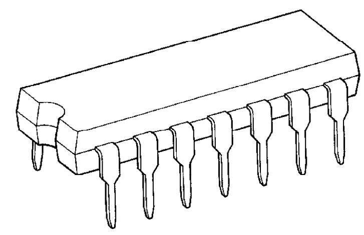
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA7508P, TA7508F

QUAD OPERATIONAL AMPLIFIER

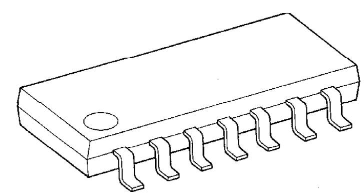
The TA7508P and TA7508F are quad low-noise operational amplifier.

TA7508P



DIP14-P-300-2.54

TA7508F



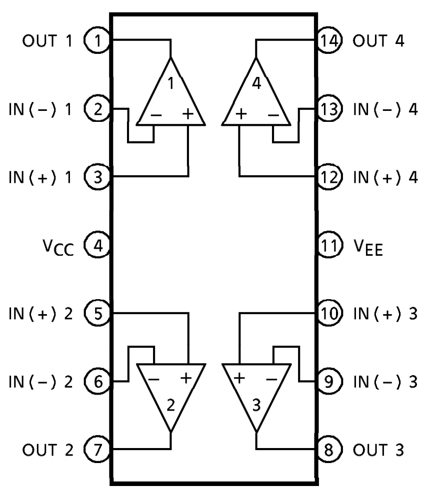
SOP14-P-225-1.27

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

FEATURES

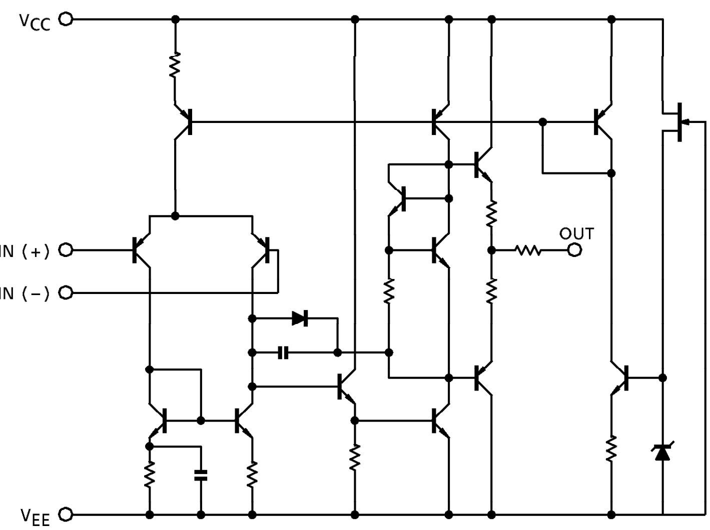
- Equivalent Input Noise Voltage : 2.5μV_{rms} (Typ.)
- Slew Rate : 1V / μs (Typ.)
- Wide Power Supply Range : ±4~±18V
- Internal Frequency Compensation
- Output Short Circuit Protection

PIN CONNECTION (TOP VIEW)



961001EBA1

EQUIVALENT CIRCUIT



MAXIMUM RATINGS (Ta = 25°C)

