

# AN5534N

## Vertical deflection output IC

### ■ Overview

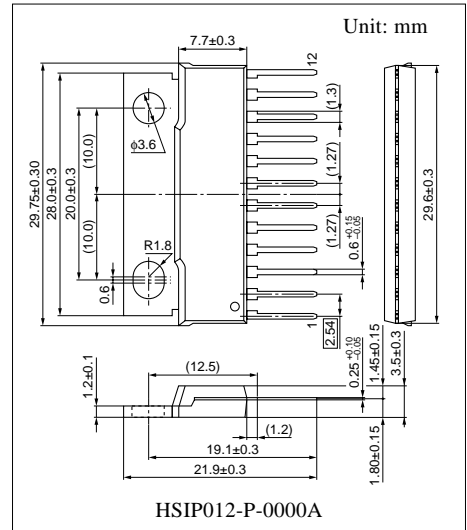
The AN5534N is a vertical deflection output IC for television and CRT monitor. Incorporating a sawtooth wave generator, this IC enables you to form an AC/DC feedback-loop by itself only.

### ■ Features

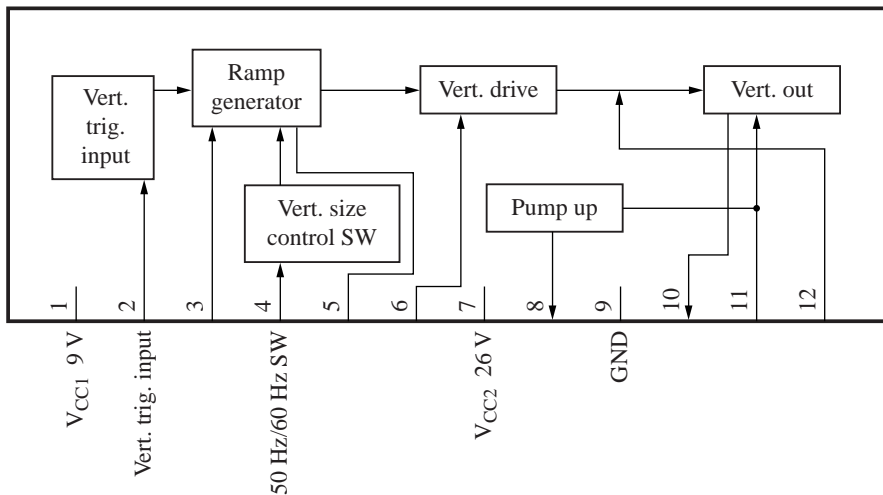
- Built-in stable sawtooth wave generator independent of input pulse width variation
- Built-in 50 Hz/60 Hz changeover circuit
- Minimum fly-back time of saw-tooth wave signal: 100  $\mu$ s

### ■ Applications

- Televisions and CRT displays



### ■ Block Diagram



### ■ Pin Descriptions

Pin No.	Description	Pin No.	Description
1	Power supply 1	7	Power supply 2
2	Vertical pulse input	8	Pulse amplification
3	Vertical amplitude control	9	GND
4	50 Hz/60 Hz changeover	10	Vertical output
5	Saw-tooth wave generation	11	Power supply for vertical output
6	AC/DC feedback input	12	Prevention from oscillation

### ■ Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Supply voltage	$V_{CC1}$	15	V
	$V_{CC2}$	30	
Pin voltage	$V_{2-9}$	0 to 2.7	V
	$V_{4-9}$	0 to $V_{1-9}$	
	$V_{5-9}$	0 to $V_{1-9}$	
	$V_{6-9}$	0 to $V_{1-9}$	
	$V_{10-9}$	0 to 61	
	$V_{11-9}$	0 to 61	
Supply current	$I_{CC1}$	20	mA
Pin current	$I_3$	-0.2 to 0	mA
	$I_8$	-1.8 to +1.8	
	$I_{10}$	-2.2 to +2.2	
Power dissipation	$P_D$	27	W
Operating ambient temperature *	$T_{opr}$	-20 to +70	°C
Storage temperature *	$T_{stg}$	-55 to +150	°C

Note) 1. Do not apply external currents or voltages to any pins not specifically mentioned.

2. For circuit currents, '+' denotes current flowing into the IC, and '-' denotes current flowing out of the IC.

3. \* : Except for the operating ambient temperature and storage temperature, all ratings are for  $T_a = 25^\circ\text{C}$ .

### ■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	$V_{CC1}$	7 to 15	V
	$V_{CC2}$	10 to 30	

### ■ Electrical Characteristics at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Load short-circuit	R. short	$V_{CC2} = 26\text{ V}$	Free from breakdown			
Deflection current	$I_{HP-P}$	$V_{CC2} = 26\text{ V}$ , $V_5 = 2.2\text{ V[p-p]}$ Sine wave 1 kHz	1.8	2.0	2.2	A[p-p]
Vertical amplifier distortion factor	T. H. $D_H$	$V_{CC2} = 26\text{ V}$ , $V_5 = 2.2\text{ V[p-p]}$ Sine wave 1 kHz	—	2.0	5.0	%
Input threshold voltage	$V_2$	Refer to the "• Test method"	0.5	0.7	1.0	V
Sawtooth wave generating start voltage	$V_5$	Refer to the "• Test method"	3.6	4.5	5.4	V
Middle point voltage	$V_{MID}$		11.5	12.8	14.1	V
Idling current	$I_{11}$		21.0	36.0	51.0	mA
Output saturation voltage (lower)	$V_{11-10}$	$V_7 = \text{GND}$	—	3.0	4.0	V
Output saturation voltage (upper)	$V_{10-9}$	$V_7 = \text{GND}$	—	1.5	2.5	V
Pump up charging saturation voltage	$V_{8-9}$	$V_7 = \text{GND}$	—	0.2	0.5	V
Pump up discharging saturation voltage	$V_{7-8}$	$V_7 = \text{GND}$	—	3.0	4.0	V

