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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HA17558 Series

Dual Operational Amplifier

REJ03D0682-0100
(Previous: ADE-204-042)
Rev.1.00
Jun 15, 2005

Description

HA17558 is dual operational amplifiers which provides internal frequency compensation and high performance. It can be applied widely to measuring control equipment and to general Use. The two amplifiers share a common bias network and power supply leads.

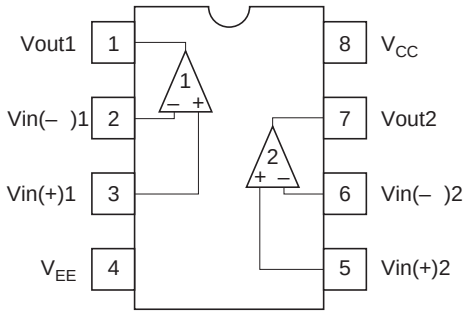
Features

- High voltage Gain: 104dB (Typ)
- High speed: 1V/μs
- Continuous short-circuit protection
- Low-noise operational amplifiers
- Internal frequency compensation

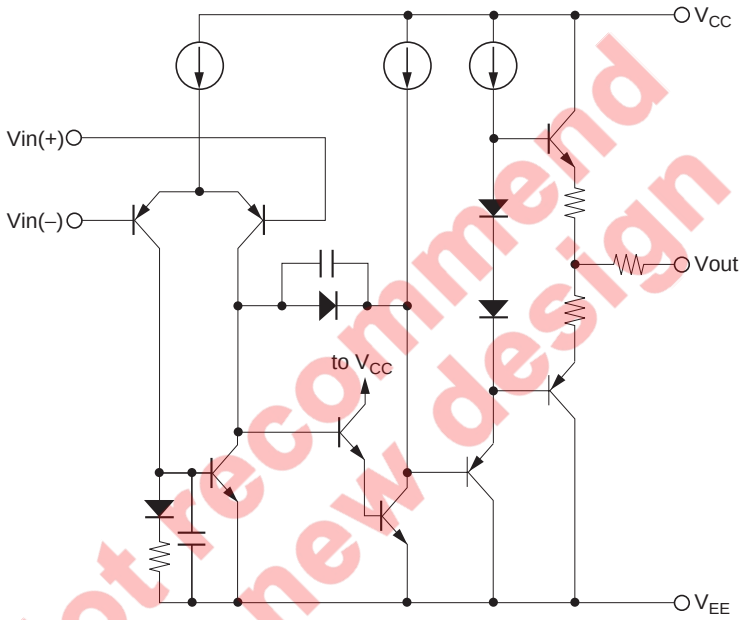
Ordering Information

Type No.	Application	Package Code (Previous Code)
HA17558FP	Industrial use	PRSP0008DE-B (FP-8DGV)
HA17558F	Commercial use	PRSP0008DE-B (FP-8DGV)
HA17558	Commercial use	PRDP0008AF-A (DP-8B)
HA17558PS	Industrial use	PRDP0008AF-A (DP-8B)

Pin Arrangement



Circuit Schematic (1/2)



Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings				Unit
		HA17558	HA17558PS	HA17558F	HA17558FP	
Supply voltage	V_{CC}	+18	+18	+18	+18	V
	V_{EE}	–18	–18	–18	–18	V
Differential input voltage	$V_{IN\ (diff)}$	±30	±30	±30	±30	V
Common-mode input voltage	V_{CM}*[3]	±15	±15	±15	±15	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	–20 to +75
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.

