

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

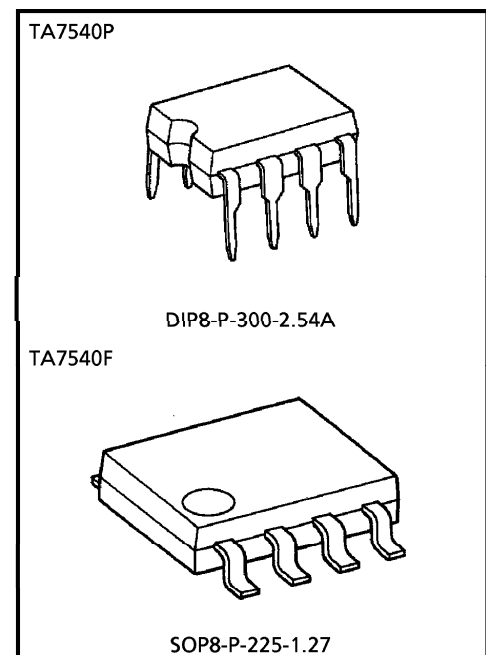
TA7540P, TA7540F**SINGLE OPERATIONAL AMPLIFIER**

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



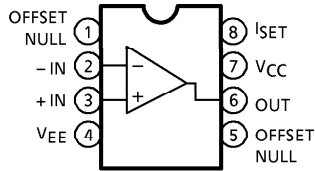
Weight
 DIP8-P-300-2.54 : 0.5g (Typ.)
 SOP8-P-225-1.27 : 0.1g (Typ.)

961001EBA1

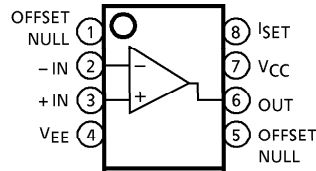
- TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.
- The products described in this document are subject to foreign exchange and foreign trade control laws.
- 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.
- The information contained herein is subject to change without notice.

PIN CONNECTION (TOP VIEW)

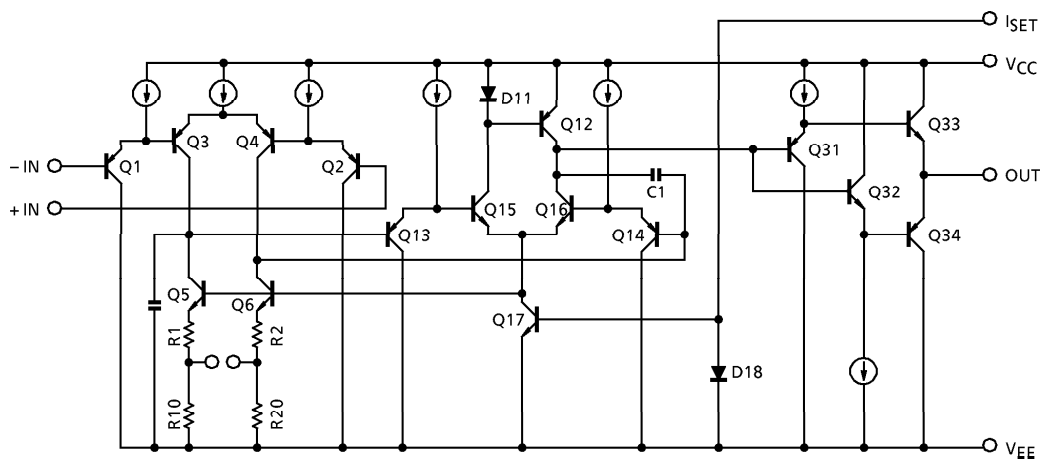
TA7540P



TA7540F



EQUIVALENT CIRCUIT



MAXIMUM RATINGS (Ta = 25°C)

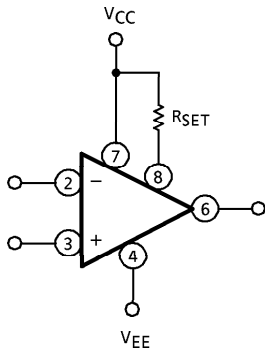
CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	$V_{CC} \cdot V_{EE}$	± 18 or 36	V
Differential Voltage	DV_{IN}	± 36	V
Input Voltage	V_{IN}	-0.3~36	V
Power Dissipation	TA7540P	500	mW
	TA7540F	240	
Operating Temperature	T_{opr}	-40~85	°C
Storage Temperature	T_{stg}	-55~125	°C

