# AN5858K

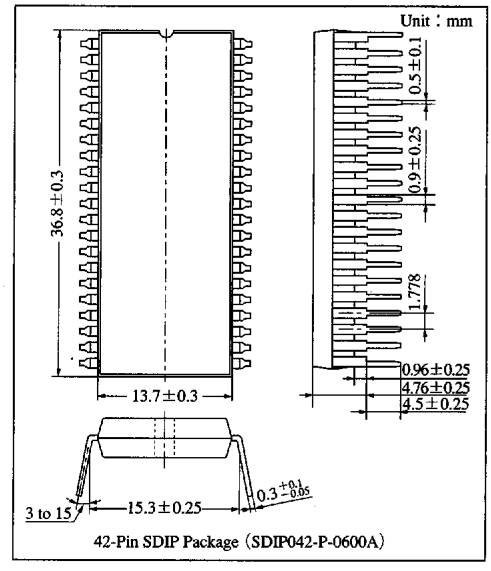
## Color-TV AV-Switch IC

### ■ Overview

The AN5858K is an AV switch IC. It switches five inputs (V, SY, SC, R, and L), and two outputs (TV and monitor). It has the most S- input-pins in the industry and can support many kind of high grade multi-function TV.

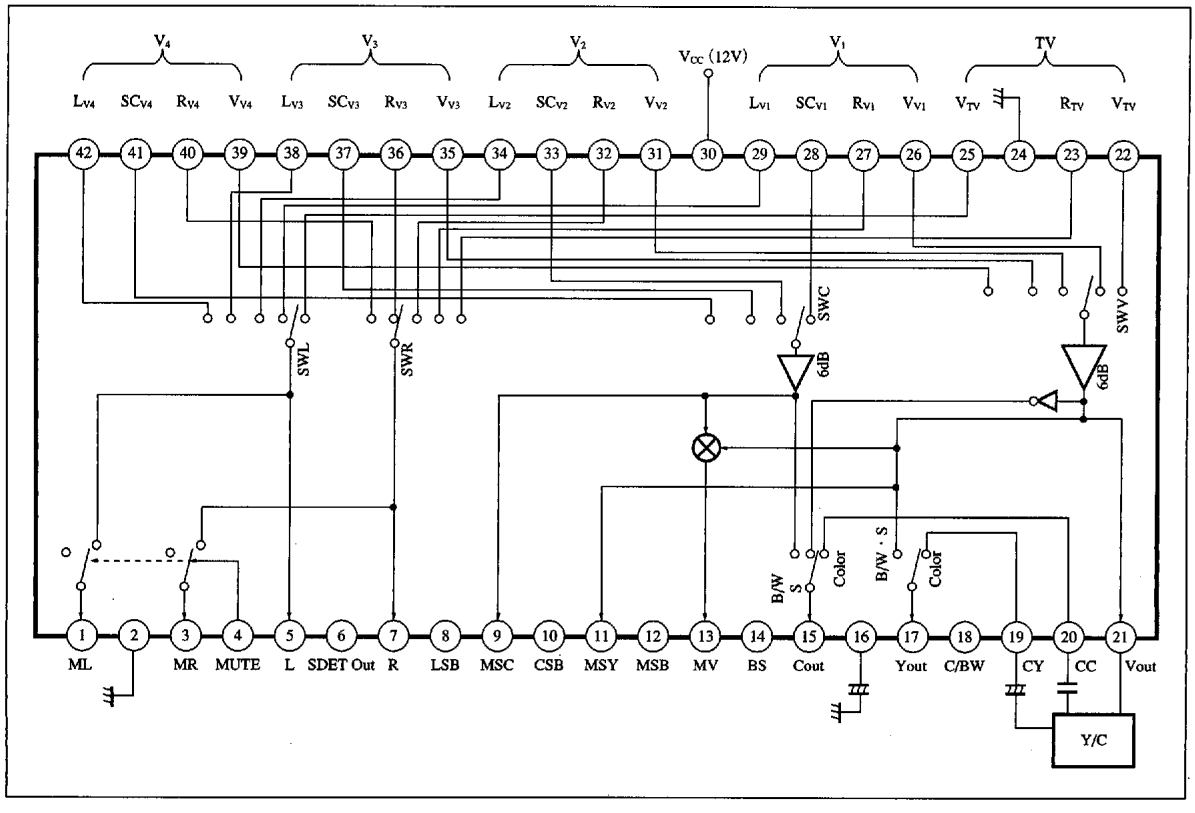
### ■ Features

- Supporting TVs with a BS tuner
- 4 channels of S-input
- Built-in oscillation preventing circuit
- Built-in monochrome/color switching function




42-Pin SDIP Package (SDIP042-P-0600A)

### ■ Block Diagram



## Pin Descriptions

| Pin No. | Pin name | Pin No. | Pin name |
|---|---|---|---|
| 1 | L signal output (monitor) | 22 | TV video signal input |
| 2 | GND2 | 23 | TV R signal input |
| 3 | R signal output (monitor) | 24 | GND1 |
| 4 | Mute signal input | 25 | TV L signal input |
| 5 | L signal output | 26 | $V_1$ brightness/video signal input |
| 6 | S mode discrimination output | 27 | $V_1$ R signal input |
| 7 | R signal output | 28 | $V_1$ chroma signal input |
| 8 | Mode change-over (LSB) | 29 | $V_1$ L signal input |
| 9 | Chroma signal output (monitor) | 30 | Power supply |
| 10 | Mode change-over (CSB) | 31 | $V_2$ brightness/video signal input |
| 11 | Brightness signal output (monitor) | 32 | $V_2$ R signal input |
| 12 | Mode change-over (MSB) | 33 | $V_2$ chroma signal input |
| 13 | Video signal output (monitor) | 34 | $V_1$ L signal input |
| 14 | Forced BS/V1 defeat change-over | 35 | $V_3$ brightness/video signal input |
| 15 | Chroma signal output | 36 | $V_3$ R signal input |
| 16 | Defeat pulse generation | 37 | $V_3$ chroma signal input |
