
HA17458 Series

Dual Operational Amplifier

HITACHI

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.

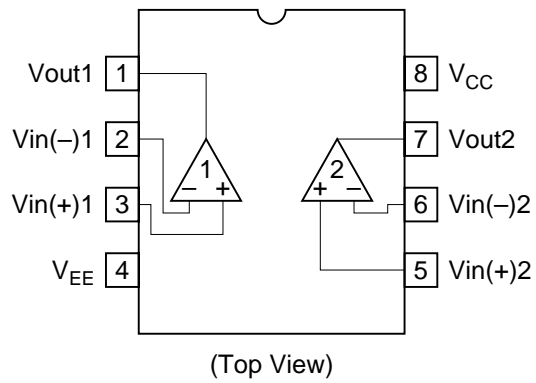
Features

- 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

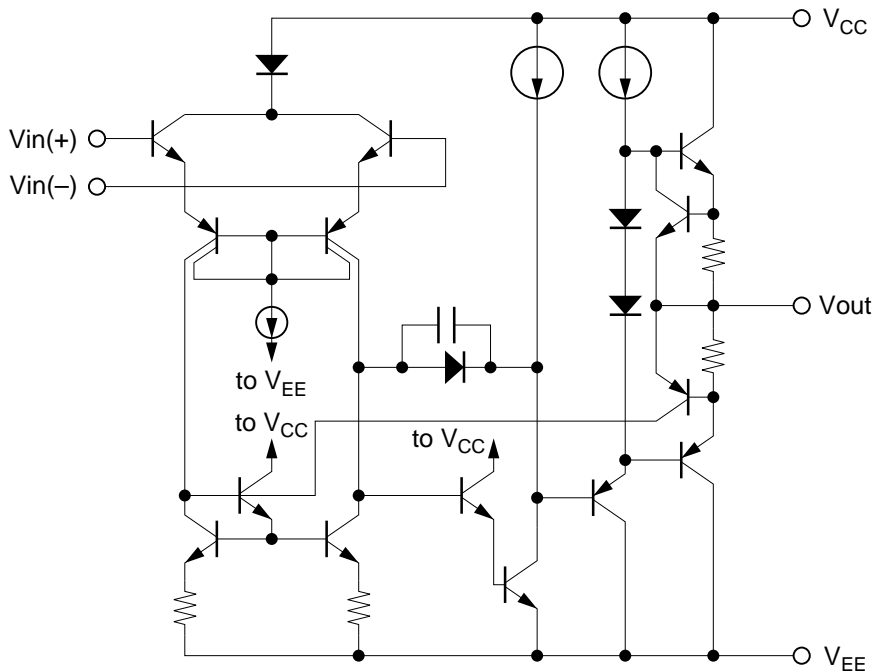
Ordering Information

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_{CC}	+18	+18	+18	+18	V
	V_{EE}	-18	-18	-18	-18	V
Input voltage	V_{IN}^{*3}	±15	±15	±15	±15	V
Differential input voltage	$V_{IN(diff)}$	±30	±30	±30	±30	V
Power dissipation	P_T	670 ^{*1}	670 ^{*1}	385 ^{*2}	385 ^{*2}	mW
Operating temperature	Topr	-20 to +75	-20 to +75	-20 to +75	-20 to +75	°C
Storage temperature	Tstg	-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.

