

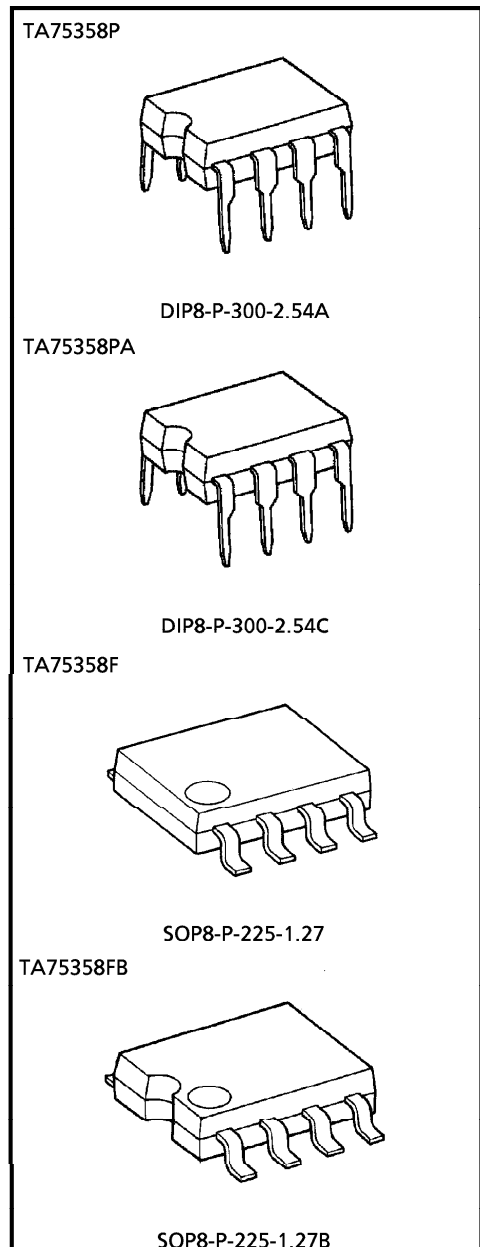
TA75358P, TA75358PA, TA75358F, TA75358FB

DUAL OPERATIONAL AMPLIFIER

FEATURES

- In the linear mode the input common mode voltage range includes ground.
- Two internally compensated OP amps are in single 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. : $0V \sim V_{CC} - 1.5V$
- Wide power supply voltage range and single power supply is possible.
- Low input biasing current : $I_I = 45nA$ (Typ.)
- Wide Band Decompensated ($A_V \geq 20dB$).

Weight	
DIP8-P-300-2.54A	: 0.5g (Typ.)
DIP8-P-300-2.54C	: 0.6g (Typ.)
SOP8-P-225-1.27	: 0.1g (Typ.)
SOP8-P-225-1.27B	: 0.1g (Typ.)

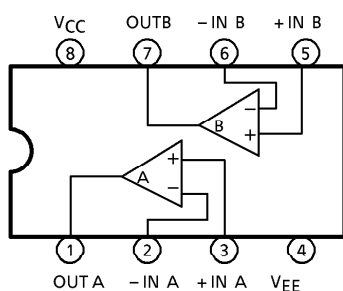


961001EBA2

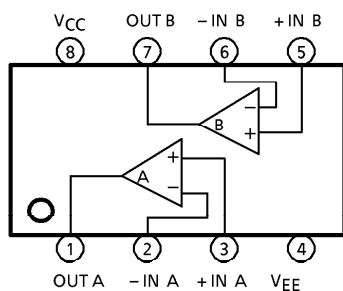
● TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing 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.

PIN CONNECTION (TOP VIEW)