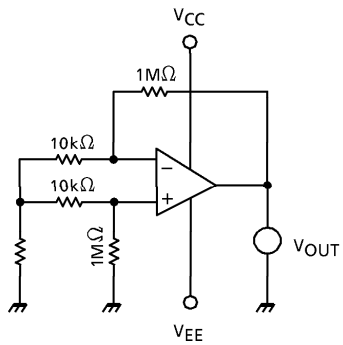
CHARACTERISTIC	SYMBOL	TA7508P	TA7508F	UNIT
Supply Voltage	V_{CC}	18	18	V
	V_{EE}	− 18	− 18	
Differential Input Voltage	DV_{IN}	± 36	± 36	V
Input Voltage	V_{IN}	V_{CC}~V_{EE}	V_{CC}~V_{EE}	V
Power Dissipation	P_D	625	280	mW
Operating Temperature	T_{opr}	− 40~85	− 40~85	°C
Ambient Temperature	T_{stg}	− 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	$R_g \leqq 10k\Omega$	—	0.5	6	mV
Input Offset Current	I_{IO}	2	—	—	5	200	nA
Input Bias Current	I_I	2	—	—	60	500	nA
Common Mode Input Voltage	CMV_{IN}	3	—	± 12	± 14	—	V
Maximum Output Voltage	V_{OM}	6	$R_L = 10k\Omega$	± 12	± 14	—	V
	V_{OMR}		$R_L = 2k\Omega$	± 10	± 13	—	
Source Current	I_{source}	8	—	—	40	—	mA
Sink Current	I_{sink}	7	—	—	40	—	mA
Voltage Gain (Open Loop)	G_V	5	$V_{OUT} = \pm 10V$, $R_L = 2k\Omega$	86	100	—	dB
Common Mode Input Signal Rejection Ratio	CMRR	3	$R_g \leqq 10k\Omega$	70	90	—	dB
Supply Voltage Rejection Ratio	SVRR	1	$R_g \leqq 10k\Omega$	—	30	150	μV / V
Slew Rate	SR	9	$G_V = 1$, $R_L = 2k\Omega$	—	1.0	—	V / μs
Unity Gain Cross Frequency	f_T	5	Open Loop	—	3.0	—	MHz
Supply Current	I_{CC}, I_{EE}	4	—	—	7.0	11.3	mA
Equivalent Input Noise Voltage	V_{NI}	—	$R_S = 1k\Omega$, f = 30Hz~30kHz	—	2.5	—	μV_{rms}

TEST CIRCUIT

(1) V_{IO}, S_{VRR}

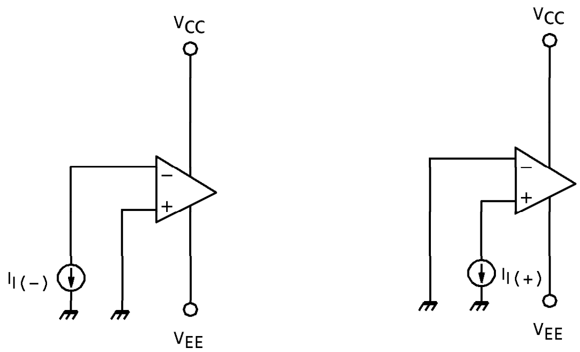


- $V_{IO} = V_{OUT} / 100$
- $SVRR = 20\ell og\ E$ (dB)

$$E = \left| \frac{V_{OUT1} - V_{OUT2}}{(V_{CC1} - V_{EE1}) - (V_{CC2} - V_{EE2})} \right| \times \frac{1}{100}$$

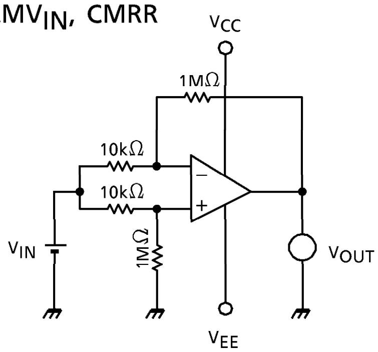
V_{OUT1} : V_{OUT} (V_{CC}, $V_{EE} = \pm 8V$)
V_{OUT2} : V_{OUT} (V_{CC}, $V_{EE} = \pm 18V$)
V_{CC1} : $V_{CC} = -8V$
V_{EE1} : $V_{EE} = -8V$
V_{CC2} : $V_{CC} = +18V$
V_{EE2} : $V_{EE} = -18V$

(2) I_I, I_{IO}



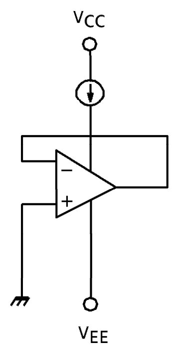
$I_{IO} = |I_{I(-)} - I_{I(+)}|$

(3) CMV_{IN}, CMRR



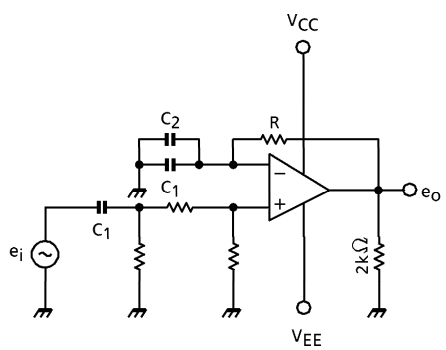
- $CMRR = 20\ell og\ G_D / G_C$ (dB)
  G_D : DIFFERENTIAL VOLTAGE GAIN
  G_C : COMMON MODE VOLTAGE GAIN
- CMV_{IN} : $V_{IN} = -12V$, 12V SUPPLIES

