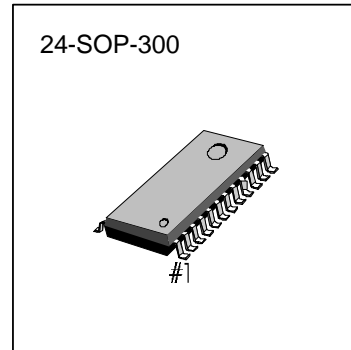


RGB ENCODER FOR PAL/NTSC

The KA2198BD is a monolithic circuit designed for RGB encoder of video system. This device provides encoding system of PAL and NTSC video signal. The KA2198BD contains matrix of R-Y/B-Y, modulator, pulse generator, regulator, built in BPF of chroma and delay line of luminance, Y/C output using S-VHS system. It is suitable for video equipment.

FUNCTIONS

- Regulator
- Mixer of R-Y, B-Y
- Modulator
- Pulse generator (ECL circuit)
- Audio buffer
- Clamp circuit
- Y-TRAP filter
- BPF & D.L circuit
- Y/C output driver



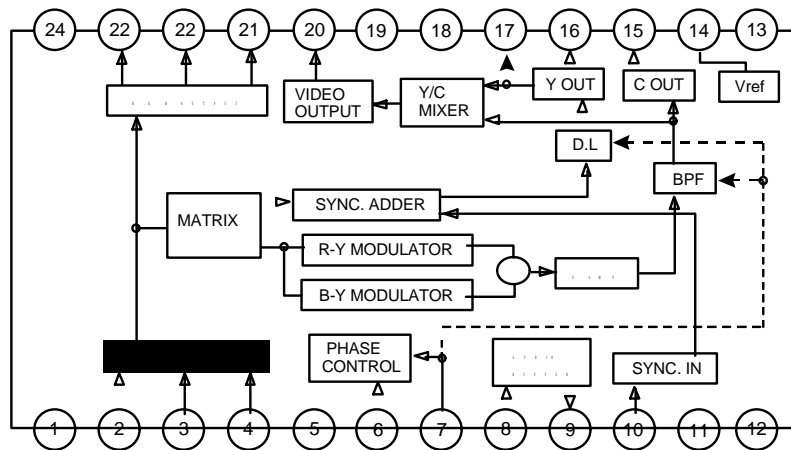
ORDERING INFORMATION

| Device | Package | Operating Temperature |
|----------|------------|-----------------------|
| KA2198BD | 24-SOP-300 | -20°C~+65°C |

FEATURES

- Lower operating voltage : $V_{CC} = 5V$
- Stabilized bias condition in regulator
- Available PAL/NTSC system
- Included 75 ohm driver (RGB output, composite video output, Y/C output)
- External fsc (color sub-carrier)
- Include BPF & delay line
- Audio buffer circuit
- R-Y, B-Y modulator
- Available S-VHS
- High frequency response of luminance

BLOCK DIAGRAM



PIN CONFIGURATION

| Pin No. | DESCRIPTION | Pin No. | DESCRIPTION |
|---------|--------------------|---------|------------------------|
| 1 | GND1 | 13 | N.C |
| 2 | R INPUT | 14 | 2V REGULATOR |
| 3 | G INPUT | 15 | C.OUT |
| 4 | B INPUT | 16 | Y OUT |
| 5 | N.C | 17 | Y-TRAP FILTER |
| 6 | fsc INPUT | 18 | N.C |
| 7 | NTSC/PAL SW | 19 | VCC2 |
| 8 | AUDIO IN | 20 | COMPOSITE VIDEO OUTPUT |
| 9 | AUDIO OUT | 21 | B OUTPUT |
| 10 | COMPOSITE SYNC. IN | 22 | G OUTPUT |
| 11 | N.C | 23 | R OUTPUT |
| 12 | VCC1 | 24 | GND2 |

(note) V_{CC1} , GND1 : except output stage
 V_{CC2} , GND2 : output stage supply voltage

ABSOLUTE MAXIMUM RATINGS ($T_A=25^{\circ}\text{C}$)

| Characteristics | Symbol | Value | Unit |
|-----------------------|-------------|----------|--------------------|
| MAX Supply Voltage | V_{CCMAX} | 10 | V |
| Power Dissipation | P_D | 1250 | mW |
| Operating Temperature | T_{OPR} | -20~+70 | $^{\circ}\text{C}$ |
| Storage Temperature | T_{STG} | -55~+150 | $^{\circ}\text{C}$ |

ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$, $V_{CC}=5\text{V}$)

