

To all our customers

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Renesas Technology Corp.  
Customer Support Dept.  
April 1, 2003

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Keep safety first in your circuit designs!

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Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of nonflammable material or (iii) prevention against any malfunction or mishap.

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# HA17458 Series

## Dual Operational Amplifier



ADE-204-040 (Z)  
Rev. 0  
Dec. 2000

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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.

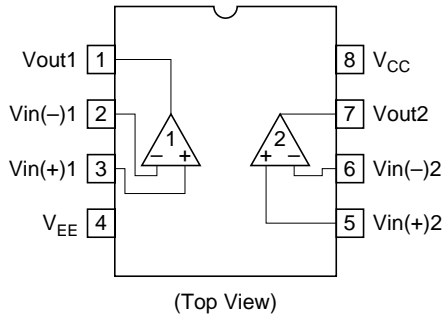
### Features

- 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

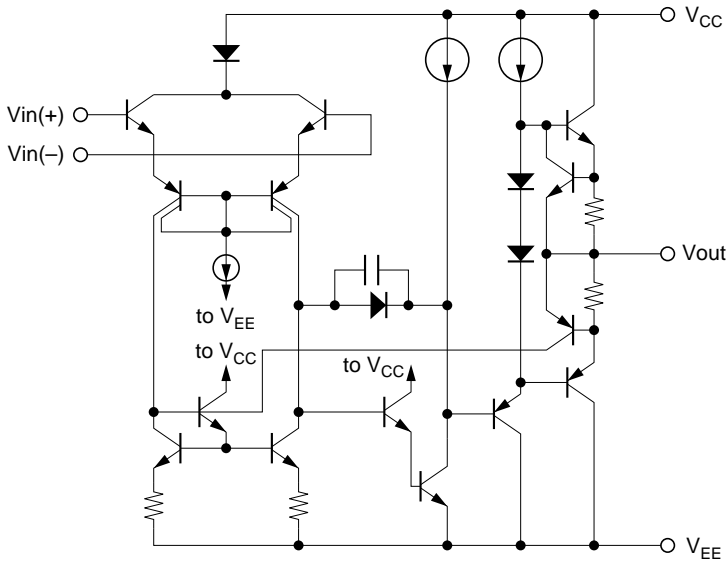
### Ordering Information

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 (Ta = 25°C)

Item	Symbol	Ratings				Unit
		HA17458	HA17458PS	HA17458F	HA17458FP	
Supply voltage	V <sub>CC</sub>	+18	+18	+18	+18	V
	V <sub>EE</sub>	-18	-18	-18	-18	V
Input voltage	V <sub>IN</sub> <sup>*3</sup>	±15	±15	±15	±15	V
Differential input voltage	V <sub>IN(diff)</sub>	±30	±30	±30	±30	V
Power dissipation	P <sub>T</sub>	670 <sup>*1</sup>	670 <sup>*1</sup>	385 <sup>*2</sup>	385 <sup>*2</sup>	mW
Operating temperature	T <sub>opr</sub>	-20 to +75	-20 to +75	-20 to +75	-20 to +75	°C
Storage temperature	T <sub>stg</sub>	-55 to	-55 to	-55 to	-55 to	°C
		+125	+125	+125	+125	