| 17 | Brightness signal output | 38 | $V_3$ L signal input |
| 18 | Color/Black and white change-over | 39 | $V_4$ brightness/video signal input |
| 19 | Comb filter brightness signal input | 40 | $V_4$ R signal input |
| 20 | Comb filter chroma signal input | 41 | $V_4$ chroma signal input |
| 21 | Video signal output | 42 | $V_4$ L signal input |

## Absolute Maximum Ratings

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Supply voltage | $V_{CC}$ | 13.5 | V |
| Supply current | $I_{CC}$ | 60 | mA |
| Power dissipation Note 2) | $P_D$ | 810 | mW |
| Operating ambient temperature Note 1) | $T_{opr}$ | −20 to +70 | ℃ |
| Storage temperature Note 1) | $T_{stg}$ | −55 to +150 | ℃ |
| Mode change-over pin voltage | $V_{8, 10, 12}$ | −0.3 to +5.5 | V |
| Video signal input pin voltage | $V_{22, 26, 31, 35, 39}$ | −0.3 to $V_{30}$+0.3 | V |
| Chroma signal input terminal voltage | $V_{28, 33, 37, 41}$ | −0.3 to $V_{30}$+0.3 | V |
| R signal input terminal current | $I_{23, 27, 32, 36, 40}$ | −15 to +15 | mA |
| L signal input terminal current | $I_{25, 29, 34, 38, 42}$ | −15 to +15 | mA |
| Mute signal input terminal voltage | $V_4$ | −0.3 to +5.5 | V |
| Forced BS/$V_1$ defeat change-over terminal voltage | $V_{14}$ | −0.3 to $V_{30}$+0.3 | V |
| Color/black and white change-over terminal voltage | $V_{18}$ | −0.3 to $V_{30}$+0.3 | V |
| S mode discrimination output change-over terminal voltage | $V_6$ | 0 to $V_{30}$+0.3 | V |
| Comb filter brightness signal input terminal voltage | $V_{19}$ | −0.3 to $V_{30}$+0.3 | V |
| Comb filter chroma signal input terminal voltage | $V_{20}$ | −0.3 to $V_{30}$+0.3 | V |