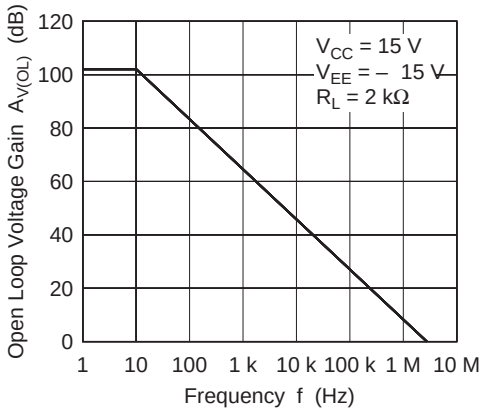
Electrical Characteristics

(Ta = 25°C, V_{CC} = +15V, V_{EE} = –15V)

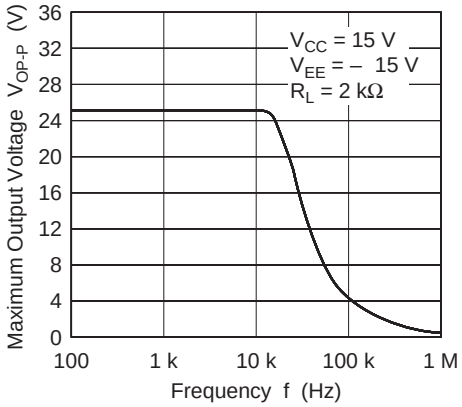
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Input offset voltage	V_{IO}	—	0.5	6	mV	R_S ≤ 10kΩ
Input offset current	I_{IO}	—	5	200	nA	
Input bias current	I_{IB}	—	50	500	nA	
Voltage gain	A_{VD}	86	104	—	dB	R_L ≥ 2kΩ, V_O = ±10V
Maximum output voltage	Vop-p	±12	±14	—	V	R_L ≥ 10kΩ
Maximum output voltage	Vop-p	±10	±12.4	—	V	R_L ≥ 2kΩ
Common mode input voltage range	V_{CM}	±12	±14	—	V	
Common mode rejection ratio	CMR	70	100	—	dB	R_S ≤ 10kΩ
Supply voltage rejection ratio	PSRR	—	10	150	µV/V	R_S ≤ 10kΩ
Power dissipation	Pd	—	90	170	mW	2-channel, No load
Slew rate	SR	—	1.0	—	V/µs	A_{VD} = 1
Equivalent input noise voltage	V_{NI}	—	6	—	µVp-p	R_S = 1kΩ, f = 1H_Z to 1kH_Z
Channel separation	CS	—	105	—	dB	f = 1kHz

