

BIPOLAR ANALOG INTEGRATED CIRCUIT

μ PC1158H2

LOW NOISE PREAMPLIFIER WITH AUTOMATIC LEVEL CONTROL

SILICON BIPOLAR MONOLITHIC INTEGRATED CIRCUIT

DESCRIPTION

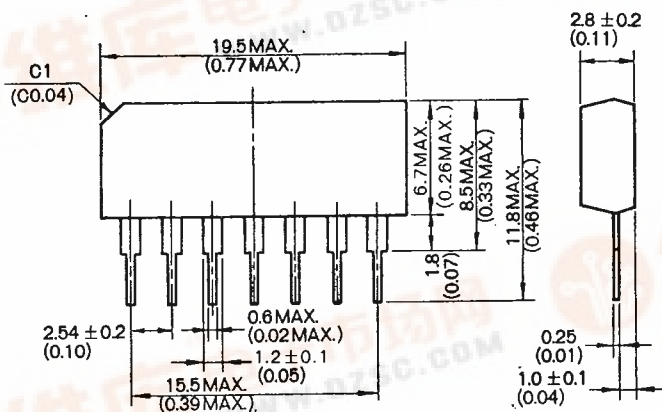
The μ PC1158H2 is a silicon monolithic integrated circuit designed for high gain, low noise preamplifier with Automatic Level Control (ALC).

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

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

PACKAGE DIMENSIONS

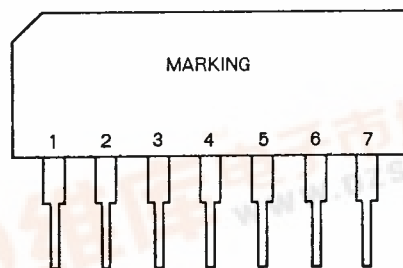
in millimeters (inches)



FEATURES

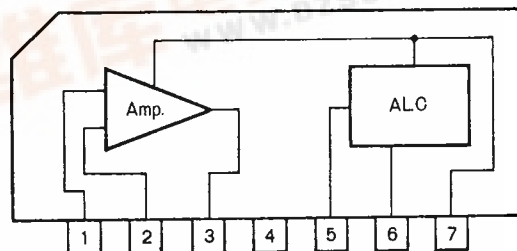
- Low noise, especially low pulsed noise.
- Wide supply voltage range
($V_{CC} = 2.2 \sim 15V$).
- High gain: $A_{VO} = 70dB$ TYP.
- High output voltage: $V_{OM} = 1.0V_{r.m.s.}$ TYP.
- Low distortion.
- Wide ALC range.
- SIP assures easy mounting on printed circuit board.
- Fast build up power switch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

CONNECTION DIAGRAM

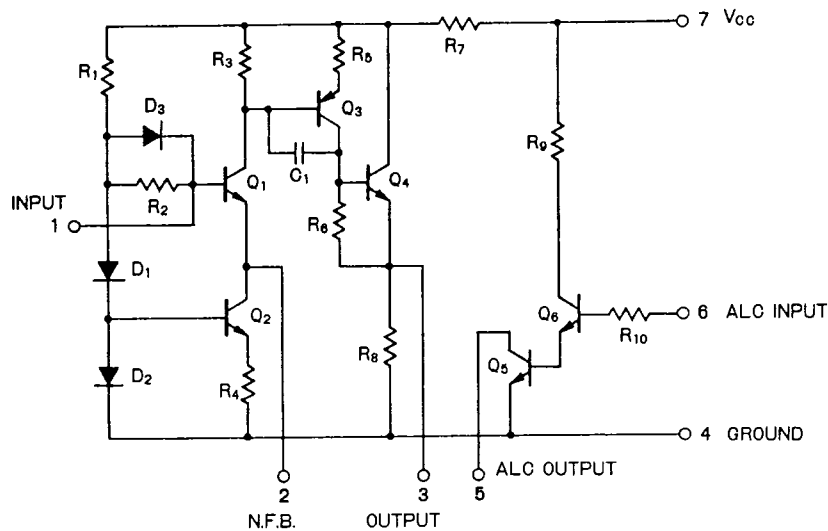


Pin No.	Electrical Connection
1	INPUT
2	N.F.B.
3	OUTPUT
4	GROUND
5	ALC OUTPUT
6	ALC INPUT
7	V_{CC}

BLOCK DIAGRAM



EQUIVALENT CIRCUIT



ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

Supply Voltage	V_{CC}	15.0	V
Package Dissipation ($T_a = 75^\circ\text{C}$)	P_D	270	mW
Operating Temperature	T_{opt}	-20 to +75	$^\circ\text{C}$
Storage Temperature	T_{stg}	-40 to +125	$^\circ\text{C}$

RECOMMENDED CONDITIONS ($T_a = 25^\circ\text{C}$)

