

**TOSHIBA**

TA7540P/F

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

# TA7540P, TA7540F

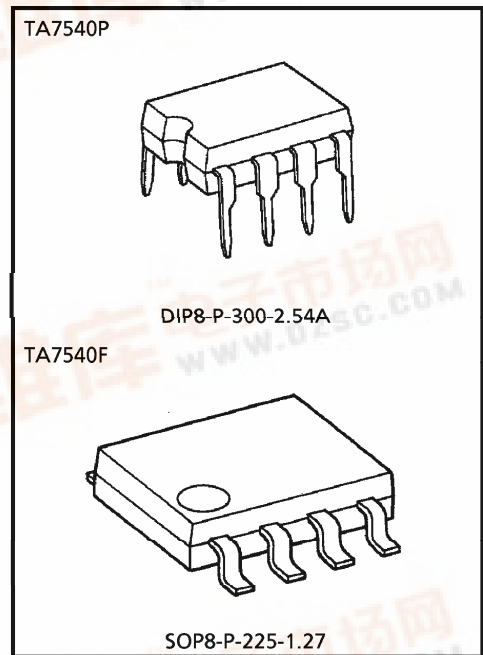
## SINGLE OPERATIONAL AMPLIFIER

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

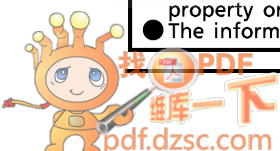
- Very Low Power Consumption
- Programmable Supply Current : 25~85 $\mu$ A (Typ.)
- Wide Power Supply Range : Single Supply 3~36V  
Dual Supplies  $\pm 1.5\sim\pm 18$ V
- Input Common-Mode Voltage Range Includes Ground
- Low Input Offset Voltage : 1mV (Typ.)
- Low Input Offset Current : 0.5nA (Typ.)
- 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.)

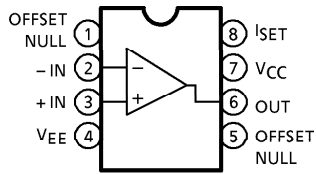
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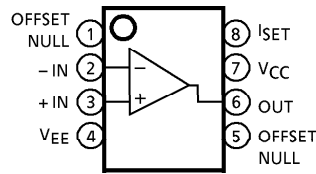


**PIN CONNECTION (TOP VIEW)**

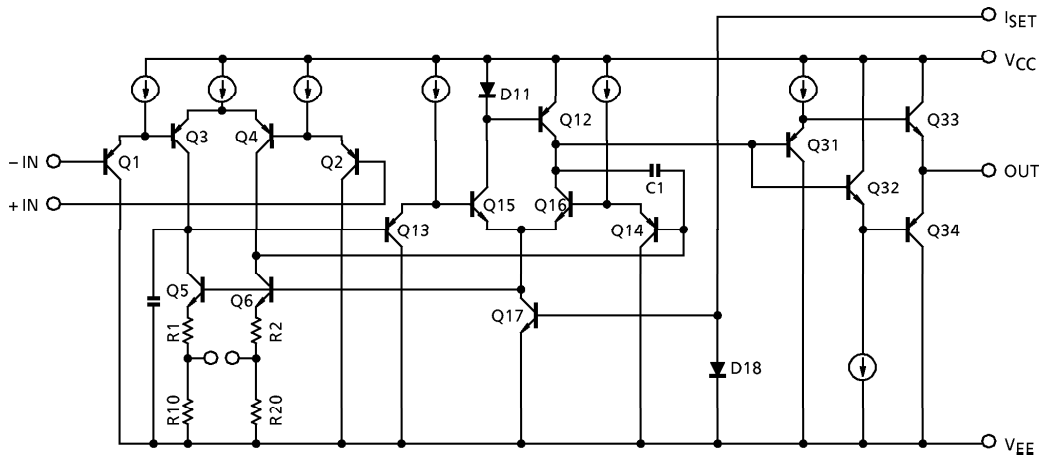
TA7540P



TA7540F



**EQUIVALENT CIRCUIT**



## MAXIMUM RATINGS (Ta = 25°C)

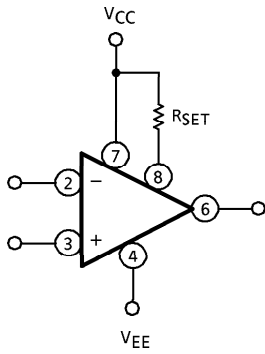
CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	$V_{CC} \cdot V_{EE}$	$\pm 18$ or 36	V
Differential Voltage	$DV_{IN}$	$\pm 36$	V
Input Voltage	$V_{IN}$	-0.3~36	V
Power Dissipation	TA7540P	$P_D$	mW
	TA7540F		
Operating Temperature	$T_{opr}$	-40~85	°C
Storage Temperature	$T_{stg}$	-55~125	°C

