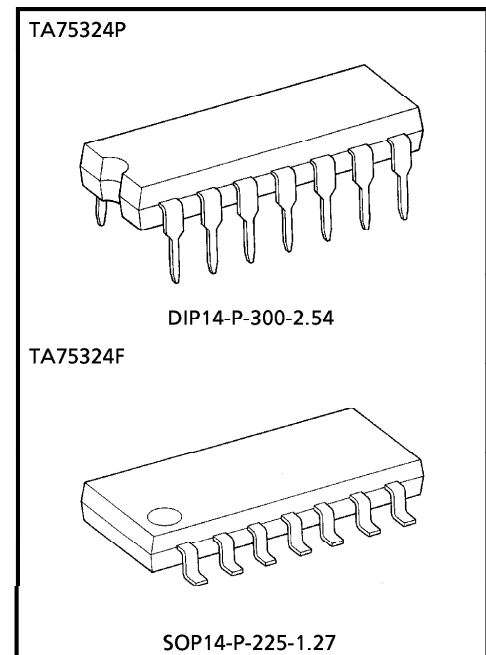


TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA75324P, TA75324F**QUAD OPERATIONAL AMPLIFIER****FEATURES**

- In the Linear Mode the Input Common Mode Voltage Range Includes Ground.
- Four Internally Compensated OP Amp is Single Package.
- Low power Dissipation and Power Drain Suitable for Battery Operation.
- Differential Input Voltage Range Equal to the Power Supply Voltage.
- Wide Power Supply Voltage Range and Signal Power Supply.
- Large Output Voltage Swing : $0V \sim V_{CC} - 1.5V$
- Low Input Biasing Current : $I_I = 45nA$ (Typ.)

**Weight**

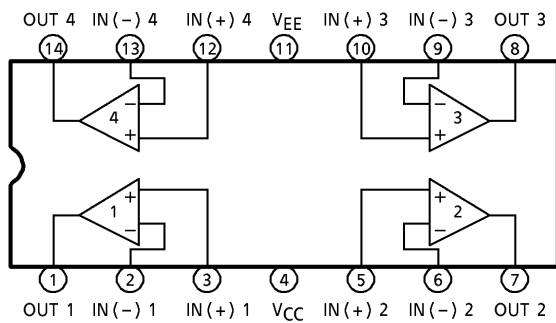
DIP14-P-300-2.54 : 1.0g (Typ.)
 SOP14-P-225-1.27 : 0.2g (Typ.)

961001EBA1

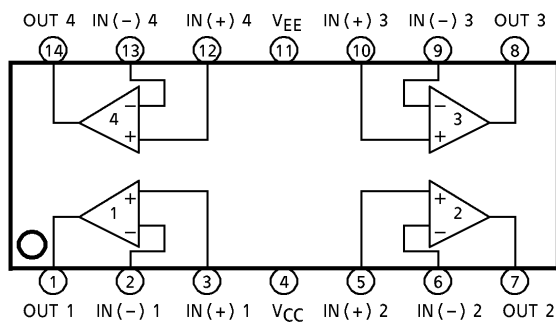
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- The information contained herein is subject to change without notice.

PIN CONNECTION (TOP VIEW)