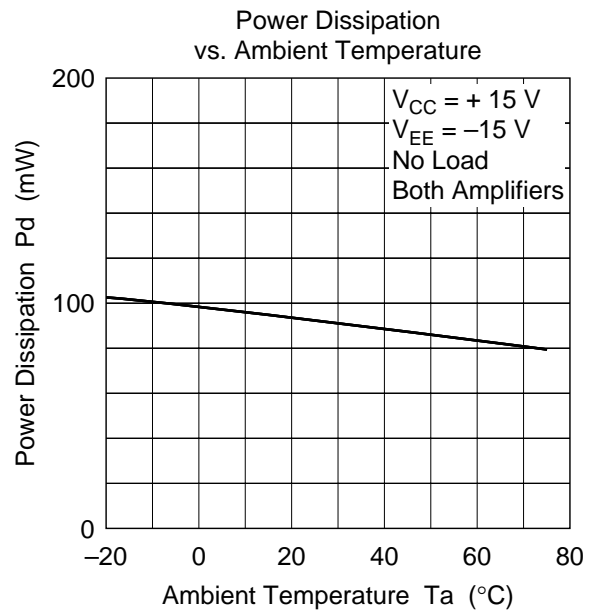
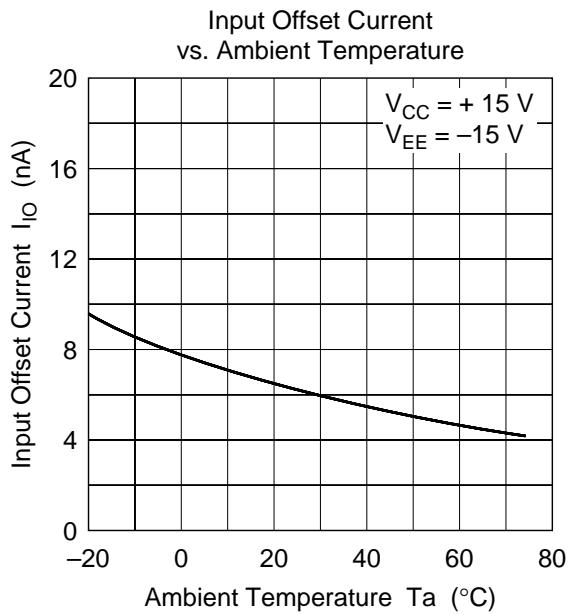
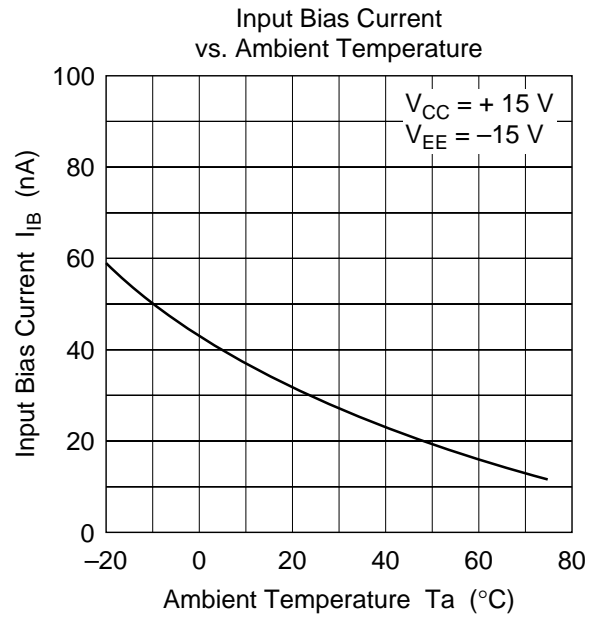
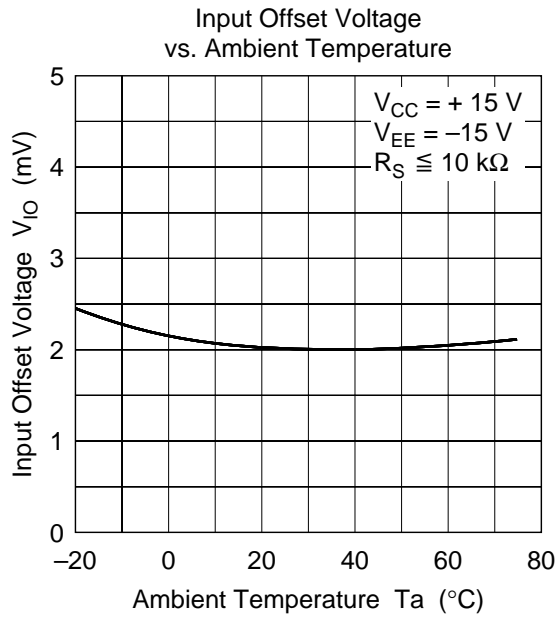
Electrical Characteristics 1 ($V_{CC} = -V_{EE} = 15V$, $T_a = 25^\circ C$)