Characteristic Curves

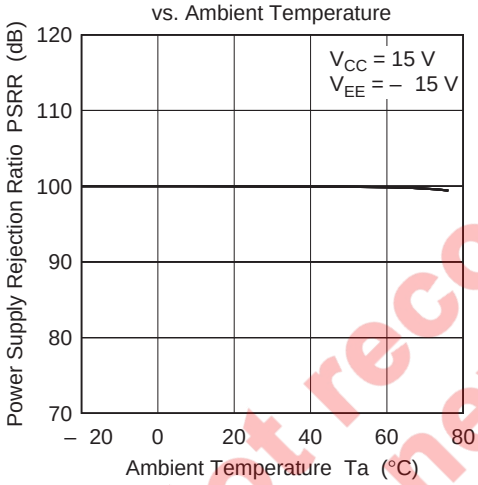
Open Loop Voltage Gain vs. Frequency



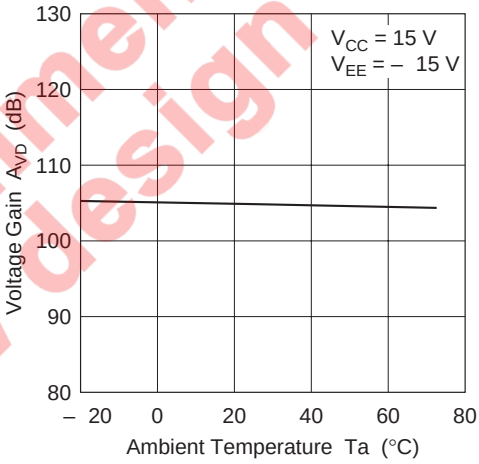
Maximum Output Voltage vs. Frequency



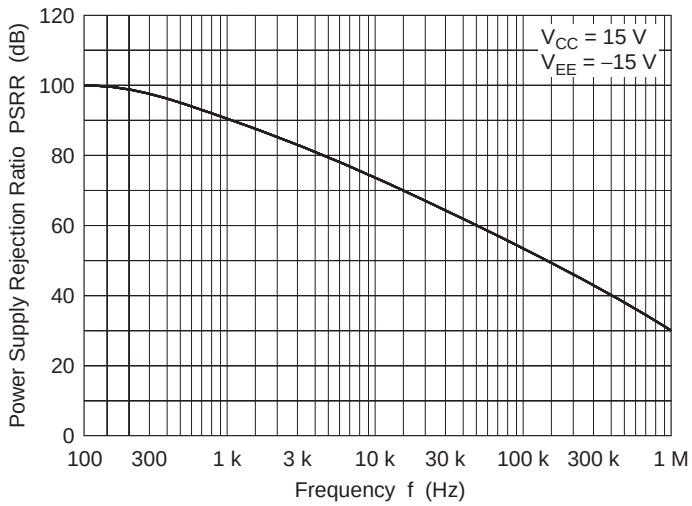
Power Supply Rejection Ratio vs. Ambient Temperature



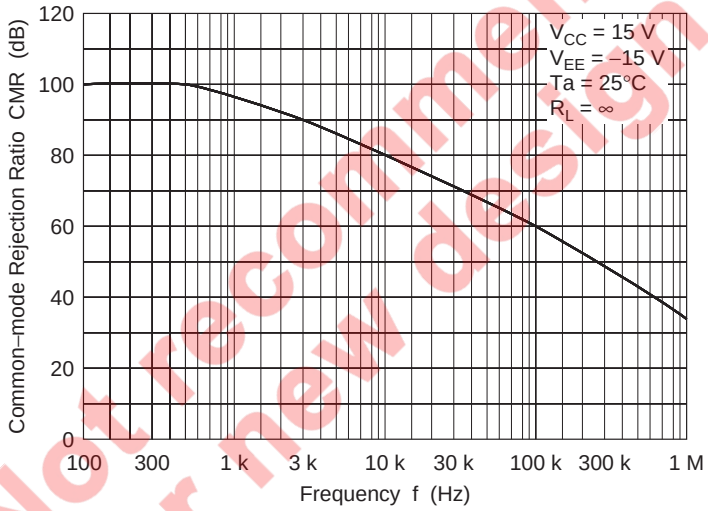
Voltage Gain vs. Ambient Temperature



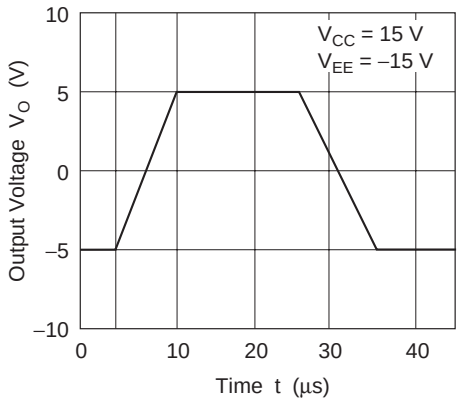
Power Supply Rejection Ratio vs. Frequency



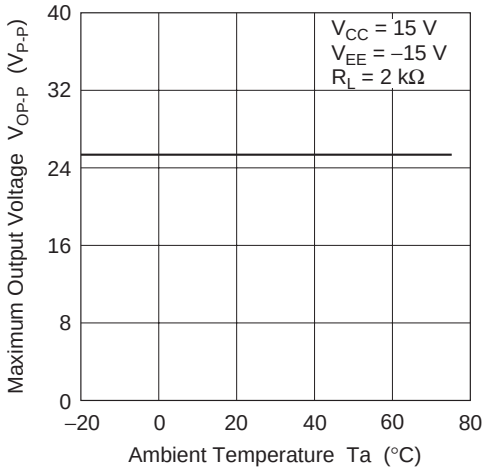
Common-mode Rejection Ratio vs. Frequency



