AN5767K

Synchronizing signal processing IC

■ Overview

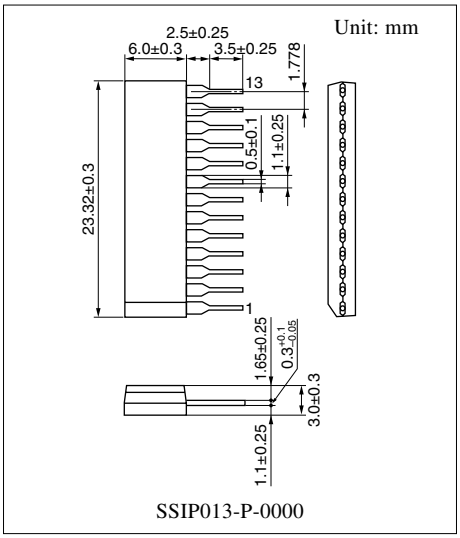
The AN5767K is a synchronizing signal processing IC with built-in frequency divider circuit for horizontal and vertical synchronizing signal. Input signal is outputted after being devided by two.

■ Features

- Built-in dividing-by-two circuit for horizontal synchronizing signal
- Built-in dividing-by-two circuit for vertical synchronizing signal
- On/off switch function of dividing output
- Gain control function of dividing output

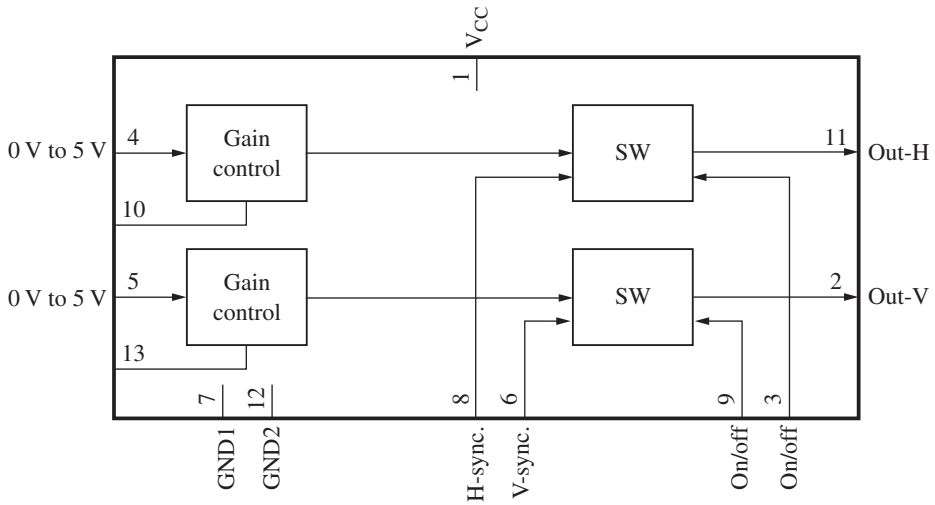
■ Applications

- CRT monitors



Note) The package of this product will be changed to lead-free type (SSIP013-P-0000A). See the new package dimensions section later of this datasheet.

■ Block Diagram



■ Pin Descriptions

Pin No.	Description	Pin No.	Description
1	Power supply 12 V(V_{CC})	8	H-sync. input
2	Freq.-divided output1 output	9	Freq.-divided output1 on/off
3	Freq.-divided output2 on/off	10	Freq.-divided output2 control resistor
4	Freq.-divided output2 control input	11	Freq.-divided output2 output
5	Freq.-divided output1 control input	12	GND2
6	V-sync. input	13	Freq.-divided output1 control resistor
7	GND1		

■ Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Supply voltage	V_{CC}	13.5	V
Supply current	I_{CC}	25	mA
Power dissipation *2	P_D	337.5	mW
Operating ambient temperature *1	T_{opr}	−25 to +75	°C
Storage temperature *1	T_{stg}	−55 to +150	°C

Note) ∗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 in free air at T_a = 75°C.

