

KA2184

LINEAR INTEGRATED CIRCUIT

REMOTE CONTROL PREAMPLIFIER

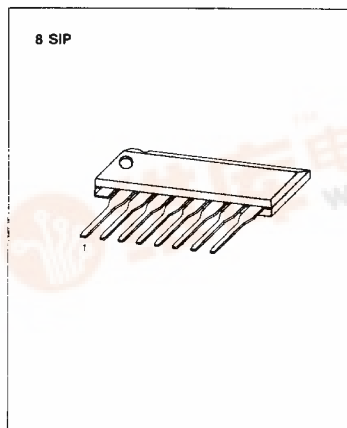
The KA2184 is a bipolar IC for the receiving pre-amplifier of infra-red remote control systems.

FUNCTIONS

- Primary stage amplifier
- Limiter amplifier
- BPF
- Signal waveform detecting
- Waveform shaping

FEATURES

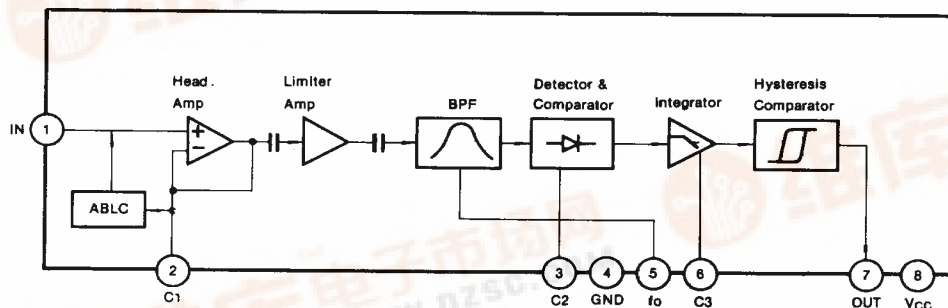
- Low power consumption ($V_{CC} = 5V$, 9mW typ)
- Low power supply voltage ($V_{CC} = 5V$)
- Built-in filter (Enables to vary center frequency with an externally attached resistor. $f_0 = 30KHz$ to $60KHz$, 40KHz typ.)
- It is free from inductance due to magnetic field since it uses no L.
- Possible to direct connection to a photodiode
- Open collector output (possible to direct connection to TTL and CMOS)



ORDERING INFORMATION

Device	Package	Operating Temperature
KA2184G	Bare Chip	-20 ~ +75
KA2184-15	8 SIP	-20 ~ +75
KA2184-18	8 SIP	-20 ~ +75
KA2184-20	8 SIP	-20 ~ +75

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

Characteristics	Symbol	Value	Unit
Power Supply Voltage	V _{CC}	+ 12	V
Input Voltage	V _{IN}	5	V _{pp} (Pin 1 input)
Operating Temperature	T _{opr}	- 20 ~ + 75	°C
Storage Temperature	T _{stg}	- 55 ~ + 150	°C
Allowable Power Dissipation	P _D	0.4	W

RECOMMENDED OPERATING CONDITIONS

Characteristics	Symbol	Min.	Typ.	Max.	Unit
Power Supply	V _{CC}	4.7	—	5.3	V

ELECTRICAL CHARACTERISTICS (V_{CC} = 5V, Ta = 25°C)

Characteristics	Symbol	Test Conditions			Test Point	Min.	Typ.	Max.	Unit
		Signal	Level	ON-SW					
Input Pin Voltage (1)	V _{IN1}			S1, 8, 11-a	A	2.0	2.5	3.1	V
Input Pin Voltage (2)	V _{IN2}			S1, 2, 4, 8, 11-a	A	0.6	1.0	1.7	V
L level output voltage	V _{OL}			S3, 7-a, 10, 11-a	D	—	0.2	0.4	V
Output Leakage Current	I _{OH}			S3, 7-b, 9, 11-a	C	—	0	2.2	μA
Voltage Gain	A _v	40KHz cw	50μV _{pp}	S2, 5, 6, 7-c, 11-a	B	74	79	84	dB
BPF Characteristics	A _{vo}	30KHz, 37KHz, 43KHz, 50KHz cw	50μV _{pp}	S2, 5, 6, 7-c, 11-a	B	4	9	—	dB
Input Impedance	r _{in}	40KHz cw	0.2 V _{pp}	S1, 2, 6, 8, 11-a	A	27	40	55	KΩ
Detecting Ability (1)	V _{in1}	burst wave	60μV _{pp}	S2, 5, 6, 8, 10, 11-a	D	440	540	770	μs
Detecting Ability (2)	V _{in2}	burst wave	50mV _{pp}	S2, 5, 6, 8, 10, 11-b	D	440	660	770	μs
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 37KHz and that of 30KHz denotes A1 (dB).

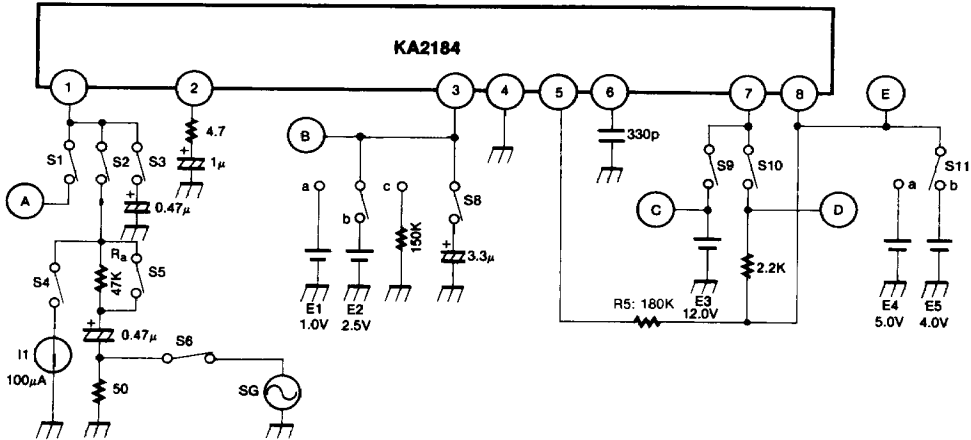
$$A1 = 20 \log \frac{\text{measure value (f = 37KHz)}}{\text{measure value (f = 30KHz)}}$$

The level ratio between AC level of during 43KHz and that of 50KHz denotes A2 (dB).