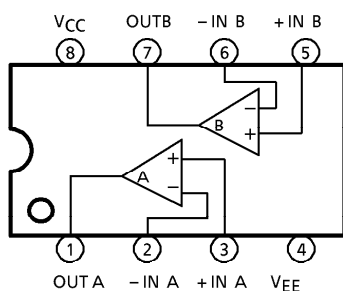
TA75358P
TA75358PA



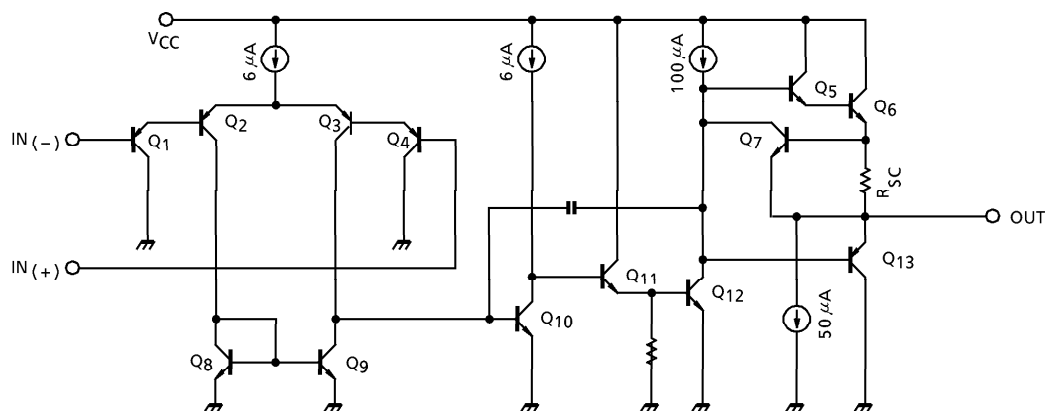
TA75358F



TA75358FB



EQUIVALENT CIRCUIT



961001EBA2'

- 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.

MAXIMUM RATINGS (Ta = 25°C)

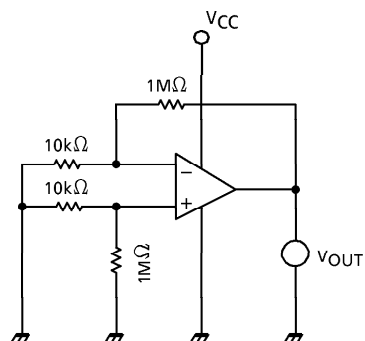
CHARACTERISTIC	SYMBOL	TA75358P TA75358PA	TA75339F TA75339FB	UNIT
Supply Voltage	V _{CC} , V _{EE}	± 18 OR 36	± 18 OR 36	V
Differential Input Voltage	DV _{IN}	± 36	± 36	V
Input Voltage	V _{IN}	- 0.3~36	- 0.3~36	V
Power Dissipation	P _D	500	240	mW
Operating Temperature	T _{opr}	- 40~85	- 40~85	°C
Storage Temperature	T _{stg}	- 55~125	- 55~125	°C

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

CHARACTERISTIC	SYMBOL	TEST CIR- CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Offset Voltage	V _{IO}	1	R _g ≤ 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	V _{CC} = 30V, V _{EE} = GND	0	—	V _{CC} - 1.5	V
Supply Current	I _{CC} , I _{EE}	4	R _L = ∞, All OP Amps	—	0.7	1.2	mA
Voltage Gain	G _V	5	R _L ≥ 2kΩ	86	100	—	dB
Maximum Output Voltage Swing	V _{Op-p}	6	R _L = 2kΩ	0	—	V _{CC} - 1.5	V
Common Mode Rejection Ratio	CMRR	3	—	60	85	—	dB
Supply Voltage Rejection Ratio	SVRR	1	R _g = 10kΩ	60	100	—	dB
Source Current	I _{source}	6	IN (-) = 0V, IN (+) = 1V	20	40	—	mA
Sink Current	I _{sink}	6	IN (-) = 1V, IN (+) = 0V	10	20	—	mA
Unity Gain Cross Frequency	f _T	—	—	—	1.5	—	MHz
Slew Rate	S _R	—	—	—	0.8	—	V / μs

TEST CIRCUIT

(1) V_{IO} , SVRR



- $V_{IO} = V_{OUT} / 100$

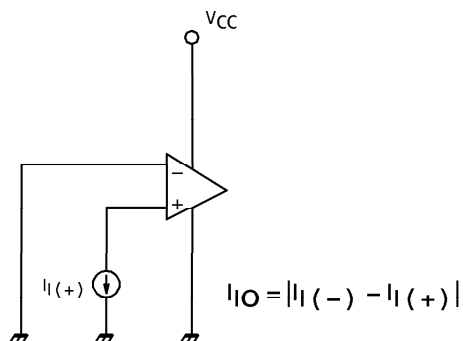
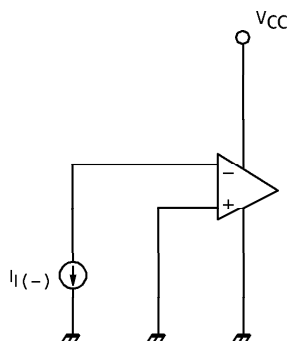
- $SVRR = 20 \log E \text{ (dB)}$

$$E = \left| \frac{V_{OUT1} - V_{OUT2}}{V_{CC1} - V_{CC2}} \right| \times \frac{1}{100}$$

