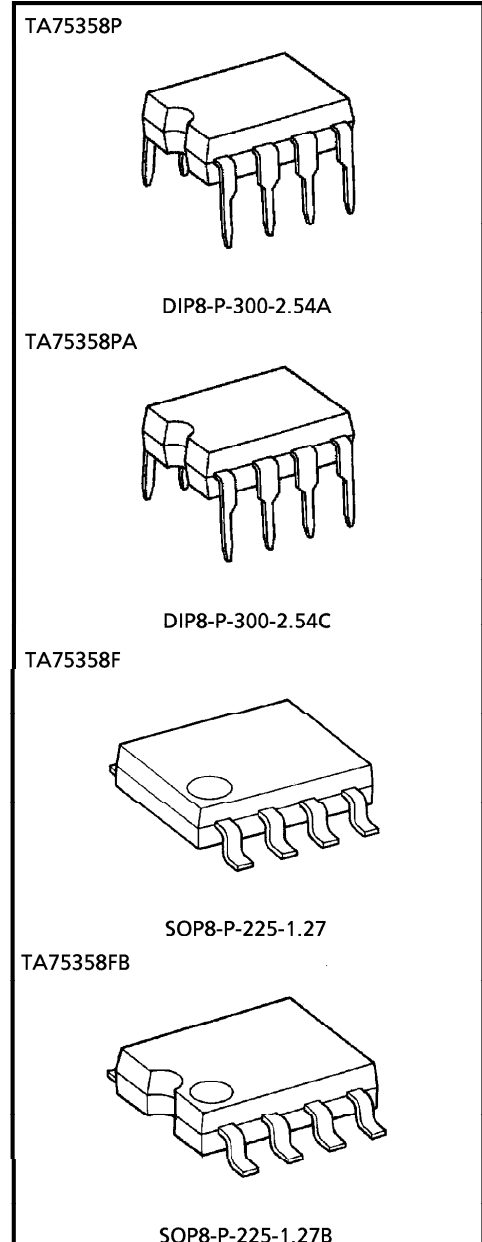


TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA75358P, TA75358PA, TA75358F, TA75358FB**DUAL OPERATIONAL AMPLIFIER****FEATURES**

- In the linear mode the input common mode voltage range includes ground.
- Two internally compensated OP amps are in single package.
- Low power dissipation and power drain suitable for battery operation.
- Differential input voltage range equal to the power supply voltage.
- Large output voltage swing. : $0V \sim V_{CC} - 1.5V$
- Wide power supply voltage range and single power supply is possible.
- Low input biasing current : $I_I = 45nA$ (Typ.)
- Wide Band Decompensated ($A_V \geq 20dB$).

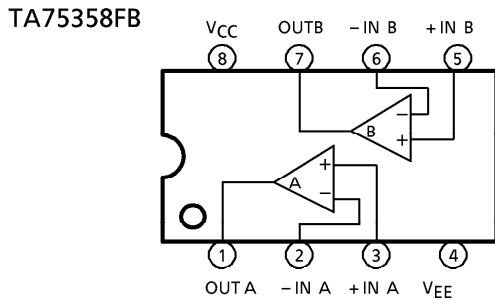
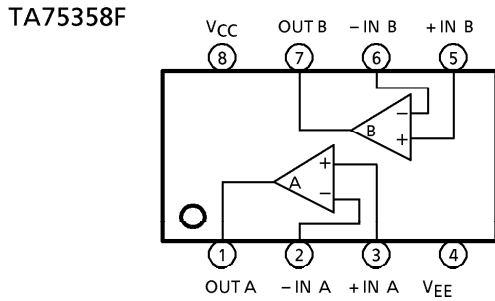
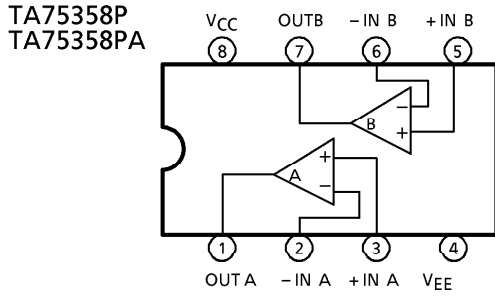


| | |
|------------------|---------------|
| Weight | |
| DIP8-P-300-2.54A | : 0.5g (Typ.) |
| DIP8-P-300-2.54C | : 0.6g (Typ.) |
| SOP8-P-225-1.27 | : 0.1g (Typ.) |
| SOP8-P-225-1.27B | : 0.1g (Typ.) |

