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# HA17458 Series

Dual Operational Amplifier

# HITACHI

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## Description

HA17458 is dual operational amplifiers which provides internal phase compensation and high performance. It can be applied widely to measuring control equipment and to general use.

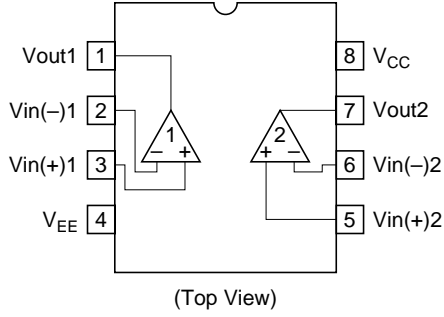
## Features

- High voltage gain: 100dB (Typ)
- Wide output amplitude:  $\pm 13\text{V}$  (Typ) [at  $R_L \geq 2\text{k}\Omega$ ]
- Protected from output shortcircuit
- Internal phase compensation

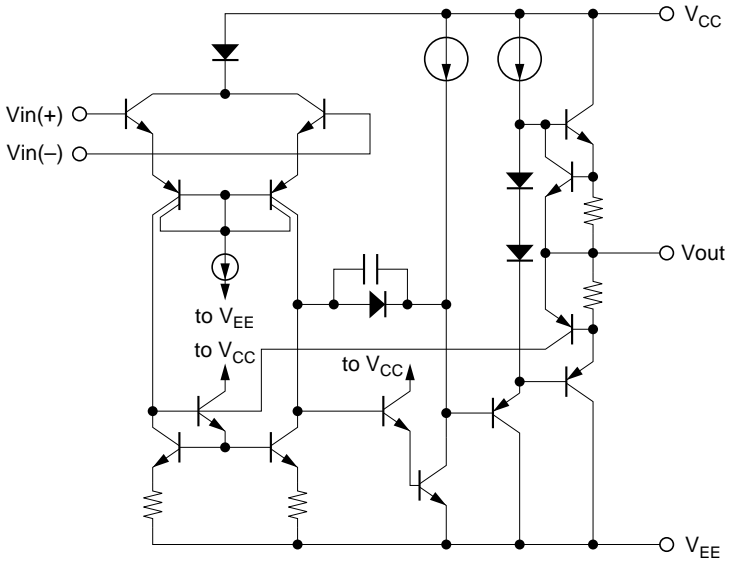
## Ordering Information

Type No.	Application	Package
HA17485FP	Industrial use	FP-8D
HA17458F	Commercial use	FP-8D
HA17458	Commercial use	DP-8
HA17458PS	Industrial use	DP-8

## Pin Arrangement



## Circuit Schematic (1/2)



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

Item	Symbol	Ratings				Unit
		HA17458	HA17458PS	HA17458F	HA17458FP	
Supply voltage	$V_{CC}$	+18	+18	+18	+18	V
	$V_{EE}$	-18	-18	-18	-18	V
Input voltage	$V_{IN}^{*3}$	$\pm 15$	$\pm 15$	$\pm 15$	$\pm 15$	V
Differential input voltage	$V_{IN(diff)}$	$\pm 30$	$\pm 30$	$\pm 30$	$\pm 30$	V
Power dissipation	$P_T$	670 <sup>*1</sup>	670 <sup>*1</sup>	385 <sup>*2</sup>	385 <sup>*2</sup>	mW
Operating temperature	$T_{opr}$	-20 to +75	-20 to +75	-20 to +75	-20 to +75	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +125	-55 to +125	-55 to +125	-55 to +125	$^\circ\text{C}$

- Notes:
1. These are the allowable values up to  $T_a = 45^\circ\text{C}$ . Derate by  $8.3\text{mW}/^\circ\text{C}$  above that temperature.
  2. These are the allowable values up to  $T_a = 31^\circ\text{C}$  mounting on 30% wiring density glass epoxy board. Derate by  $7.14\text{mW}/^\circ\text{C}$  above that temperature.
  3. If the supply voltage is less than  $\pm 15\text{V}$ , input voltage should be less than supply voltage.

