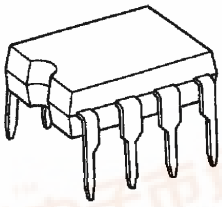
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA75070P

SINGLE OPERATIONAL AMPLIFIER

The TA75070P is a Low-Noise J-FET input operational amplifier with low input bias and offset current, fast slew rate and wide bandwidth. The TA75070P is pin compatible with the TA7506P and 301A allowing designers to immediately upgrade the overall performance of existing designs. The TA75070P is an excellent choice for active filters, integrators and sample-and-hold circuits.



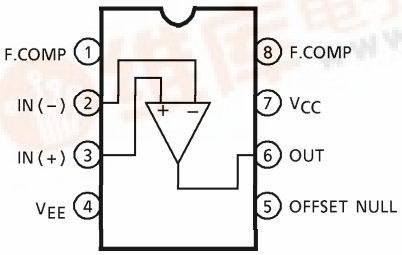
DIP8-P-300-2.54A

Weight : 0.5g (Typ.)

FEATURES

- Low Input Bias Current : 200pA Max.
- Low Input Offset Current : 50pA Max.
- High Slew Rate : 13V / μs (A_V = 1)
- Low Noise : 18nV / $\sqrt{Hz}$
- Wide Supply Voltage Range : ±4 ~ ±18V
- Output Short Circuit Protection
- Offset Null Capability

PIN CONNECTION (TOP VIEW)



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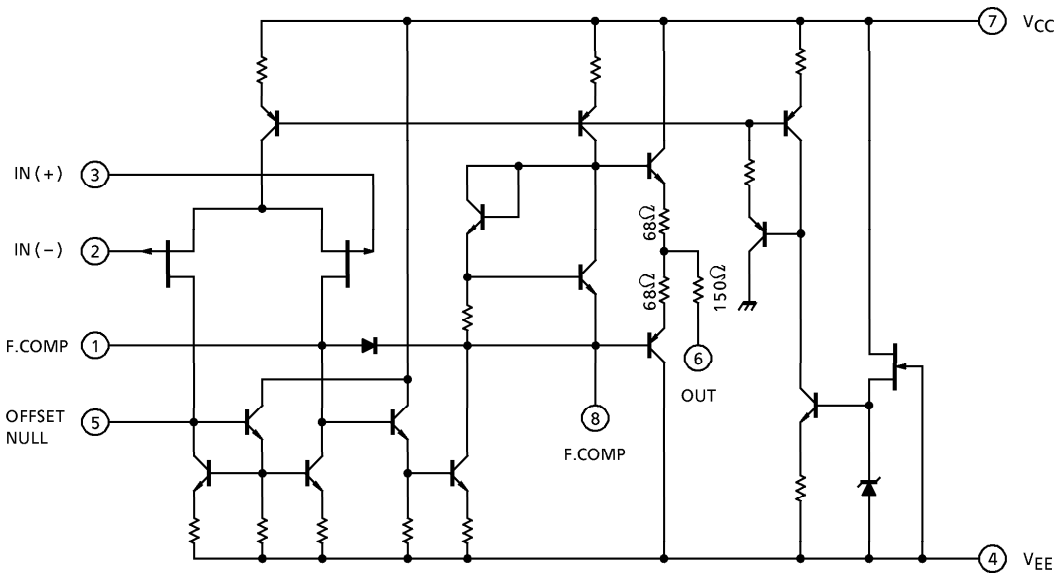
EQUIVALENT CIRCUIT



MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	+ 18	V
	V_{EE}	− 18	V
Differential Input Voltage	DV_{IN}	± 30	V
Input Voltage	V_{IN}	± 15	V
Power Dissipation	P_D	500	mW
Operating Temperature	T_{opr}	− 40~85	°C
Storage Temperature	T_{stg}	− 55~125	°C

ELECTRICAL CHARACTERISTICS (V_{CC} = 15V, V_{EE} = − 15V, Ta = 25°C)