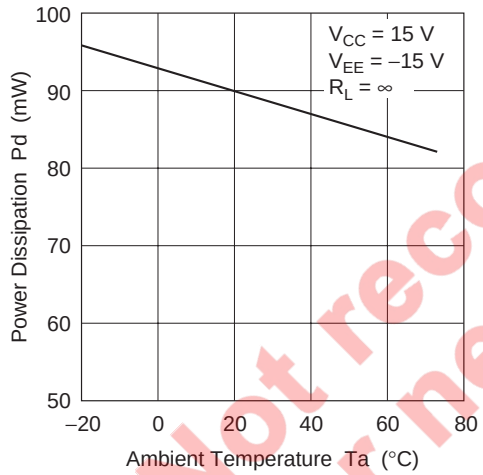
Transient Response



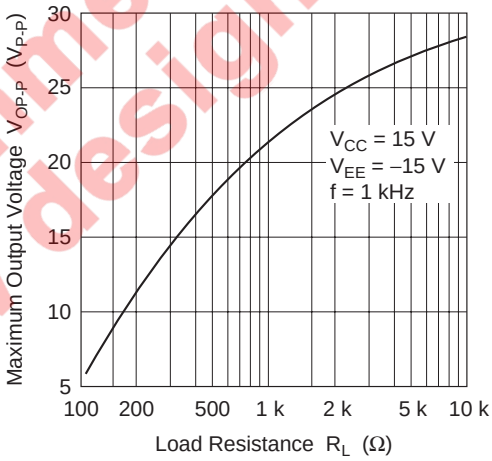
Maximum Output Voltage vs. Ambient Temperature



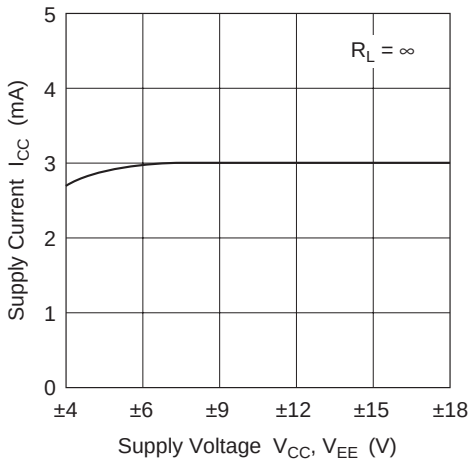
Power Dissipation vs. Ambient Temperature



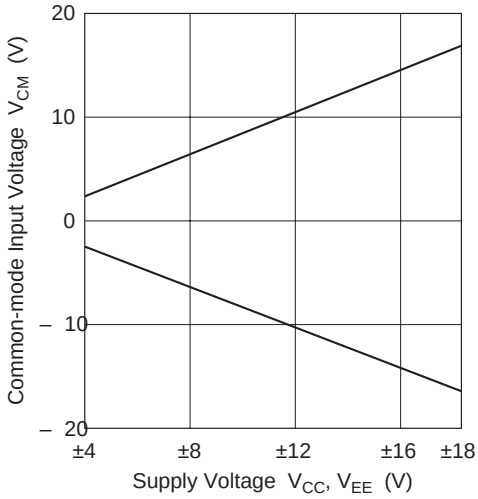
Maximum Output Voltage vs. Load Resistance



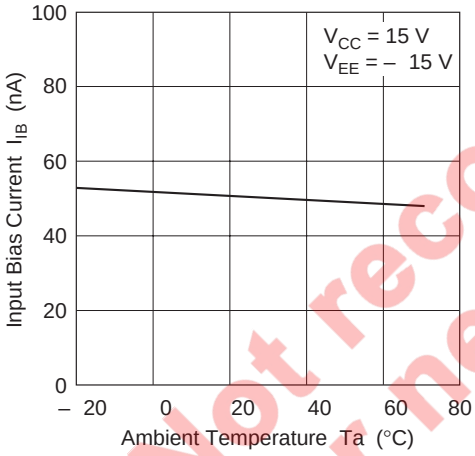
Supply Current vs. Supply Voltage



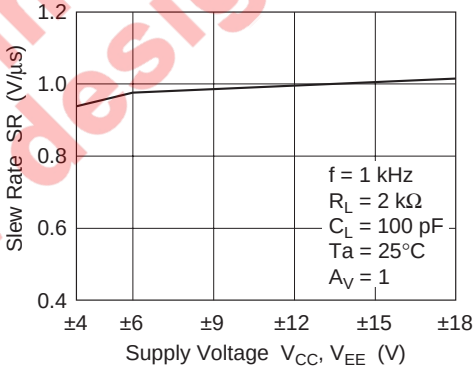
Common-mode Input Voltage vs. Supply Voltage



