Dual Operational Amplifier

HITACHI

ADE-204-033A (Z) Rev. 1 Mar. 2001

Description

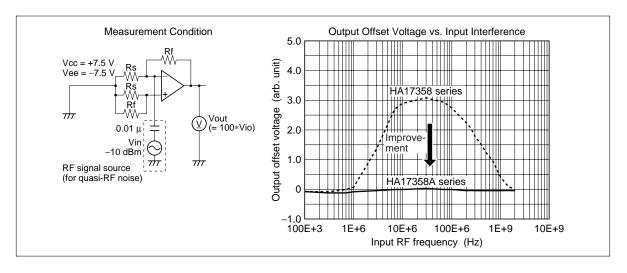
HA17358 series and HA17358A series are dual operational amplifier that provide high gain and internal phase compensation, with single power supply. They can be widely applied to control equipments and to general use.

Features

- Wide range of supply voltage, and single power supply used
- Wide range of common mode voltage, and possible to operate with an input about 0 V, and output around 0 V is available
- Frequency characteristics and input bias current are temperature compensated

Features only for "A" series

Low electro-magnetic susceptibility level

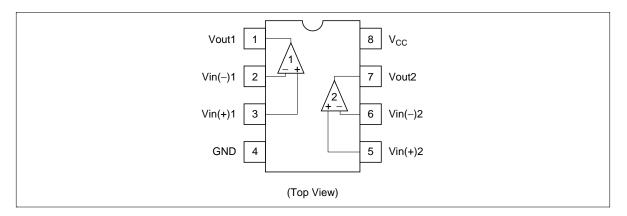




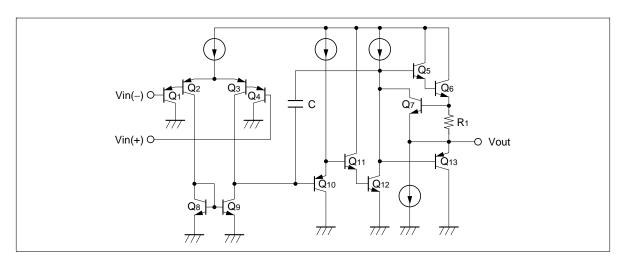
Ordering Information

Type No.	Application	Package	
HA17358	Commercial use	DP-8B	
HA17358F		FP-8D	
HA17358APS	Industrial use	DP-8B	
HA17358ARP	Commercial use	FP-8DC	
HA17358AFP		FP-8D	

Pin Arrangement



Circuit Schematic (1/2)



Absolute Maximum Ratings $(Ta = 25^{\circ}C)$

Ratings

Item	Symbol	HA17358	HA17358F	HA17358APS	HA17358AFP/ARP	Unit
Supply voltage	V _{cc}	32	32	32	32	V
Sink current	Isink	50	50	50	50	mA
Power dissipation	P _T	570 *1	385 *2	570 * ¹	385 * ²	mW
Common mode input voltage	V _{CM}	-0.3 to V_{CC}	-0.3 to V_{CC}	-0.3 to V_{cc}	-0.3 to V_{cc}	V
Differential input voltage	Vin (diff)	±V _{cc}	±V _{cc}	±V _{cc}	±V _{cc}	V
Operating temperature	Topr	-20 to +75	-20 to +75	-40 to +85	-40 to +85	°C
Storage temperature	Tstg	-55 to +125	-55 to +125	-55 to +125	-55 to +125	°C

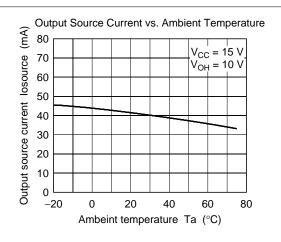
Notes: 1. This is the allowable values up to $Ta = 50^{\circ}C$. Derate by 8.3 mW/ $^{\circ}C$.

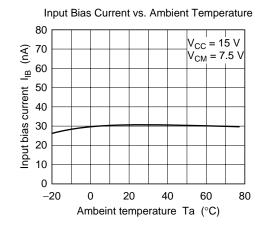
2. These are the allowable values up to $Ta = 25^{\circ}C$ mounting in air. When it is mounted on glass epoxy board of 40 mm \times 40 mm \times 1.5 mmt with 30% wiring density, the allowable value is 570 mW up to $Ta = 45^{\circ}C$. If $Ta > 45^{\circ}C$, derate by 7.14 mW/°C.