(4) I_{CC}



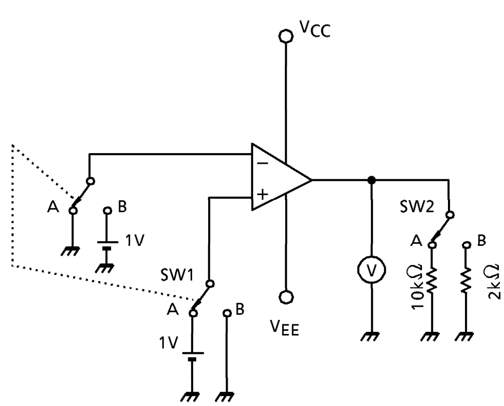
- I_{CC} : V_{CC}, $V_{EE} = \pm 15V$

(5) G_V, f_T



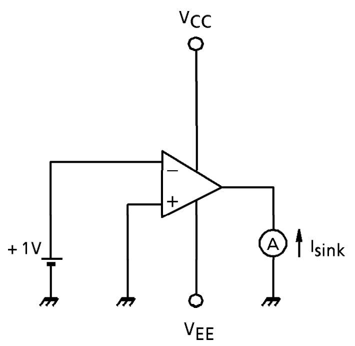
- $G_V = 20\ell og\ e_o / e_i$ (dB)
  $R \gg 1 / W_{C1}$
  C_1 : COUPLING CONDENSER
  C_2 : HIGH FREQUENCY BYPASS CONDENSER
- f_T : INPUT FREQUENCY AT $e_i = e_o$

(6) V_{OM}, V_{OMR}

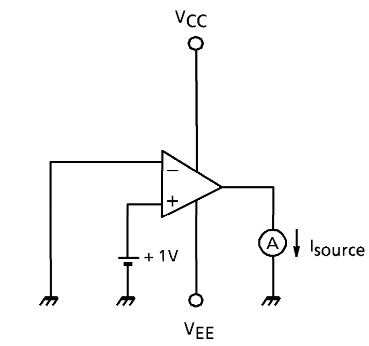


- V_{OM} : (+) : SW1 IS SIDE A, SW2 IS SIDE A
  (−) : SW1 IS SIDE B, SW2 IS SIDE A
- V_{OMR} : (+) : SW1 IS SIDE A, SW2 IS SIDE B
  (−) : SW1 IS SIDE B, SW2 IS SIDE B