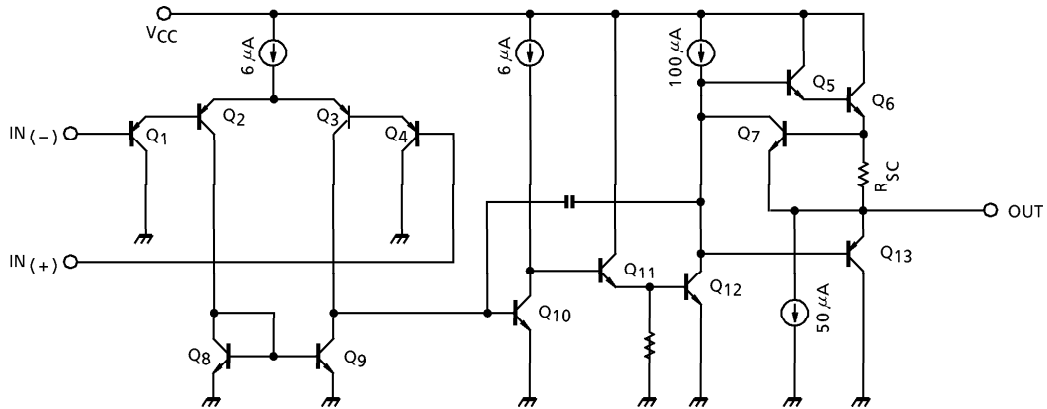
961001EBA2

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PIN CONNECTION (TOP VIEW)



EQUIVALENT CIRCUIT



961001EBA2'

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- The information contained herein is subject to change without notice.

MAXIMUM RATINGS (Ta = 25°C)

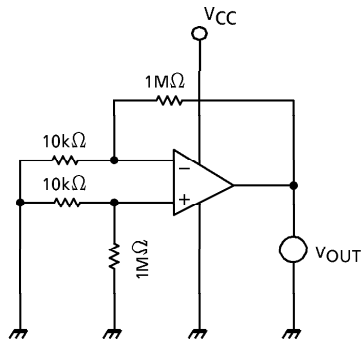
| CHARACTERISTIC | SYMBOL | TA75358P TA75358PA | TA75339F TA75339FB | UNIT |
|----------------------------|-----------------------------------|-----------------------|-----------------------|------|
| Supply Voltage | V _{CC} , V _{EE} | ± 18 OR 36 | ± 18 OR 36 | V |
| Differential Input Voltage | DV _{IN} | ± 36 | ± 36 | V |
| Input Voltage | V _{IN} | - 0.3~36 | - 0.3~36 | V |
| Power Dissipation | P _D | 500 | 240 | mW |
| Operating Temperature | T _{opr} | - 40~85 | - 40~85 | °C |
| Storage Temperature | T _{stg} | - 55~125 | - 55~125 | °C |

ELECTRICAL CHARACTERISTICS (V_{CC} = 5V, V_{EE} = GND, Ta = 25°C)

| CHARACTERISTIC | SYMBOL | TEST CIR-CUIT | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|--------------------------------|-----------------------------------|---------------|--|------|------|--------------------------|--------|
| Input Offset Voltage | V _{IO} | 1 | R _g ≤ 10kΩ | — | 2 | 7 | mV |
| Input Offset Current | I _{IO} | 2 | — | — | 5 | 50 | nA |
| Input Bias Current | I _I | 2 | — | — | 45 | 250 | nA |
| Common Mode Input Voltage | CMV _{IN} | 3 | V _{CC} = 30V, V _{EE} = GND | 0 | — | V _{CC} - 1.5 | V |
| Supply Current | I _{CC} , I _{EE} | 4 | R _L = ∞, All OP Amps | — | 0.7 | 1.2 | mA |
| Voltage Gain | G _V | 5 | R _L ≥ 2kΩ | 86 | 100 | — | dB |
| Maximum Output Voltage Swing | V _{Op-p} | 6 | R _L = 2kΩ | 0 | — | V _{CC} - 1.5 | V |
| Common Mode Rejection Ratio | CMRR | 3 | — | 60 | 85 | — | dB |
| Supply Voltage Rejection Ratio | SVRR | 1 | R _g = 10kΩ | 60 | 100 | — | dB |
| Source Current | I _{source} | 6 | IN (-) = 0V, IN (+) = 1V | 20 | 40 | — | mA |
| Sink Current | I _{sink} | 6 | IN (-) = 1V, IN (+) = 0V | 10 | 20 | — | mA |
| Unity Gain Cross Frequency | f _T | — | — | — | 1.5 | — | MHz |
| Slew Rate | S _R | — | — | — | 0.8 | — | V / μs |

