TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

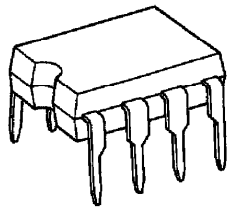
TA75358CP, TA75358CS, TA75358CF

DUAL OPERATIONAL AMPLIFIER

FEATURES

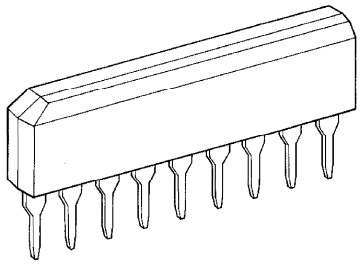
- In the Linear Mode the Input Common Mode Voltage Range Includes Ground.
- Two Internally Compensated OP Amps is Single Package.
- Low Power Dissipation and Power Drain Suitable for Battery Operation.
- Differential Input Voltage Range Equal to the Power Supply Voltage.
- Large Output Voltage Swing : $0V \sim V_{CC} - 1.5V$
- Wide Power Supply Voltage Range and Single Power Supply is Possible.
- Single Supply 3V~36V or Dual Supplies $\pm 1.5V \sim 18V$.
- Low Input Biasing Current : $I_I = 45nA$ (Typ.)

TA75358CP



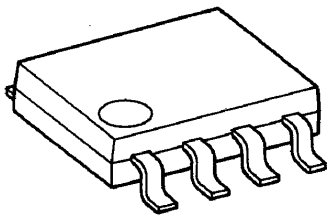
DIP8-P-300-2.54A

TA75358CS



SIP9-P-2.54A

TA75358CF

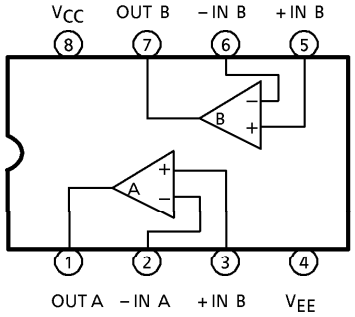


SOP8-P-225-1.27

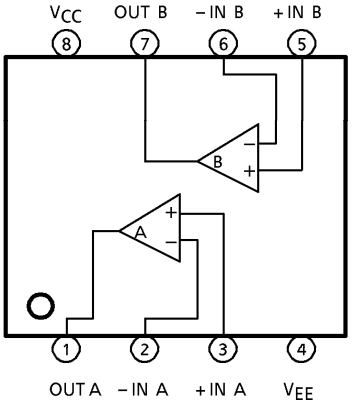
Weight
DIP8-P-300-2.54A : 0.5g (Typ.)
SIP9-P-2.54A : 0.9g (Typ.)
SOP8-P-225-1.27 : 0.1g (Typ.)

PIN CONNECTION (TOP VIEW)

