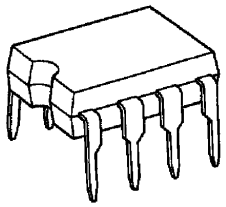
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA7540P, TA7540F

SINGLE OPERATIONAL AMPLIFIER

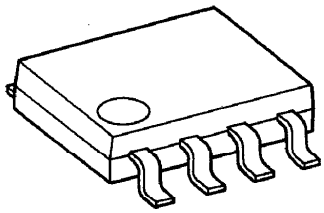
The TA7540P is a programmable monolithic precision micro-power operational amplifier that can be used either in signal or dual supply operation.
A signal external bias current setting resistor programs the input bias current, input offset current, quiescent power consumption, slew rate, and the gain-bandwidth product.

TA7540P



DIP8-P-300-2.54A

TA7540F



SOP8-P-225-1.27

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

FEATURES

- Very Low Power Consumption
- Programmable Supply Current : 25~85μA (Typ.)
- Wide Power Supply Range : Single Supply 3~36V
  Dual Supplies ±1.5~±18V
- 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

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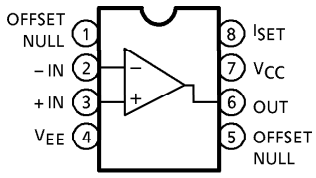
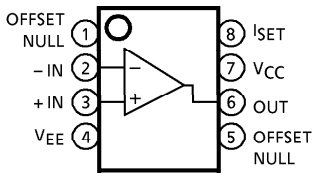
PIN CONNECTION (TOP VIEW)

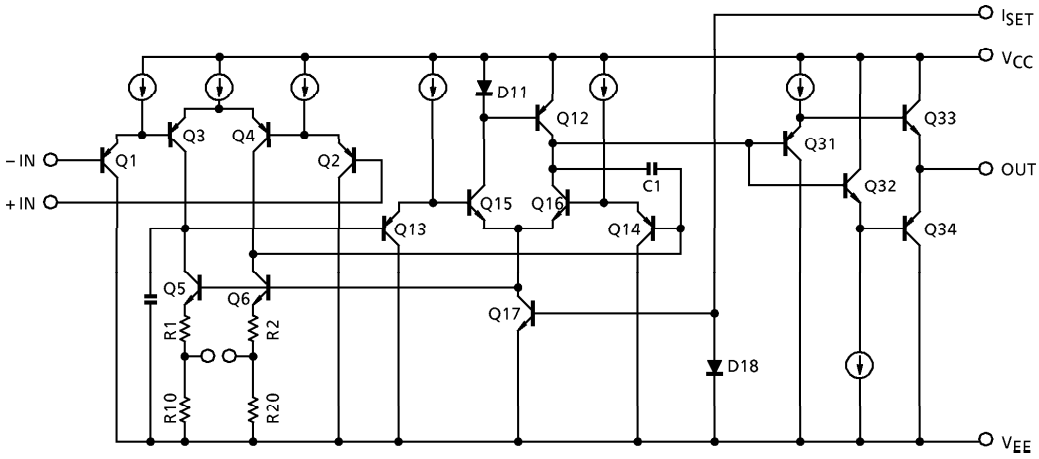
TA7540P



TA7540F



EQUIVALENT CIRCUIT



MAXIMUM RATINGS (Ta = 25°C)

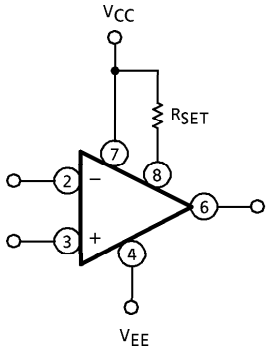
CHARACTERISTIC		SYMBOL	RATING	UNIT
Supply Voltage		V_{CC}·V_{EE}	± 18 or 36	V
Differential Voltage		DV_{IN}	± 36	V
Input Voltage		V_{IN}	− 0.3~36	V
Power Dissipation	TA7540P	P_D	500	mW
	TA7540F		240	
Operating Temperature		T_{opr}	− 40~85	°C
Storage Temperature		T_{stg}	− 55~125	°C

ELECTRICAL CHARACTERISTICS (Unless otherwise noted, V_{CC} = 2.5V, V_{EE} = − 2.5V, Ta = 25°C, I_{SET} = 2.5μA)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V_{IO}	—	$R_g \leqq 10k\Omega$	—	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	—	$R_g \leqq 10k\Omega$	80	100	—	dB
Supply Voltage Rejection Ratio	SVRR	—	$R_g \leqq 10k\Omega$	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

