To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

Renesas Electronics website: http://www.renesas.com

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (http://www.renesas.com)

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HA17458 Series

Dual Operational Amplifier

REJ03D0680-0100
(Previous: ADE-204-040)
Rev.1.00
Jun 15, 2005

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.

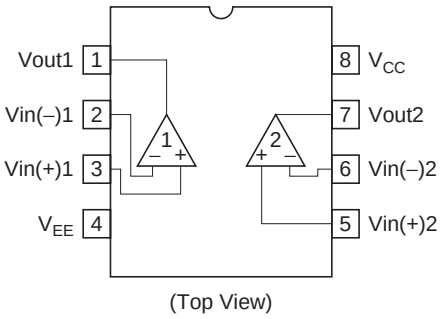
Features

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

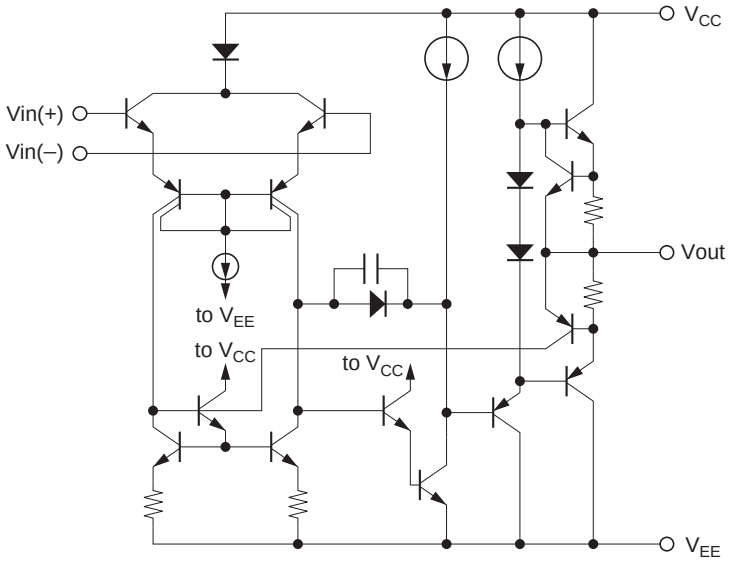
Ordering Information

Type No.	Application	Package Code (Previous Code)
HA17485FP	Industrial use	PRSP0008DE-B (FP-8DGV)
HA17458F	Commercial use	PRSP0008DE-B (FP-8DGV)
HA17458	Commercial use	PRDP0008AF-A (DP-8B)
HA17458PS	Industrial use	PRDP0008AF-A (DP-8B)

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
Intput 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 +125	–55 to +125	–55 to +125	–55 to +125	°C

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, Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Input offset voltage	V_{IO}	—	2.0	6.0	mV	R_S ≤ 10kΩ
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	µV/V	R_S ≤ 10kΩ
	$\Delta V_{IO}/\Delta V_{EE}$	—	30	150	µV/V	R_S ≤ 10kΩ
Voltage gain	A_{VD}	86	100	—	dB	R_L ≥ 2kΩ, Vout = ±10V
Common mode rejection ratio	CMR	70	90	—	dB	R_S ≤ 10kΩ
Common mode input voltage range	V_{CM}	±12	±13	—	V	
Peak-to-peak output voltage	Vop-p	±12	±14	—	V	R_L = 10kΩ
Power dissipation	P_d	—	90	200	mW	No load, 2 channel
Slew rate	SR	—	0.6	—	V/µs	A_{VD} = 1
Input resistance	Rin	0.3	1.0	—	MΩ	
Input capacitance	Cin	—	6.0	—	pF	
Output resistance	Rout	—	75	—	Ω	

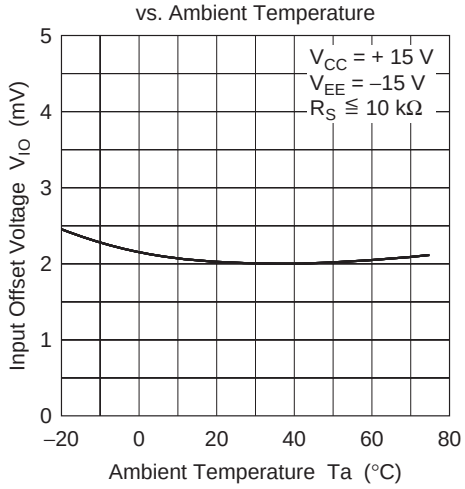
Electrical Characteristics 2

(V_{CC} = –V_{EE} = 15V, Ta = –20 to +75°C)