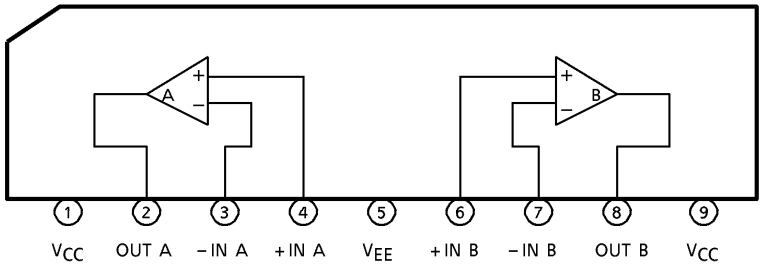
TA75358CP



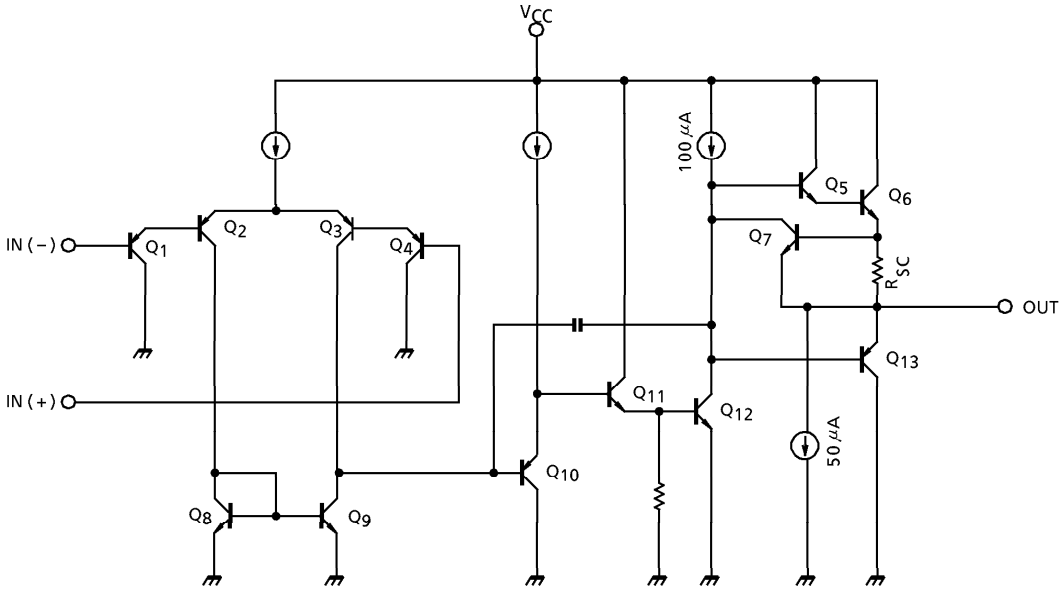
TA75358CF



TA75358CS



EQUIVALENT CIRCUIT



MAXIMUM RATINGS (Ta = 25°C)

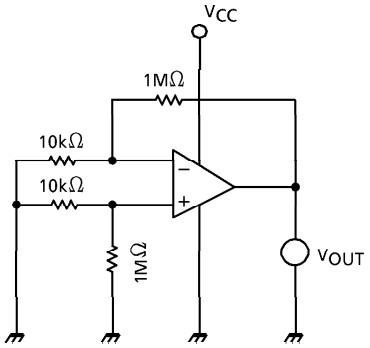
CHARACTERISTIC		SYMBOL	RATING	UNIT
Supply Voltage		V_{CC}, V_{EE}	± 18 OR 36	V
Differential Input Voltage		DV_{IN}	± 36	V
Input Voltage		V_{IN}	− 0.3~36	V
Power Dissipation	TA75358CP	P_D	500	mW
	TA75358CS			
	TA75358CF		240	
Operating Temperature		T_{opr}	− 40~85	°C
Storage Temperature		T_{stg}	− 55~125	°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	$R_g \leqq 10k\Omega$	—	2	7	mV
Input Offset Current	I_{IO}	2	—	—	5	50	nA
Input Bias Cureent	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	$R_L = \infty$, All OP Amps	—	0.7	1.2	mA
Voltage Gain	G_V	5	$R_L \geqq 2k\Omega$	86	100	—	dB
Maximum Output Voltage Swing	V_{Op-p}	6	$R_L = 2k\Omega$	0	—	V_{CC} − 1.5	V
Common Mode Rejection Ratio	CMRR	3	—	60	85	—	dB
Supply Voltage Rejection Ratio	SVRR	1	$R_g = 10k\Omega$	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	—	—	—	0.6	—	MHz
Slew Rate	SR	—	—	—	0.3	—	V / μs

TEST CIRCUIT

(1) V_{IO}, SVRR

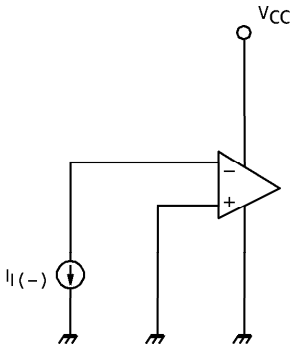


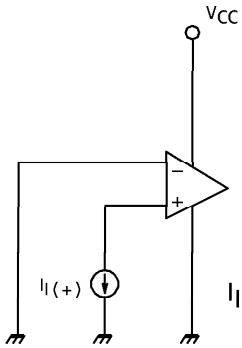
- $V_{IO} = V_{OUT} / 100$
- SVRR = 20ℓog E (dB)

