

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

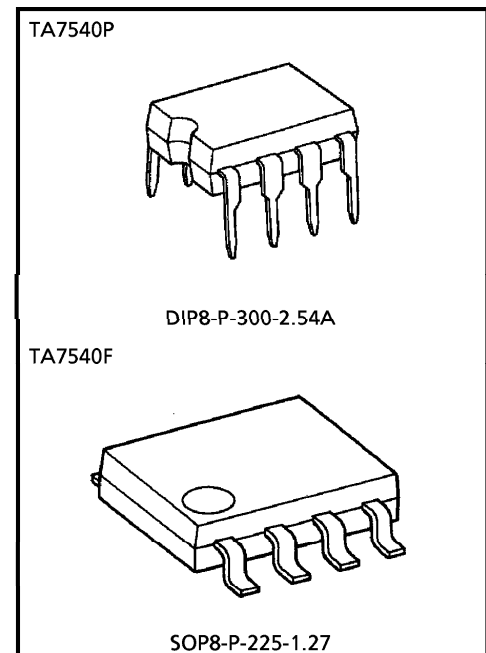
TA7540P, TA7540F**SINGLE OPERATIONAL AMPLIFIER**

The TA7540P is a programmable monolithic precision micro-power operational amplifier that can be used either in signal or dual supply operation.

A signal external bias current setting resistor programs the input bias current, input offset current, quiescent power consumption, slew rate, and the gain-bandwidth product.

FEATURES

- Very Low Power Consumption
- Programmable Supply Current : 25~85 μ A (Typ.)
- Wide Power Supply Range : Single Supply 3~36V
Dual Supplies $\pm 1.5\sim\pm 18$ V
- Input Common-Mode Voltage Range Includes Ground
- Low Input Offset Voltage : 1mV (Typ.)
- Low Input Offset Current : 0.5nA (Typ.)
- No Frequency Compensation Required
- Programmable Electrical Characteristics
- Offset Voltage Nulling Capability



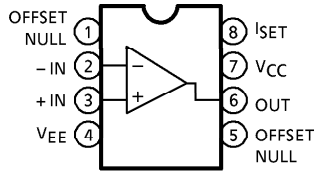
Weight
 DIP8-P-300-2.54 : 0.5g (Typ.)
 SOP8-P-225-1.27 : 0.1g (Typ.)

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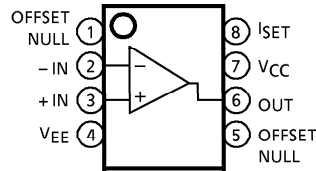
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PIN CONNECTION (TOP VIEW)

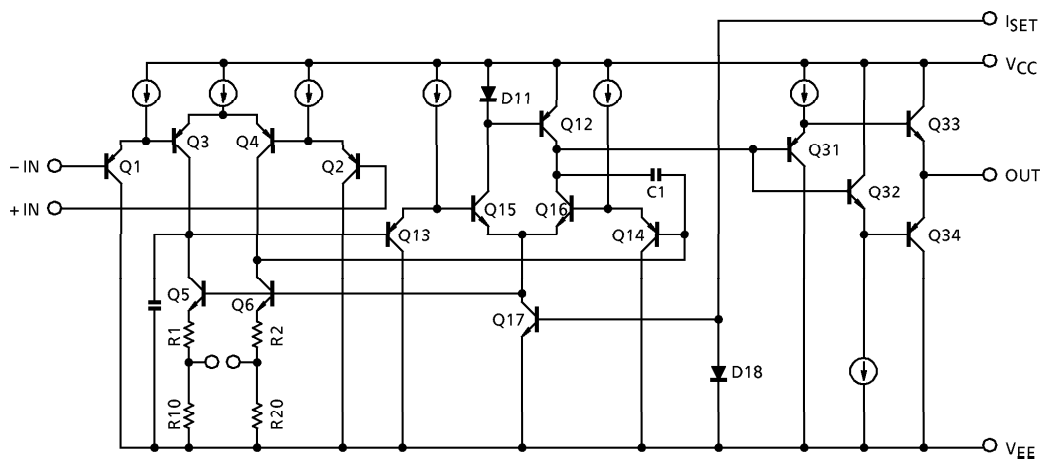
TA7540P



TA7540F



EQUIVALENT CIRCUIT



MAXIMUM RATINGS (Ta = 25°C)