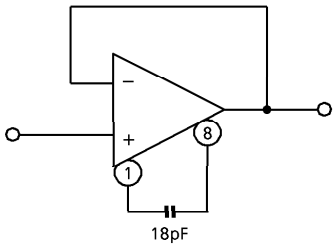
CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V_{IO}	—	$R_g \leqq 10k\Omega$	—	3	10	mV
TC of Input Offset Voltage	TCV_{IO}	—	—	—	10	—	$\mu V / °C$
Input Offset Current	I_{IO}	—	—	—	5	50	pA
Input Bias Current	I_I	—	—	—	30	200	pA
Common Mode Input Voltage	CMV_{IN}	—	—	± 11	± 12	—	V
Maximum Output Voltage	V_{OM}	—	$R_L = 10k\Omega$	24	—	—	V_{p-p}
	V_{OMR}	—	$R_L = 2k\Omega$	20	24	—	
Voltage Gain (Open Loop)	G_V	—	V_{OUT} = ± 10V, $R_L = 2k\Omega$	25	200	—	V / mV
Unity Gain Cross Frequency	f_T	—	Open Loop, $R_L = 10k\Omega$	—	3	—	MHz
Input Resistance	R_{IN}	—	—	—	10^{12}	—	Ω
Common Mode Input Signal Rejection Ratio	CMRR	—	$R_g \leqq 10k\Omega$	70	76	—	dB
Supply Voltage Rejection Ratio	SVRR	—	$R_g \leqq 10k\Omega$	70	76	—	dB
Supply Current	I_{CC}, I_{EE}	—	Non Load	—	1.4	2.5	mA

OPERATING CHARACTERISTICS (V_{CC} = 15V, V_{EE} = − 15V, Ta = 25°C)

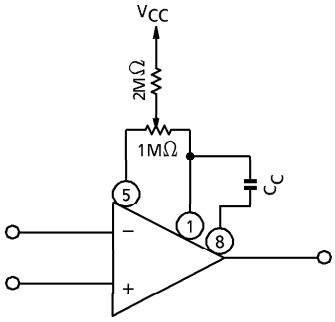
CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Slew Rate	SR	—	$V_{IN} = 10V_{p-p}$, $R_L = 2k\Omega$, $C_L = 100pF$		—	13	—	$V / \mu s$
Equivalent Input Noise Voltage	V_{NI}	—	$R_S = 100\Omega$	f = 1kHz	—	18	—	$nV/\sqrt{Hz}$
				f = 10Hz~10kHz	—	4	—	μV_{rms}
Equivalent Input Noise Current	I_{NI}	—	$R_S = 100\Omega$, f = 1kHz		—	0.01	—	$pA/\sqrt{Hz}$
Total Harmonic Distortion	THD	—	$V_{OUT} = 10V_{rms}$, $R_S \leqq 1k\Omega$, $R_L \geqq 2k\Omega$, f = 1kHz		—	0.01	—	%

