

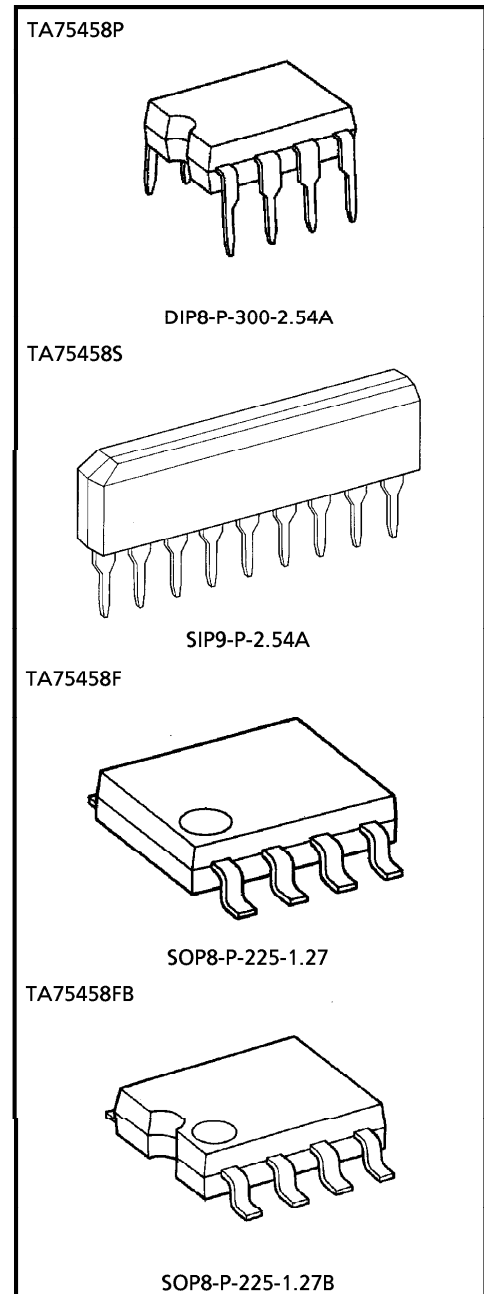
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA75458P, TA75458S, TA75458F, TA75458FB

DUAL OPERATIONAL AMPLIFIER

FEATURES

- Pair of Internally Compensated High Performance Amplifier
- No Frequency Compensation Required
- No Latch-up
- Short Circuit Protection
- Side Common Mode and Differential Voltage Range
- Low Power Consumption



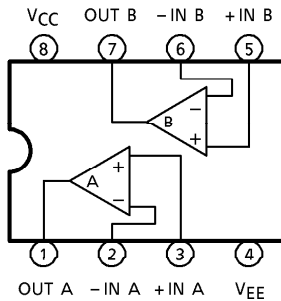
Weight
 DIP8-P-300-2.54A : 0.5g (Typ.)
 SIP9-P-2.54A : 0.9g (Typ.)
 SOP8-P-225-1.27 : 0.1g (Typ.)
 SOP8-P-225-1.27B : 0.1g (Typ.)

961001EBA1

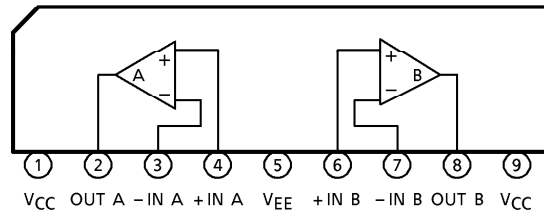
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PIN CONNECTION (TOP VIEW)

