | V | |
| Det Select Gain | $V_{in}TV$ | G5D | — | −0.5 | 0 | 0.5 | dB | (1) Apply a 15kHz, $1.0V_{p-p}$ sine wave to each input pin. (2) In each select mode, find the gain between input and output. |
| | $V_{in}V1$ | G8D | — | −0.5 | 0 | 0.5 | dB | |
| | $V_{in}V2$ | G24D | — | −0.5 | 0 | 0.5 | dB | |
| | $Y/V_{in}S1$ | G10D | — | −0.5 | 0 | 0.5 | dB | |
| | $V_{out1}$ | G34D | — | −0.1 | 0 | 0.1 | dB | |
| | $Y_{out}$ | G32D | — | −0.1 | 0 | 0.1 | dB | |
| | $C_{out}$ | G30D | — | −0.1 | 0 | 0.1 | dB | |
| $L_{out}1$ Input Dynamic Range | $L_{in}TV$ | VDR3L1 | — | 6.0 | 6.5 | — | $V_{p-p}$ | (1) Apply a 1kHz sine wave to each input pin. (2) In each select mode, measure an input amplitude at which the output waveform on pin 33 begins to be distorted. |
| | $L_{in}V1$ | VDR6L1 | — | 6.0 | 6.5 | — | $V_{p-p}$ | |
| | $L_{in}V2$ | VDR25L1 | — | 6.0 | 6.5 | — | $V_{p-p}$ | |
| | $L_{in}S1$ | VDR9L1 | — | 6.0 | 6.5 | — | $V_{p-p}$ | |
| | $L_{in}S2$ | VDR13L1 | — | 6.0 | 6.5 | — | $V_{p-p}$ | |

