

Wide band IF / waveform rectifier IC for infrared reception and RF 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 remote control operations such as remote keyless entry systems (RKE). The 14-pin SSOPB-14 package makes this product ideal for sets where compact size is required.

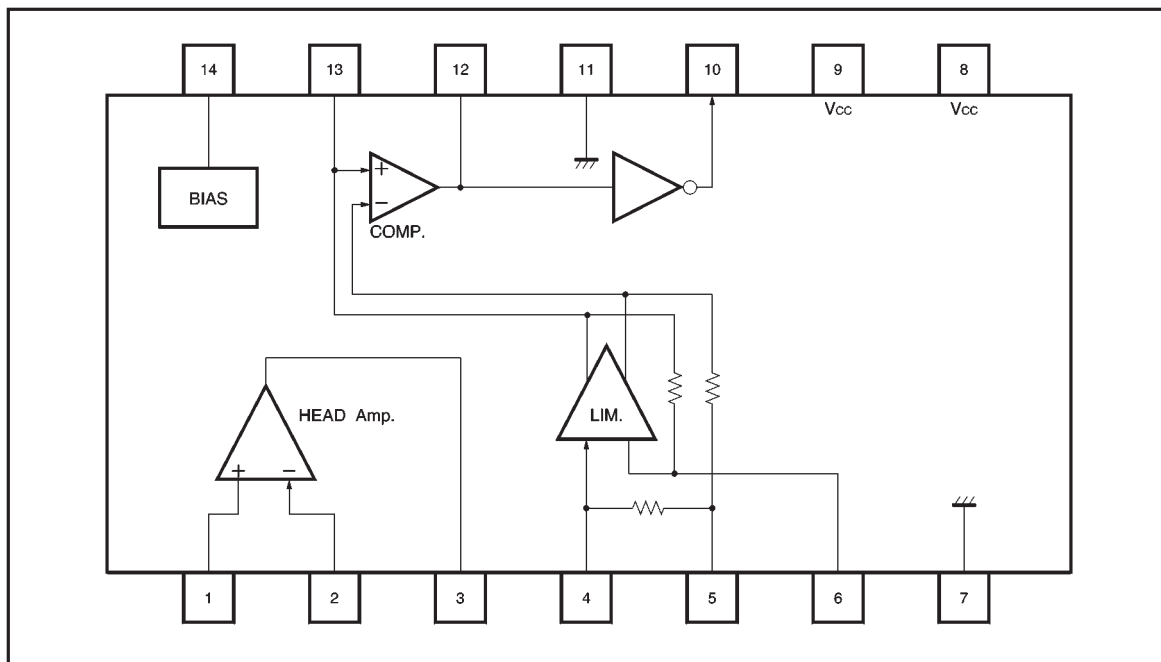
●Applications

Keyless vehicle entry, portable terminals

●Features

- 1) Low current dissipation (4mA typ.).
- 2) Accommodates infrared light reception ranging from 1kbps to 4Mbps.
- 3) Accommodates remote control units (keyless entry) using the ASK system.
- 4) Short output pulse rise and fall times (5ns typ.).
- 5) Variable input amplifier gain.
- 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	*
Operating temperature	T _{opr}	-25~+75	°C	
Storage temperature	T _{stg}	-55~+125	°C	

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

● Recommended operating conditions

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

* Ta = 25°C, for basic operation.

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Current consumption	I _q	3.0	4.0	5.0	mA	With no signal
Output high level voltage	V _{OH}	4.6	—	—	V	
Output low level 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.

● Pin descriptions

Pin No.	Pin name	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	Connected to bypass capacitor
6	BY - PASS2	Bypass	Connected to bypass capacitor
7	GND	Ground	
8	Vcc	Power supply	
9	D - Vcc	Power supply (comparator, inverter)	
10	OUT	Output	Inverter output (CMOS output)
11	D - GND	Ground (comparator, inverter)	
12	OUT	Output	Comparator output
13	VTH CTRL	VTH control	Comparator threshold control
14	BIAS	Bias	1/2 Vcc output; connected to capacitor