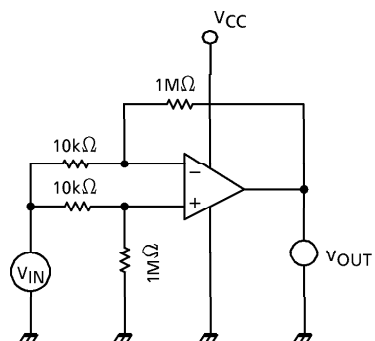
V_{OUT1} : V_{OUT} ($V_{CC1} = 5V$)

V_{OUT2} : V_{OUT} ($V_{CC2} = 10V$)

(2) I_I , I_{IO}



(3) CMV_{IN} , CMRR



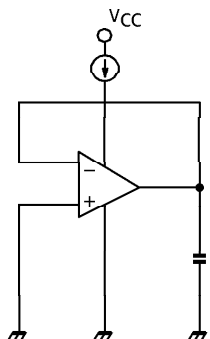
- $CMRR = 20 \log G_D / G_C \text{ (dB)}$

G_D : DIFFERENTIAL VOLTAGE GAIN

G_C : COMMON MODE VOLTAGE GAIN

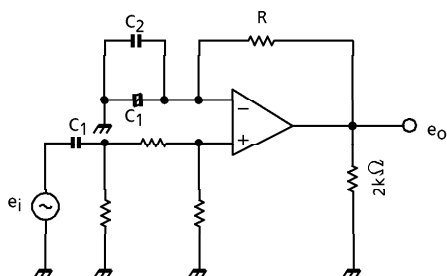
- CMV_{IN} : $V_{IN} = 0V$, $V_{CC} - 1.5V$ SUPPLES