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

V_{OUT1} : V_{OUT} (V_{CC1} = 5V)
V_{OUT2} : V_{OUT} (V_{CC2} = 10V)

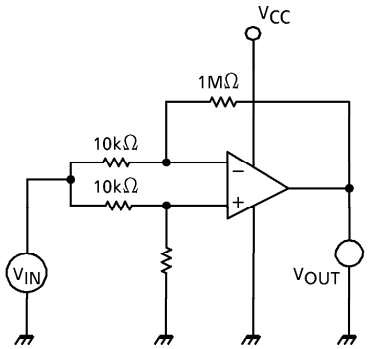
(2) I_I, I_{IO}





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

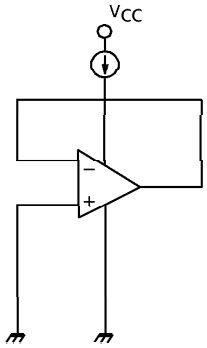
(3) CMV_{IN}, CMRR



- CMRR = 20ℓog G_D / G_C (dB)
  G_D : DIFFERENTIAL VOLTAGE GAIN
  G_C : COMMON MODE VOLTAGE GAIN

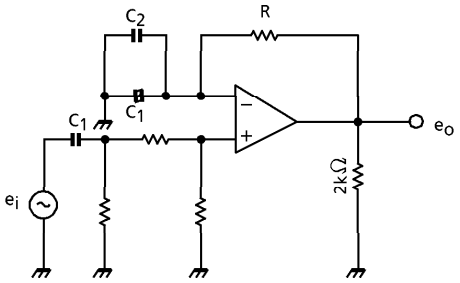
- CMV_{IN} : V_{IN} = 0V
  V_{CC} – 1.5V SUPPLIES

(4) I_{CC}



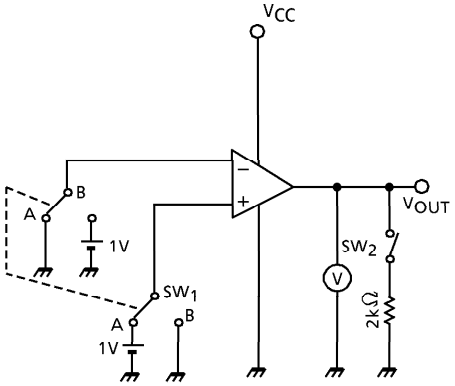
- I_{CC} : V_{CC} = 5V

(5) G_V



- $G_V = 20\ell og\ e_o / e_i$ (dB)
  $R \gg 1 / WC_1$
  C_1 : COUPLING CONDENSER
  C_2 : HIGH FREQUENCY BYPASS CONDENSER