#### • Test method

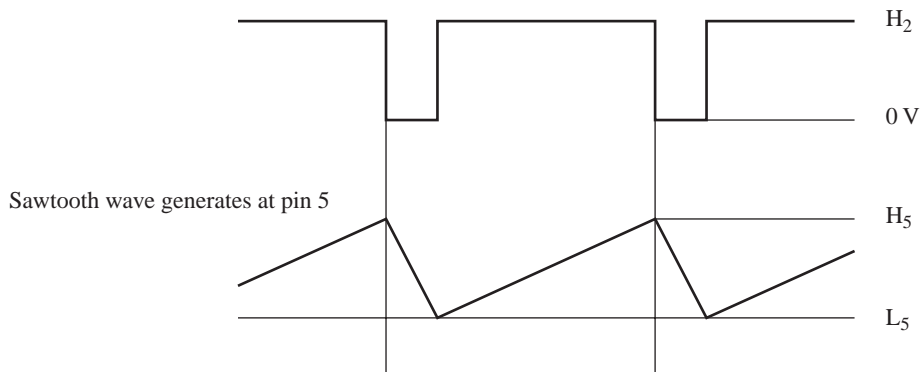
##### 1. Input threshold voltage ( $V_2$ )

$H_2$  voltage at which a saw-tooth wave shown below is generated at pin 5 when  $H_2$  voltage is gradually increased from 0 V

##### 2. Saw-tooth wave generating start voltage ( $V_5$ )

Lower level voltage of a sawtooth wave which generates at pin 5

Input pulse of pin 2



■ Usage Notes

- Inter-pin short-circuit test result

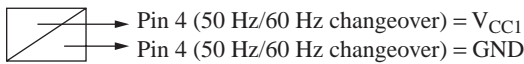
1												
2	●											
3	●	●										
4	●	▲	●	●								
5	●	●	●	●								
6	●	●	●	●	●							
7	▲	●	●	▲	▲	×	●					
8	●	●	●	●	●	●	●	●				
9	▲	●	●	▲	●	●	●	▲	●			
10	●	●	●	●	×	●	●	●	●	×		
11	●	●	●	▲	▲	×	●	●	●	●	▲	●
12	●	●	●	●	●	●	●	●	●	●	●	●
Pin No.	1	2	3	4	5	6	7	8	9	10	11	12

Test conditions:  $V_{CC} = 30\text{ V}$ , DC power supply (30 V, 5 A)

●: IC does not break down even if pins are short-circuited.

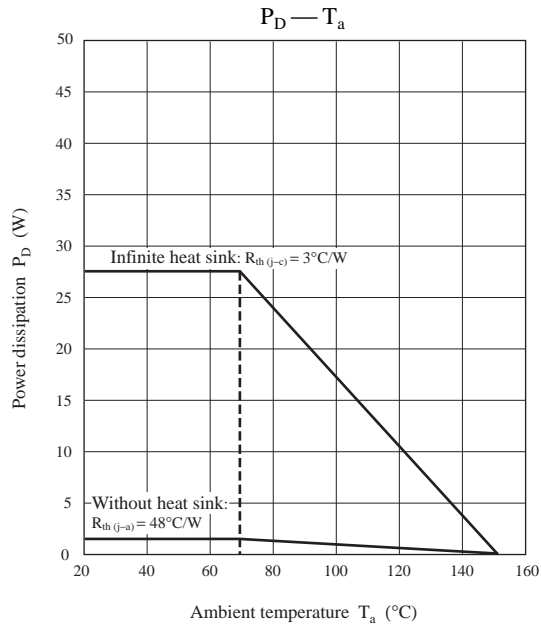
×: IC breaks down if pins are short-circuited.

▲: IC does not break down even if pins are short-circuited, but it causes over-current flows in the external power supply circuit.



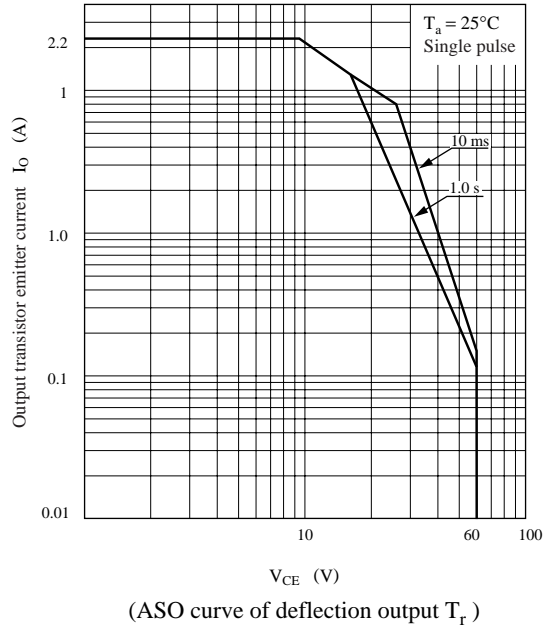
■ Technical Information

1.  $P_D - T_a$  curves of HSIP012-P-0000A



■ Technical Information (continued)

2. Area of safe operation (ASO) of output transistor forward-biased



Note) The maximum value of deflection current for the actual use is suitable within  $\pm 1.5$  A[0-p] (3 A[p-p]).

■ Application Circuit Example

