TOSHIBA Bipolar Linear Integrated Circuit Silicon Monolithic

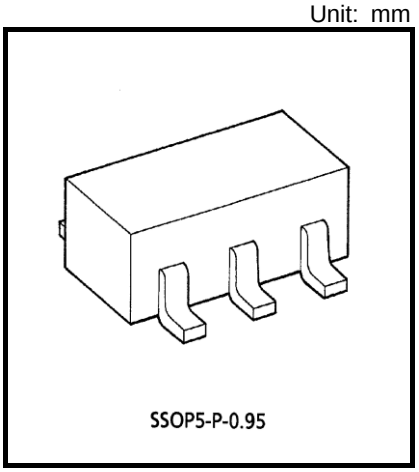
TA75S01F

Single Operational Amplifier

Features

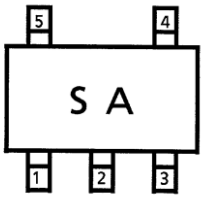
- In the linear mode the input common mode voltage range includes ground.
- The internally compensated Operational Amplifier is small package.
- Low power dissipation and power drain suitable for battery operation.
- Differential input voltage range equal to the power supply voltage.
- Large output voltage swing: $0V_{DC}$ to $3.4V_{DC}$ (V_{DC} = 5V)
- Wide power supply voltage range and single power supply is possible.
- Single supply $3V_{DC}$ to $12V_{DC}$ or dual supplies $\pm1.5V_{DC}$ to $\pm6V_{DC}$.

Unit: mm

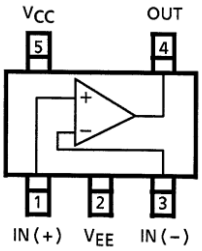


Weight:0.014g (typ.)

Marking (Top View)

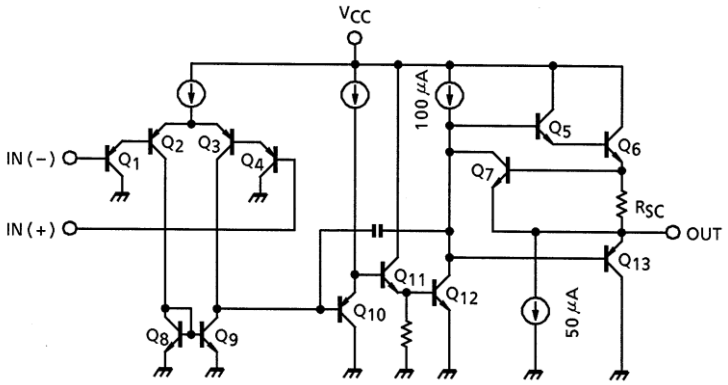


Pin Connection (Top View)



Start of commercial production
1991-02

Equivalent Circuit



Absolute Maximum Ratings (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Supply voltage	V_{CC}, V_{EE}	±6 or 12	V
Differential input voltage	DV_{IN}	±12	V
Input voltage	V_{IN}	−0.3 to V_{CC}	V
Power dissipation	P_D	200	mW
Operating temperature	T_{opr}	−40 to 85	°C
Storage temperature	T_{stg}	−55 to 125	°C

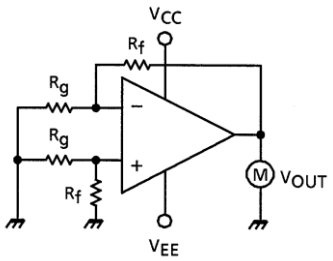
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings and the operating ranges.
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook (“Handling Precautions”/“Derating Concept and Methods”) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Electrical Characteristics (V_{CC} = 5V, V_{EE} = GND, Ta = 25°C)