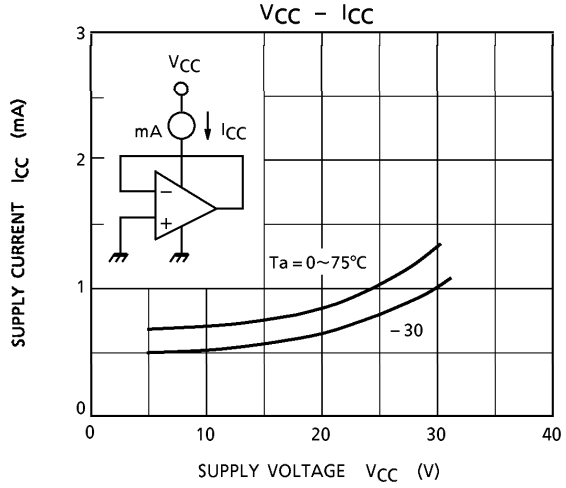
(6) V_{Op-p}, I_{source}, I_{sink}



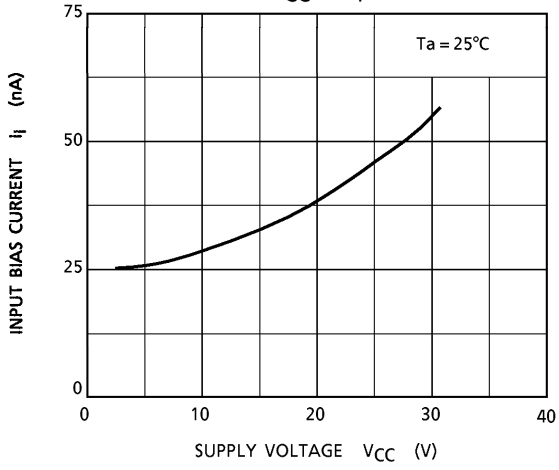
- V_{Op-p}
  V_{OH} : SW_1 IS SIDE A, SW_2 ON
  V_{OL} : SW_1 IS SIDE B, SW_2 ON
- I_{source}
  SW_1 IS SIDE A, SW_2 OFF
  $V_{OUT} \rightarrow 0V$ MEASURE
- I_{sink}
  SW_1 IS SIDE B, SW_2 OFF
  $V_{OUT} \rightarrow 5V$ MEASURE