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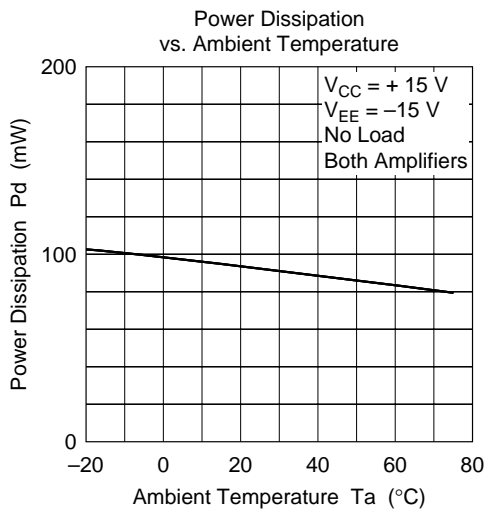
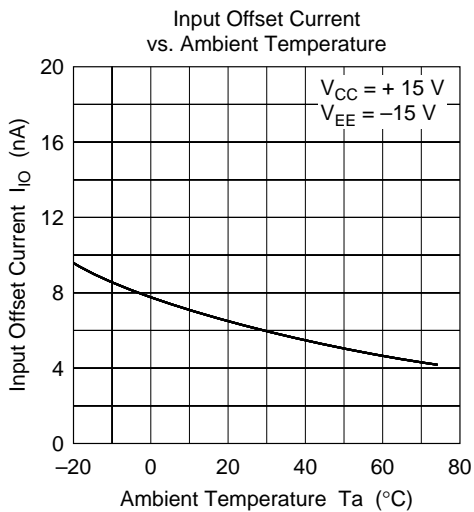
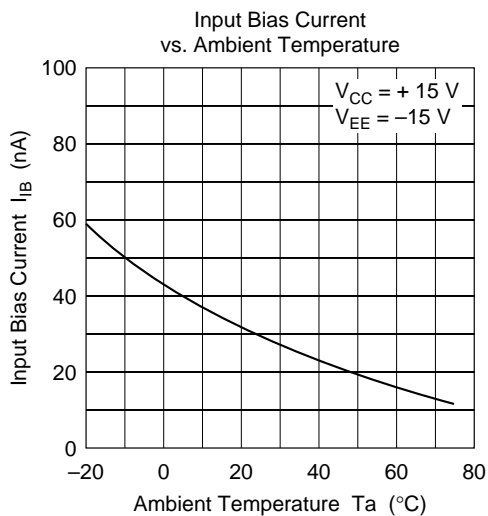
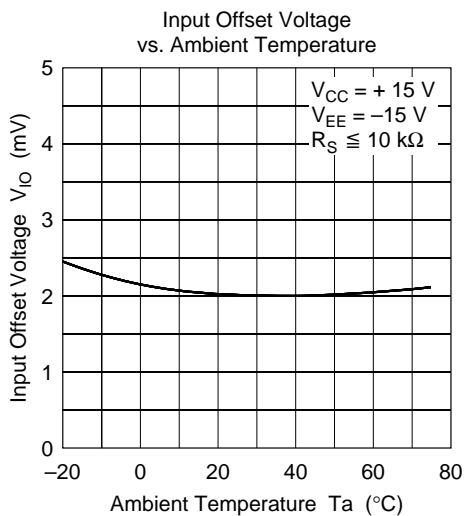
## Electrical Characteristics 1 ( $V_{CC} = -V_{EE} = 15V$ , $T_a = 25^\circ C$ )