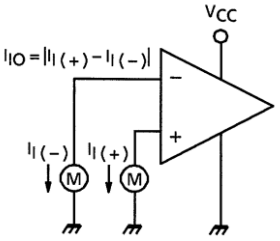
Characteristic	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Input offset voltage	V_{IO}	1	Rg≤10kΩ	—	2	7	mV
Input offset current	I_{IO}	2	—	—	5	50	nA
Input bias current	I_I	2	—	—	45	250	nA
Common mode input voltage	CMV_{IN}	3	—	0	—	V_{CC}−1.5	V
Supply current	I_{CC}	4	—	—	0.4	0.8	mA
Voltage gain	G_V	—	RL≥2kΩ	86	100	—	dB
Maximum output voltage swing	V_{op-p}	5	RL = 2kΩ	0	—	3.4	V
Common mode rejection ratio	CMRR	3	—	65	85	—	dB
Supply voltage rejection ratio	SVRR	—	Rg = 10kΩ	65	100	—	dB
Source current	I_{source}	6	IN (−) = 0V, IN (+) = 1V	20	40	—	mA
Sink current	I_{sink}	7	IN (−) = 1V, IN (+) = 0V	10	20	—	mA
Unity gain cross frequency	f_T	—	—	—	0.3	—	MHz

Test Circuit

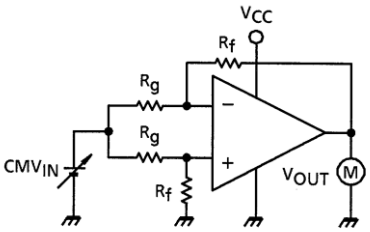
(1) V_{IO}



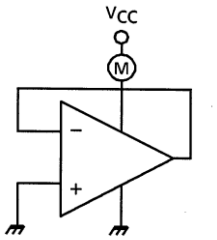
(2) I_I, I_{IO}



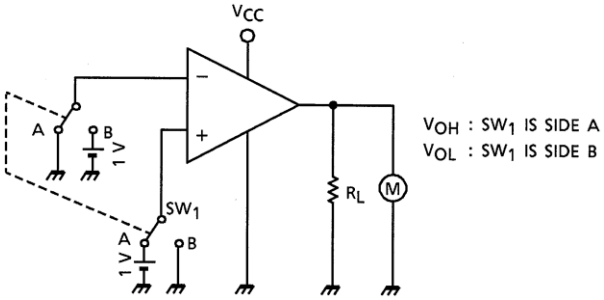
(3) CMV_{IN}, CMRR



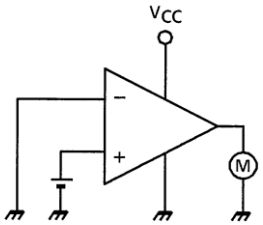
(4) I_{CC}



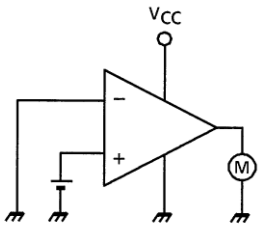
(5) V_{OP-P}

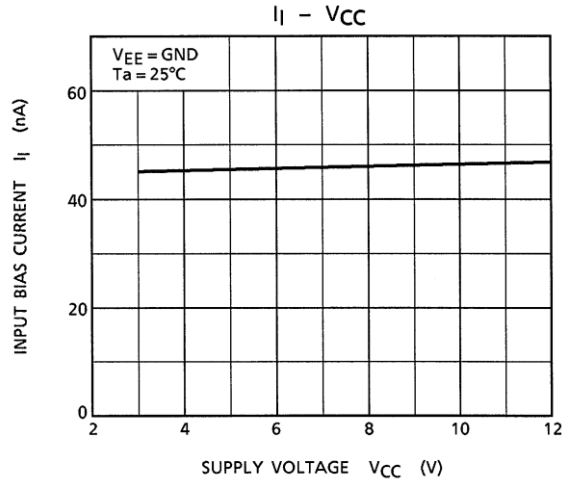


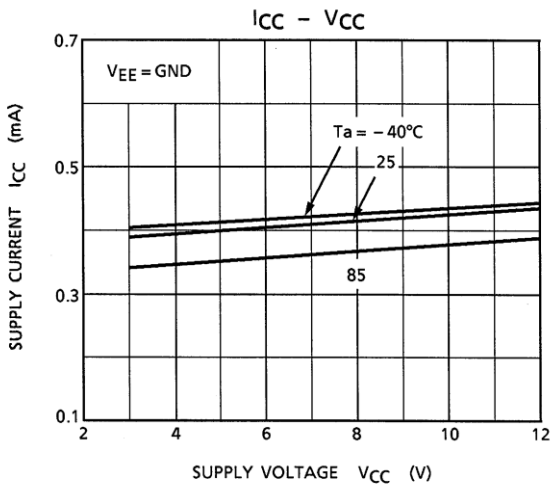
(6) Isource

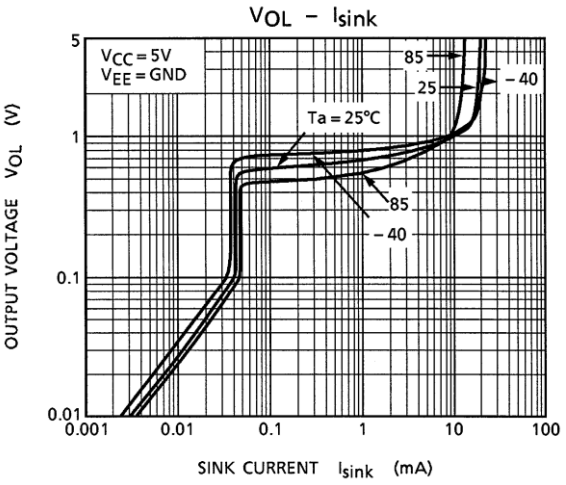


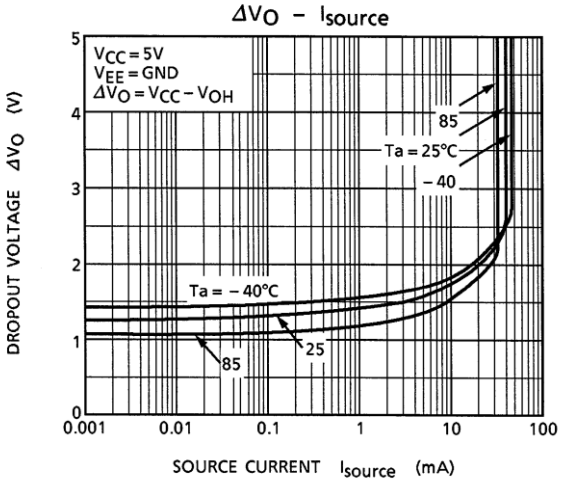
(7) Isink

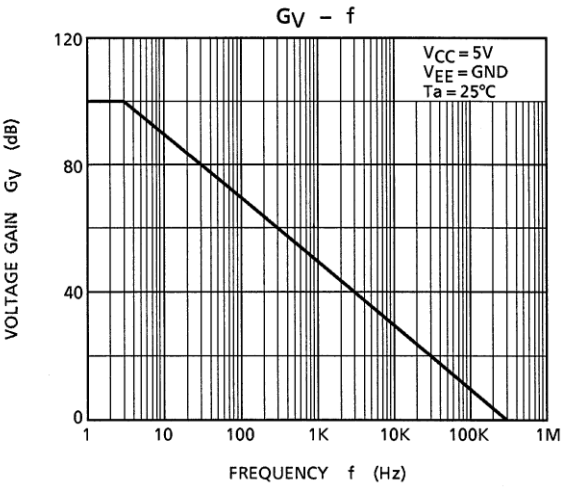


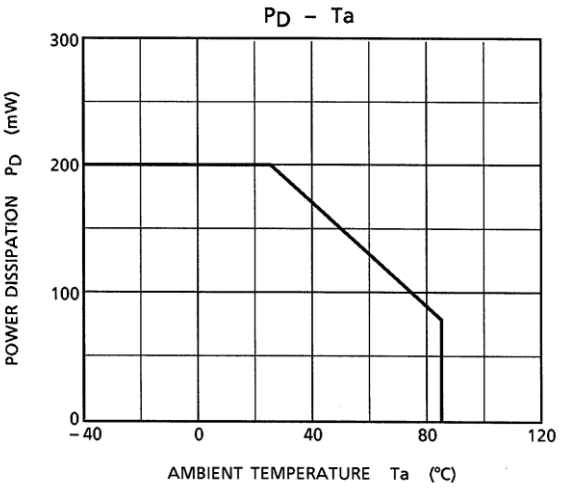

I_I – V_{CC}
V_{EE} = GND
Ta = 25°C
INPUT BIAS CURRENT I_I (nA)
SUPPLY VOLTAGE V_{CC} (V)