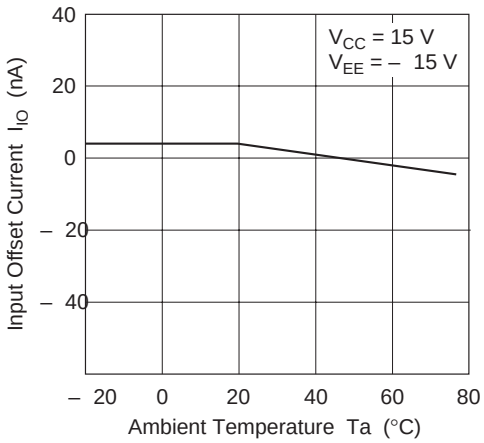
Input Bias Current vs. Ambient Temperature



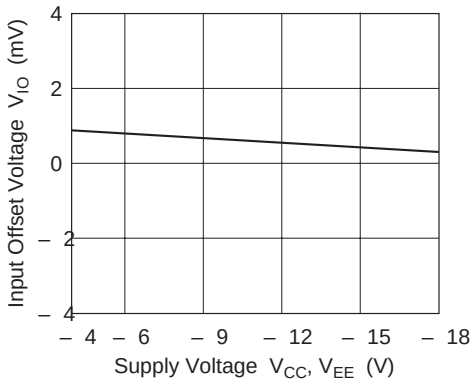
Slew Rate vs. Supply Voltage



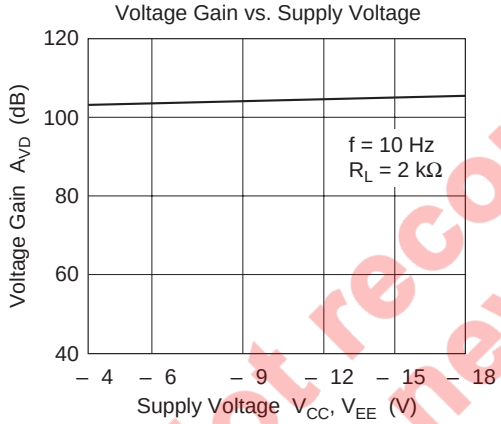
Input Offset Current vs. Ambient Temperature