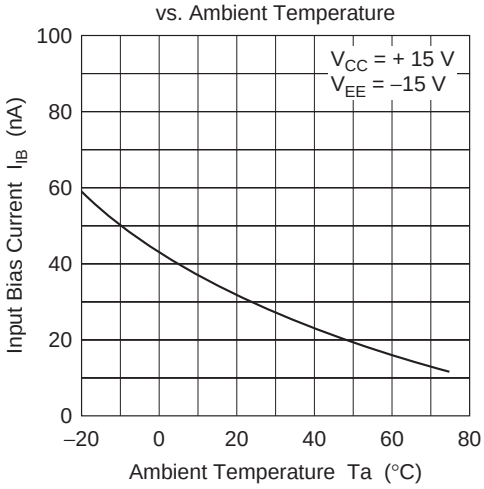
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Input offset voltage	V_{IO}	—	—	9.0	mV	R_S ≤ 10kΩ
Input offset current	I_{IO}	—	—	400	nA	
Input bias current	I_{IB}	—	—	1100	nA	
Voltage gain	A_{VD}	80	—	—	dB	R_L ≥ 2kΩ, Vout = ±10V
Peak-to-peak output voltage	Vop-p	±10	±13	—	V	R_L = 2kΩ

Characteristic Curves

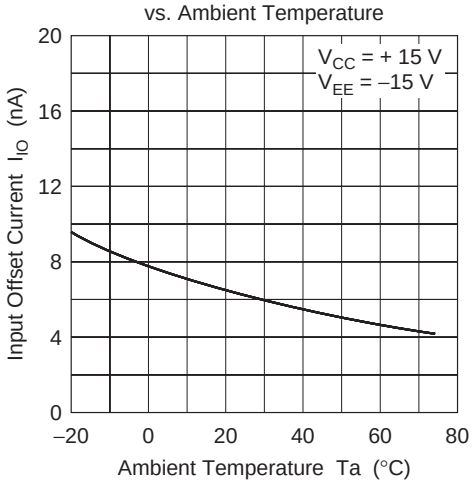
Input Offset Voltage vs. Ambient Temperature



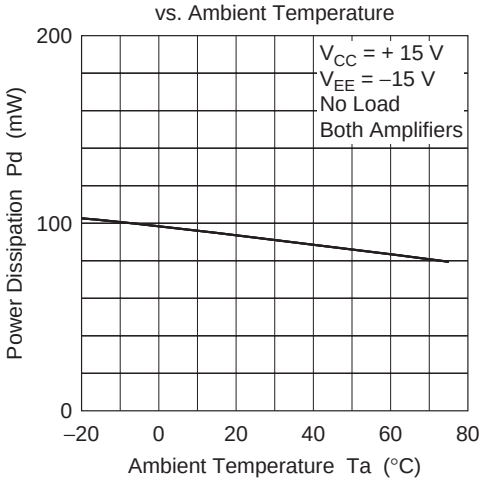
Input Bias Current vs. Ambient Temperature



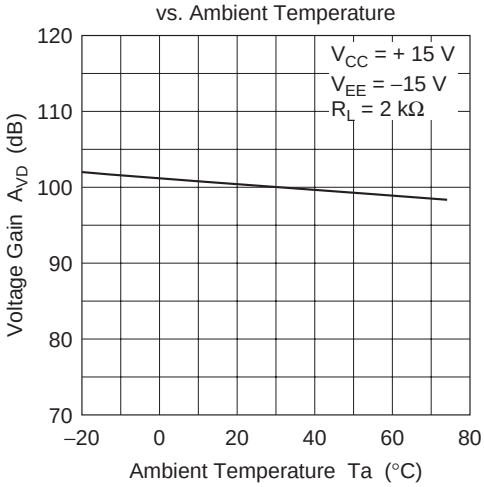
Input Offset Current vs. Ambient Temperature