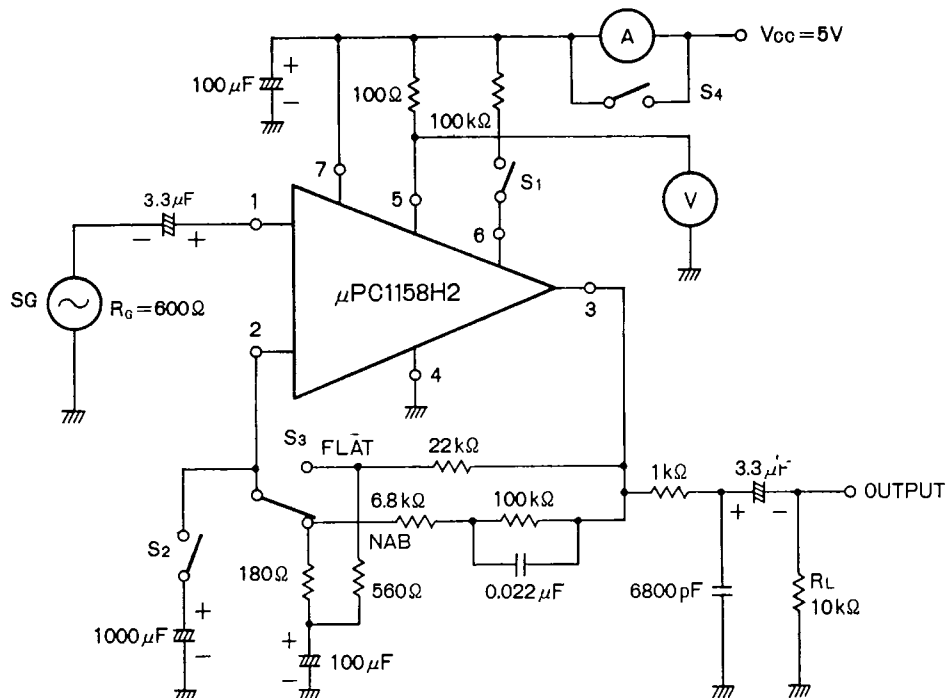
Operating Supply Voltage	5.0	V
Supply Voltage Range	2.2 to 15.0	V

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$, $V_{CC} = 5\text{V}$, $f = 1\text{kHz}$, $R_L = 10\text{k}\Omega$)

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	$v_{in} = -80\text{dBm}$
Voltage Gain	A_v		33.5		dB	$v_{in} = -50\text{dBm}$
Maximum Output Voltage	V_{OM}	0.7	1.0		V	T.H.D. = 1%
Input Impedance	r_i		100		$\text{k}\Omega$	$f = 1\text{kHz}$
Equivalent Input Noise Voltage	v_{nin}		1.2	2.0	$\mu\text{Vr.m.s.}$	$R_G = 2.2\text{k}\Omega$, NAB Equalized 15~30kHz BPF + 40dB Amp.
Collector Voltage of ALC Transistor	V_5		0.7		V	Pin 7 to Pin 6: $100\text{k}\Omega$ Pin 7 to Pin 5: 100Ω

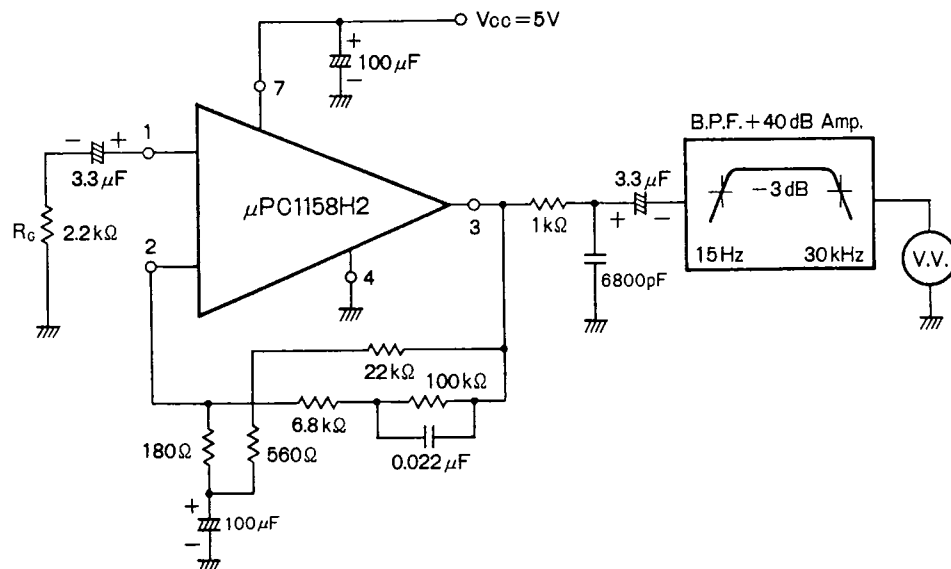
TEST CIRCUITS

Test Circuit for General Characteristics Given in the Table Below.



