

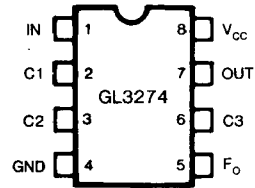
GL3274

Preamplifier for Remote Control Use

Description

The GL3274 is a bipolar IC for receiving preamplifier of infrared remote control system. It is comprised of a primary stage amplifier, limiter amplifier, BPF, signal stage amplifier, limiter amplifier, BPF, signal waveform detecting circuit, waveform shaping circuit, etc.

Pin Configurations



Features

- Low Power Consumption ($V_{CC}=5V$, 9 mW typ.)
- Low Power Supply Voltage ($V_{CC}=5V$)
- Built-in Filter (Enables to Vary Center frequency with an Externally Attached Resistor.
 $f_o=30$ kHz to 60 kHz, 40 kHz typ.)
- It is free from Inductance due to Magnetic Field Since it uses no Inductance Coil.
- Possible to Direct Connection to a Photodiode
- Open Collector Output (Possible to Direct Connection to TTL and CMOS)
- Package 8 SIP(A) or 8SOP(D)

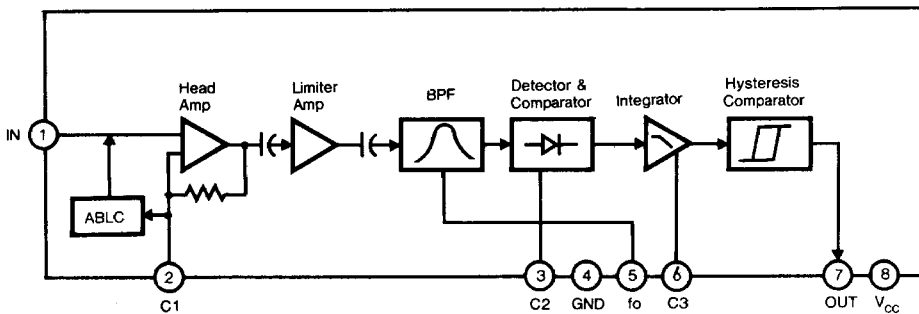
Absolute Maximum Ratings ($T_A=25^\circ C$)

Supply Voltage	V_{CC}	17	V
Input Voltage	V_{IN}	5	V_{P-P}
Operation Temperature	T_{opr}	-20 to +75	$^\circ C$
Storage Temperature	T_{stg}	-55 to +150	$^\circ C$
Allowable Power Dissipation	P_D	0.6 (A) 0.3 (D)	W

Recommended Operating Condition

Supply Voltage	V_{CC}	4.7 to 5.3	V
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Block Diagram



Electrical Characteristics: $V_{CC}=5V$, $T_A=25^\circ C$

No.	Item	Symbol	Test condition		Test Point	Min.	Typ.	Max.	Unit	Remark
			Signal	Level						
1	Input pin voltage (1)	V_{IN1}		S1, 8, 11-a	A	2.0	2.5	3.1	V	
2	Input pin voltage (2)	V_{IN2}		S1, 2, 4, 8, 11-a	A	0.6	1.0	1.7	V	
3	L Level output voltage	V_{OL}		S3, 7-a, 10, 11-a	D	-	0.2	0.4	V	
4	Output leakage current	I_{OH}		S3, 7-b, 9, 11-a	C	-	0	2.2	μA	
5	Voltage gain	A_V	40 kHz cw	$50\mu V_{p-p}$	S2, 5, 6, 7-c, 11-a	B	74	79	84	dB
6	BPF characteristics	A_{V0}	30kHz, 37 kHz, 43kHz, 50kHz cw	$50\mu V_{p-p}$	S2, 5, 6, 7-c, 11-a	B	4	9	-	dB *1
7	Input impedance	r_{in}	40kHz cw	$0.2 V_{p-p}$	S1, 2, 6, 8, 11-a	A	27	40	55	k Ω
8	Detecting ability (1)	V_{in1}	burst wave	$60\mu V_{p-p}$	S2, 5, 6, 8, 10, 11-a	D	440	540	770	μs
9	Detecting ability (2)	V_{in2}	burst wave	$50mV_{p-p}$	S2, 5, 6, 8, 10, 11-b	D	440	660	770	μs
10	Consumption current	I_{CC}		S3, 8, 11-a	E	1.0	1.8	2.8	mA	

