

HA17747/P

Dual Operational Amplifier

HITACHI

ADE-204-044 (Z)

Rev. 0

Dec. 2000

Description

The HA17747/P is a dual internal phase compensation high-performance operational amplifier, that is appropriate for use in a wide range of applications in the test and control fields.

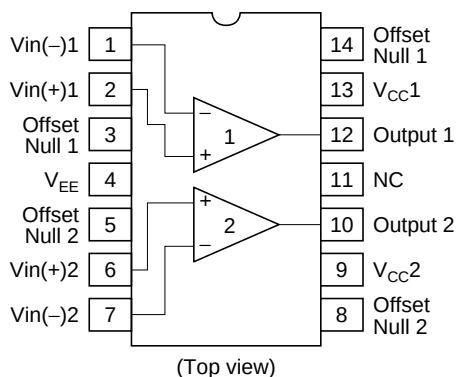
Features

- High voltage gain : 106 dB (Typ)
- Wide output amplitude : ± 13 V (Typ) (at $R_L \geq 2$ k Ω)
- Shorted output protection
- Adjustable offset voltage
- Internal phase compensation

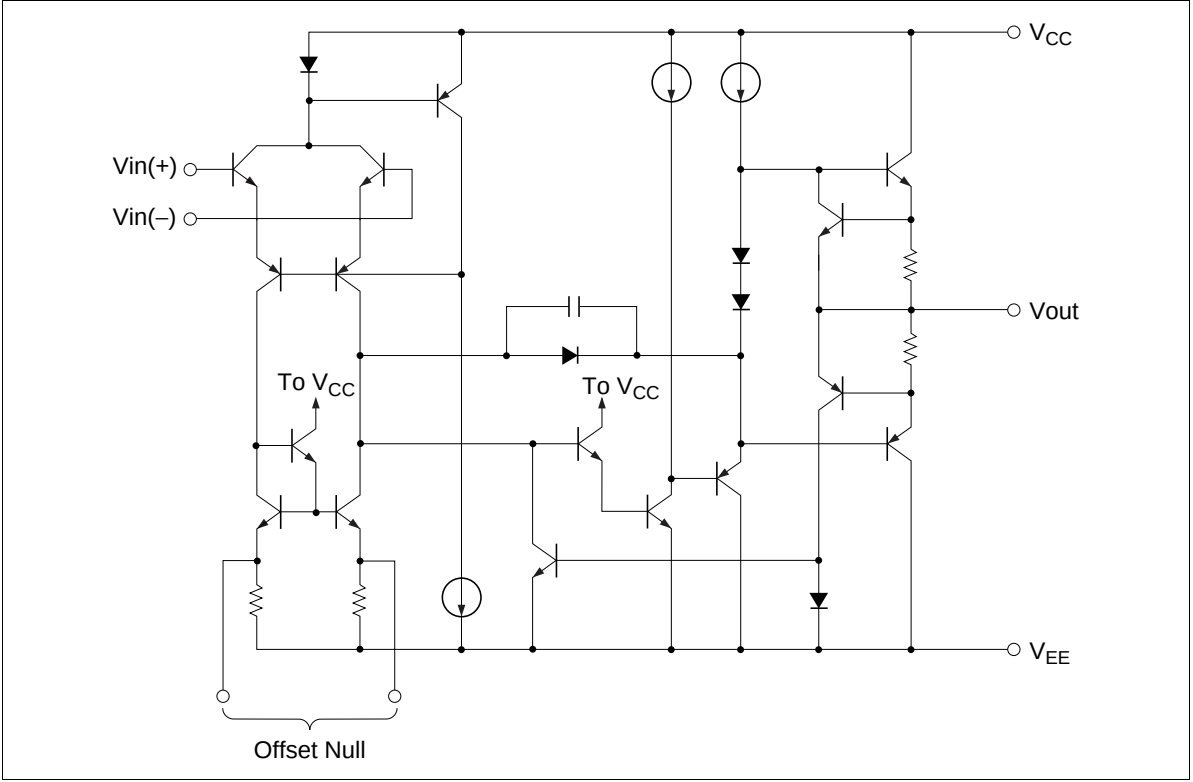
Ordering Information

Type No.	Application	Package
HA17747P	Industrial use	DP-14
HA17747	Commercial use	

Pin Arrangement



Circuit Structure



Absolute Maximum Ratings ($T_a = 25^{\circ}\text{C}$)

Item	Symbol	Ratings		Unit
		HA17747P	HA17747	
Power-supply voltage	V_{CC}	+18	+18	V
	V_{EE}	-18	-18	V
Input voltage	V_{in}	$\pm 15^{*1}$	$\pm 15^{*1}$	V
Differential input voltage	$V_{in}(\text{diff})$	± 30	± 30	V
Offset adjustment pin – V_{EE} voltage	$V_{OFF} - V_{EE}$	± 0.5	± 0.5	V
Allowable power dissipation	P_T	670 *2	670 *2	mW
Operating temperature	T_{opr}	-20 to +75	-20 to +75	$^{\circ}\text{C}$
Storage temperature	T_{stg}	-55 to +125	-55 to +125	$^{\circ}\text{C}$

Notes: 1. When the power-supply voltage is less than ± 15 V, the input voltage must fall within the power-supply voltage range.

