
HA17324 Series

Quad Operational Amplifier

HITACHI

Description

HA17324 is quad operational amplifier that provide high gain and internal phase compensation, with single power supply. They can be widely used to control equipments.

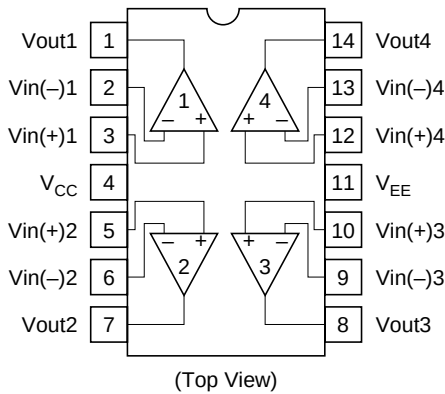
Features

- Wide range of supply voltage, and single power supply used
- Internal phase compensation
- Wide range of common mode voltage, and possible to operate with an input about 0V

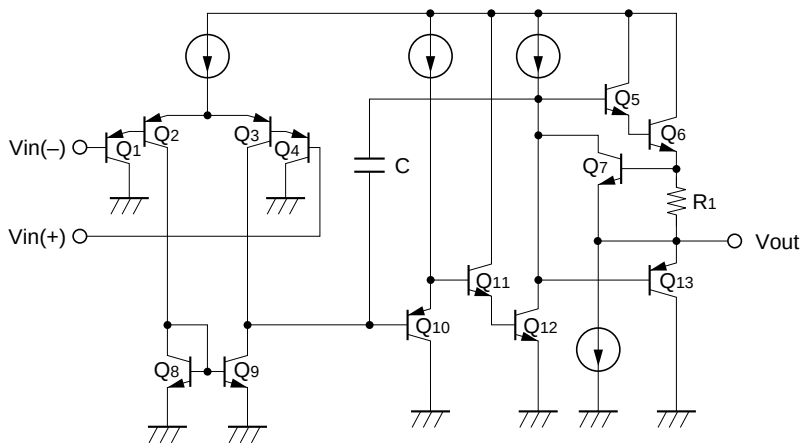
Ordering Information

Type No.	Application	Package
HA17324FP	Industrial use	FP-14DA
HA17324F	Commercial use	FP-14DA
HA17324	Commercial use	DP-14
HA17324P	Industrial use	DP-14

Pin Arrangement



Circuit Schematic (1/4)



Absolute Maximum Ratings (Ta = 25°C)

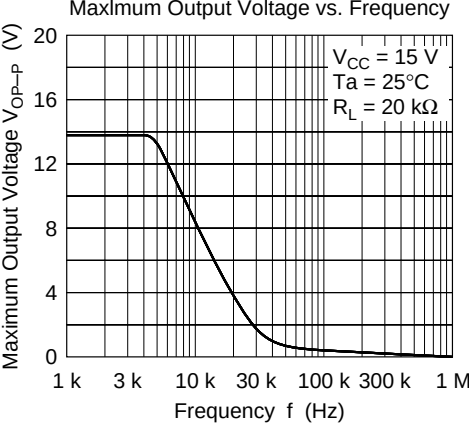
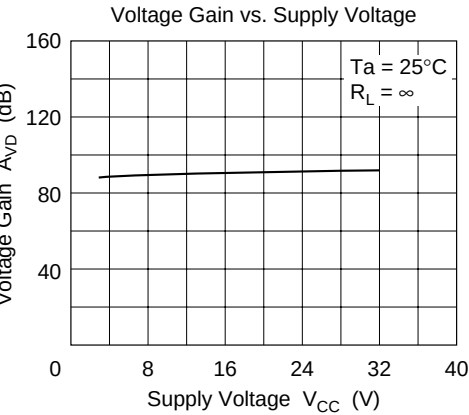
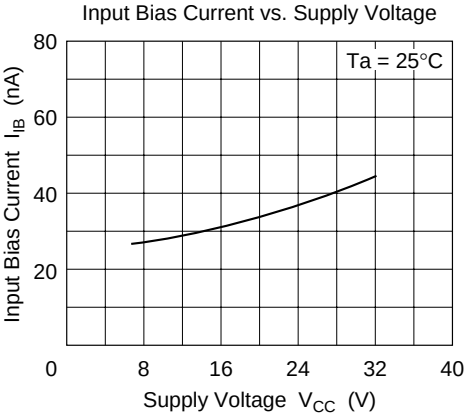
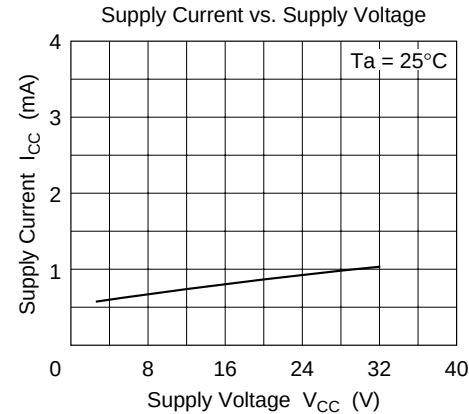
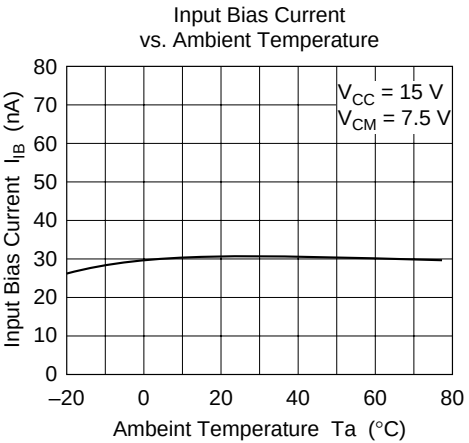
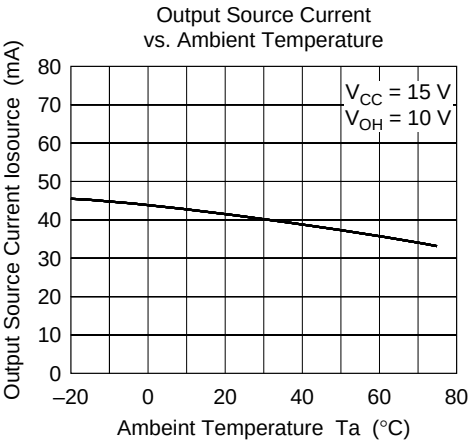
Item	Symbol	Rating	Unit
Supply voltage	V _{CC}	32	V
Sink current	I _{sink}	50	mA
Power dissipation	P _T	625*	mW
Common mode input voltage	V _{CM}	−0.3 to V _{CC}	V
Differential input voltage	V _{in} (diff)	±V _{CC}	V
Operating temperature	T _{opr}	−20 to +75	°C
Storage temperature	T _{stg}	−55 to +125	°C