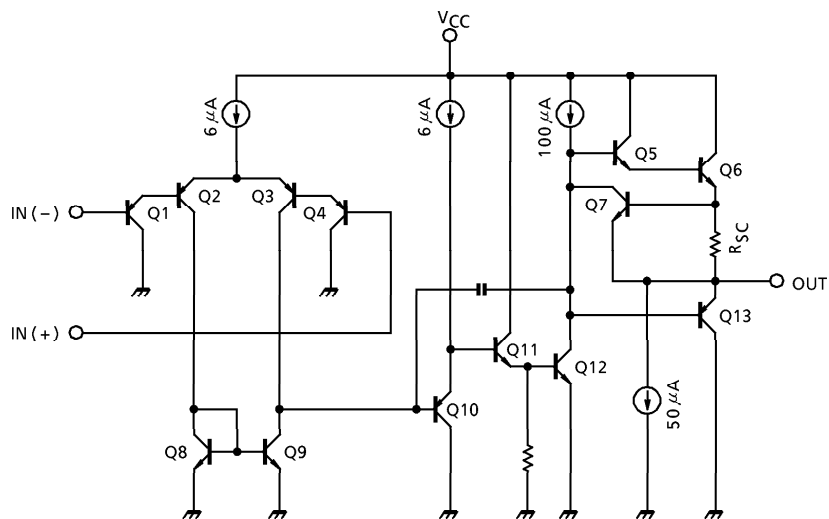
TA75324P



TA75324F



EQUIVALENT CIRCUIT



MAXIMUM RATINGS (Ta = 25°C)

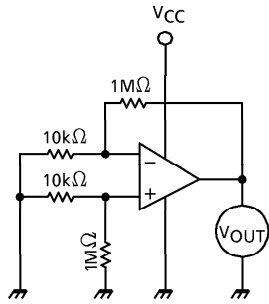
CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V _{CC} , V _{EE}	± 18 OR 36	V
Differential Input Voltage	DV _{IN}	± 36	V
Input Voltage	V _{IN}	- 0.3~36	V
Power Dissipation	TA75324P	P _D	625
	TA75324F		280
Operating Temperature	T _{opr}	- 40~85	°C
Storage Temperature	T _{stg}	- 55~125	°C

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 ≤ 10kΩ	—	2	10	mV
Input Offset Current	I _{IO}	2	—	—	5	100	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 OF 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 _{DC} , IN (+) = 1V _{DC}	20	40	—	mA
Sink Current	I _{sink}	6	IN (-) = 1V _{DC} , IN (+) = 0V _{DC}	10	20	—	mA

TEST CIRCUIT

(1) V_{IO} , SVRR

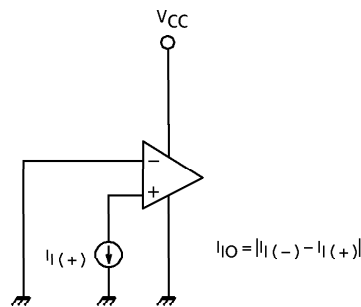
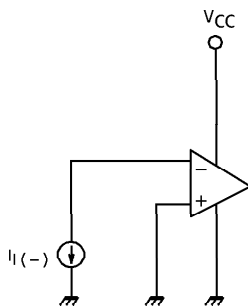


- $V_{IO} = V_{OUT} / 100$
- $SVRR = 20 \log E \text{ (dB)}$

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

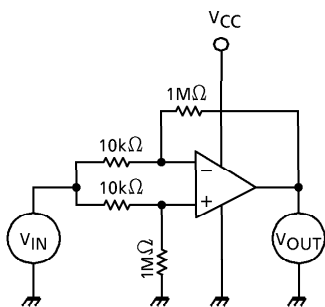
V_{OUT1} : V_{OUT} ($V_{CC1} = 5V$)
 V_{OUT2} : V_{OUT} ($V_{CC2} = 10V$)

(2) I_I , I_{IO}



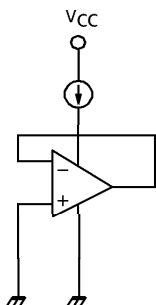
$$I_{IO} = |I_I(-) - I_I(+)|$$

(3) CMV_{IN} , CMRR



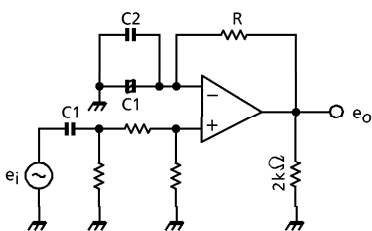
- $CMRR = 20 \log \cdot G_D / G_C \text{ (dB)}$
 G_D : DIFFERENTIAL VOLTAGE GAIN
 G_C : COMMON MODE VOLTAGE GAIN
- CMV_{IN} : $V_{IN} = 0V$, $V_{CC} - 1.5V$ SUPPLES