2. These are the allowable values up to $T_a = 45^{\circ}\text{C}$. Above that temperature, derate by $8.3 \text{ mW}/^{\circ}\text{C}$.

Electrical Characteristics

Electrical Characteristics-1 ($V_{CC} = -V_{EE} = 15\text{ V}$, $T_a = 25^\circ\text{C}$)

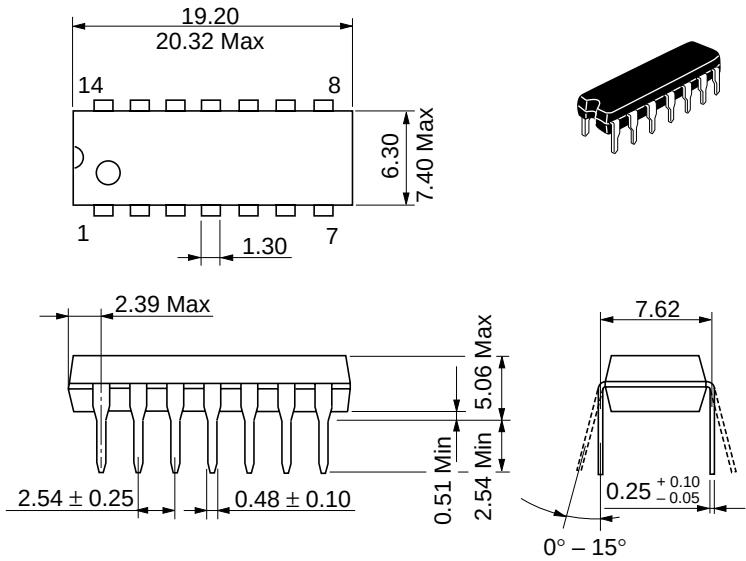
Item	Symbol	Min	Typ	Max	Unit	Test Condition
Input offset voltage	V_{IO}	—	1.0	6.0	mV	$R_s \leq 10\text{ k}\Omega$
Input offset current	I_{IO}	—	20	200	nA	
Input bias current	I_{IB}	—	80	500	nA	
Voltage gain	A_{VD}	88	106	—	dB	$R_L \geq 2\text{ k}\Omega$, $V_{out} = \pm 10\text{ V}$
Supply current	I_{CC}	—	1.7	2.8	mA	No load
Power dissipation	P_d	—	50	85	mW	(per channel rating)
Input resistance	R_{in}	0.3	2.0	—	$M\Omega$	
Input capacitance	C_{in}	—	1.4	—	pF	
Output resistance	R_{out}	—	75	—	Ω	
Slew rate	SR	—	1.0	—	V/ μs	$R_L \geq 2\text{ k}\Omega$
Rise time	t_r	—	0.3	—	μs	$V_{in} = -20\text{ mV}$,
Overshoot	V_{over}	—	5.0	—	%	$R_L = 2\text{ k}\Omega$, $C_L = 100\text{ pF}$
Input offset voltage adjustment range	$\Delta V_{IO(adj)}$	—	± 15	—	mV	
Output shorted current	I_{OS}	—	25	—	mA	
Channel separation	CS	—	120	—	dB	

Electrical Characteristics-2 ($V_{CC} = -V_{EE} = 15\text{ V}$, $T_a = -20\text{ to }+75^\circ\text{C}$)

Item	Symbol	Min	Typ	Max	Unit	Test Condition
Input offset voltage	V_{IO}	—	1.0	9.0	mV	$R_s \leq 10\text{ k}\Omega$
Input offset current	I_{IO}	—	20	400	nA	
Input bias current	I_{IB}	—	80	1,100	nA	
Power-supply rejection ratio	$\Delta V_{IO}/\Delta V_{CC}$	—	30	150	$\mu\text{V/V}$	$R_s \leq 10\text{ k}\Omega$
	$\Delta V_{IO}/\Delta V_{EE}$	—	30	150	$\mu\text{V/V}$	$R_s \leq 10\text{ k}\Omega$
Voltage gain	A_{VD}	80	—	—	dB	$R_L \geq 2\text{ k}\Omega$, $V_{out} = \pm 10\text{ V}$
Common-mode rejection ratio	CMR	70	90	—	dB	$R_s \leq 10\text{ k}\Omega$
Common-mode input voltage range	V_{CM}	± 12	± 13	—	V	
Maximum output	V_{OP-P}	± 12	± 14	—	V	$R_L \geq 10\text{ k}\Omega$
voltage amplitude		± 10	± 13	—	V	$R_L \geq 2\text{ k}\Omega$
Supply current	I_{CC}	—	2.1	3.7	mA	No load
Power dissipation	P_d	—	65	110	mW	(per channel rating)

Package Dimensions

Unit: mm



Hitachi Code	DP-14
JEDEC	Conforms
EIAJ	Conforms
Mass (reference value)	0.97 g

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