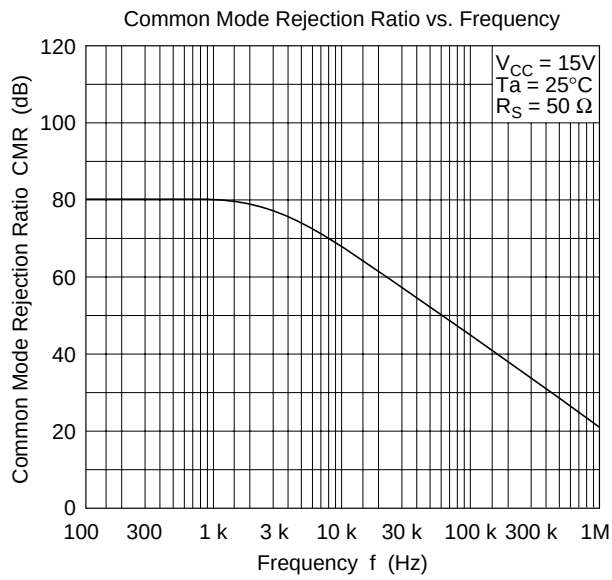
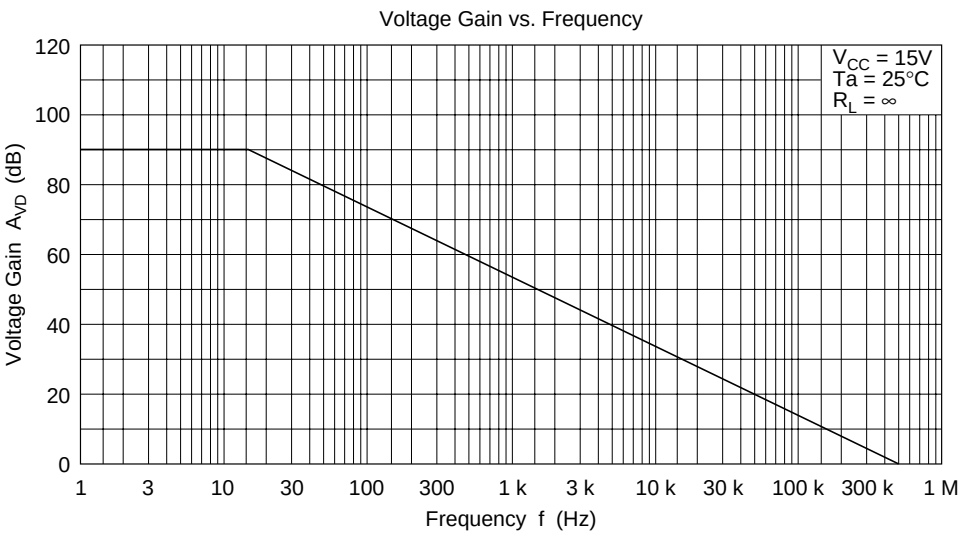
Note: These are allowable values up to Ta=50°C.
Derate by 8.3mW/°C above that temperature.
In case of SOP, see notes on SOP Package Usage in Reliability section.

