BIPOLAR ANALOG INTEGRATED CIRCUIT

μPC1158H2

LOW NOISE PREAMPLIFIER WITH AUTOMATIC LEVEL CONTROL SILICON BIPOLAR MONOLITHIC INTEGRATED CIRCUIT

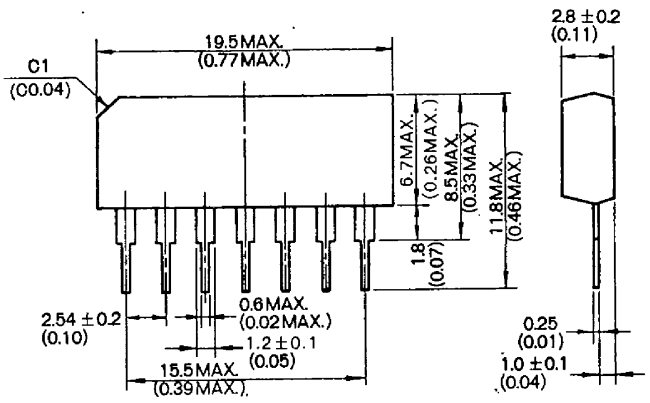
DESCRIPTION

The μPC1158H2 is a silicon monolithic integrated circuit designed for high gain, low noise preamplifier with Automatic Level Control (ALC).

As an advanced production process is used, the device has an excellent feature of very low pulsive noise characteristics.

It is ideally suitable for use as a recording and playing amplifier in a cassette tape recorder.

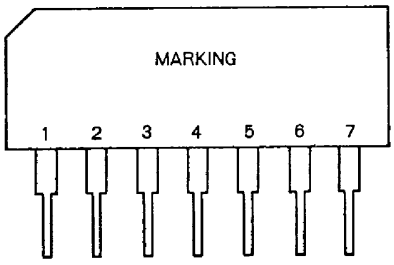
PACKAGE DIMENSIONS
in millimeters (inches)



FEATURES

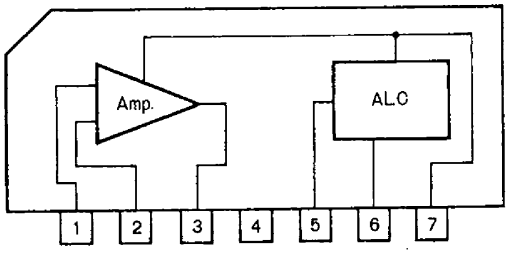
- Low noise, especially low pulsive noise.
- Wide supply voltage range (V_{CC} = 2.2 ~ 15 V).
- High gain: A_{vo} = 70 dB TYP.
- High output voltage: V_{OM} = 1.0 Vr.m.s. TYP.
- Low distortion.
- Wide ALC range.
- SIP assures easy mounting on printed circuit board.
- Fast build up power switch on.

CONNECTION DIAGRAM



Pin No.	Electrical Connection
1	INPUT
2	N.F.B.
3	OUTPUT
4	GROUND
5	ALC OUTPUT
6	ALC INPUT
7	V_{CC}

BLOCK DIAGRAM



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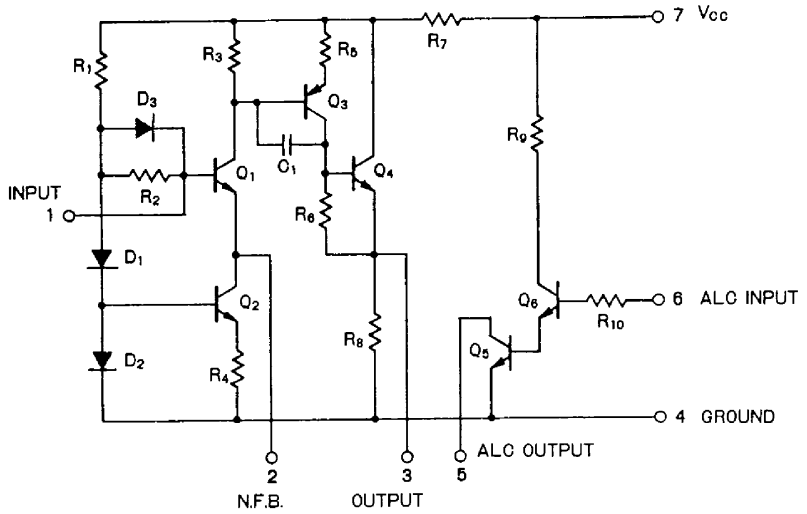
EQUIVALENT CIRCUIT



ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Supply Voltage	V_{CC}	15.0	V
Package Dissipation (Ta=75°C)	P_D	270	mW
Operating Temperature	T_{opt}	−20 to +75	°C
Storage Temperature	T_{stg}	−40 to +125	°C

RECOMMENDED CONDITIONS (Ta=25°C)

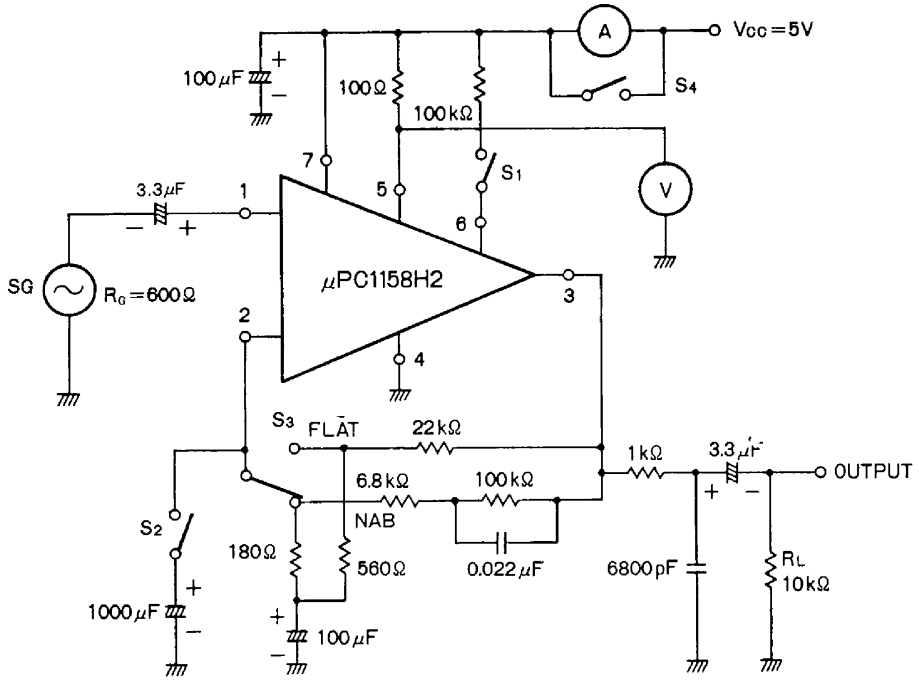
Operating Supply Voltage	5.0	V
Supply Voltage Range	2.2 to 15.0	V

ELECTRICAL CHARACTERISTICS (Ta=25°C, Vcc=5V, f=1kHz, R_L=10kΩ)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Circuit Current	I_{CC}	0.9	1.5	2.2	mA	$v_{in}=0$
Open Loop Voltage Gain	A_{vo}	64	70		dB	$v_{in}=-80$dBm
Voltage Gain	A_v		33.5		dB	$v_{in}=-50$dBm
Maximum Output Voltage	V_{OM}	0.7	1.0		V	T.H.D.=1%
Input Impedance	r_i		100		kΩ	f=1kHz
Equivalent Input Noise Voltage	v_{nin}		1.2	2.0	μVr.m.s.	R_G=2.2kΩ, NAB Equalized 15~30kHz BPF+40dB Amp.
Collector Voltage of ALC Transistor	V_5		0.7		V	Pin 7 to Pin 6: 100kΩ Pin 7 to Pin 5: 100Ω

