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April 1st, 2010
Renesas Electronics Corporation

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HA17558B Series

Dual Operational Amplifier

REA03D0003-0200

Rev.2.00

Dec 24, 2008

Description

HA17558B is dual bipolar op-amp with improved characteristics compared to HA17558A. It has wide bandwidth, low noise, high slew rate; wide operating voltage range and high gain characteristics.

This product has a wide range of applications that is appropriate for audio application, as well as AC/DC converter.

Features

- Wide bandwidth: 7 MHz
- High speed: 3 V/ μ s
- Low input noise voltage: 1 μ Vrms
- Large DC voltage gain: 110 dB
- Operating voltage: ± 2 V to ± 18 V
- Package outline available in Pb free lead frame:
 - DP-8
 - SOP-8 (JEITA)
 - SOP-8 (JEDEC)

Applications

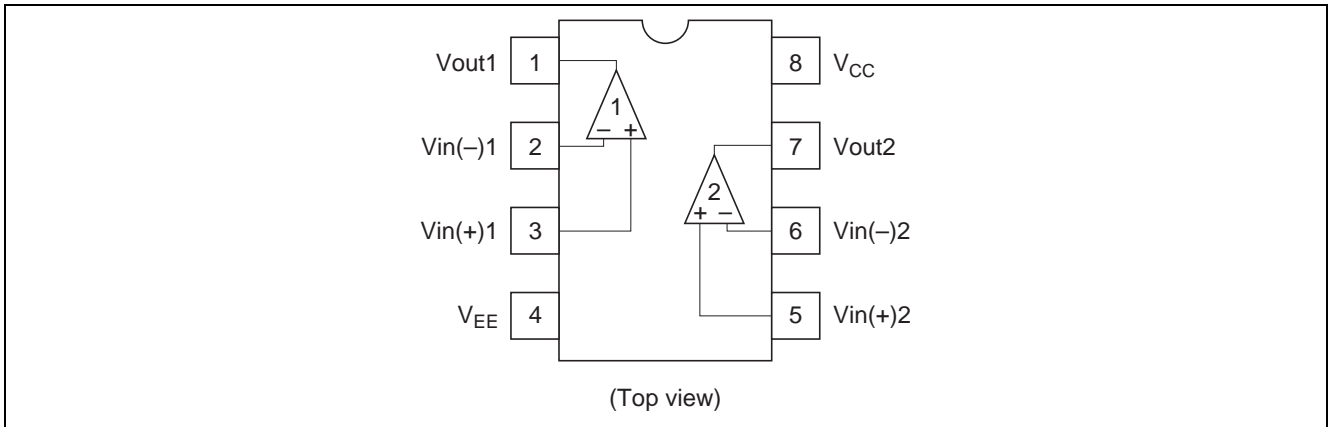
- Audio AC-3 decoder system
- Audio amplifier
- AC/DC converter