Note: *1 The level ratio between AC level of during 37 kHz and that of 30 kHz denotes A1 [dB].

$$A1 \equiv 20 \log \frac{\text{measure value (f=37 kHz)}}{\text{measure value (f=30 kHz)}}$$

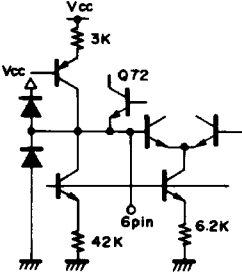
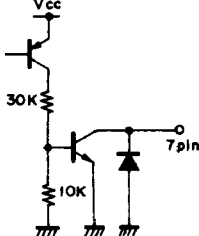
The level ratio between AC level of during 43 kHz and that of 50 kHz denotes A2 [dB].

$$A2 \equiv 20 \log \frac{\text{measure value (f=43 kHz)}}{\text{measure value (f=50kHz)}}$$

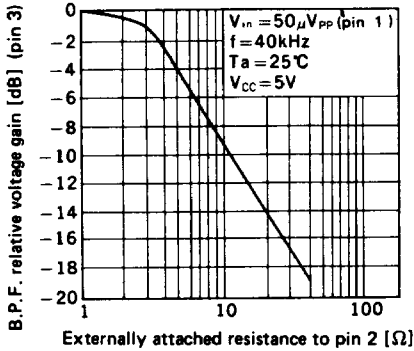
Note: *2 $r_{in} \equiv \frac{47 \text{ k}\Omega}{\frac{V_i}{V_x} - 1}$ [k Ω]

Pin Description: Pin voltages are depended on the DC Characteristics Test Circuit.

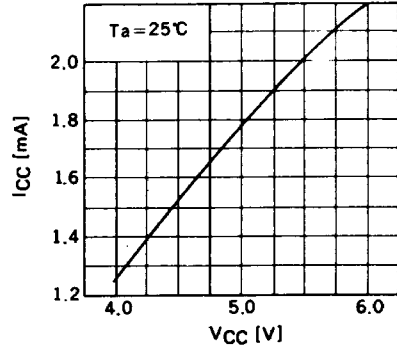
No.	Symbol	Voltage	Equivalent circuit	Description
1	IN	2.5V		<p>An input pin. Connect a photodiode with PIN structure between the pin and GND.</p>
2	C1	2.5V		<p>Connect a resistor and capacitor in series between the pin and GND and set the frequency characteristics and gain of the "Head amp". When the resistance is large and capacitance is small, the gain becomes small. When the capacitance is large, the sensitivity is lowered against the transient response.</p>
3	C2	1.5V		<p>Connect a detection capacitor between the pin and GND. When the capacitance is large, the sensitivity becomes lowered against the mean value detection wave and transient response. When the capacitance is small, fluctuation of the peak detection wave and output pulse width becomes large. The capacitor to be used is of standard 3.3 μF, however, set it so that the output pulse width fluctuation and noise elimination characteristics become optimum.</p>
4	GND			<p>An GND pin of the IC. Make the pattern design so that the parts to be attached externally will be located as closely as possible to this pin and to be grounded them at the same one point. The reaching distance and noise elimination characteristics are greatly influenced by the pattern design of around the GND.</p>
5	fo	1.4V		<p>Connect a resistor between the pin and the power supply. Set the center frequency of the built-in BPF. See "Pin 5 externally attached resistor vs. Center frequency characteristics".</p>