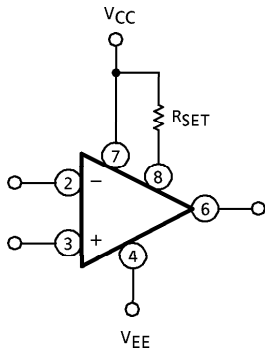
| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|-----------------------|-----------------------|----------------|------|
| Supply Voltage | $V_{CC} \cdot V_{EE}$ | ± 18 or 36 | V |
| Differential Voltage | DV_{IN} | ± 36 | V |
| Input Voltage | V_{IN} | -0.3~36 | V |
| Power Dissipation | TA7540P | 500 | mW |
| | TA7540F | 240 | |
| Operating Temperature | T_{opr} | -40~85 | °C |
| Storage Temperature | T_{stg} | -55~125 | °C |

ELECTRICAL CHARACTERISTICS (Unless otherwise noted, $V_{CC} = 2.5V$, $V_{EE} = -2.5V$, $T_a = 25^\circ C$, $I_{SET} = 2.5\mu A$)

| CHARACTERISTIC | SYMBOL | TEST CIR-CUIT | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|--|--------------|---------------|---|------------|-----------|----------------|--------------|
| Input Offset Voltage | V_{IO} | — | $R_g \leq 10k\Omega$ | — | 1 | 5 | mV |
| Input Offset Current | I_{IO} | — | — | — | 0.5 | 30 | nA |
| Input Bias Current | I_I | — | — | — | 6 | 100 | nA |
| Common Mode Input Voltage | CMV_{IN} | — | — | V_{EE} | — | $V_{CC} - 1.5$ | V |
| Maximum Output Voltage Swing | V_{OM} | — | $R_L = 100k\Omega$ | ± 1.5 | ± 1.7 | — | V |
| | V_{OMR} | — | $V_{CC} = 15V, V_{EE} = -15V$ $R_L = 25k\Omega$ | ± 13.5 | ± 14 | — | |
| Open Loop Voltage Gain | G_V | — | $R_L = 100k\Omega$ | 86 | 100 | — | dB |
| Common Mode Input Signal Rejection Ratio | CMRR | — | $R_g \leq 10k\Omega$ | 80 | 100 | — | dB |
| Supply Voltage Rejection Ratio | SVRR | — | $R_g \leq 10k\Omega$ | 80 | 110 | — | dB |
| Slew Rate | SR | — | $G_V = 1, R_L = 100k\Omega$ | — | 40 | — | mV / μs |
| Unity Gain Cross Frequency | $f_T(1)$ | — | — | — | 100 | — | kHz |
| | $f_T(2)$ | — | $I_{SET} = 0.5\mu A$ | — | 50 | — | |
| Supply Current | $I_{CC}(1)$ | — | — | — | 85 | 150 | μA |
| | $I_{CC}(2)$ | — | $I_{SET} = 0.5\mu A$ | — | 35 | 80 | |
| | $I_{CC}(3)$ | — | $V_{CC} = 15V, V_{EE} = -15V$ $I_{SET} = 2.5\mu A$ | — | 120 | 300 | |
| Output Sink Current | I_{SINK} | — | — | 0.5 | 2.0 | — | mA |
| Output Source Current | I_{SOURCE} | — | — | 0.5 | 2.0 | — | mA |

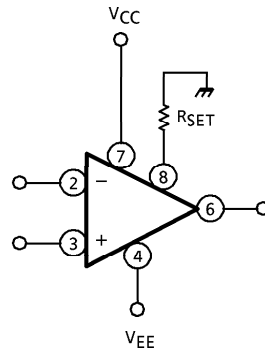
TYPICAL APPLICATIONS

R_{SET} CONNECTED TO V_{CC}



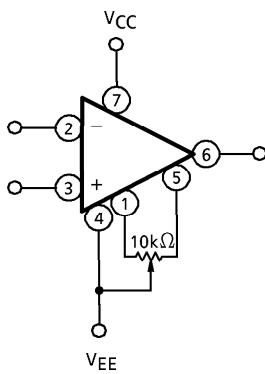
$$I_{SET} \approx \frac{V_{CC} - V_{EE} - 0.6}{R_{SET}}$$