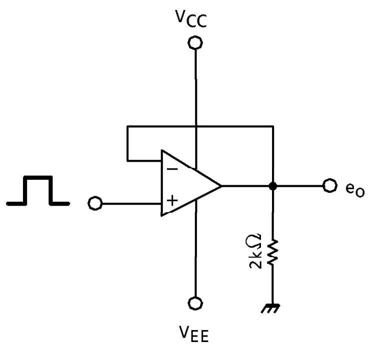
(7) I_{sink}

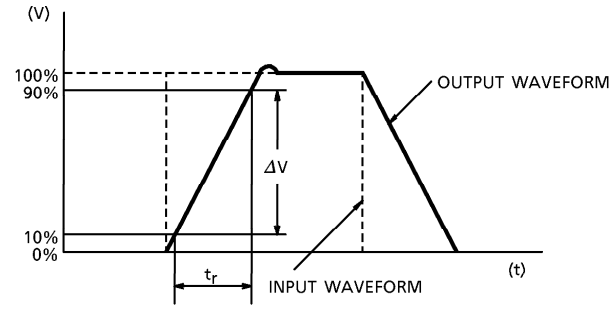


(8) I_{source}



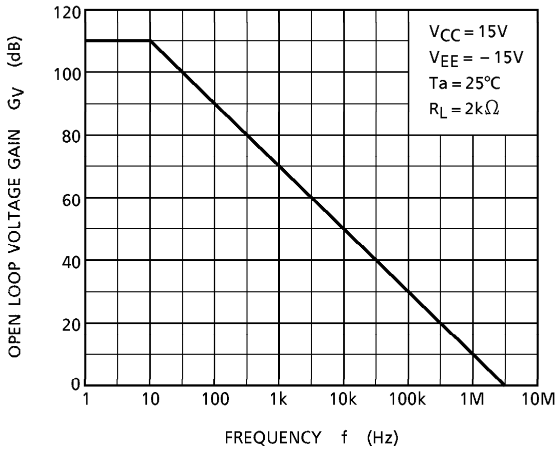
(9) SR



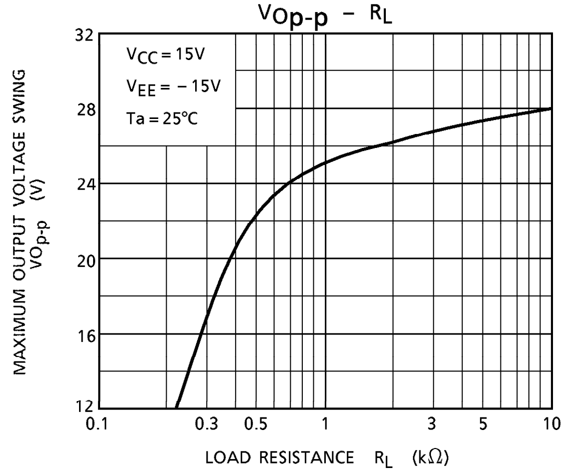


CHARACTERISTIC

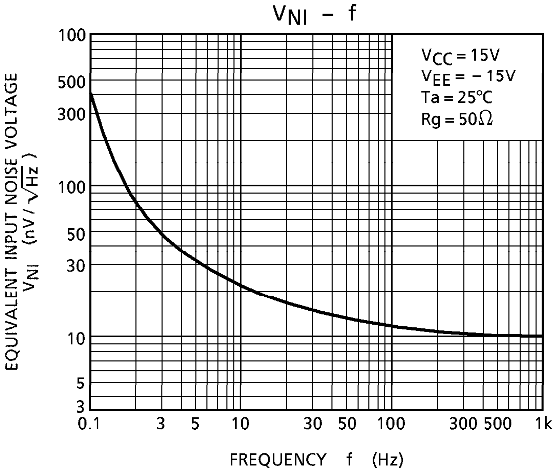
G_V – f



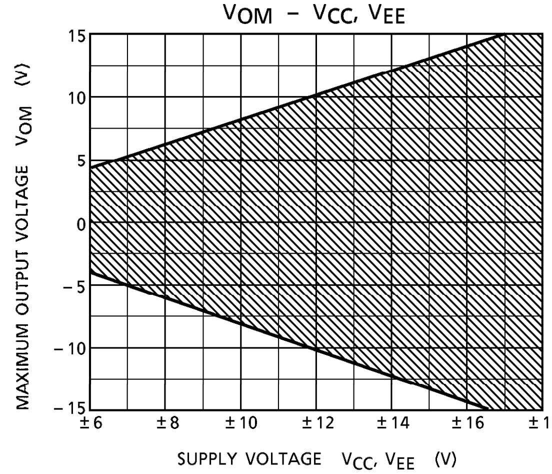