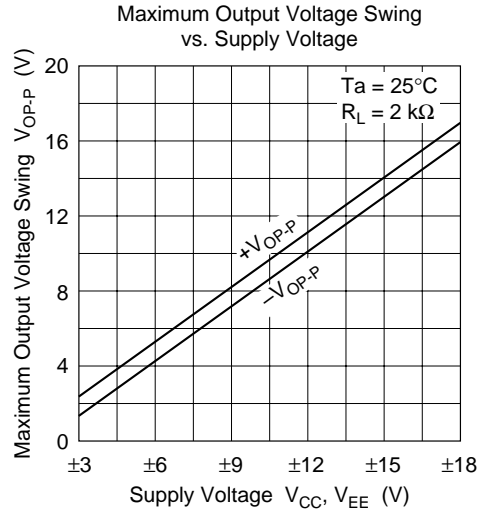
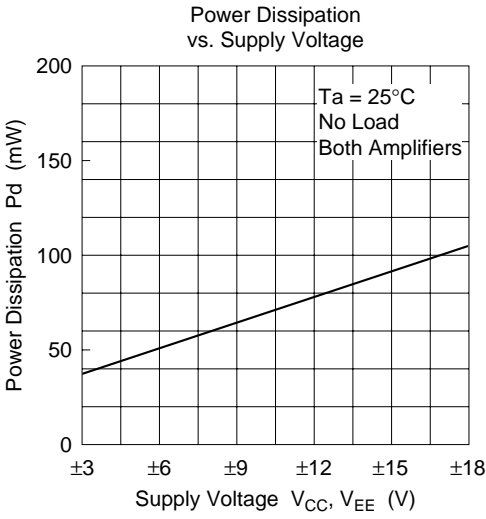
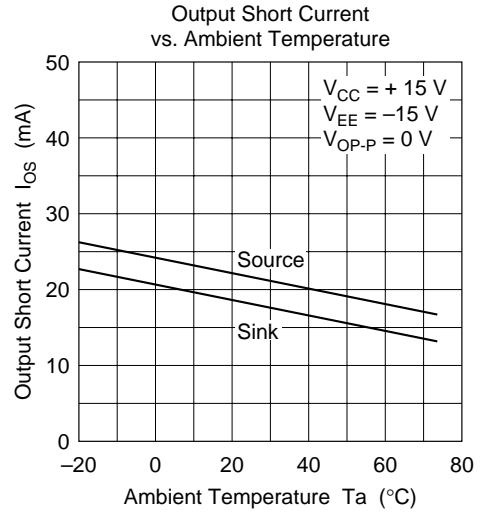
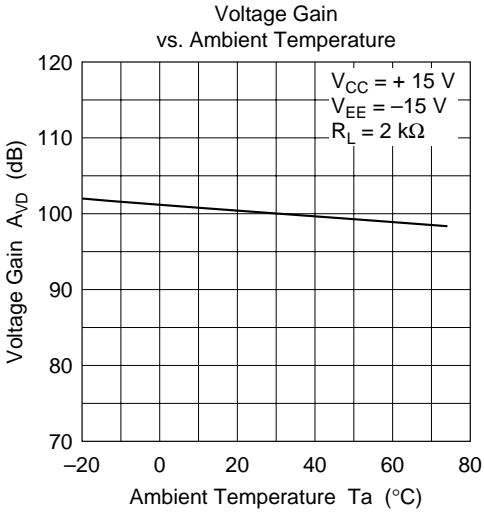
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Input offset voltage	$V_{IO}$	—	2.0	6.0	mV	$R_s \leq 10k\Omega$
Input offset current	$I_{IO}$	—	6	200	nA	
Input bias current	$I_{IB}$	—	30	500	nA	
Line regulation	$\Delta V_{IO}/\Delta V_{CC}$	—	30	150	$\mu V/V$	$R_s \leq 10k\Omega$
	$\Delta V_{IO}/\Delta V_{EE}$	—	30	150	$\mu V/V$	$R_s \leq 10k\Omega$
Voltage gain	$A_{VD}$	86	100	—	dB	$R_L \geq 2k\Omega$ , $V_{out} = \pm 10V$
Common mode rejection ratio	CMR	70	90	—	dB	$R_s \leq 10k\Omega$
Common mode input voltage range	$V_{CM}$	$\pm 12$	$\pm 13$	—	V	
Peak-to-peak output voltage	$V_{op-p}$	$\pm 12$	$\pm 14$	—	V	$R_L = 10k\Omega$
Power dissipation	$P_d$	—	90	200	mW	No load, 2 channel
Slew rate	SR	—	0.6	—	V/ $\mu s$	$A_{VD} = 1$
Input resistance	$R_{in}$	0.3	1.0	—	M $\Omega$	
Input capacitance	$C_{in}$	—	6.0	—	pF	
Output resistance	$R_{out}$	—	75	—	$\Omega$	