Note 1) Ta=25℃ except operating ambient temperature and storage temperature.
Note 2) Allowable power dissipation of the package at Ta=70℃.

## Recommended Operating Range (Ta=25℃)

| Parameter | Symbol | Range |
|---|---|---|
| Operating supply voltage range | $V_{CC}$ | 10.8V to 13.2V |

## ■ Electrical Characteristics (Ta=25±2℃)

| Parameter | Symbol | Condition | min | typ | max | Unit |
|---|---|---|---|---|---|---|
| Supply current | $I_{30}$ | | 25 | 34 | 43 | mA |
| Video signal input terminal voltage | $V_{IV}$ | Pin㉒, ㉖, ㉛, ㉟ | 2.5 | 3.0 | 3.5 | V |
| Chroma signal input terminal voltage | $V_{IC}$ | Pin㉘, ㉝, ㊲, ㊶ | 6.7 | 7.2 | 7.7 | V |
| Audio signal input terminal voltage (R) | $V_{IR}$ | Pin㉓, ㉗, ㉜, ㊱ | 6 | 6.5 | 7 | V |
| Audio signal input terminal voltage (L) | $V_{IL}$ | Pin㉕, ㉙, ㉞, ㊳ | 6 | 6.5 | 7 | V |
| Comb filter luminance signal input terminal voltage | $V_{I19}$ | | 8.1 | 8.6 | 9.1 | V |
| Comb filter chroma signal input terminal voltage | $V_{I20}$ | | 5.9 | 6.4 | 6.9 | V |
| Video signal output terminal voltage | $V_{O21}$ | | 7.2 | 7.7 | 8.2 | V |
| Video signal output terminal voltage (monitor) | $V_{O13}$ | | 6.5 | 7.0 | 7.5 | V |
| Luminance signal output terminal voltage | $V_{O17}$ | | 7.2 | 7.7 | 8.2 | V |
| Luminance signal output terminal voltage (monitor) | $V_{O11}$ | | 7.2 | 7.7 | 8.2 | V |
| Chroma signal output terminal voltage | $V_{O15}$ | | 5.1 | 5.6 | 6.1 | V |
| Chroma signal output terminal voltage (monitor) | $V_{O9}$ | | 7.1 | 7.6 | 8.1 | V |
| Mode change-over terminal threshold voltage | $V_{MOD}$ | Pin⑧, ⑩, ⑫ | 0.5 | 1.0 | 1.5 | V |
| Mute terminal threshold voltage | $V_{MUT}$ | Pin④ | 0.5 | 0.85 | 1.2 | V |
| Forced BS threshold voltage | $V_{BS}$ | Pin⑭ | 2.7 | 3.3 | 3.8 | V |
| V1 defeat threshold voltage | $V_{DEF}$ | Pin⑭ | 0.6 | 0.9 | 1.2 | V |
| Color/black and white change-over terminal voltage | $V_{C/W}$ | Pin⑱ | 0.6 | 1.6 | 3.6 | V |