(4) I_{CC}



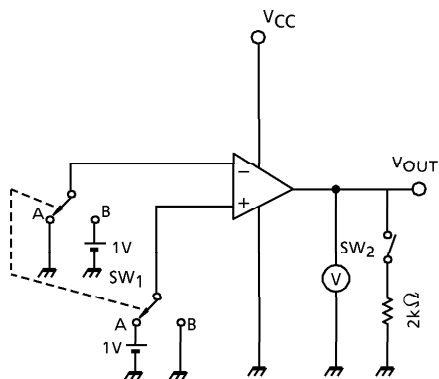
- $I_{CC} : V_{CC} = 5V$

(5) G_V



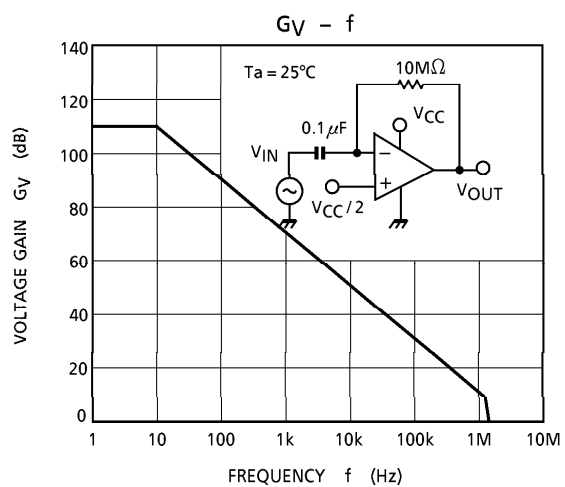
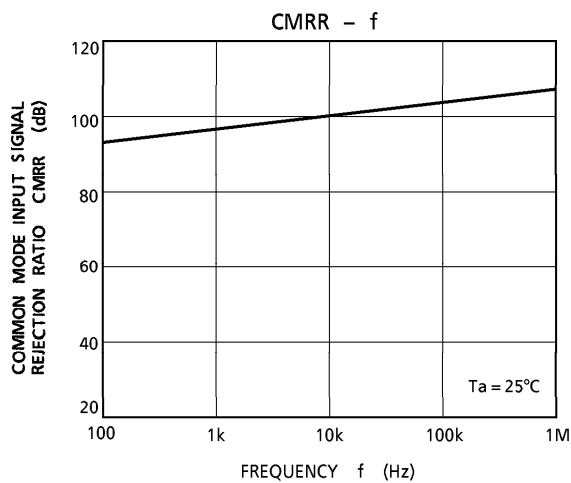
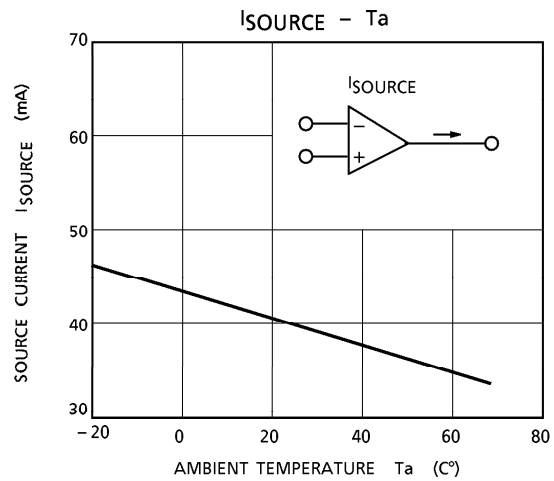
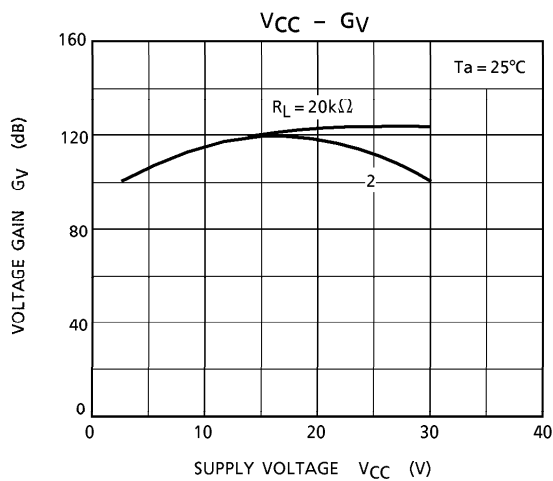
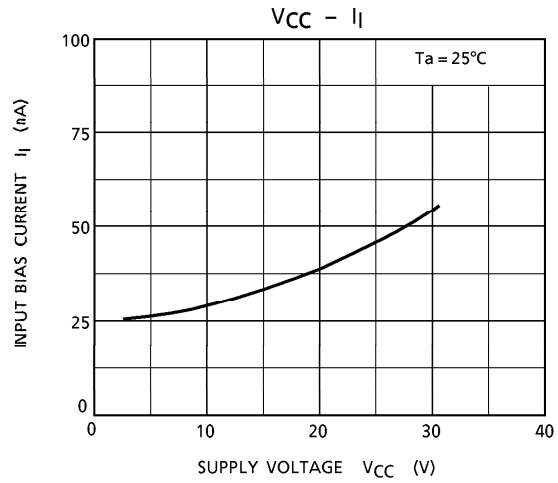
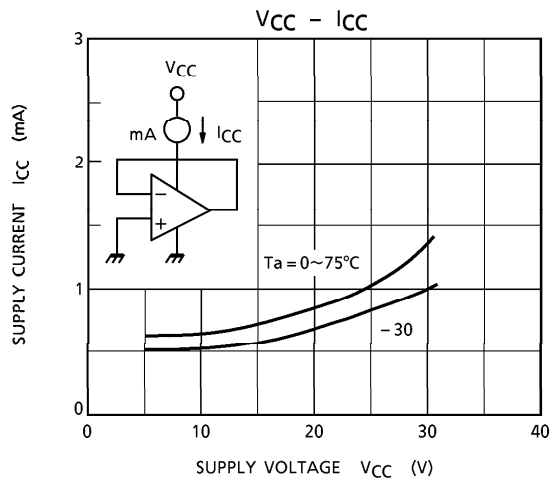
- $G_V = 20 \log e_o / e_i$ (dB)
 $R \gg 1 / W_{C1}$
 C_1 : COUPLING CONDENSER
 C_2 : HIGH FREQUENCY BYPASS CONDENSER