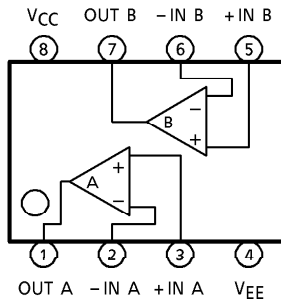
TA75458P



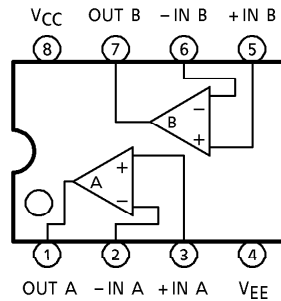
TA75458S



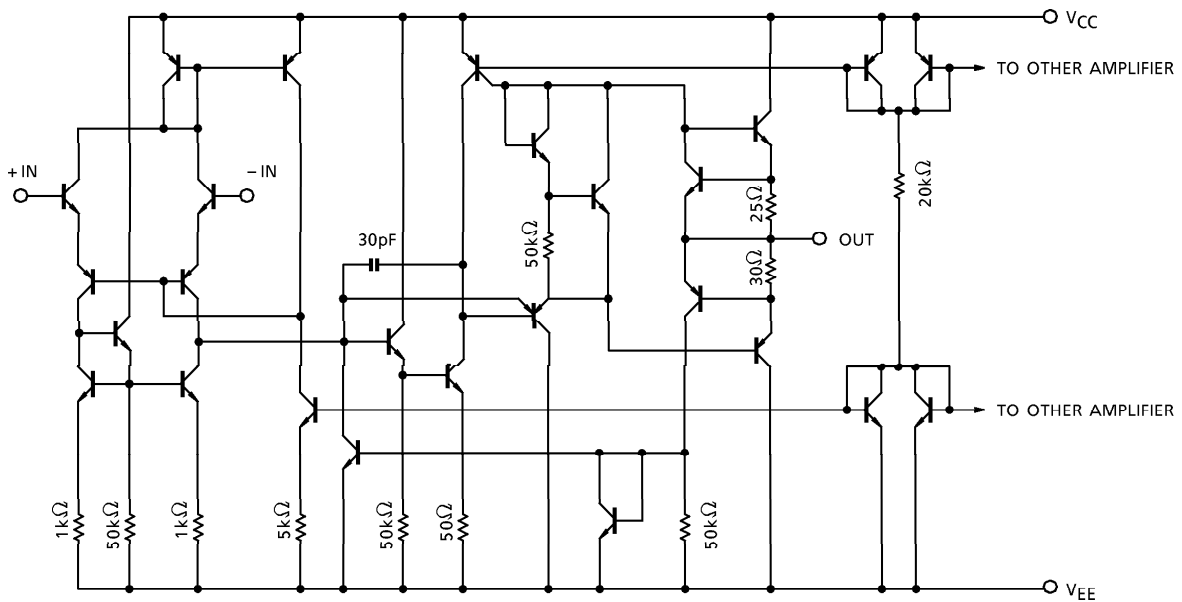
TA75458F



TA75458FB



EQUIVALENT CIRCUIT



961001EBA1'

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MAXIMUM RATINGS (Ta = 25°C)

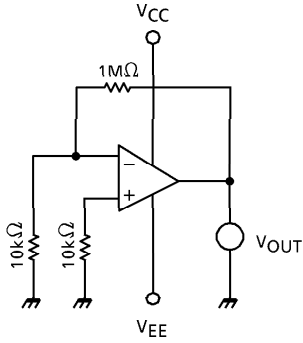
CHARACTERISTIC	SYMBOL	TA75458P	TA75458S	TA75458F TA75458FB	UNIT
Supply Voltage	V _{CC} , V _{EE}	+ 18, - 18	+ 18, - 18	+ 18, - 18	V
Differential Input Voltage	DV _{IN}	± 30	± 30	± 30	V
Input Voltage	V _{IN}	V _{CC} ~V _{EE}	V _{CC} ~V _{EE}	V _{CC} ~V _{EE}	V
Power Dissipation	P _D	500	400	240	mW
Operating Temperature	T _{opr}	- 40~85	- 40~85	- 30~75	°C
Ambient Temperature	T _{stg}	- 55~125	- 55~125	- 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}	1	R _g ≤ 10kΩ	—	1	5	mV
Input Offset Current		I _{IO}	2		—	20	200	nA
Input Bias Current		I _I	2		—	80	500	nA
Common Mode Input Voltage		CMV _{IN}	3		± 12	± 13	—	V
Maximum Output Voltage		V _{OM}	4	R _L = 10kΩ	± 12	± 14	—	V
		V _{OMR}	4	R _L = 2kΩ	± 10	± 13	—	
Source Current		I _{source}	4		—	20	—	mA
Sink Current		I _{sink}	4		—	20	—	mA
Differential Input Impedance	Parallel Input Resistance	Z _{Di}	—	f = 20Hz Open Loop	0.3	1.0	—	MΩ
	Parallel Input Capacitance	C _i	—		—	6.0	—	pF
Output Impedance		Z _o	—	f = 20Hz	—	75	—	Ω
Voltage Gain (Open Loop)		G _V	7	V _{OUT} = ± 10V, R _L = 2kΩ	86	100	—	dB
Common Mode Input Signal Rejection Ratio		CMRR	3	f = 100Hz	70	90	—	dB
Supply Voltage Rejection Ratio		SVRR	1	R _g ≤ 10kΩ	—	30	150	μV/V
Power Bandwidth		f _W	—	G _V = 1, R _L = 2kΩ V _{OUT} = 20V _{p-p}	—	14	—	kHz
Slew Rate		SR	6	G _V = 1, R _L = 2kΩ	—	0.8	—	V/μs
Unity Gain Cross Frequency		f _T	7	Open Loop	—	1.1	—	MHz
Power Dissipation		P _D	5	V _O = 0V	—	70	170	mW
Input Offset Voltage Drift		ΔV _{IO} /ΔT	1	R _g ≤ 10kΩ, Ta = - 30~75°C	—	—	50	μV/°C
Supply Current		I _{CC} , I _{EE}	5		—	2.3	5.6	mA