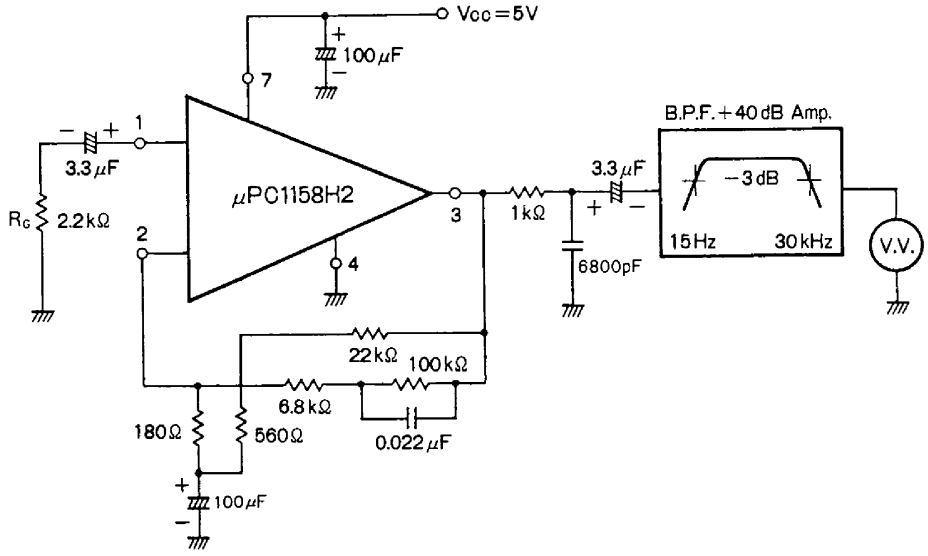
TEST CIRCUITS

Test Circuit for General Characteristics Given in the Table Below.



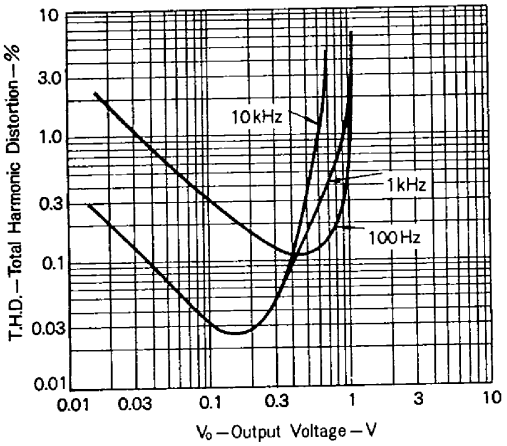
CHARACTERISTIC	SYMBOL	S_1	S_2	S_3	S_4	TEST POINT
Circuit Current	I_{CC}	OFF	OFF	NAB	OFF	Pin 7
Open Loop Voltage Gain	A_{vo}	OFF	ON	FLAT	ON	Pin 3
Voltage Gain	A_v	OFF	OFF	NAB	ON	Pin 3
Maximum Output Voltage	V_{OM}	OFF	OFF	NAB	ON	Pin 3
Collector Voltage of ALC Transistor	V_5	ON	OFF	NAB	ON	Pin 5

Test Circuit for Noise Voltage.

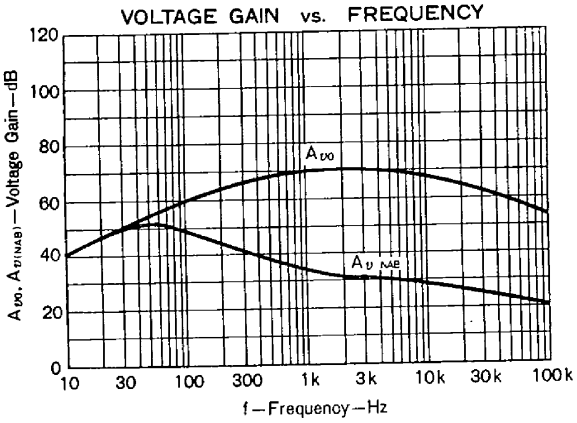


TYPICAL CHARACTERISTICS (Ta=25°C)

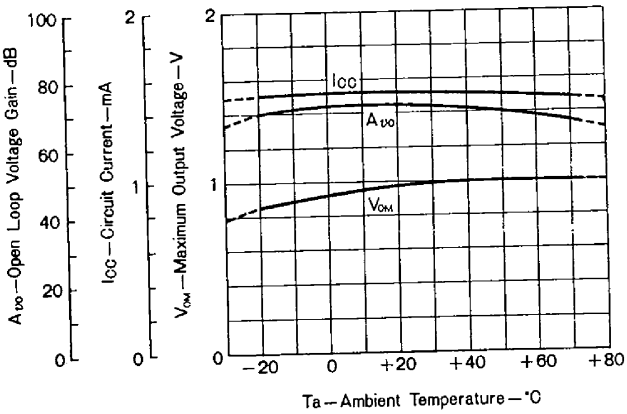
TOTAL HARMONIC DISTORTION vs. OUTPUT VOLTAGE