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 CIRCUIT	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

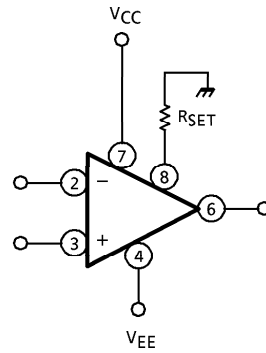
TYPICAL APPLICATIONS

R_{SET} CONNECTED TO V_{CC}



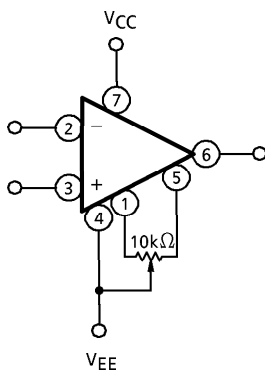
$$I_{SET} \approx \frac{V_{CC} - V_{EE} - 0.6}{R_{SET}}$$

R_{SET} CONNECTED TO GROUND

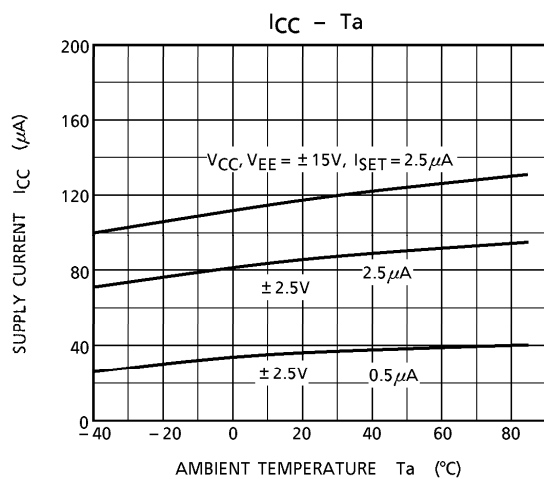
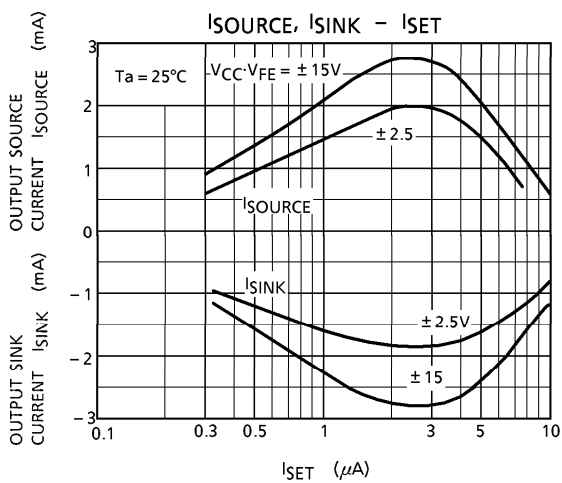
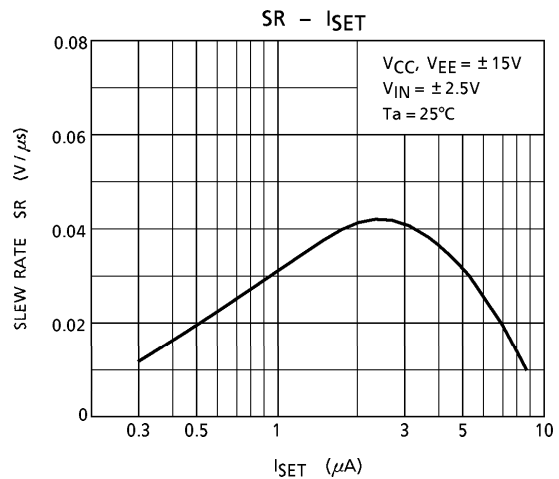
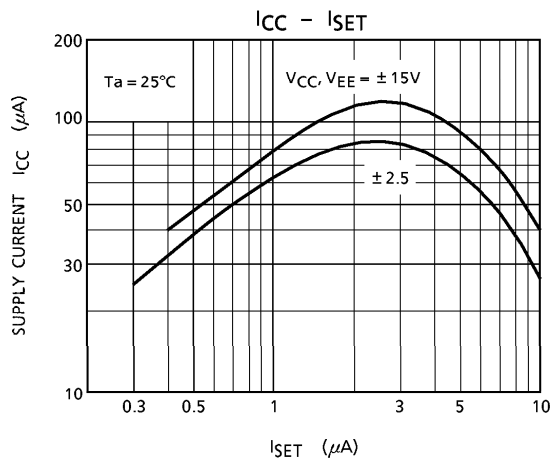
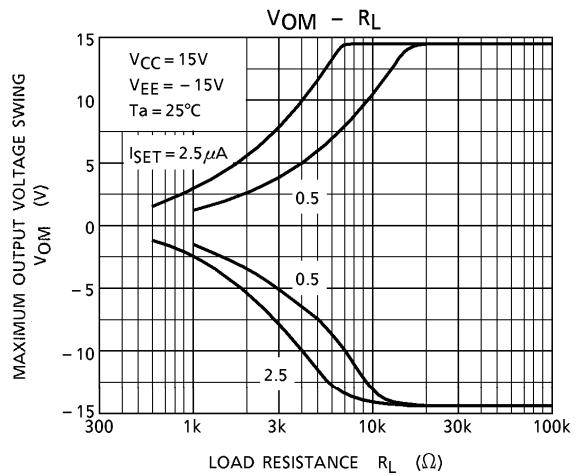
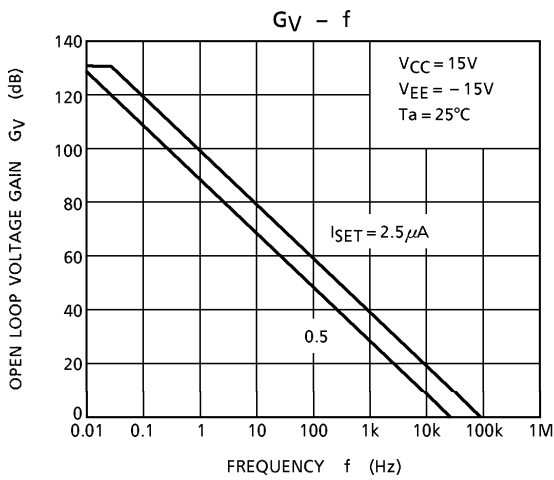