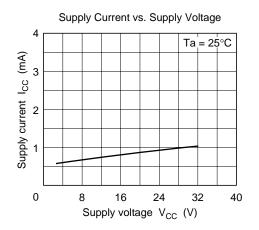
Electrical Characteristics (V $_{CC} = +15~V,\, Ta = 25 ^{\circ}C)$

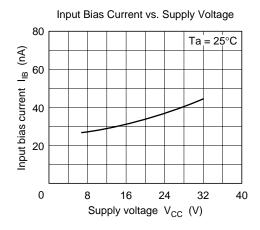
Item	Symbol	Min	Тур	Max	Unit	Test Conditions
Input offset voltage	V _{IO}		3	7	mV	$V_{\text{CM}} = 7.5 \text{V}, \ \text{R}_{\text{S}} = 50 \Omega, \ \text{Rf} = 50 \text{k}\Omega$
Input offset current	I _{IO}	_	5	50	nA	$V_{CM} = 7.5V$, $I_{IO} = I_{I(+)} - I_{I(-)} $
Input bias current	I _{IB}		30	250	nA	$V_{CM} = 7.5V$
Power source rejection ratio	PSRR	_	93	_	dB	$R_s = 1k\Omega$, $Rf = 100k\Omega$
Voltage gain	A _{VD}	75	90	_	dB	$R_L = \infty$, $R_S = 1k\Omega$, $Rf = 100k\Omega$
Common mode rejection ratio	CMR		80	_	dB	$R_s = 50\Omega$, $Rf = 5k\Omega$
Common mode input voltage range	V _{CM (+)}	13.5	_	_	V	$R_s = 1k\Omega$, $Rf = 100k\Omega$
	V _{CM (-)}	_	_	-0.3	V	$R_s = 1k\Omega$, $Rf = 100k\Omega$
Peak-to-peak output voltage	Vop-p		13.6		V	$f = 100Hz$, $R_L = 20k\Omega$, $R_S = 1k\Omega$, $Rf = 100k\Omega$
Output source current	losource	20	40	_	mA	$V_{IN}^{+} = 1V, V_{IN}^{-} = 0V, V_{OH} = 10V$
Output sink current	losink	10	20	_	mA	$V_{IN}^- = 1V, V_{IN}^+ = 0V, V_{OL} = 2.5V$
Output sink current	losink	15	50	_	μА	$V_{IN}^{-} = 1V, V_{IN}^{+} = 0V,$ Vout = 200mV
Supply current	I _{cc}	_	0.8	2	mA	$V_{IN} = GND, R_{L} = \infty$
Slew rate	SR	_	0.2	_	V/µs	$R_L = \infty$, $V_{CM} = 7.5V$, $f = 1.5kHz$
Channel separation	CS	_	120	_	dB	f = 1kHz

