TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

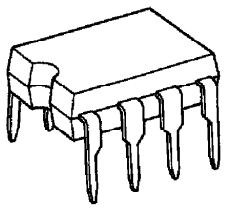
TA75458P, TA75458S, TA75458F, TA75458FB

DUAL OPERATIONAL AMPLIFIER

FEATURES

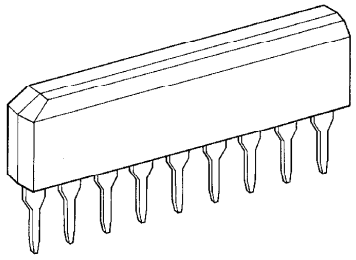
- Pair of Internally Compensated High Performance Amplifier
- No Frequency Compensation Required
- No Latch-up
- Short Circuit Protection
- Side Common Mode and Differential Voltage Range
- Low Power Consumption

TA75458P



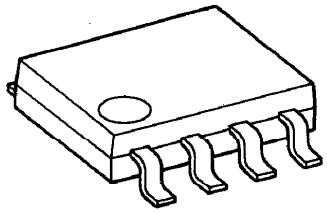
DIP8-P-300-2.54A

TA75458S



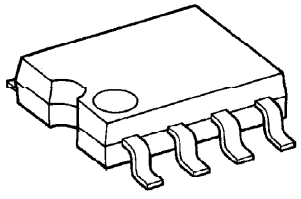
SIP9-P-2.54A

TA75458F



SOP8-P-225-1.27

TA75458FB



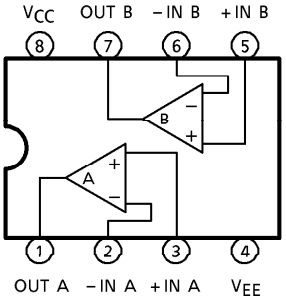
SOP8-P-225-1.27B

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.)

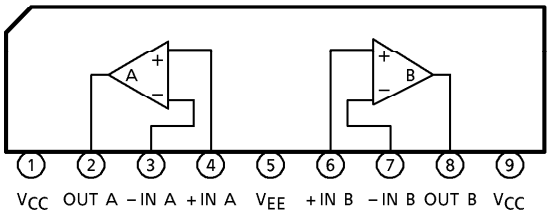
961001EBA1

PIN CONNECTION (TOP VIEW)