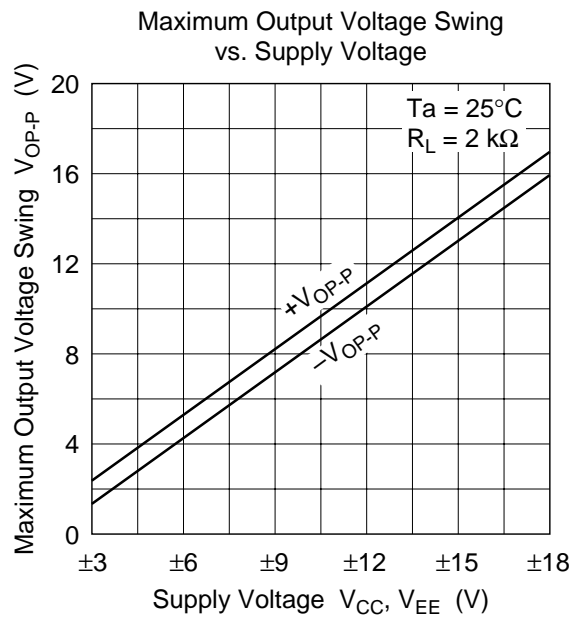
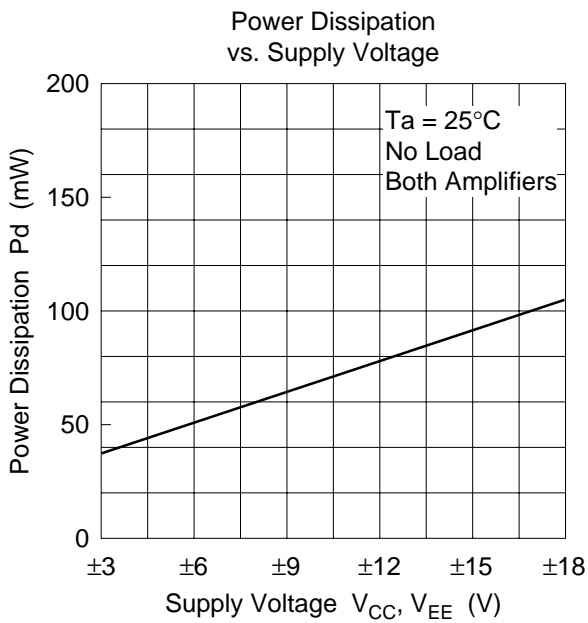
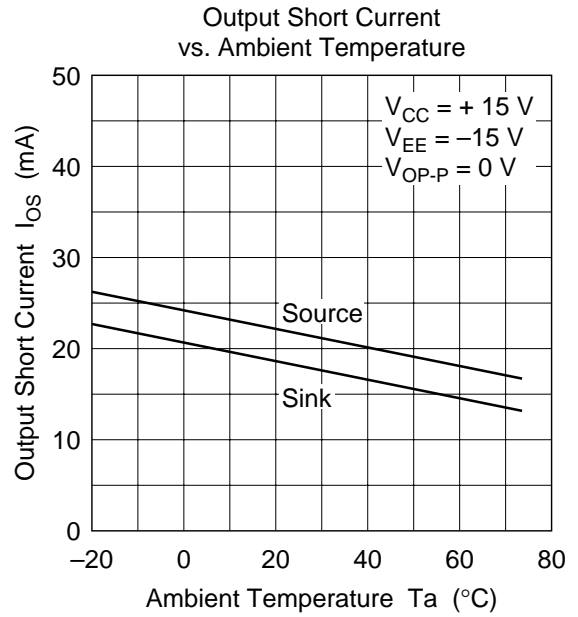
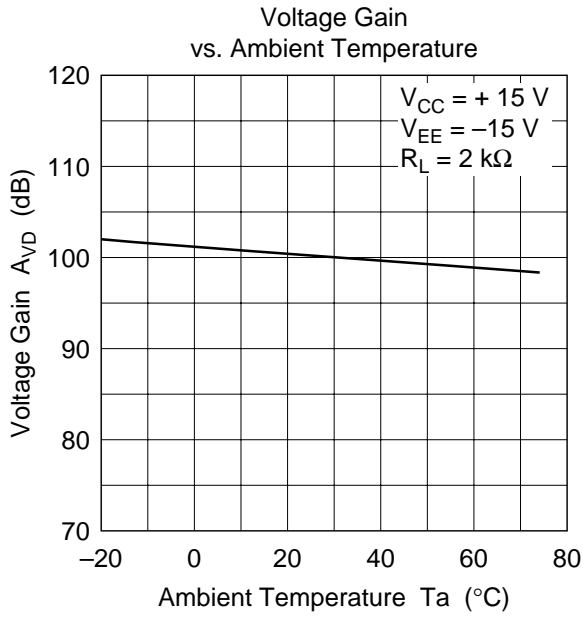
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Input offset voltage	V_{IO}	—	2.0	6.0	mV	$R_s \leq 10k\Omega$
Input offset current	I_{IO}	—	6	200	nA	
Input bias current	I_{IB}	—	30	500	nA	
Line regulation	$\Delta V_{IO}/\Delta V_{CC}$	—	30	150	$\mu V/V$	$R_s \leq 10k\Omega$
	$\Delta V_{IO}/\Delta V_{EE}$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