R_{SET} CONNECTED TO GROUND

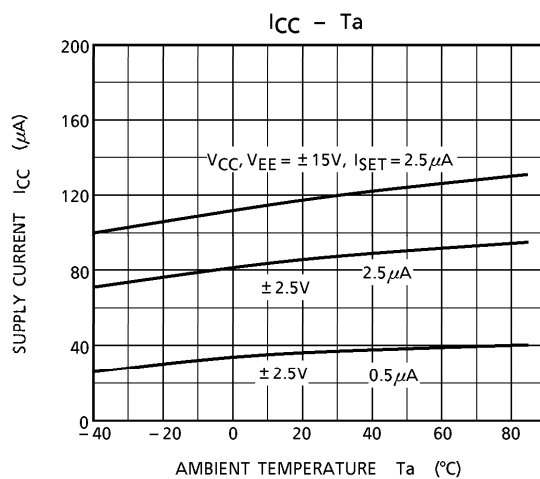
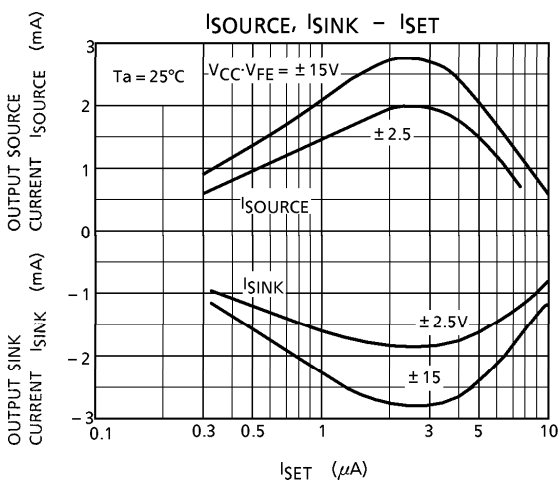
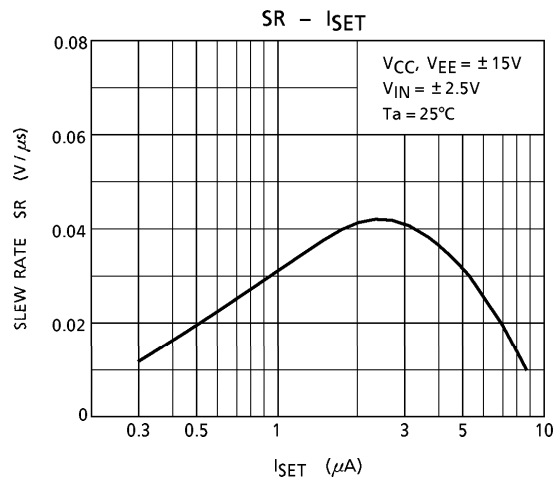
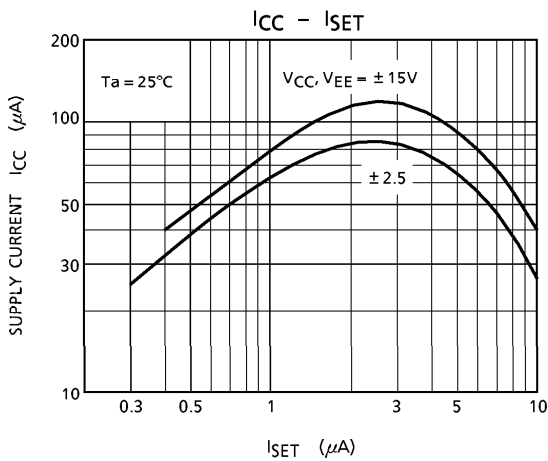
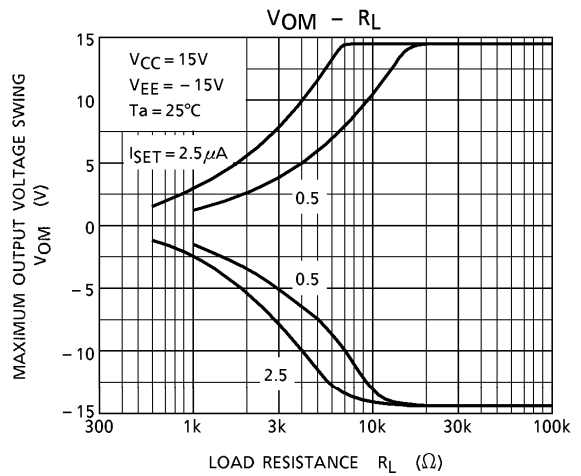
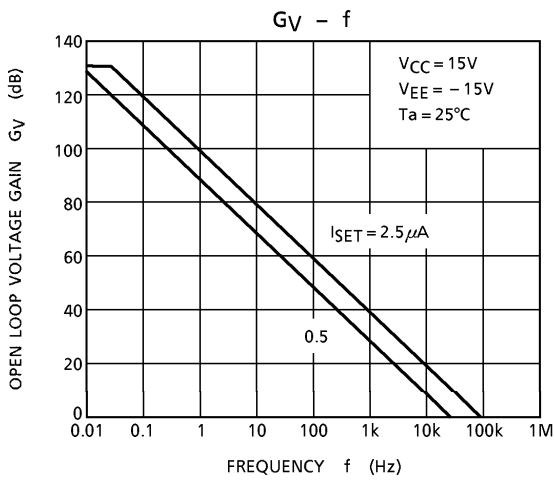


