



SANYO Semiconductors

DATA SHEET

LA73060V — Monolithic Linear IC

Wideband 75Ω Video Driver

Overview

This LA73060V is a wideband 75Ω Video Driver IC. The LA73060V is ideal for use the video output driver such as TV-monitor and DVD-player equipment.

Functions

- 6channel output.
- 6MHz or 30MHz low pass filter.
- 6dB amplifier.
- Output mute.
- Y/C_MIX.
- Standby mode.

Specifications

Maximum Ratings at $T_a = 25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | Unit |
|-----------------------------|---------------------|-------------------------------|-------------|------------------|
| Maximum supply voltage | $V_{CC\text{ max}}$ | | 7.0 | V |
| Allowable power dissipation | $P_d\text{ max}$ | $T_a \leq 75^\circ\text{C} *$ | 780 | mW |
| Operating temperature | T_{opr} | | -20 to +75 | $^\circ\text{C}$ |
| Storage temperature | T_{stg} | | -40 to +150 | $^\circ\text{C}$ |

* When mounted on a 114.3×76.1×1.6mm³ glass epoxy board.

Recommended Operating Conditions at $T_a = 25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | Unit |
|-------------------------------------|--------------------|------------|----------------------------------|------|
| Recommending operation voltage | V_{CC} | | 5.0 | V |
| Operating voltage range | $V_{CC\text{ op}}$ | | 4.75 to 5.25 | V |
| Input pin voltage application range | V_{IN} | | -0.3 to $V_{CC\text{ op}} + 0.3$ | V |

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Electrical Characteristics at $T_a = 25^{\circ}\text{C}$, $V_{CC} = 5\text{V}$

| Parameter | Symbol | SIG | Level [Vp-p] | Freq. [Hz] | IN point | OUT point | Conditions | Ratings | | | Unit |
|--|----------------|-----|-----------------|---------------|--|---------------------------------------|--|---------|------|-------|------|
| | | | | | | | | min | typ | max | |
| Current dissipation 1 | I_{CC1} | | | | | | No signal. | 69.0 | 87.0 | 105.0 | mA |
| Current dissipation 2 | I_{CC2} | | | | | | Standby mode, No signal. | 0.3 | 0.4 | 0.5 | mA |
| Regulator voltage | REG3V | | | | | T27 | | 2.8 | 3.0 | 3.2 | V |
| Voltage gain 1 | V_{G1} | 1 | 0.3 | 100k | T4A T6A T14A T12A T14A T16A | T1 T35 T22 T30 T28 T26 | Output gain. | 5.5 | 6.0 | 6.5 | dB |
| Voltage gain 2 | V_{G2} | 3 | 0.3 | 100k | T8A T12A T16A | T32 T24 T19 | Output gain. | 5.5 | 6.0 | 6.5 | dB |
| Frequency characteristics 1 (CV, Y, P _y , R, G, B) | V_{F1} (SD) | 1 | 0.3 | 6M | T4A T6A T14A T12A T14A T16A | T1 T35 T22 T30 T28 T26 | 6MHz LPF is selected. $f = 6\text{MHz} / 100\text{kHz}$. | -3 | 0.0 | 3 | dB |
| Frequency characteristics 2 (C, P _r , P _b) | V_{F2} (SD) | 3 | 0.3 | 6M | T8A T12A T16A | T32 T24 T19 | 6MHz LPF is selected. $f = 6\text{MHz} / 100\text{kHz}$. | -3 | 0.0 | 3 | dB |
| Frequency characteristics 3 (CV, Y, P _y , R, G, B) | V_{F3} (SD) | 1 | 0.3 | 27M | T4A T6A T14A T12A T14A T16A | T1 T35 T22 T30 T28 T26 | 6MHz LPF is selected. $f = 27\text{MHz} / 100\text{kHz}$. | | -40 | -35 | dB |
| Frequency characteristics 4 (C, P _r , P _b) | V_{F4} (SD) | 3 | 0.3 | 27M | T8A T12A T16A | T32 T24 T19 | 6MHz LPF is selected. $f = 27\text{MHz} / 100\text{kHz}$. | | -40 | -35 | dB |
| Frequency characteristics 5 | V_{F5} (HD) | 1 | 0.3 | 20M | T14A T12A T14A T16A | T22 T30 T28 T26 | 30MHz LPF is selected. $f = 20\text{MHz} / 100\text{kHz}$. | -1 | 0.0 | 1 | dB |
| Frequency characteristics 6 | V_{F6} (HD) | 3 | 0.3 | 20M | T12A T16A | T24 T19 | 30MHz LPF is selected. $f = 20\text{MHz} / 100\text{kHz}$. | -1 | 0.0 | 1 | dB |
| Frequency characteristics 7 | V_{F7} (HD) | 1 | 0.3 | 30M | T14A T12A T14A T16A | T22 T30 T28 T26 | 30MHz LPF is selected. $f = 30\text{MHz} / 100\text{kHz}$. | -5 | -2.5 | 0 | dB |
| Frequency characteristics 8 | V_{F8} (HD) | 3 | 0.3 | 30M | T12A T16A | T24 T19 | 30MHz LPF is selected. $f = 30\text{MHz} / 100\text{kHz}$. | -5 | -2.5 | 0 | dB |
| Frequency characteristics 9 | V_{F9} (HD) | 1 | 0.3 | 75M | T14A T12A T14A T16A | T22 T30 T28 T26 | 30MHz LPF is selected. $f = 75\text{MHz} / 100\text{kHz}$. | | -40 | -35 | dB |
| Frequency characteristics 10 | V_{F10} (HD) | 3 | 0.3 | 75M | T12A T16A | T24 T19 | 30MHz LPF is selected. $f = 75\text{MHz} / 100\text{kHz}$. | | -40 | -35 | dB |