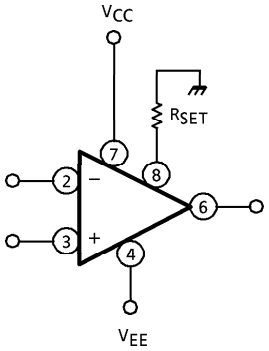
TYPICAL APPLICATIONS

R_{SET} CONNECTED TO V_{CC}



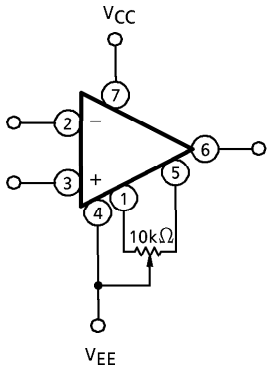
$$I_{SET} \simeq \frac{V_{CC} - V_{EE} - 0.6}{R_{SET}}$$

R_{SET} CONNECTED TO GROUND



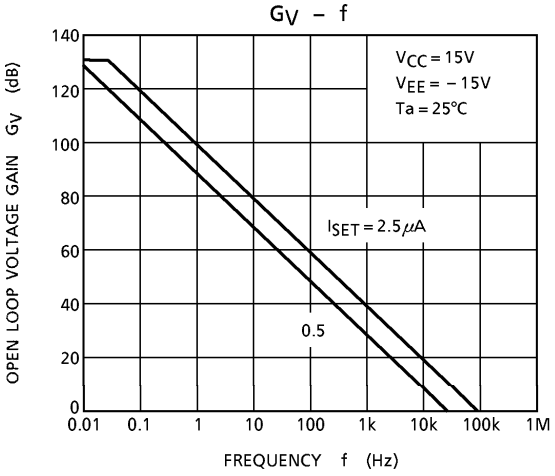
$$I_{SET} \simeq \frac{-V_{EE} - 0.6}{R_{SET}}$$