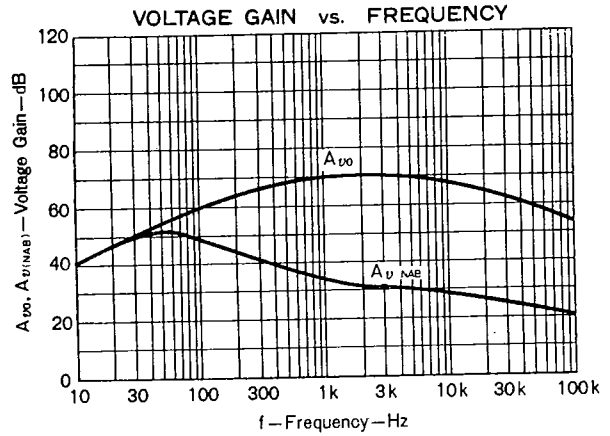
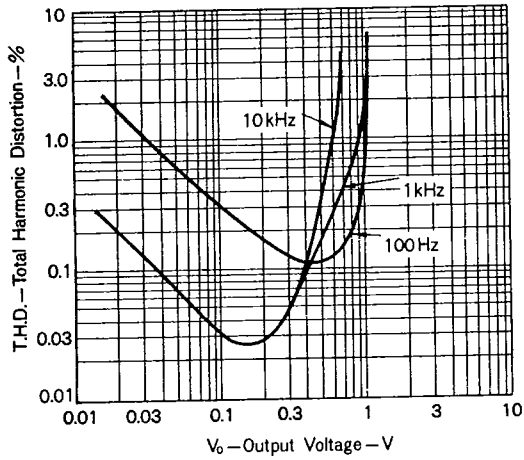
CHARACTERISTIC	SYMBOL	S ₁	S ₂	S ₃	S ₄	TEST POINT
Circuit Current	I_{CC}	OFF	OFF	NAB	OFF	Pin 7
Open Loop Voltage Gain	A_{VO}	OFF	ON	FLAT	ON	Pin 3
Voltage Gain	A_V	OFF	OFF	NAB	ON	Pin 3
Maximum Output Voltage	V_{OM}	OFF	OFF	NAB	ON	Pin 3
Collector Voltage of ALC Transistor	V_5	ON	OFF	NAB	ON	Pin 5

Test Circuit for Noise Voltage.

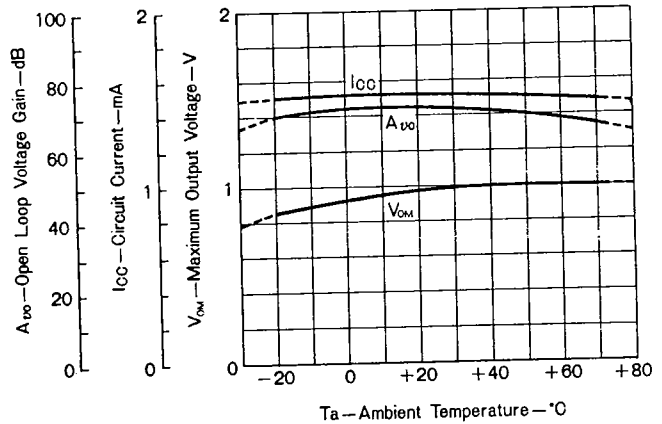
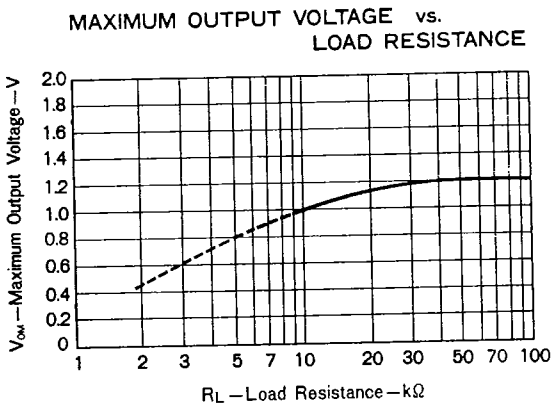


TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

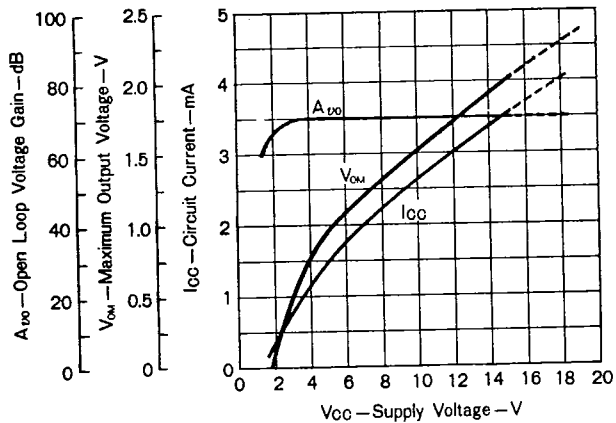
TOTAL HARMONIC DISTORTION vs. OUTPUT VOLTAGE



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

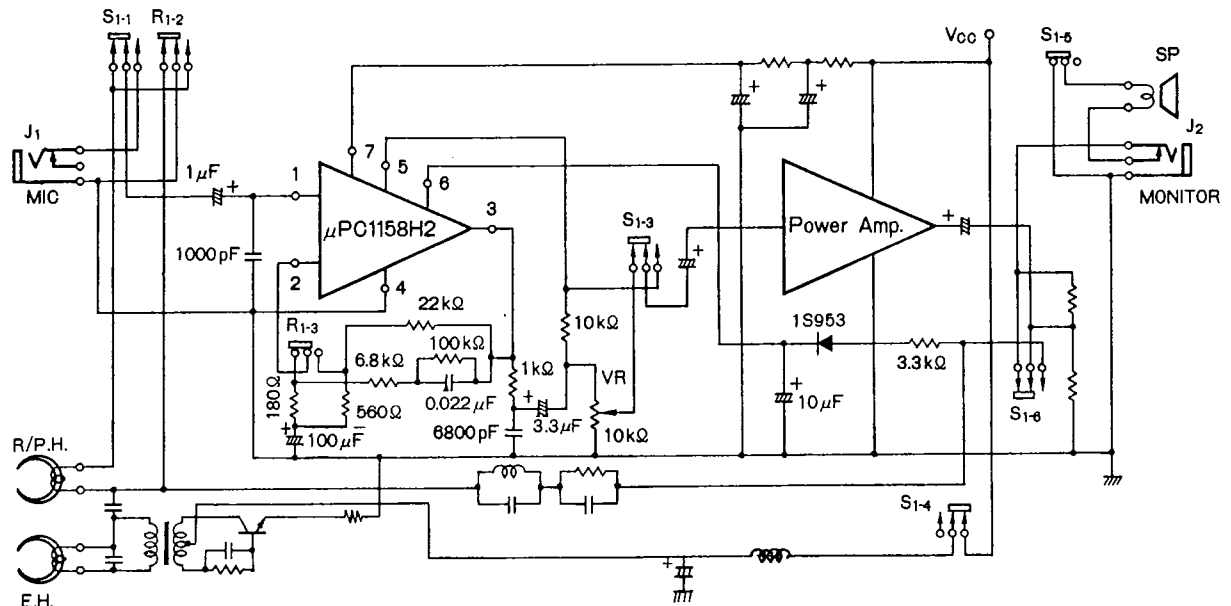


CIRCUIT CURRENT, MAXIMUM OUTPUT VOLTAGE, OPEN LOOP VOLTAGE GAIN vs. SUPPLY VOLTAGE



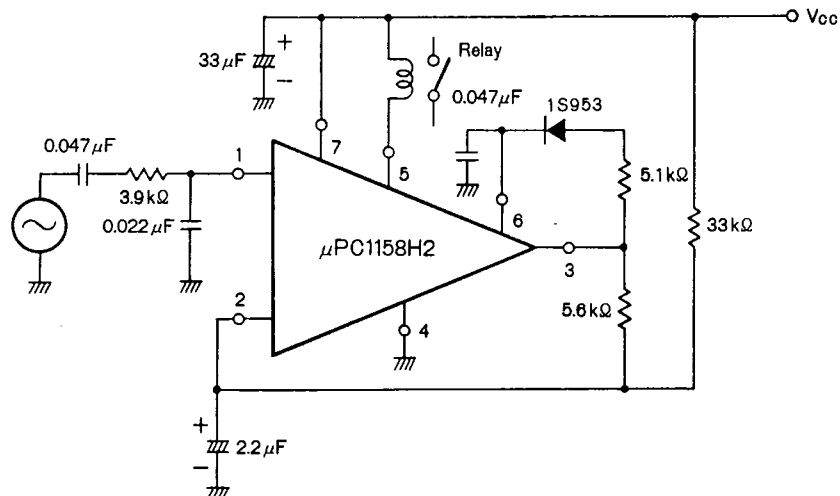
TYPICAL APPLICATIONS

Pre Amplifier for Cassette Tape Recorder.



- * Rec./Play Switch S1-1 ~ S1-7 are shown in play mode.
- * Actual D.C. resistance of feed back element between pin 2 and pin 3 is advisable about 18 kΩ 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)