Electrical Characteristics (V_{CC} = +15V, Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Input offset voltage	V _{IO}	—	2	7	mV	V _{CM} = 7.5V, R _S = 50Ω, R _f = 50kΩ
Input offset current	I _{IO}	—	5	50	nA	V _{CM} = 7.5V, I _{IO} = I _{I(-)} - I _{I(+)}
Input bias current	I _{IB}	—	30	500	nA	V _{CM} = 7.5V
Power source rejection ratio	PSRR	—	93	—	dB	f = 100Hz, R _S = 1kΩ, R _j = 100kΩ
Voltage gain	A _{VD}	75	90	—	dB	R _S = 1 kΩ, R _f = 100kΩ, R _L = ∞
Common mode rejection ratio	CMR	—	80	—	dB	R _S = 50Ω, R _f = 5kΩ
Common mode input voltage range	V _{CM}	-0.3	—	13.5	V	R _S = 1kΩ, R _f = 100kΩ, f = 100Hz
Maximum output voltage	V _{op-p}	—	13.6	—	V	f = 100Hz, R _S = 1kΩ, R _f = 100kΩ, R _L = 20kΩ
Output source current	I _{osource}	20	40	—	mA	V _{IN} ⁺ = 1V, V _{IN} ⁻ = 0V, V _{OH} = 10V
Output sink current	I _{osink}	10	20	—	mA	V _{IN} = 0V, V _{IN} = 1V, V _{OL} = 2.5V
Supply current	I _{CC}	—	0.8	2	mA	V _{IN} = GND, R _L = ∞
Slew rate	SR	—	0.19	—	V/μs	f = 1.5kHz, V _{CM} = 7.5V, R _L = ∞
Channel separation	CS	—	120	—	dB	f = 1kHz
Output sink current	I _{osink}	15	50	—	μA	V _{IN} ⁺ = 0V, V _{IN} ⁻ = 1V, V _{OL} = 200mV
	I _{osink}	3	9	—	mA	V _{IN} ⁺ = 0V, V _{IN} ⁻ = 1V, V _{OL} = 1V
Output voltage	V _{OH}	13.2	13.6	—	V	I _{OH} = -1mA
	V _{OH}	12.0	13.3	—	V	I _{OH} = -10mA
Output voltage	V _{OL}	—	0.8	1.0	V	I _{OL} = 1mA
	V _{OL}	—	1.1	1.8	V	I _{OL} = 10mA

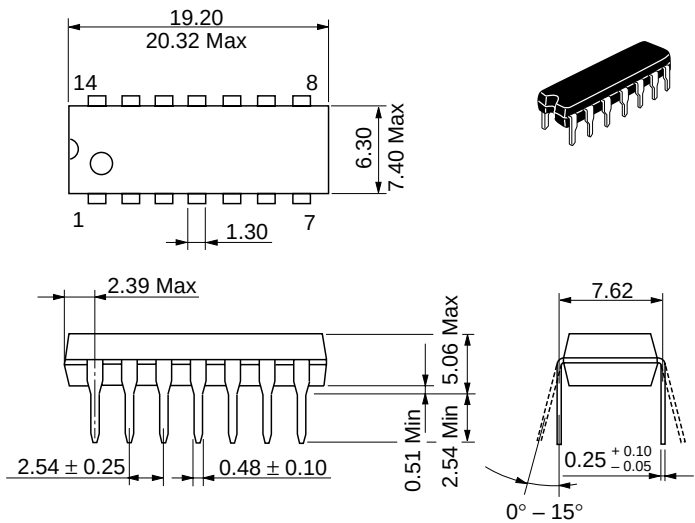
Characteristic Curves





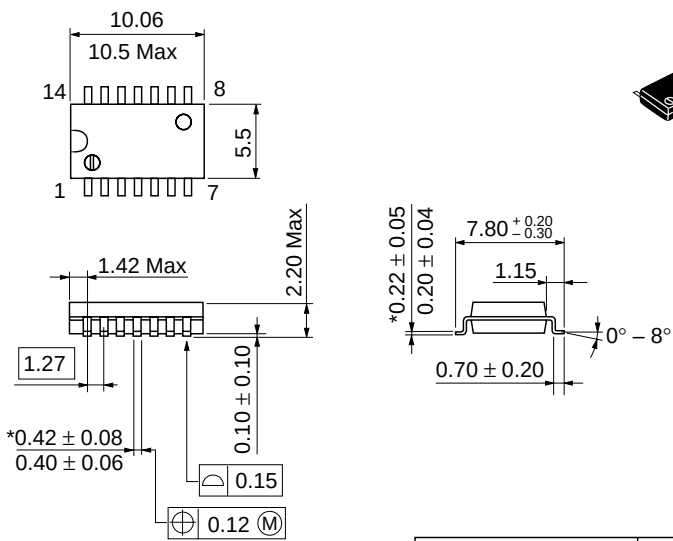
Package Dimensions

Unit: mm



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

Unit: mm



*Dimension including the plating thickness
Base material dimension

Hitachi Code	FP-14DA
JEDEC	—
EIAJ	Conforms
Mass (reference value)	0.23 g

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