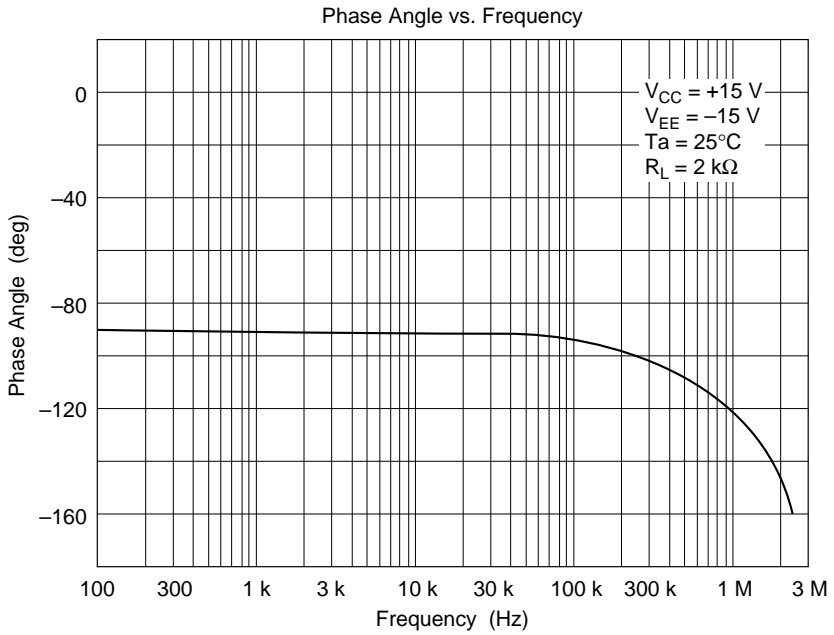
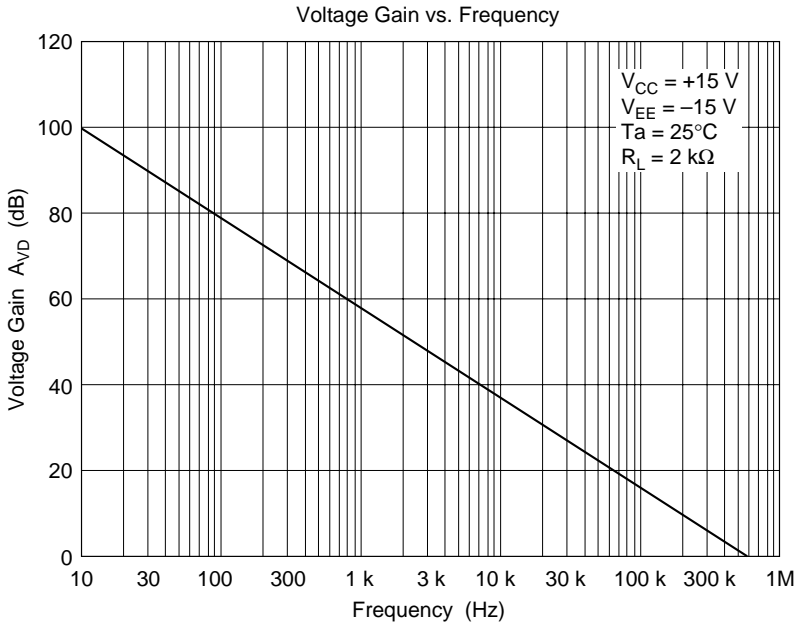
## Electrical Characteristics 2 ( $V_{CC} = -V_{EE} = 15V$ , $T_a = -20$ to $+75^\circ C$ )

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Input offset voltage	$V_{IO}$	—	—	9.0	mV	$R_s \leq 10k\Omega$
Input offset current	$I_{IO}$	—	—	400	nA	
Input bias current	$I_{IB}$	—	—	1100	nA	
Voltage gain	$A_{VD}$	80	—	—	dB	$R_L \geq 2k\Omega$ , $V_{out} = \pm 10V$
Peak-to-peak output voltage	$V_{op-p}$	$\pm 10$	$\pm 13$	—	V	$R_L = 2k\Omega$