TEST CIRCUIT

(1) V_{IO} , $\Delta V_{IO} / \Delta T$, SVRR



$$V_{IO} = V_{OUT} / 100 \text{ (V)}$$

$$\Delta V_{IO} / \Delta T = \{V_{IO} (25^\circ\text{C}) - V_{IO} (-30^\circ\text{C})\} / 55 \text{ (V/}^\circ\text{C)}$$

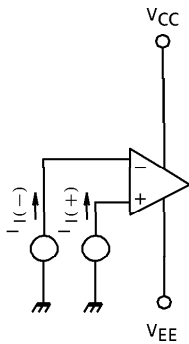
$$\Delta V_{IO} / \Delta T = \{V_{IO} (75^\circ\text{C}) - V_{IO} (25^\circ\text{C})\} / 50 \text{ (V/}^\circ\text{C)}$$

$$SVRR = (V_{IO1} - V_{IO2}) / 5 \text{ (}\mu\text{V/V)}$$

V_{IO1} : V_{CC} , AT $V_{EE} = \pm 17.5\text{V}$

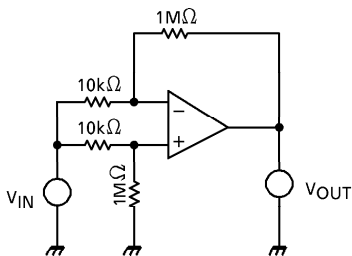
V_{IO2} : V_{CC} , At $V_{EE} = \pm 12.5\text{V}$

(2) I_I , I_{IO}



$$I_{IO} = |I_I(+)-I_I(-)|$$

(3) CMV_{IN} , CMRR

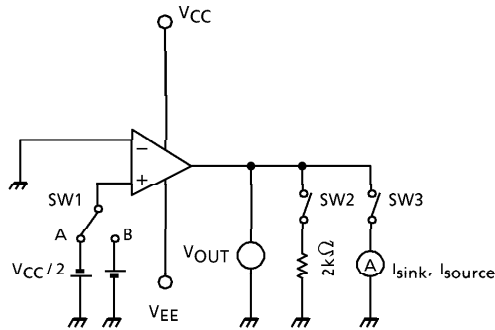


CMV_{IN} : $V_{OUT} = \pm 1\text{V (DC)}$
 $V_{IN} = \text{MEASURE}$

CMRR : RATIO OF G_{diff} vs G_{CM}

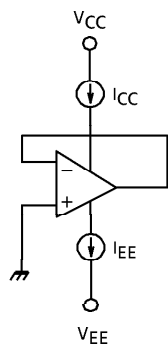
$$CMRR = 20 \log \frac{G_{diff}}{G_{CM}} \text{ (dB)}$$

(4) V_{OM} , V_{OMR} , I_{sink} , I_{source}



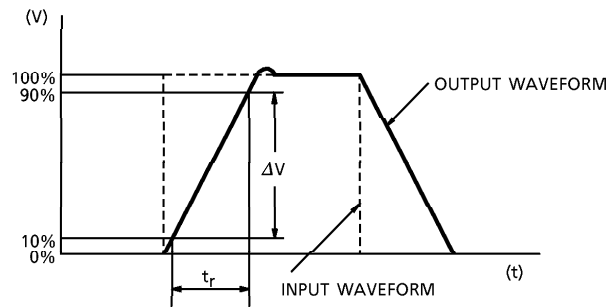
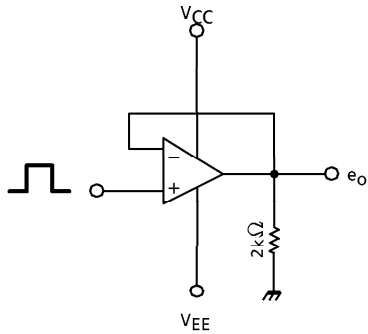
- $V_{OM} (+)$: SW1 IS SIDE B, SW2 OFF, SW3 OFF
- $V_{OM} (-)$: SW1 IS SIDE A, SW2 OFF, SW3 OFF
- $V_{OMR} (+)$: SW1 IS SIDE B, SW2 ON, SW3 OFF
- $V_{OMR} (-)$: SW1 IS SIDE A, SW2 ON, SW3 OFF
- I_{sink} : SW1 IS SIDE A, SW2 OFF, SW3 ON
- I_{source} : SW1 IS SIDE B, SW2 OFF, SW3 ON