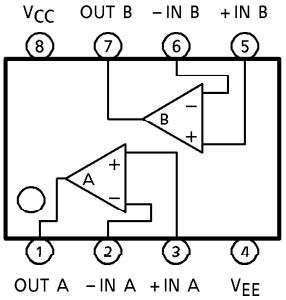
TA75458P



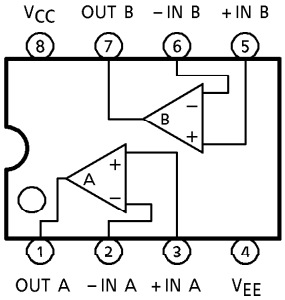
TA75458S



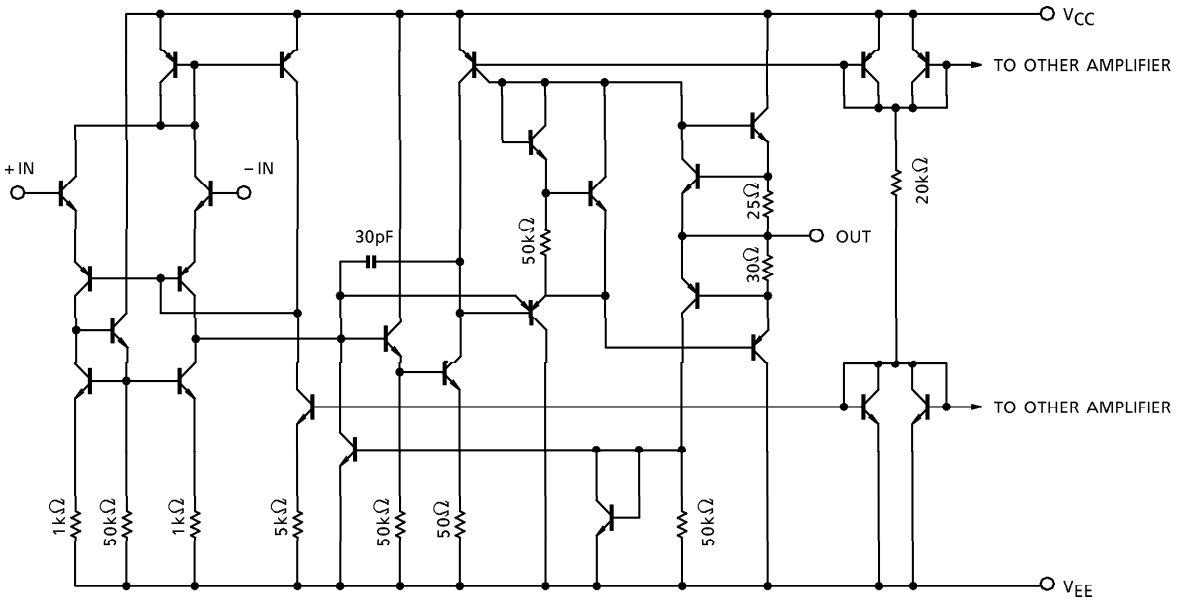
TA75458F



TA75458FB



EQUIVALENT CIRCUIT



961001EBA1'

MAXIMUM RATINGS (Ta = 25°C)

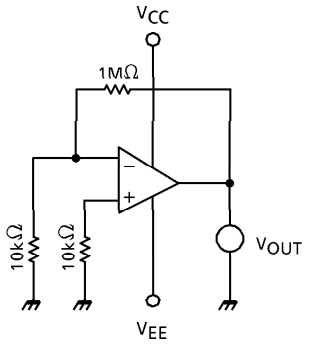
CHARACTERISTIC	SYMBOL	TA75458P	TA75458S	TA75458F TA75458FB	UNIT
Supply Voltage	V_{CC}, V_{EE}	+ 18, − 18	+ 18, − 18	+ 18, − 18	V
Differential Input Voltage	DV_{IN}	± 30	± 30	± 30	V
Input Voltage	V_{IN}	V_{CC}~V_{EE}	V_{CC}~V_{EE}	V_{CC}~V_{EE}	V
Power Dissipation	P_D	500	400	240	mW
Operating Temperature	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	$R_g \leqq 10k\Omega$	—	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	$R_L = 10k\Omega$	± 12	± 14	—	V
		V_{OMR}	4	$R_L = 2k\Omega$	± 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, $R_L = 2k\Omega$	86	100	—	dB
Common Mode Input Signal Rejection Ratio		CMRR	3	f = 100Hz	70	90	—	dB
Supply Voltage Rejection Ratio		SVRR	1	$R_g \leqq 10k\Omega$	—	30	150	μV / V
Power Bandwidth		f_W	—	G_V = 1, $R_L = 2k\Omega$ $V_{OUT} = 20V_{p-p}$	—	14	—	kHz
Slew Rate		SR	6	G_V = 1, $R_L = 2k\Omega$	—	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		$\Delta V_{IO} / \Delta T$	1	$R_g \leqq 10k\Omega$, 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



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

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

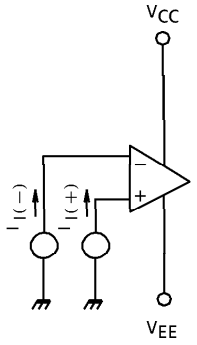
$\Delta V_{IO} / \Delta T = \{V_{IO}(75°C) - V_{IO}(25°C)\} / 50$ (V / °C)

SVRR = $(V_{IO1} - V_{IO2}) / 5$ (μV / V)

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

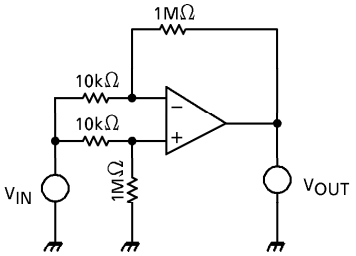
V_{IO2} : V_{CC}, At $V_{EE} = \pm 12.5$V

