

# AN5769

## H/V convergence correction IC

### Overview

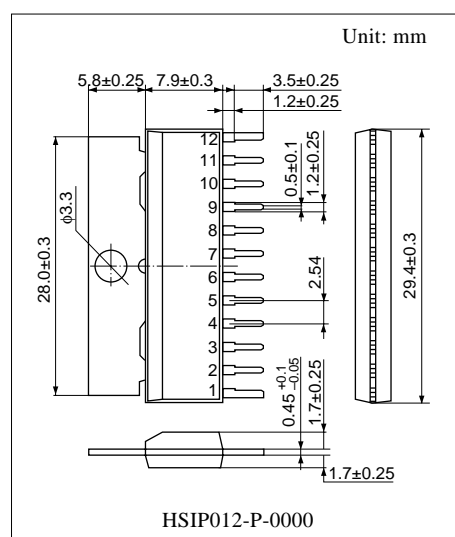
The AN5769 is an IC to correct convergence in horizontal and vertical directions. It is possible to allow  $\pm 100$  mA (max.) DC current flow by connecting a coil between the output pins which operate with the reverse phase each other.

### Features

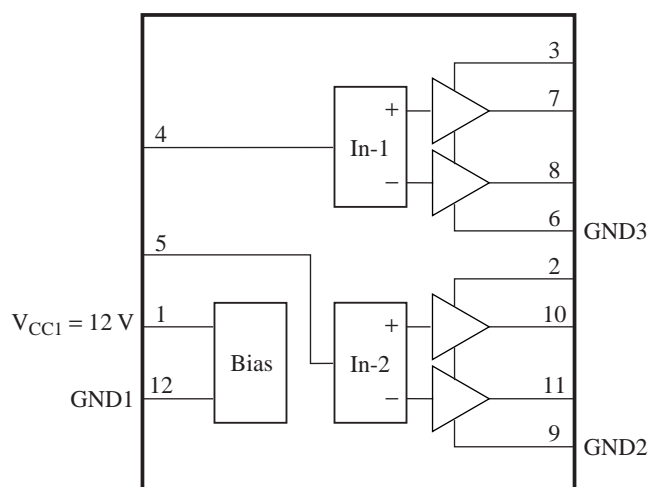
- DC control input 0 V to 5 V
- Output dynamic range 1.2 V to 3.8 V
- Maximum output current  $\pm 100$  mA

### Applications

- CRT monitors



### Block Diagram



## ■ Pin Descriptions

Pin No.	Description	Pin No.	Description
1	Power supply 12 V ( $V_{CC1}$ )	6	Output block GND (GND3)
2	Output block power supply 7 V ( $V_{CC2}$ ), protection resistor is required.	7	H-conv. positive output
3	Output block power supply 7 V ( $V_{CC3}$ ), protection resistor is required.	8	H-conv. negative output
4	H-conv. control input	9	Output block GND (GND2)
5	V-conv. control input	10	V-conv. positive output
		11	V-conv. negative output
		12	GND (GND1)

## ■ Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Supply voltage	$V_{CC1}$	13.5	V
	$V_{CC2}$	11.05	
	$V_{CC3}$	11.05	
Supply current	$I_{CC1}$	28	mA
	$I_{CC2}$	150	
	$I_{CC3}$	150	
Power dissipation <sup>*2</sup>	$P_D$	1 171	mW
Operating ambient temperature <sup>*1</sup>	$T_{opr}$	-25 to +75	°C
Storage temperature <sup>*1</sup>	$T_{stg}$	-55 to +150	°C

Note) 1. <sup>\*1</sup>: Except for the operating ambient temperature and storage temperature, all ratings are for  $T_a = 25^\circ\text{C}$ .

<sup>\*2</sup>: The power dissipation shown is for the IC package at  $T_a = 75^\circ\text{C}$ .