(5) I_{CC} , I_{EE} , P_D

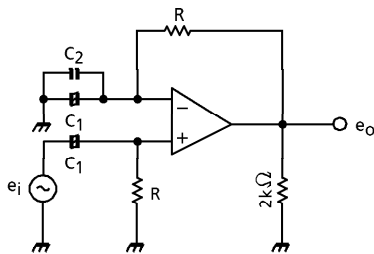


$$P_D = V_{CC} \cdot I_{CC} + V_{EE} \cdot I_{EE} \text{ (W)}$$

(6) SR



(7) G_V , f_T



G_V

$$R \geq 1 / \omega C_1$$

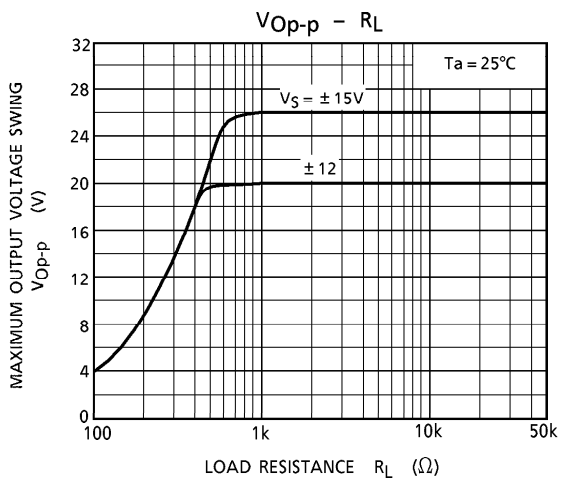
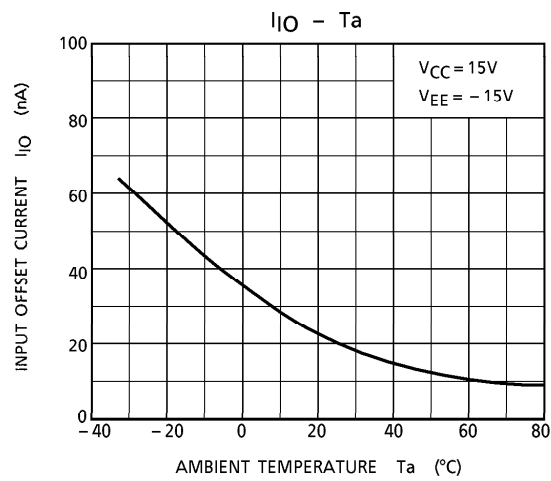
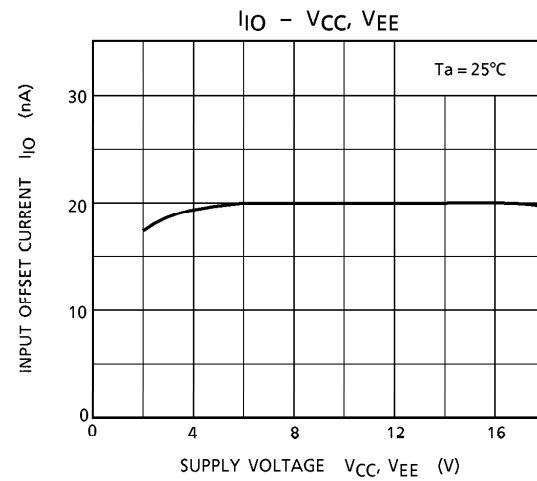
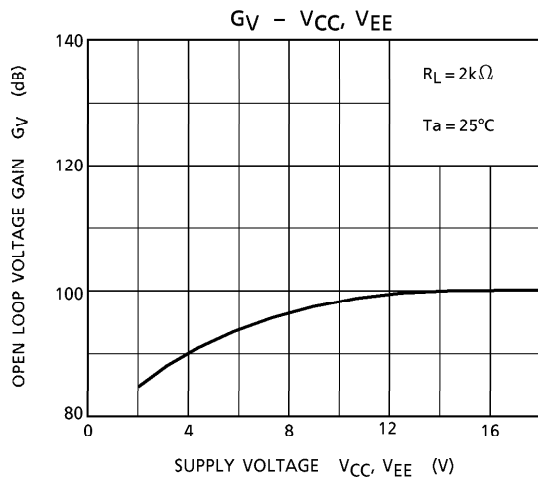
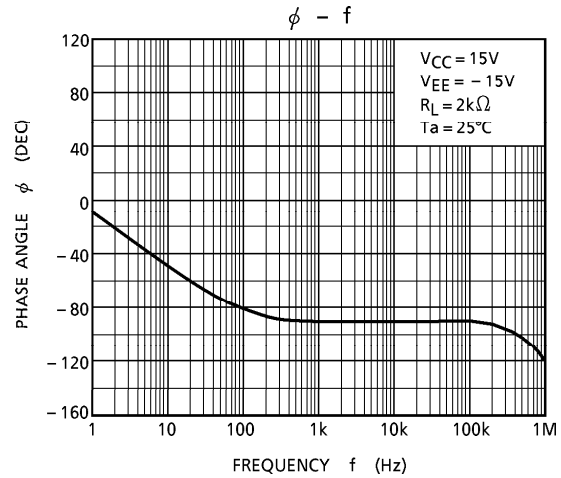
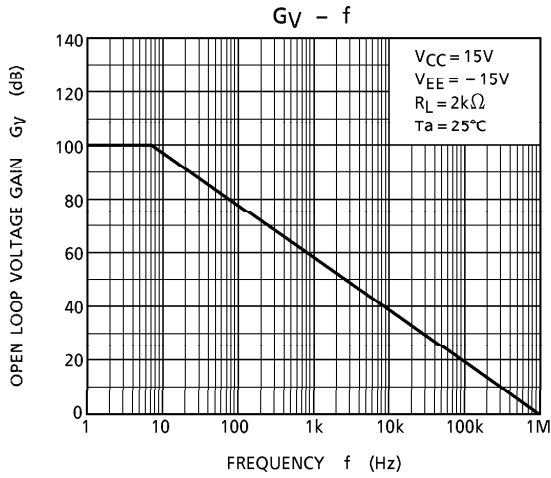
C_1 : COUPLING CONDENSER