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| Parameter | Symbol | SIG | Level [Vp-p] | Freq. [Hz] | IN point | OUT point | Conditions | Ratings | | | Unit |
|---------------------------------|---------------------|-----|-----------------|---------------|--|---|----------------------------|---------|-----|-----|------|
| | | | | | | | | min | typ | max | |
| 2nd order distortion 1 (SD) | Dst1 (SD) | 1 | 0.7 | 4M | T4A T6A T14A T12A T14A T16A | T1A T35A T22A T30A T28A T26A | | | -40 | -35 | dB |
| 2nd order distortion 2 (SD) | Dst2 (SD) | 3 | 0.7 | 4M | T8A T12A T16A | T32A T24A T19A | | | -40 | -35 | dB |
| 2nd order distortion 3 (HD) | Dst3 (HD) | 1 | 0.7 | 10M | T14A T12A T14A T16A | T22A T30A T28A T26A | | | -40 | -35 | dB |
| 2nd order distortion 4 (HD) | Dst4 (HD) | 3 | 0.7 | 10M | T8A T12A T16A | T32A T24A T19A | | | -40 | -35 | dB |
| Clipping output level 1 | V _O max1 | 3 | 2 | 100k | T4A T6A T14A T12A T14A T16A | T1 T35 T22 T30 T28 T26 | Output level for clipping. | 2.2 | 2.4 | | Vp-p |
| Clipping output level 2 | V _O max2 | 3 | 2 | 100k | T8A T12A T16A | T32 T24 T19 | Output level for clipping. | 2.2 | 2.4 | | Vp-p |
| Amount of mute attenuation 1 | V _M 1 | 1 | 0.3 | 4M | T4A T6A T14A T12A T14A T16A | T1 T35 T22 T30 T28 T26 | | | -60 | -50 | dB |
| Amount of mute attenuation 2 | V _M 2 | 3 | 0.3 | 4M | T8A T12A T16A | T32 T24 T19 | | | -60 | -50 | dB |
| Crosstalk between channels 1 | V _{CT} 1 | 1 | 0.3 | 4M | T4A T6A T14A T12A T14A T16A | | | | -60 | -50 | dB |
| Crosstalk between channels 2 | V _{CT} 2 | 3 | 0.3 | 4M | T8A T12A T16A | | | | -60 | -50 | dB |