● Measurement circuit

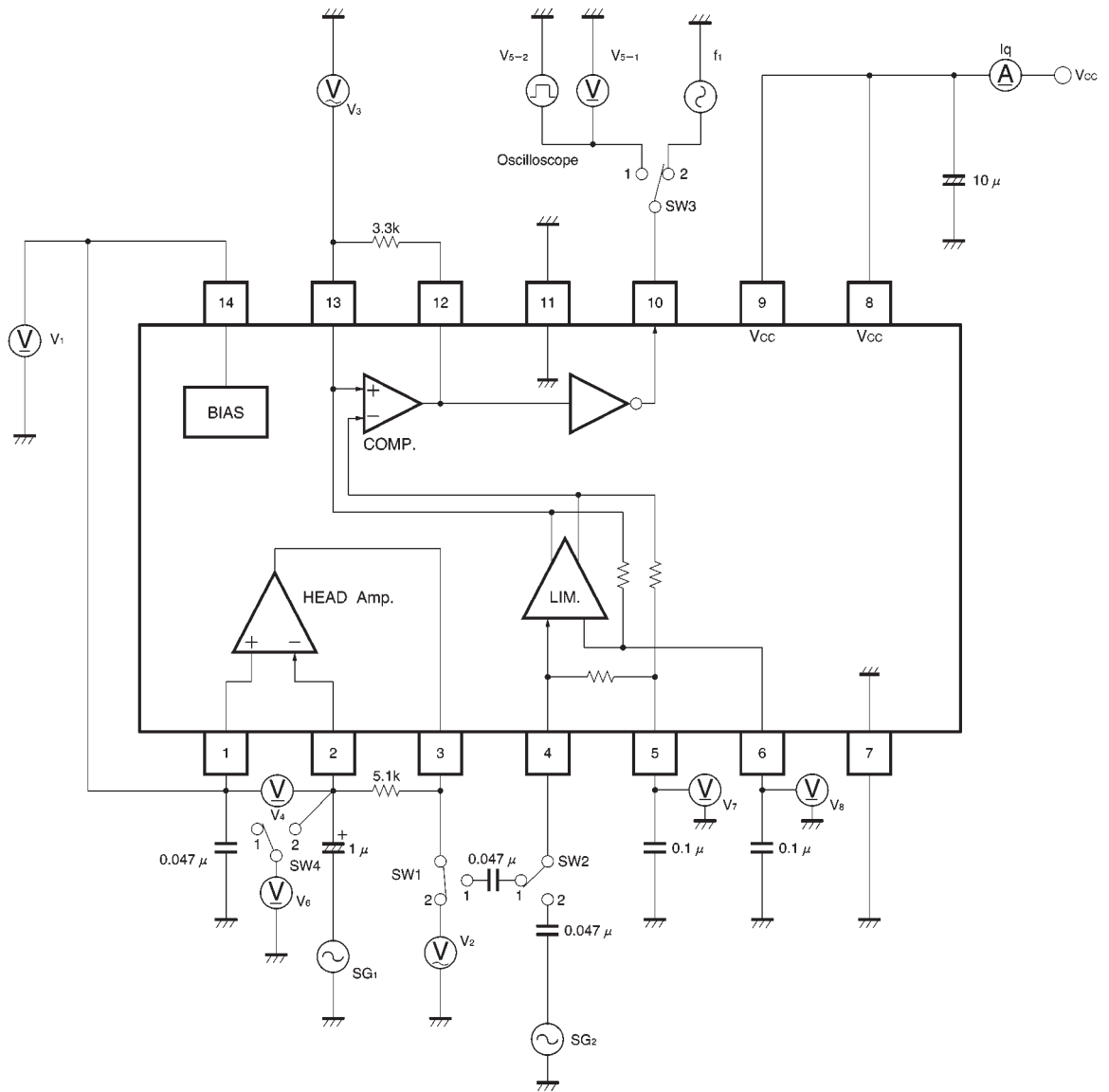


Fig. 1

● Application example

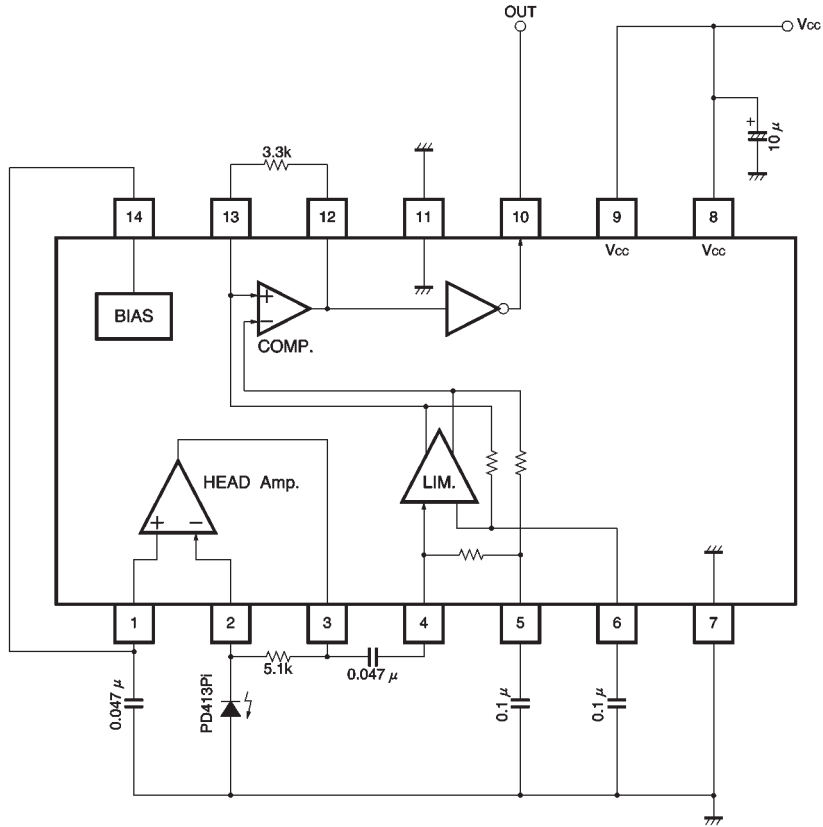


Fig. 2

● External dimensions (Units: mm)