Ordering Information

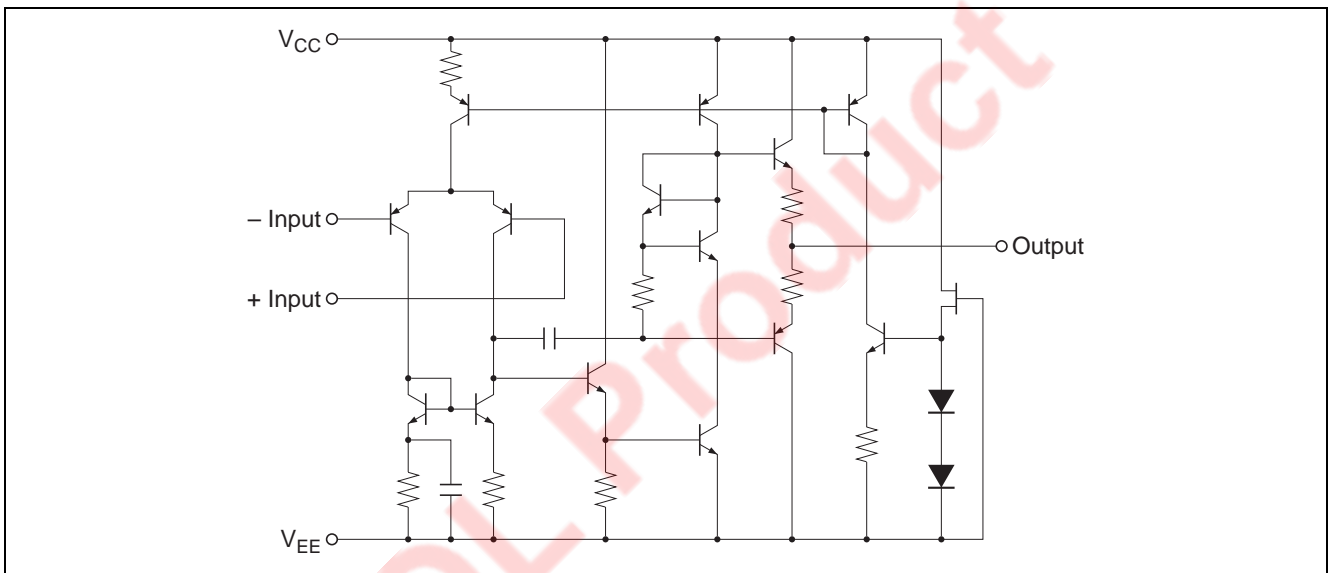
Part No.	Application	Package Code (Package Name)	Packing Abbreviation (Quantity)
HA17558B	Commercial use	PRDP0008AF-B (DP-8FV)	— (50 pcs/stick 1,000 pcs/box)
HA17558BF		PRSP0008DE-B (FP-8DGV)	EL (2,500 pcs/reel)
HA17558BRP		PRSP0008DD-C (FP-8DCV)	EL (2,500 pcs/reel)

Note: This product is designed for consumer use and not for automotive and industry.

Pin Arrangement



Circuit Schematic (1/2)



Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings			Unit
		HA17558B	HA17558BF	HA17558BRP	
Supply Voltage	V _{CC}	18	18	18	V
	V _{EE}	-18	-18	-18	V
Differential input voltage	V _{IN} (diff)	±30	±30	±30	V
Common mode input voltage	V _{CM} *3	±15	±15	±15	V
Power dissipation	P _T	670 *1	385 *2	385 *2	mW
Operating temperature	Topr	-40 to +85	-40 to +85	-40 to +85	°C
Storage temperature	Tstg	-55 to +125	-55 to +125	-55 to +125	°C

Notes: 1. This is the allowable value up to Ta = 45°C. Derate by 8.3 mW/°C above that temperature.

2. These are the allowable values up to Ta = 60°C mounting on 40mm × 40mm × 1.6mm (t) 10% wiring density glass epoxy board. Derate by 5.9 mW/°C above that temperature.

3. If the supply voltage is less than ±15 V, input voltage should be less than supply voltage.

Electrical Characteristics

(Ta = 25°C, V_{CC} = +15 V, V_{EE} = -15 V, unless otherwise specified)

