**Panasonic** 

# **AN5769**

# H/V convergence correction IC

#### ■ Overview

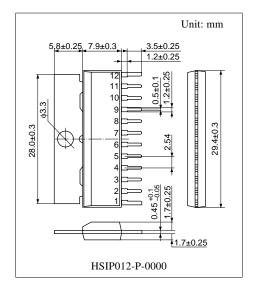
The AN5769 is an IC to correct convergence in horizontal and vertical directions. It is possible to allow  $\pm 100$  mA (max.) DC current flow by connecting a coil between the output pins which operate with the reverse phase each other.

#### ■ Features

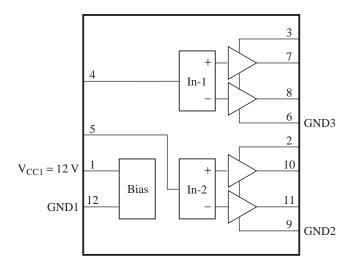
- DC control input 0 V to 5 V
- Output dynamic range 1.2 V to 3.8 V
- Maximum output current ±100 mA

#### Applications

• CRT monitors



#### ■ Block Diagram



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#### ■ Pin Descriptions

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

#### ■ Absolute Maximum Ratings

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

Note) 1. \*1: Except for the operating ambient temperature and storage temperature, all ratings are for  $T_a = 25$ °C.

- \*2: The power dissipation shown is for the IC package at  $T_a = 75$ °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 <sub>CC1</sub>	10.8 to 13.2	V
	V <sub>CC2</sub>	6.0 to 9.0	
	$V_{CC3}$	6.0 to 9.0	

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

Parameter	Symbol	Conditions	Min	Тур	Max	Unit
Circuit current 1	I <sub>CC1</sub>	$V_{CC1} = 12 \text{ V}, \ V_{CC2} = V_{CC3} = 7 \text{ V}$	17	22	27	mA
Circuit current 2	I <sub>CC2</sub>	$V_{CC1} = 12 \text{ V}, \ V_{CC2} = V_{CC3} = 7 \text{ V}$	_	0	1	mA
Circuit current 3	I <sub>CC3</sub>	$V_{CC1} = 12 \text{ V}, \ V_{CC2} = V_{CC3} = 7 \text{ V}$	_	0	1	mA
Circuit voltage 7	V <sub>7-6</sub>	$V_{CC1} = 12 \text{ V}, \ V_{CC2} = V_{CC3} = 7 \text{ V}$	2.8	3.0	3.2	V
Circuit voltage 8	V <sub>8-6</sub>	$V_{CC1} = 12 \text{ V}, \ V_{CC2} = V_{CC3} = 7 \text{ V}$	2.8	3.0	3.2	V
Circuit voltage 10	V <sub>10-9</sub>	$V_{CC1} = 12 \text{ V}, \ V_{CC2} = V_{CC3} = 7 \text{ V}$	2.8	3.0	3.2	V
Circuit voltage 11	V <sub>11-9</sub>	$V_{CC1} = 12 \text{ V}, \ V_{CC2} = V_{CC3} = 7 \text{ V}$	2.8	3.0	3.2	V
H-conv. output voltage 1	E <sub>H1</sub>	$V_7 - V_8$ at $V_4 = 2.5 \text{ V}$	- 0.15	0	+0.15	V
H-conv. output voltage 2	E <sub>H2</sub>	$V_7 - V_8$ at $V_4 = 5 \text{ V}$	+2.3	+2.5	+2.7	V
H-conv. output voltage 3	E <sub>H3</sub>	$V_7 - V_8$ at $V_4 = 0$ V	-2.7	-2.5	-2.3	V
V-conv. output voltage 1	E <sub>V1</sub>	$V_{10} - V_{11}$ at $V_5 = 2.5 \text{ V}$	- 0.15	0	+0.15	V
V-conv. output voltage 2	E <sub>V2</sub>	$V_{10} - V_{11}$ at $V_5 = 5$ V	+2.3	+2.5	+2.7	V
V-conv. output voltage 3	E <sub>V3</sub>	$V_{10} - V_{11}$ at $V_5 = 0$ 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	Тур	Max	Unit
High-level H-conv. output fluctuation with supply voltage	ΔE <sub>H/VCCH</sub>	$\Delta E$ 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	ΔE <sub>H/VCCL</sub>	$\Delta E \mbox{ with } V_{CC1} \mbox{ change } 12 \mbox{ V to } 10.8 \mbox{ V}, \\ \mbox{and } V_{CC2,} V_{CC3} \mbox{ from } 7 \mbox{ V to } 6 \mbox{ V}$	- 0.1	_	+0.1	V
High-level V-conv. output fluctuation with supply voltage	ΔE <sub>V/VCCH</sub>	$\Delta E \text{ with } V_{CC1} \text{ change } 12 \text{ V to } 13.2 \text{ V}, \\ \text{and } V_{CC2,} V_{CC3} \text{ from } 7 \text{ V to } 9 \text{ V}$	- 0.1	_	+0.1	V
Low-level V-conv. output fluctuation with supply voltage	ΔE <sub>V/VCCL</sub>	$\Delta E$ 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°C to +70°C and with $T_a$ change from +25°C to -20°C	- 0.1	_	+0.1	V
V-conv. output fluctuation with temperature	$\Delta E_{V/Ta}$	$\Delta E$ with $T_a$ change from +25°C to +70°C and with $T_a$ change from +25°C to -20°C	- 0.1	_	+0.1	V

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## ■ Terminal Equivalent Circuits

Pin No.	Equivalent circuit	Equivalent circuit Description	
1	1 V <sub>CC1</sub>	Power supply 12 V (V <sub>CC1</sub> ): Power supply pin Apply DC 12 V.	12
2	7 V — W 2 To 10 Ω To 10 To 11 To 9	Output block power supply 7 V (V <sub>CC2</sub> ): Power supply pin for V-conv. output Apply DC 7 V via protective resistor.	7
3	7 V — W 3 To 7 To 8 To 6	Output block power supply 7 V (V <sub>CC3</sub> ): Power supply pin for H-conv. output Apply DC 7 V via protective resistor.	7
4	$V_{CC1}$ $3 \text{ k}\Omega$ $M_{CC1}$ $M_{CC1}$	H-conv. control input: Control input for H-conv. Apply DC 0 V to 5 V. (typ. = 2.5 V)	_
5	$V_{CC1}$ $3 \text{ k}\Omega$ $M$	V-conv. control input: Control input for V-conv. Apply DC 0 V to 5 V. (typ. = 2.5 V)	_
6	To 3	GND3: Grounding pin of H-conv. output block	0

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## ■ Terminal Equivalent Circuits (continued)

Pin No.	Equivalent circuit	Description	DC voltage (V)
7	To 3 To 6	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	To 3 To 6	H-conv. negative output: Negative output pin for H-conv. Outputs polarity opposite to that of pin 4.	1.7 to 4.2
9	To (10) To (11)	GND2: Grounding pin of V-conv. output block	0
10	To 2  To 9	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	To 2 To 9	V-conv. negative output: Negative output pin for V-conv. Outputs polarity opposite to that of pin 5.	1.7 to 4.2
12	(12) GND1	GND1: Grounding pin for 12V-system	0

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## ■ Application Circuit Example