(2) I_I, I_{IO}



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

(3) CMV_{IN}, CMRR

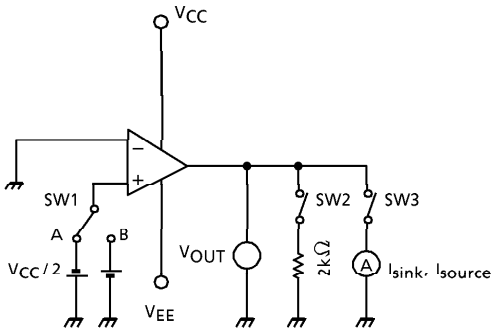


CMV_{IN} : $V_{OUT} = \pm 1$V (DC)
V_{IN} = MEASURE

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

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

(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

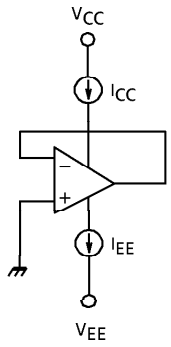
V_{OMR} (+) : SW1 IS SIDE B, SW2 ON, SW3 OFF

V_{OMR} (−) : SW1 IS SIDE A, SW2 ON, SW3 OFF

I_{sink} : SW1 IS SIDE A, SW2 OFF, SW3 ON

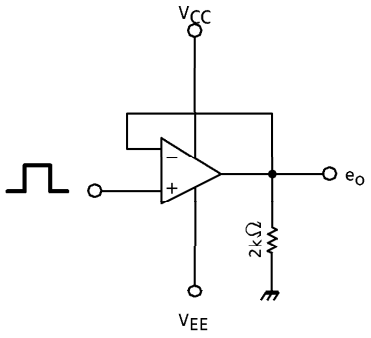
I_{source} : SW1 IS SIDE B, SW2 OFF, SW3 ON

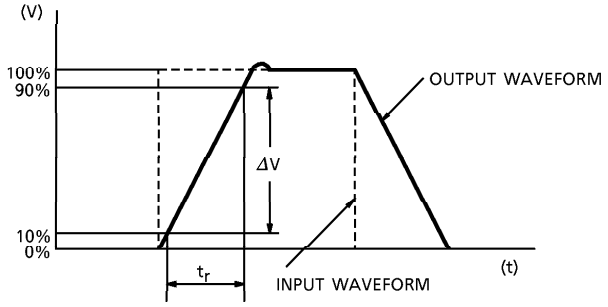
(5) I_{CC}, I_{EE}, P_D



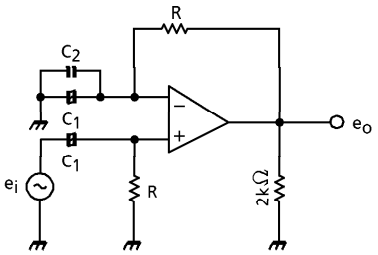
$$P_D = V_{CC} \cdot I_{CC} + V_{EE} \cdot I_{EE} \ (W)$$

(6) SR





(7) G_V, f_T



G_V

$R \gg 1 / WC_1$

C_1 : COUPLING CONDENSER

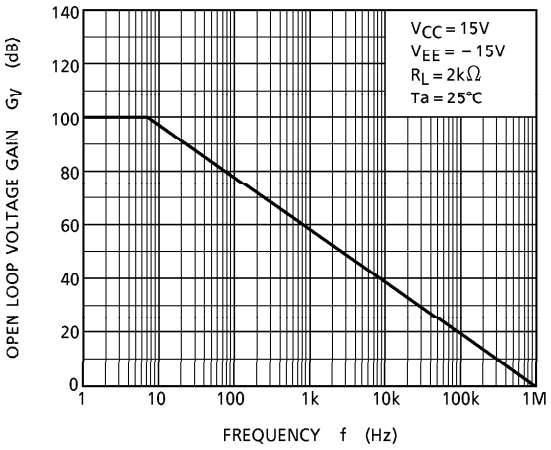
C_2 : HIGH FREQUENCY BYPASS CONDENSER
$0.1\mu F$

$G_V = 20\ell og\ e_o / e_i$ (dB)