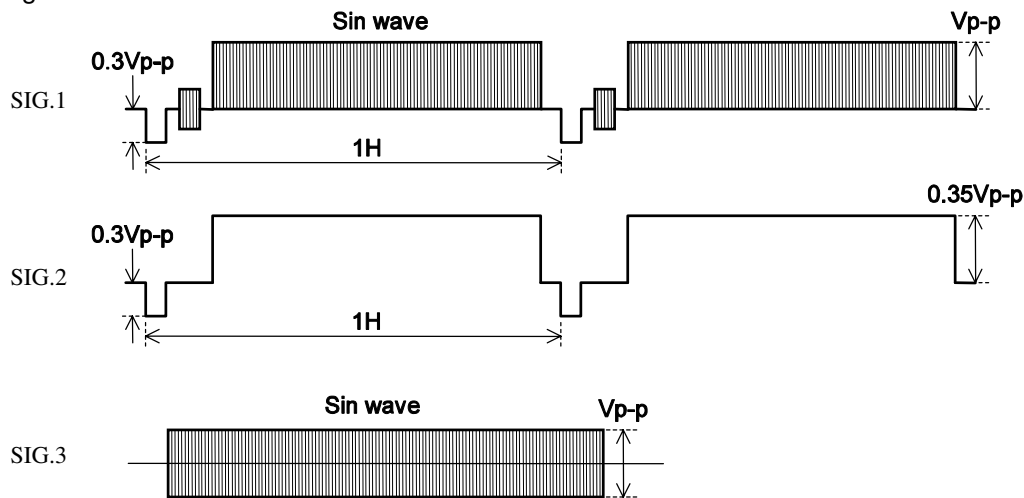
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| Parameter | Symbol | SIG | Level [Vp-p] | Freq. [Hz] | IN point | OUT point | Conditions | Ratings | | | Unit |
|-----------------------|-----------------|-----|-----------------|---------------|--|---|---|---------|-----|-----|------|
| | | | | | | | | min | typ | max | |
| Video S/N 1 (SD) | $V_{S/N1}$ (SD) | 2 | 0.65 | | T4A T6A T14A T12A T14A T16A | T1A T35A T22A T30A T28A T26A | V_{IN} = Video (50% White), The band is between 100kHz and 4.2MHz | | -70 | -60 | dB |
| Video S/N 2 (HD) | $V_{S/N2}$ (HD) | 2 | 0.65 | | T14A T12A T14A T16A | T22A T30A T28A T26A | V_{IN} = Video (50% White), The band is between 100kHz and 30MHz | | -60 | -50 | dB |
| Group delay 1 (SD) | GD1 (SD) | 1 | 0.3 | 6M | T4A T6A T14A T12A T14A T16A | T1 T35 T22 T30 T28 T26 | Input / Output delay time. $f=6\text{MHz}/100\text{kHz}$ | | 20 | 30 | ns |
| Group delay 2 (SD) | GD2 (SD) | 3 | 0.3 | 6M | T8A T12A T16A | T32 T24 T19 | Input / Output delay time. $f=6\text{MHz}/100\text{kHz}$ | | 20 | 30 | ns |
| Group delay 3 (HD) | GD3 (HD) | 1 | 0.3 | 30M | T14A T12A T14A T16A | T22 T30 T28 T26 | Input / Output delay time. $f=30\text{MHz}/100\text{kHz}$ | | 10 | 20 | ns |
| Group delay 4 (HD) | GD4 (HD) | 3 | 0.3 | 30M | T12A T16A | T24 T19 | Input / Output delay time. $f=30\text{MHz}/100\text{kHz}$ | | 10 | 20 | ns |

Input signal



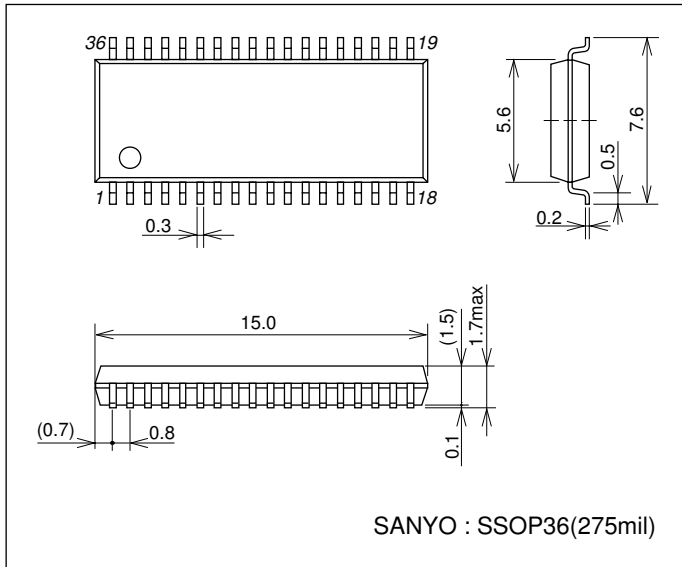
Truth Table

| SW No. | Pin No. | Function | H (2.3V to V_{CC}) | L (0 to 0.7V) |
|--------|---------|----------------------------|-----------------------|------------------------------|
| SW1 | 5 | Y/C MIX | OFF | ON |
| SW2 | 7 | CV Mute control | OFF | ON |
| SW3 | 11 | Power save control | OFF | ON |
| SW4 | 13 | Input control | CLAMP ON(RGB Mode) | BIAS ON(Component Mode) |
| SW5 | 15 | Filter control | 6MHz LPF ON(RGB Mode) | 30MHz LPF ON(Component Mode) |
| SW6 | 17 | Output control | RGB ON(RGB Mode) | Component ON(Component Mode) |
| SW7 | 20 | RGB&Component Mute control | OFF | ON |

