

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

# TA8407P, TA8407F

## DUAL POWER OPERATIONAL AMPLIFIER

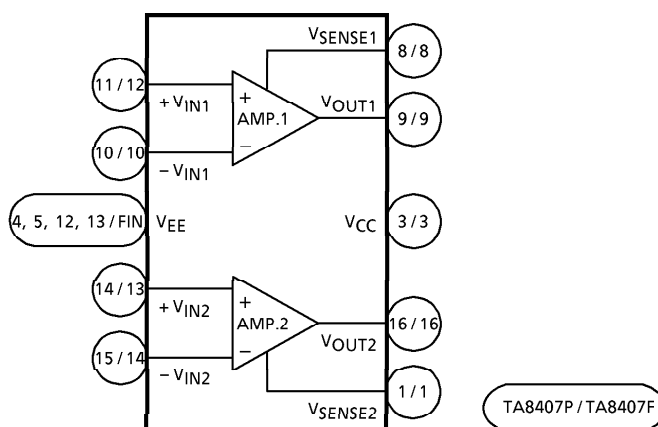
The TA8407P, TA8407F are dual power operational amplifier.

It is intended for use especially DC MOTOR positioning system applications, such as Arm Driver (for Audiodisk Players), head or voice coil motor drivers (for Floppy and Winchester Disk Drivers) and any other power driver applications.

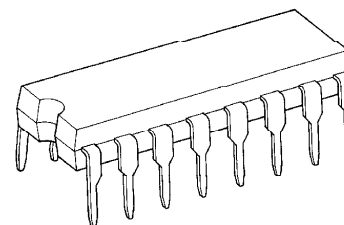
### FEATURES

- Built-in over current protector
- Few external parts are required
- Output current up to 1.2A Max. (AVE)
- Excellent crosstalk characteristics

### BLOCK DIAGRAM

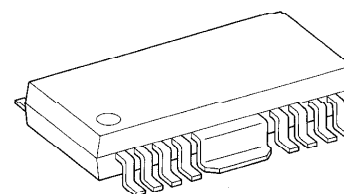


TA8407P



DIP16-P-300-2.54A

TA8407F



HSOP16-P-300-1.00

### Weight

DIP16-P-300-2.54A : 1.0g (Typ.)  
 HSOP16-P-300-1.00 : 0.5g (Typ.)

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## PIN FUNCTION

## TA8407P

| PIN No. | SYMBOL              | FUNCTION DESCRIPTION                     |
|---------|---------------------|------------------------------------------|
| 1       | V <sub>SENSE2</sub> | Amp.2 output current detection terminal. |
| 2       | NC                  | No connection.                           |
| 3       | V <sub>CC</sub>     | Positive-side power supply terminal.     |
| 4       | V <sub>EE</sub>     | Negative-side power supply terminal.     |
| 5       | V <sub>EE</sub>     | Negative-side power supply terminal.     |
| 6       | NC                  | No connection.                           |
| 7       | NC                  | No connection.                           |
| 8       | V <sub>SENSE1</sub> | Amp.1 output current detection terminal. |
| 9       | V <sub>OUT1</sub>   | Amp.1 output terminal.                   |
| 10      | -V <sub>IN1</sub>   | Amp.1 input terminal (-).                |
| 11      | +V <sub>IN1</sub>   | Amp.1 input terminal (+).                |
| 12      | V <sub>EE</sub>     | Negative-side power supply terminal.     |
| 13      | V <sub>EE</sub>     | Negative-side power supply terminal.     |
| 14      | +V <sub>IN2</sub>   | Amp.2 input terminal (+).                |
| 15      | -V <sub>IN2</sub>   | Amp.2 input terminal (-).                |
| 16      | V <sub>OUT2</sub>   | Amp.2 output terminal                    |

## TA8407F

| PIN No. | SYMBOL              | FUNCTION DESCRIPTION                     |
|---------|---------------------|------------------------------------------|
| 1       | V <sub>SENSE2</sub> | AMP.2 output current detection terminal. |
| 2       | NC                  | No connection.                           |
| 3       | V <sub>CC</sub>     | Positive-side power supply terminal.     |
| 4       | NC                  | No connection                            |
| 5       | NC                  | No connection                            |
| 6       | NC                  | No connection                            |
| 7       | NC                  | No connection                            |
| 8       | V <sub>SENSE1</sub> | AMP.1 output current detection terminal. |
| 9       | V <sub>OUT1</sub>   | AMP.1 output terminal.                   |
| 10      | -V <sub>IN1</sub>   | AMP.1 input terminal (-).                |
| 11      | NC                  | No connection.                           |
| 12      | +V <sub>IN1</sub>   | AMP.1 input terminal (+).                |
| 13      | +V <sub>IN2</sub>   | AMP.2 input terminal (+).                |
| 14      | -V <sub>IN2</sub>   | AMP.2 input terminal (-).                |
| 15      | NC                  | No connection.                           |
| 16      | V <sub>OUT2</sub>   | AMP.2 output terminal.                   |
| FIN     | V <sub>EE</sub>     | Negative-side power supply terminal.     |