2. Pay attention to a breakdown to be caused by static electricity for pin 1.

3. Observe the following order of the supply power start-up:

- Turn-on order      First: Pin 2, pin 3 on (7 V) power supply  
                              Second: Pin 1 on (12 V) power supply
- Turn-off order      First: Pin 1 off (12 V) power supply  
                              Second: Pin 2, pin 3 off (7 V) power supply

## ■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	$V_{CC1}$	10.8 to 13.2	V
	$V_{CC2}$	6.0 to 9.0	
	$V_{CC3}$	6.0 to 9.0	

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


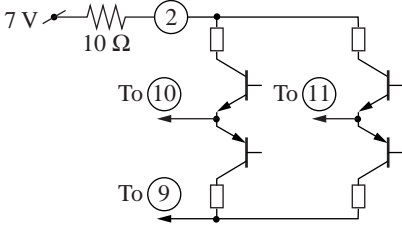
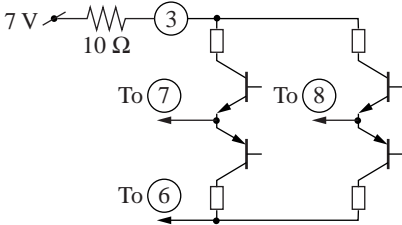
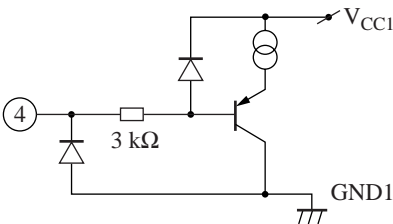
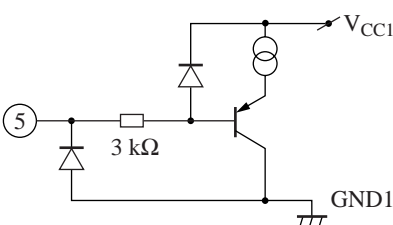
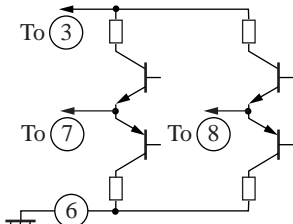
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Circuit current 1	$I_{CC1}$	$V_{CC1} = 12\text{ V}$ , $V_{CC2} = V_{CC3} = 7\text{ V}$	17	22	27	mA
Circuit current 2	$I_{CC2}$	$V_{CC1} = 12\text{ V}$ , $V_{CC2} = V_{CC3} = 7\text{ V}$	—	0	1	mA
Circuit current 3	$I_{CC3}$	$V_{CC1} = 12\text{ V}$ , $V_{CC2} = V_{CC3} = 7\text{ V}$	—	0	1	mA
Circuit voltage 7	$V_{7-6}$	$V_{CC1} = 12\text{ V}$ , $V_{CC2} = V_{CC3} = 7\text{ V}$	2.8	3.0	3.2	V
Circuit voltage 8	$V_{8-6}$	$V_{CC1} = 12\text{ V}$ , $V_{CC2} = V_{CC3} = 7\text{ V}$	2.8	3.0	3.2	V
Circuit voltage 10	$V_{10-9}$	$V_{CC1} = 12\text{ V}$ , $V_{CC2} = V_{CC3} = 7\text{ V}$	2.8	3.0	3.2	V
Circuit voltage 11	$V_{11-9}$	$V_{CC1} = 12\text{ V}$ , $V_{CC2} = V_{CC3} = 7\text{ V}$	2.8	3.0	3.2	V
H-conv. output voltage 1	$E_{H1}$	$V_7 - V_8$ at $V_4 = 2.5\text{ V}$	-0.15	0	+0.15	V
H-conv. output voltage 2	$E_{H2}$	$V_7 - V_8$ at $V_4 = 5\text{ V}$	+2.3	+2.5	+2.7	V
H-conv. output voltage 3	$E_{H3}$	$V_7 - V_8$ at $V_4 = 0\text{ V}$	-2.7	-2.5	-2.3	V
V-conv. output voltage 1	$E_{V1}$	$V_{10} - V_{11}$ at $V_5 = 2.5\text{ V}$	-0.15	0	+0.15	V
V-conv. output voltage 2	$E_{V2}$	$V_{10} - V_{11}$ at $V_5 = 5\text{ V}$	+2.3	+2.5	+2.7	V
V-conv. output voltage 3	$E_{V3}$	$V_{10} - V_{11}$ at $V_5 = 0\text{ V}$	-2.7	-2.5	-2.3	V