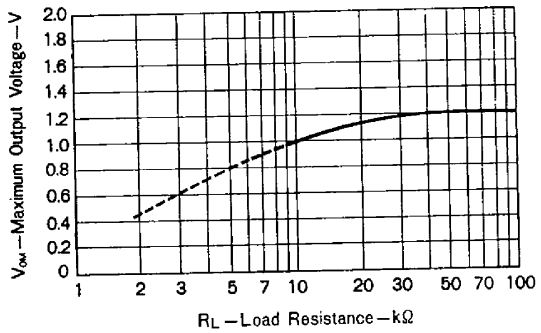
VOLTAGE GAIN vs. FREQUENCY



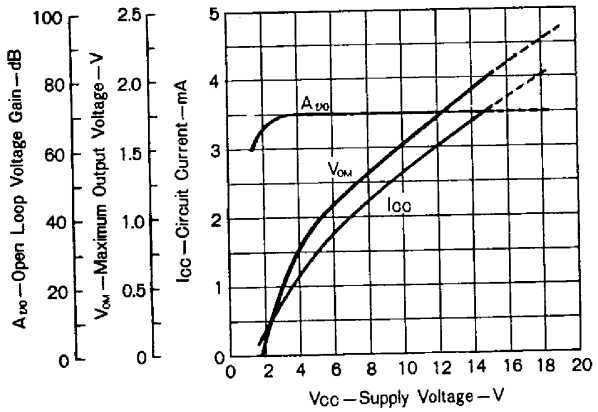
CIRCUIT CURRENT, MAXIMUM OUTPUT VOLTAGE, OPEN LOOP VOLTAGE GAIN vs. AMBIENT TEMPERATURE



