Contents

RECEIVER IC FOR INFRARED REMOTE CONTROLLER

S-8270A

The S-8270A is a CMOS IC developed for infrared remote control System. A photodetecting PIN diode can be directly connected. An input amplifier, limiter amplifier,band-pass filter, detector and an output waveform shaper are contained in a one-chip.

■ Features

Characteristics

- Power supply voltage : 2. 4 to 6. 0 V (I_{IN} = 30 μA)
- Current consumption: 0.13 mA typ. 0. 25 mA max. at 3. 0 V

Hardware functions

- Incorporates band-pass filter (possible to adjust resonance frequency by external resistance: f0 = 30 to 46KHz)
- Incorporates trap filter
- Possible to connect input terminal directly to photodetecting PIN diode
- Output logic is active "LOW"
- Output is generated N-channel open drain with pull-up resistor (Possible to connect output terminal directly to TTL or CMOS)

Package

- 8-pin SOP: S-8270AFE
- 8-pin DIP : S-8270ADP

■ Applications

- Infrared remote control encoder for TVs, VCRs, audio devices
- Infrared remote control TOYs

■ Functions

The S-8270A amplifies the voltage converted from the current signal of the PIN diode , which is coupled directly to S-8270A, at the reception of the infrared.
The signal, then, goes through the band-pass filter for noise reduction before being input to the discriminator. The discriminator recovers the transmitted data out of a burst signal. Finally the data are shaped by the signal shaping circuit.

■ Block diagram

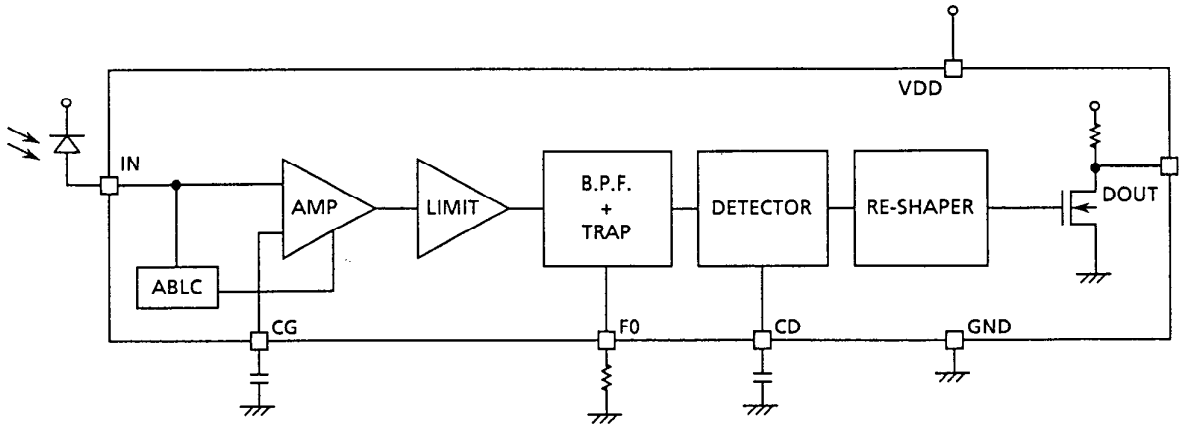


Figure 1

■ Terminals

1. Pin assignment (Top view)

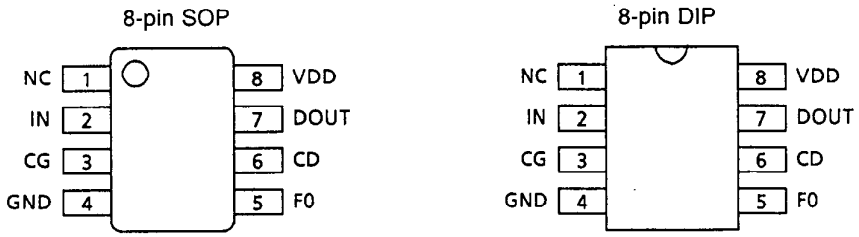
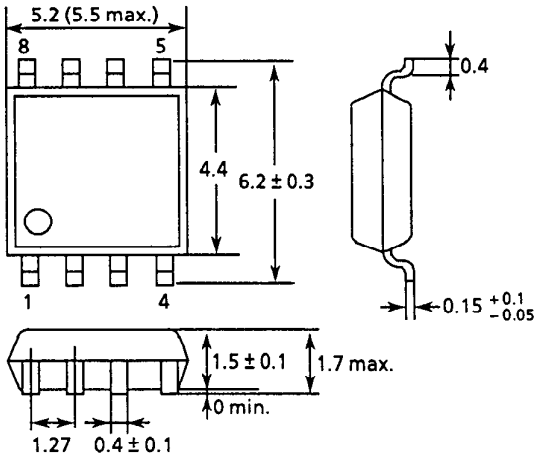