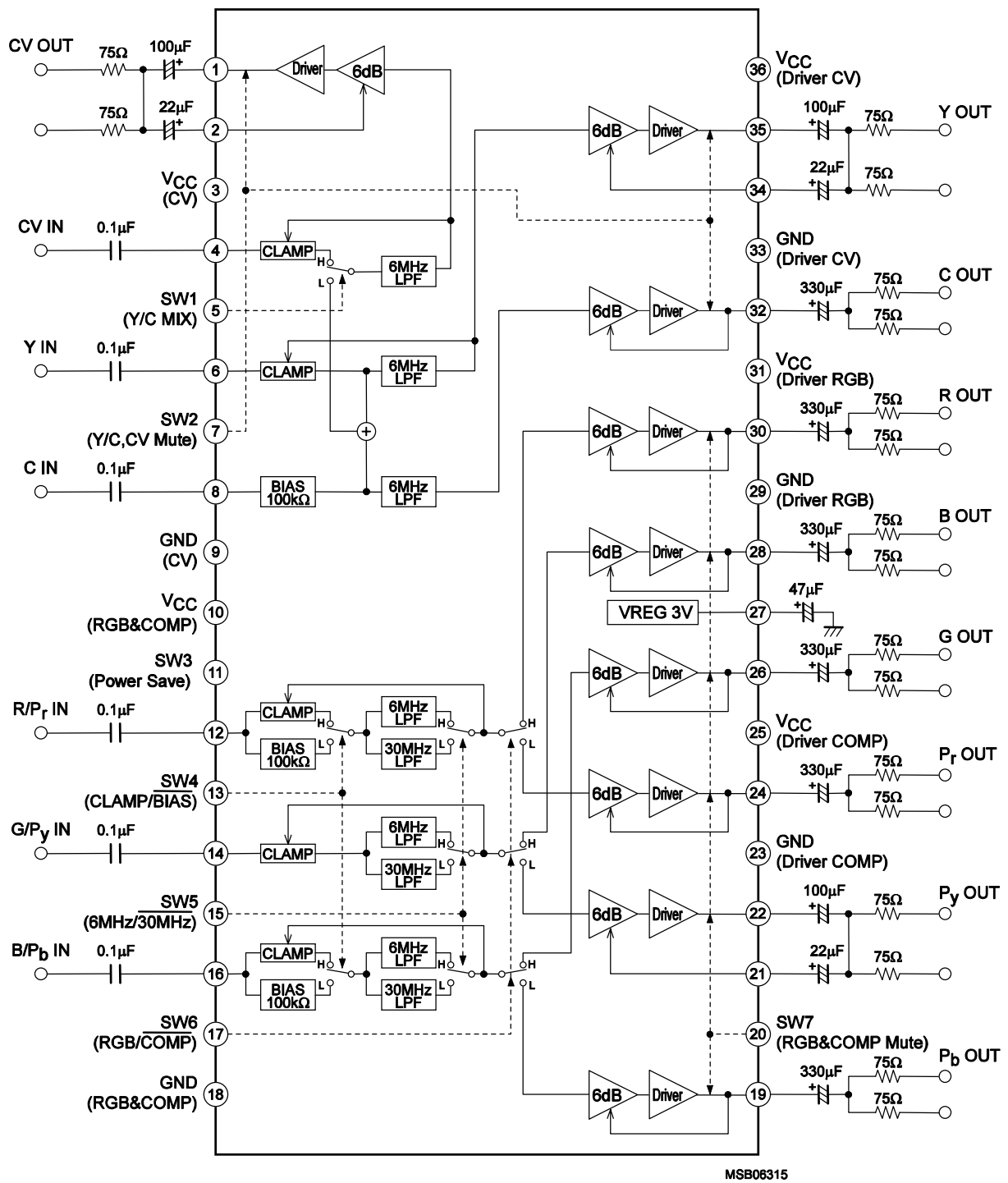
Package Dimensions

unit : mm