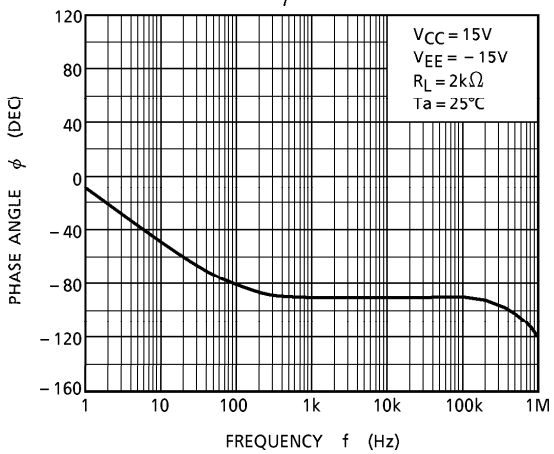
f_T INPUT FREQUENCY AT $e_i = e_o$

CHARACTERISTICS

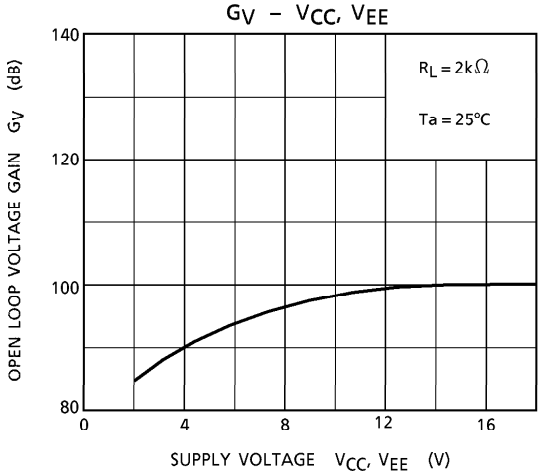
G_V – f



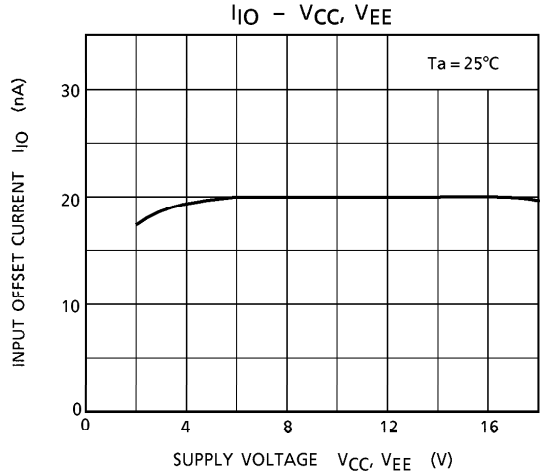
ϕ – f



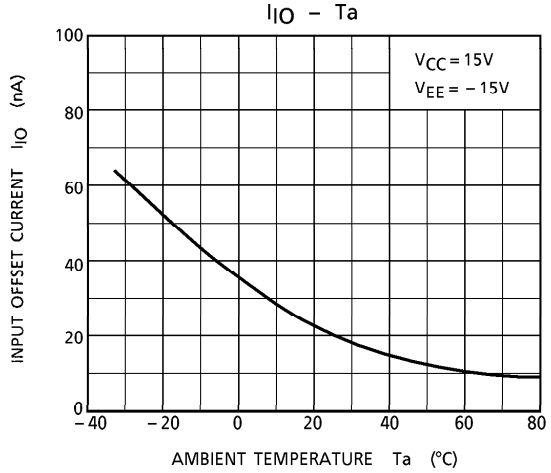
G_V – V_{CC}, V_{EE}



