

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

# TA7259P, TA7259P(LB), TA7259F

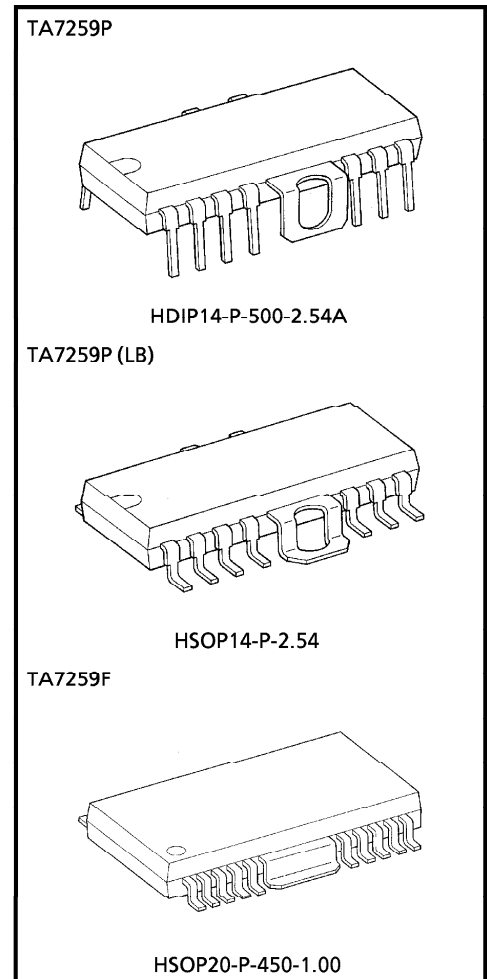
## DC MOTOR DRIVER IC

The TA7259P is a 3-phase Bi-directional motor driver IC. It designed for use VTR tape deck, floppy disk and record player motor drivers.

It contains output power drivers, position sensing circuits, control amplifier and CW/CCW control circuit.

### FEATURES

- 3-phase Bi-directional driver and output current up to  $\pm 1.2A$ .
- Few external parts required.
- Wide operating supply voltage range :  $V_{CC}$  (opr.) MIN. = 7V
- Forward and reverse rotation is controlled simply by means of a CW/CCW control signal fed into FRS.
- High sensitivity of position sensing amplifier. ( $V_H = 10mV$  (Typ.)), recommend to use TOSHIBA Ga-As hall sensor "THS" series.
- Surge protect diode connected for all input terminals. (Position sensing, control, CW/CCW control inputs.)
- DIP-14F power package.

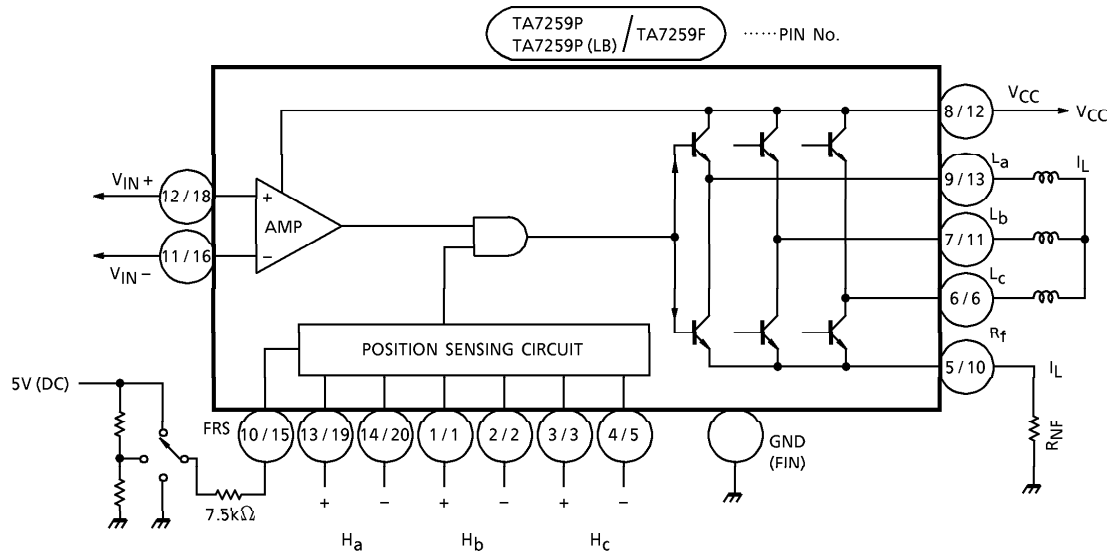


Weight  
 HDIP14-P-500-2.54A : 3.00g (Typ.)  
 HSOP14-P-2.54 : 3.00g (Typ.)  
 HSOP20-P-450-1.00 : 0.79g (Typ.)

