AN2514S

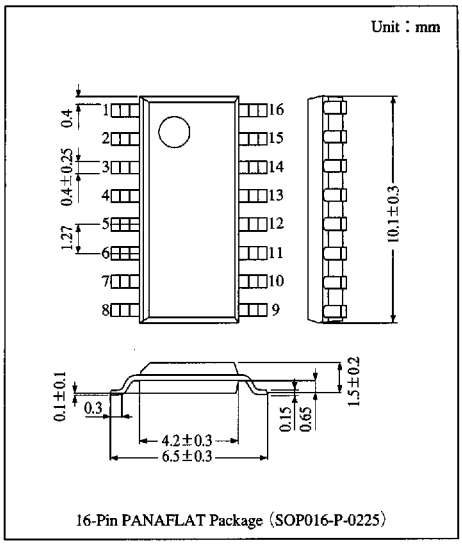
Electronic View-finder Driving IC with Synchronous Signal

■ Overview

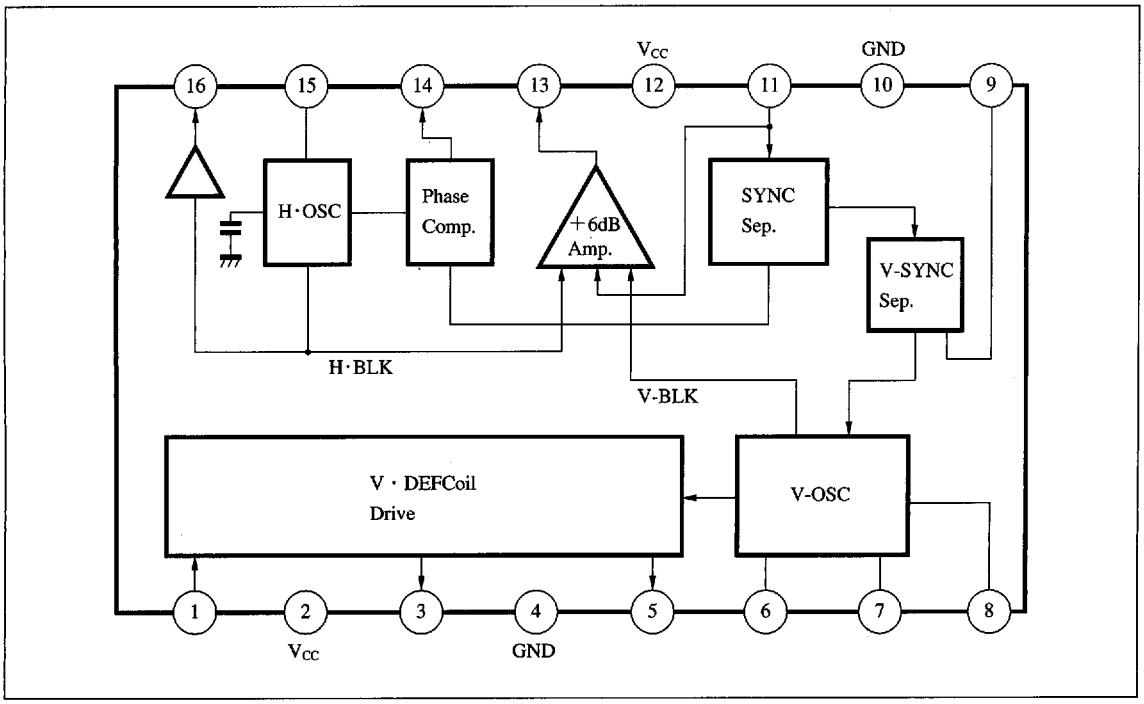
The AN2514S is an integrated circuit designed for driving the monochrome monitor (view finder) of the video camera, and its idling current of the vertical driving circuit is increased from that of the AN2513S, and it is possible to easily make up a 1.5-inch electronic view finder driving circuit by inputting a video signal. VD output is available for timing-reference of character.