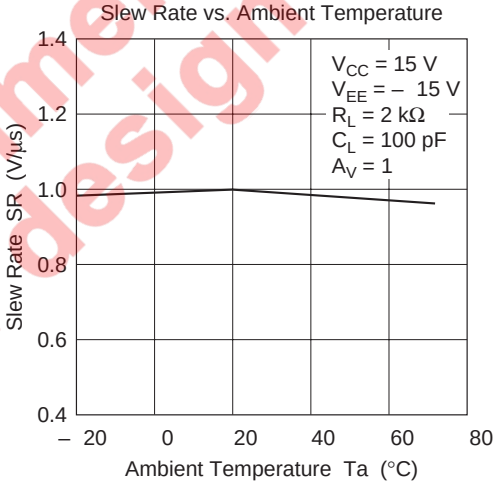
Input Offset Voltage vs. Supply Voltage



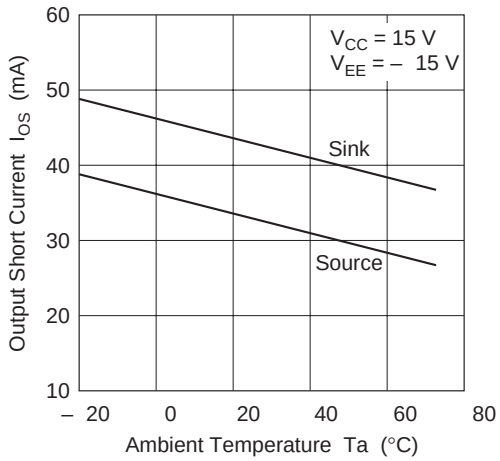
Voltage Gain vs. Supply Voltage



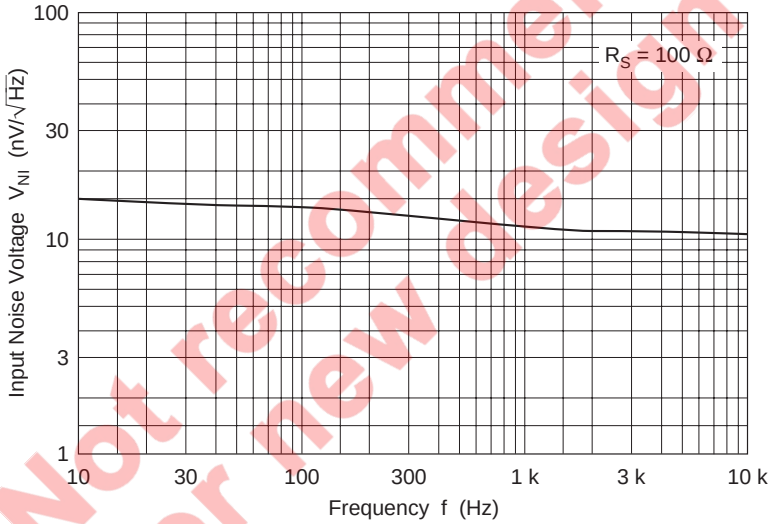
Slew Rate vs. Ambient Temperature



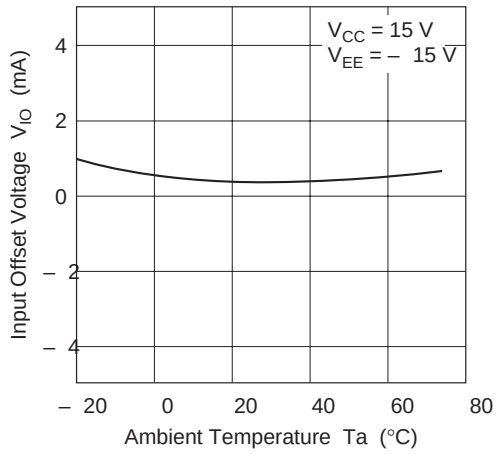
Output Short Current vs. Ambient Temperature