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

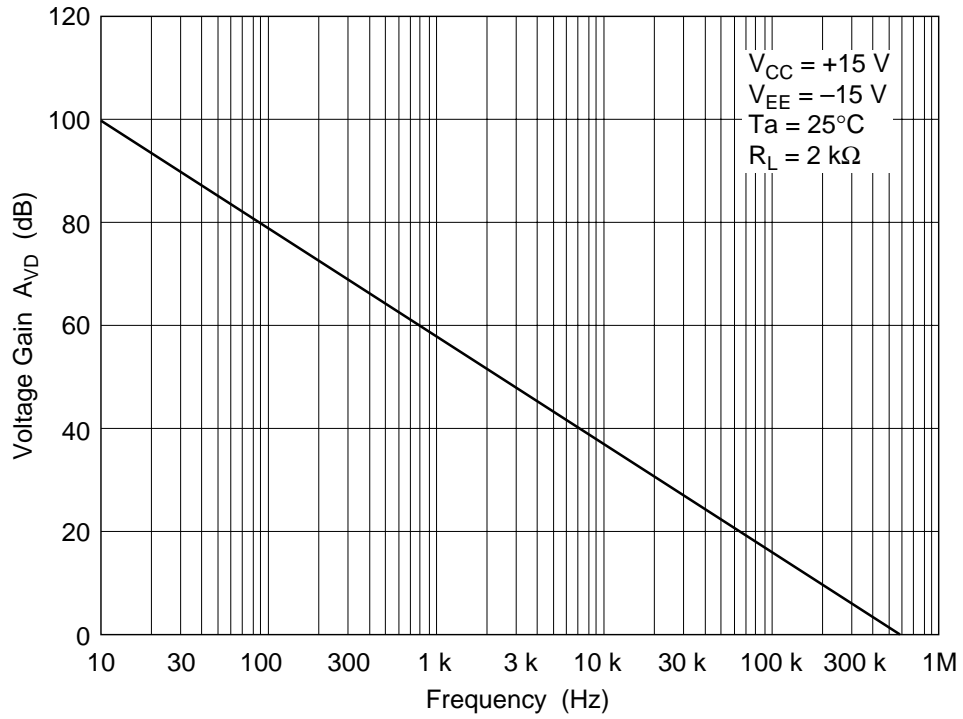
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Input offset voltage	V_{IO}	—	—	9.0	mV	$R_s \leq 10k\Omega$
Input offset current	I_{IO}	—	—	400	nA	
Input bias current	I_{IB}	—	—	1100	nA	
Voltage gain	A_{VD}	80	—	—	dB	$R_L \geq 2k\Omega$, $V_{out} = \pm 10V$
Peak-to-peak output voltage	V_{op-p}	± 10	± 13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