■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	V_{CC}	10.8 to 13.2	V

■ Electrical Characteristics at T_a = 25°C

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Circuit current	I_{CC}	V_{CC} = 12 V	4.8	5.9	7.2	mA
Circuit voltage 1	$V_{10(1)}$	V_{CC} = 12 V, V_4 = 0 V	− 0.1	0.0	+0.1	V
Circuit voltage 2	$V_{10(2)}$	V_{CC} = 12 V, V_4 = 5 V	4.60	4.85	5.10	V
Circuit voltage 3	$V_{13(1)}$	V_{CC} = 12 V, V_5 = 0 V	− 0.1	0.0	+0.1	V
Circuit voltage 4	$V_{13(2)}$	V_{CC} = 12 V, V_5 = 5 V	4.60	4.85	5.10	V
Freq.-divided output2 output current 1	$I_{11(1)}$	V_{CC} = 12 V, V_3 = 5 V, V_4 = 5 V, R = 120 kΩ	30	40	50	µA
Freq.-divided output2 output current 2	$I_{11(2)}$	V_{CC} = 12 V, V_3 = 0 V, V_4 = 5 V	−5	0	+5	µA
Freq.-divided output2 output current 3	$I_{11(3)}$	V_{CC} = 12 V, V_3 = 5 V, V_4 = 0 V	−5	0	+5	µA
Freq.-divided output1 output current 1	$I_{2(1)}$	V_{CC} = 12 V, V_5 = 5 V, V_9 = 5 V, R = 20 kΩ	−3.0	−2.5	−2.0	mA
Freq.-divided output1 output current 2	$I_{2(2)}$	V_{CC} = 12 V, V_5 = 5 V, V_9 = 0 V	− 0.05	0	+0.05	mA
Freq.-divided output1 output current 3	$I_{2(3)}$	V_{CC} = 12 V, V_5 = 0 V, V_9 = 5 V	− 0.05	0	+0.05	mA

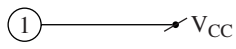
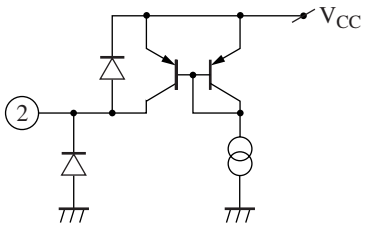
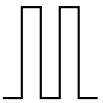
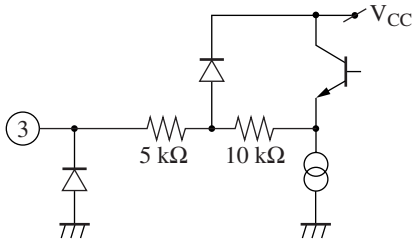
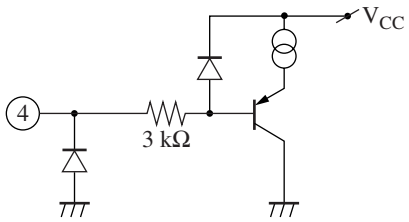
■ Electrical Characteristics at T_a = 25°C (continued)