MAXIMUM OUTPUT VOLTAGE vs. LOAD RESISTANCE

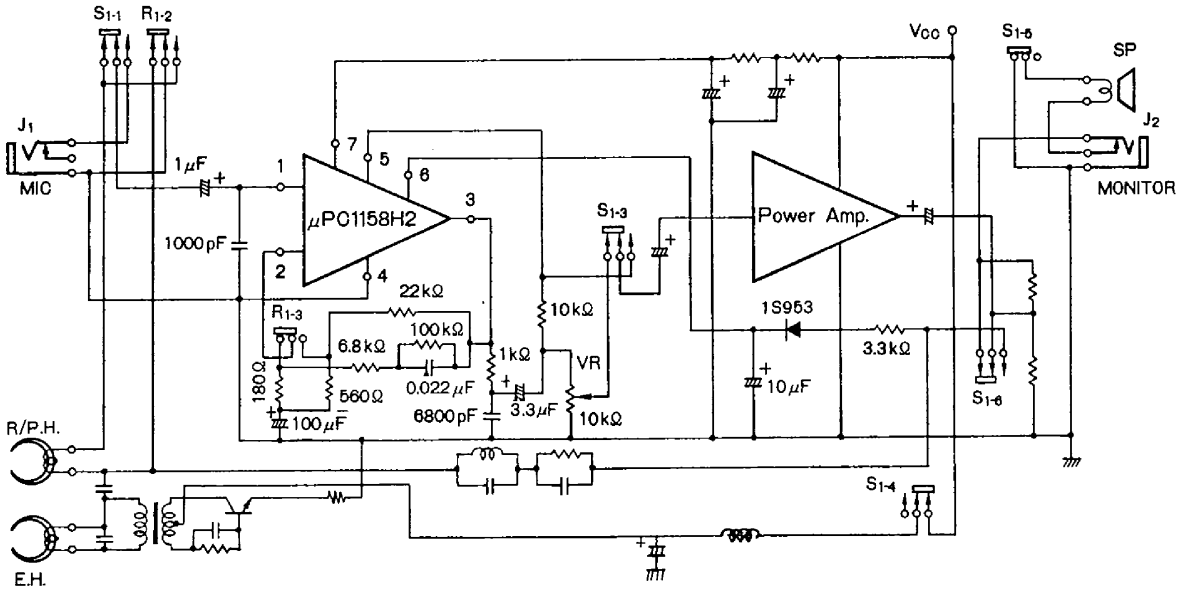


CIRCUIT CURRENT, MAXIMUM OUTPUT VOLTAGE, OPEN LOOP VOLTAGE GAIN vs. SUPPLY VOLTAGE



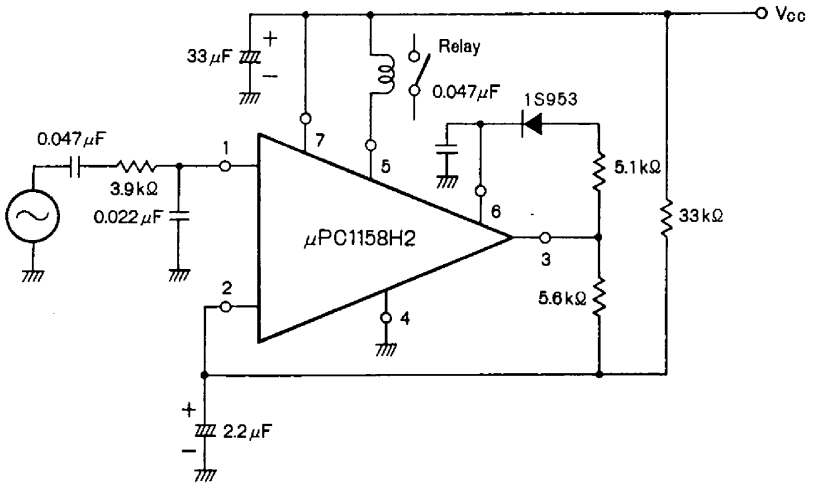
TYPICAL APPLICATIONS

Pre Amplifier for Cassette Tape Recorder.



* Rec./Play Switch S_{1-1} ~ S_{1-7} are shown in play mode.
* Actual D.C. resistance of feed back element between pin 2 and pin 3 is advisable about 18kΩ or more.

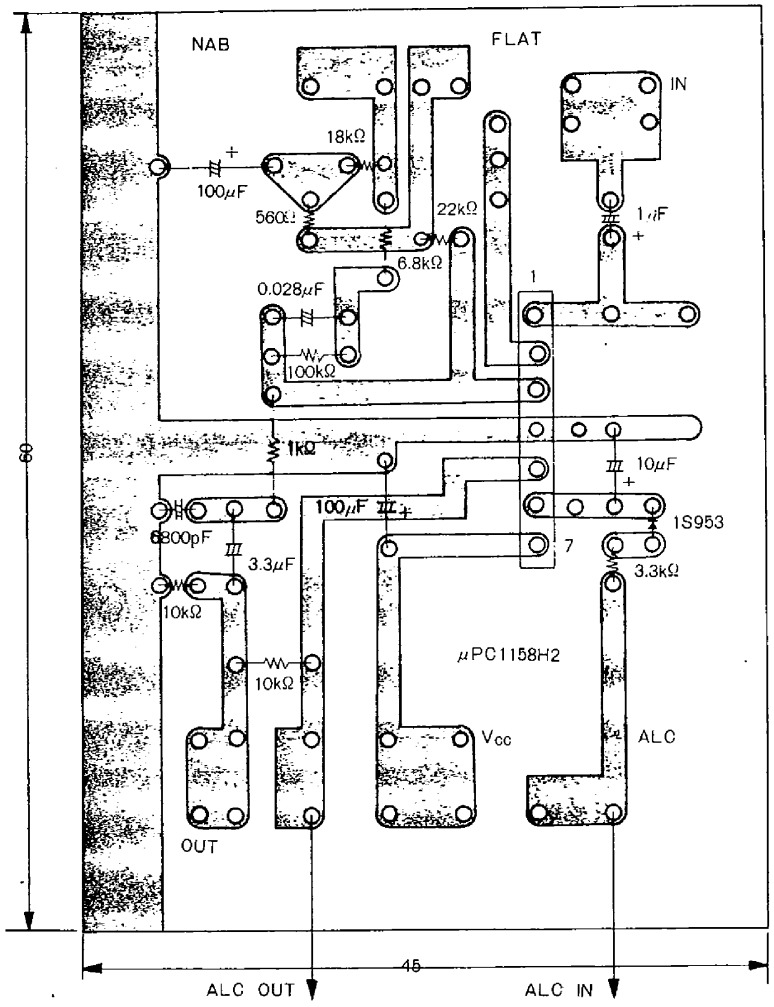
Relay Driver for Radio Control Equipment.



TYPICAL PRINTED CIRCUIT BOARD PATTERN

(1) Pre-Amplifier for Cassette Tape Recorder.

PRINTED CIRCUIT LAYOUT & COMPONENT LAYOUT (BOTTOM VIEW)



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IC-1153A
MAY-15-78K
Printed in Japan