Figure 2

2. Dimensions

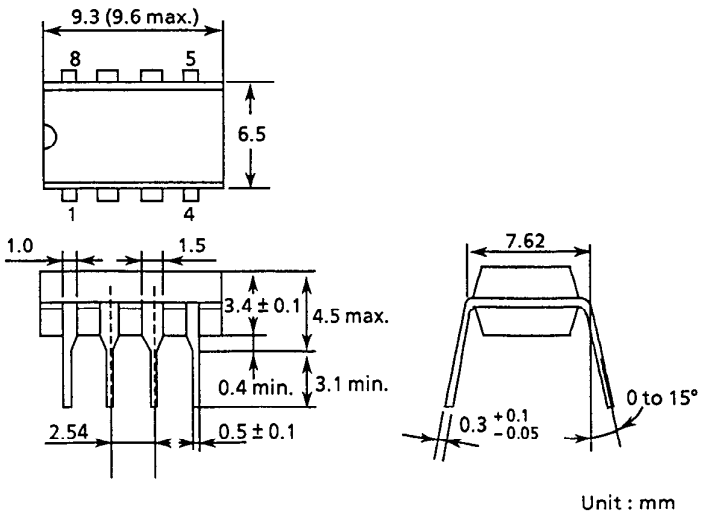
8-Pin SOP



Unit : mm

Figure 3

8-Pin DIP



Unit : mm

Figure 4

3. Terminal Description

Table 1

Terminal No.	Symbol	External parts	Description
1	NC		· No connection
2	IN	Photodetecting PIN diode	· Input terminal which connects photodetecting PIN diode. · Internal impedance is 50 kΩ typ. Therefore a photodetecting PIN diode can be directly connected. · ABLC (Automatic Bias Level Control) prevent from satulation of input level
3	CG	1500pF to 0.01μF	· Input terminal which connects condenser to AMP gain control.
4	VSS		· GND potential terminal.
5	F0	24K Ω	· Input terminal which connects resistance to adjust resonance frequency of band-pass filter (f0 = 30 to 46KHZ) · TRAP AMP. prevent from illigal action which is caused by high frequency noise of fluore scent lamp.
6	CD	200pF	· Input terminal which connects condenser to adjust detector circuit.
7	DOUT		· Output terminal which output logic is active "LOW". · Output is generated at N-channel open drain with pull-up resistor, which is easily interfaced to next stage circuit.
8	VDD		· Positive power supply

■ Absolute Maximum Ratings (Ta = 25°C)

Table 2

Item	Symbol	Rating	Unit
Storage temperature	Tstg	-40 to + 125	°C
Operating ambient temperature	Topr	-30 to + 85	°C
Power supply voltage	V_{DD}	-0.3 to + 7.0	V
Input voltage	V_{IN}	0 to V_{DD}	V
Output voltage	V_{OUT}	0 to V_{DD}	V
Power dissipation	Pd	200	mW

■ Recommended Operating Conditions

Table 3

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Power supply voltage	V_{DD}	I_{IN} = 30 μA	2.4		6.0	V
		I_{IN} = 300 μA	2.7		6.0	V
Input frequency	f_{in}		30		46	KHz
Condenser for AMP gain control	CG			2000		pF
Resistor to sdjust resonance frequency of band-pass filter	F0	f_{IN} = 38 KHz		24		KΩ
Condenser to adjust detector circuit	CD			200		pF

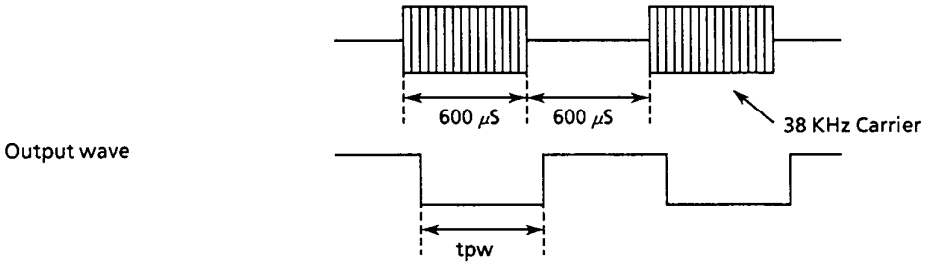
■ Electrical Characteristics (Ta = 25°C, V_{DD} = 3.0 V)