• Design reference data

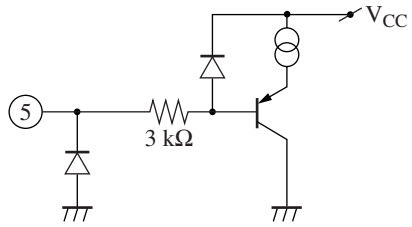
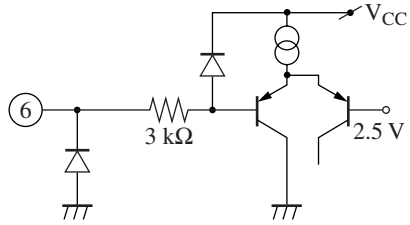
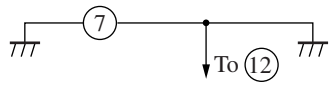
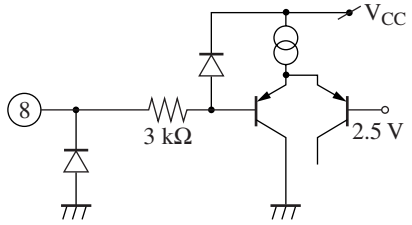
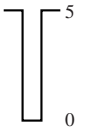
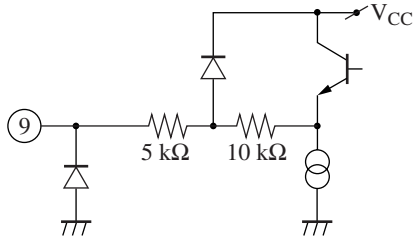
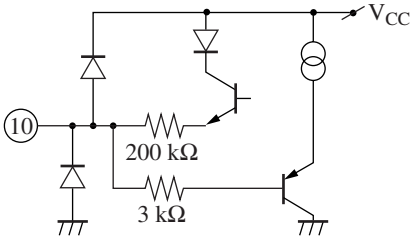
Note) The characteristics listed below are theoretical values based on the IC design and are not guaranteed.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
V-sync. dividing operation	f_{V2}	Pin 2 output frequency at pulse input to pin 6	—	$f_{V2} = 1/2f_{V6}$	—	Hz
H-sync. dividing operation	f_{H11}	Pin 11 output frequency at pulse input to pin 8	—	$f_{H11} = 1/2f_{H8}$	—	Hz
H-sync. dividing operation polarity between field	f_{H11P}	Pin 11 output frequency at pulse input to pin 6	—	$f_{H11} = 1/2f_{V6}$	—	Hz
V-sync. input	V_{VS}	Threshold value	—	2.5	—	V
H-sync. input	V_{HS}	Threshold value	—	2.5	—	V
V-sync. input	f_{VIN}	Operating frequency	30	—	200	Hz
H-sync. input	f_{HIN}	Operating frequency	15	—	150	kHz

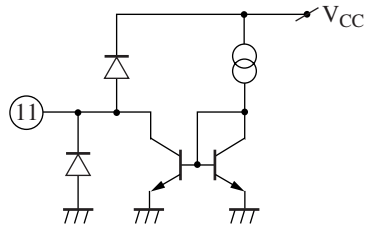
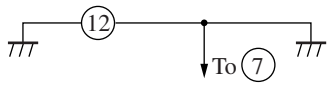
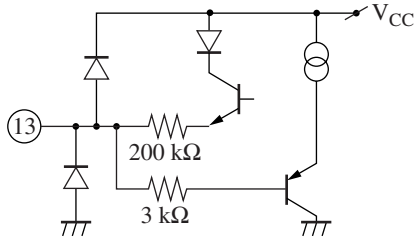
■ Terminal Equivalent Circuits

Pin No.	Equivalent circuit	Description	DC voltage (V)
1		Power supply 12 V (V_{CC}): Supply pin Apply DC 12 V.	12
2		Freq.-divided output1: Freq.-divided output of V-sync. Outputted with current	
3		Freq.-divided output2 on/off: On/off changeover pin for freq.-divided output2 Off at 0 V.	
4		Freq.-divided output2 control input: Control input pin for freq.-divided output2 Apply DC 0 V to 5 V.	0 to 5

■ Terminal Equivalent Circuits (continued)

Pin No.	Equivalent circuit	Description	DC voltage (V)
5		Freq.-divided output1 control input: Control input pin for freq.-divided output1 Apply DC 0 V to 5 V.	0 to 5
6		V-sync. input: Input pin for V-sync. Input negative polarity pulse.	
7		GND1: Ground pin	0
8		H-sync. input: Input pin for H-sync. Possible to input with both polarities, but phase will be delayed by a pulse width if pulse is inputted with positive polarity.	
9		Freq.-divided output1 on/off: On/off changeover pin for freq.-divided output1. Off at 0 V.	
10		Control resistor for freq.-divided output2: Resistor pin to determine freq.-divided output2 output current. Connect the resistor (recommended 120 kΩ) from this pin to GND.	0 to 5

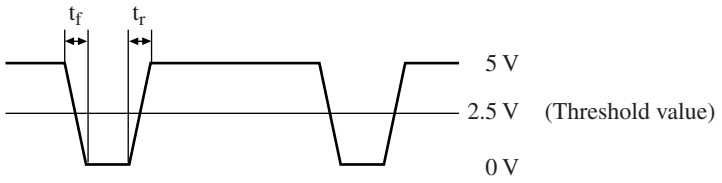
■ Terminal Equivalent Circuits (continued)