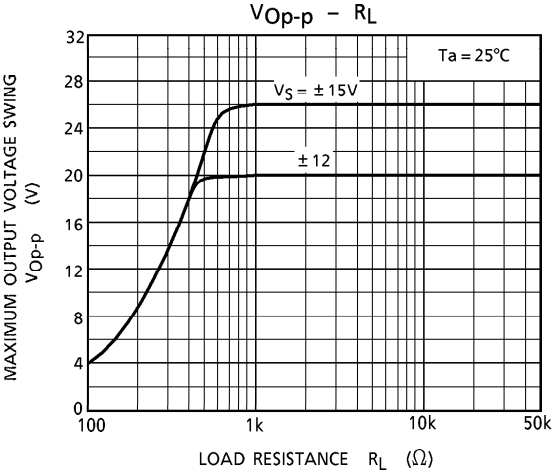
I_{IO} – V_{CC}, V_{EE}



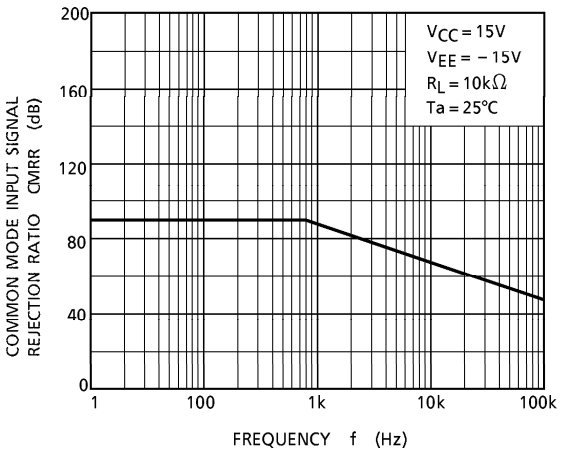
I_{IO} – Ta



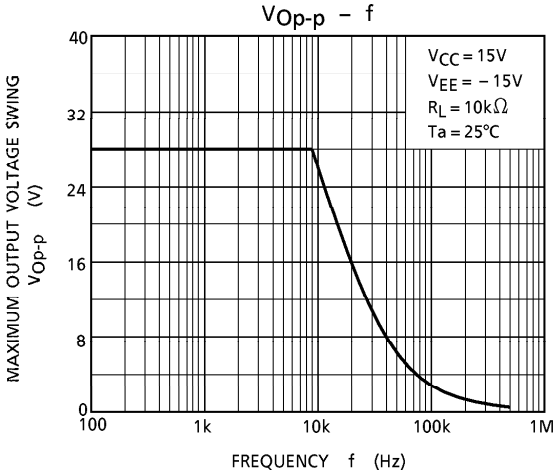
V_{Op-p} – R_L



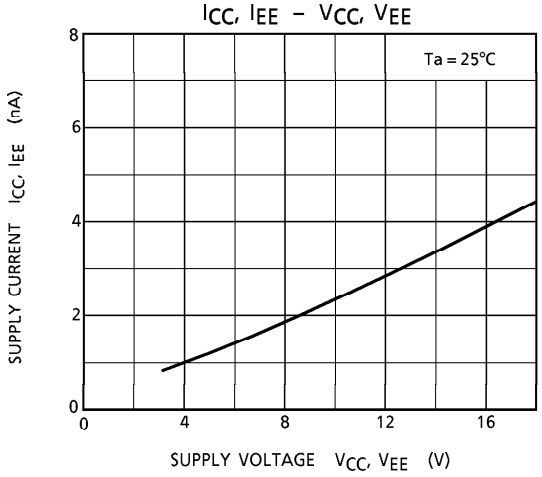
CMRR – f