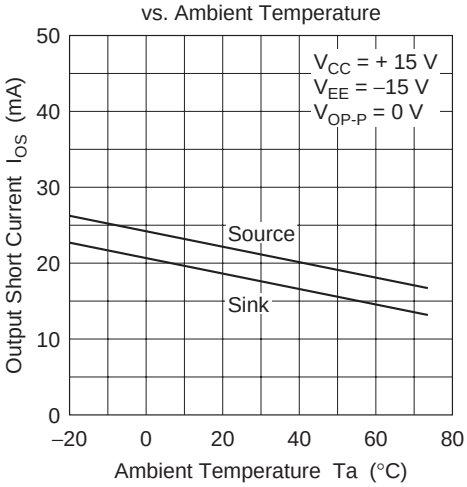
Power Dissipation vs. Ambient Temperature



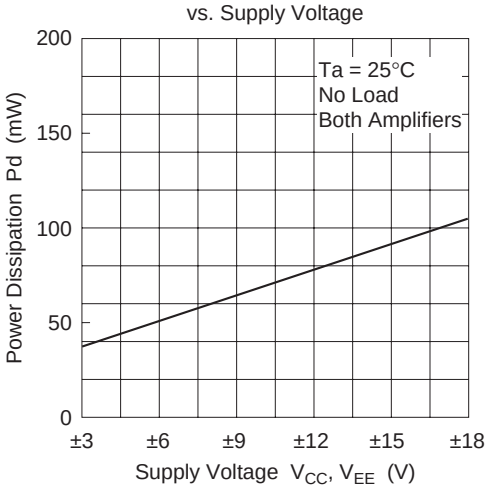
Voltage Gain
vs. Ambient Temperature



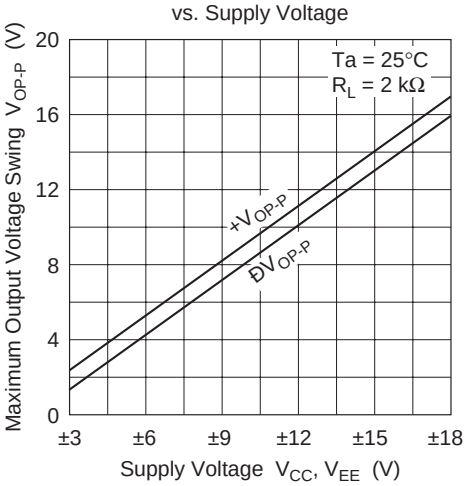
Output Short Current
vs. Ambient Temperature