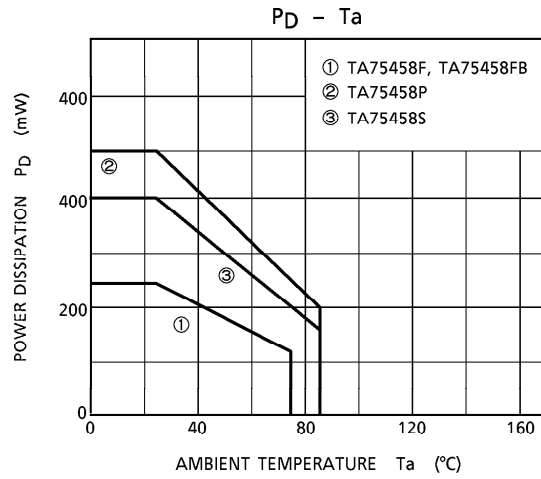
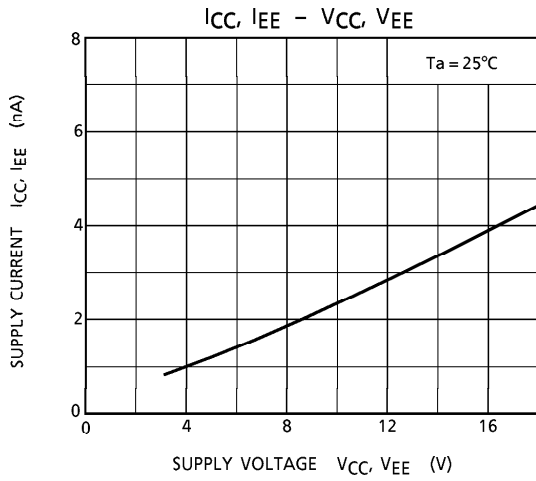
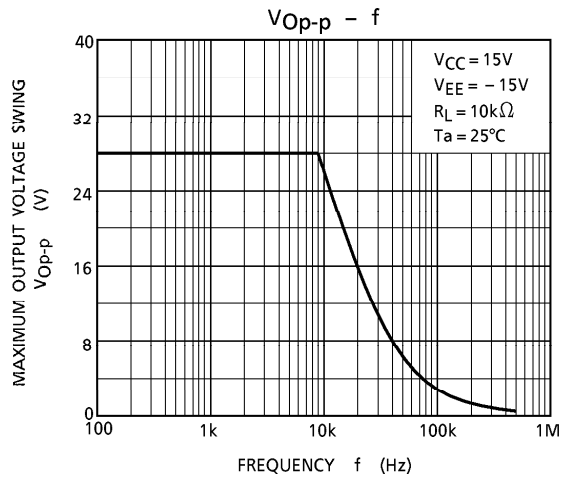
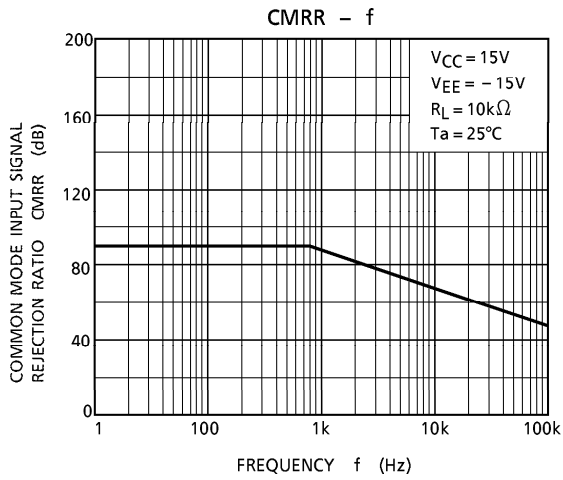
C_2 : HIGH FREQUENCY BYPASS CONDENSER
0.1 μ F

