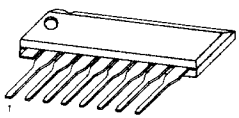
REMOTE CONTROL PREAMPLIFIER

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

8 SIP



FUNCTIONS

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

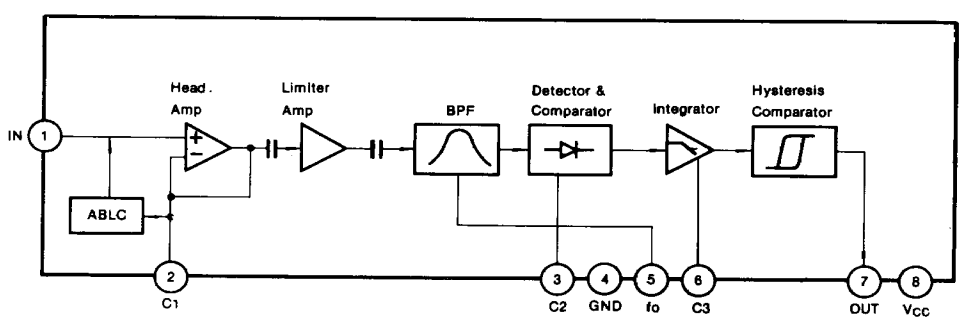
FEATURES

- **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 resister. fo = 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	$V_{p\text{-}p}$ (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)	$V_{IN}1$			S1, 8, 11-a	A	2.0	2.5	3.1	V
Input Pin Voltage (2)	$V_{IN}2$			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	$50\mu V_{p\text{-}p}$	S2, 5, 6, 7-c, 11-a	B	74	79	84	dB
BPF Characteristics	A_{VO}	30KHz, 37KHz, 43KHz, 50KHz cw	$50\mu V_{p\text{-}p}$	S2, 5, 6, 7-c, 11-a	B	4	9	—	dB
Input Impedance	r_{in}	40KHz cw	0.2 $V_{p\text{-}p}$	S1, 2, 6, 8, 11-a	A	27	40	55	KΩ
Detecting Ability (1)	$V_{in}1$	burst wave	$60\mu V_{p\text{-}p}$	S2, 5, 6, 8, 10, 11-a	D	440	540	770	μs
Detecting Ability (2)	$V_{in}2$	burst wave	$50mV_{p\text{-}p}$	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).

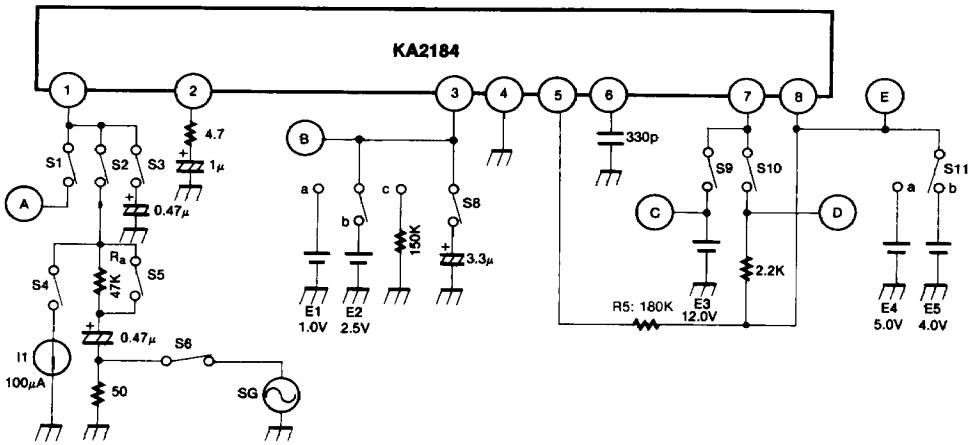
$$A1 = 20 \log \frac{\text{measure value (f = 37KHz)}}{\text{measure value (f = 30KHz)}}$$

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. $$rin = \frac{47K\Omega}{\frac{V_i}{V_x} - 1}$$