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- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
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**MAXIMUM RATINGS** (Ta = 25°C)

| CHARACTERISTIC        |         | SYMBOL           | RATING       | UNIT |
|-----------------------|---------|------------------|--------------|------|
| Supply Voltage        |         | $V_{CC}, V_{EE}$ | $\pm 18$     | V    |
| Output Current        |         | $I_O$ (AVE.)     | (Note 1) 1.2 | A    |
| Power Dissipation     | TA8407P | $P_D$            | (Note 2) 1.4 | W    |
|                       |         |                  | (Note 3) 2.7 |      |
|                       | TA8407P |                  | (Note 4) 1.4 |      |
| Operating Temperature |         | $T_{opr}$        | -30~75       | °C   |
| Storage Temperature   |         | $T_{stg}$        | -55~150      | °C   |

(Note 1)  $V_{CC} = 6V$ ,  $V_{EE} = -6V$ 

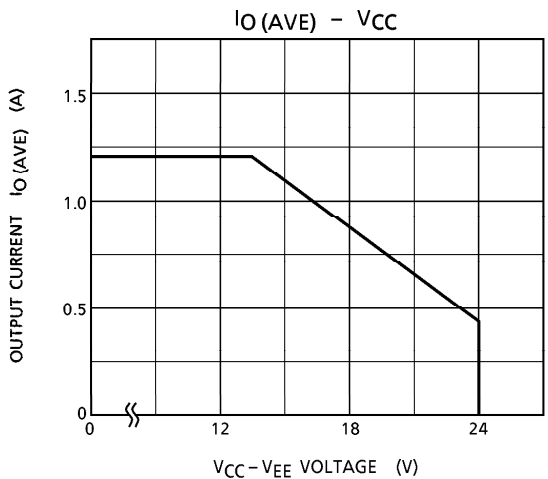
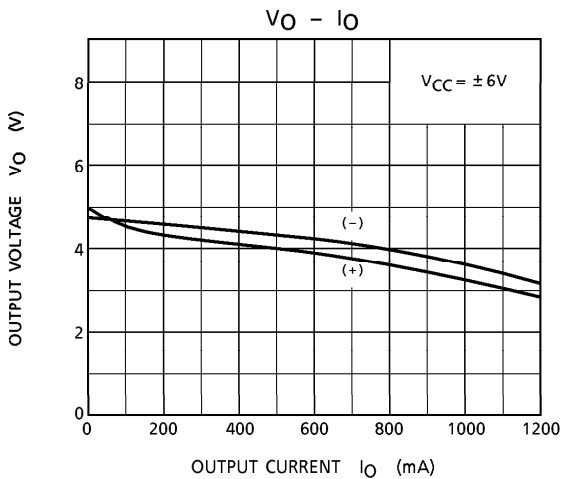
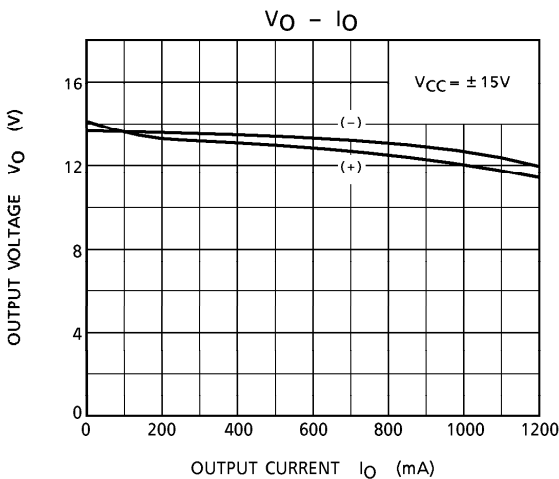
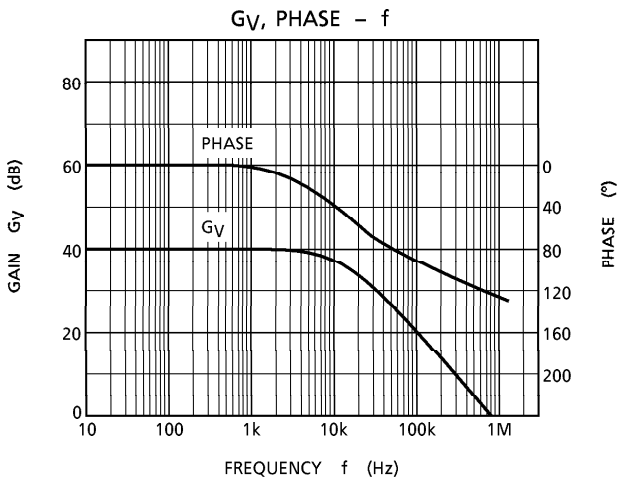
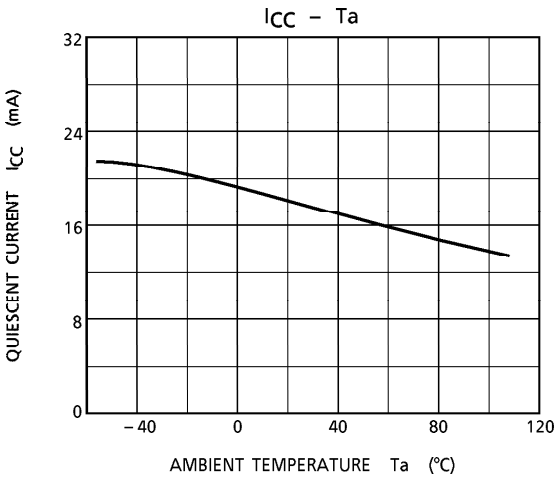
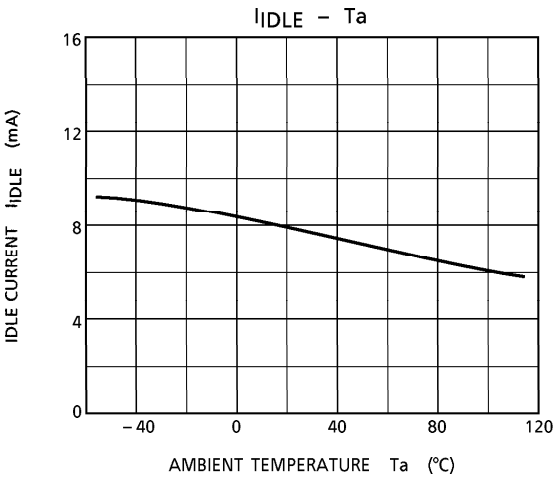
(Note 2) No heat sink