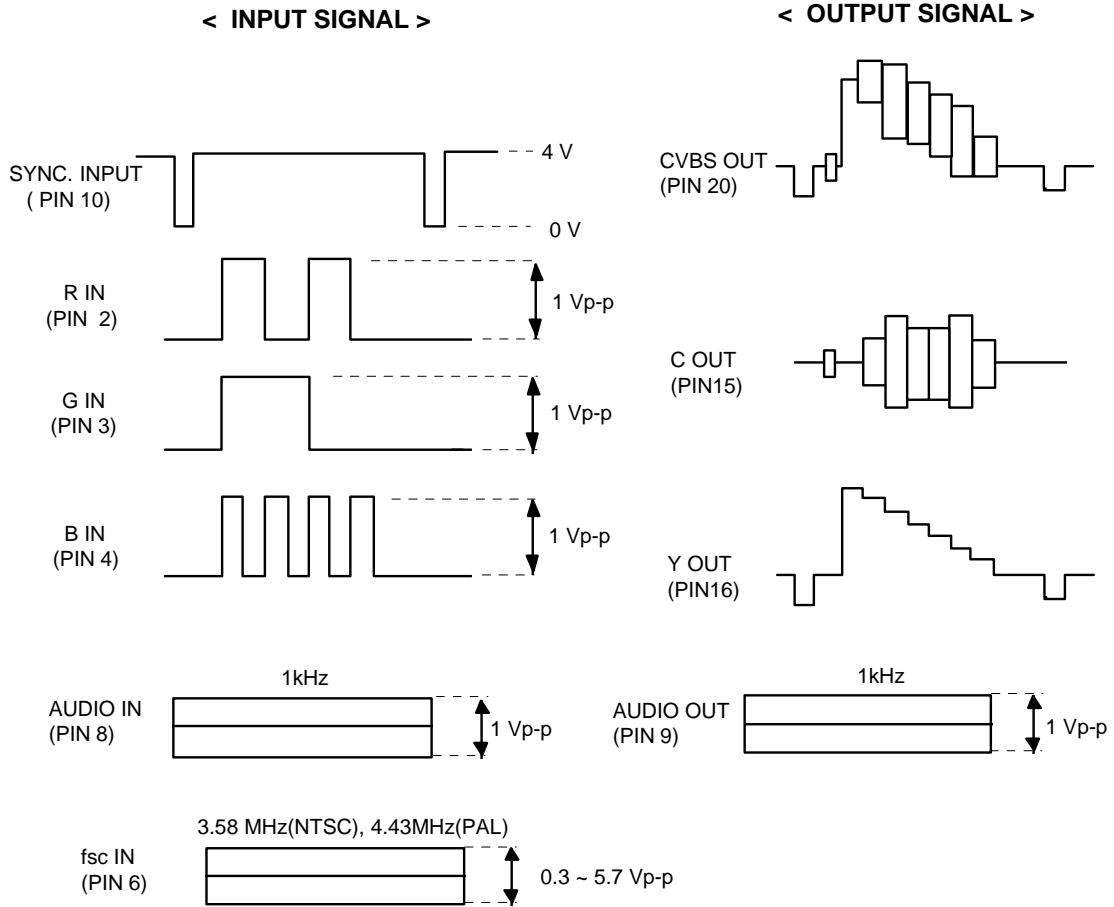
| Characteristics | Symbol | Test Conditions | Min | Typ | Max | Unit |
|----------------------------|-----------|--|------|------|------|-----------|
| Supply Current 1 | I_{CC1} | No signal input | 25 | 39 | 49 | mA |
| Supply Current 2 | I_{CC2} | | 5.0 | 11 | 16 | mA |
| R Output Voltage | V_{OR} | R,G,B input signals | 0.64 | 0.71 | 0.78 | V_{P-P} |
| G Output Voltage | V_{OG} | $V_{in}=1.0 V_{P-P}$, $f=200\text{KHz}$ | 0.64 | 0.71 | 0.78 | V_{P-P} |
| B Output Voltage | V_{OB} | | 0.64 | 0.71 | 0.78 | V_{P-P} |
| R Frequency Response | R_{FC} | R,G,B input signals | 5.0 | - | - | MHz |
| G Frequency Response | G_{FC} | $V_{in}=1.0 V_{P-P}$, $f=200\text{KHz}$ | 5.0 | - | - | MHz |
| B Frequency Response | B_{FC} | (-3dB point) | 5.0 | - | - | MHz |
| Y Frequency Response | Y_{FCN} | Y OUT (-3dB point) | 6.0 | - | - | MHz |
| R 100% Y Level Ratio(CVBS) | V_{YR1} | R,G,B input signals | 0.19 | 0.21 | 0.25 | - |
| G 100% Y Level Ratio(CVBS) | V_{YG1} | $V_{in}=1.0 V_{P-P}$ | 0.38 | 0.42 | 0.48 | - |
| B 100% Y Level Ratio(CVBS) | V_{YB1} | (100% R,G,B / 100% Y) | 0.07 | 0.08 | 0.09 | - |