$$I_{SET} \approx \frac{-V_{EE} - 0.6}{R_{SET}}$$

OFFSET NULL CIRCUIT

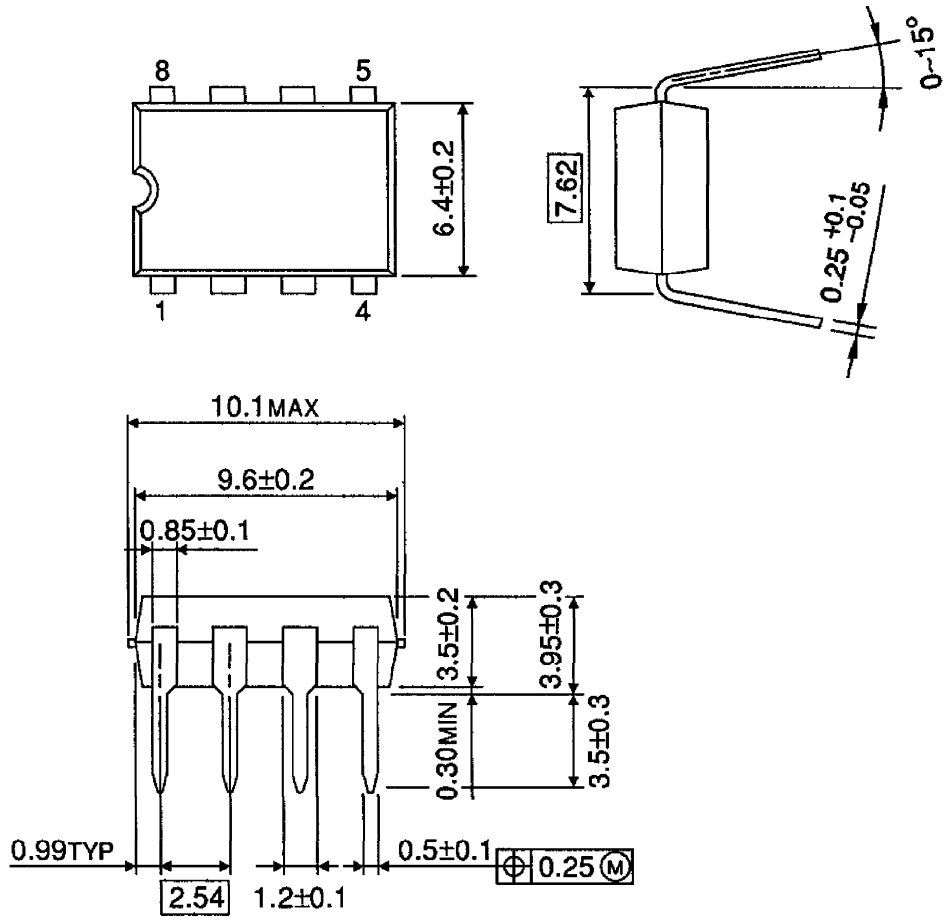


CHARACTERISTICS



OUTLINE DRAWING