OFFSET NULL CIRCUIT

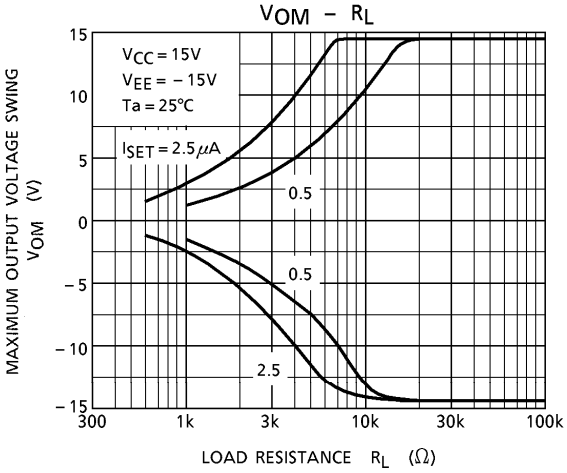


CHARACTERISTICS

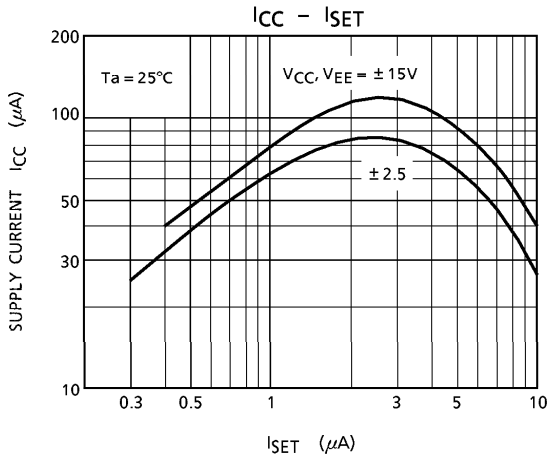
G_V – f



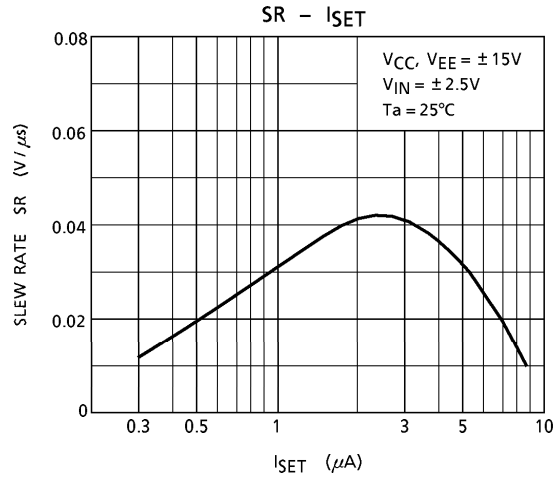
V_{OM} – R_L



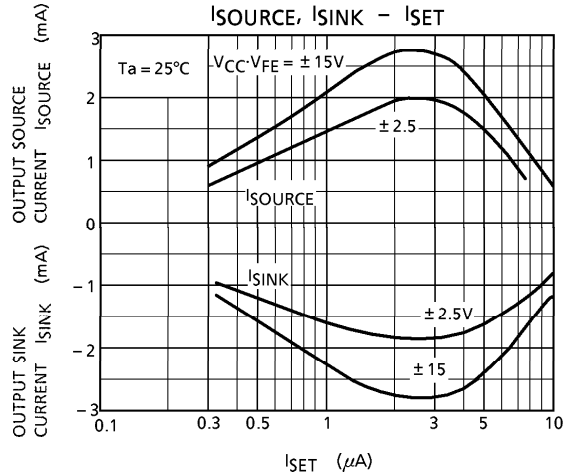
I_{CC} – I_{SET}



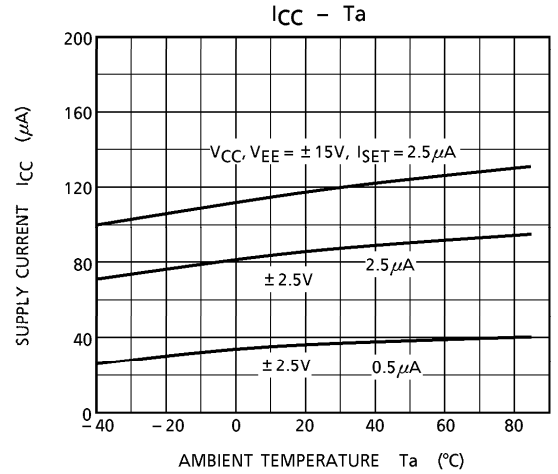