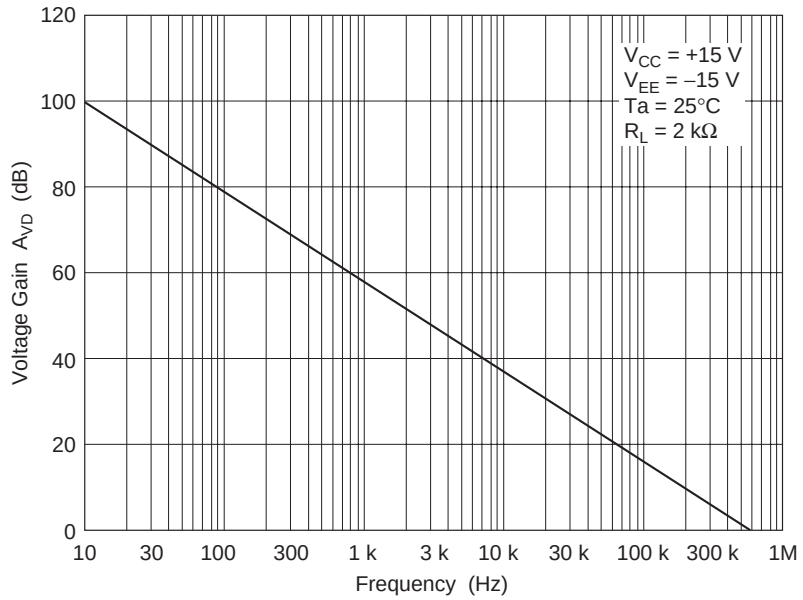
Power Dissipation
vs. Supply Voltage



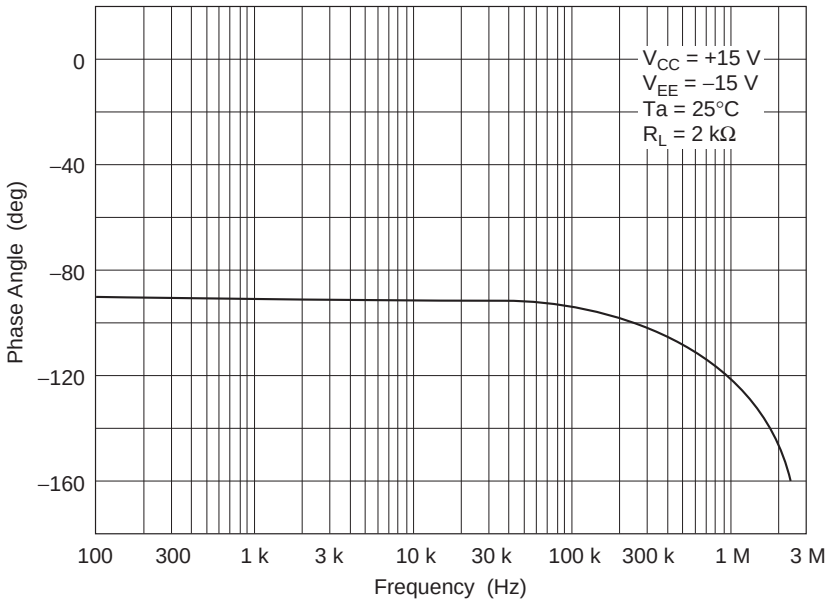
Maximum Output Voltage Swing
vs. Supply Voltage



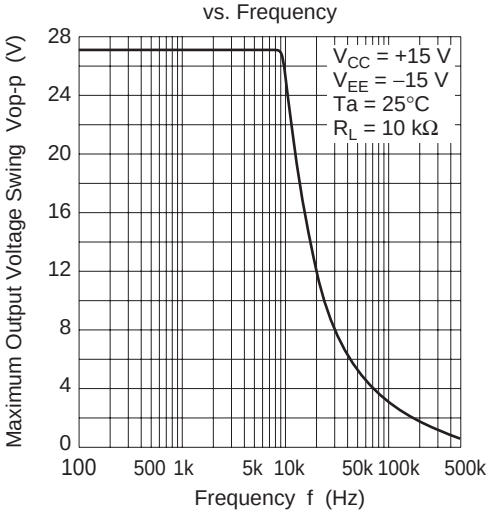
Voltage Gain vs. Frequency



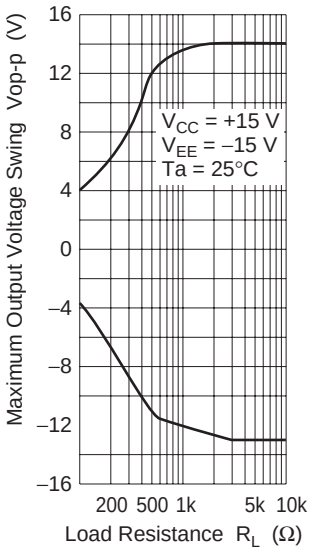
Phase Angle vs. Frequency



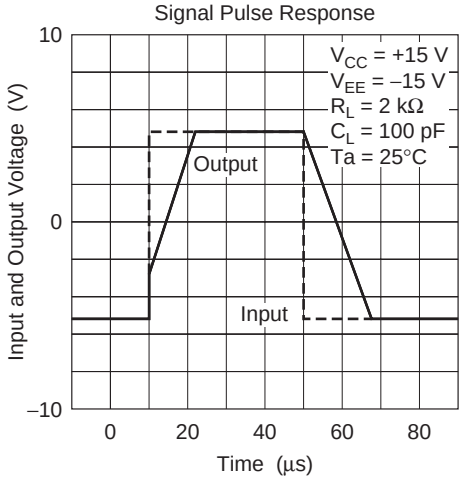
Maximum Output Voltage Swing vs. Frequency