TYPICAL APPLICATION

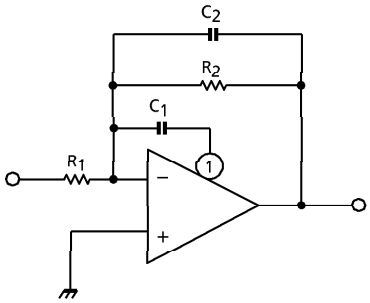
(1) UNITY-GAIN BUFFER



(2) OFFSET NULL CIRCUIT



(3) FEED FORWARD COMPENSATION

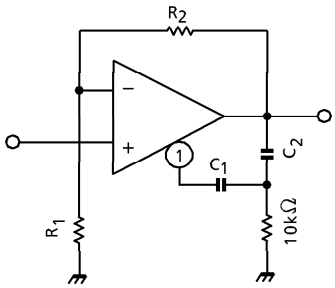


$C_1 = 500pF$

$C_2 = \dfrac{1}{2\pi f_o R_2}$

$f_o \simeq 3MHz$

(4) TWO POLE COMPENSATION



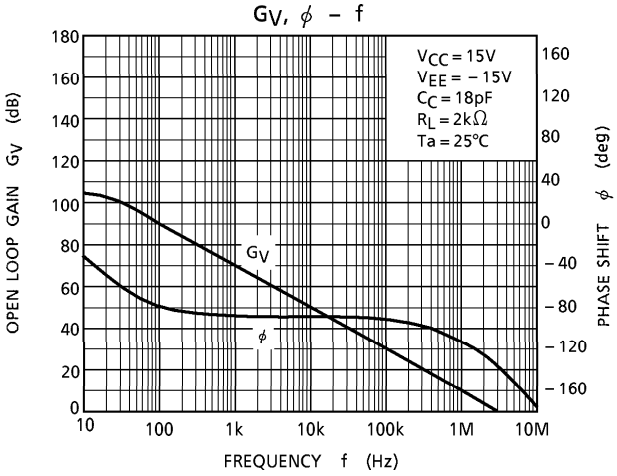
$C_1 > \dfrac{R_1}{R_1 + R_2} C_S$

$C_S = 18pF$

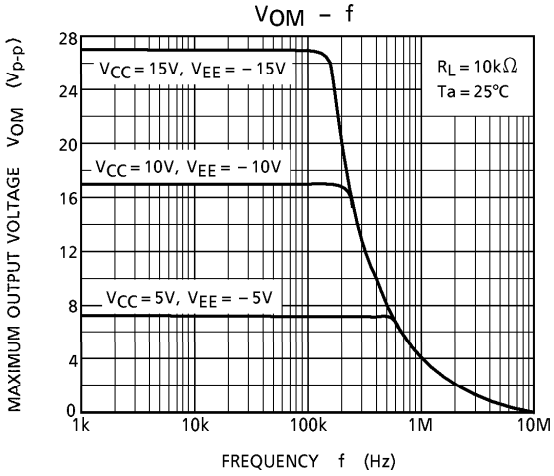
$C_2 = 10C_1$

CHARACTERISTICS

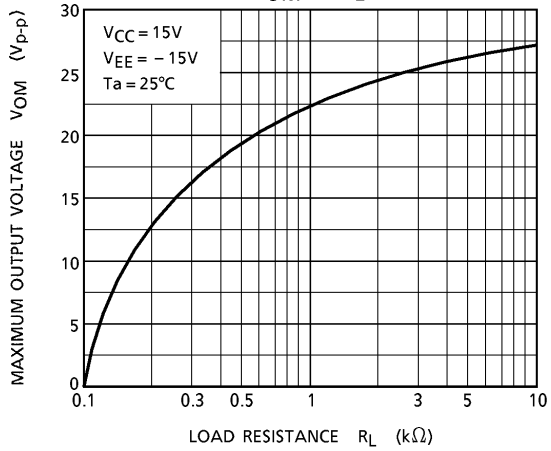
G_V, ϕ – f



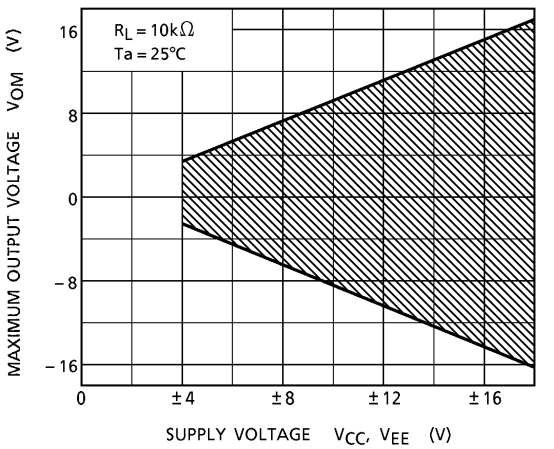
V_{OM} – f



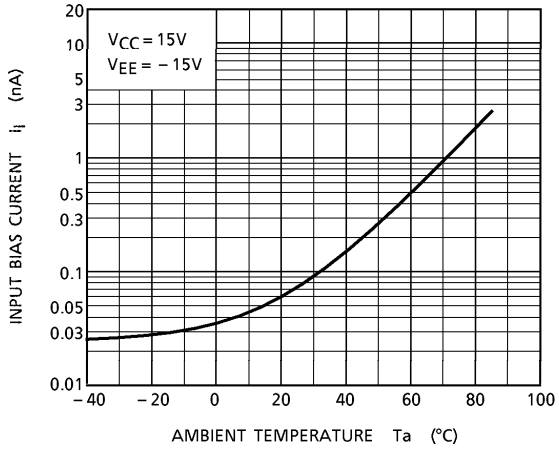