SR – I_{SET}



I_{SOURCE}, I_{SINK} – I_{SET}



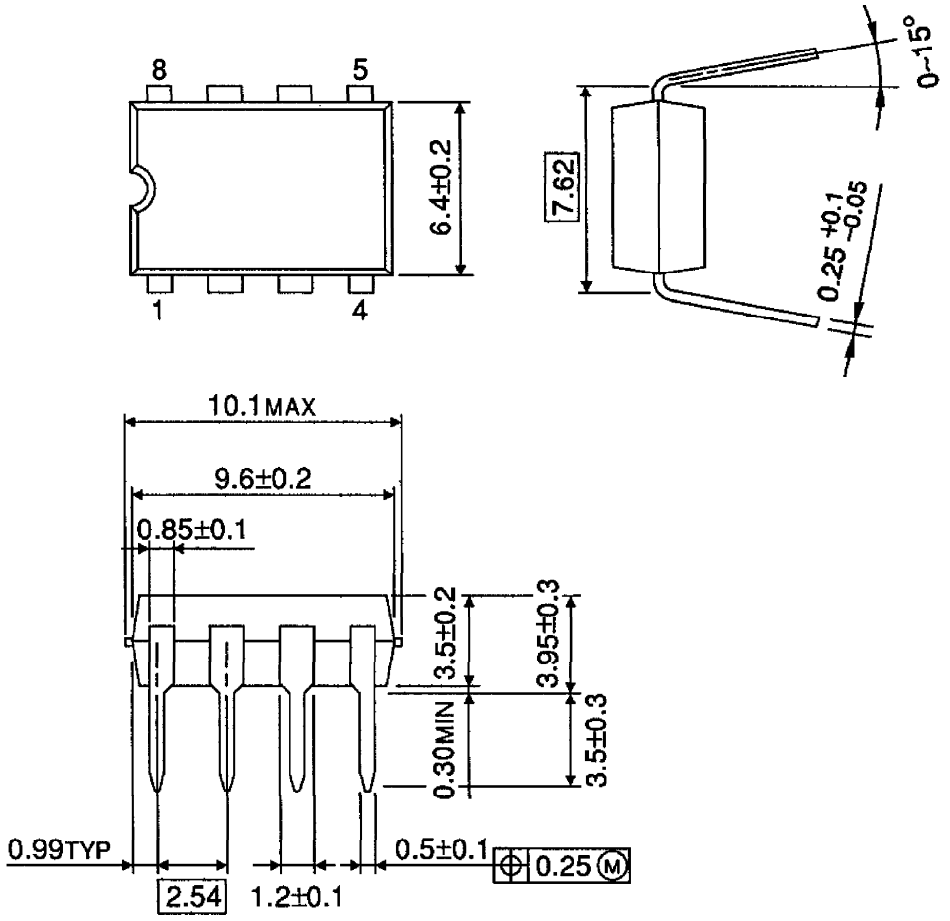
I_{CC} – Ta



OUTLINE DRAWING

DIP8-P-300-2.54A

Unit : mm

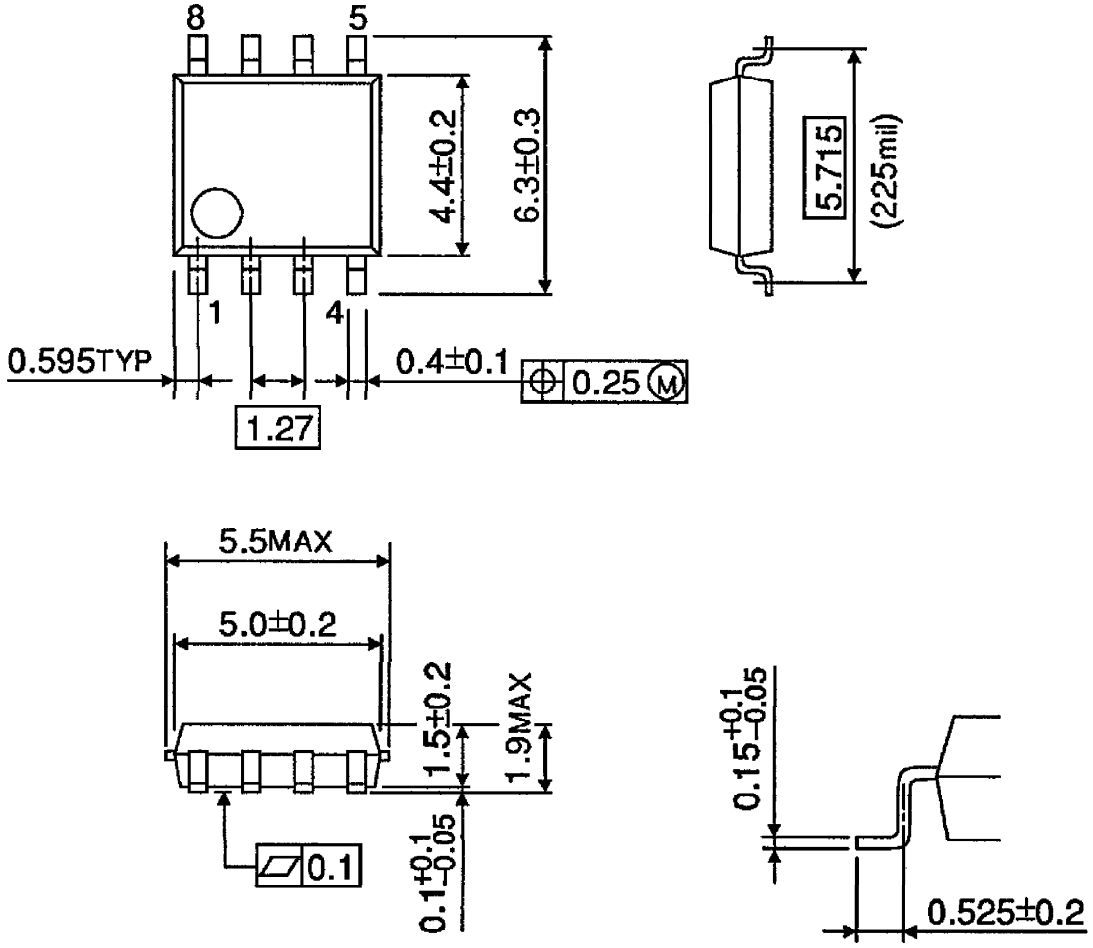


Weight : 0.5g (Typ.)

OUTLINE DRAWING

SOP8-P-225-1.27

Unit : mm



Weight : 0.1g (Typ.)