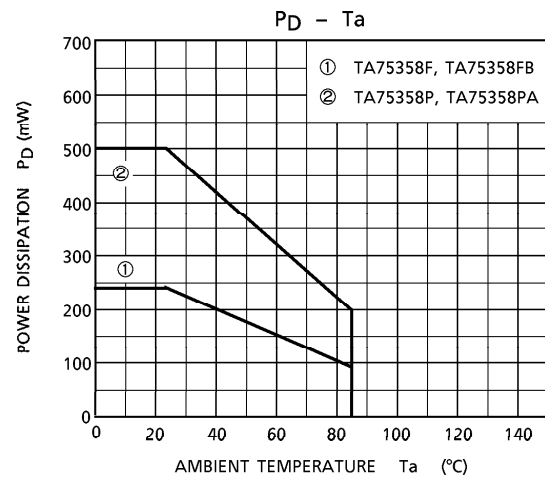
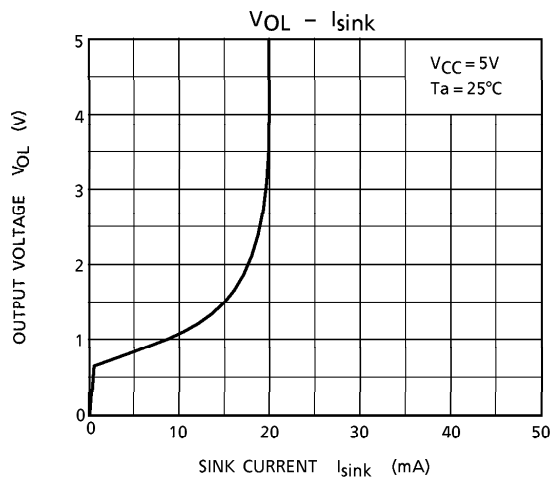
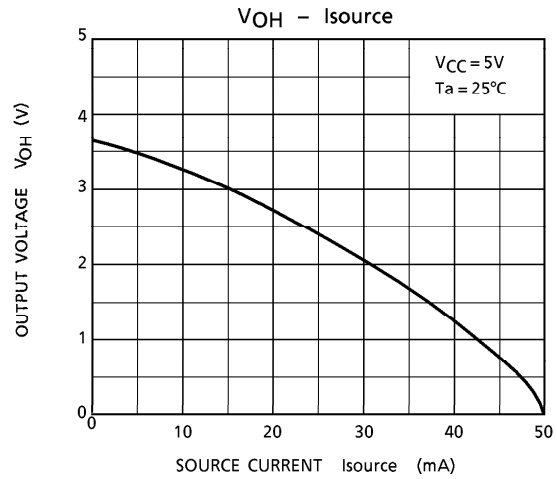
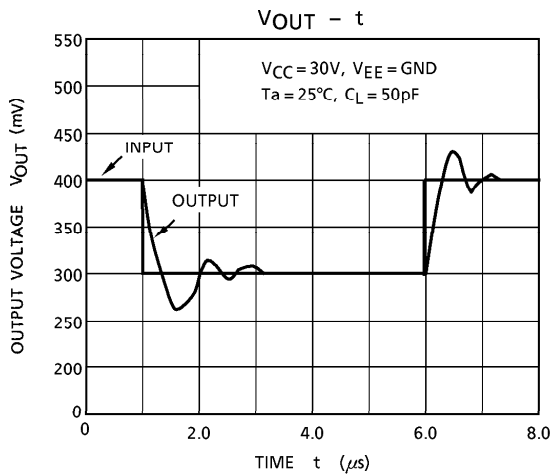
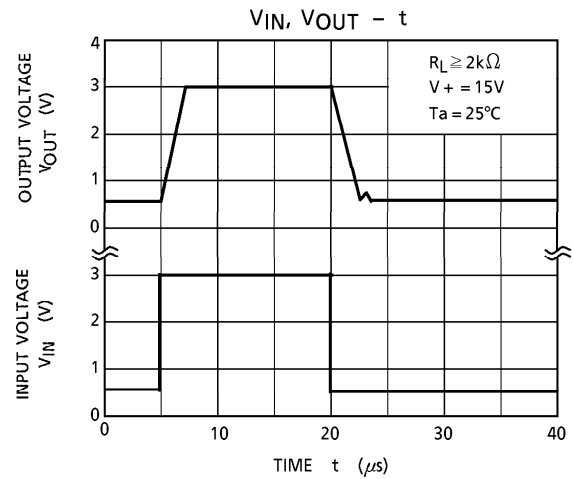
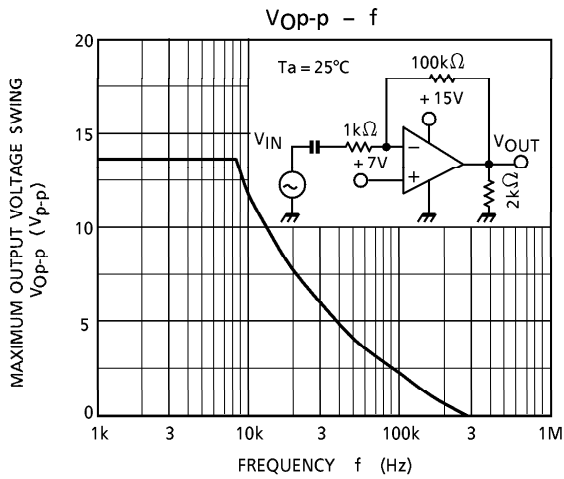
(6) V_{Op-p} , I_{source} , I_{sink}