TEST CIRCUIT

(1) V_{IO} , SVRR



- $V_{IO} = V_{OUT} / 100$

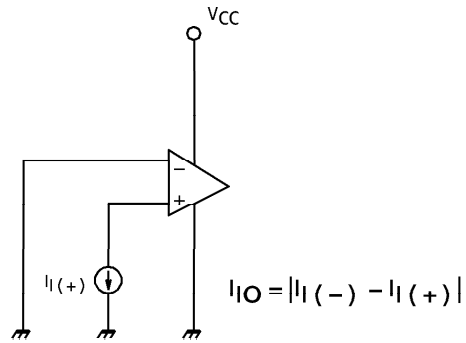
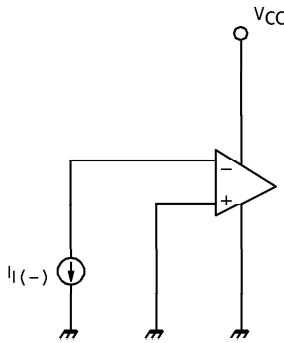
- $SVRR = 20 \log E \text{ (dB)}$

$$E = \left| \frac{V_{OUT1} - V_{OUT2}}{V_{CC1} - V_{CC2}} \right| \times \frac{1}{100}$$

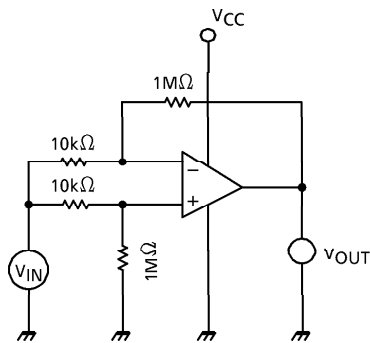
V_{OUT1} : V_{OUT} ($V_{CC1} = 5V$)

V_{OUT2} : V_{OUT} ($V_{CC2} = 10V$)

(2) I_I , I_{IO}



(3) CMV_{IN} , CMRR



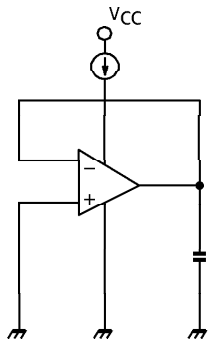
- $CMRR = 20 \log G_D / G_C \text{ (dB)}$

G_D : DIFFERENTIAL VOLTAGE GAIN

G_C : COMMON MODE VOLTAGE GAIN

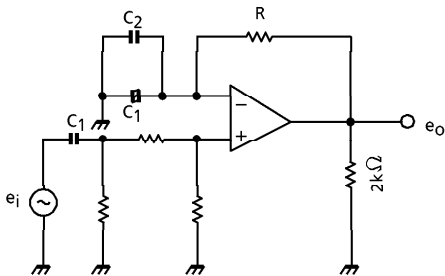
- CMV_{IN} : $V_{IN} = 0V$, $V_{CC} - 1.5V$ SUPPLES