$$I_{SET} \approx \frac{-V_{EE} - 0.6}{R_{SET}}$$

OFFSET NULL CIRCUIT

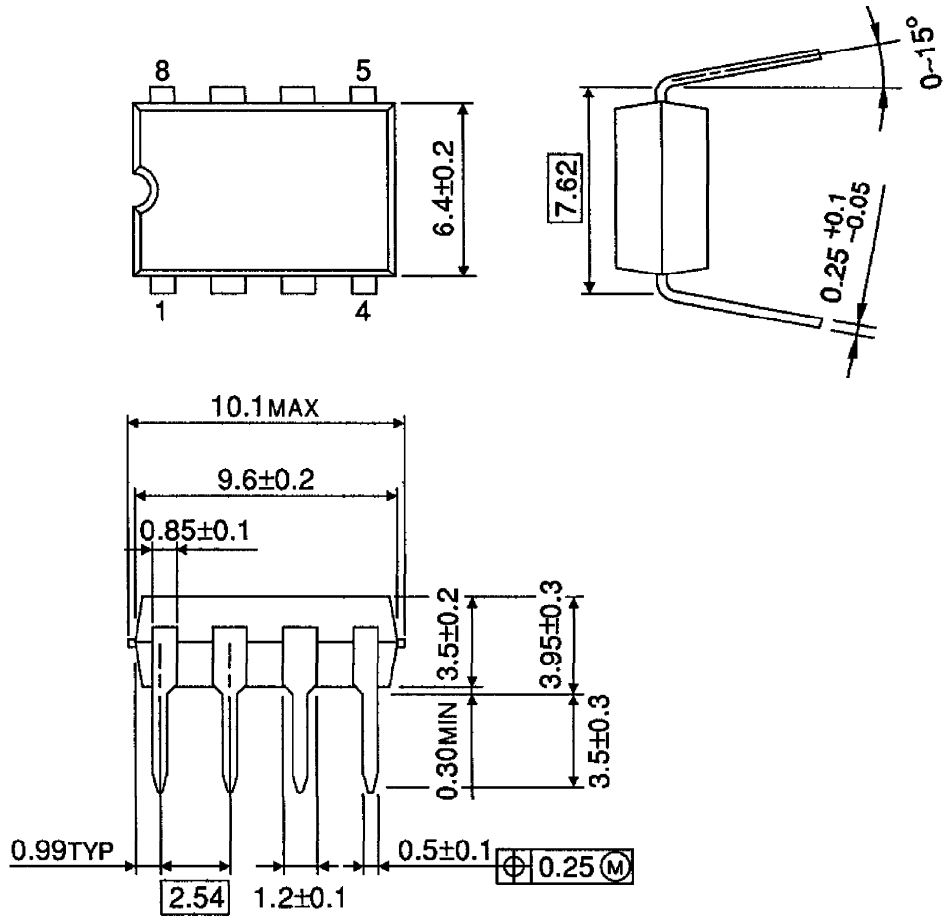


CHARACTERISTICS



OUTLINE DRAWING