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BLOCK DIAGRAM



PIN FUNCTION

| PIN No. |        | SYMBOL            | FUNCTION DESCRIPTION                      |
|---------|--------|-------------------|---|
| P TYPE  | F TYPE |                   |   |
| 1       | 1      | H <sub>b</sub> +  | b-phase Hall Amp. positive input terminal |
| 2       | 2      | H <sub>b</sub> -  | b-phase Hall Amp. negative input terminal |
| 3       | 3      | H <sub>c</sub> +  | c-phase Hall Amp. positive input terminal |
| 4       | 5      | H <sub>c</sub> -  | c-phase Hall Amp. negative input terminal |
| 5       | 10     | R <sub>F</sub>    | Output current detection terminal         |
| 6       | 6      | L <sub>c</sub>    | c-phase drive output terminal             |
| 7       | 11     | L <sub>b</sub>    | b-phase drive output terminal             |
| 8       | 12     | V <sub>CC</sub>   | Power supply input terminal               |
| 9       | 13     | L <sub>a</sub>    | a-phase drive output terminal             |
| 10      | 15     | FRS               | Forward / Reverse / Stop switch terminal  |
| 11      | 16     | V <sub>IN</sub> - | Control Amp, negative input terminal      |
| 12      | 18     | V <sub>IN</sub> + | Control Amp, positive input terminal      |
| 13      | 19     | H <sub>a</sub> +  | a-phase Hall Amp. positive input terminal |
| 14      | 20     | H <sub>a</sub> -  | a-phase Hall Amp. negative input terminal |
| Fin     | Fin    | GND               | GND Terminal                              |

**FUNCTION**

| FRS<br>(10 PIN) | POSITION SENSING INPUT |                |                | COIL OUTPUT    |                |                |
|-----------------|------------------------|----------------|----------------|----------------|----------------|----------------|
|                 | H <sub>a</sub>         | H <sub>b</sub> | H <sub>c</sub> | L <sub>a</sub> | H <sub>b</sub> | L <sub>c</sub> |
| L               | 1                      | 0              | 1              | H              | L              | M              |
|                 | 1                      | 0              | 0              | H              | M              | L              |
|                 | 1                      | 1              | 0              | M              | H              | L              |
|                 | 0                      | 1              | 0              | L              | H              | M              |
|                 | 0                      | 1              | 1              | L              | M              | H              |
|                 | 0                      | 0              | 1              | M              | L              | H              |
| H               | 1                      | 0              | 1              | L              | H              | M              |
|                 | 1                      | 0              | 0              | L              | M              | H              |
|                 | 1                      | 1              | 0              | M              | L              | H              |
|                 | 0                      | 1              | 0              | H              | L              | M              |
|                 | 0                      | 1              | 1              | H              | M              | L              |
|                 | 0                      | 0              | 1              | M              | H              | L              |
| M               | 1                      | 0              | 1              | High Impedance |                |                |
|                 | 1                      | 0              | 0              |                |                |                |
|                 | 1                      | 1              | 0              |                |                |                |
|                 | 0                      | 1              | 0              |                |                |                |
|                 | 0                      | 1              | 1              |                |                |                |
|                 | 0                      | 0              | 1              |                |                |                |