TEST CIRCUITS

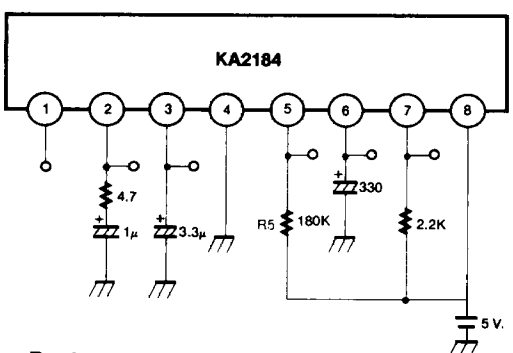


STANDARD CIRCUIT DESIGN DATA

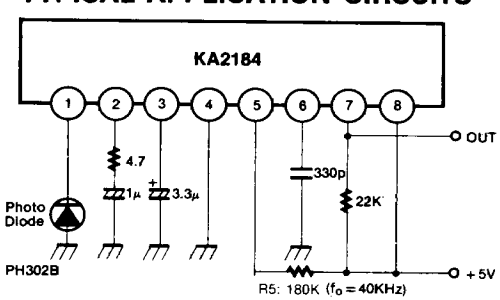
DC Characteristics (See DC Current Measuring Circuit)

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



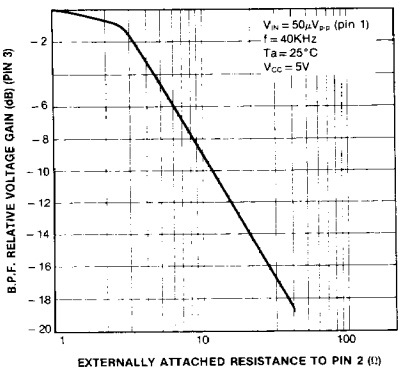
TYPICAL APPLICATION CIRCUITS



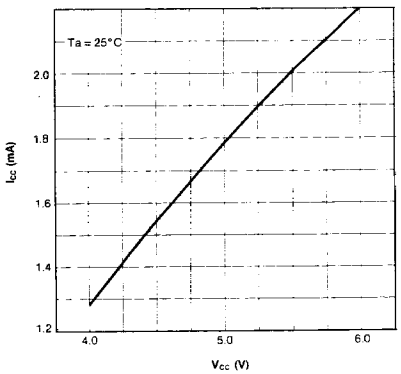
Resistor of Pin 5

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

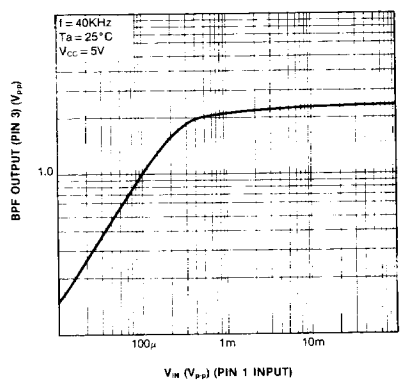
A_V CHARACTERISTICS VS. EXTERNALLY ATTACHED RESISTANCE TO PIN 2



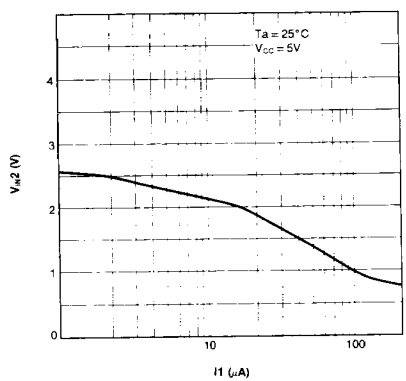
I_{CC} VS. V_{CC} CHARACTERISTICS



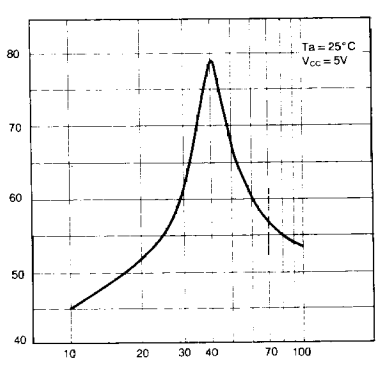
PIN 3 OUTPUT VOLTAGE CHARACTERISTICS VS. PIN 1 INPUT VOLTAGE



V_{IN2} VS. I_1 CHARACTERISTICS



A_V VS. f CHARACTERISTICS



CENTER FREQUENCY CHARACTERISTICS VS. EXTERNALLY ATTACHED RESISTANCE