V_{OM} – R_L



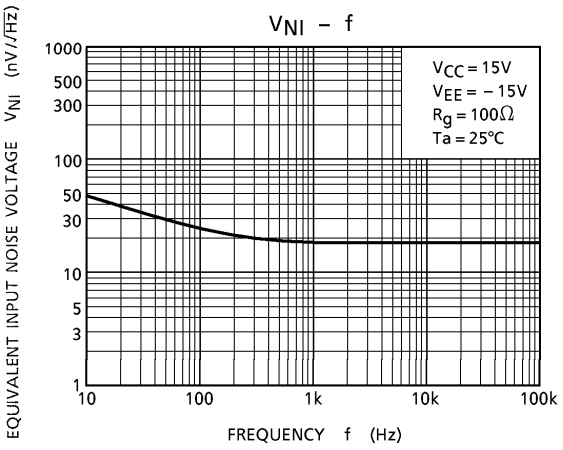
V_{OM} – V_{CC}, V_{EE}

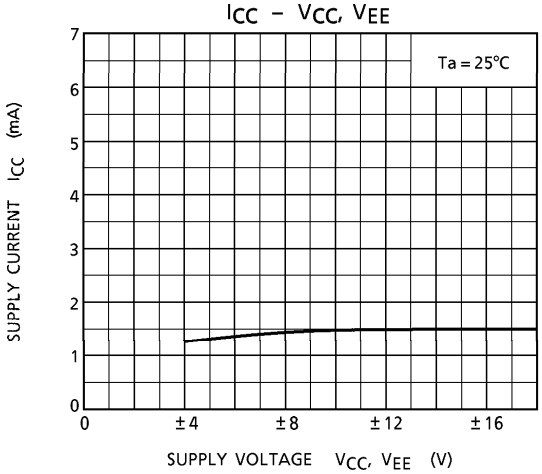


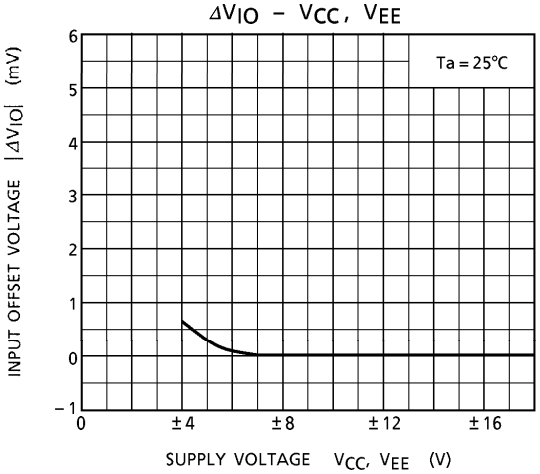
I_I – Ta



V_{NI} – f



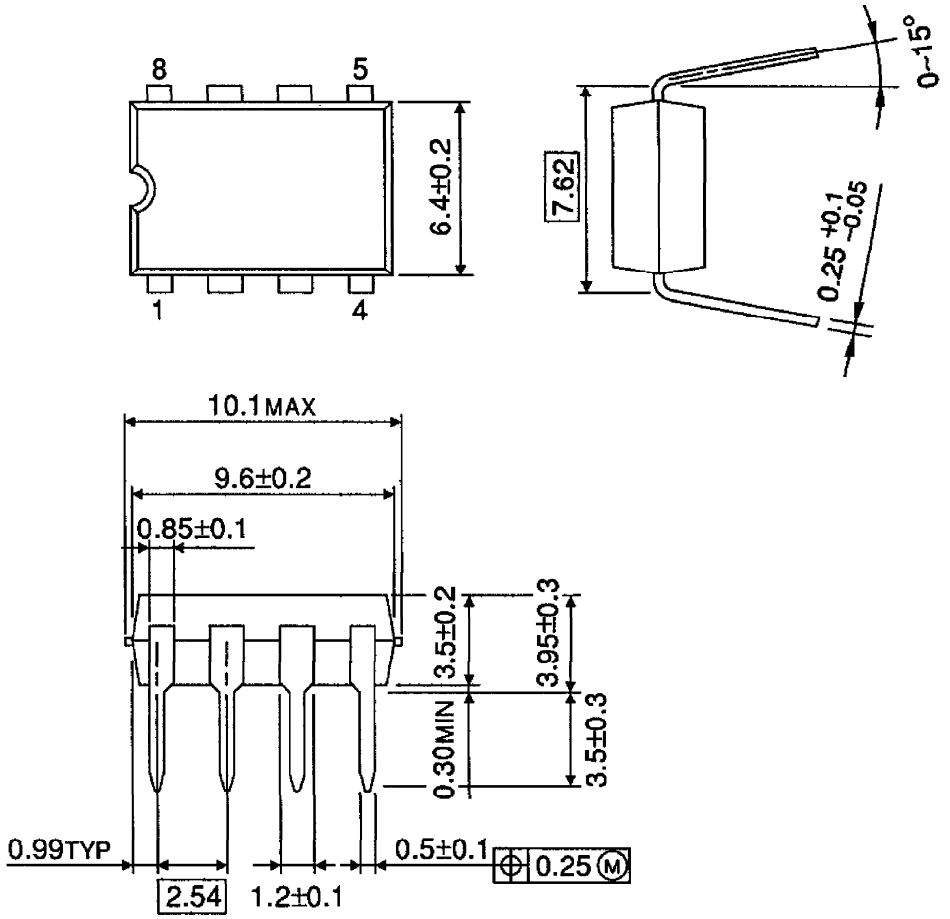

I_{CC} – V_{CC}, V_{EE}
Ta = 25°C
SUPPLY CURRENT I_{CC} (mA)
0
1
2
3
4
5
6
7
0
±4
±8
±12
±16
SUPPLY VOLTAGE V_{CC}, V_{EE} (V)


ΔV_{IO} – V_{CC}, V_{EE}
Ta = 25°C
INPUT OFFSET VOLTAGE $|\Delta V_{IO}|$ (mV)
–1
0
1
2
3
4
5
6
0
±4
±8
±12
±16
SUPPLY VOLTAGE V_{CC}, V_{EE} (V)

OUTLINE DRAWING

DIP8-P-300-2.54A

Unit : mm



Weight : 0.5g (Typ.)