$V_{Op\text{-}p}$ – R_L



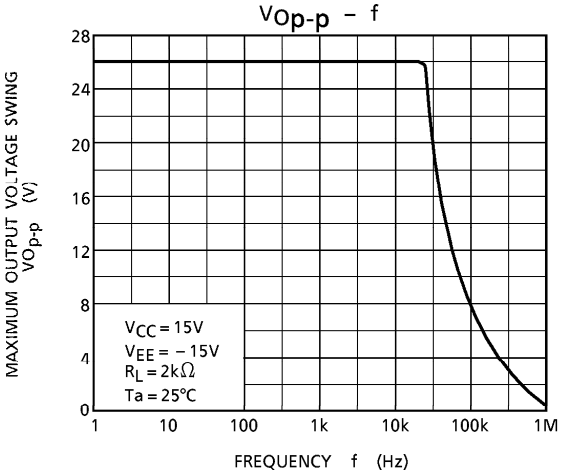
V_{NI} – f



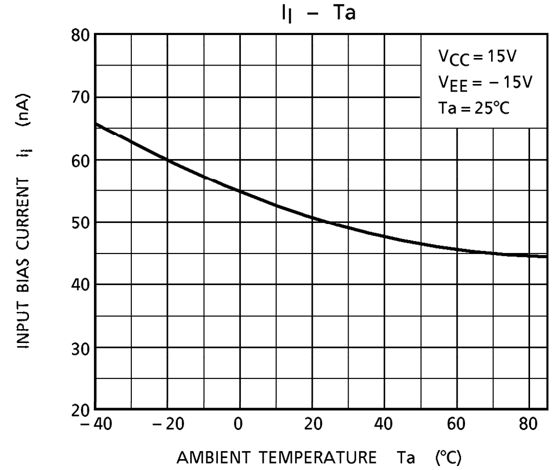
V_{OM} – V_{CC}, V_{EE}

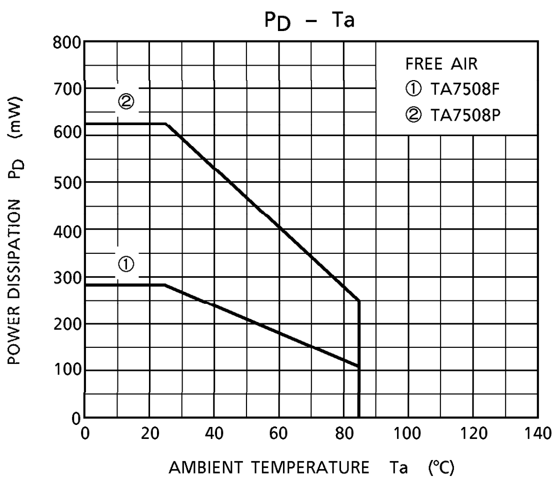


$V_{Op\text{-}p}$ – f

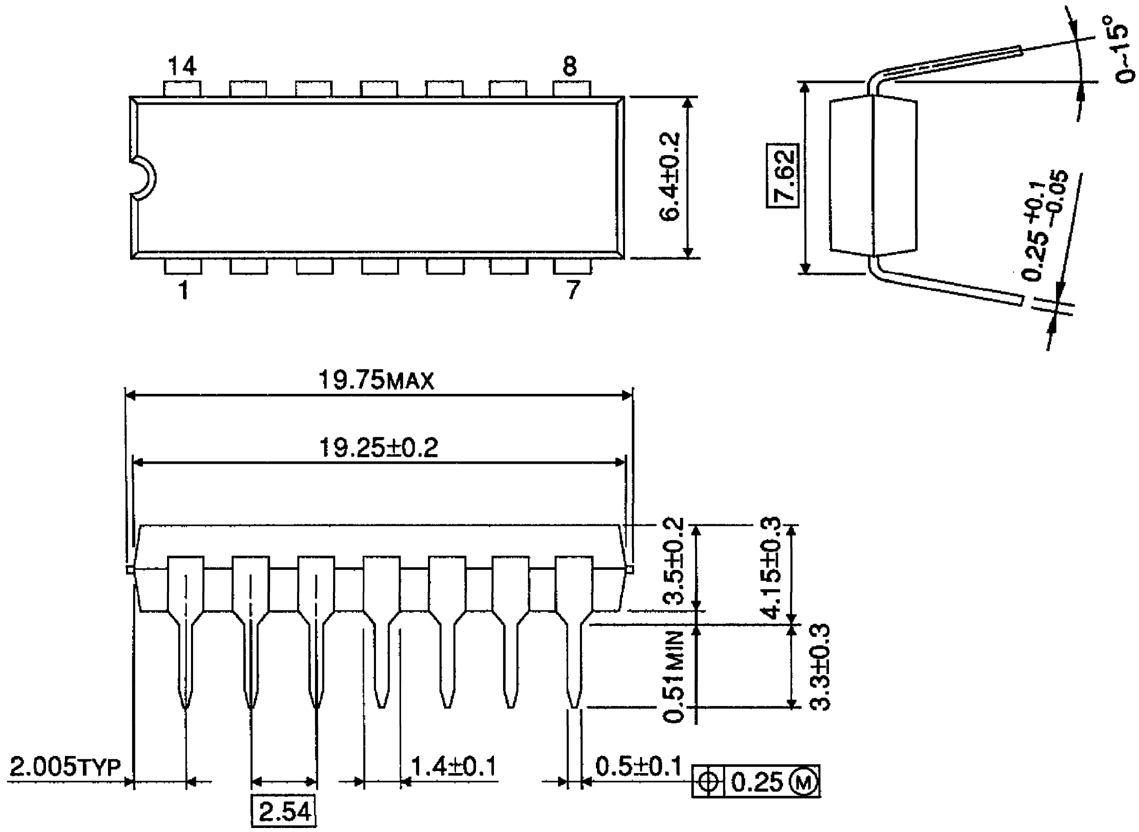


I_I – Ta




PD – Ta
FREE AIR
① TA7508F