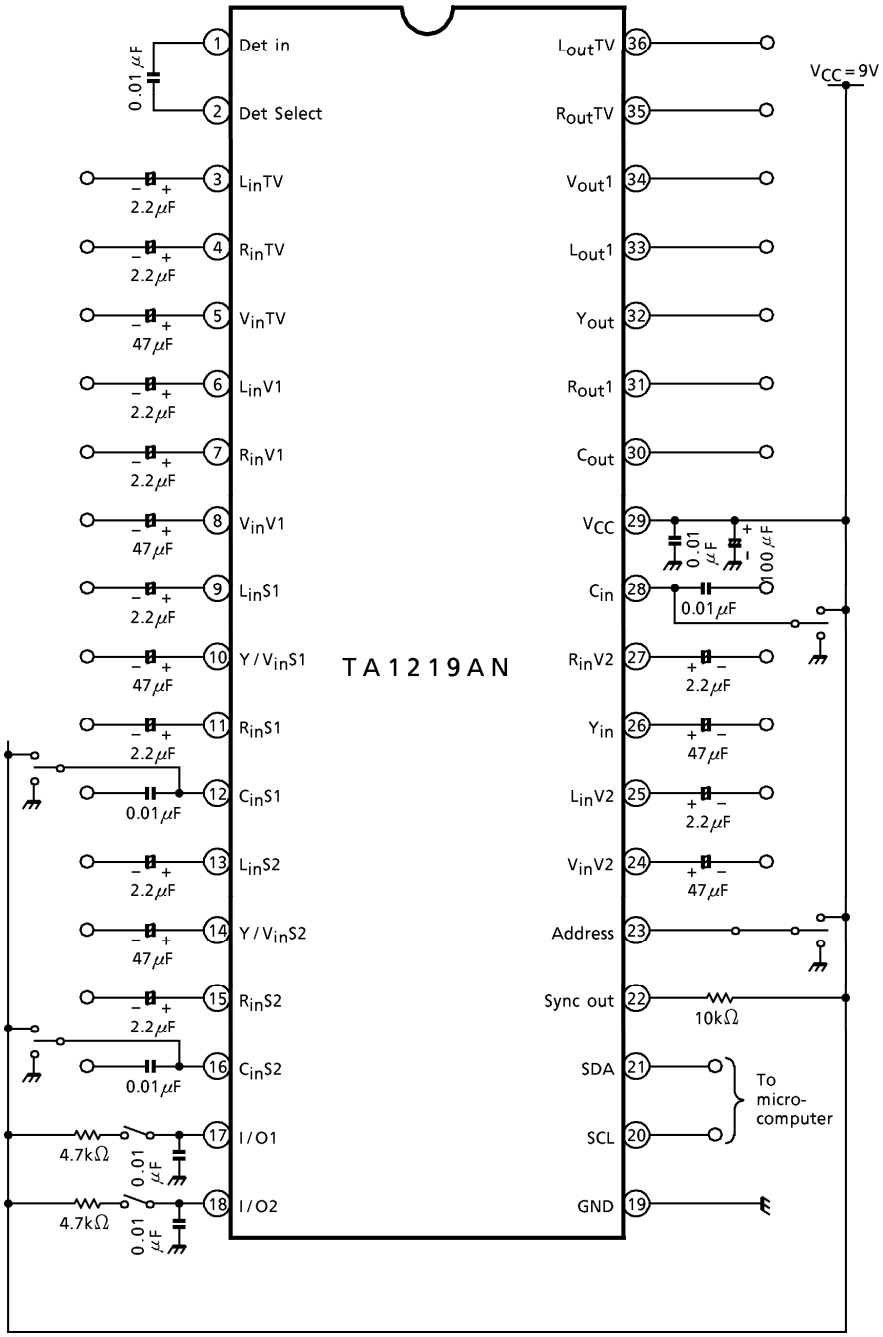
| CHARACTERISTIC | SELECT MODE | SYMBOL | TEST CIR-CUIT | MIN. | TYP. | MAX. | UNIT | TEST METHOD |
|---|---|---|---|---|---|---|---|---|
| $L_{out}1$ Gain | $L_{in}TV$ | G3L1 | — | −0.5 | 0 | 0.5 | dB | (1) Apply a 1kHz, 1.0$V_{p-p}$ sine wave to each input pin. (2) In each select mode, find the gain between input and output. |
| | $L_{in}V1$ | G6L1 | — | −0.5 | 0 | 0.5 | dB | |
| | $L_{in}V2$ | G25L1 | — | −0.5 | 0 | 0.5 | dB | |
| | $L_{in}S1$ | G9L1 | — | −0.5 | 0 | 0.5 | dB | |
| | $L_{in}S2$ | G13L1 | — | −0.5 | 0 | 0.5 | dB | |
| $L_{out}1$ Frequency Response | $L_{in}TV$ | F3L1 | — | 0.1 | 2.0 | — | MHz | (1) Apply a 1.0$V_{p-p}$ sine wave to each input pin. (2) In each select mode, measure a frequency at which the output amplitude on pin 33 is 3dB down from the 1 kHz applied level. |
| | $L_{in}V1$ | F6L1 | — | 0.1 | 2.0 | — | MHz | |
| | $L_{in}V2$ | F25L1 | — | 0.1 | 2.0 | — | MHz | |
| | $L_{in}S1$ | F9L1 | — | 0.1 | 2.0 | — | MHz | |
| | $L_{in}S2$ | F13L1 | — | 0.1 | 2.0 | — | MHz | |
| $L_{out}1$ Crosstalk | $L_{in}TV$ | CT3L1 | — | 70 | 100 | — | dB | (1) Apply a 1kHz, 1.0$V_{p-p}$ sine wave to each input pin. (2) In each select mode, compare signal output from the selected pin with leakage components from nonselected pins to find a crosstalk. |
| | $L_{in}V1$ | CT6L1 | — | 70 | 100 | — | dB | |
| | $L_{in}V2$ | CT25L1 | — | 70 | 100 | — | dB | |
| | $L_{in}S1$ | CT9L1 | — | 70 | 100 | — | dB | |
| | $L_{in}S2$ | CT13L1 | — | 70 | 100 | — | dB | |
| $L_{out}1$ Mute Attenuation | $L_{in}TV$ | M3L1 | — | 70 | 100 | — | dB | (1) Apply a 1kHz, 1.0$V_{p-p}$ sine wave to each input pin. (2) In each select mode, compare the output amplitudes on pin 33 when mute is turned on and turned off to find mute attenuation. |
| | $L_{in}V1$ | M6L1 | — | 70 | 100 | — | dB | |
| | $L_{in}V2$ | M25L1 | — | 70 | 100 | — | dB | |
| | $L_{in}S1$ | M9L1 | — | 70 | 100 | — | dB | |
| | $L_{in}S2$ | M13L1 | — | 70 | 100 | — | dB | |
| $R_{out}1$ Input Dynamic Range | $R_{in}TV$ | VDR4R1 | — | 6.0 | 6.5 | — | $V_{p-p}$ | (1) Apply a 1kHz sine wave to each input pin. (2) In each select mode, measure an input amplitude at which the output waveform on pin 31 begins to be distorted. |
| | $R_{in}V1$ | VDR7R1 | — | 6.0 | 6.5 | — | $V_{p-p}$ | |
| | $R_{in}V2$ | VDR27R1 | — | 6.0 | 6.5 | — | $V_{p-p}$ | |
| | $R_{in}S1$ | VDR11R1 | — | 6.0 | 6.5 | — | $V_{p-p}$ | |
| | $R_{in}S2$ | VDR15R1 | — | 6.0 | 6.5 | — | $V_{p-p}$ | |