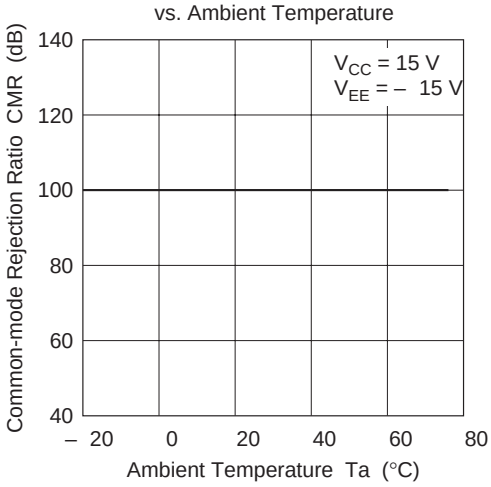
Input Noise Voltage vs. Frequency



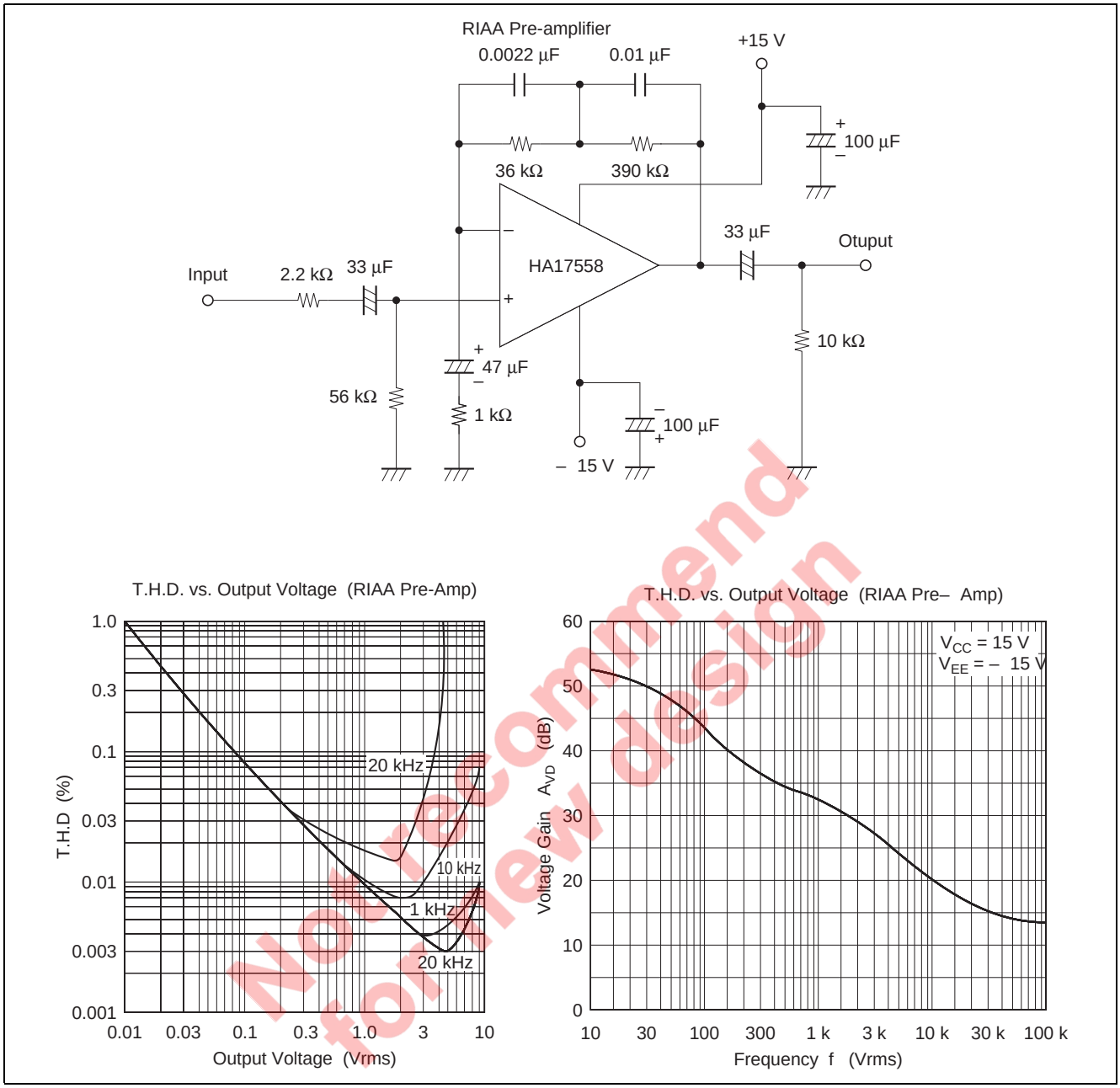
Input Offset Voltage vs. Ambient Temperature



