AN5534N

Vertical deflection output IC

■ Overview

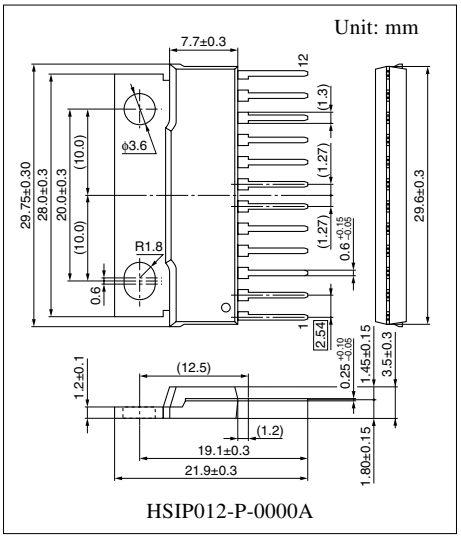
The AN5534N is a vertical deflection output IC for television and CRT monitor. Incorporating a sawtooth wave generator, this IC enables you to form an AC/DC feedback-loop by itself only.

■ 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 µs

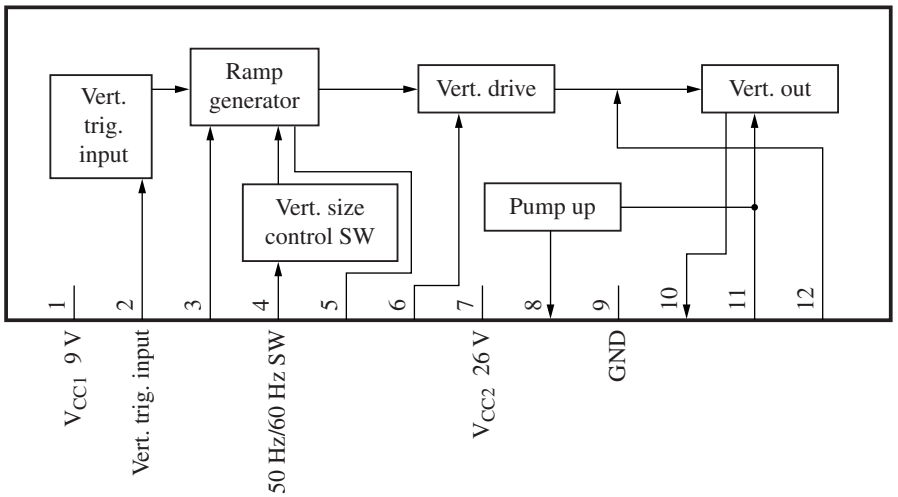
■ Applications

- Televisions and CRT displays



Note) The package of this product will be changed to lead-free type (HSIP012-P-0000E). See the new package dimensions section later of this datasheet.

■ 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	A[0-p]
	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°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°C

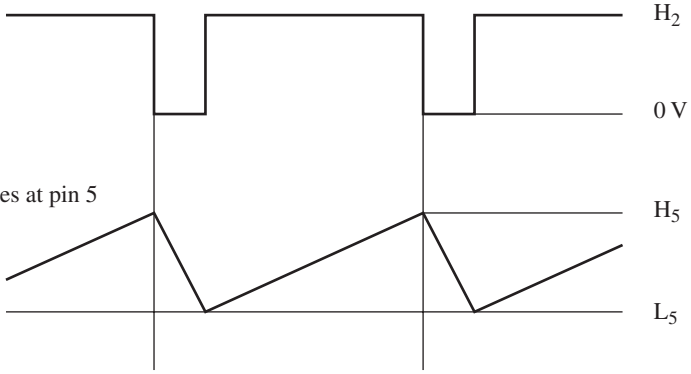
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Load short-circuit	R. short	V_{CC2} = 26 V	Free from breakdown			
Deflection current	I_{HP-P}	V_{CC2} = 26 V, V_5 = 2.2 V[p-p] Sine wave 1 kHz	1.8	2.0	2.2	A[p-p]
Vertical amplifier distortion factor	T. H. D_H	V_{CC2} = 26 V, V_5 = 2.2 V[p-p] Sine wave 1 kHz	—	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 = GND	—	3.0	4.0	V
Output saturation voltage (upper)	V_{10-9}	V_7 = GND	—	1.5	2.5	V
Pump up charging saturation voltage	V_{8-9}	V_7 = GND	—	0.2	0.5	V
Pump up discharging saturation voltage	V_{7-8}	V_7 = 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

Sawtooth wave generates at pin 5



■ 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 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.

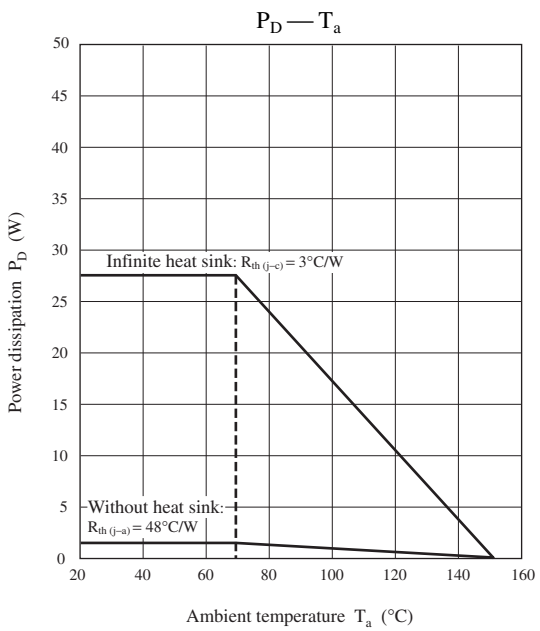
▲: IC does not break down even if pins are short-circuited, but it causes over-current flows in the external power supply circuit.