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

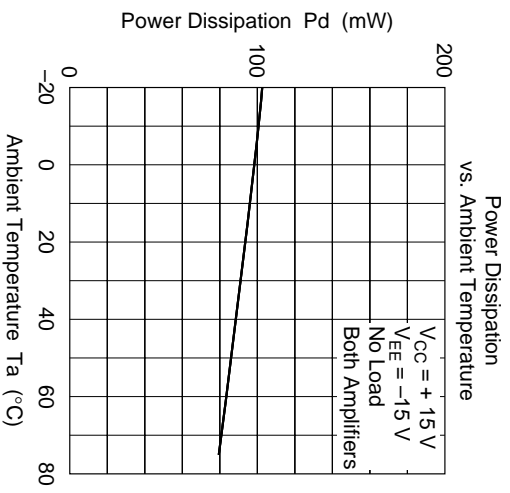
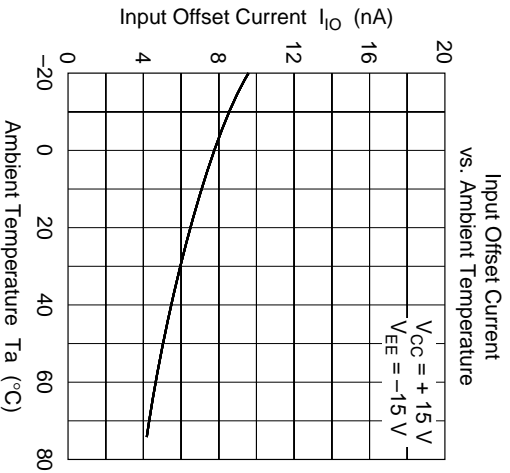
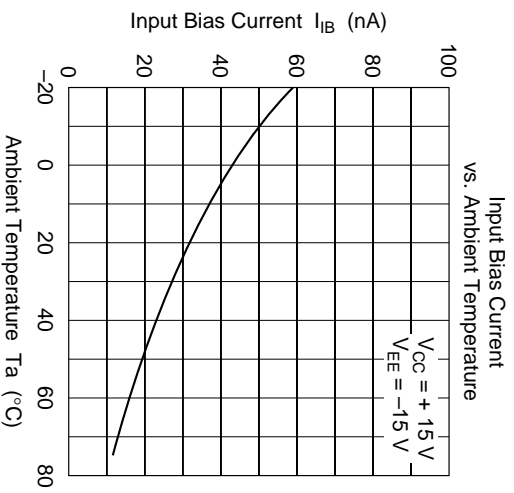
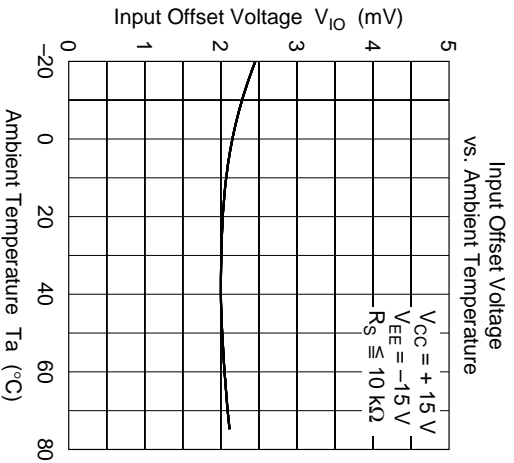
## Electrical Characteristics 1 ( $V_{CC} = -V_{EE} = 15V$ , $T_a = 25^\circ C$ )