No.	Symbol	Voltage	Equivalent circuit	Description
6	C3	1.0V		<p>Connect an integral capacitor between the pin and GND. Connect an integral capacitor of standard 330 pF. When a large capacitance is used, it becomes strong against disturbance noise and the low level section of the output pulse becomes longer. However, if the capacitance becomes too large, the reaching distance becomes shorter.</p>
7	OUT	5.0V		<p>An open-collector output. Connect a loading resistor between this pin and the power supply. It should be low level standard of 0.2V when using a loading resistor of 2.2kΩ.</p>
8	V _{CC}	5.0V		<p>The power supply voltage pin.</p>

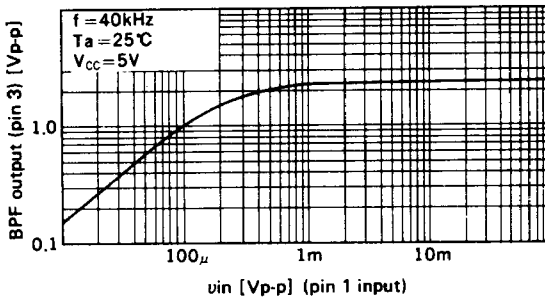
A_v characteristics vs. Externally attached resistance to pin 2



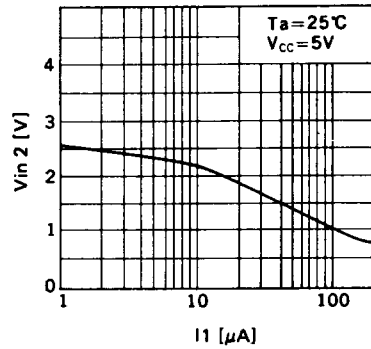
I_{CC} vs. V_{CC} characteristics



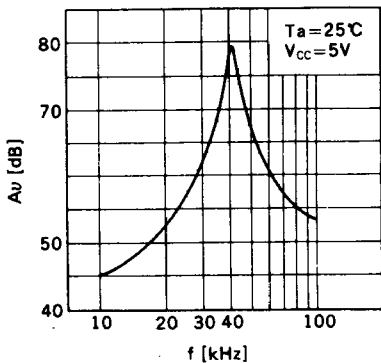
Pin 3 output voltage characteristics vs. Pin 1 input voltage