Table 4

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Operating current consumption	I_{DD}	$V_{IN} = V_{SS}$	—	0.13	0.25	mA
AMP gain	AV	fin = 38 KHz V_{IN} = 30 μVp-p (*1)	77	80	83	dB
Resonance frequency of band-pass filter	f0	V_{IN} = 300 μVp-p (*1)	—	38	—	KHz
Band width of band-pass filter	fBW	-3dB band width f0 = 38 KHz	2.0	2.5	3.0	KHz
Output pulse width	tpw	fin = 38 KHz BW V_{IN} = 50 mVp-p (*2)	440	—	770	μS
Low level output voltage	V_{OL}	I_{OL} = 0.1 mA	—	—	0.4	V
High level output current	I_{OH}	$V_{OH} = V_{DD}$	-1	—	1	μA
Input resistance	RIN	I_{IN} = 300 μA (*3)	30	50	70	KΩ
Input voltage 1	V_{IN1}	I_{IN} = 0 μA	—	0	—	V
Input voltage 2	V_{IN2}	I_{IN} = 300 μA	0.5	1.2	1.8	V
Output pull-up resistance	R_{OUT}	V_{DD} = 3.0V	50	100	200	KΩ

(*1) V_{IN} is input voltage

(*2) Input (burst wave)

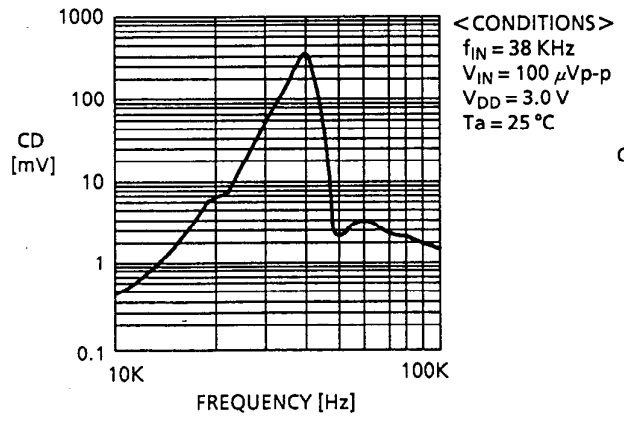


(*3) V_{IN} : Input voltage, Vr : Measurement voltage

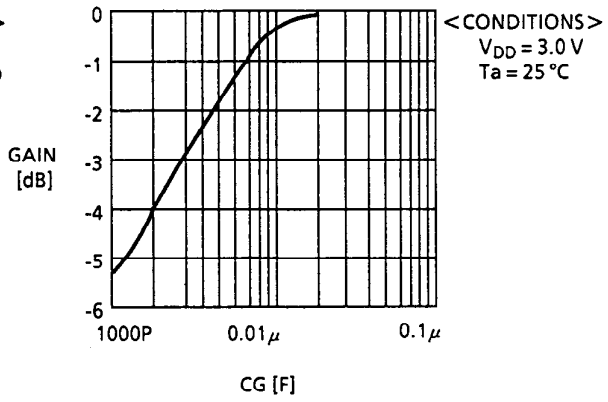
$$RIN = \frac{50}{V_{IN}/Vr-1} \ [K\Omega]$$

■ Electrical Characteristic Curves

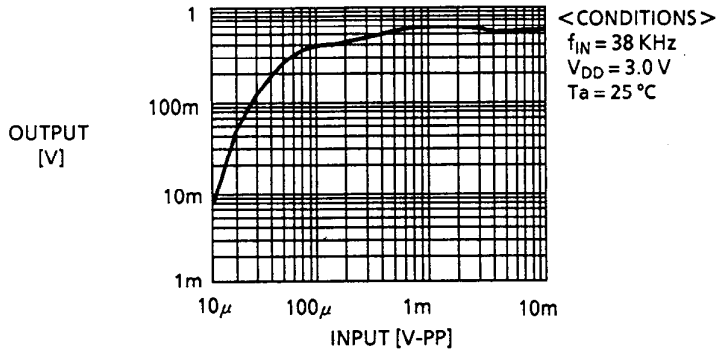
(1) Voltage Gain - Frequency



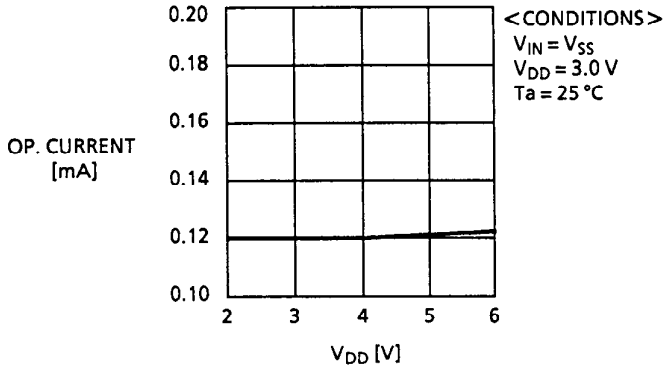
(2) AMP Gain - External Condenser



(3) Input - Output



(4) V_{DD} - Operating current



(5) B.P.F frequency - External Resistor