$$G_V = 20 \log e_o / e_i \text{ (dB)}$$

f_T INPUT FREQUENCY AT $e_i = e_o$

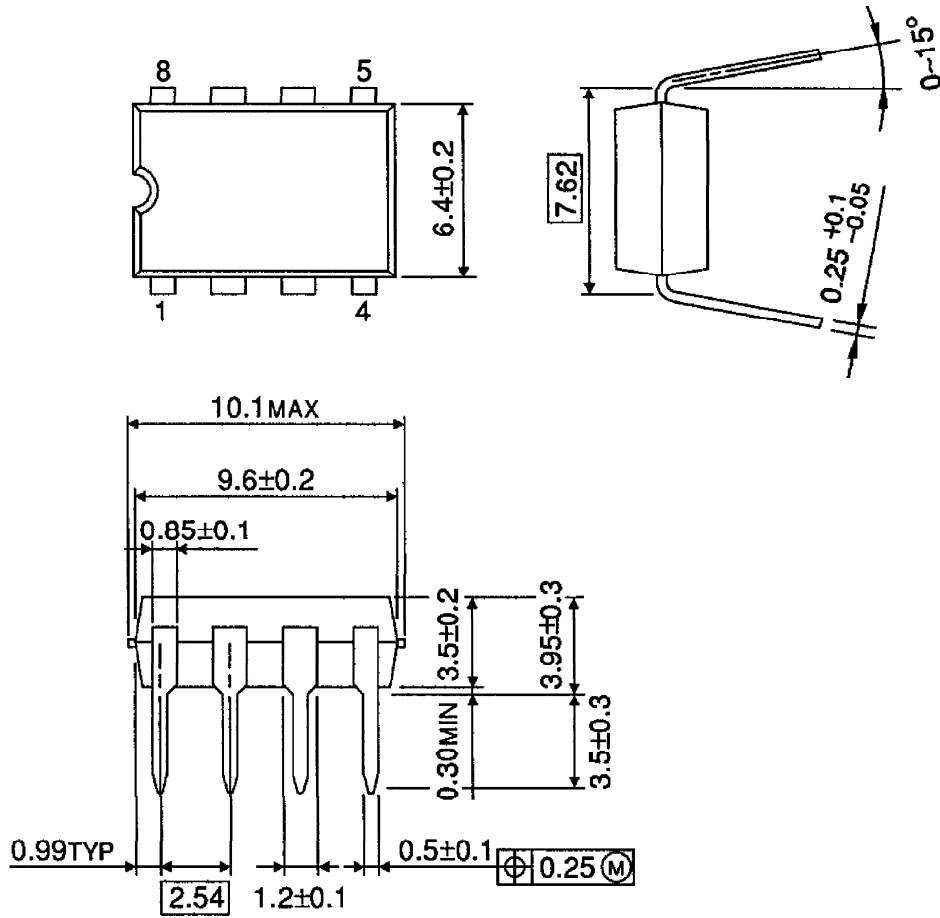
CHARACTERISTICS





OUTLINE DRAWING
DIP8-P-300-2.54A

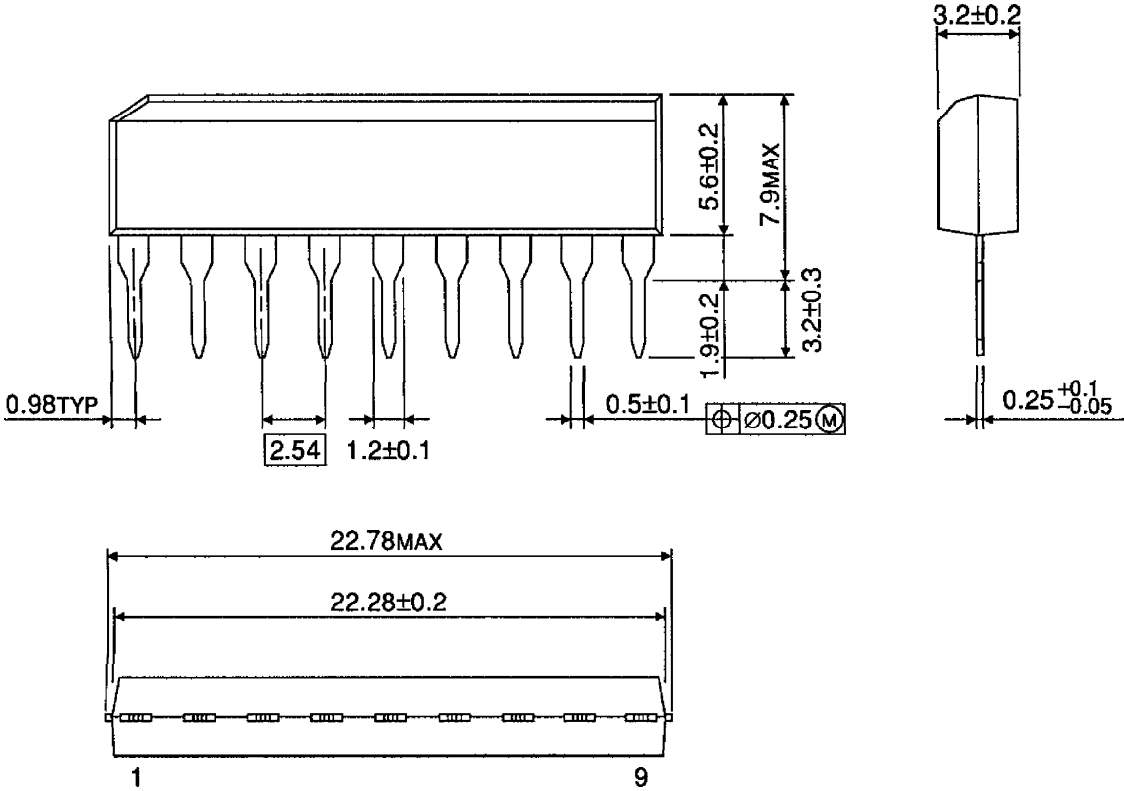
Unit : mm



Weight : 0.5g (Typ.)