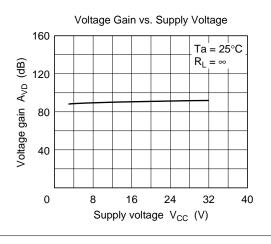
Characteristic Curves

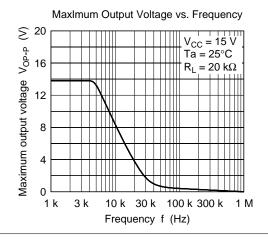


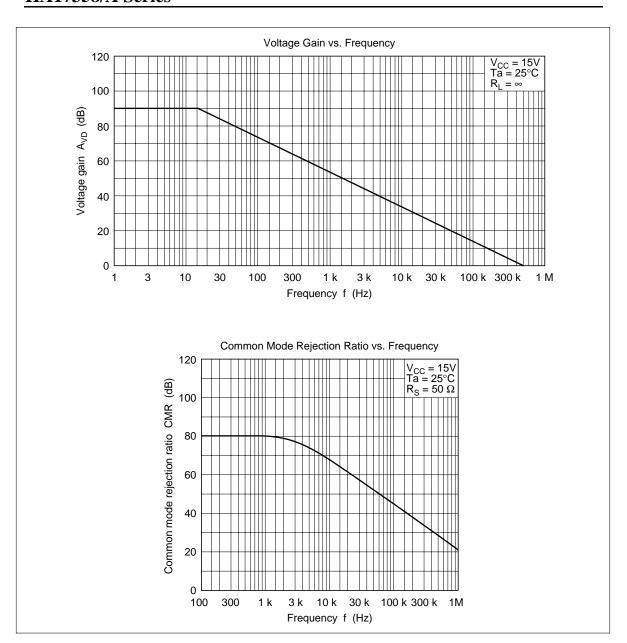












Solder Mounting Method

- Small and light surface-mount packages require spicial attentions on solder mounting.
 On solder mounting, pre-heating before soldering is needed.
 The following figure show an example of infrared rays refow.
- The difference of thermal expansion coefficient between mounted substrates and IC leads may cause a
 failure like solder peeling or soler wet, and electrical characteristics may change by thermal stress.
 Therefore, mounting should be done after sufficient confirmation for especially in case of ceramic
 substrates.

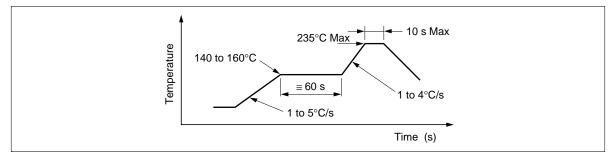
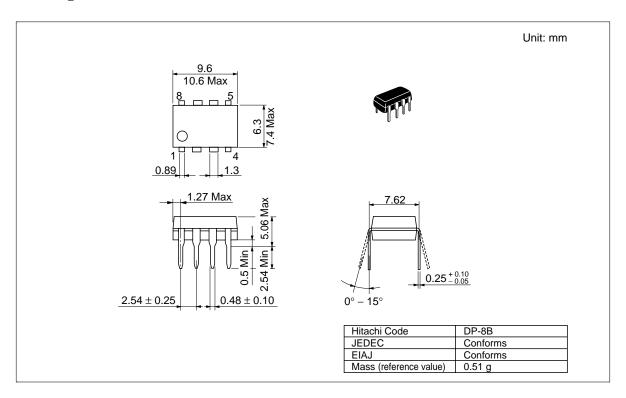
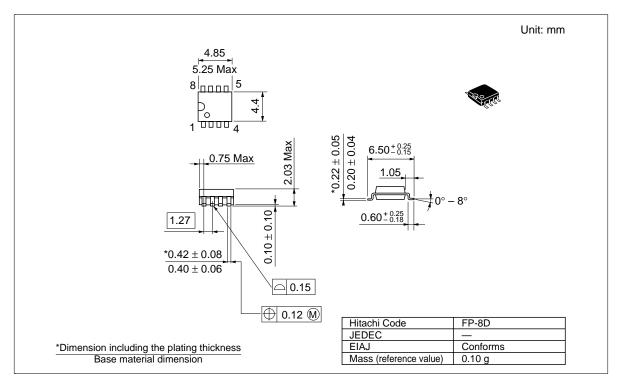
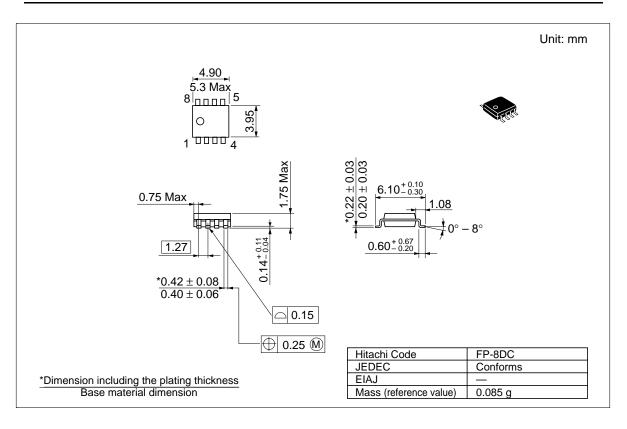


Figure 1 An Example of Infrared Rays Reflow Conditions

Package Dimensions







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