Characteristic Curves

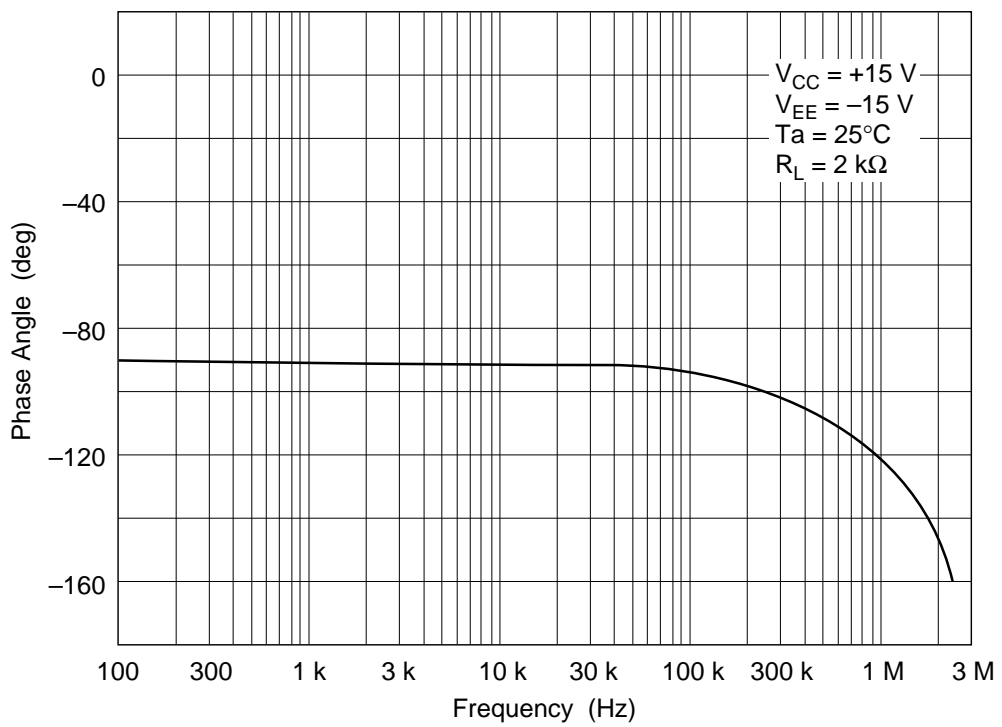




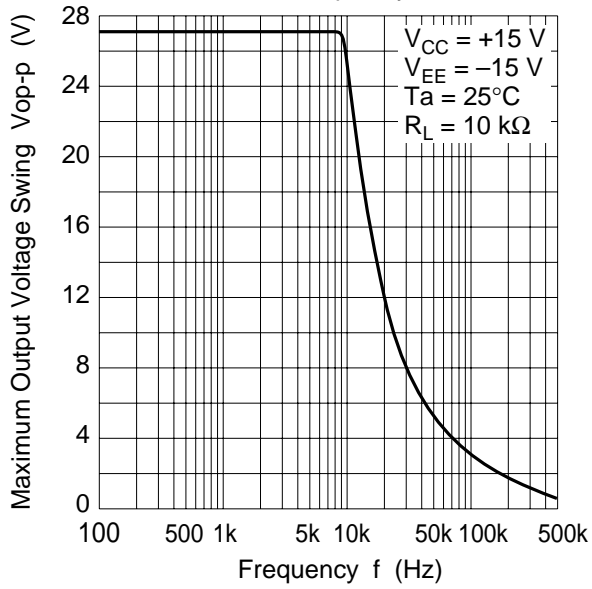
Voltage Gain vs. Frequency



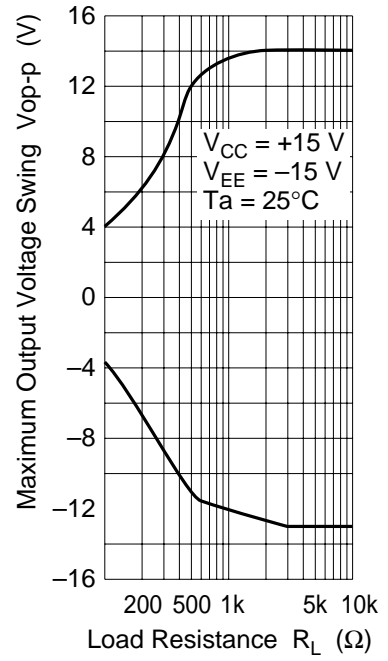
Phase Angle vs. Frequency



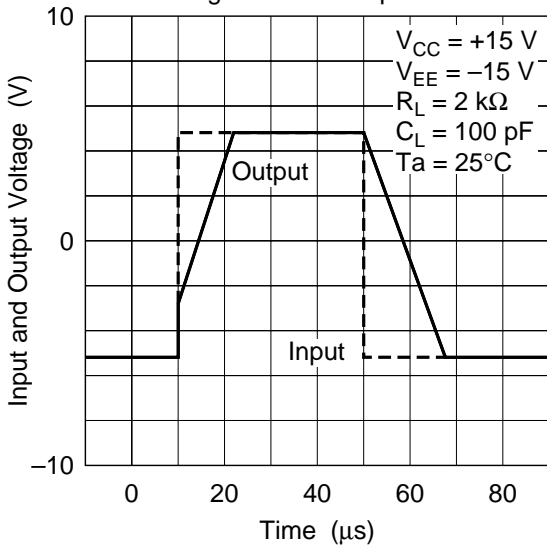
Maximum Output Voltage Swing vs. Frequency