## • Design reference data

Note) The characteristics listed below are theoretical values based on the IC design and are not guaranteed.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
High-level H-conv. output fluctuation with supply voltage	$\Delta E_{H/VCCH}$	$\Delta E$ with $V_{CC1}$ change 12 V to 13.2 V, and $V_{CC2}$ , $V_{CC3}$ from 7 V to 9 V	-0.1	—	+0.1	V
Low-level H-conv. output fluctuation with supply voltage	$\Delta E_{H/VCLL}$	$\Delta E$ with $V_{CC1}$ change 12 V to 10.8 V, and $V_{CC2}$ , $V_{CC3}$ from 7 V to 6 V	-0.1	—	+0.1	V
High-level V-conv. output fluctuation with supply voltage	$\Delta E_{V/VCCH}$	$\Delta E$ with $V_{CC1}$ change 12 V to 13.2 V, and $V_{CC2}$ , $V_{CC3}$ from 7 V to 9 V	-0.1	—	+0.1	V
Low-level V-conv. output fluctuation with supply voltage	$\Delta E_{V/VCLL}$	$\Delta E$ with $V_{CC1}$ change 12 V to 10.8 V, and $V_{CC2}$ , $V_{CC3}$ from 7 V to 6 V	-0.1	—	+0.1	V
H-conv. output fluctuation with temperature	$\Delta E_{H/Ta}$	$\Delta E$ with $T_a$ change from $+25^\circ\text{C}$ to $+70^\circ\text{C}$ and with $T_a$ change from $+25^\circ\text{C}$ to $-20^\circ\text{C}$	-0.1	—	+0.1	V
V-conv. output fluctuation with temperature	$\Delta E_{V/Ta}$	$\Delta E$ with $T_a$ change from $+25^\circ\text{C}$ to $+70^\circ\text{C}$ and with $T_a$ change from $+25^\circ\text{C}$ to $-20^\circ\text{C}$	-0.1	—	+0.1	V

# Terminal Equivalent Circuits

Pin No.	Equivalent circuit	Description	DC voltage (V)
1		Power supply 12 V ( $V_{CC1}$ ): Power supply pin Apply DC 12 V.	12
2		Output block power supply 7 V ( $V_{CC2}$ ): Power supply pin for V-conv. output Apply DC 7 V via protective resistor.	7
3		Output block power supply 7 V ( $V_{CC3}$ ): Power supply pin for H-conv. output Apply DC 7 V via protective resistor.	7
4		H-conv. control input: Control input for H-conv. Apply DC 0 V to 5 V. (typ. = 2.5 V)	—
5		V-conv. control input: Control input for V-conv. Apply DC 0 V to 5 V. (typ. = 2.5 V)	—
6		GND3: Grounding pin of H-conv. output block	0

■ Terminal Equivalent Circuits (continued)

Pin No.	Equivalent circuit	Description	DC voltage (V)
7		H-conv. positive output: Positive output pin for H-conv. Outputs polarity as same as that of pin 4.	1.7 to 4.2
8		H-conv. negative output: Negative output pin for H-conv. Outputs polarity opposite to that of pin 4.	1.7 to 4.2
9		GND2: Grounding pin of V-conv. output block	0
10		V-conv. positive output: Positive output pin for V-conv. Outputs polarity as same as that of pin 5.	1.7 to 4.2
11		V-conv. negative output: Negative output pin for V-conv. Outputs polarity opposite to that of pin 5.	1.7 to 4.2
12		GND1: Grounding pin for 12V-system	0

# ■ Application Circuit Example