**MAXIMUM RATINGS (Ta = 25°C)**

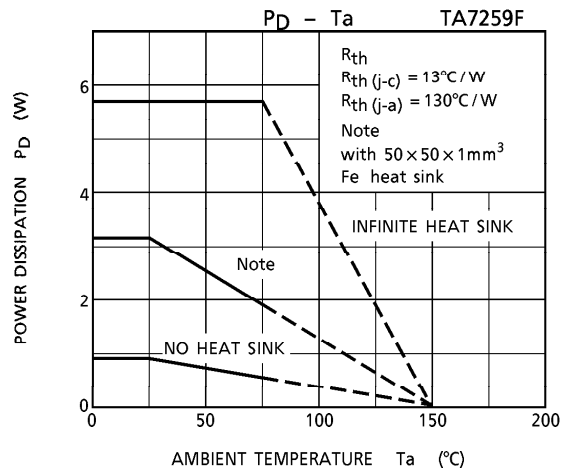
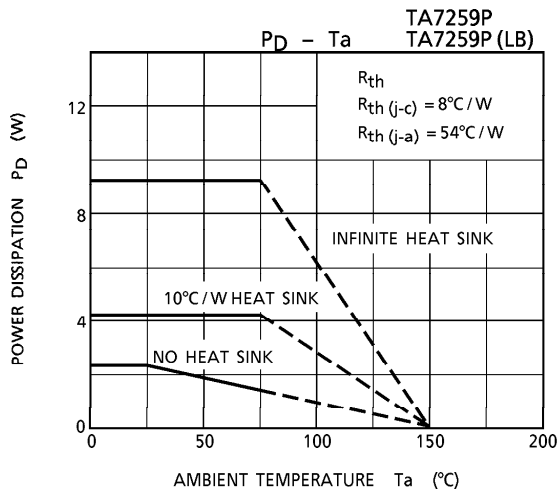
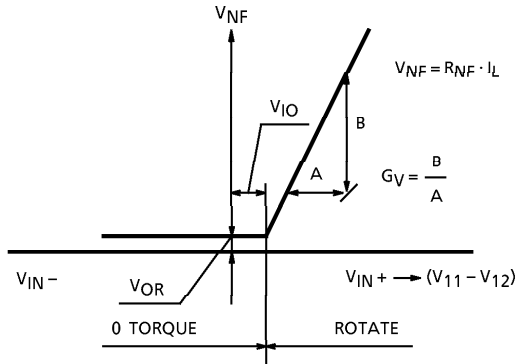
| CHARACTERISTIC                 |              | SYMBOL           | RATING  | UNIT |
|--------------------------------|--------------|------------------|---------|------|
| Supply Voltage                 |              | V <sub>CC</sub>  | 26      | V    |
| Output Current                 |              | I <sub>O</sub>   | 1.2     | A    |
| Power<br>Dissipation<br>(Note) | TA7259P      | P <sub>D</sub>   | 2.3     | W    |
|                                | TA7259P (LB) |                  | 2.3     |      |
|                                | TA7259F      |                  | 1.0     |      |
| Operating Temperature          |              | T <sub>opr</sub> | -30~75  | °C   |
| Storage Temperature            |              | T <sub>stg</sub> | -55~150 | °C   |

(Note) No heat sink.

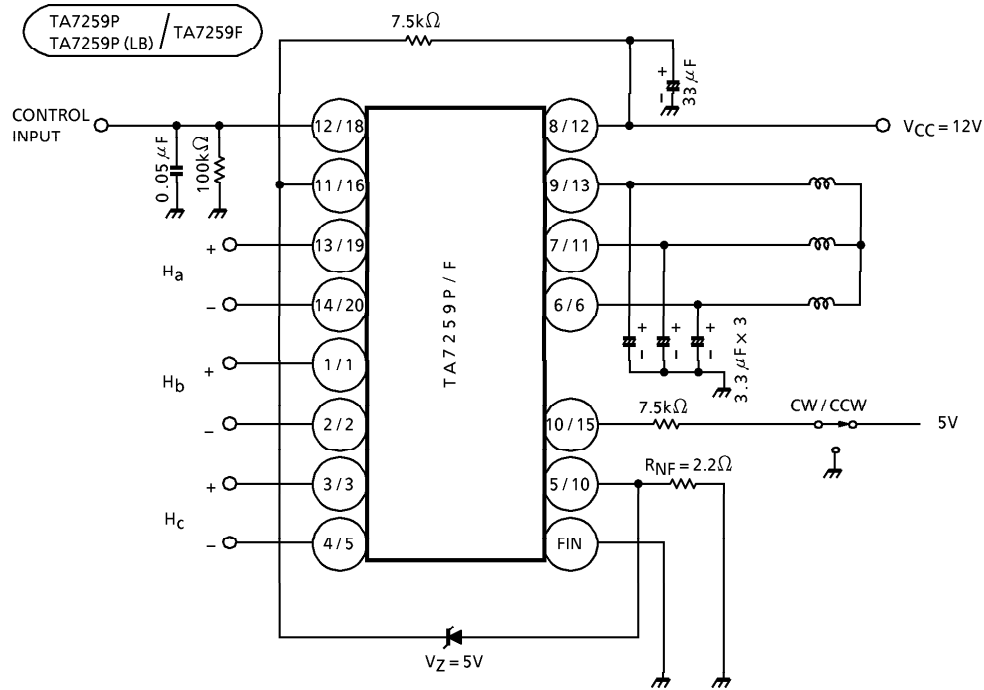
**ELECTRICAL CHARACTERISTICS** (Unless otherwise specified,  $V_{CC} = 12V$ ,  $T_a = 25^\circ C$ )