Maximum Output Voltage Swing vs. Load Resistance

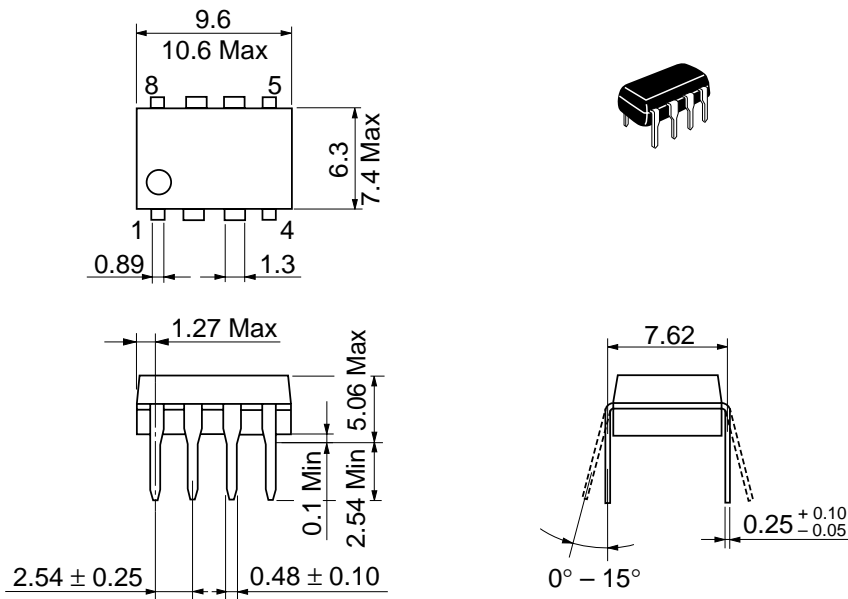


Voltage Follower Large Signal Pulse Response



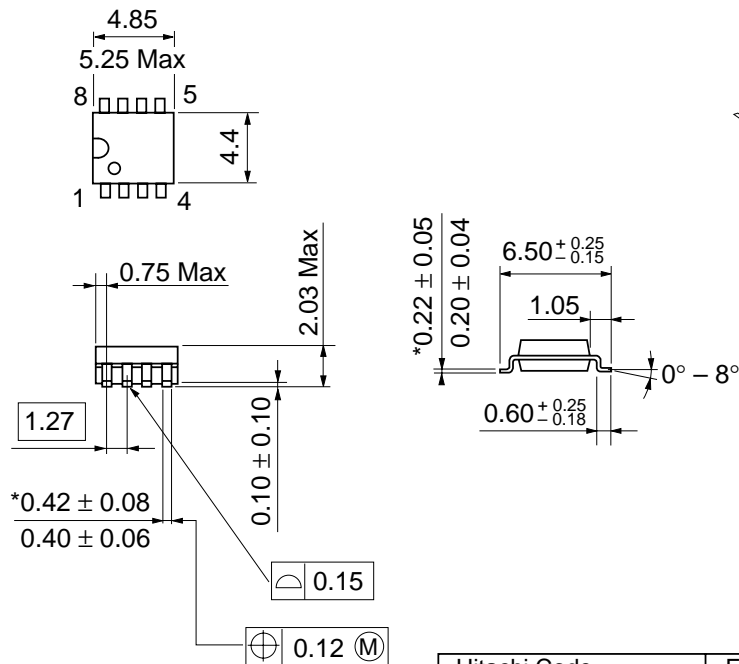
Package Dimensions

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

Cautions

1. Hitachi neither warrants nor grants licenses of any rights of Hitachi's or any third party's patent, copyright, trademark, or other intellectual property rights for information contained in this document. Hitachi bears no responsibility for problems that may arise with third party's rights, including intellectual property rights, in connection with use of the information contained in this document.
2. Products and product specifications may be subject to change without notice. Confirm that you have received the latest product standards or specifications before final design, purchase or use.
3. Hitachi makes every attempt to ensure that its products are of high quality and reliability. However, contact Hitachi's sales office before using the product in an application that demands especially high quality and reliability or where its failure or malfunction may directly threaten human life or cause risk of bodily injury, such as aerospace, aeronautics, nuclear power, combustion control, transportation, traffic, safety equipment or medical equipment for life support.
4. Design your application so that the product is used within the ranges guaranteed by Hitachi particularly for maximum rating, operating supply voltage range, heat radiation characteristics, installation conditions and other characteristics. Hitachi bears no responsibility for failure or damage when used beyond the guaranteed ranges. Even within the guaranteed ranges, consider normally foreseeable failure rates or failure modes in semiconductor devices and employ systemic measures such as fail-safes, so that the equipment incorporating Hitachi product does not cause bodily injury, fire or other consequential damage due to operation of the Hitachi product.