Common-mode Rejection Ratio vs. Ambient Temperature

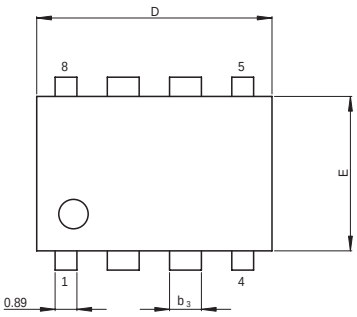


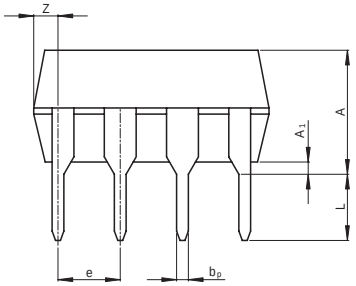
Circuit Example

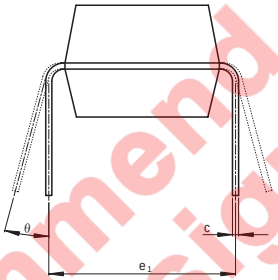


Package Dimensions

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

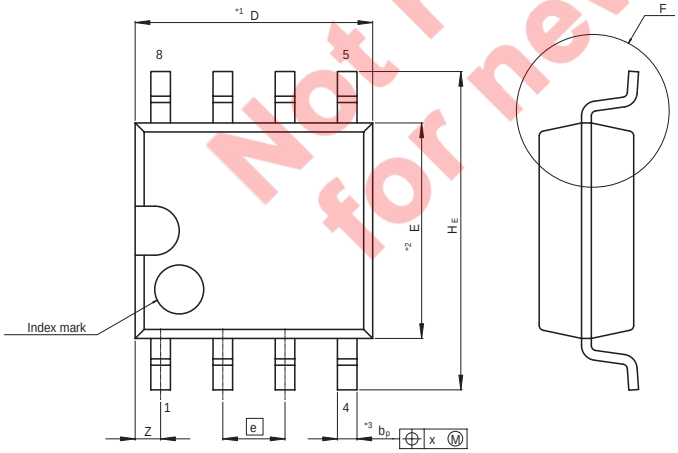


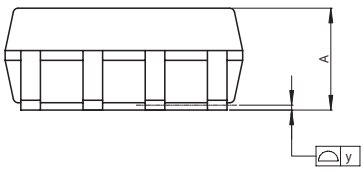




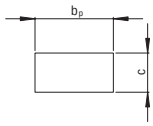
Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
e 1	——	7.62	——
D	——	9.6	10.6
E	——	6.3	7.4
A	——	——	5.06
A 1	0.5	——	——
b p	0.38	0.48	0.58
b 3	——	1.3	——
c	0.20	0.25	0.35
θ	0°	——	15°
e	2.29	2.54	2.79
Z	——	——	1.27
L	2.54	——	——

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

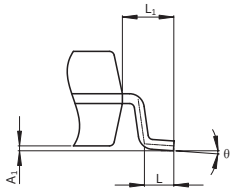




NOTE)
1. DIMENSIONS"*1 (Nom)"AND"*2" DO NOT INCLUDE MOLD FLASH.
2. DIMENSION"*3"DOES NOT INCLUDE TRIM OFFSET.



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	——

Renesas Technology Corp. Sales Strategic Planning Div. Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan

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Renesas Technology America, Inc.
450 Holger Way, San Jose, CA 95134-1368, U.S.A
Tel: <1> (408) 382-7500, Fax: <1> (408) 382-7501

Renesas Technology Europe Limited
Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K.
Tel: <44> (1628) 585-100, Fax: <44> (1628) 585-900

Renesas Technology Hong Kong Ltd.
7th Floor, North Tower, World Finance Centre, Harbour City, 1 Canton Road, Tsimshatsui, Kowloon, Hong Kong
Tel: <852> 2265-6688, Fax: <852> 2730-6071

Renesas Technology Taiwan Co., Ltd.
10th Floor, No.99, Fushing North Road, Taipei, Taiwan
Tel: <886> (2) 2715-2888, Fax: <886> (2) 2713-2999

Renesas Technology (Shanghai) Co., Ltd.
Unit2607 Ruijing Building, No.205 Maoming Road (S), Shanghai 200020, China
Tel: <86> (21) 6472-1001, Fax: <86> (21) 6415-2952

Renesas Technology Singapore Pte. Ltd.
1 Harbour Front Avenue, #06-10, Keppel Bay Tower, Singapore 098632
Tel: <65> 6213-0200, Fax: <65> 6278-8001

Colophon 2.0