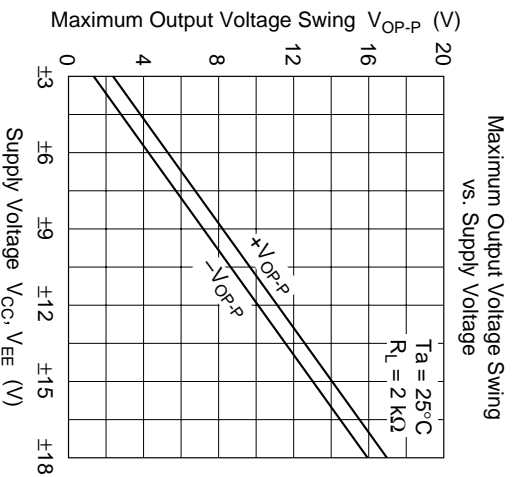
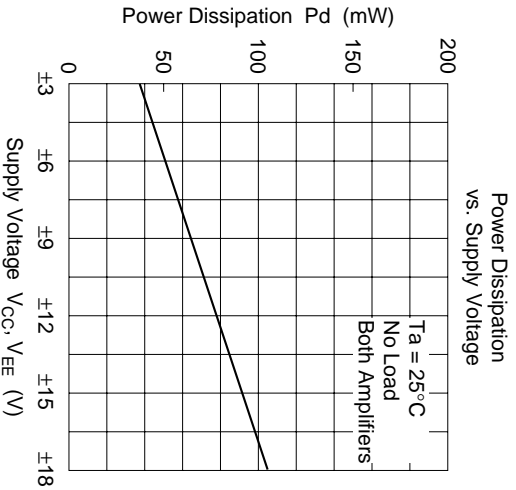
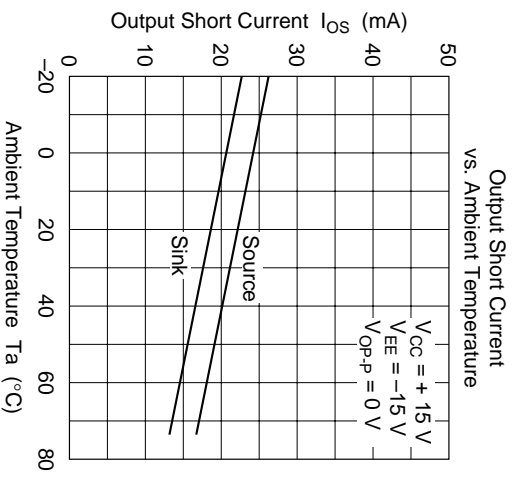
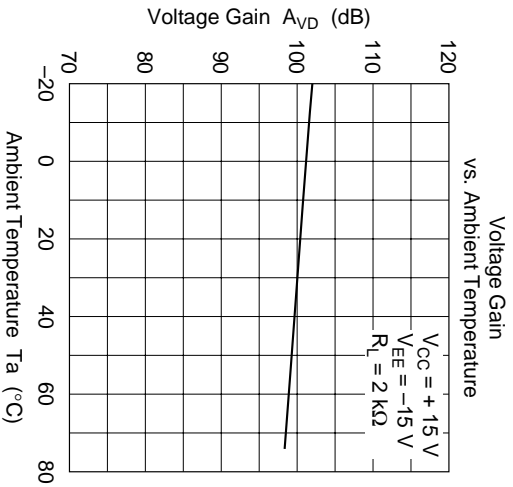
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Input offset voltage	$V_{IO}$	—	2.0	6.0	mV	$R_s \leq 10k\Omega$
Input offset current	$I_{IO}$	—	6	200	nA	
Input bias current	$I_{IB}$	—	30	500	nA	
Line regulation	$\Delta V_{IO}/\Delta V_{CC}$	—	30	150	$\mu V/V$	$R_s \leq 10k\Omega$
	$\Delta V_{IO}/\Delta V_{EE}$	—	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 $+75^\circ C$ )