② TA7508P
②
①
POWER DISSIPATION PD (mW)
800
700
600
500
400
300
200
100
0
0
20
40
60
80
100
120
140
AMBIENT TEMPERATURE Ta (°C)

OUTLINE DRAWING
DIP14-P-300-2.54 Unit : mm

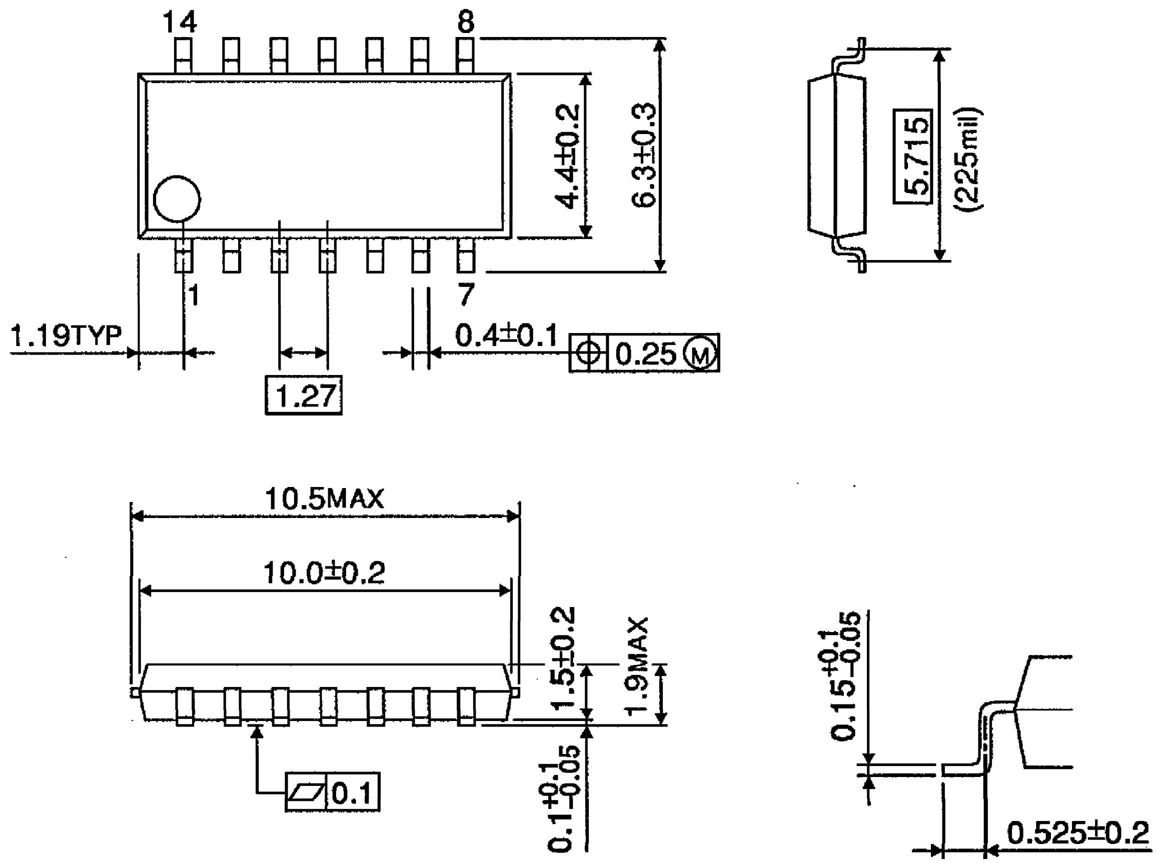


Weight : 1.0g (Typ.)

OUTLINE DRAWING

SOP14-P-225-1.27

Unit : mm



Weight : 0.2g (Typ.)