

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

# TD62318BP, TD62318BF

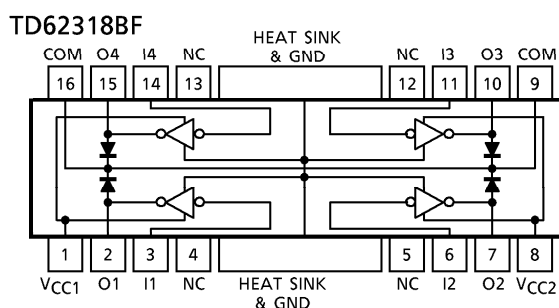
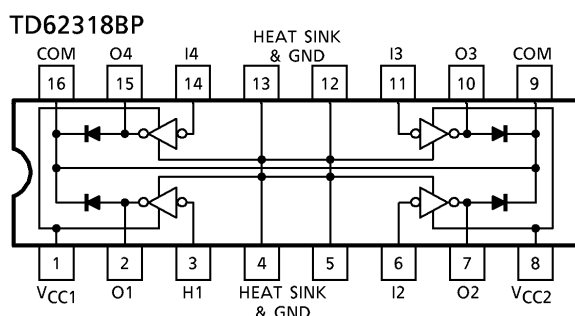
## 4ch LOW INPUT ACTIVE HIGH-CURRENT DARLINGTON SINK DRIVER

The TD62318BP and TD62318BF are non-inverting transistor array which are comprised of four NPN darlington output stages and PNP input stages. This device is low level input active driver and are suitable for operation with TTL, 5V CMOS and 5V Microprocessor which have sink current output drivers. Applications include relay, hammer, lamp and stepping motor drivers.

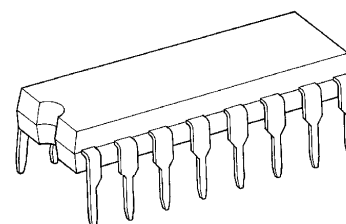
### FEATURES

- Two  $V_{CC}$  Terminals  $V_{CC1}$ ,  $V_{CC2}$  (Separated)
- Package Type BP : DIP-16pin  
BF : PFP-16pin
- High Sustaining Voltage Output :  $V_{CE(SUS)} = 80V$  (Min.)
- Output Current (Single Output) :  $I_{OUT} = 700mA / ch$  (Max.)
- Output Clamp Diodes
- Input Compatible with TTL and 5V CMOS
- GND and SUB Terminal = Heat Sink
- Low Level Active Input
- Standard Supply Voltage

### PIN CONNECTION (TOP VIEW)

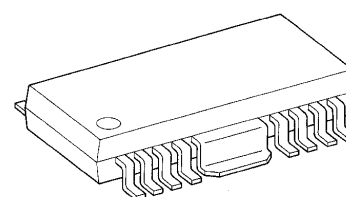


TD62318BP



DIP16-P-300-2.54A

TD62318BF

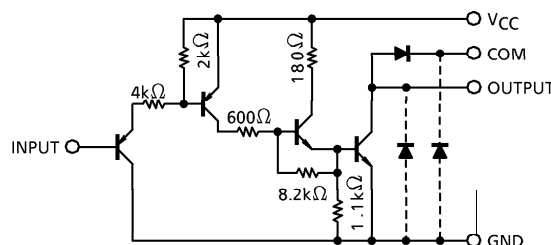


HSOP16-P-300-1.00

### Weight

DIP16-P-300-2.54A : 1.11g (Typ.)  
HSOP16-P-300-1.00 : 0.50g (Typ.)

### SCHEMATICS (EACH DRIVER)



(Note) The output parasitic diode cannot be used as clamp diode.

961001EBA2

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## MAXIMUM RATINGS (Ta = 25°C)

| CHARACTERISTIC              | SYMBOL                | RATING         | UNIT    |
|-----------------------------|-----------------------|----------------|---------|
| Supply Voltage              | V <sub>CC</sub>       | − 0.5~17       | V       |
| Output Sustaining Voltage   | V <sub>CE (SUS)</sub> | − 0.5~80       | V       |
| Output Current              | I <sub>OUT</sub>      | 700            | mA / ch |
| Input Current               | I <sub>IN</sub>       | − 10           | mA      |
| Input Voltage               | V <sub>IN</sub>       | − 0.5~17       | V       |
| Clamp Diode Reverse Voltage | V <sub>R</sub>        | 80             | V       |
| Clamp Diode Forward Current | I <sub>F</sub>        | 700            | mA      |
| Power Dissipation           | BP                    | P <sub>D</sub> | W       |
|                             | BF                    |                |         |
| Operating Temperature       | T <sub>opr</sub>      | − 40~85        | °C      |
| Storage Temperature         | T <sub>stg</sub>      | − 55~150       | °C      |