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	$V_{OM}$	—	$R_L = 100k\Omega$	$\pm 1.5$	$\pm 1.7$	—	V
	$V_{OMR}$	—	$V_{CC} = 15V, V_{EE} = -15V$ $R_L = 25k\Omega$	$\pm 13.5$	$\pm 14$	—	
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 / $\mu s$
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	$\mu A$
	$I_{CC}(2)$	—	$I_{SET} = 0.5\mu A$	—	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

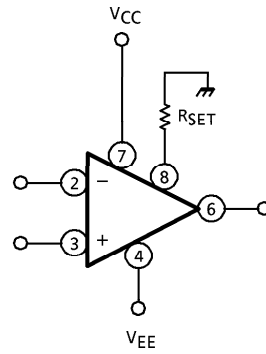
**TYPICAL APPLICATIONS**

**R<sub>SET</sub> CONNECTED TO V<sub>CC</sub>**



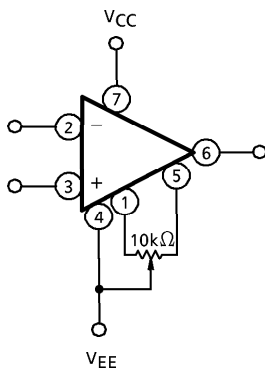
$$I_{SET} \approx \frac{V_{CC} - V_{EE} - 0.6}{R_{SET}}$$

**R<sub>SET</sub> CONNECTED TO GROUND**

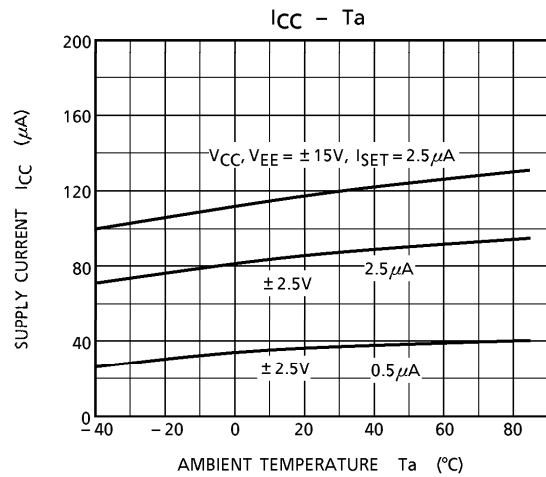
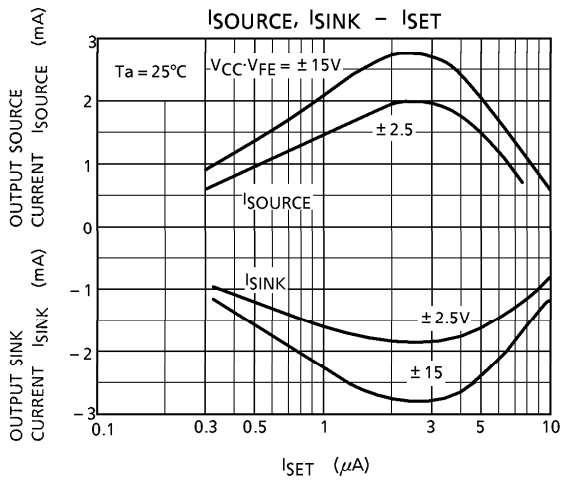
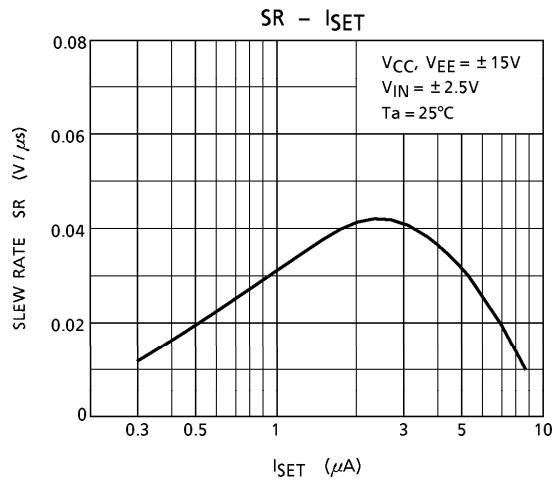
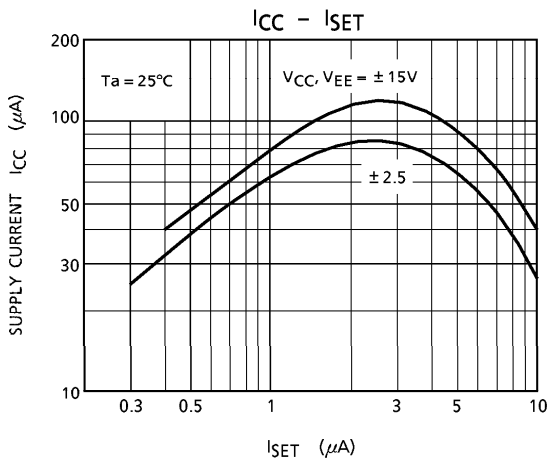
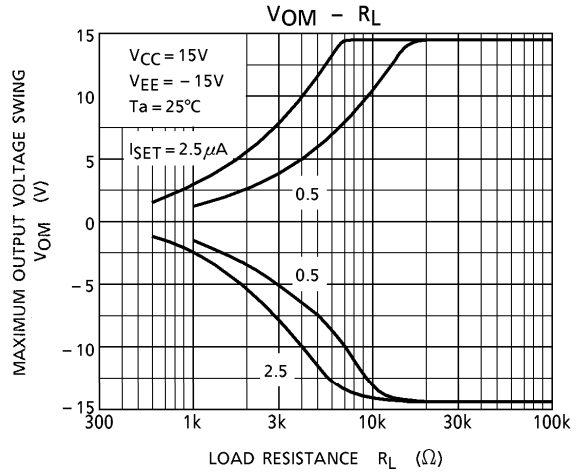
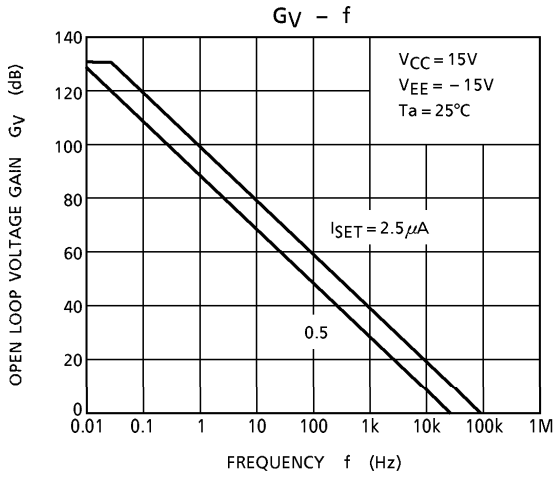