(4) I_{CC}



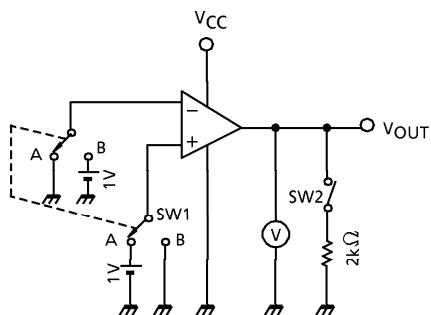
- $I_{CC} : (V_{CC} = 5V)$

(5) G_V



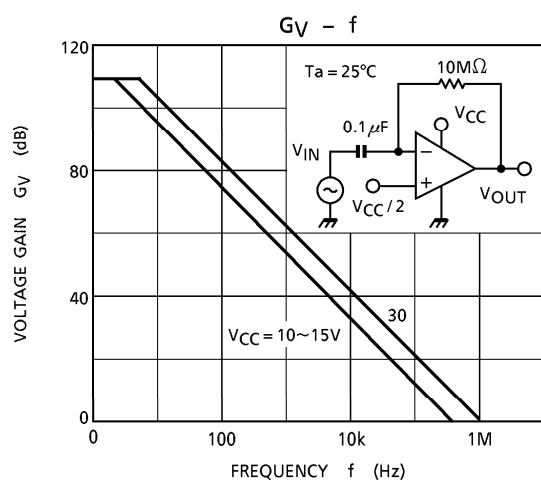
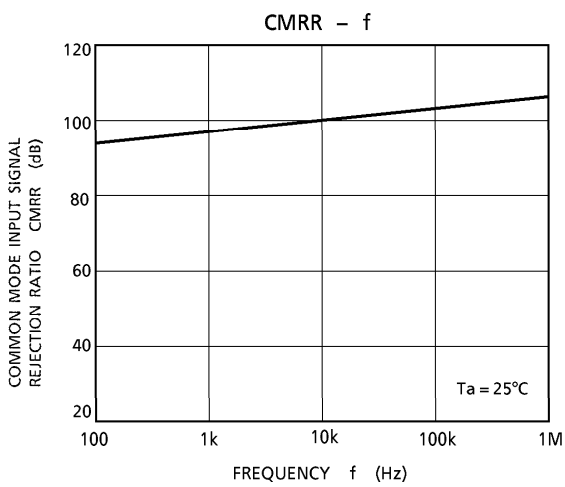
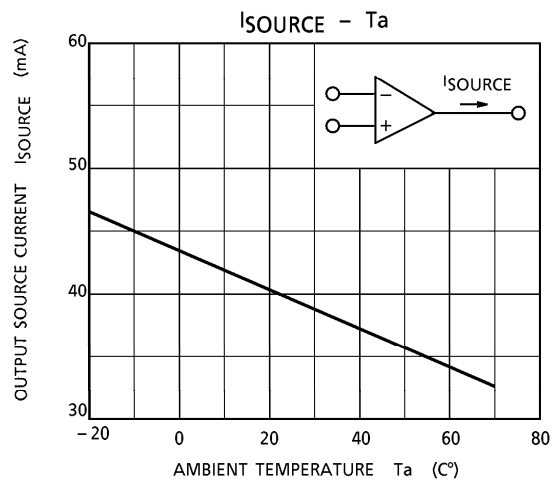