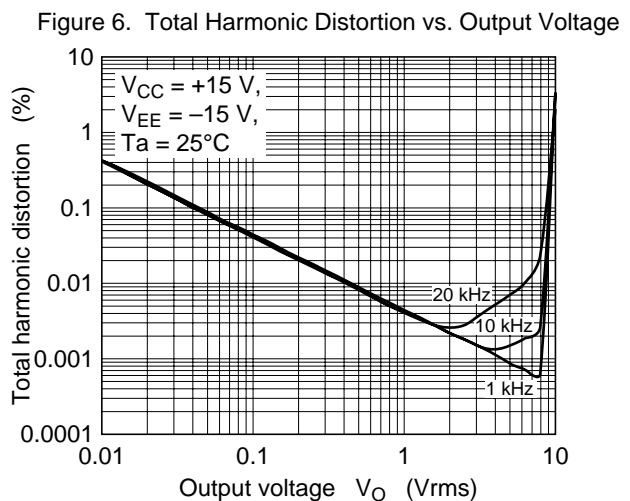
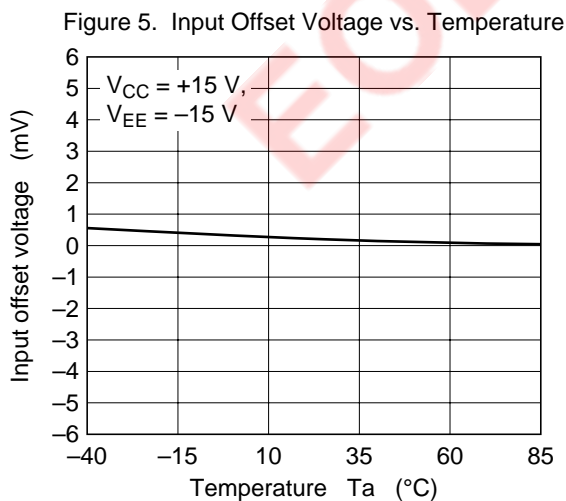
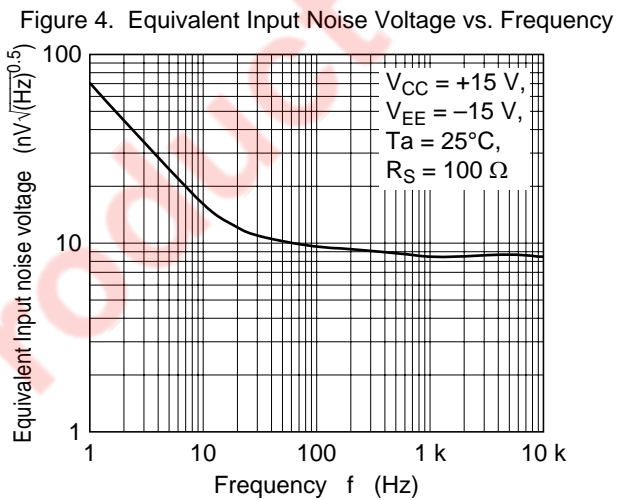
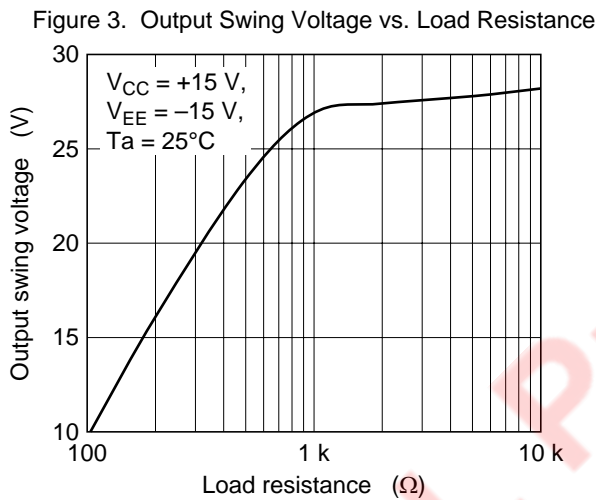
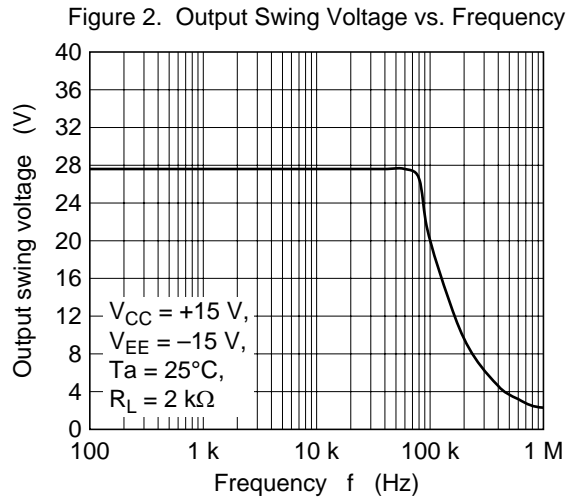
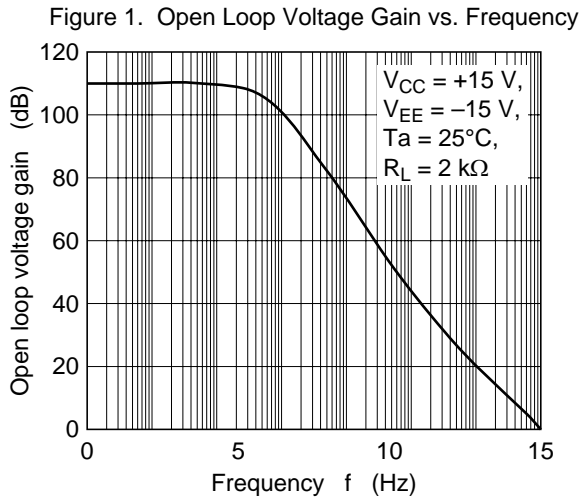
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Input offset voltage	V _{IO}	—	0.5	3	mV	R _S ≤ 10 kΩ
Input offset current	I _{IO}	—	5	50	nA	
Input bias current	I _{IB}	—	65	250	nA	
Supply current	I _{CC}	—	2.5	4	mA	
Power supply rejection ratio	PSRR	80	100	—	dB	R _S ≤ 10 kΩ
Voltage gain	A _V	85	110	—	dB	R _L ≥ 2 kΩ, V _O = ±10 V
Common mode rejection ratio	CMR	80	100	—	dB	R _S ≤ 10 kΩ
Output swing voltage	V _{OS}	±10	±13	—	V	R _L ≥ 2 kΩ
		±12	±14	—	V	R _L ≥ 10 kΩ
Output sink current	I _{OSINK}	—	70	—	mA	V _{IN(-)} = 1 V, V _{IN(+)} = 0 V, V _O = 2 V
Output source current	I _{OSOURCE}	—	45	—	mA	V _{IN(-)} = 0 V, V _{IN(+)} = 1 V, V _O = 2 V
Slew rate	SR	—	3	—	V/μs	
Equivalent input noise voltage	V _{NI}	—	1	—	μVrms	RIAA, R _S = 1 kΩ, 30 kHz LPF
Gain bandwidth product	f _u	—	7	—	MHz	f = 10 kHz
Total harmonic distortion	THD	—	0.0045	—	%	f = 1 kHz, V _O = 1 Vrms