CHARACTERISTICS

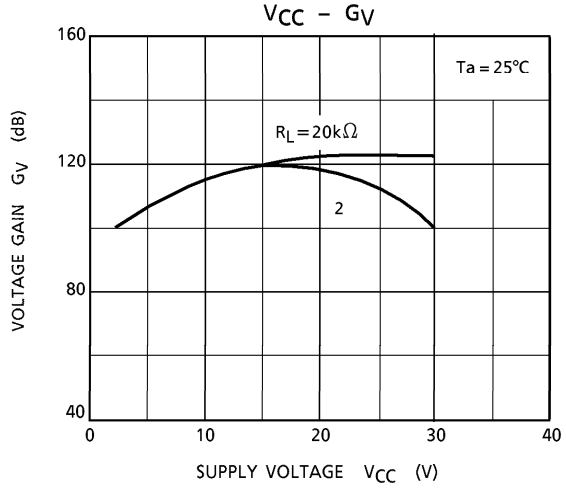
V_{CC} – I_{CC}



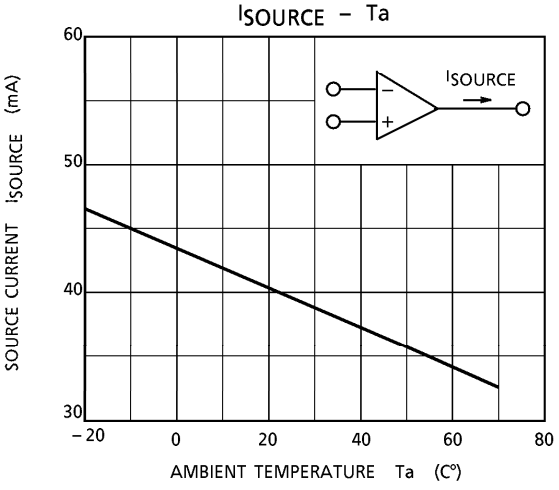
V_{CC} – I_I



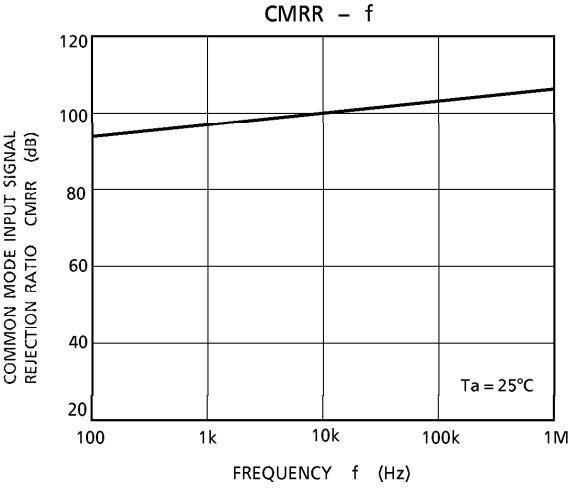
V_{CC} – G_V



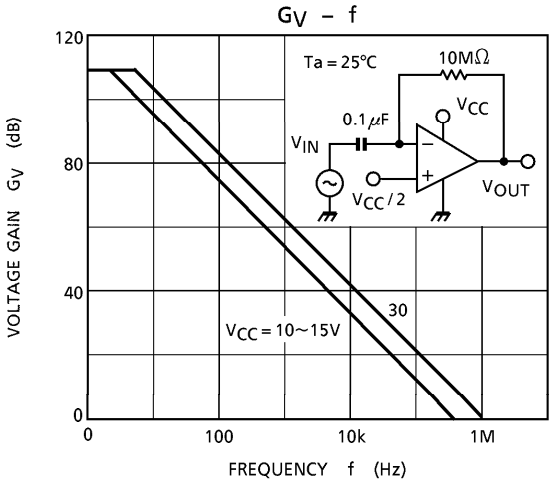
I_{SOURCE} – Ta