Pin 4 (50 Hz/60 Hz changeover) = V_{CC1}

Pin 4 (50 Hz/60 Hz changeover) = GND

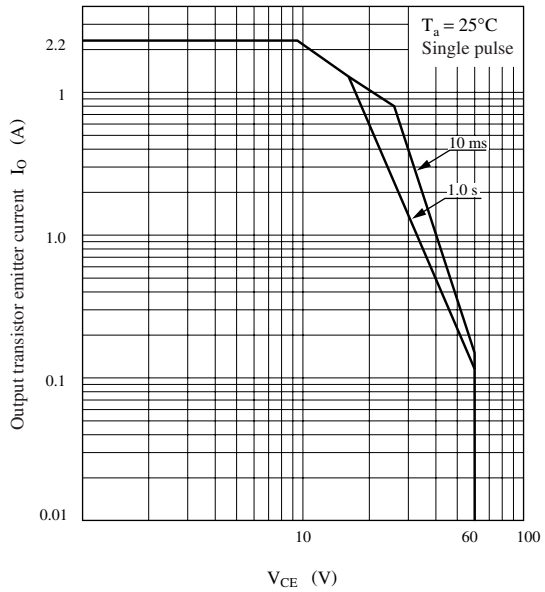
■ Technical Information

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



■ Technical Information (continued)

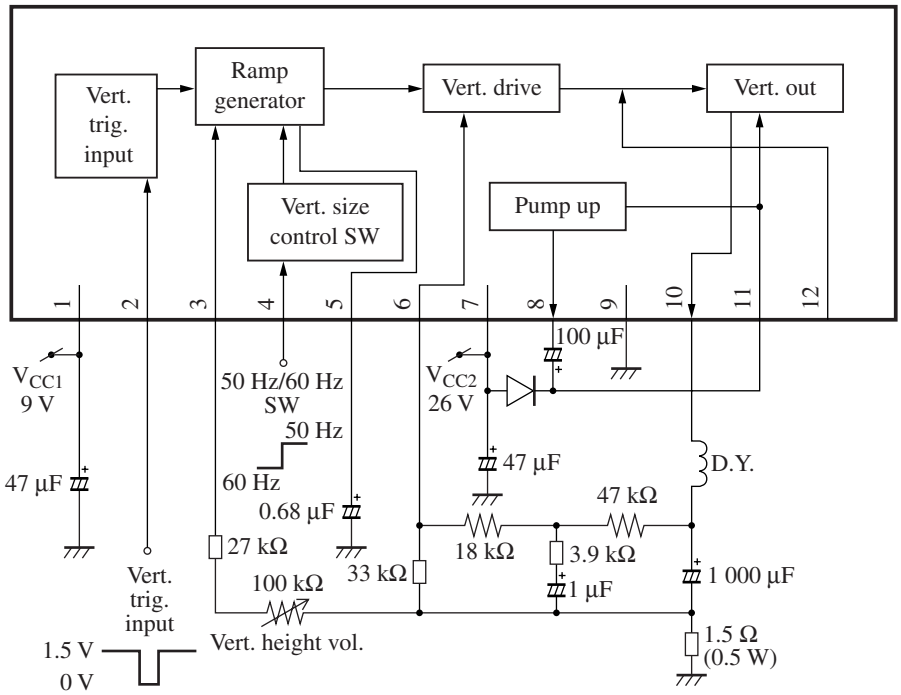
2. Area of safe operation (ASO) of output transistor forward-biased



(ASO curve of deflection output T_r)

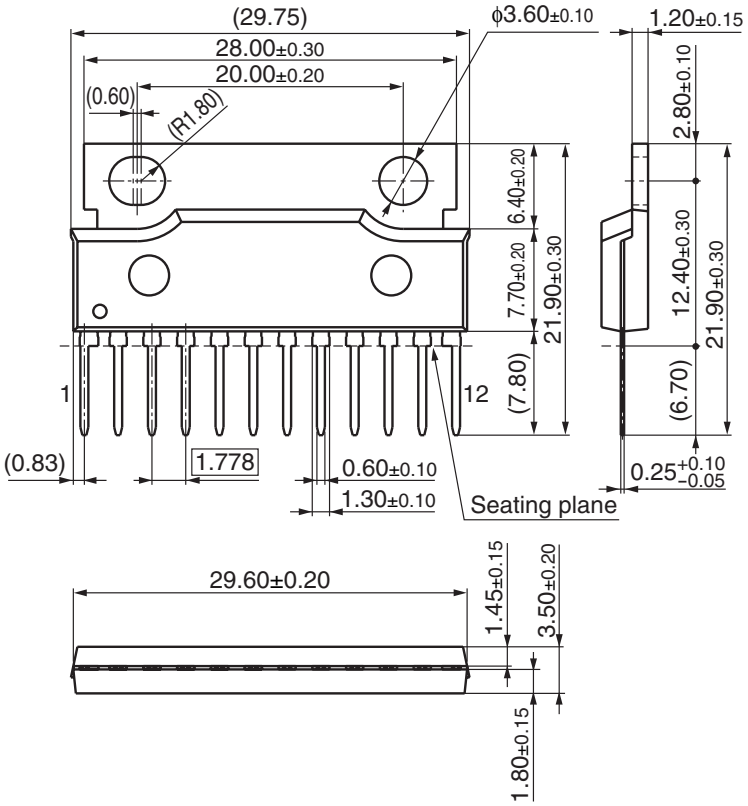
Note) The maximum value of deflection current for the actual use is suitable within ±1.5 A[0-p] (3 A[p-p]).

■ Application Circuit Example



■ New Package Dimensions (Unit: mm)

• HSIP012-P-0000E (Lead-free package)



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