Maximum Output Voltage Swing vs. Load Resistance

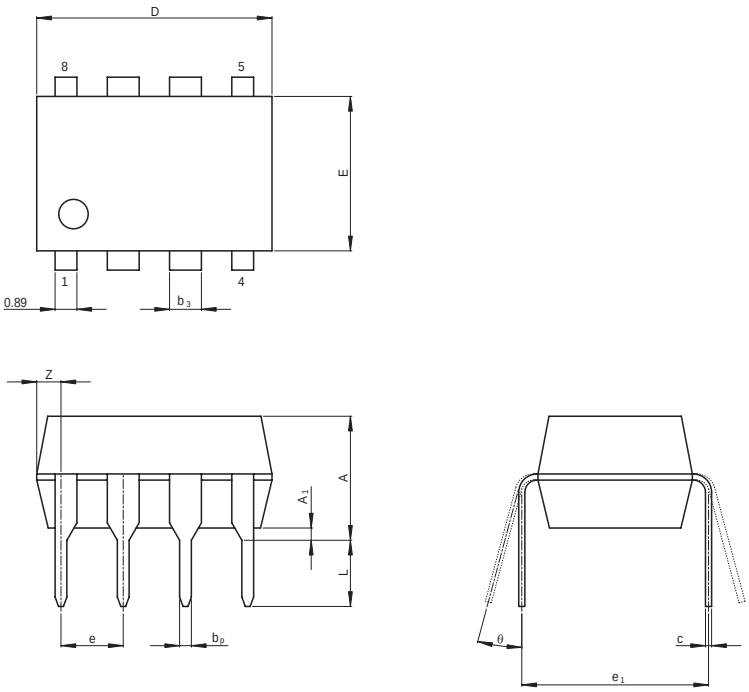


Voltage Follower Large Signal Pulse Response



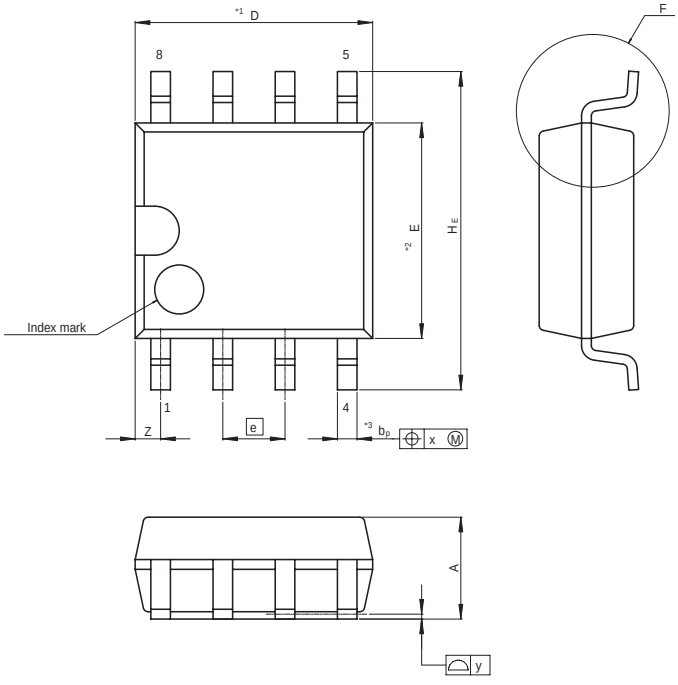
Package Dimensions

JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-DIP8-6.3x9.6-2.54	PRDP0008AF-A	DP-8B	0.51g

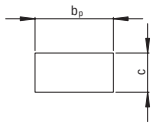


Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
e 1	——	7.62	——
D	——	9.6	10.6
E	——	6.3	7.4
A	——	——	5.06
A 1	0.5	——	——
b p	0.38	0.48	0.58
b 3	——	1.3	——
c	0.20	0.25	0.35
θ	0°	——	15°
e	2.29	2.54	2.79
Z	——	——	1.27
L	2.54	——	——

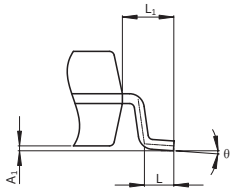
JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-SOP8-4.4x4.85-1.27	PRSP0008DE-B	FP-8DGV	0.1g



NOTE)
1. DIMENSIONS"*1 (Nom)"AND"*2" DO NOT INCLUDE MOLD FLASH.
2. DIMENSION"*3"DOES NOT INCLUDE TRIM OFFSET.



Terminal cross section
(Ni/Pd/Au plating)



Detail F

Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	——	4.85	5.25
E	——	4.4	——
A 2	——	——	——
A 1	0.00	0.1	0.20
A	——	——	2.03
b p	0.35	0.4	0.45
b 1	——	——	——
c	0.15	0.20	0.25
c 1	——	——	——
θ	0°	——	8°
H E	6.35	6.5	6.75
e	——	1.27	——
x	——	——	0.12
y	——	——	0.15
Z	——	——	0.75
L	0.42	0.60	0.85
L 1	——	1.05	——

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