Pin No.	Equivalent circuit	Description	DC voltage (V)
11		Freq.-divided output2: Freq.-divided output of H-sync.. Outputted with current.	
12		GND2: Ground pin	0
13		Freq.-divided output1 control input: Resistor pin to determine freq.-divided output1 output current. Connect the resistor (recommended 20 kΩ) between this pin and GND.	0 to 5

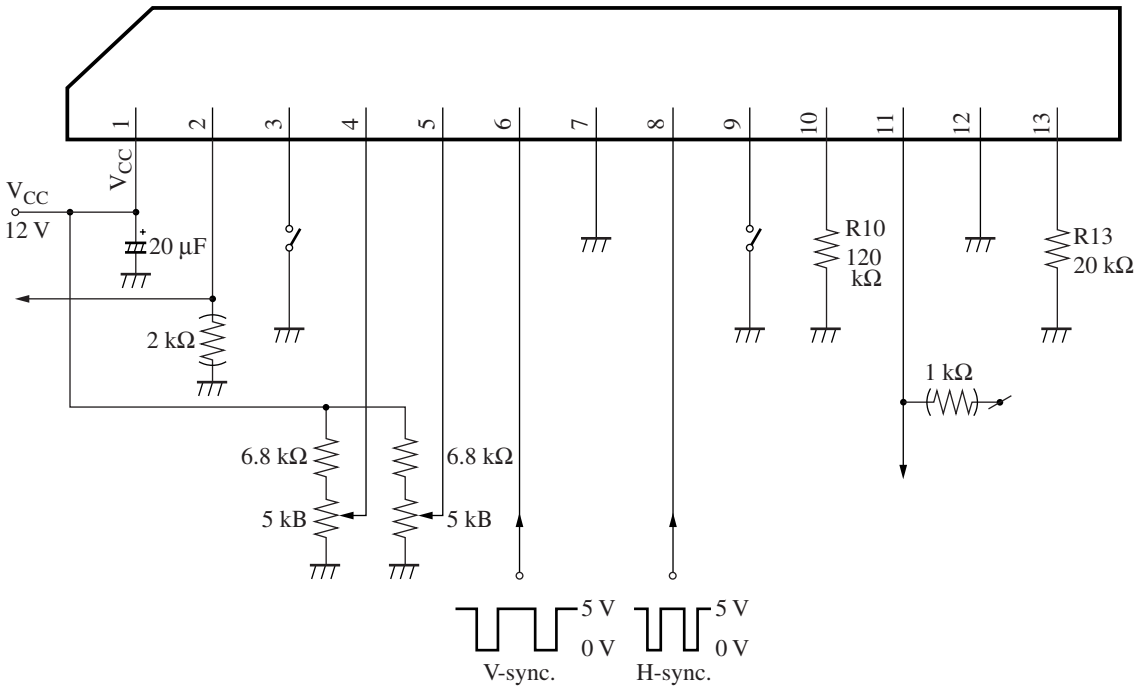
■ Usage Notes

ECL is used for flip-flop circuit.

Use the condition of $t_r \leq 10$ µs and $t_f \leq 10$ µs for H-sync. and V-sync. respectively.



■ Application Circuit Example



1. Recommended application conditions

Parameter	Symbol	Range	Unit
Freq.-divided output2 control input	V_{4-7}	0 to 6	V
Freq.-divided output1 control input	V_{5-7}	0 to 6	V
H-sync. input	V_{8-7}	0 to 6	V
V-sync. input	V_{6-7}	0 to 6	V
Freq.-divided output2 output current	I_{11}	0 to 1	mA
Freq.-divided output1 output current	I_2	−10 to 0	mA
Recommended resistance	R10	20k to 200k	Ω
Recommended resistance	R13	10k to 200k	Ω