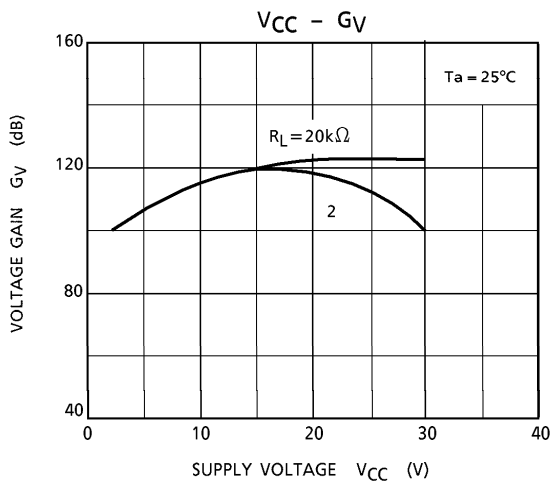
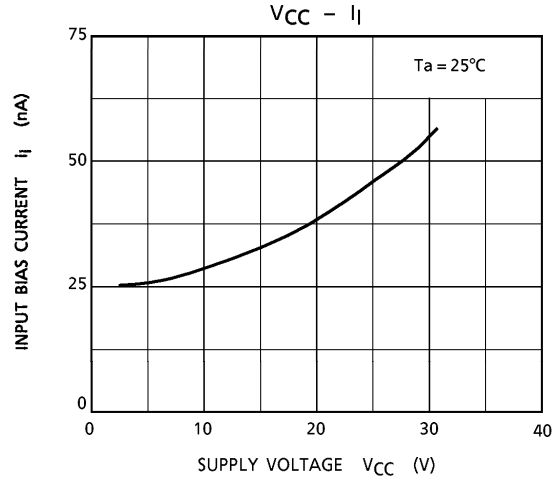
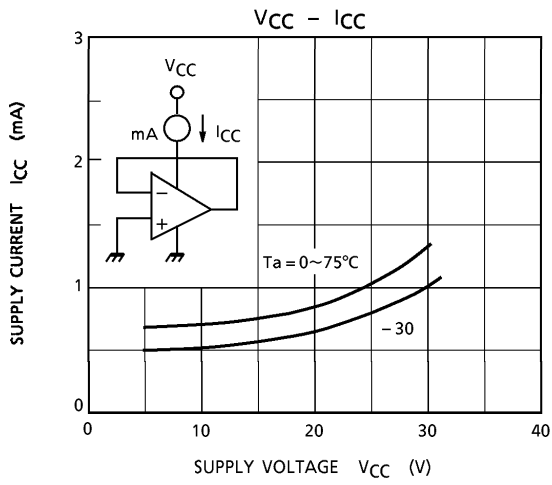
- $G_V = 20 \log e_o / e_i$ (dB)
 $R \gg 1 / \omega C_1$
 C1 : COUPLING CONDENSER
 C2 : HIGH FREQUENCY BYPASS CONDENSER