(\*1) On Glass Epoxy PCB (50 × 50 × 1.6mm Cu 50%)

(\*2) On Glass Epoxy PCB (60 × 30 × 1.6mm Cu 30%)

## RECOMMENDED OPERATING CONDITIONS (Ta = − 40~85°C)

| CHARACTERISTIC              | SYMBOL                | CONDITION               | MIN.                  | TYP. | MAX.                  | UNIT    |
|-----------------------------|-----------------------|-------------------------|-----------------------|------|-----------------------|---------|
| Supply Voltage              | V <sub>CC</sub>       |                         | 4.5                   | —    | 5.5                   | V       |
| Output Sustaining Voltage   | V <sub>CE (SUS)</sub> |                         | 0                     | —    | 50                    | V       |
| Output Current              | I <sub>OUT</sub>      | DC 1 Circuit, Ta = 25°C | 0                     | —    | 570                   | mA / ch |
|                             |                       | T <sub>pw</sub> = 25ms  |                       |      |                       |         |
|                             |                       | Duty = 10%              | 0                     | —    | 570                   |         |
|                             |                       | 4 Circuits              |                       |      |                       |         |
|                             |                       | Duty = 50%              | 0                     | —    | 330                   |         |
| Input Voltage               | V <sub>IN</sub>       | T <sub>j</sub> = 120°C  |                       |      |                       | V       |
|                             |                       | Ta = 85°C               |                       |      |                       |         |
|                             |                       | Duty = 10%              | 0                     | —    | 570                   |         |
|                             |                       | Duty = 50%              | 0                     | —    | 100                   |         |
|                             |                       |                         |                       |      |                       |         |
| Input Voltage               | V <sub>IN</sub>       |                         | 0                     | —    | 15                    | V       |
|                             |                       | Output On               | V <sub>IN (ON)</sub>  |      | V <sub>CC</sub> − 3.6 |         |
|                             |                       | Output Off              | V <sub>IN (OFF)</sub> |      | 5.5                   |         |
| Clamp Diode Reverse Voltage | V <sub>R</sub>        |                         | —                     | —    | 80                    | V       |
| Clamp Diode Forward Current | I <sub>F</sub>        |                         | —                     | —    | 700                   | mA      |
| Power Dissipation           | BP                    | P <sub>D</sub>          | —                     | —    | 1.4                   | W       |
|                             | BF                    |                         |                       |      | 0.7                   |         |

(\*1) On Glass Epoxy PCB (50 × 50 × 1.6mm Cu 50%)

(\*2) On Glass Epoxy PCB (60 × 30 × 1.6mm Cu 30%)