(Note 3) This value is obtained by 50×50×0.8mm PCB mounting occupied in excess of 60% of copper area.

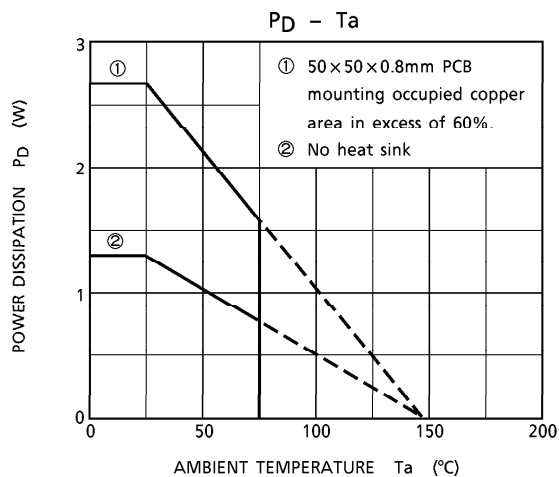
(Note 4) This value is obtained by 60×30×1.6mm PCB mounting occupied in excess of 50% of copper area.

**ELECTRICAL CHARACTERISTICS**(Unless otherwise specified,  $V_{CC} = 15V$ ,  $V_{EE} = -15V$ , Ta = 25°C)

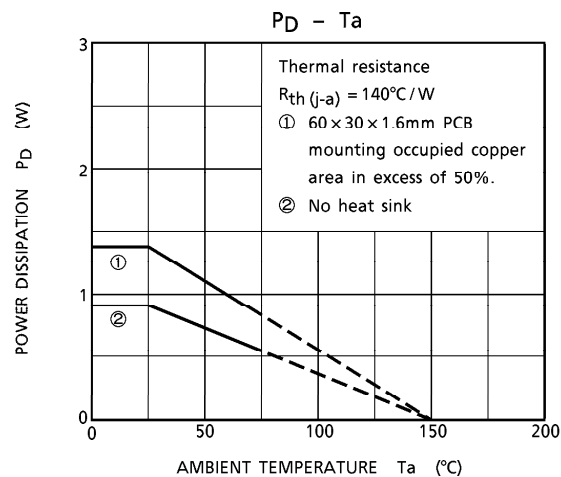
| CHARACTERISTIC                  |       | SYMBOL   | TEST CIRCUIT | TEST CONDITION               | MIN.  | TYP.     | MAX. | UNIT       |
|---------------------------------|-------|----------|--------------|------------------------------|-------|----------|------|------------|
| Quiescent Current               |       | $I_{CC}$ | —            | —                            | —     | 20       | 35   | mA         |
| Input Off Set Current           |       | $I_{IO}$ | —            | —                            | —     | 2        | 100  | nA         |
| Input Bias Current              |       | $I_I$    | —            | —                            | —     | 50       | 300  | nA         |
| Input Off Set Voltage           |       | $V_{IO}$ | —            | —                            | —     | 1.0      | 7.0  | mV         |
| Output Voltage Swing            | Upper | $V_{OH}$ | —            | $V_{CC} = \pm 15V, I_O = 1A$ | 11.5  | 12.1     | —    | V          |
|                                 | Lower | $V_{OL}$ | —            |                              | -11.5 | -12.3    | —    |            |
|                                 | Upper | $V_{OH}$ | —            | $V_{CC} = \pm 6V, I_O = 1A$  | 2.2   | 3.3      | —    | V          |
|                                 | Lower | $V_{OL}$ | —            |                              | -2.2  | -3.7     | —    |            |
| Open Loop Gain                  |       | $G_{VO}$ | —            | —                            | —     | 90       | —    | dB         |
| Input Common Mode Voltage Range |       | CMR      | —            | —                            | —     | $\pm 14$ | —    |            |
| Common Mode Rejection Ratio     |       | CMRR     | —            | —                            | —     | 95       | —    | dB         |
| Supply Voltage Rejection Ratio  |       | SVRR     | —            | —                            | —     | 45       | 150  | $\mu V/V$  |
| Slew Rate                       |       | SR       | —            | —                            | —     | 0.4      | —    | V/ $\mu s$ |
| Short Circuit Current           |       | $I_{SC}$ | —            | $R_{SC} = 0.68\Omega$        | 0.8   | 1.0      | —    | A          |
| Cross Talk                      |       | CT       | —            | —                            | —     | 60       | —    | dB         |