■ Features

- Video amp, synchronous separation circuit, horizontal/vertical oscillation circuit, AFC circuit, and vertical driving circuit built-in
- A vertical deflection coil can be driven directly.
- Horizontal oscillating capacitors built-in



■ Block Diagram



■ Absolute Maximum Ratings (Ta=25℃)

Parameter	Symbol	Rating	Unit
Supply voltage	V_{CC1}/V_{CC2}	5.5	V
Power dissipation (Ta=75℃)	P_D	260 *	mW
Operating ambient temperature	T_{opr}	−20 to +75	℃
Storage temperature	T_{stg}	−55 to +125	℃

* Value when mounted on the printed circuit board

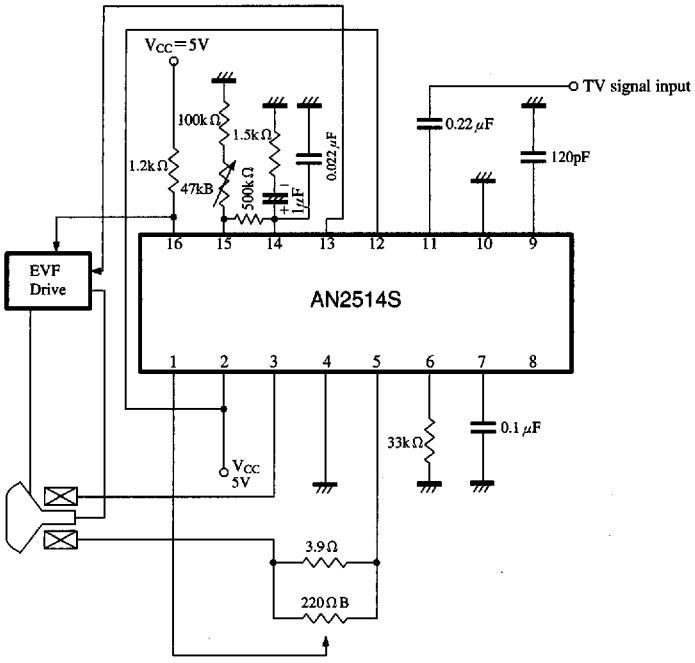
■ Recommended Operating Range (Ta=25℃)

Parameter	Symbol	Range
Operating supply voltage range	V_{CC1}, V_{CC2}	4.5V to 5.3V

■ Electrical Characteristics (V_{CC1}=5V, V_{CC2}=5V, Ta=25℃)

Parameter	Symbol	Condition	min	typ	max	Unit
Circuit current	$I_{CC1(2)}$	No load	2.35	7.5	13	mA
	$I_{CC2(10)}$		5.5	10	14	mA
Video amp gain	G_v	Input a video signal ($1V_{PP}$) to Pin⑨, measure the output of Pin⑪	5.1	6.5	7.9	dB
Video amp dynamic range	DR_v	Input a video signal ($1.3V_{PP}$) to Pin⑨, measure the output of Pin⑪	1.7	2.1	2.5	V
Synchronous separating capability (1)	HSep1	Input only SYNC to Pin⑨ and measure the minimum level at which synchronization is provided.	0.2	—	—	V
Synchronous separating capability (2)	HSep2	Input SYNC ($0.29V_{PP}$) plus video component to Pin⑨ and measure the maximum video level at which synchronization is provided.	—	—	1.3	V
Video signal HD width	τ_{HD}	Measure the time from the falling of input HD to blanking OFF of Pin⑪ output.	7.5	8.5	9.5	μs
AFC output HD width	τ_{AFCHD}	Input a signal to Pin⑨ and measure while Pin⑭ is Lo.	10.5	11.5	12.5	μs
Horizontal free-oscillation frequency	f_{HO}	Measure the output frequency of Pin⑭ in the horizontal free-oscillation mode.	13.75	15.75	17.75	kHz
AFC lock range	f_{AFC}	Change the frequency of input signal to Pin⑨ and measure the synchronizing frequency.	15.25	15.75	16.25	kHz
AFC control sensitivity	β	Flow in and out current to Pin⑬ and measure the difference in frequency of Pin⑭ output.	720	840	960	Hz/μA
Vertical separating time	t_{Vsep}	Input a signal from Pin⑨ and measure the difference in falling between Pin⑮ output and input VD.	30	50	70	μs
Video signal VD width	τ_{VOUT}	Measure the time from the falling of input VD signal to blanking OFF of Pin⑪ output.	1	1.2	1.4	ms
Vertical free-oscillation frequency	f_{VO}	Measure the oscillation frequency of Pin③ in the vertical free-oscillation mode.	47	51	55	Hz
Vertical deflection output amplitude (1)	$v_{VDEF(1)}$	Input a signal ($1V_{PP}$) from Pin⑨ and measure the output of Pin⑤.	1.3	1.6	1.9	V
Vertical deflection output amplitude (2)	$v_{VDEF(2)}$	Input a signal ($1V_{PP}$) from Pin⑨ and measure the output of Pin③.	1.3	1.6	1.9	V
Vertical output dynamic range (1)	$D_{RVDEF(1)}$	Input a signal ($1V_{PP}$) from Pin⑨ and measure the output of Pin⑤.	2	2.4	2.8	V
Vertical output dynamic range (2)	$D_{RVDEF(2)}$	Input a signal ($1V_{PP}$) from Pin⑨ and measure the output of Pin③.	2	2.4	2.8	V
VD width	τ_{VD}	Input a signal to Pin⑨ and measure while Pin⑧ is Lo.	800	900	1000	μs