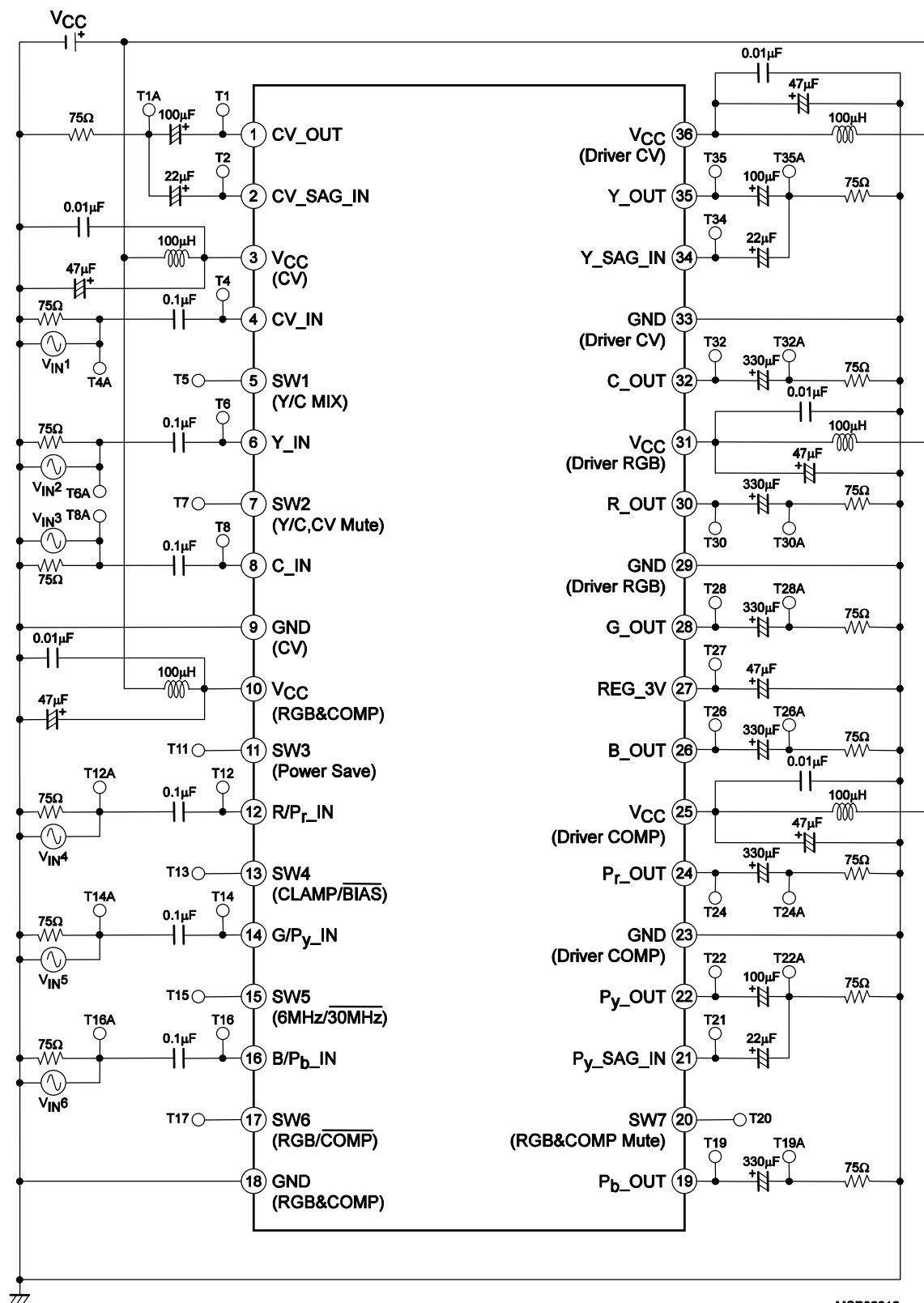
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Block Diagram