(4) I_{CC}



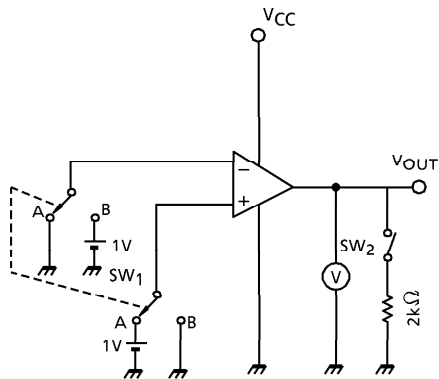
- $I_{CC} : V_{CC} = 5V$

(5) G_V



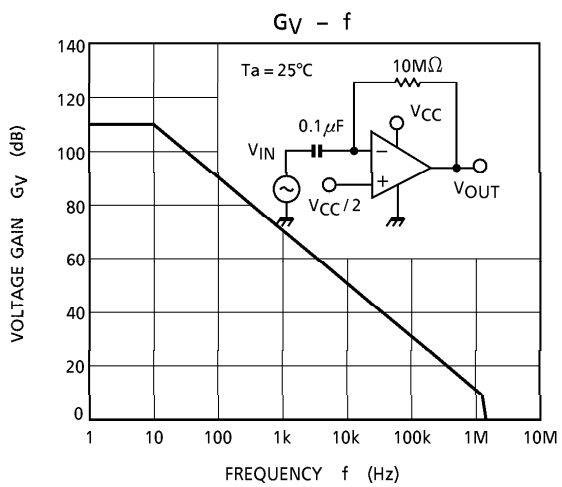
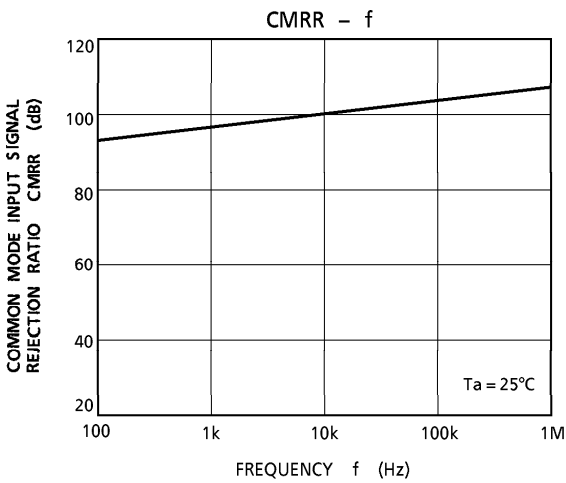
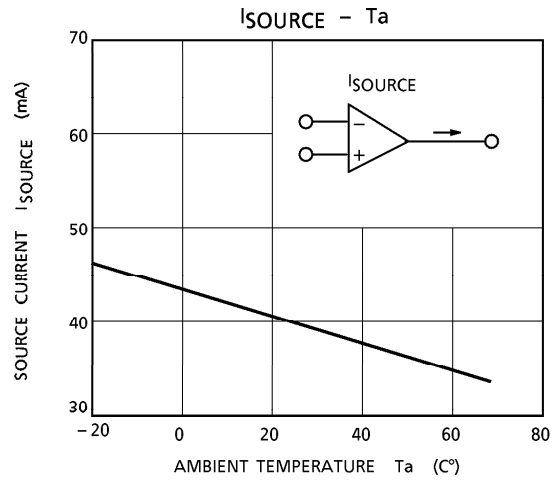
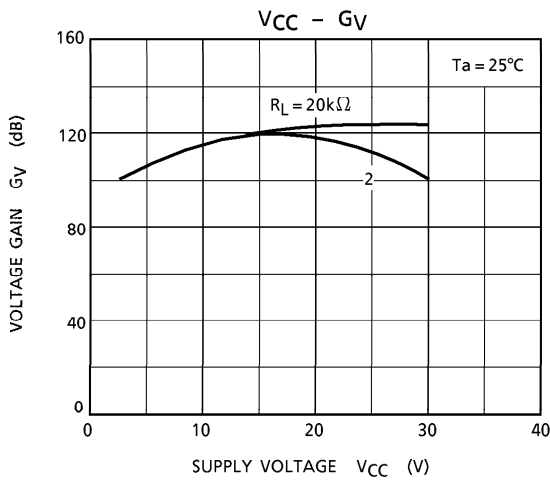
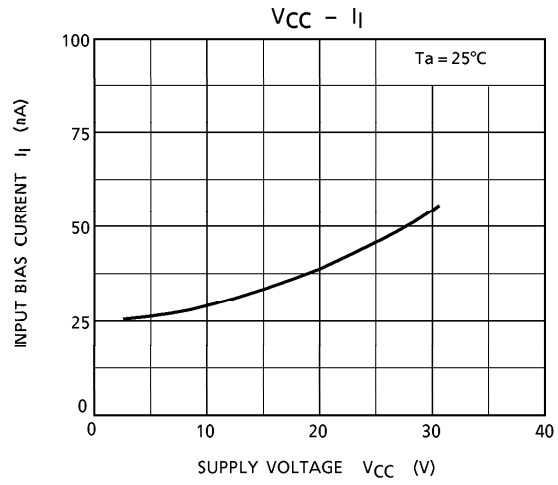
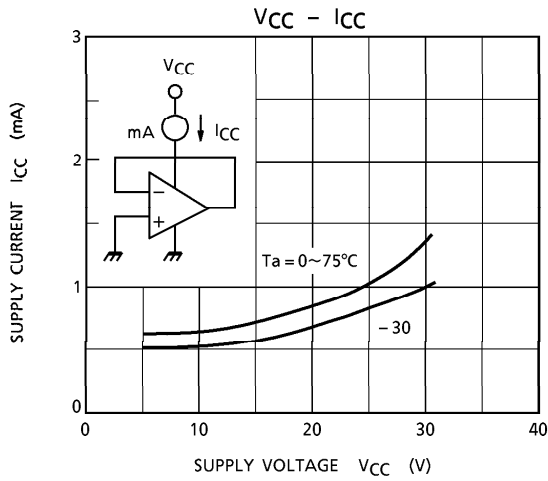
- $G_V = 20 \log e_o / e_i$ (dB)
- $R \gg 1 / \omega C_1$
- C_1 : COUPLING CONDENSER
- C_2 : HIGH FREQUENCY BYPASS CONDENSER