I_{CC} – V_{CC}
V_{EE} = GND
Ta = – 40°C
25
85
SUPPLY CURRENT I_{CC} (mA)
SUPPLY VOLTAGE V_{CC} (V)


V_{OL} – I_{sink}
V_{CC} = 5V
V_{EE} = GND
Ta = 25°C
85
25
– 40
OUTPUT VOLTAGE V_{OL} (V)
SINK CURRENT I_{sink} (mA)

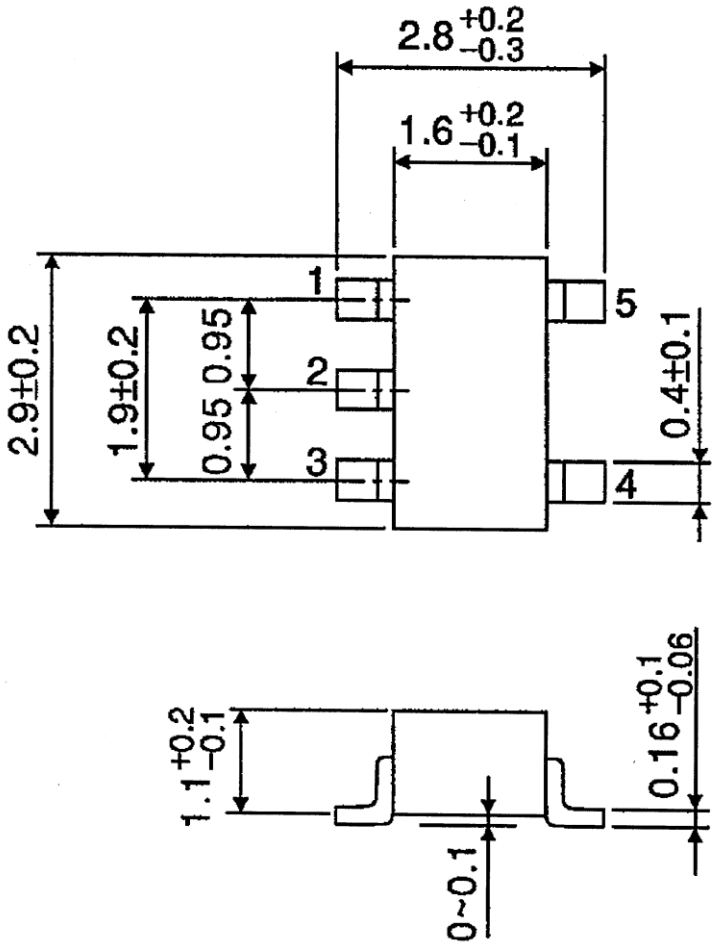

ΔV_O – I_{source}
V_{CC} = 5V
V_{EE} = GND
$\Delta V_O = V_{CC} - V_{OH}$
85
Ta = 25°C
– 40
Ta = – 40°C
25
85
DROPOUT VOLTAGE ΔV_O (V)
SOURCE CURRENT I_{source} (mA)


G_V – f
V_{CC} = 5V
V_{EE} = GND
Ta = 25°C
VOLTAGE GAIN G_V (dB)
FREQUENCY f (Hz)


P_D – Ta
POWER DISSIPATION P_D (mW)
AMBIENT TEMPERATURE Ta (°C)

Package Dimensions

SSOP5-P-0.95 Unit: mm



Weight: 0.014g (typ.)

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