Table of Graphs

Electrical Characteristics		Figure
Open loop voltage gain	vs. Frequency f	1
Output swing voltage	vs. Frequency f	2
Output swing voltage	vs. Load resistance R_L	3
Equivalent input noise voltage	vs. Frequency f	4
Input offset voltage	vs. Temperature T_a	5
Total harmonic distortion	vs. Output Voltage V_o	6

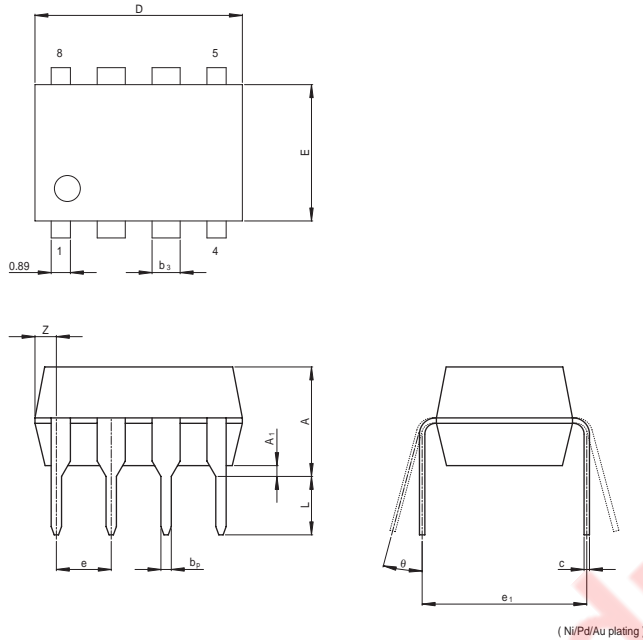
EOL Product

Typical Characteristics Curves



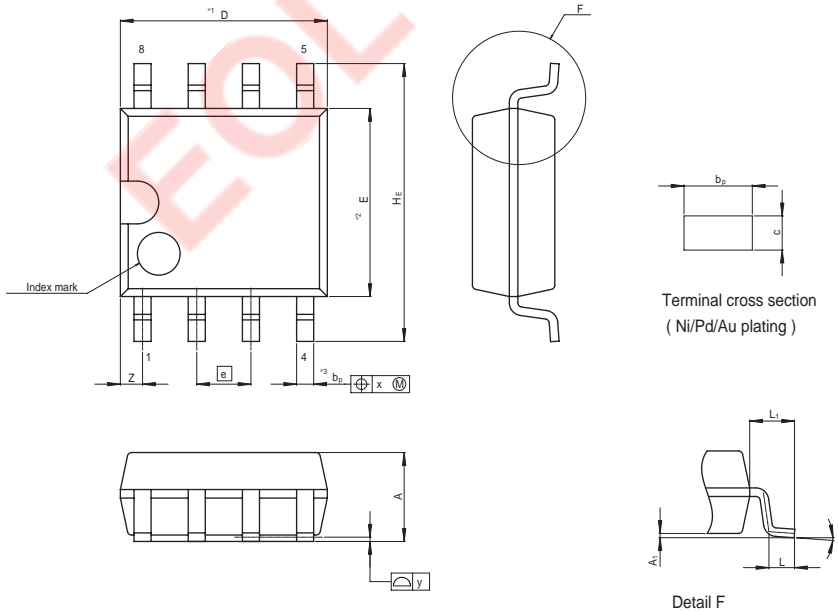
Package Dimensions

JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-DIP8-6.3x9.6-2.54	PRDP0008AF-B	DP-8FV	0.54g



Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
e ₁	—	7.62	—
D	—	9.60	10.6
E	—	6.30	7.4
A	—	—	5.06
A ₁	0.5	—	—
b _p	0.40	0.48	0.56
b ₃	—	1.30	—
c	0.19	0.25	0.31
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

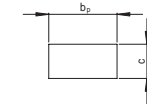
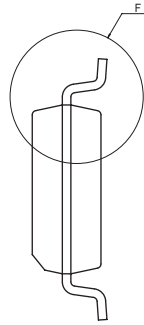
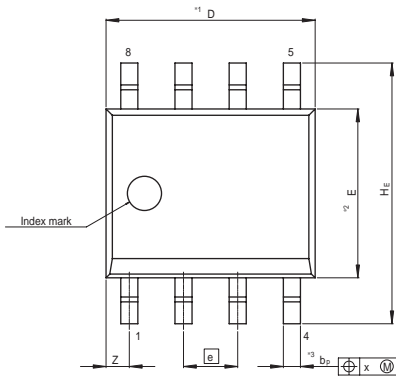


NOTE
 1. DIMENSIONS**1 (Nom)**AND**2 DO NOT INCLUDE MOLD FLASH.
 2. DIMENSION**3 DOES NOT INCLUDE TRIM OFFSET.

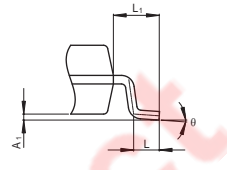
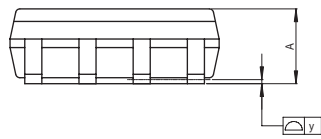
Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	—	4.85	5.25
E	—	4.4	—
A ₂	—	—	—
A ₁	0.00	0.1	0.20
A	—	—	2.03
b _p	0.35	0.4	0.45
b ₁	—	—	—
c	0.15	0.20	0.25
c ₁	—	—	—
θ	0°	—	8°
H _E	6.35	6.5	6.75
Ⓧ	—	1.27	—
x	—	—	0.12
y	—	—	0.15
Z	—	—	0.75
L	0.42	0.60	0.85
L ₁	—	1.05	—

HA17558B Series

JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-SOP8-3.95x4.9-1.27	PRSP0008DD-C	FP-8DCV	0.085g



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



Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	—	4.90	5.30
E	—	3.95	—
A ₂	—	—	—
A ₁	0.10	0.14	0.25
A	—	—	1.75
b _p	0.34	0.40	0.46
b ₁	—	—	—
c	0.15	0.20	0.25
c ₁	—	—	—
θ	0°	—	8°
H _E	5.80	6.10	6.20
\square	—	1.27	—
x	—	—	0.25
y	—	—	0.10
Z	—	—	0.75
L	0.40	0.60	1.27
L ₁	—	1.08	—

EOL Product

Notes:

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