

AN5858K

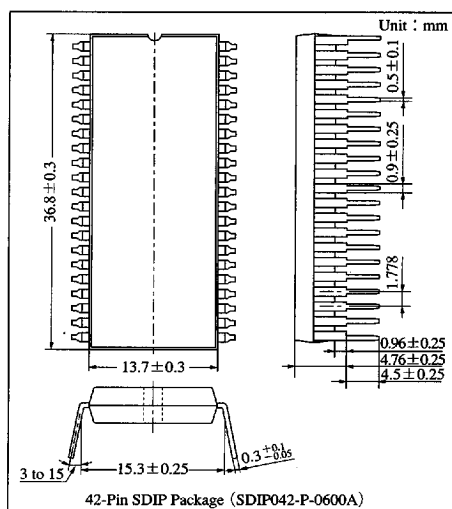
Color-TV AV-Switch IC

■ Overview

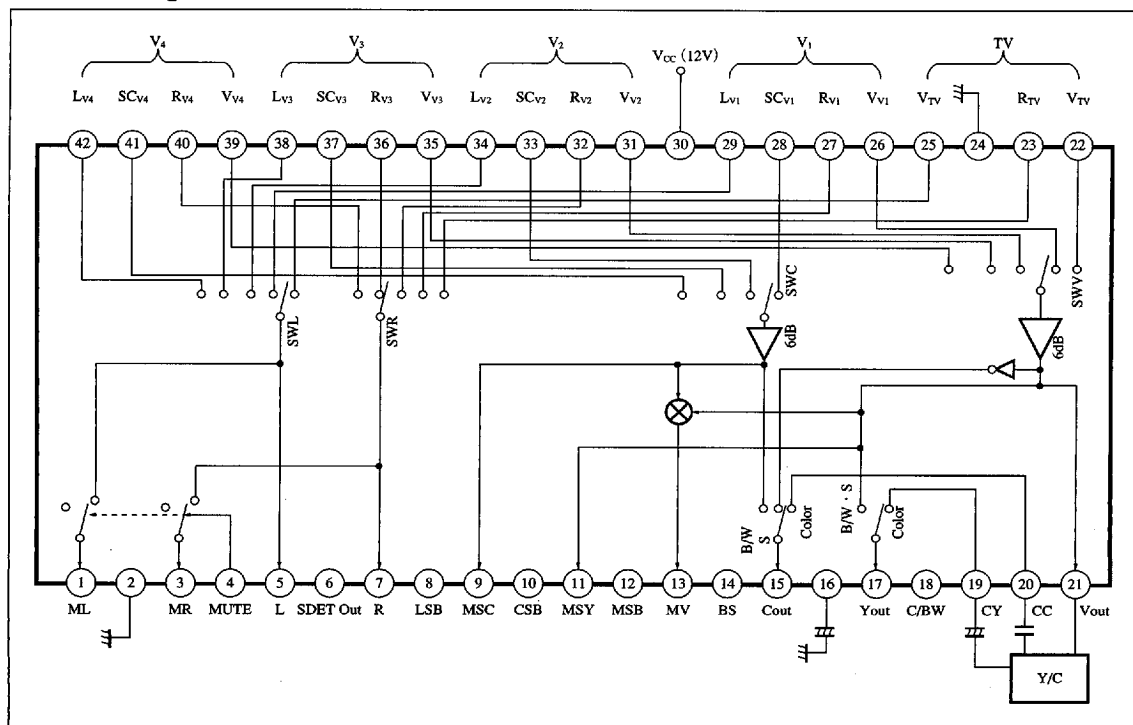
The AN5858K is an AV switch IC. It switches five inputs (V, SY, SC, R, and L), and two outputs (TV and monitor). It has the most S- input-pins in the industry and can support many kind of high grade multi-function TV.

■ Features

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



■ 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/V ₁ 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	°C
Storage temperature ^{Note 1)}	T _{stg}	−55 to +150	°C
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°C except operating ambient temperature and storage temperature.

Note 2) Allowable power dissipation of the package at Ta=70°C.

Recommended Operating Range (Ta=25°C)

Parameter	Symbol	Range
Operating supply voltage range	V _{CC}	10.8V to 13.2V

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■ 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}	Pin②, 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}	Pin⑬	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	ΔV ₂₁		0	5	100	mV
Video signal output offset voltage (monitor)	ΔV ₁₃		0	5	100	mV
Luminance signal output offset voltage	ΔV ₁₇		0	5	100	mV
Luminance signal output offset voltage (monitor)	ΔV ₁₁		0	5	100	mV
Chroma signal output offset voltage	ΔV ₁₅		0	5	100	mV
Chroma signal output offset voltage (monitor)	ΔV ₉		0	5	100	mV
Audio signal output offset voltage	ΔV _A	Pin⑤, ⑦	0	5	100	mV
Audio signal output offset voltage (monitor)	ΔV _{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 (S)	G _Y	Pin⑭7	-1	0	1	dB
Luminance signal voltage gain (S)	G _{YS}	Pin⑪, ⑭7	5	6	7	dB
Chroma signal voltage gain (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, ⑭7, ②1	—	0.07	1.0	%
Crosstalk (audio)	CT _A	Pin①, ③, ⑤, ⑦	—	-100	-80	dB
Crosstalk (luminance)	CT _Y	Pin⑪, ⑬, ⑭7, 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

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■ 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}	Pin②, -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}	Pin④⑨, 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}	Pin② 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, ②⑪, ②⑬, ③⑥, ③⑧, ④②, ④③	(55)	(75)	(95)	kΩ
Input impedance (2)	R _{iy}	Pin⑰⑨, ②②, ②⑥, ③①, ③⑤, ③⑨	(16)	(21)	(26)	kΩ
Input impedance (3)	R _{ic}	Pin②⑩, 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}	Pin②	(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% Pin②③, 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% Pin⑰⑨	(6.0)	—	—	V
Comb filter C input dynamic range	D _{I20}	f=10kHz, distortion rate 1% Pin②⑩	(6.0)	—	—	V

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