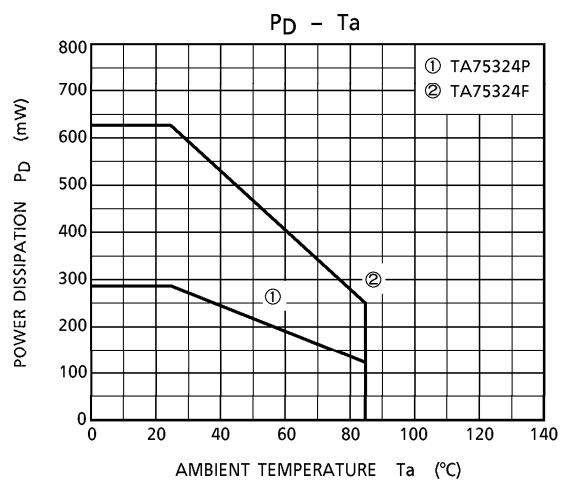
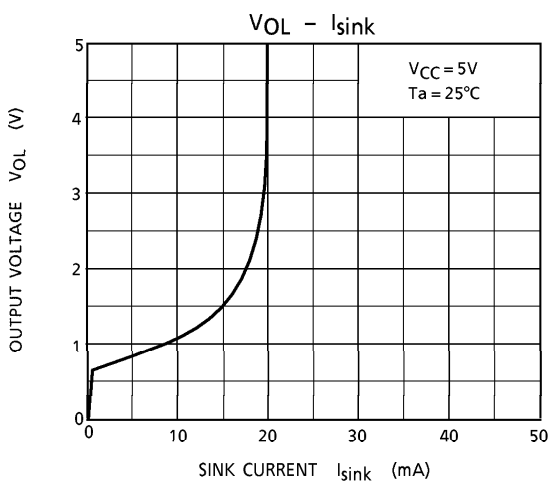
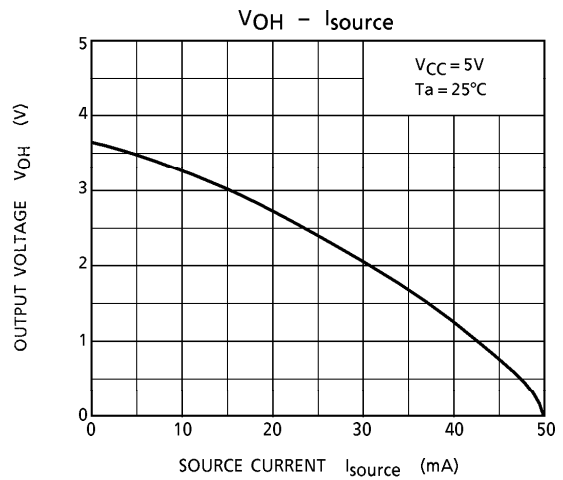
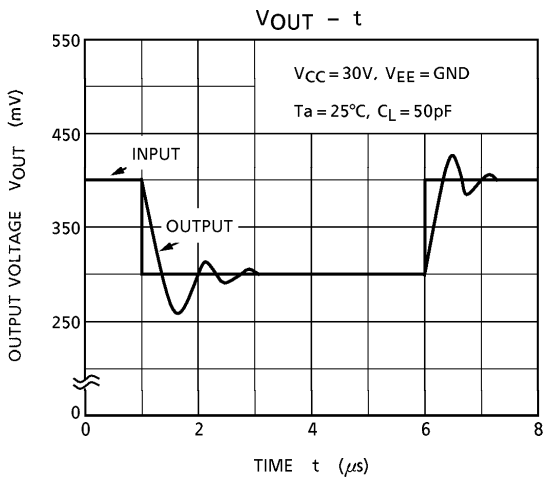
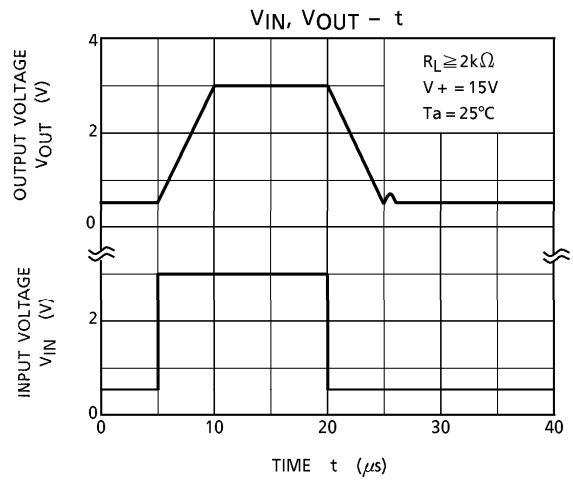
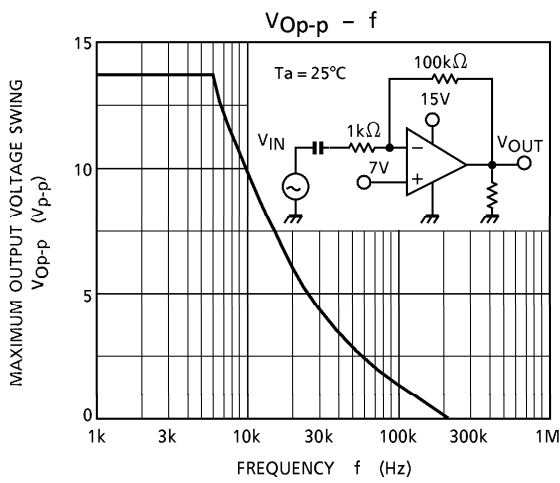
(6) $V_{Op-p}, I_{source}, I_{sink}$