| CHARACTERISTIC | SELECT MODE | SYMBOL | TEST CIR-CUIT | MIN. | TYP. | MAX. | UNIT | TEST METHOD |
|---|---|---|---|---|---|---|---|---|
| $R_{out}1$ Gain | $R_{in}TV$ | G4R1 | — | −0.5 | 0 | 0.5 | dB | (1) Apply a 1kHz, 1.0$V_{p-p}$ sine wave to each input pin. (2) In each select mode, find the gain between input and output. |
| | $R_{in}V1$ | G7R1 | — | −0.5 | 0 | 0.5 | dB | |
| | $R_{in}V2$ | G27R1 | — | −0.5 | 0 | 0.5 | dB | |
| | $R_{in}S1$ | G11R1 | — | −0.5 | 0 | 0.5 | dB | |
| | $R_{in}S2$ | G15R1 | — | −0.5 | 0 | 0.5 | dB | |
| $R_{out}1$ Frequency Response | $R_{in}TV$ | F4R1 | — | 0.1 | 2.0 | — | MHz | (1) Apply a 1.0$V_{p-p}$ sine wave to each input pin. (2) In each select mode, measure a frequency at which the output amplitude on pin 31 is 3dB down from the 1kHz applied level. |
| | $R_{in}V1$ | F7R1 | — | 0.1 | 2.0 | — | MHz | |
| | $R_{in}V2$ | F27R1 | — | 0.1 | 2.0 | — | MHz | |
| | $R_{in}S1$ | F11R1 | — | 0.1 | 2.0 | — | MHz | |
| | $R_{in}S2$ | F15R1 | — | 0.1 | 2.0 | — | MHz | |
| $R_{out}1$ Crosstalk | $R_{in}TV$ | CT4R1 | — | 70 | 100 | — | dB | (1) Apply a 1kHz, 1.0$V_{p-p}$ sine wave to each input pin. (2) In each select mode, compare signal output from the selected pin with leakage components from nonselected pins to find a crosstalk. |
| | $R_{in}V1$ | CT7R1 | — | 70 | 100 | — | dB | |
| | $R_{in}V2$ | CT27R1 | — | 70 | 100 | — | dB | |
| | $R_{in}S1$ | CT11R1 | — | 70 | 100 | — | dB | |
| | $R_{in}S2$ | CT15R1 | — | 70 | 100 | — | dB | |
| $R_{out}1$ Mute Attenuation | $R_{in}TV$ | M4R1 | — | 70 | 100 | — | dB | (1) Apply a 1kHz, 1.0$V_{p-p}$ sine wave to each input pin. (2) In each select mode, compare the output amplitudes on pin 31 when mute is turned on and turned off to find mute attenuation. |
| | $R_{in}V1$ | M7R1 | — | 70 | 100 | — | dB | |
| | $R_{in}V2$ | M27R1 | — | 70 | 100 | — | dB | |
| | $R_{in}S1$ | M11R1 | — | 70 | 100 | — | dB | |
| | $R_{in}S2$ | M15R1 | — | 70 | 100 | — | dB | |
| $L_{out}TV$ Input Dynamic Range | $L_{in}TV$ | VDR3LTV | — | 6.0 | 6.5 | — | $V_{p-p}$ | While applying a 1kHz sine wave to pin 3, measure an input amplitude at which the output waveform on pin 36 begins to be distorted. |
| $L_{out}TV$ Gain | $L_{in}TV$ | G3LTV | — | −0.5 | 0 | 0.5 | dB | While applying a 1kHz, 1.0$V_{p-p}$ sine wave to pin 3, find the gain between pins 3 and 36. |

