

Wide band IF/waveform rectifier IC for infrared light reception and radio remote control units

BH4100FV

The BH4100FV is an IC with an internal wide band IF amplifier and waveform rectifying circuit, ideal for infrared light reception, particularly in radio remote control operations such as the operation of vehicles without using keys. The 14-pin SSOPB-B14 package makes this product ideal for sets where compact size is required.

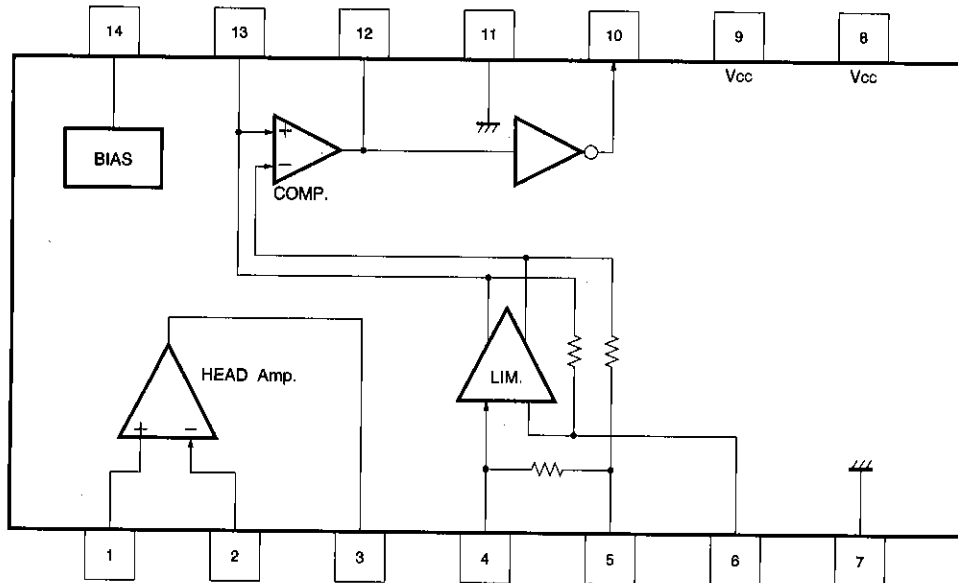
●Applications

Keyless vehicle entry, portable terminals

●Features

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|--|---|
| 1) Low current consumption (4mA typ.). | 4) Short output pulse rise and fall times (5nS typ.). |
| 2) Accommodates infrared light reception ranging from 1kbps to 4Mbps. | 5) Variable input amplifier gain. |
| 3) Accommodates radio remote control units (keyless entry) using the ASK system. | 6) Variable output comparator hysteresis. |

●Block diagram



● Absolute maximum ratings (Ta=25°C, for measurement circuit)

Parameter	Symbol	Limits	Unit	Conditions
Power supply voltage	V _{CC}	7	V	V _{CC}
Output pin voltage	V _O	7	V	Each pin
Power dissipation	P _d	350	mW	*1
Operating temperature	T _{opr}	-25~+75	°C	
Storage temperature	T _{stg}	-55~+125	°C	

*1 Reduced by 3.5mW for each increase in Ta of 1°C over 25°C.
(when mounting on 90 mm × 50 mm × 1.6 t glass epoxy board).

● Recommended operating conditions

Parameter	Symbol	Limits	Unit	Conditions
Operating voltage	V _{CC}	2.5~6.0	V	*2

*2 Ta = 25°C, for basic operation.

● Electrical characteristics (Unless otherwise noted, Ta=25°C, V_{CC}=5V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Quiescent current	I _q	3.0	4.0	5.0	mA	With no signal
"H" output voltage	V _{OH}	4.6	—	—	V	
"L" output voltage	V _{OL}	—	—	0.4	V	
I/V amplifier gain	G _{IV}	17	20	23	dB	f _{IN} =4MHz
I/V amplifier input offset	V _{OS}	-20	0	20	mV	
I/V amplifier input DC voltage	V _{DC}	2.7	2.5	2.3	V	
Reference voltage	V _{REF}	2.7	2.5	2.3	V	
IF amplifier gain	G _{IF}	47	50	53	dB	f _{IN} =4MHz
Bypass DC voltage	V _{PAS}	3.98	4.18	4.38	V	
Pulse rise time	T _R	—	5	—	nS	
Pulse fall time	T _F	—	5	—	nS	
I/V amplifier input impedance	Z _{IN}	—	270	—	Ω	f _{IN} =4MHz
Input conversion noise	N	—	17	—	PA/√HZ	
IF amplifier input impedance	Z _{IF}	—	1.8	—	KΩ	f _{IN} =4MHz

© Not designed for radiation resistance.