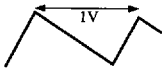
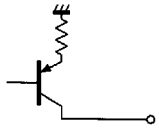
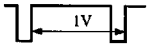
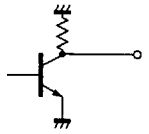
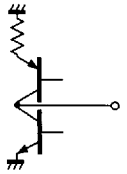
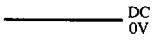
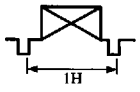
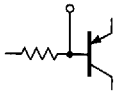
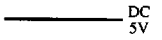
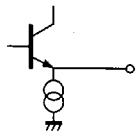
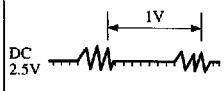
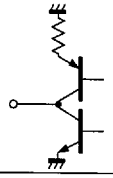
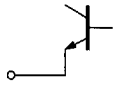
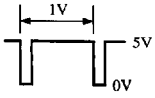
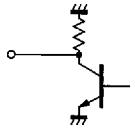
■ Application Circuit



■ Pin Descriptions

Pin No.	Pin name	Typ. waveform	Description	Equivalent circuit
1	Vertical size control input	1V	Control the V size of the vertical deflection coil driving pin.	
2	Power pin	DC 5V	Vertical deflection driving circuit V_{CC}.	
3	Vertical deflection coil driving Pin①	1V	Vertical deflection coil driving output.	
4	GND	DC 0V	Vertical deflection driving circuit GND.	
5	Vertical deflection coil driving Pin②	1V	Vertical deflection coil driving output (inversion of Pin③).	
6	Vertical oscillating resistance pin	DC 0.7V	Vertical oscillating resistor pin.	

■ Pin Descriptions (cont.)

Pin No.	Pin name	Typ. waveform	Description	Equivalent circuit
7	Vertical oscillating capacitor pin		Determine the vertical free-oscillation frequency by the resistor of Pin⑥ and capacitor of Pin⑦.	
8	V_D output pin		Pulse output synchronized with a vertical oscillation waveform.	
9	Vertical synchronous separating capacitor pin		Charges and discharges the vertical synchronous separating capacitor.	
10	GND		Main circuit GND	
11	Video input		Clamped to the video signal input pin (1.6V).	
12	Power pin		Main circuit V_{CC}.	
13	Video amp output pin		Amplified to the video amp signal output (6.5dB).	
14	Phase comparator output		The output DC of the phase comparator changes and AFC operates.	
15	Horizontal oscillating resistor pin		Horizontal free-oscillation frequency determining resistor.	
16	Horizontal AFC output		A pulse waveform synchronized with a horizontal oscillation waveform is output.	

■ Supplementary Explanation

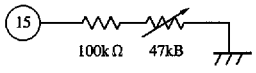
• Precautions on Use

1. Horizontal free oscillation frequency adjusting method

The frequency of Pin⑮ should essentially be adjusted to 15.75Hz by the counter, changing the resistor of Pin⑯ at no signal input. But this causes the voltage of Pin⑭ (AFC detecting pin) to be about 2V when a signal is input. Because supply voltage is 5V (typ.), it is desirable to use a digital voltmeter so that the voltage of Pin⑭ may be 2.5V, considering dispersion, etc.

2. External constant of Pin⑮

The following value is recommeded to take in the dispersion of horizontal free oscillation frequency of IC.

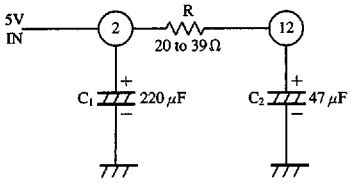


3. Vertical oscillating R.C

High-precision parts should be used for the grounding resistor of Pin⑥ and grounding capacitor of Pin⑦ which determine vertical free-oscillation frequency. Because of 54Hz (typ.) at $C_7 = 0.1\,\mu F$ and $R_6 = 30k\Omega$, the value of R_6 is desirable to be 33 to 36kΩ, considering the dispersion and temperature characteristics of IC in ordernot to be out of vertical synchronization.

4. Power filter

It is recommended to use the following filter for power pins of Pins② and ⑫, to prevent from being out of vertical synchronization and horizontal noise. C_2 of good temperature characteristics should be used.



• Characteristic Curve