| S-mode discrimination threshold voltage | $V_S$ | Pin㉘, ㉝, ㊲, ㊶ | 4.5 | 5.3 | 6 | V |
| S-mode discrimination output voltage | $V_{SO}$ | Pin⑥ | 0 | 0.2 | 0.5 | V |
| Video signal output offset voltage | $\Delta V_{21}$ | | 0 | 5 | 100 | mV |
| Video signal output offset voltage (monitor) | $\Delta V_{13}$ | | 0 | 5 | 100 | mV |
| Luminance signal output offset voltage | $\Delta V_{17}$ | | 0 | 5 | 100 | mV |
| Luminance signal output offset voltage (monitor) | $\Delta V_{11}$ | | 0 | 5 | 100 | mV |
| Chroma signal output offset voltage | $\Delta V_{15}$ | | 0 | 5 | 100 | mV |
| Chroma signal output offset voltage (monitor) | $\Delta V_9$ | | 0 | 5 | 100 | mV |
| Audio signal output offset voltage | $\Delta V_A$ | Pin⑤, ⑦ | 0 | 5 | 100 | mV |
| Audio signal output offset voltage (monitor) | $\Delta V_{MA}$ | Pin①, ③ | 0 | 5 | 100 | mV |
| Video signal voltage gain | $G_V$ | Pin㉑ | 5 | 6 | 7 | dB |
| Video signal voltage gain (monitor) | $G_{MV}$ | Pin⑬ | 4.6 | 5.7 | 6.8 | dB |
| Luminance signal voltage gain ($\overline{S}$) | $G_Y$ | Pin⑰ | −1 | 0 | 1 | dB |
| Luminance signal voltage gain (S) | $G_{YS}$ | Pin⑪, ⑰ | 5 | 6 | 7 | dB |
| Chroma signal voltage gain ($\overline{S}$) | $G_C$ | Pin⑮ | −1 | 0 | 1 | dB |
| Chroma signal voltage gain (S) | $G_{CS}$ | Pin⑨, ⑮ | 4.4 | 5.8 | 7.2 | dB |
| Audio signal voltage gain | $G_A$ | Pin⑤, ⑦ | −1 | 0 | 1 | dB |
| Audio signal voltage gain (monitor) | $G_{MA}$ | Pin①, ③ | −1 | 0 | 1 | dB |
| Total harmonics distortion rate (video) | $THD_V$ | Pin⑪, ⑬, ⑰, ㉑ | — | 0.07 | 1.0 | % |
| Crosstalk (audio) | $CT_A$ | Pin①, ③, ⑤, ⑦ | — | −100 | −80 | dB |
| Crosstalk (luminance) | $CT_Y$ | Pin⑪, ⑬, ⑰, ㉑ | — | −64 | −50 | dB |
| Crosstalk (chroma) | $CT_C$ | Pin⑨, ⑮ | — | −60 | −46 | dB |
| Defeat pulse charge current | $I_{O16}$ | | −0.13 | −0.1 | −0.07 | mA |
| Defeat pulse discharge current | $I_{I16}$ | | 0.6 | 0.9 | 1.2 | mA |