DIP8-P-300-2.54A

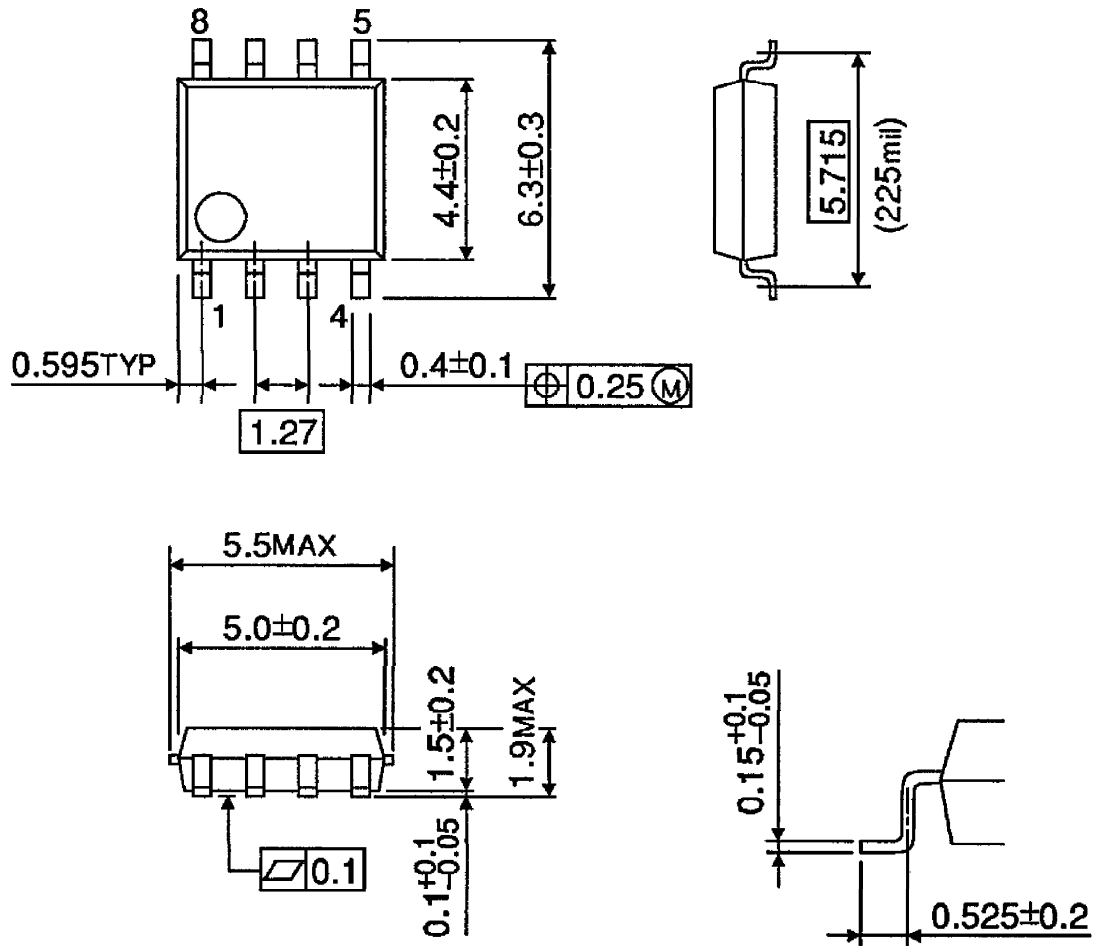
Unit : mm



Weight : 0.5g (Typ.)

OUTLINE DRAWING
SOP8-P-225-1.27

Unit : mm



Weight : 0.1g (Typ.)