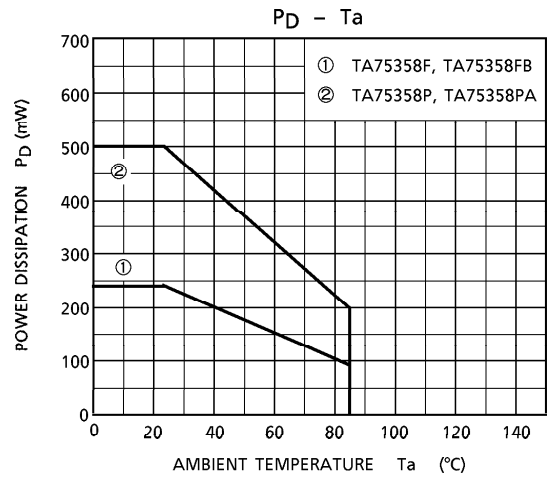
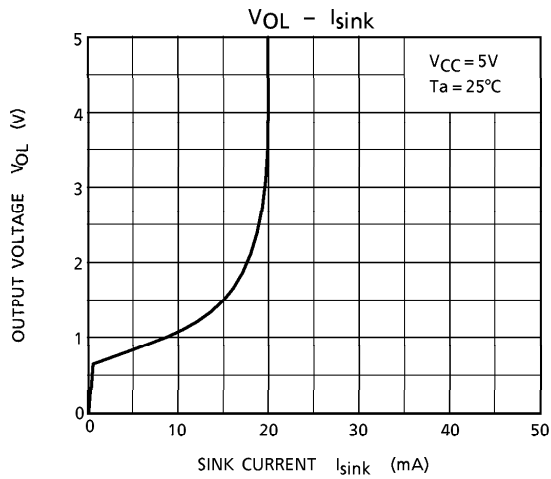
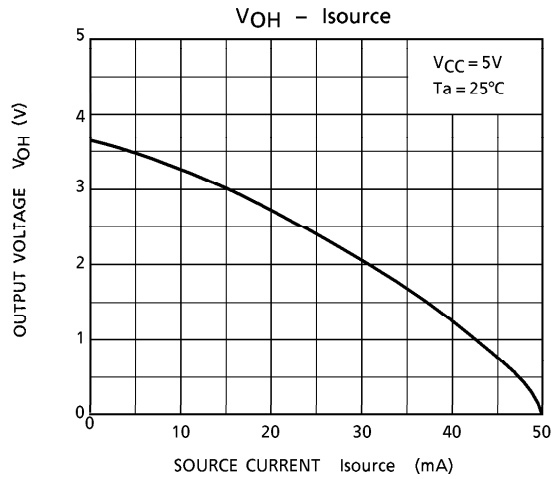
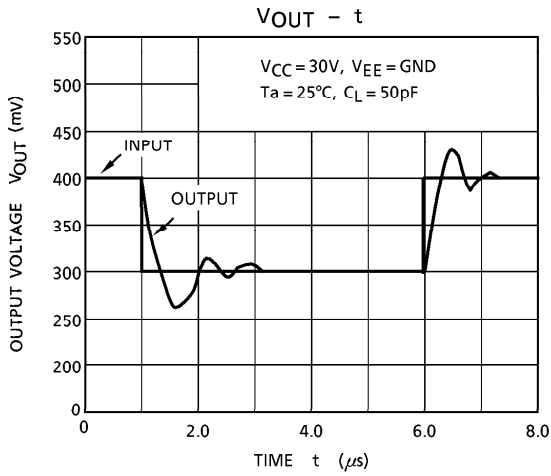
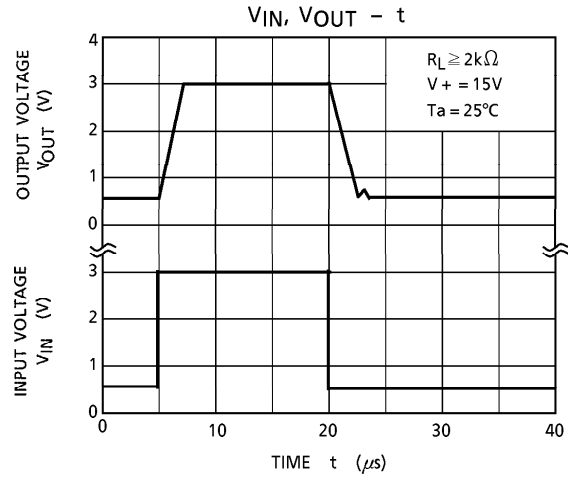
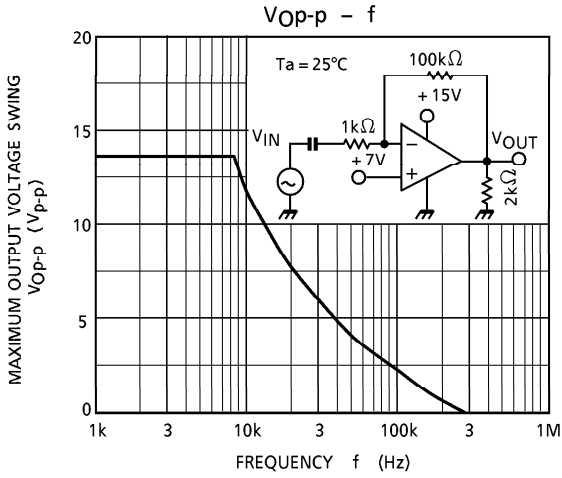
(6) V_{Op-p} , I_{source} , I_{sink}