OUTLINE DRAWING
SIP9-P-2.54A

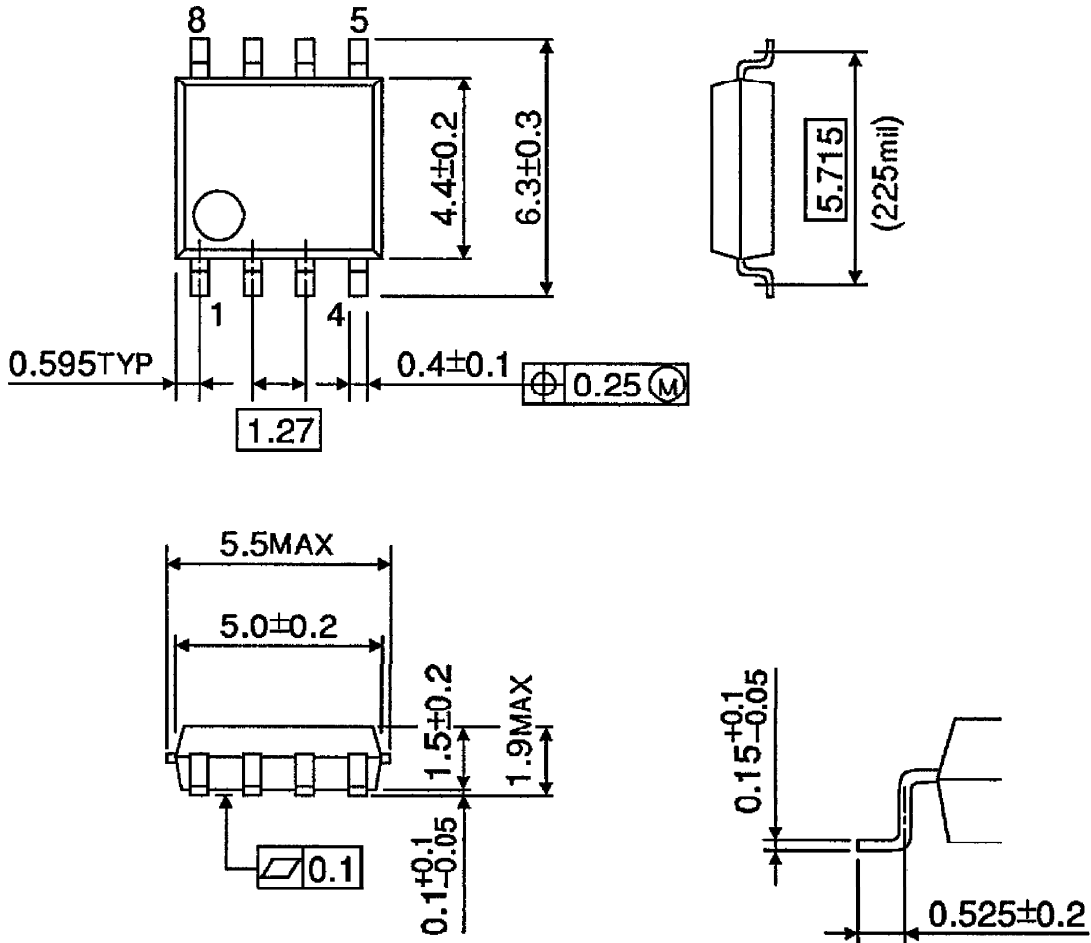
Unit : mm



Weight : 0.9g (Typ.)

OUTLINE DRAWING
SOP8-P-225-1.27