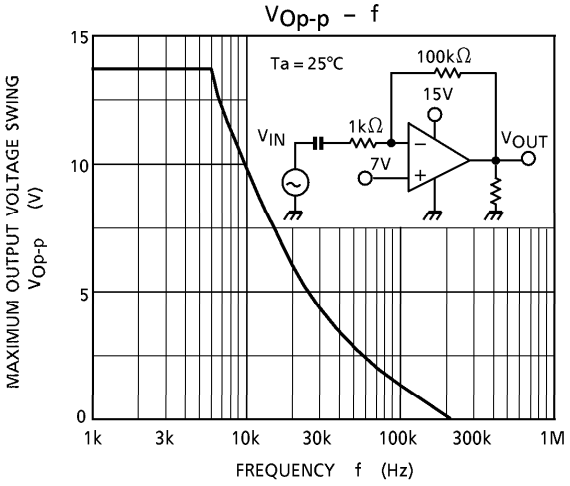
CMRR – f



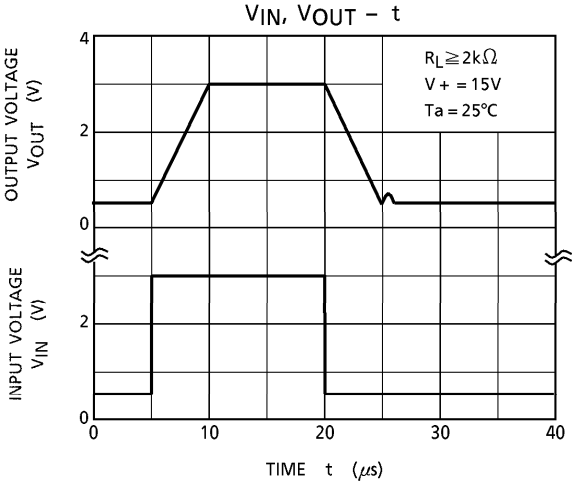
G_V – f



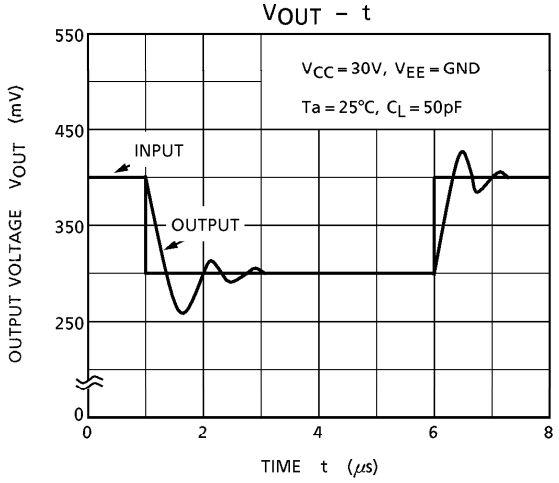
V_{Op-p} – f



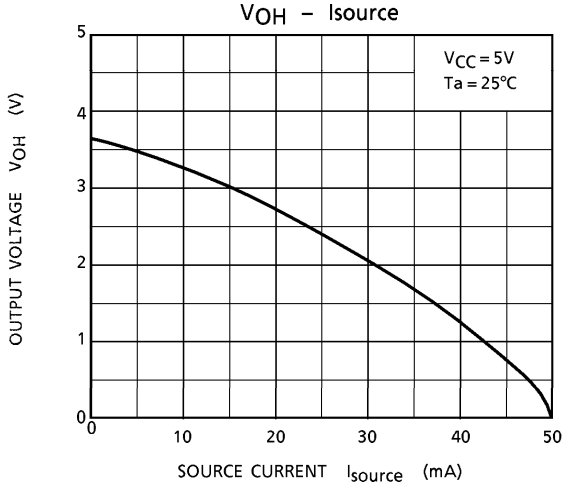
V_{IN}, V_{OUT} – t



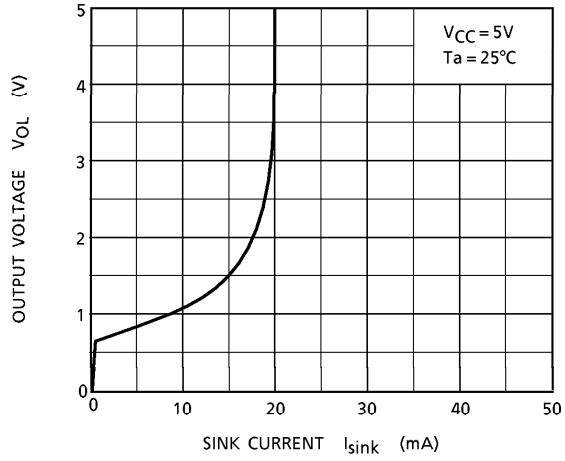