5. This product is not designed to be radiation resistant.
6. No one is permitted to reproduce or duplicate, in any form, the whole or part of this document without written approval from Hitachi.
7. Contact Hitachi's sales office for any questions regarding this document or Hitachi semiconductor products.

HITACHI

Hitachi, Ltd.

Semiconductor & Integrated Circuits.
Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan
Tel: Tokyo (03) 3270-2111 Fax: (03) 3270-5109

URL NorthAmerica : <http://semiconductor.hitachi.com/>
 Europe : <http://www.hitachi-eu.com/hel/ecg>
 Asia (Singapore) : <http://www.has.hitachi.com.sg/grp3/sicd/index.htm>
 Asia (Taiwan) : http://www.hitachi.com.tw/E/Product/SICD_Frame.htm
 Asia (HongKong) : <http://www.hitachi.com.hk/eng/bo/grp3/index.htm>
 Japan : <http://www.hitachi.co.jp/Sicd/indx.htm>

For further information write to:

Hitachi Semiconductor
(America) Inc.
179 East Tasman Drive,
San Jose, CA 95134
Tel: <1> (408) 433-1990
Fax: <1> (408) 433-0223

Hitachi Europe GmbH
Electronic components Group
Dornacher Straße 3
D-85622 Feldkirchen, Munich
Germany
Tel: <49> (89) 9 9180-0
Fax: <49> (89) 9 29 30 00

Hitachi Europe Ltd.
Electronic Components Group.
Whitebrook Park
Lower Cookham Road
Maidenhead
Berkshire SL6 8YA, United Kingdom
Tel: <44> (1628) 585000
Fax: <44> (1628) 778322

Hitachi Asia Pte. Ltd.
16 Collyer Quay #20-00
Hitachi Tower
Singapore 049318
Tel: 535-2100
Fax: 535-1533

Hitachi Asia Ltd.
Taipei Branch Office
3F, Hung Kuo Building. No.167,
Tun-Hwa North Road, Taipei (105)
Tel: <886> (2) 2718-3666
Fax: <886> (2) 2718-8180

Hitachi Asia (Hong Kong) Ltd.
Group III (Electronic Components)
7/F., North Tower, World Finance Centre,
Harbour City, Canton Road, Tsim Sha Tsui,
Kowloon, Hong Kong
Tel: <852> (2) 735 9218
Fax: <852> (2) 730 0281
Telex: 40815 HITEC HX

Copyright © Hitachi, Ltd., 1998. All rights reserved. Printed in Japan.

HITACHI