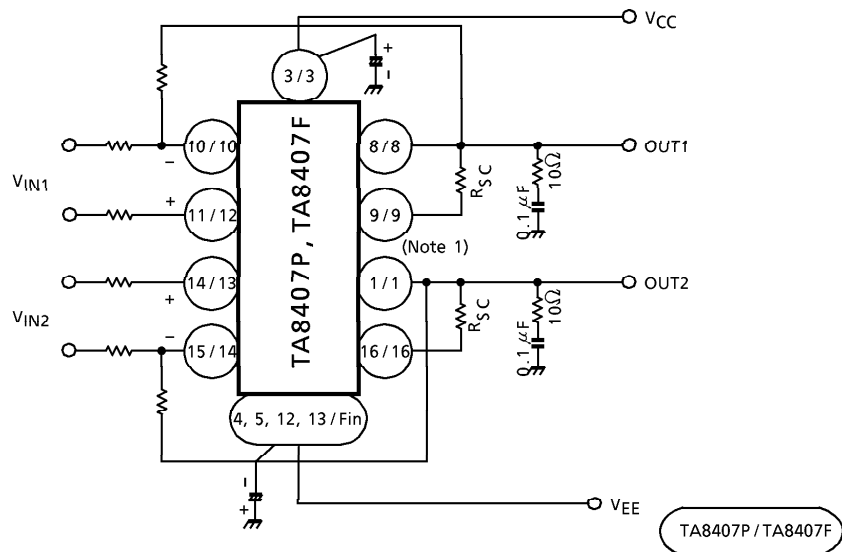
TA8407P



TA8407F



## APPLICATION CIRCUIT 1.

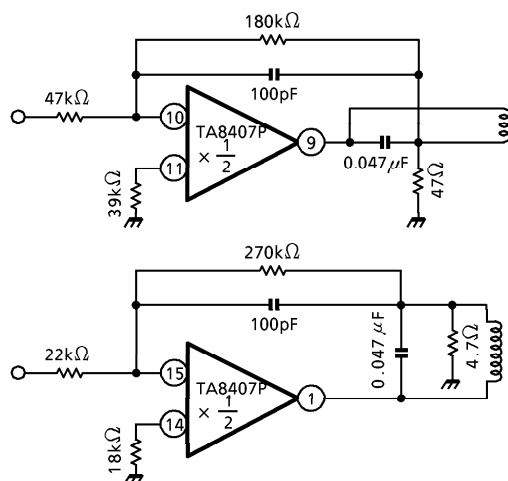


(Note 1)  $I_{SC} \doteq \frac{0.7(V)}{R_{SC}(\Omega)} (A)$

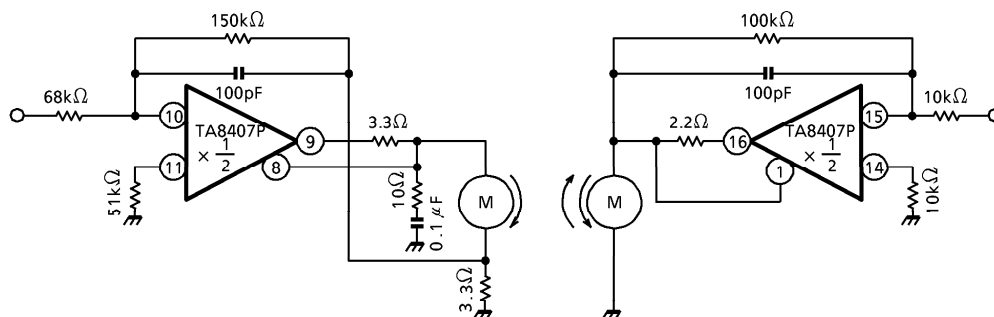
(Note 2) If crosstalk is recognizable remarkably in applications above 80kHz, change a capacitor to one having a value of about  $0.33\mu F$  as a compensating circuit. Further, no resistor is needed in this case.

(Note 3) Utmost care is necessary in the design of the output line,  $V_{CC}$  and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.

## APPLICATION CIRCUIT 2. (Actuator)



## APPLICATION CIRCUIT 3. (Speed and carriage control)



DIP16-P-300-2.54A

Technical drawing of the 7662-01 package showing three views: top, side, and front views with dimensions.

**Top View Dimensions:**

- Pin 16 (top left) and Pin 9 (top right)
- Pin 1 (bottom left) and Pin 8 (bottom right)
- Width:  $6.4 \pm 0.2$

**Side View Dimensions:**

- Height:  $7.62$
- Lead angle:  $0 \sim 15^\circ$
- Lead thickness:  $0.25^{+0.1}_{-0.05}$

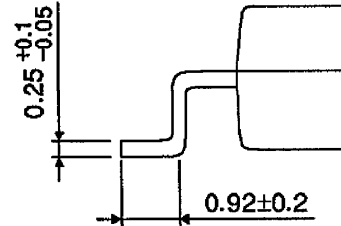
**Front View Dimensions:**

- Overall length:  $19.75 \text{ MAX}$
- Length to last pin:  $19.25 \pm 0.2$
- Pin pitch:  $0.95 \pm 0.1$
- Pin height (from base):  $3.5 \pm 0.2$
- Pin height (from base):  $4.15 \pm 0.3$
- Pin height (from base):  $3.3 \pm 0.3$
- Pin height (from base):  $0.51 \text{ MIN}$
- Pin height (from base):  $0.5 \pm 0.1$
- Pin height (from base):  $1.4 \pm 0.1$
- Pin height (from base):  $0.735 \text{ TYP}$
- Pin height (from base):  $2.54$
- Pin height (from base):  $\oplus 0.25 \text{ (M)}$

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HSOP16-P-300-1.00

The drawing shows the mechanical specifications of the 16-pin package. The top view includes dimensions for the pin pitch (1.0 TYP), pin width (0.4 ± 0.1), and overall width (9.6 ± 0.3). The side view shows the package height (2.85 MAX) and the distance from the base to the top of the package (2.3 ± 0.2). The drawing also indicates the maximum length (13.5 MAX) and the length of the package body (13.0 ± 0.2).



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