| CHARACTERISTIC | SELECT MODE | SYMBOL | TEST CIR-CUIT | MIN. | TYP. | MAX. | UNIT | TEST METHOD |
|---|---|---|---|---|---|---|---|---|
| $L_{out}$TV Frequency Response | $L_{in}$TV | F3LTV | — | 0.1 | 2.0 | — | MHz | While applying a 1.0$V_{p-p}$ sine wave to pin 3, measure a frequency at which the output waveform on pin 36 is 3dB down from the 1kHz applied level. |
| $L_{out}$TV Crosstalk | $L_{in}$TV | CT3LTV | — | 70 | 100 | — | dB | (1) Apply a 1kHz, 1.0$V_{p-p}$ sine wave to each input pin. (2) Compare the output amplitude when $L_{in}$TV is selected with leakage components from nonselected pins to find a crosstalk. |
| | $L_{in}$V1 | CT6LTV | — | 70 | 100 | — | dB | |
| | $L_{in}$V2 | CT25LTV | — | 70 | 100 | — | dB | |
| | $L_{in}$S1 | CT9LTV | — | 70 | 100 | — | dB | |
| | $L_{in}$S2 | CT13LTV | — | 70 | 100 | — | dB | |
| $L_{out}$TV Mute Attenuation | $L_{in}$TV | M3LTV | — | 70 | 100 | — | dB | While applying a 1kHz, 1.0$V_{p-p}$ sine wave to pin 3, compare the output amplitudes on pin 36 when mute is turned on and turned off to find mute attenuation. |
| $R_{out}$TV Input Dynamic Range | $R_{in}$TV | VDR4RTV | — | 6.0 | 6.5 | — | $V_{p-p}$ | While applying a 1kHz sine wave to pin 4, measure an input amplitude at which the output waveform on pin 35 begins to be distorted. |
| $R_{out}$TV Gain | $R_{in}$TV | G4RTV | — | −0.5 | 0 | 0.5 | dB | While applying a 1kHz, 1.0$V_{p-p}$ sine wave to pin 4, find the gain between pins 4 and 35. |
| $R_{out}$TV Frequency Response | $R_{in}$TV | F4RTV | — | 0.1 | 2.0 | — | MHz | While applying a 1.0$V_{p-p}$ sine wave to pin 4, measure a frequency at which the output waveform on pin 35 is 3dB down from the 1kHz applied level. |