| CHARACTERISTIC                         |          | SYMBOL             | TEST CIR-CUIT | TEST CONDITION             | MIN. | TYP. | MAX.           | UNIT              |
|--|----------|--------------------|---------------|----------------------------|------|------|----------------|-------------------|
| Quiescent Current                      |          | $I_{CC1}$          | —             | FRS open                   | 2    | 4    | 7              | mA                |
|  |          | $I_{CC2}$          |               | FRS = 5V                   | 2    | 5    | 9              |                   |
|  |          | $I_{CC3}$          |               | $V_{CC} = 22V$ , FRS = GND | 2    | 5    | 9              |                   |
| Input Offset Voltage                   |          | $V_{IO}$           | —             | —                          | —    | 40   | —              | mV                |
| Residual Output Voltage                |          | $V_{OR}$           | —             | $V_{IN-} = V_{IN+} = 7V$   | —    | 0    | 10             | mV                |
| Voltage Gain                           |          | $G_V$              | —             | $R_{NF} = 2.2\Omega$       | —    | 15.0 | —              | —                 |
| Saturation Voltage                     | Upper    | $V_{SAT1}$         | —             | $I_L = 400mA$              | —    | 1.0  | 1.5            | V                 |
|  | Lower    | $V_{SAT2}$         | —             |                            | —    | 0.4  | 1.0            |                   |
| Cut-off Current                        | Upper    | $I_{OC1}$          | —             | $V_C = 20V$                | —    | —    | 20             | $\mu A$           |
|  | Lower    | $I_{OC2}$          | —             |                            | —    | —    | 20             |                   |
| Position sensing Input Sensitivity     |          | $V_H$              | —             | —                          | —    | 10   | —              | mV                |
| Maximum Position Sensing Input Voltage |          | $V_H \text{ MAX.}$ | —             | —                          | —    | —    | 400            | mV <sub>p-p</sub> |
| Input Operating Voltage                | Position | $CMR_H$            | —             | —                          | 2.0  | —    | $V_{CC} - 2.5$ | V                 |
|  | Control  | $CMR_C$            | —             | —                          | 2.0  | —    | $V_{CC} - 2.5$ |                   |
| Rotation Control Input Voltage         | CW       | $V_F$              | —             | —                          | —    | 0    | 0.4            | V                 |
|  | STOP     | $V_S$              | —             | —                          | 2.5  | 3.0  | 3.5            |                   |
|  | CCW      | $V_R$              | —             | —                          | 4.5  | 5.0  | 5.8            |                   |