$$I_{SET} \approx \frac{-V_{EE} - 0.6}{R_{SET}}$$

**OFFSET NULL CIRCUIT**

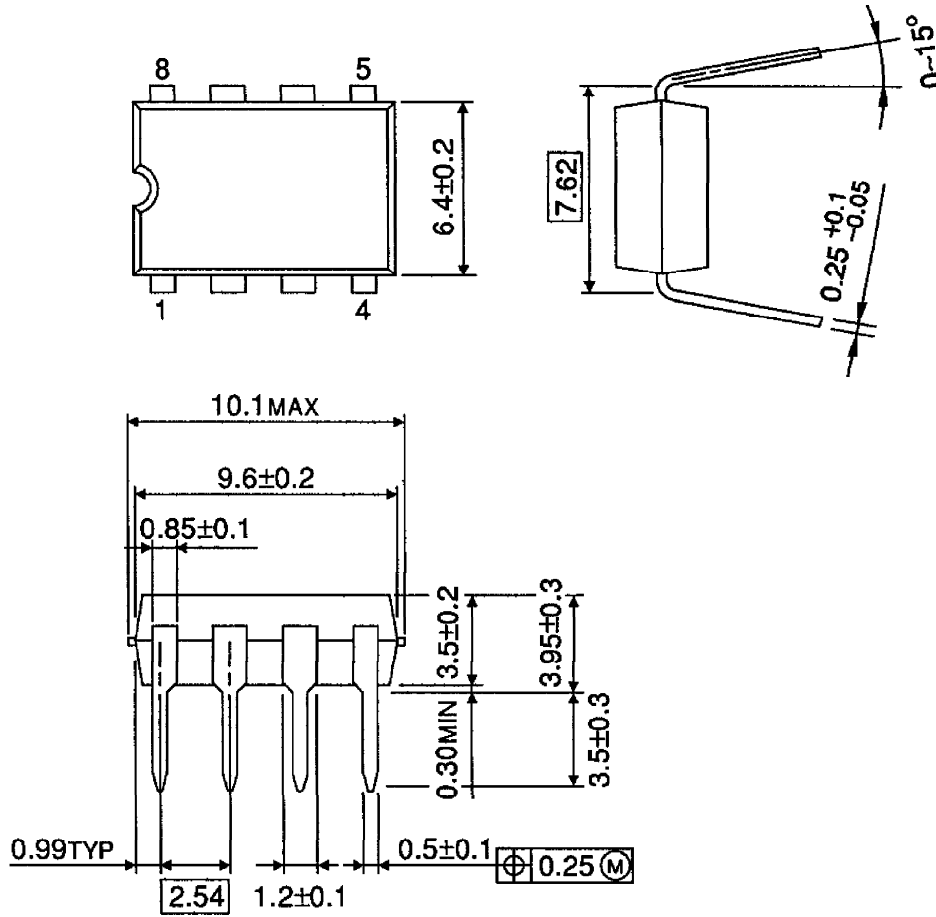


CHARACTERISTICS



**OUTLINE DRAWING**  
DIP8-P-300-2.54A

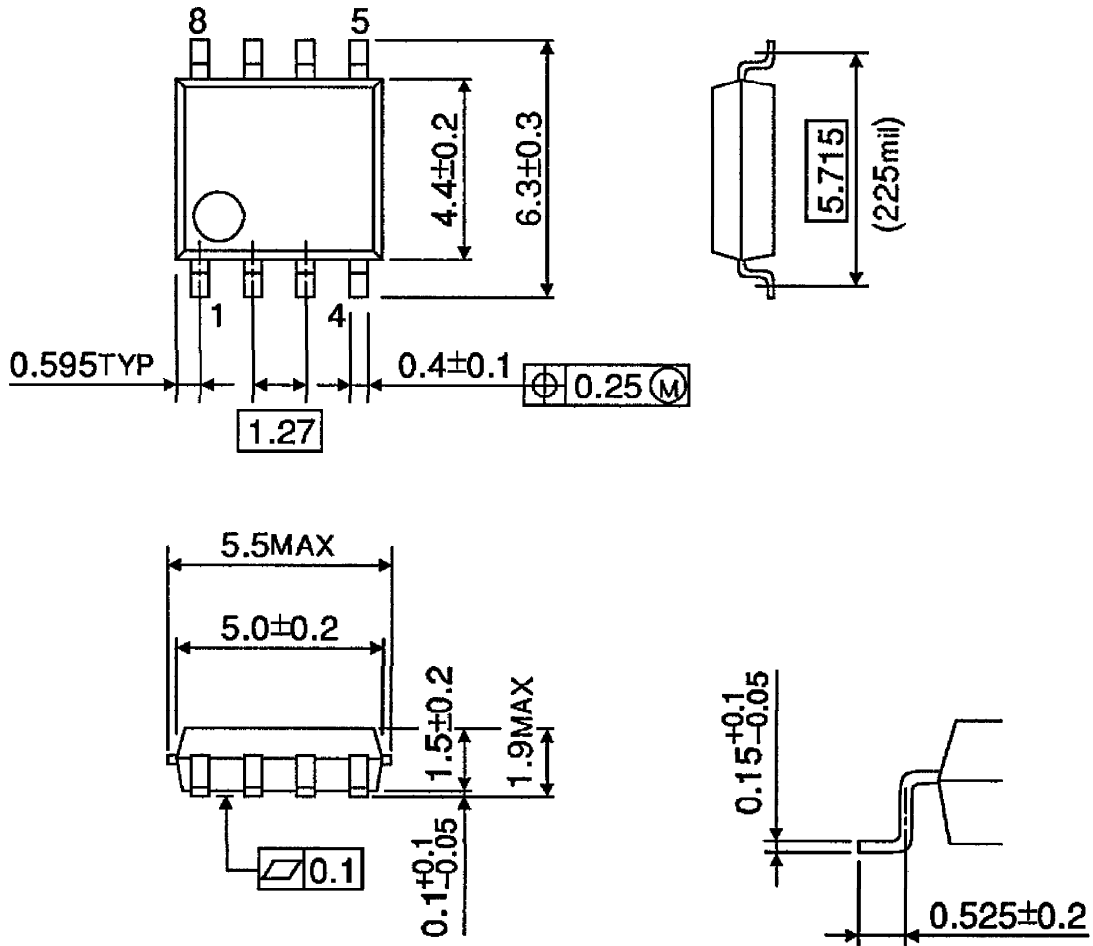
Unit : mm



Weight : 0.5g (Typ.)

OUTLINE DRAWING  
SOP8-P-225-1.27

Unit : mm



Weight : 0.1g (Typ.)