- V_{Op-p} :
 V_{OH} : SW_1 IS SIDE A, SW_2 ON
 V_{OL} : SW_1 IS SIDE B, SW_2 ON
- I_{source}
 SW_1 IS SIDE A, SW_2 OFF
 $V_{OUT} \rightarrow 0V$ MEASURE
- I_{sink}
 SW_1 IS SIDE B, SW_2 OFF
 $V_{OUT} \rightarrow 5V$ MEASURE

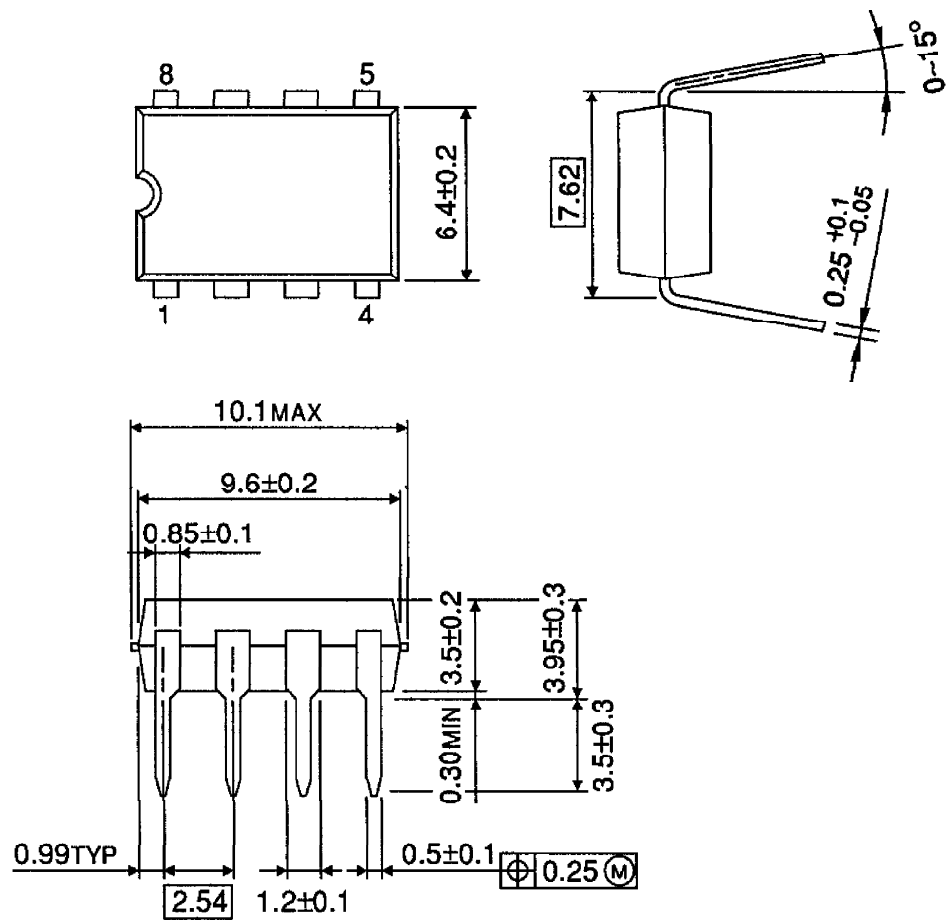
CHARACTERISTICS





OUTLINE DRAWING
DIP8-P-300-2.54A

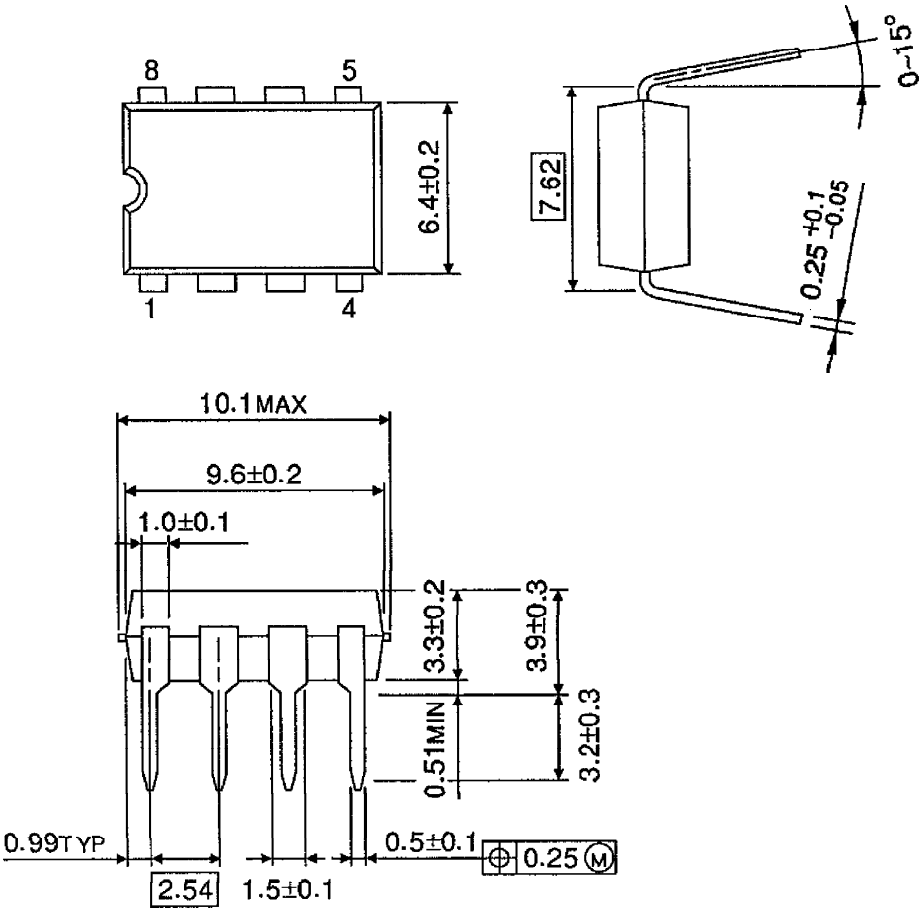
Unit : mm



Weight : 0.5g (Typ.)

