

BIPOLAR ANALOG INTEGRATED CIRCUIT

μ PC4572

LOW SUPPLY VOLTAGE, ULTRA LOW-NOISE, HIGH SPEED, WIDE BAND, LOW I_B DUAL OPERATIONAL AMPLIFIER

DESCRIPTION

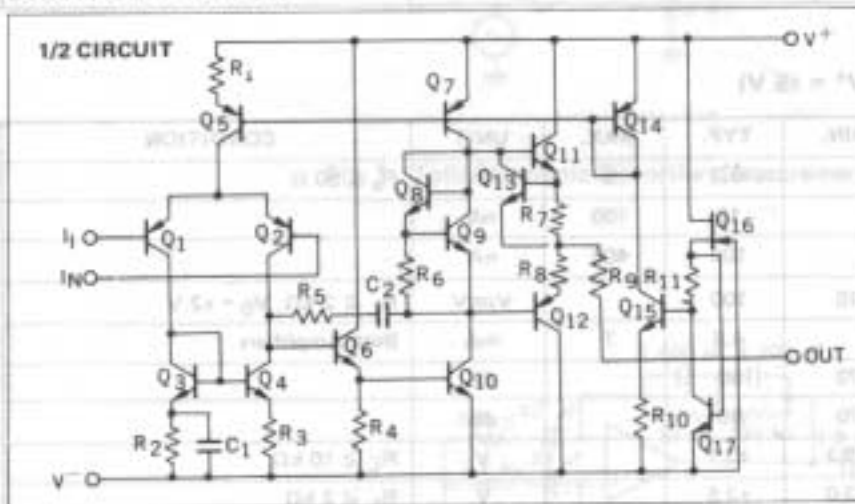
The μ PC4572 is a dual wide band, ultra low noise operational amplifier designed for low supply voltage operation of +4 V to +14 V single supply and ± 2 V to ± 7 V split supplies. Using high h_{FE} PNP transistors for the input circuit, input bias current and input equivalent noise are better than conventional wide band operational amplifier.

The μ PC4572 is an excellent choice for preamplifiers and active filters in audio, instrumentation, and communication circuit.

FEATURES

- Ultra Low Noise : $e_n = 4 \text{ nV}/\sqrt{\text{Hz}}$
- Low Input Bias Current : 100 nA
- High Slew Rate : 6 V/ μ s
- Low Supply Voltage : from ± 2 V to ± 7 V (Split)
from +4 V to +14 V (Single)
- Internal Frequency Compensation

EQUIVALENT CIRCUIT

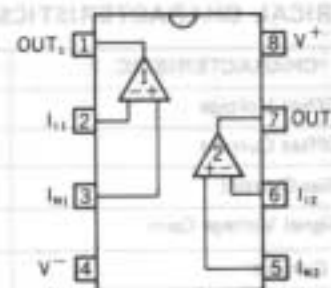


ORDERING INFORMATION

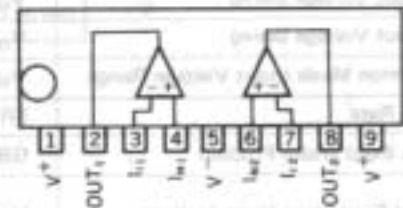
Part Number	Package
μ PC4572C	8 PIN PLASTIC DIP (300 mil)
μ PC4572G2	8 PIN PLASTIC SOP (225 mil)
μ PC4572HA	9 PIN SLIM SIP

CONNECTION DIAGRAM (Top View)

• μ PC4572C, 4572G



• μ PC4572HA



ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C)

PARAMETER	μPC4572	UNIT
Voltage between V ⁺ and V ⁻	15	V
Differential Input Voltage	±10	V
Input Voltage (Note 1)	±5	V
Power Dissipation	C Package (Note 2)	350 mW
	G Package (Note 3)	440 mW
	HA Package (Note 2)	350 mW
Output Short Circuit Duration	10	s
Operating Temperature Range	-20 to +80	°C
Storage Temperature Range	-55 to +125	°C

Note 1: The absolute maximum input voltage is equal to the supply voltage.

Note 2: Thermal derating factor is -5 mW/°C when ambient temperature is higher than 55 °C.

Note 3: Thermal derating factor is -4.4 mW/°C when ambient temperature is higher than 25 °C.

RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage (Split)	V [±]	±2	±5	±7	V
Supply Voltage (Single)	V ⁺	+4	+5/+12	+14	V
Capacitive Load (A _v = +1)	C _L			100	μF
Output Current	I _O			±10	mA

ELECTRICAL CHARACTERISTICS (T_a = 25 °C, V[±] = ±5 V)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITION
Input Offset Voltage	V _{IO}	0.3	5		mV	R _s ≤ 50 Ω
Input Offset Current	I _{IO}	10	100		nA	
Input Bias Current	I _B	100	400		nA	
Large Signal Voltage Gain	A _v	10	100		V/mV	R _L ≥ 2 kΩ, V _O = ±2 V
Supply Current	I _{CC}	4.5	7		mA	Both Amplifiers
Common Mode Rejection Ratio	CMR	70	90		dB	
Supply Voltage Rejection Ratio	SVR	70	85		dB	
Output Voltage Swing	V _{om}	±3.3	±3.7		V	R _L ≥ 10 kΩ
Output Voltage Swing	V _{om}	±3.0	±3.5		V	R _L ≥ 2 kΩ
Common Mode Input Voltage Range	V _{ICM}	±3.5	±4		V	
Slew Rate	SR	3.5	6		V/μs	A _v = 1, R _L ≥ 2 kΩ
Gain Band Width Product	GBW	10	16		MHz	f _o = 100 kHz
Input Equivalent Noise Voltage	V _n		0.5	0.65	μV _{r.m.s.}	FLAT + JIS A, R _s = 100 Ω
			0.8		μV _{r.m.s.}	RIAA
Unity Gain Frequency	f _{unity}		9		MHz	Open Loop
Phase Margin	φ _{unity}		60		°	Open Loop
Total Harmonic Distortion	THD		0.002		%	V _O = 1 V _{r.m.s.} , f = 20 Hz to 20 kHz
Input Noise Voltage	E _n		4.5		nV/√Hz	f _o = 10 Hz
			4.0		nV/√Hz	f _o = 1 kHz
Input Noise Current	Z _n		0.7		pA/√Hz	f _o = 1 kHz
Channel Separation			120		dB	f = 20 Hz to 20 kHz
Offset Voltage Drift	ΔV _{IO} /ΔT		2		μV/°C	
Output Short Circuit Current	I _{o short}	±15	±20		mA	R _L = 0

ELECTRICAL CHARACTERISTICS (T_a = 25 °C, V⁺ = 5 V, V⁻ = GND)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITION
Input Offset Voltage	V _{IO}		0.3	5	mV	R _L ≤ 50 Ω
Input Offset Current	I _{IO}		10	100	nA	
Input Bias Current	I _B		100	400	nA	
Large Signal Voltage Gain	A _v	8	80		V/mV	R _L ≥ 2 kΩ
Supply Current	I _{CC}		4	6	mA	Both Amplifiers
Common Mode Rejection Ratio	CMR	60	75		dB	
Supply Voltage Rejection Ratio	SVR	60	70		dB	
Output Voltage (High)	V _{OH}	3.2	3.5		V	R _L ≥ 2 kΩ
Output Voltage (Low)	V _{OL}		1.3	1.6	V	R _L ≥ 2 kΩ
Common Mode Input Voltage Range	V _{ICM}	1.5		3.5	V	
Slew Rate	SR		4		V/μs	A _v = 1
Gain Band Width Product	GBW		12		MHz	

MEASUREMENT CIRCUIT

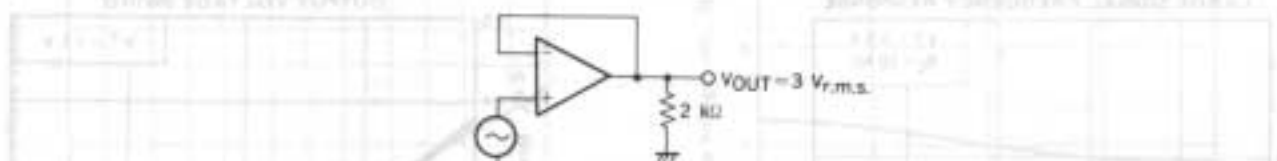


Fig. 1 Total Harmonic Distortion Measurement Circuit

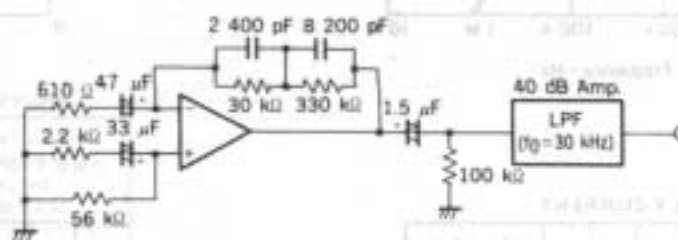


Fig. 2 Noise Measurement Circuit

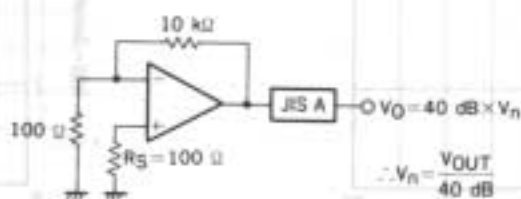


Fig. 3 Flat Noise Measurement Circuit