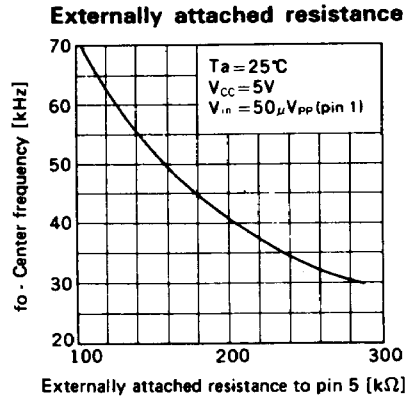
V_{IN2} vs. I₁ characteristics



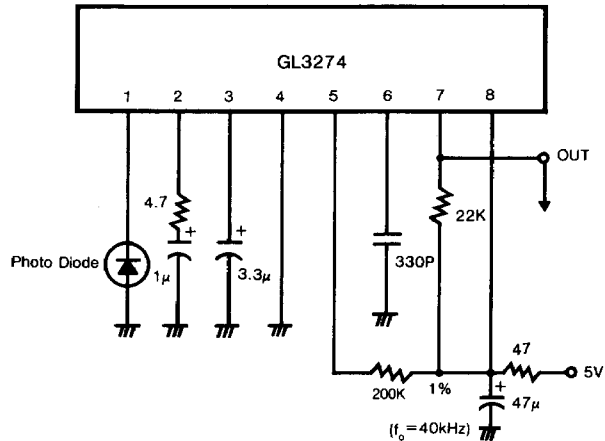
A_v vs. f characteristics



Center frequency characteristics vs. Externally attached resistance



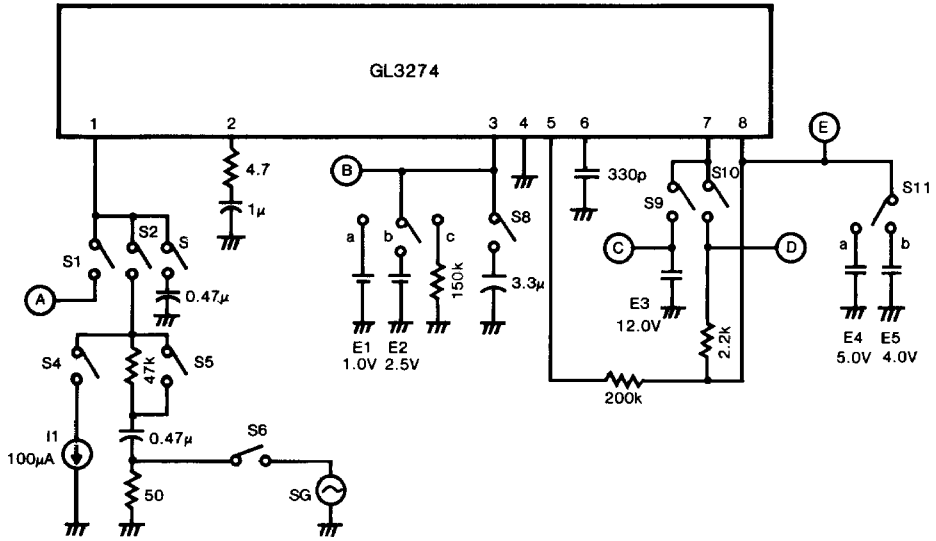
Application Circuit



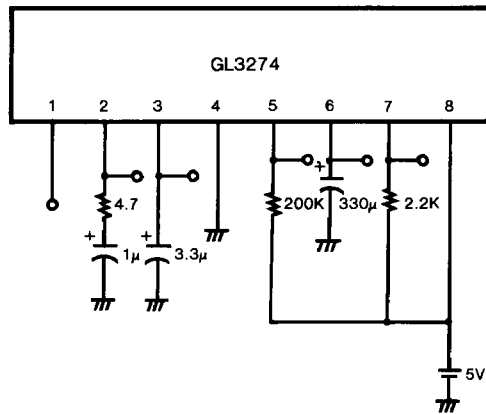
Description of Operation (See the Block Diagram)

Receive the infrared signal transmitted from the infrared remoted control commander with a photodiode and output rectangular waves as an output.

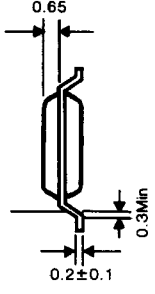
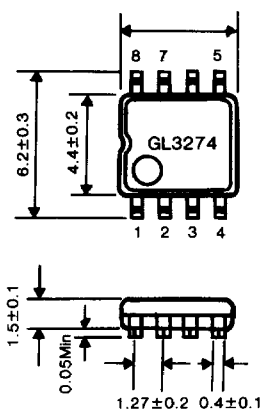
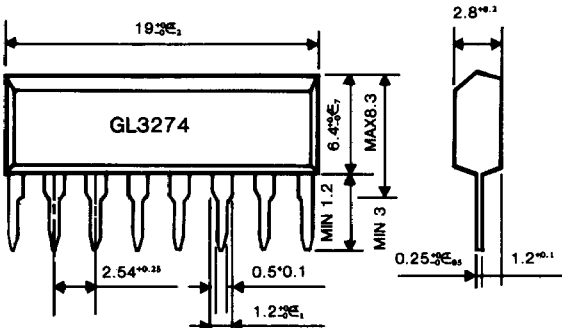
I/O pin	Waveform	Operation
Pin 1 input waveform		Converts the signal current of a photodiode into voltage and amplifies it.
BPF output waveform (Pin 3)		Suppresses the noise component with BPF.
Pin 6 Hysteresis Comparator input waveform		Detects the signal component and performs wave detection.
Pin 7 output waveform		Integrates the signal component and makes it as rectangular wave output from the Hysteresis Comparator.



DC Characteristics Test Circuit



Output Dimension



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