- V_{Op-p}
 $V_{OH} : SW1 \text{ IS SIDE A, } SW2 \text{ ON}$
 $V_{OL} : SW1 \text{ IS SIDE B, } SW2 \text{ ON}$
- I_{source}
 $SW1 \text{ IS SIDE A, } SW2 \text{ OFF}$
 $V_{OUT} \rightarrow 0V \text{ MEASURE}$
- I_{sink}
 $SW1 \text{ IS SIDE B, } SW2 \text{ OFF}$
 $V_{OUT} \rightarrow 5V \text{ MEASURE}$

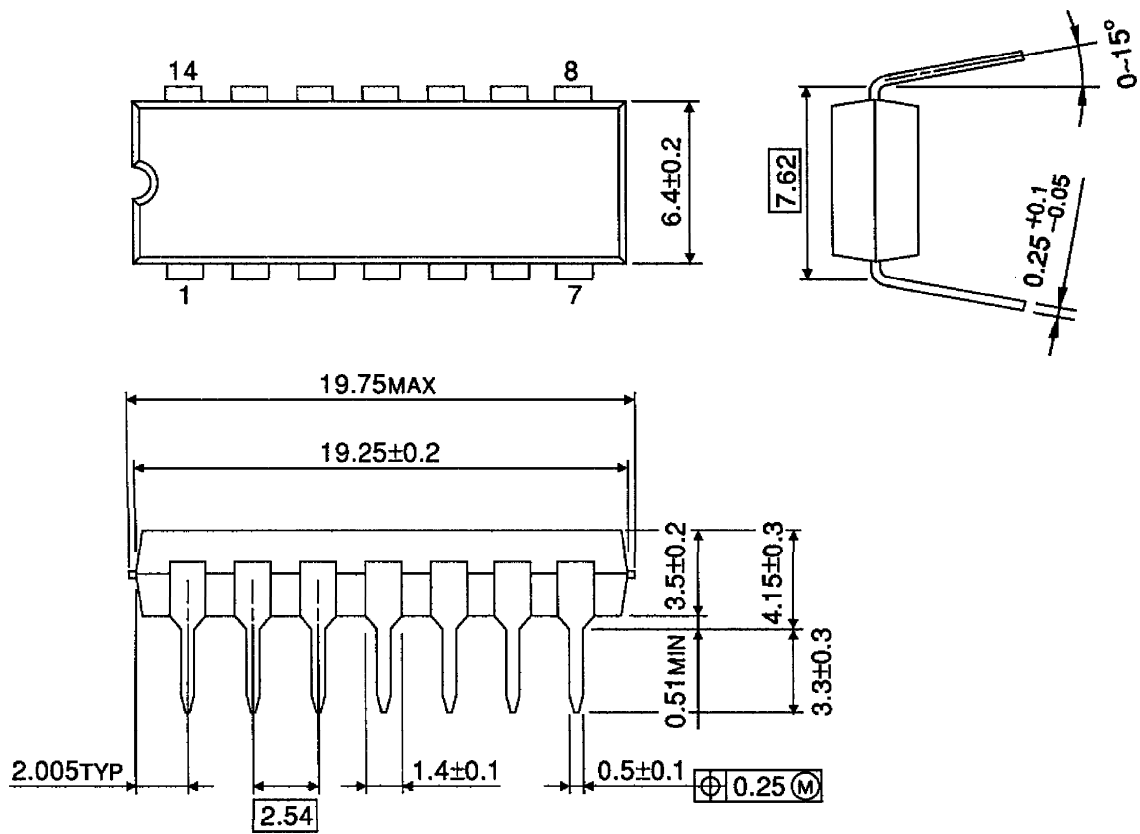
CHARACTERISTICS





OUTLINE DRAWING
DIP14-P-300-2.54

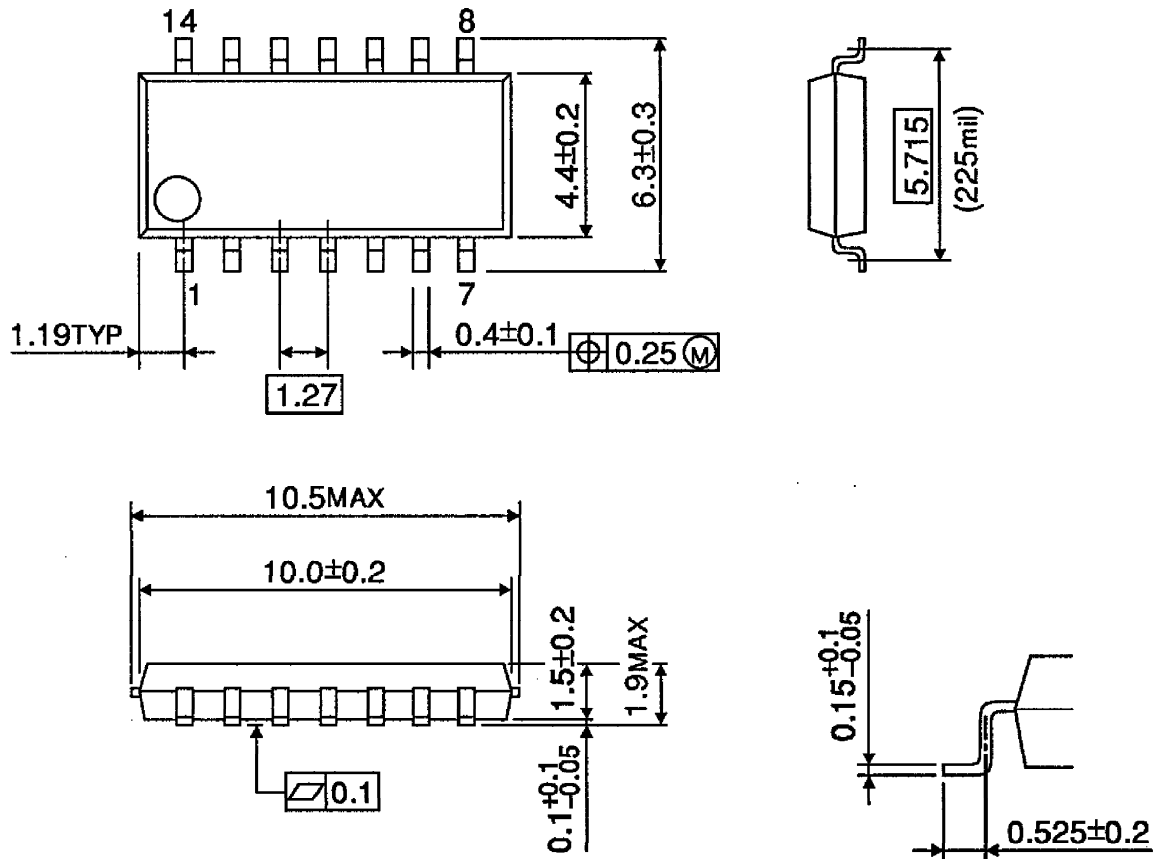
Unit : mm



Weight : 1.0g (Typ.)

OUTLINE DRAWING
SOP14-P-225-1.27

Unit : mm



Weight : 0.2g (Typ.)