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

Note 2.
$$r_{in} = \frac{47K\Omega}{\frac{V_i}{V_x} - 1}$$

TEST CIRCUITS



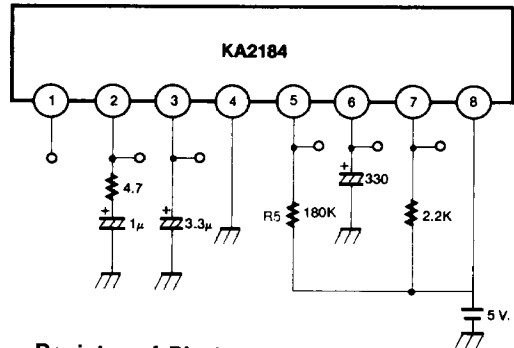
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STANDARD CIRCUIT DESIGN DATA

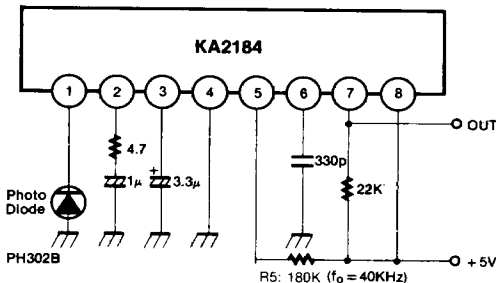
DC Characteristics (See DC Current Measuring Circuit)

Pin	Pin Voltage	Remark
1	2.5V	
2	2.5V	
3	1.5V	
4	—	GND Pin
5	1.4V	
6	1.0V	
7	5.0V	
8	—	Power Source Pin

DC Characteristics Measuring Circuit



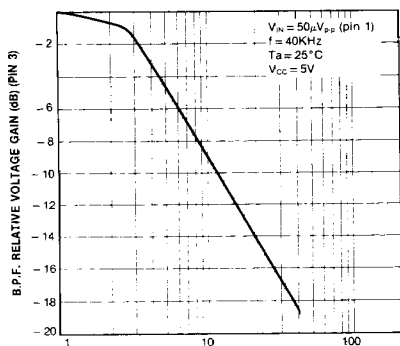
TYPICAL APPLICATION CIRCUITS



Resistor of Pin 5

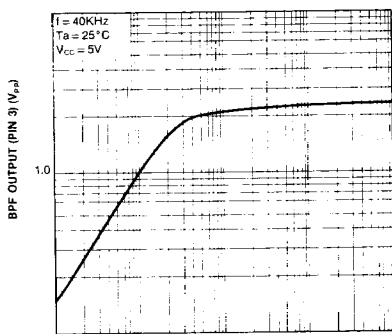
	R5 of PIN 5 (Kohm)
KA2184-15	150
KA2184-18	180
KA2184-20	200

A_v CHARACTERISTICS VS. EXTERNALLY ATTACHED RESISTANCE TO PIN 2



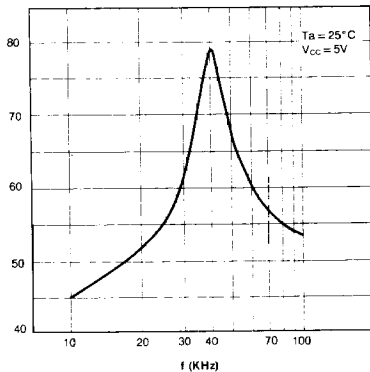
EXTERNALLY ATTACHED RESISTANCE TO PIN 2 (Ω)

PIN 3 OUTPUT VOLTAGE CHARACTERISTICS VS. PIN 1 INPUT VOLTAGE

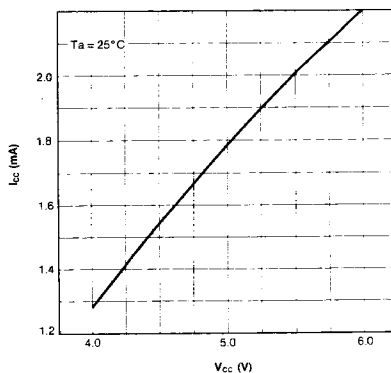


V_{in} (V_{pp}) (PIN 1 INPUT)

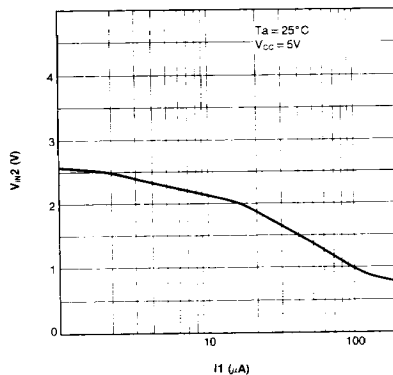
A_v VS. f CHARACTERISTICS



I_{CC} VS. V_{CC} CHARACTERISTICS



V_{IN2} VS. I₁ CHARACTERISTICS



CENTER FREQUENCY CHARACTERISTICS VS. EXTERNALLY ATTACHED RESISTANCE