2. Freq.-divided output2 on/off

At V_3 = 0 V ← 12 V Pin 11 output

At V_3 = open ← 12 V Pin 11 output

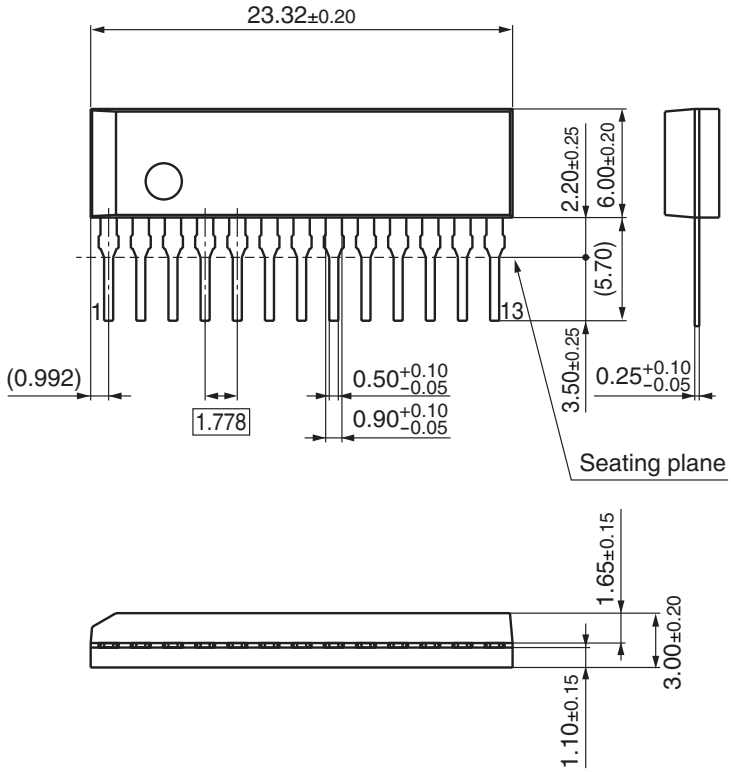
3. Freq.-divided output1 on/off

At V_9 = 0 V ← 0 V Pin 2 output

At V_9 = open ← 0 V Pin 2 output

■ New Package Dimensions (Unit: mm)

• SSIP013-P-0000A (Lead-free package)



Request for your special attention and precautions in using the technical information and semiconductors described in this material

(1) An export permit needs to be obtained from the competent authorities of the Japanese Government if any of the products or technologies described in this material and controlled under the "Foreign Exchange and Foreign Trade Law" is to be exported or taken out of Japan.

(2) The technical information described in this material is limited to showing representative characteristics and applied circuit examples of the products. It does not constitute the warranting of industrial property, the granting of relative rights, or the granting of any license.

(3) The products described in this material are intended to be used for standard applications or general electronic equipment (such as office equipment, communications equipment, measuring instruments and household appliances).
Consult our sales staff in advance for information on the following applications:
- Special applications (such as for airplanes, aerospace, automobiles, traffic control equipment, combustion equipment, life support systems and safety devices) in which exceptional quality and reliability are required, or if the failure or malfunction of the products may directly jeopardize life or harm the human body.
- Any applications other than the standard applications intended.

(4) The products and product specifications described in this material are subject to change without notice for reasons of modification and/or improvement. At the final stage of your design, purchasing, or use of the products, therefore, ask for the most up-to-date Product Standards in advance to make sure that the latest specifications satisfy your requirements.

(5) When designing your equipment, comply with the guaranteed values, in particular those of maximum rating, the range of operating power supply voltage and heat radiation characteristics. Otherwise, we will not be liable for any defect which may arise later in your equipment.
Even when the products are used within the guaranteed values, redundant design is recommended, so that such equipment may not violate relevant laws or regulations because of the function of our products.

(6) When using products for which dry packing is required, observe the conditions (including shelf life and after-unpacking standby time) agreed upon when specification sheets are individually exchanged.

(7) No part of this material may be reprinted or reproduced by any means without written permission from our company.

Please read the following notes before using the datasheets

A. These materials are intended as a reference to assist customers with the selection of Panasonic semiconductor products best suited to their applications.
Due to modification or other reasons, any information contained in this material, such as available product types, technical data, and so on, is subject to change without notice.
Customers are advised to contact our semiconductor sales office and obtain the latest information before starting precise technical research and/or purchasing activities.

B. Panasonic is endeavoring to continually improve the quality and reliability of these materials but there is always the possibility that further rectifications will be required in the future. Therefore, Panasonic will not assume any liability for any damages arising from any errors etc. that may appear in this material.

C. These materials are solely intended for a customer's individual use.
Therefore, without the prior written approval of Panasonic, any other use such as reproducing, selling, or distributing this material to a third party, via the Internet or in any other way, is prohibited.

2001 MAR