| CHARACTERISTIC | SELECT MODE | SYMBOL | TEST CIR-CUIT | MIN. | TYP. | MAX. | UNIT | TEST METHOD |
|---|---|---|---|---|---|---|---|---|
| $R_{out}$TV Crosstalk | $R_{in}$TV | CT4RTV | — | 70 | 100 | — | dB | (1) Apply a 1kHz, 1.0$V_{p-p}$ sine wave to each input pin. (2) Compare the output amplitude when $R_{in}$TV is selected with leakage components from nonselected pins to find a crosstalk. |
| | $R_{in}$V1 | CT7RTV | — | 70 | 100 | — | dB | |
| | $R_{in}$V2 | CT27RTV | — | 70 | 100 | — | dB | |
| | $R_{in}$S1 | CT11RTV | — | 70 | 100 | — | dB | |
| | $R_{in}$S2 | CT15RTV | — | 70 | 100 | — | dB | |
| $R_{out}$TV Mute Attenuation | $R_{in}$TV | M4RTV | — | 70 | 100 | — | dB | While applying a 1kHz, 1.0$V_{p-p}$ sine wave to pin 4, compare the output amplitudes on pin 35 when mute is turned on and turned off to find mute attenuation. |

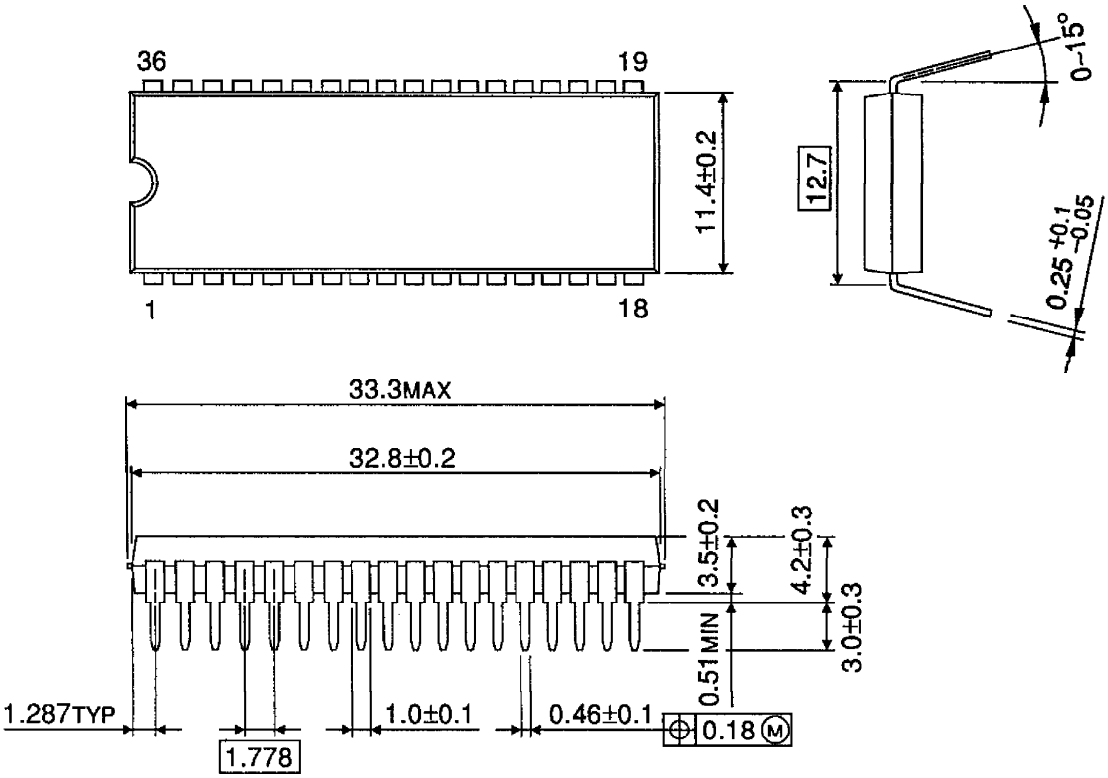
## APPLICATION CIRCUIT



**OUTLINE DRAWING**

SDIP36-P-500-1.78

Unit : mm




Weight : 2.98g (Typ.)