●Description of pin functions

Pin No.	Symbol	Pin Name	Function
1	IN - P	Head amplifier input (positive input)	Connected to bias
2	IN - N	Head amplifier input (negative input)	Connected to feedback resistance
3	I - V OUT	Head amplifier output	Connected to feedback resistance
4	LIM IN	Limiter amplifier input	Coupling via Pin 4 and capacitor
5	BY - PASS1	Bypass pin	Connected to bypass capacitor
6	BY - PASS2	Bypass pin	Connected to bypass capacitor
7	GND	Ground pin	
8	V _{cc}	Power supply pin	
9	D - V _{cc}	Power supply pin (comparator, inverter)	
10	OUT	Output pin	Inverter output (CMOS output)
11	D - GND	Ground pin (comparator, inverter)	
12	OUT	Output pin	Comparator output
13	VTH CTRL	VTH control	Comparator threshold control
14	BIAS	Bias pin	1/2 V _{cc} output; connected to capacitor

● Measurement circuit

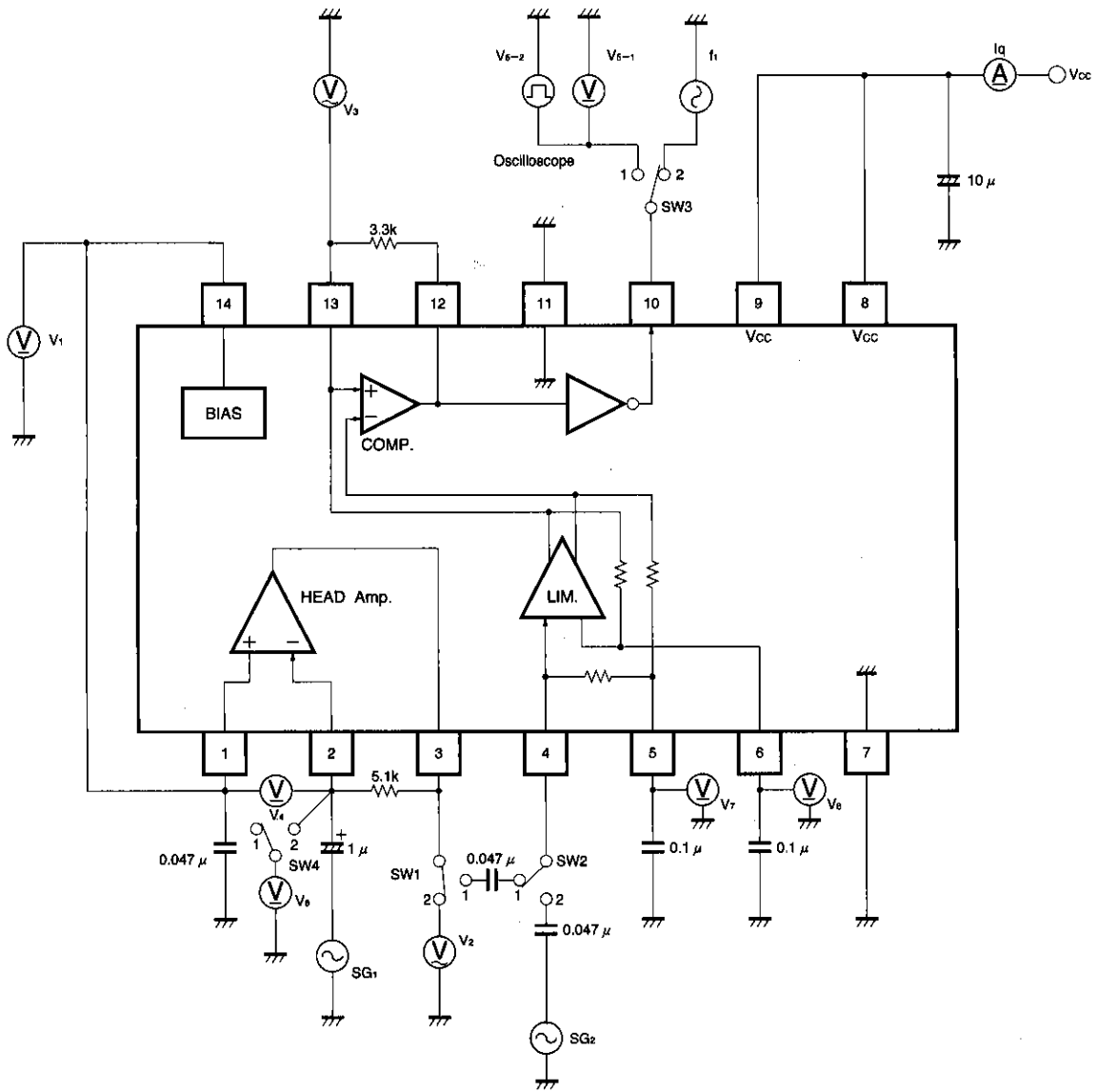
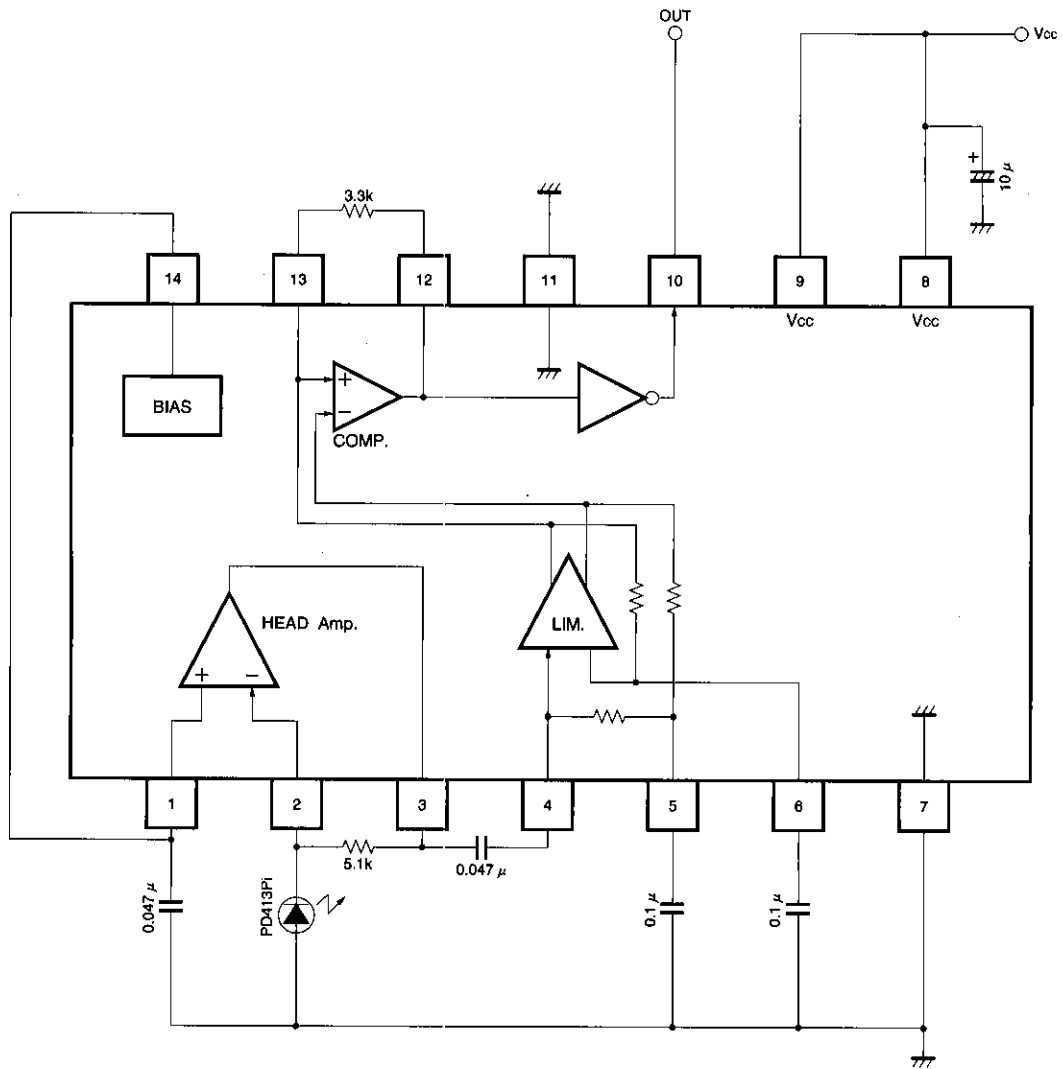


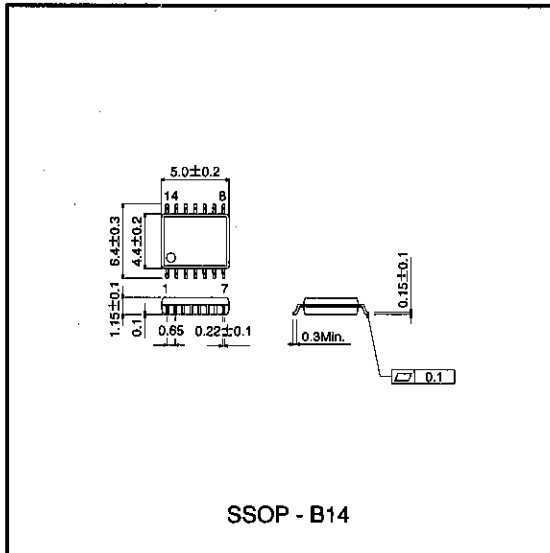
Fig. 1

Cellular phones/PHS/Pagers IFs for radio communications

● Application circuit



● External dimensions (Units: mm)



IFs for radio communications

Cellular phones / PHS / Pagers

Notes

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