INPUT vs OUTPUT



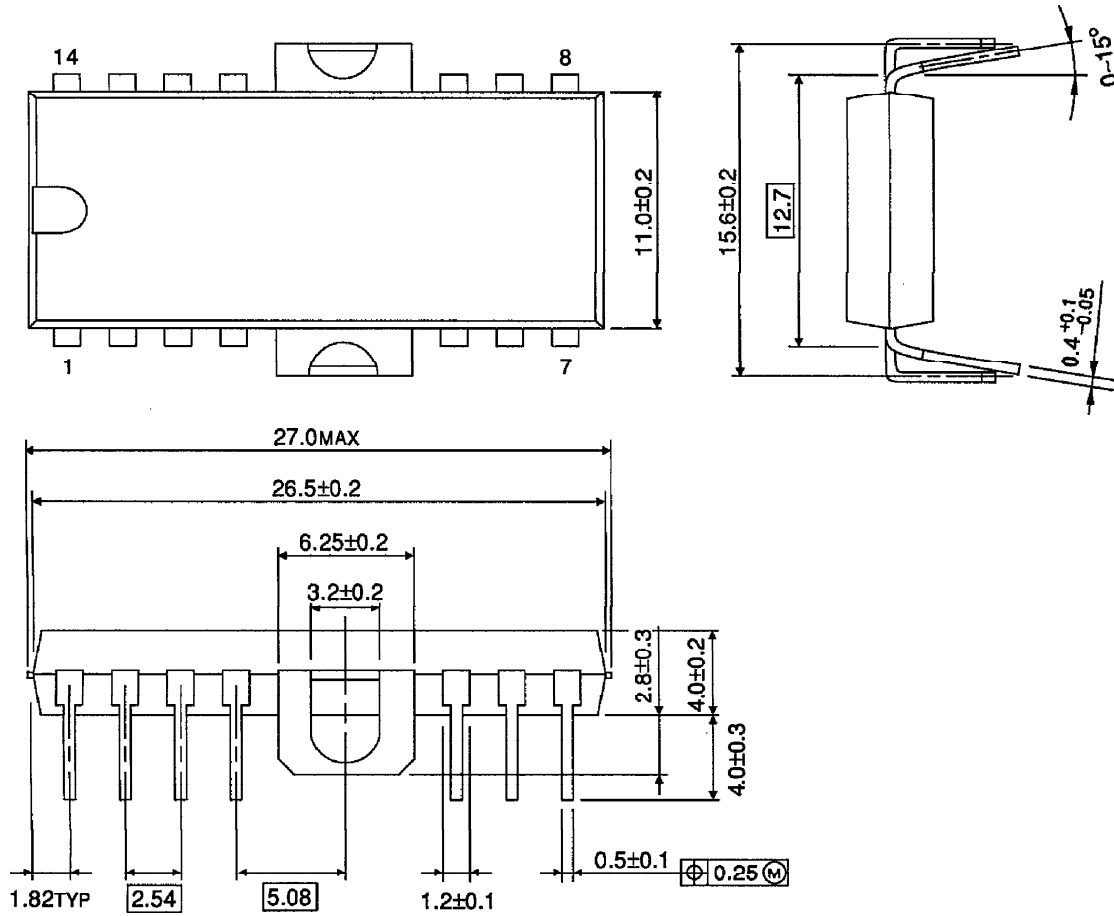
APPLICATION CIRCUIT



(Note) Utmost care is necessary in the design of the output line,  $V_{CC}$  and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.