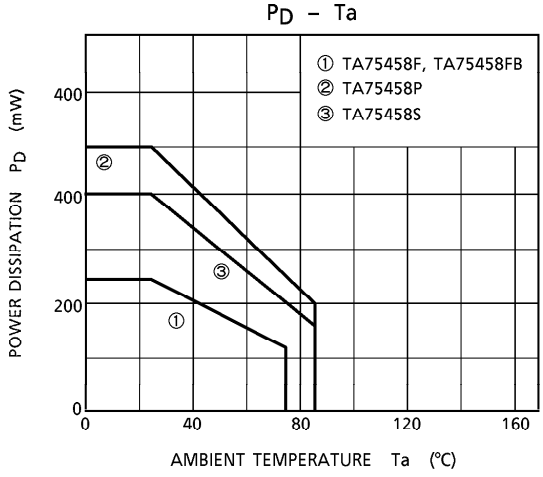
V_{Op-p} – f



I_{CC}, I_{EE} – V_{CC}, V_{EE}



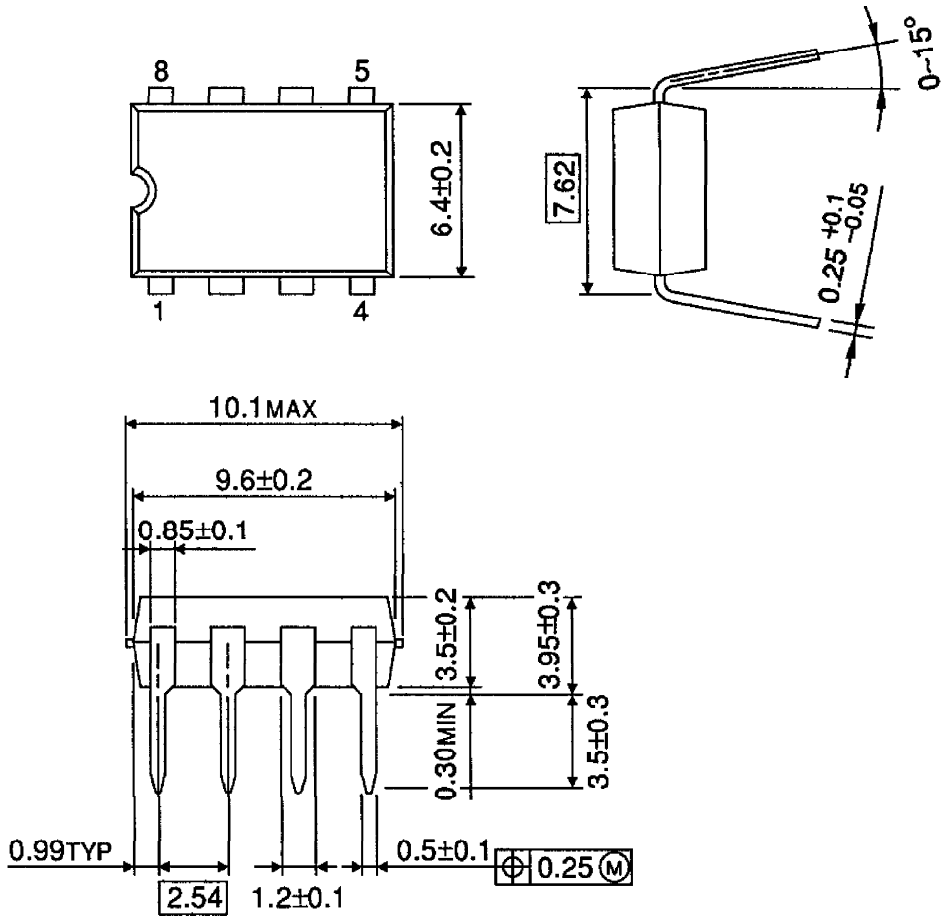
P_D – Ta



OUTLINE DRAWING

DIP8-P-300-2.54A

Unit : mm

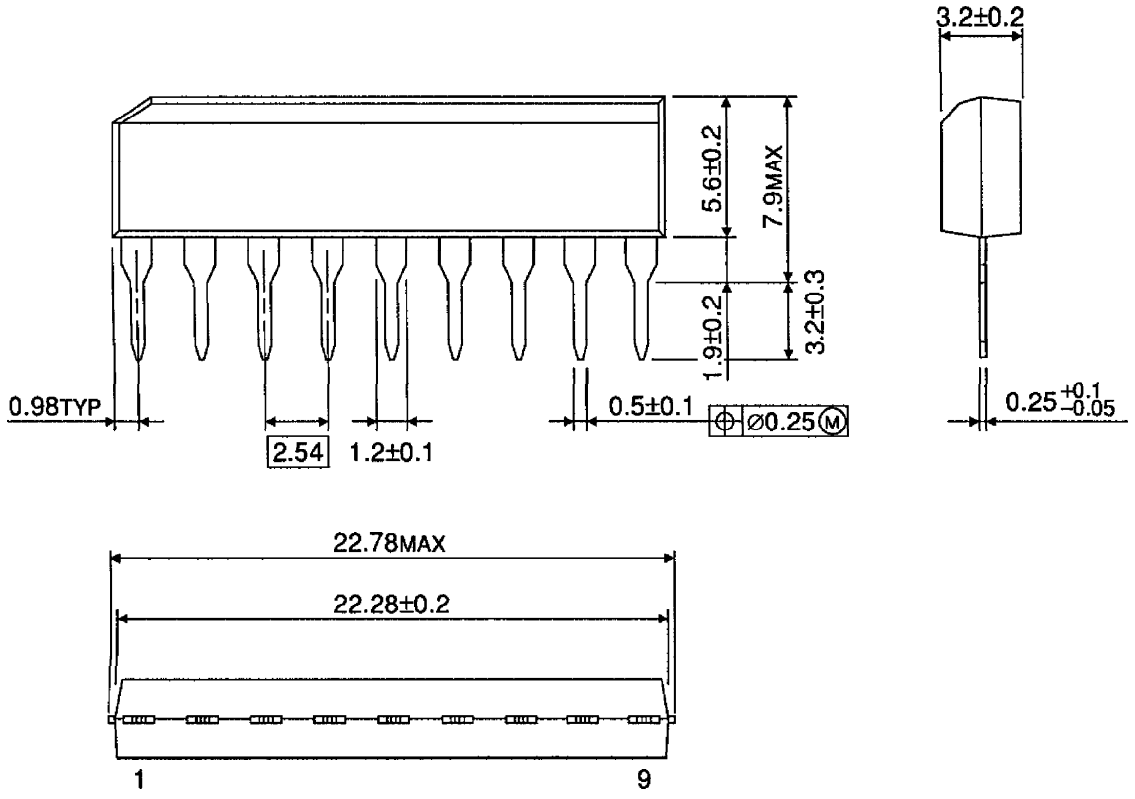


Weight : 0.5g (Typ.)