| Characteristics | Symbol | Test Conditions | Min | Typ | Max | Unit | |
|------------------------------|-------------------|---|--|------|------|------------------|-----|
| 100% Y Level (CVBS) | V _{YW1} | R,G,B input signal V _{in} =1.0V _{P-P} (100% R,G,B / 100% Y) | 0.64 | 0.71 | 0.82 | V _{P-P} | |
| Sync. Level 1 (CVBS) | V _{SNC1} | | 0.26 | 0.29 | 0.33 | V _{P-P} | |
| R 100% Y Level Ratio (Y OUT) | V _{YR2} | | 0.19 | 0.21 | 0.25 | - | |
| G 100% Y Level Ratio (Y OUT) | V _{YG2} | | 0.38 | 0.42 | 0.48 | - | |
| B 100% Y Level Ratio (Y OUT) | V _{YB2} | | 0.07 | 0.08 | 0.09 | - | |
| 100% Y Level (Y OUT) | V _{YW2} | R,G,B input signal V _{in} =1.0V _{P-P} (100% R,G,B / 100% Y) | 0.64 | 0.71 | 0.82 | V _{P-P} | |
| Sync. Level 1 (Y OUT) | V _{SNC2} | | 0.26 | 0.29 | 0.33 | V _{P-P} | |
| Audio Buffer Gain | G _a | | Audio Input 100KHz, 1V _{P-P} | -1.0 | 1.0 | 1.1 | dB |
| Audio Frequency Response | F _a | | | 30 | - | - | KHz |
| Audio Distortion | THD | | | - | - | 1.0 | % |
| NTSC mode | | | | | | | |
| R Chroma Ratio 1 (CVBS) | R/B1 | fsc input 3.58MHz, 400mV _{P-P} (check CVBS out) | 2.70 | 3.15 | 3.50 | - | |
| G Chroma Ratio 1 (CVBS) | G/B1 | | 2.55 | 2.95 | 3.25 | - | |
| B Chroma Ratio 1 (CVBS) | B/B1 | | 1.90 | 2.24 | 2.47 | - | |
| Burst level 1 (CVBS) | Vob1 | | 0.20 | 0.29 | 0.34 | V _{P-P} | |
| R Chroma Ratio 2 (C OUT) | R/B2 | fsc input 3.58MHz, 400mV _{P-P} (check C out) | 2.70 | 3.15 | 3.50 | - | |
| G Chroma Ratio 2 (C OUT) | G/B2 | | 2.55 | 2.95 | 3.25 | - | |
| B Chroma Ratio 2 (C OUT) | B/B2 | | 1.90 | 2.24 | 2.47 | - | |
| Burst level 2 (C OUT) | Vob2 | | 0.20 | 0.29 | 0.34 | V _{P-P} | |
| R Phase (CVBS) | SR _N | fsc input 3.58MHz, 400mV _{P-P} (check CVBS out) | 94 | 104 | 114 | deg | |
| G Phase (CVBS) | SG _N | | 231 | 241 | 251 | deg | |
| B Phase (CVBS) | SB _N | | 337 | 347 | 357 | deg | |
| Burst Width | T _{WN} | | 2.5 | 2.75 | 3.6 | usec | |
| Burst Position | T _{PN} | | 0.45 | 0.5 | 0.75 | usec | |
| Carrier Leakage | CL | CVBS out, Y out | - | - | 0.03 | V _{P-P} | |
| PAL mode | | | | | | | |
| R Chroma Ratio 3 (CVBS) | R/B3 | fsc input 3.58MHz, 400mV _{P-P} (check CVBS out) | 2.70 | 3.15 | 3.50 | - | |
| G Chroma Ratio 3 (CVBS) | G/B3 | | 2.55 | 2.95 | 3.25 | - | |
| B Chroma Ratio 3 (CVBS) | B/B3 | | 1.90 | 2.24 | 2.47 | - | |
| Burst level 3 (CVBS) | Vob3 | | 0.20 | 0.29 | 0.34 | V _{P-P} | |
| R Chroma Ratio 4 (C OUT) | R/B4 | fsc input 3.58MHz, 400mV _{P-P} (check C out) | 2.80 | 3.15 | 3.50 | - | |
| G Chroma Ratio 4 (C OUT) | G/B4 | | 2.65 | 2.95 | 3.25 | - | |
| B Chroma Ratio 4 (C OUT) | B/B4 | | 2.01 | 2.24 | 2.47 | - | |
| Burst level 4 (CVBS) | Vob4 | | 0.20 | 0.29 | 0.34 | V _{P-P} | |
| R Phase (CVBS) | SR _P | fsc input 3.58MHz, 400mV _{P-P} (check CVBS out) | 94 | 104 | 114 | deg | |
| G Phase (CVBS) | SG _P | | 231 | 241 | 251 | deg | |
| B Phase (CVBS) | SB _P | | 337 | 347 | 357 | deg | |
| Burst Width | T _{WP} | | 2.0 | 2.25 | 2.5 | usec | |
| Burst Position | T _{PP} | | 0.35 | 0.45 | 0.55 | usec | |
| PAL Burst Phase 1 | P1 | CVBS out, Y out | 125 | 135 | 145 | deg | |
| PAL Burst Phase 2 | P2 | | 215 | 225 | 235 | deg | |
| Y Frequency Response | Y _{FCP} | Y output (-3dB point) | 6.0 | - | - | MHz | |



ELECTRONICS

TEST WAVEFORM



KA2198BD

RGB ENCODER FOR PAL/NTSC