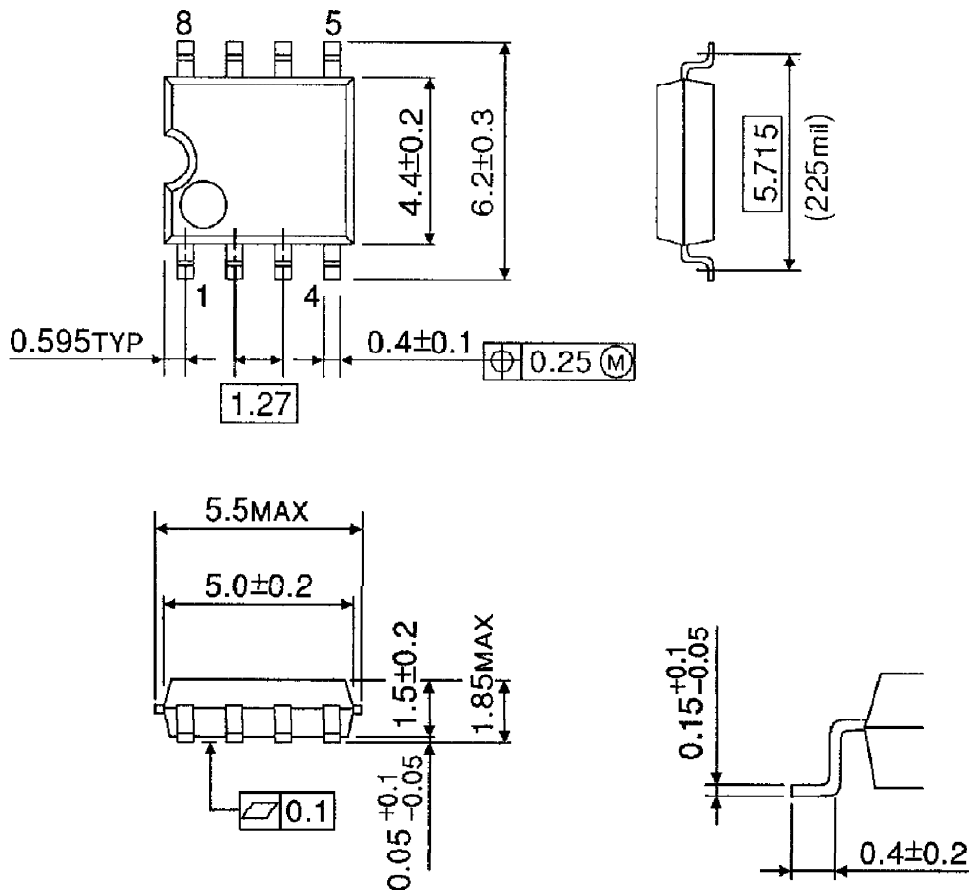
Unit : mm



Weight : 0.1g (Typ.)

OUTLINE DRAWING
SOP8-P-225-1.27B

Unit : mm



Weight : 0.1g (Typ.)