OUTLINE DRAWING

SIP9-P-2.54A

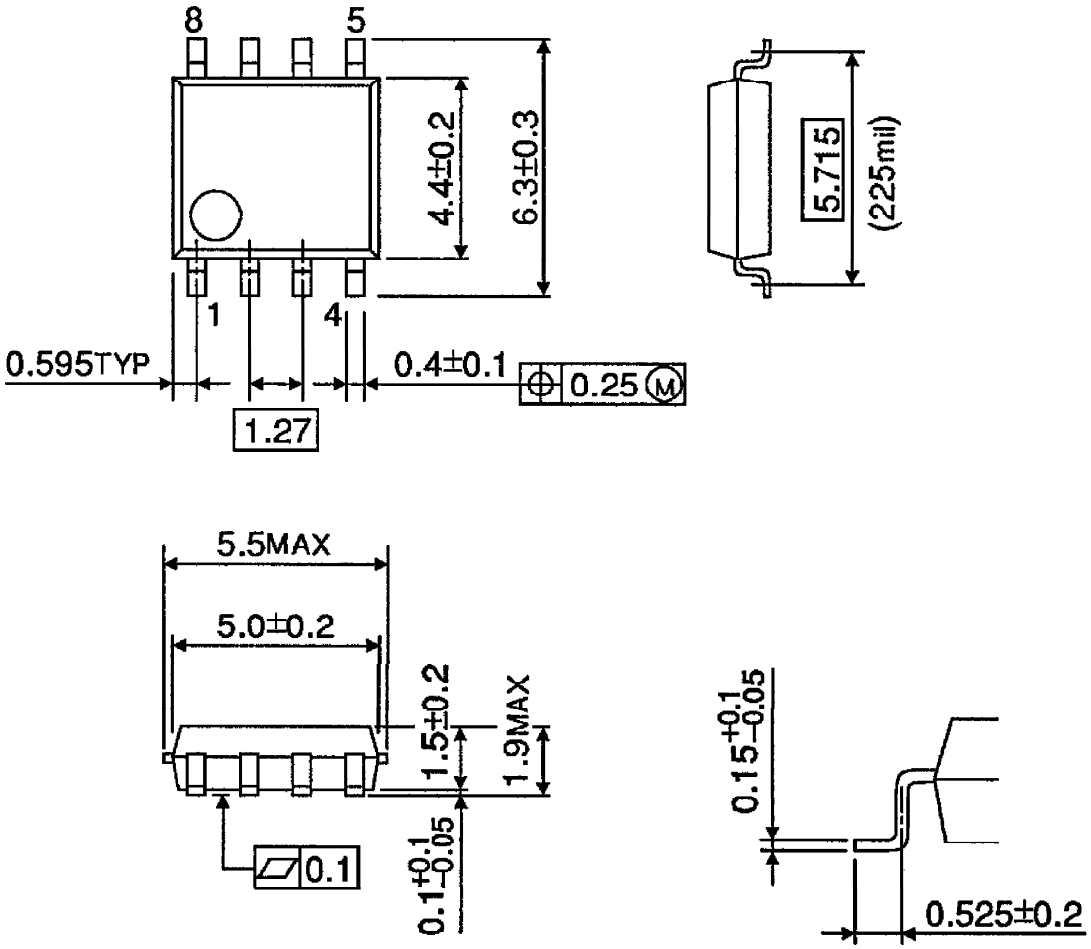
Unit : mm



Weight : 0.9g (Typ.)

OUTLINE DRAWING

SOP8-P-225-1.27 Unit : mm