OUTLINE DRAWING
DIP8-P-300-2.54C

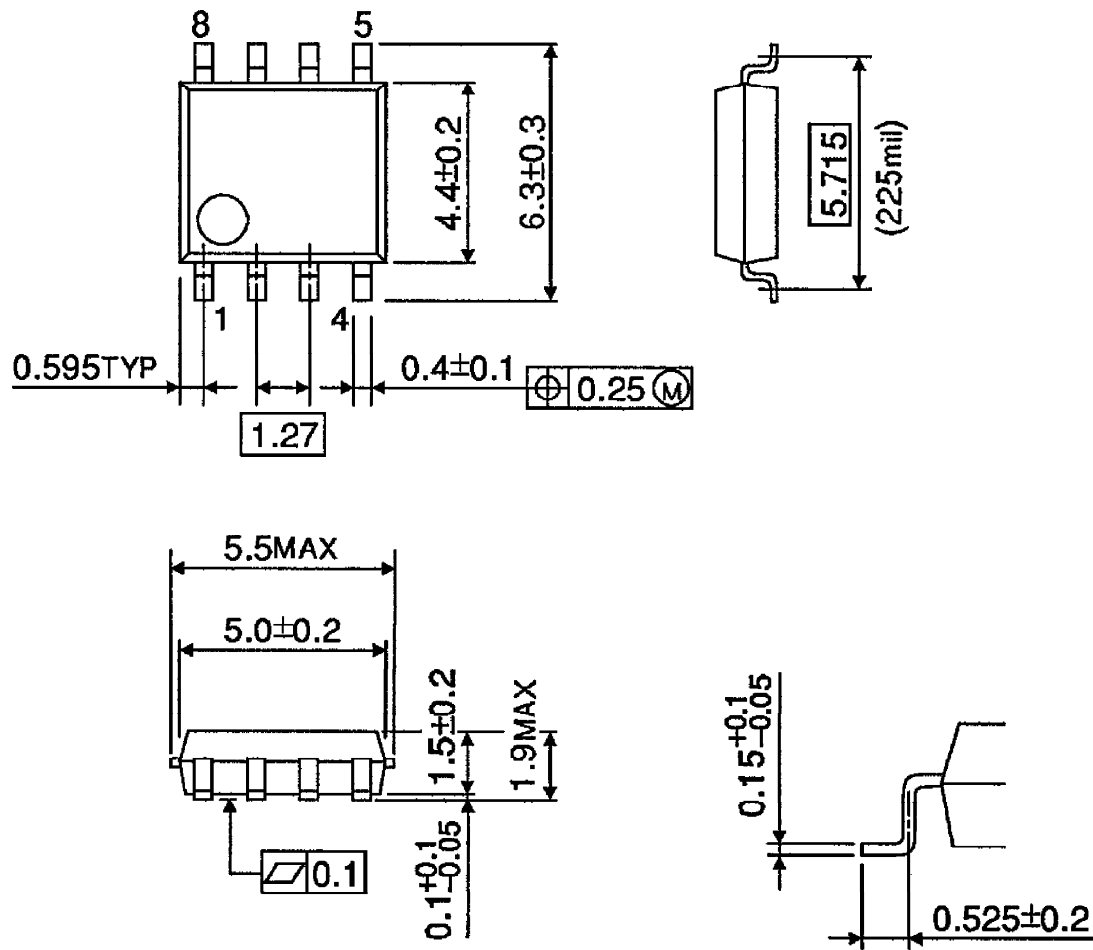
Unit : mm



Weight : 0.6g (Typ.)

OUTLINE DRAWING
SOP8-P-225-1.27