**OUTLINE DRAWING**  
HDIP14-P-500-2.54A

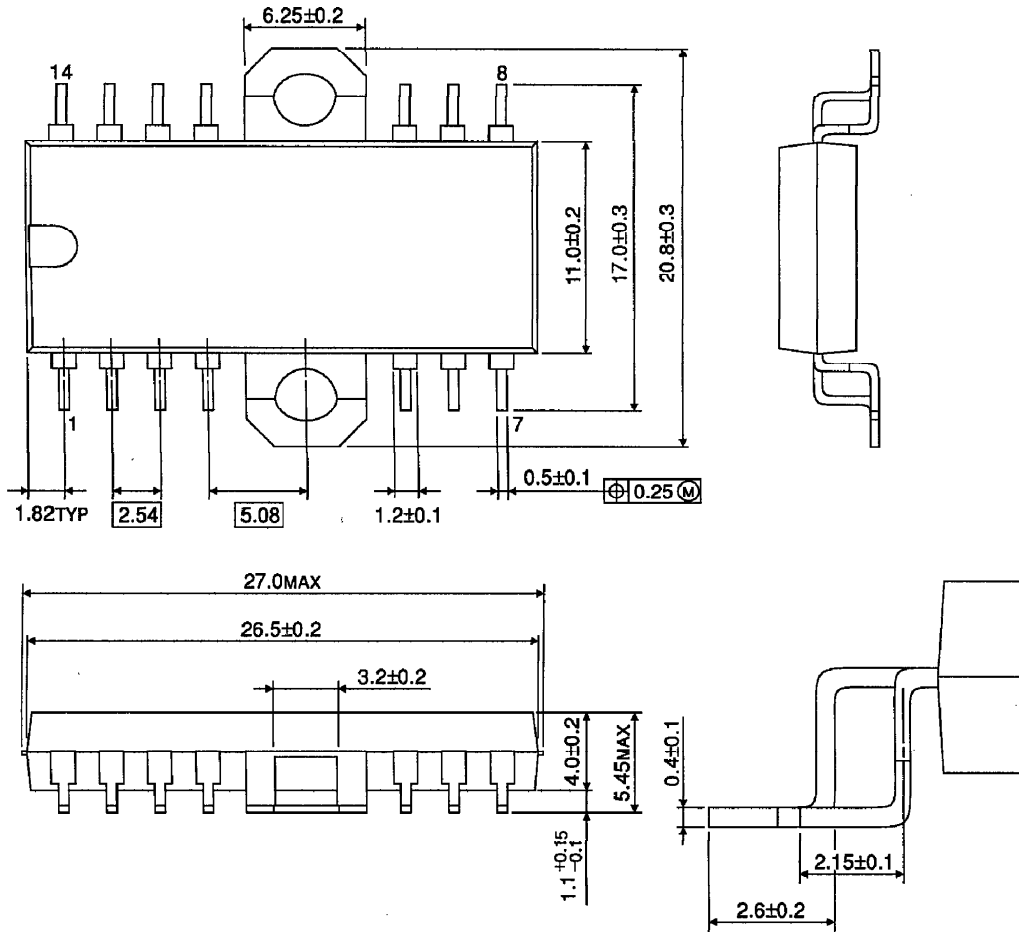
Unit : mm



Weight : 3.00g (Typ.)

**OUTLINE DRAWING**  
HSOP14-P-2.54

Unit : mm



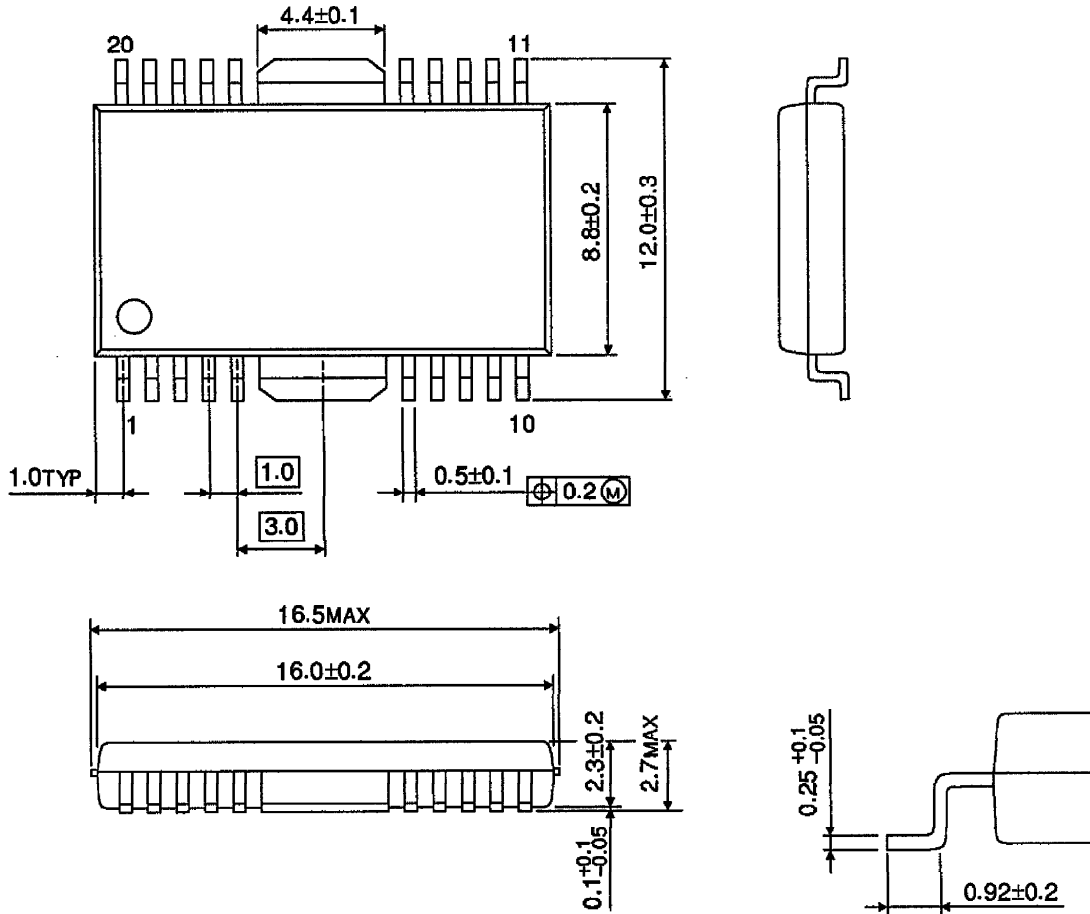
Weight : 3.00g (Typ.)



**OUTLINE DRAWING**

HSOP20-P-450-1.00

Unit : mm



Weight : 0.79g (Typ.)