- V_{Op-p} :
 V_{OH} : SW₁ IS SIDE A, SW₂ ON
 V_{OL} : SW₁ IS SIDE B, SW₂ ON
- I_{source}
 SW₁ IS SIDE A, SW₂ OFF
 $V_{OUT} \rightarrow 0V$ MEASURE
- I_{sink}
 SW₁ IS SIDE B, SW₂ OFF
 $V_{OUT} \rightarrow 5V$ MEASURE

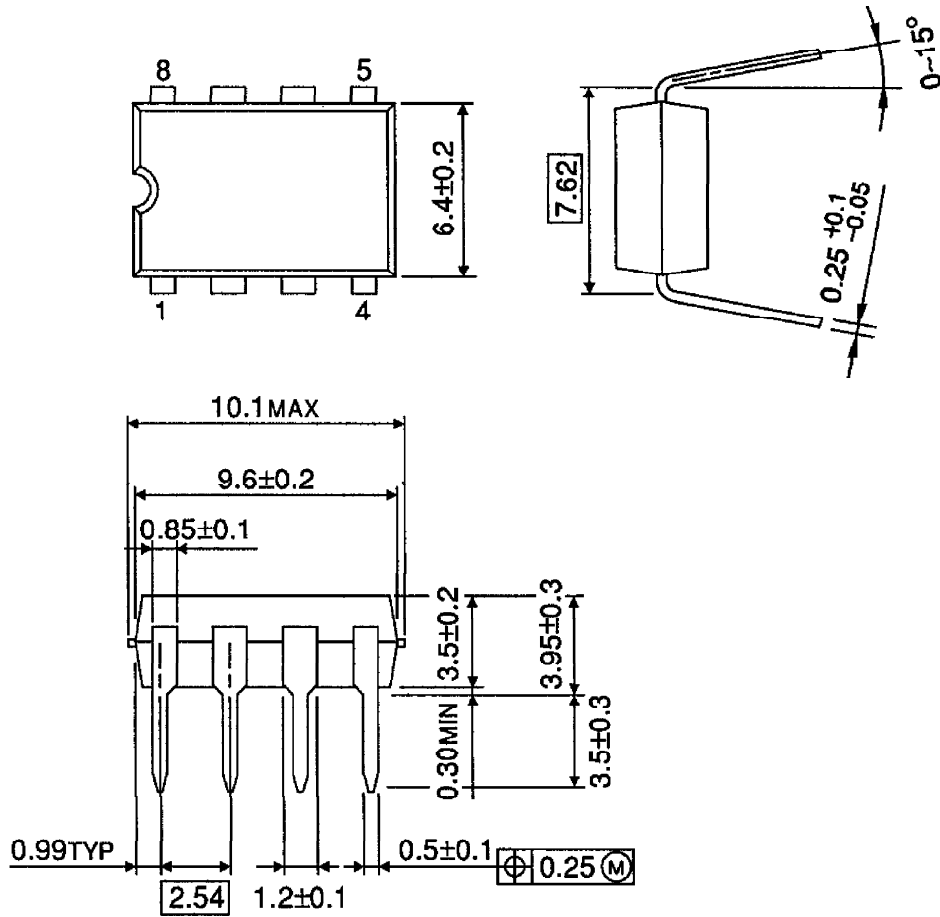
CHARACTERISTICS





OUTLINE DRAWING
DIP8-P-300-2.54A

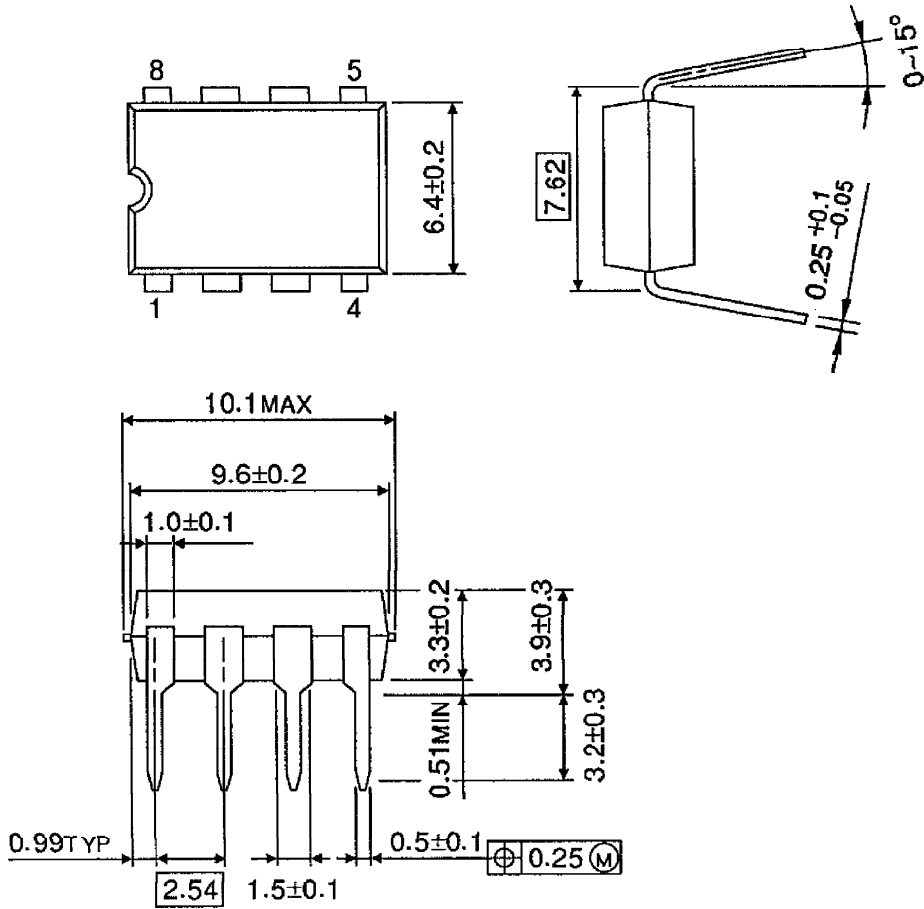
Unit : mm



Weight : 0.5g (Typ.)