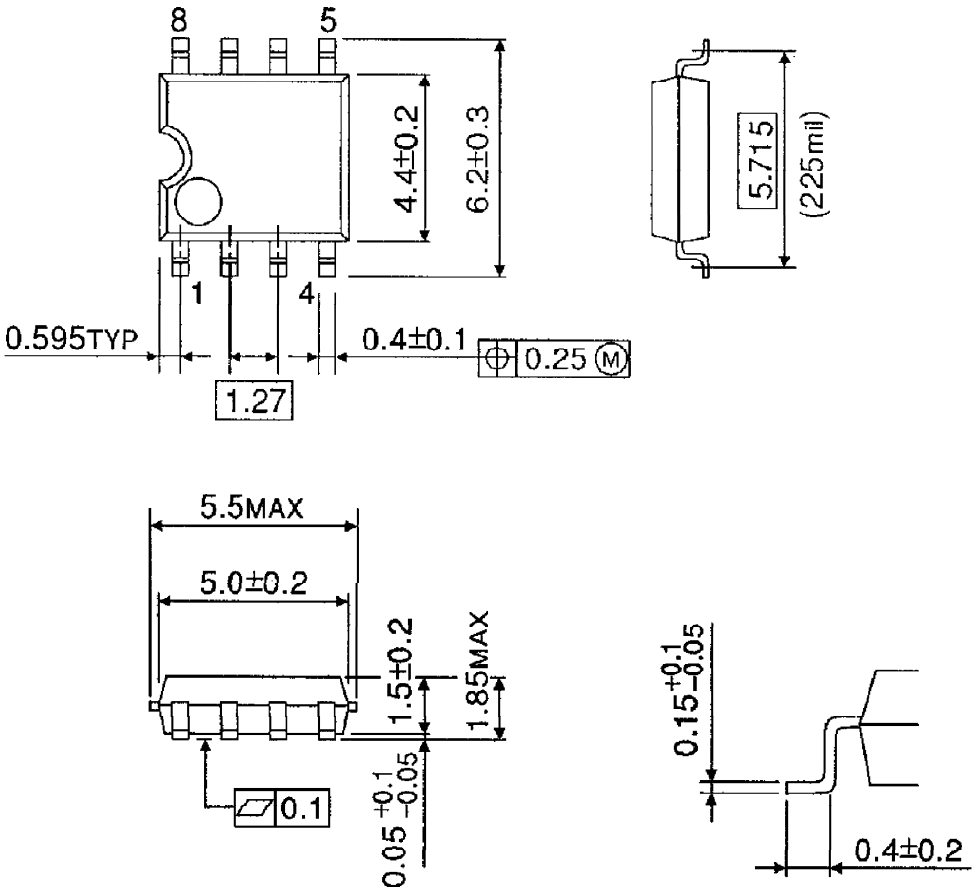


Weight : 0.1g (Typ.)

OUTLINE DRAWING

SOP8-P-225-1.27B

Unit : mm



Weight : 0.1g (Typ.)