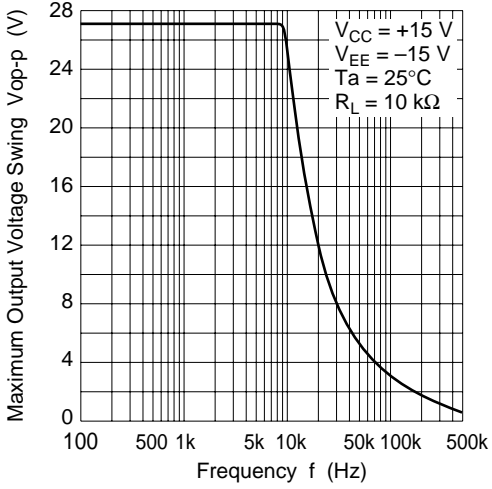
Characteristic Curves



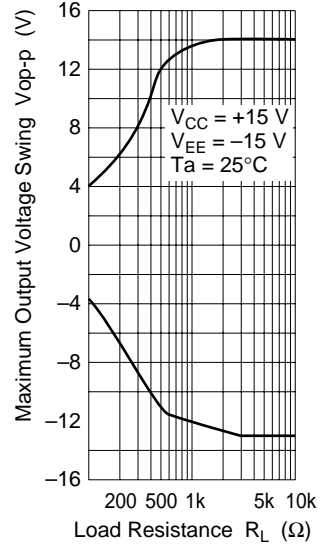




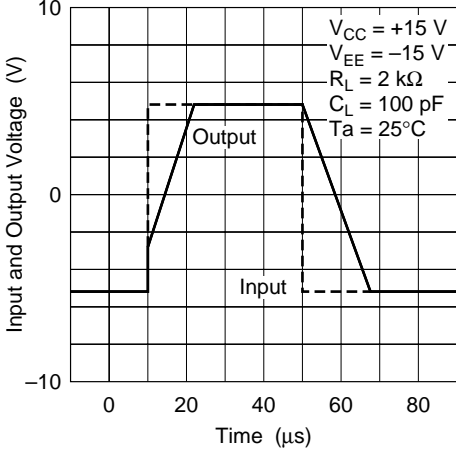
Maximum Output Voltage Swing vs. Frequency



Maximum Output Voltage Swing vs. Load Resistance



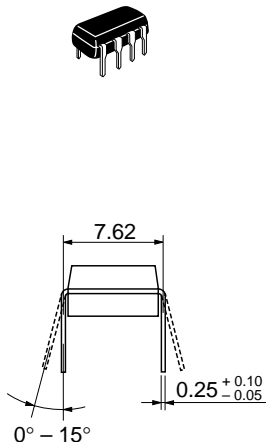
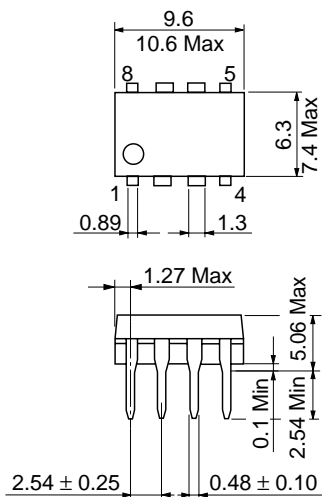
Voltage Follower Large Signal Pulse Response





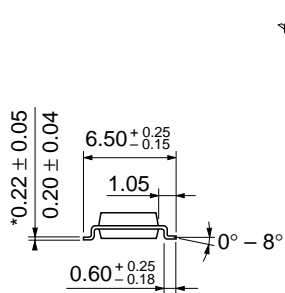
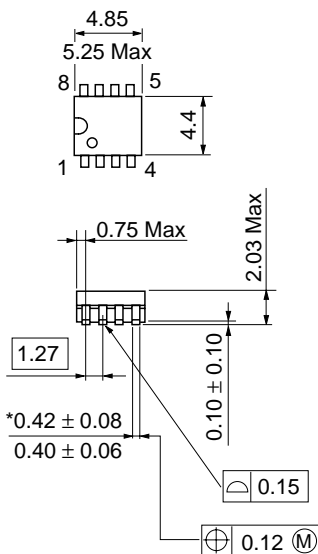
Package Dimensions

Unit: mm



Hitachi Code	DP-8
JEDEC	Conforms
EIAJ	Conforms
Mass (reference value)	0.54 g

Unit: mm



Hitachi Code	FP-8D
JEDEC	—
EIAJ	Conforms
Mass (reference value)	0.10 g

\*Dimension including the plating thickness  
Base material dimension

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