V_{OUT} – t



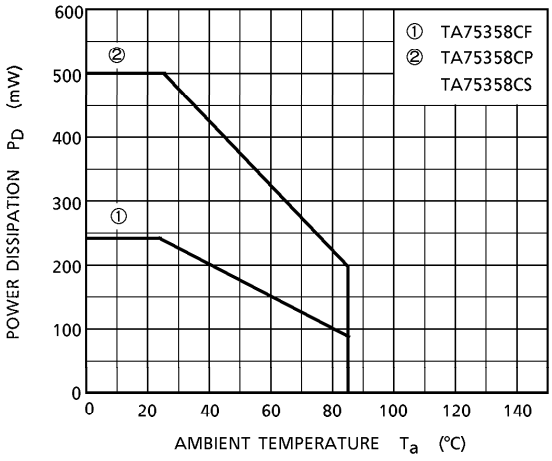
V_{OH} – Isource



V_{OL} – Isink



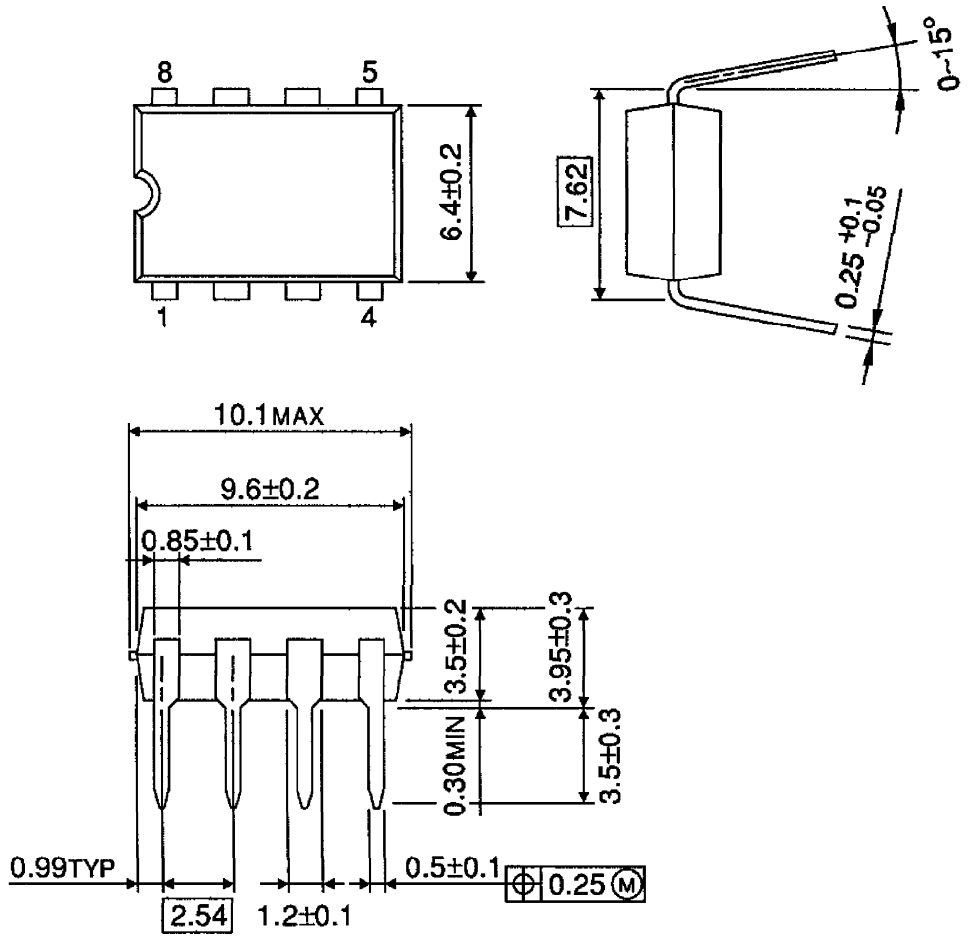
PD – Ta



PACKAGE DIMENSIONS

DIP8-P-300-2.54A

Unit : mm

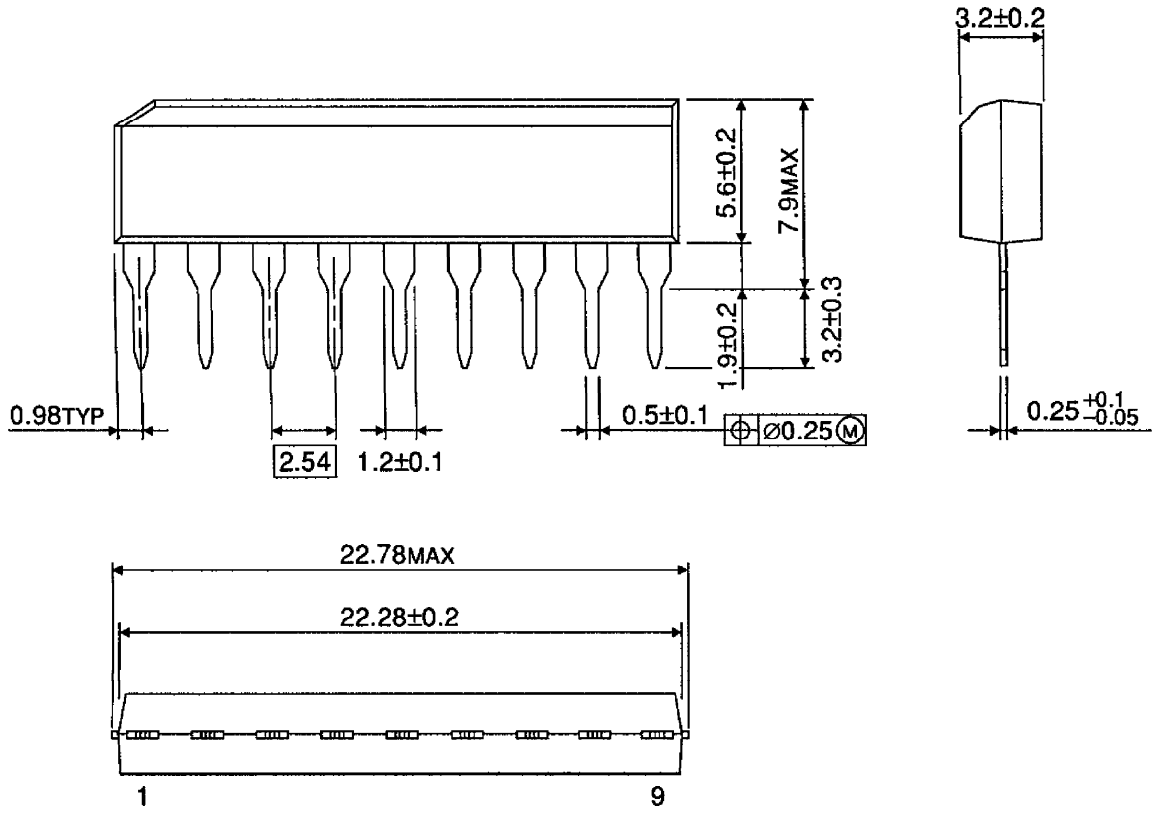


Weight : 0.5g (Typ.)