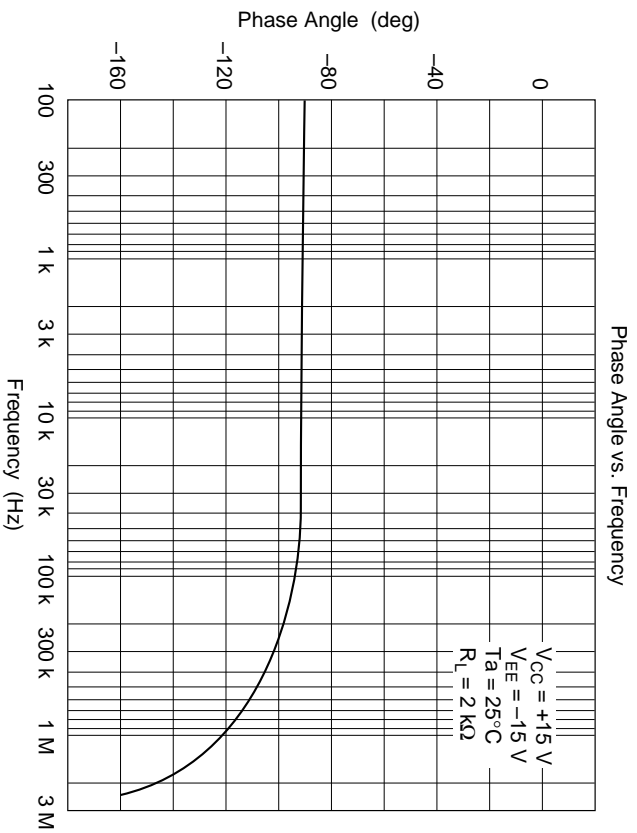
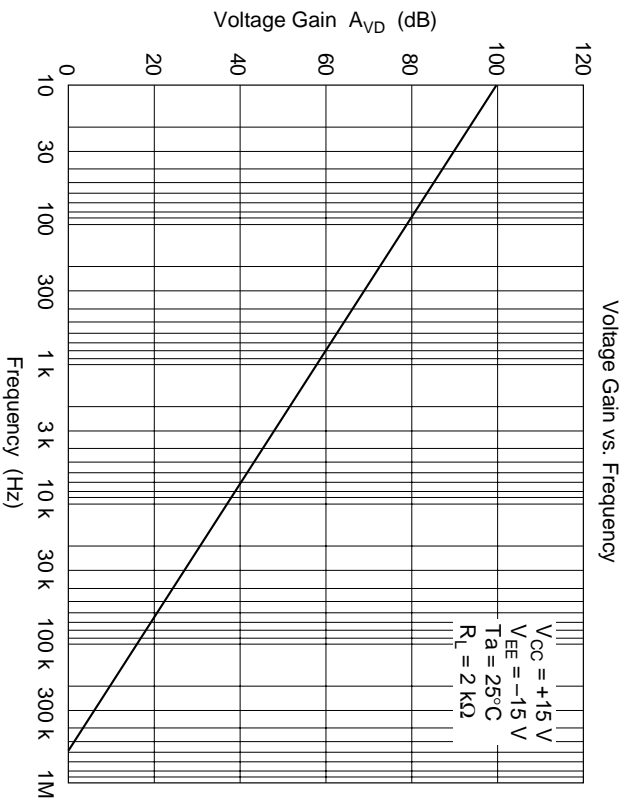
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Input offset voltage	$V_{IO}$	—	—	9.0	mV	$R_s \leq 10k\Omega$
Input offset current	$I_{IO}$	—	—	400	nA	
Input bias current	$I_{IB}$	—	—	1100	nA	
Voltage gain	$A_{VD}$	80	—	—	dB	$R_L \geq 2k\Omega$ , $V_{out} = \pm 10V$
Peak-to-peak output voltage	$V_{op-p}$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