OUTLINE DRAWING
DIP8-P-300-2.54C

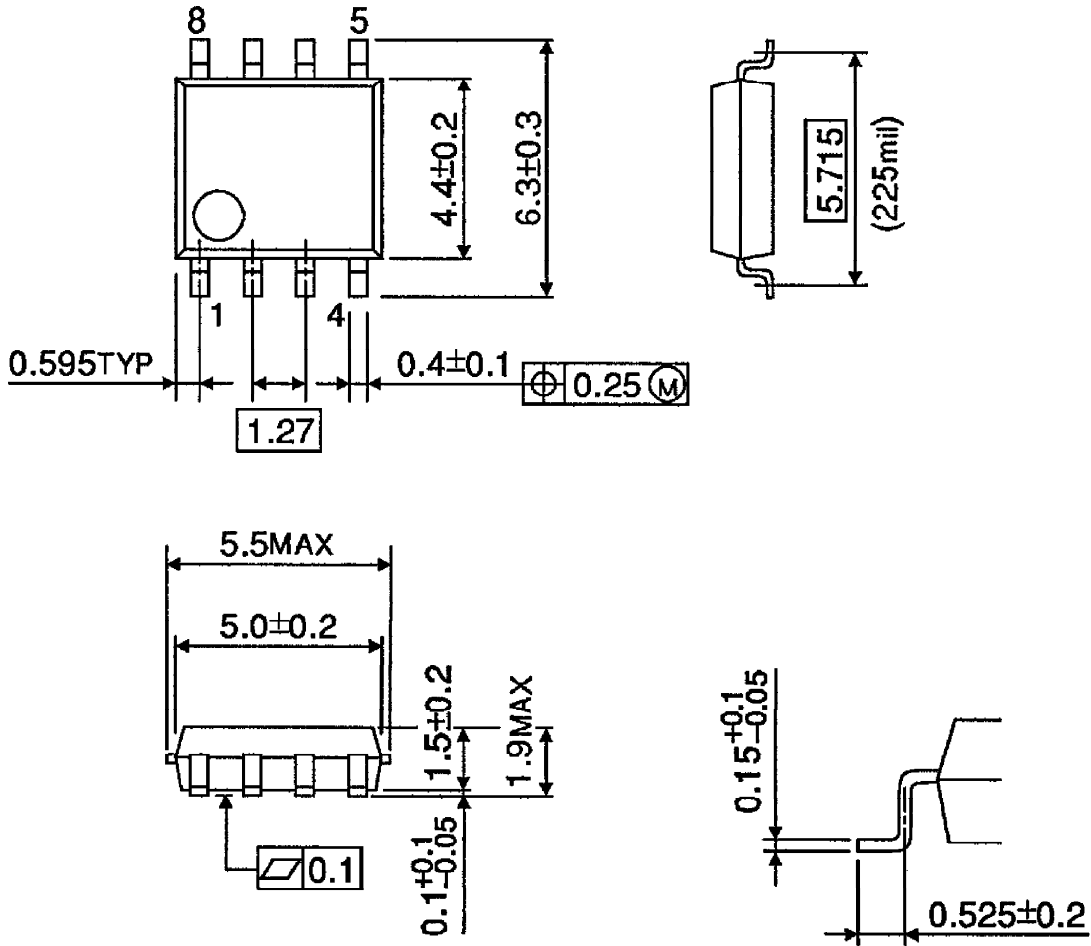
Unit : mm



Weight : 0.6g (Typ.)

OUTLINE DRAWING
SOP8-P-225-1.27