Test Circuit Diagram



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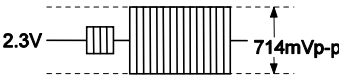
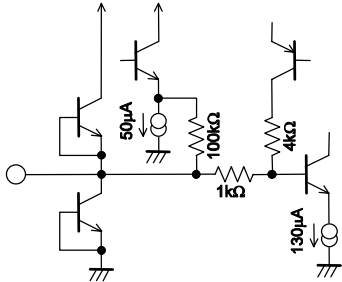
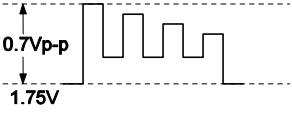
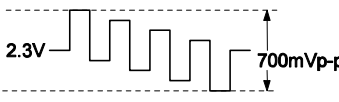
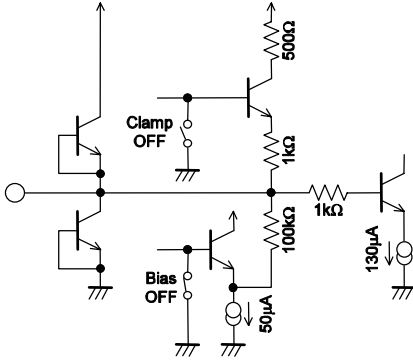
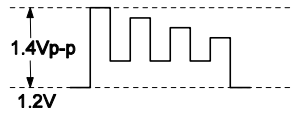
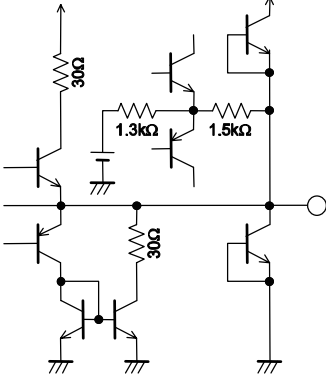
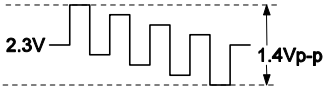
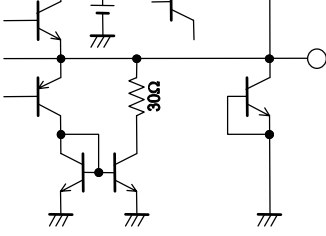
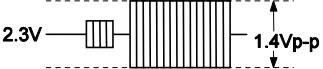
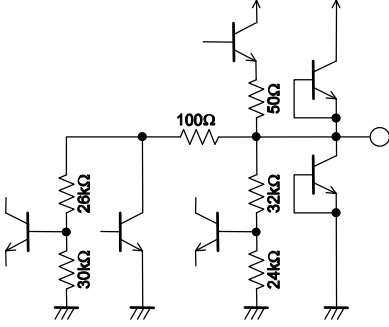
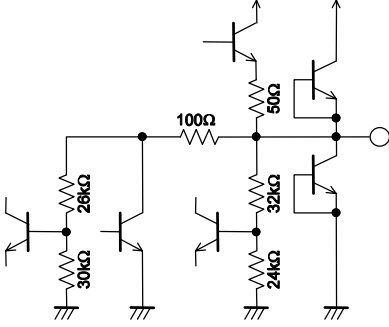
Pin Functions

| Pin No. | Pin Name | Signal Wave Form | Equivalent Circuit |
|--------------------------------------|--|------------------------------|--------------------|
| 1 | CV_OUT | | |
| 35 | Y_OUT | | |
| 2 | CV_SAG_IN | | |
| 21 34 | P _y _SAG_IN Y_SAG_IN | | |
| 4 | CV_IN | | |
| 6 | Y_IN | Y_IN, P _y _IN | |
| 14 | G/P _y _IN | RGB | |
| 5 7 11 13 15 17 20 | SW1 SW2 SW3 SW4 SW5 SW6 SW7 | *See the Truth Table. | |
| 3 10 25 31 36 | V _{CC} (CV) V _{CC} (RGB&COMP) V _{CC} (Driver COMP) V _{CC} (Driver RGB) V _{CC} (Driver CV) | | |

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| Pin No. | Pin Name | Signal Wave Form | Equivalent Circuit |
|---------------------------|--|---|--|
| 8 | C_IN |  |  |
| 12 16 | R/P _r _IN B/P _b _IN | <p>RGB</p>  <p>Component</p>  |  |
| 26 28 30 | B_OUT G_OUT R_OUT |  |  |
| 19 24 | P _b _OUT P _r _OUT |  |  |
| 32 | C_OUT |  |  |
| 9 18 23 29 33 | GND (CV) GND (RGB&COMP) GND (Driver COMP) GND (Driver RGB) GND (Driver CV) | | |
| 27 | REG3V | DC : 3.0V |  |

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