Characteristic Curves

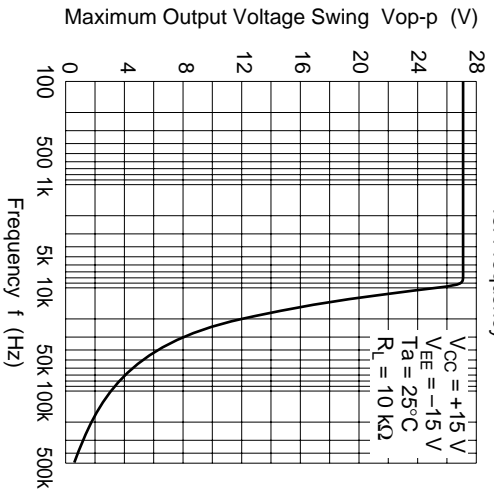




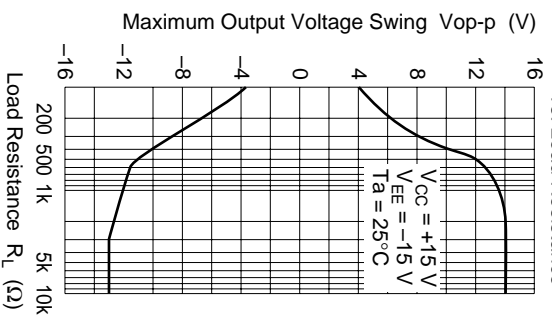




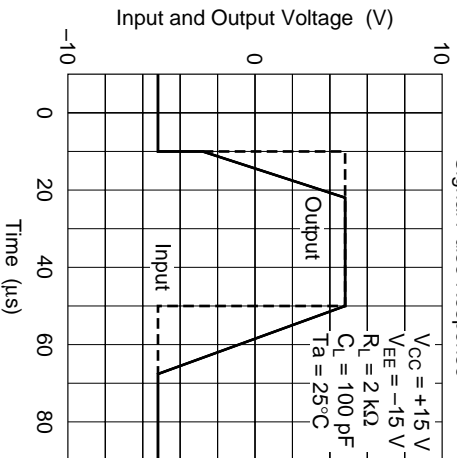
Maximum Output Voltage Swing  
vs. Frequency



Maximum Output Voltage Swing  
vs. Load Resistance

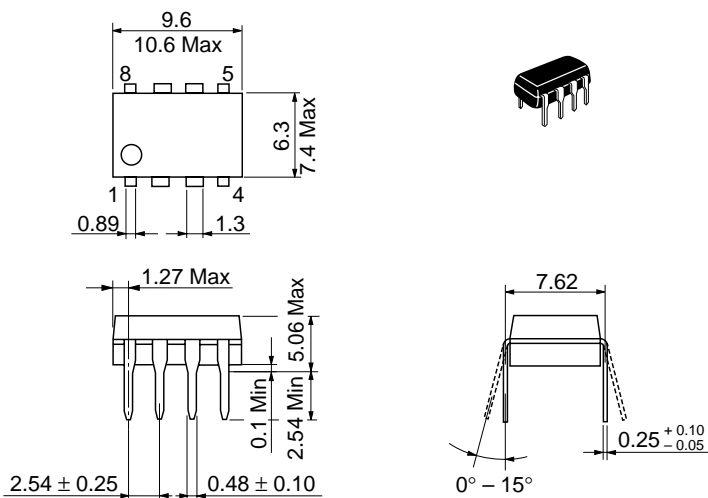


Voltage Follower Large  
Signal Pulse Response



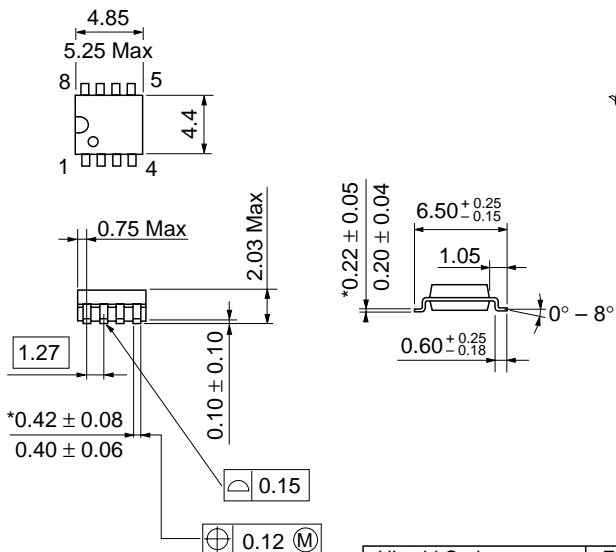
Package Dimensions

Unit: mm



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

Unit: mm



\*Dimension including the plating thickness  
Base material dimension

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

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