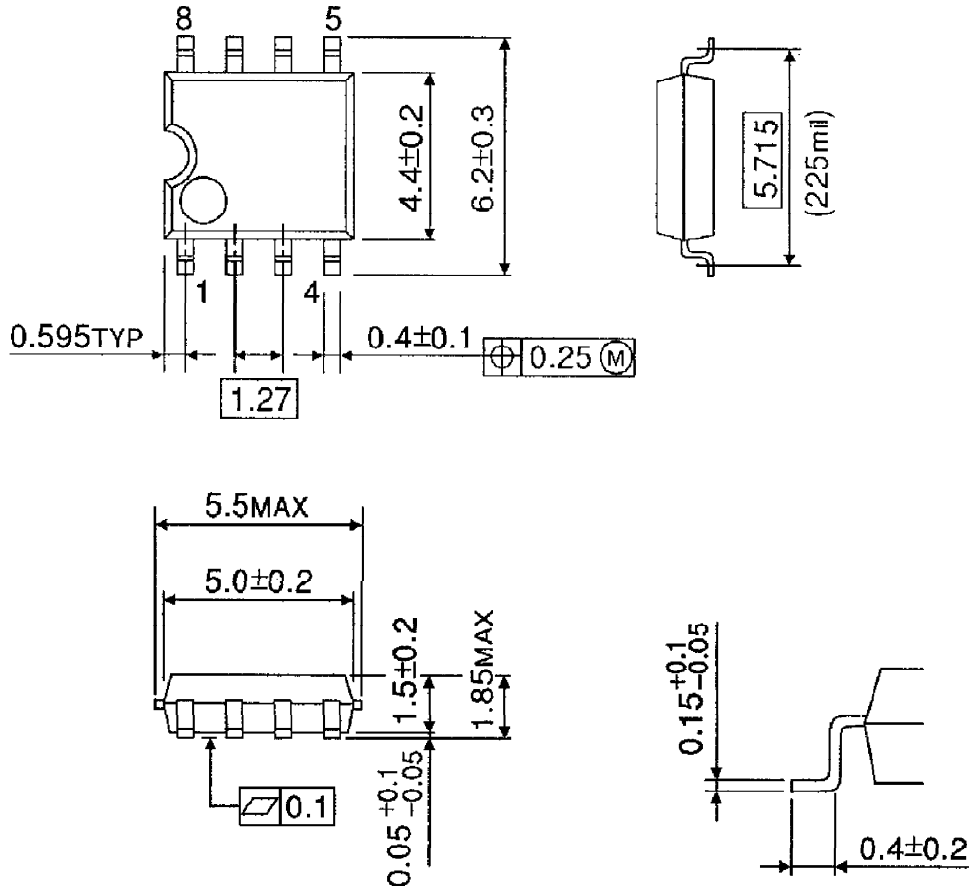
Unit : mm



Weight : 0.1g (Typ.)

OUTLINE DRAWING
SOP8-P-225-1.27B

Unit : mm



Weight : 0.1g (Typ.)