## ■ Electrical Characteristics (cont.) (Ta=25±2℃)

| Parameter | Symbol | Condition | min | typ | max | Unit |
|---|---|---|---|---|---|---|
| Defeat pulse threshold voltage | $V_{TH16}$ | Lowest voltage at which defeat pulse not emerge | 2.1 | 2.6 | 3.1 | V |
| Video signal frequency characteristics | $f_{CV}$ | Pin㉑, −3dB | 10 | 13 | — | MHz |
| Video signal frequency characteristics (monitor) | $f_{CMV}$ | Pin⑬, −3dB | 8 | 11 | — | MHz |
| Luminance signal frequency characteristics | $f_{CY}$ | Pin⑰, −3dB | 10 | 13 | — | MHz |
| Luminance signal frequency characteristics (monitor) | $f_{CMY}$ | Pin⑪, −3dB | 10 | 13 | — | MHz |
| Audio signal frequency characteristics | $f_{CA}$ | Pin①, ③, ⑤, ⑦, −3dB | 1 | — | — | MHz |
| Audio signal input terminal voltage ($R_4$, $L_4$) | $V_{IA4}$ | Pin㊵, ㊷ | 6.5 | 7.0 | 7.5 | V |
| Video signal input terminal voltage ($V_4$) | $V_{IV4}$ | Pin㊴ | 3.2 | 3.7 | 4.2 | V |
| Video output noise voltage | $V_{NV}$ | Pin㉑ bandwidth 10MHz | (0) | (0.5) | (1.0) | mVrms |
| Video output noise voltage (monitor) | $V_{NMV}$ | Pin⑬ bandwidth 10MHz | (0) | (0.5) | (1.0) | mVrms |
| Luminance output noise voltage | $V_{NY}$ | Pin⑰ bandwidth 10MHz | (0) | (0.5) | (1.0) | mVrms |
| Luminance output noise voltage (monitor) | $V_{NMY}$ | Pin⑪ bandwidth 10MHz | (0) | (0.5) | (1.0) | mVrms |
| Chroma output noise voltage | $V_{NC}$ | Pin⑮ bandwidth 10MHz | (0) | (0.5) | (1.0) | mVrms |
| Chroma output noise voltage (monitor) | $V_{NMC}$ | Pin⑨ bandwidth 10MHz | (0) | (0.5) | (1.0) | mVrms |
| Audio output noise voltage | $V_{NA}$ | Pin⑤, ⑦ bandwidth 15kHz | (0) | (5) | (50) | μVrms |
| Audio output noise voltage (monitor) | $V_{NMA}$ | Pin①, ③ bandwidth 15kHz | (0) | (5) | (50) | μVrms |
| Input impedance (1) | $R_{iA}$ | Pin㉓, ㉕, ㉗, ㉙, ㉜, ㉞, ㊱, ㊳, ㊵, ㊷ | (55) | (75) | (95) | kΩ |
| Input impedance (2) | $R_{iY}$ | Pin⑲, ㉒, ㉖, ㉛, ㉟, ㊴ | (16) | (21) | (26) | kΩ |
| Input impedance (3) | $R_{iC}$ | Pin⑳, ㉘, ㉝, ㊲, ㊶ | (16) | (21) | (26) | kΩ |
| Output impedance (1) | $R_{OA}$ | Pin①, ③, ⑤, ⑦ | (30) | (60) | (90) | Ω |
| Output impedance (2) | $R_{OV}$ | Pin㉑ | (22) | (45) | (68) | Ω |
| Output impedance (3) | $R_{OY}$ | Pin⑪, ⑬, ⑮, ⑰ | (30) | (60) | (90) | Ω |
| Output impedance (4) | $R_{OC}$ | Pin⑨ | (80) | (160) | (240) | Ω |
| Total harmonics distortion rate (Audio) | $THD_A$ | Pin①, ③, ⑤, ⑦ | — | (0.005) | (0.01) | % |
| Video signal input dynamic range | $D_{IY}$ | f=10kHz, distortion rate 1% Pin㉒, ㉖, ㉛, ㉟, ㊴ | (2.2) | (2.6) | — | V |
| Chroma signal input dynamic range | $D_{IC}$ | f=10kHz, distortion rate 1% Pin㉘, ㉝, ㊲, ㊶ | (1.1) | (1.3) | — | V |
| Audio signal input dynamic range (R) | $D_{IR}$ | f=1kHz, distortion rate 1% Pin㉓, ㉗, ㉜, ㊱ | (7.2) | (8.0) | — | V |
| Audio signal input dynamic range (L) | $D_{IL}$ | f=1kHz, distortion rate 1% Pin㉕, ㉙, ㉞, ㊳ | (7.2) | (8.0) | — | V |
| Comb filter Y input dynamic range | $D_{I19}$ | f=10kHz, distortion rate 1% Pin⑲ | (6.0) | — | — | V |
| Comb filter C input dynamic range | $D_{I20}$ | f=10kHz, distortion rate 1% Pin⑳ | (6.0) | — | — | V |

Note) The characteristics value in parentheses is not a guaranteed value, but reference one on design.

ICs for TV