PACKAGE DIMENSIONS

SIP9-P-2.54A

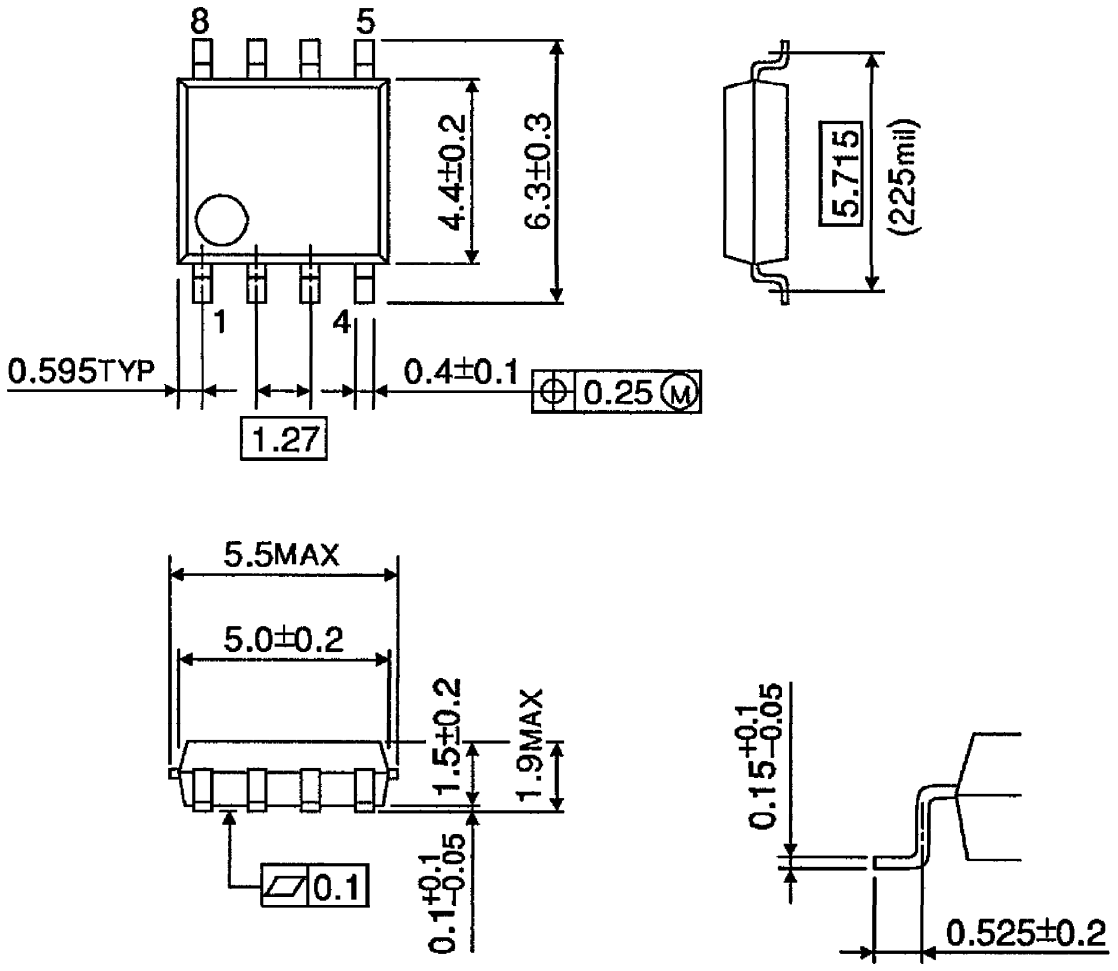
Unit : mm



Weight : 0.9g (Typ.)

PACKAGE DIMENSIONS

SOP8-P-225-1.27 Unit : mm



Weight : 0.1g (Typ.)

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000707EBA

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