DIP8-P-300-2.54A

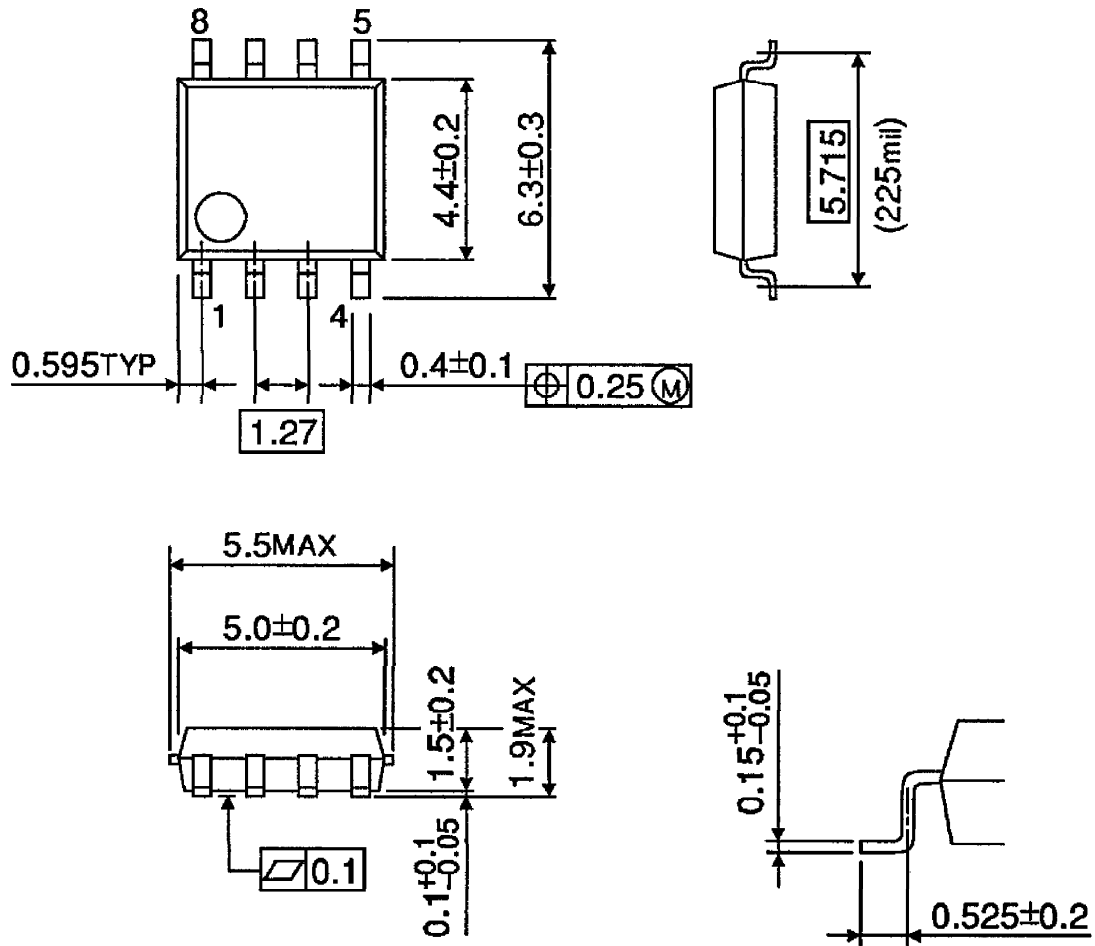
Unit : mm



Weight : 0.5g (Typ.)

OUTLINE DRAWING
SOP8-P-225-1.27

Unit : mm



Weight : 0.1g (Typ.)