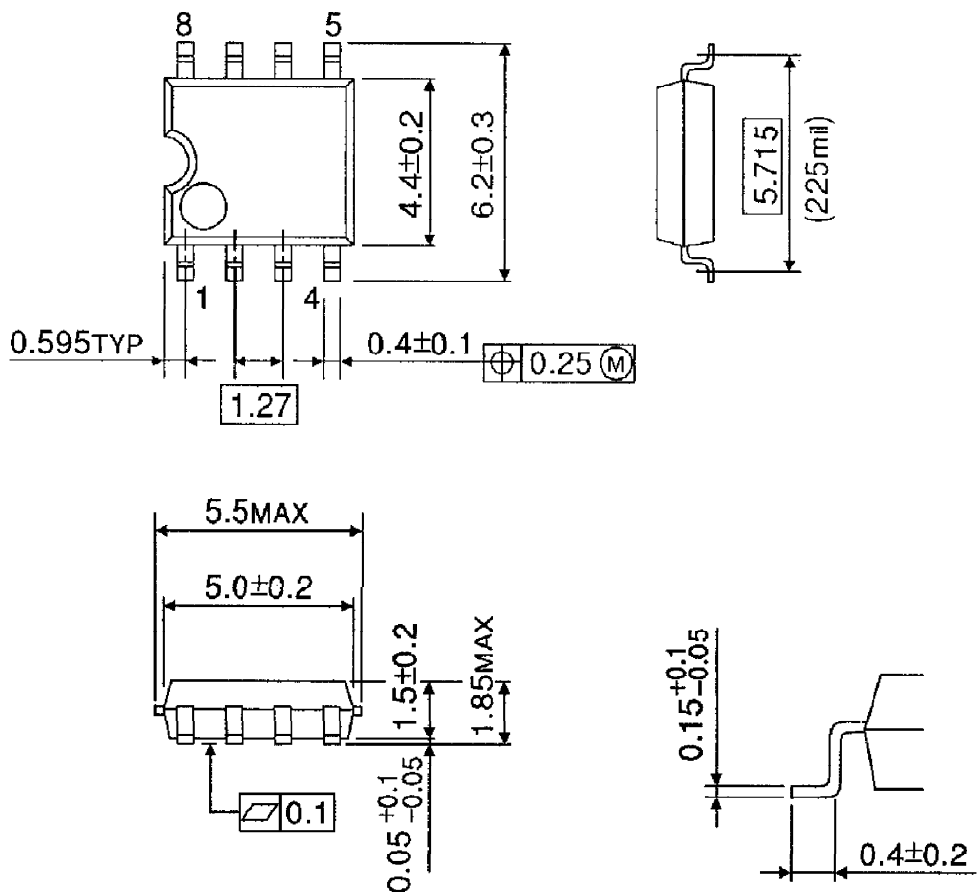
Unit : mm



Weight : 0.1g (Typ.)

OUTLINE DRAWING
SOP8-P-225-1.27B

Unit : mm



Weight : 0.1g (Typ.)