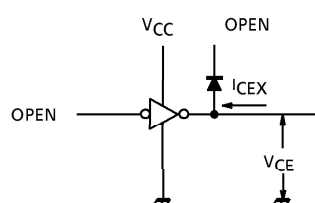
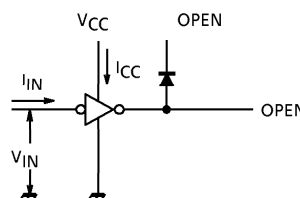
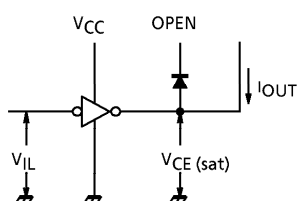
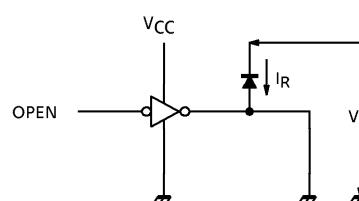
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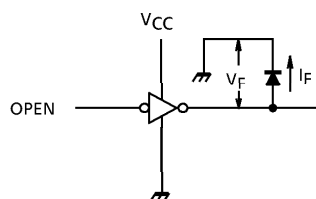
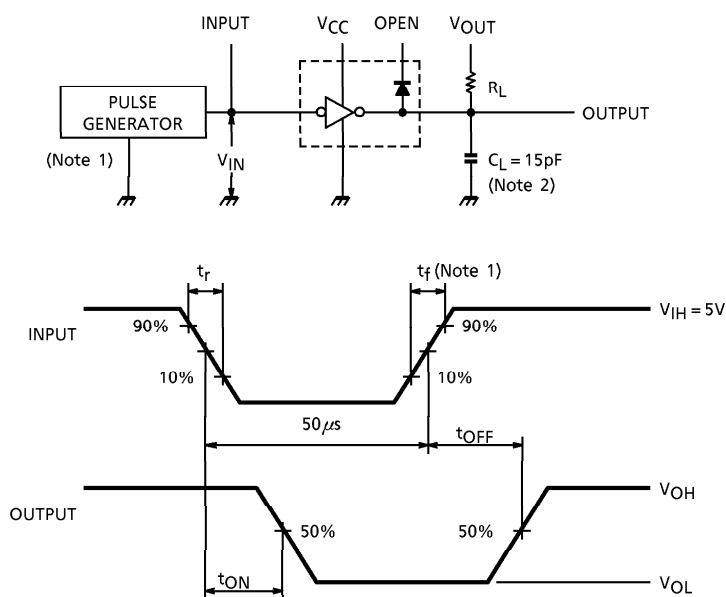
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## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC              |            | SYMBOL        | TEST CIR-<br>CUIT | TEST CONDITION                   | MIN.           | TYP.  | MAX.           | UNIT    |
|-----------------------------|------------|---------------|-------------------|----------------------------------|----------------|-------|----------------|---------|
| Input Voltage               | "H" level  | $V_{IH}$      | —                 |                                  | $V_{CC} - 1.6$ | —     | 15             | V       |
|                             | "L" level  | $V_{IL}$      |                   |                                  | 0              | —     | $V_{CC} - 3.6$ |         |
| Input Current               | "H" level  | $I_{IH}$      | 2                 |                                  | —              | —     | 10             | $\mu A$ |
|                             | "L" level  | $I_{IL}$      |                   |                                  | —              | -0.05 | -0.36          | mA      |
| Output Leakage Current      |            | $I_{CEX}$     | 1                 | $V_{CE} = 80V, Ta = 25^{\circ}C$ | —              | —     | 50             | $\mu A$ |
|                             |            |               |                   | $V_{CE} = 80V, Ta = 85^{\circ}C$ | —              | —     | 100            |         |
| Output Saturation Voltage   |            | $V_{CE(sat)}$ | 3                 | $I_{OUT} = 0.5A, V_{CC} = 4.5V$  | —              | —     | 0.8            | V       |
|                             |            |               |                   | $I_{OUT} = 0.2A, V_{CC} = 4.5V$  | —              | —     | 0.45           |         |
| Clamp Diode Reverse Current |            | $I_R$         | 4                 | $V_R = 80V, Ta = 25^{\circ}C$    | —              | —     | 50             | $\mu A$ |
|                             |            |               |                   | $V_R = 80V, Ta = 85^{\circ}C$    | —              | —     | 100            |         |
| Clamp Diode Forward Voltage |            | $V_F$         | 5                 | $I_F = 500mA$                    | —              | —     | 2.0            | V       |
| Supply Current              | Output On  | $I_{CC(ON)}$  | 2                 | $V_{CC} = 5.5V, V_{IN} = 0V$     | —              | 35    | 40             | mA / ch |
|                             | Output Off | $I_{CC(OFF)}$ | 2                 | $V_{CC} = 5.5V, V_{IN} = V_{CC}$ | —              | —     | 10             | $\mu A$ |
| Turn-On Delay               |            | $t_{ON}$      | 6                 | $V_{OUT} = 80V, R_L = 142\Omega$ | —              | 0.4   | 0.8            | $\mu s$ |
| Turn-Off Delay              |            | $t_{OFF}$     |                   | $V_{CC} = 5.0V, C_L = 15pF$      | —              | 8.0   | 16.0           |         |

## TEST CIRCUIT

1.  $I_{CEX}$ 2.  $I_{IH}, I_{IL}$ 3.  $V_{CE(sat)}$ 4.  $I_R$ 

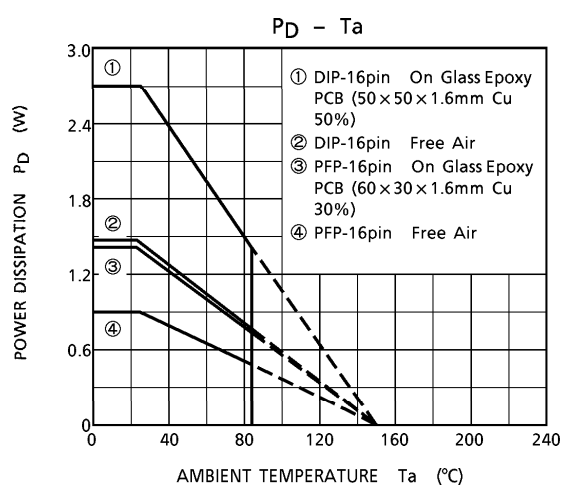
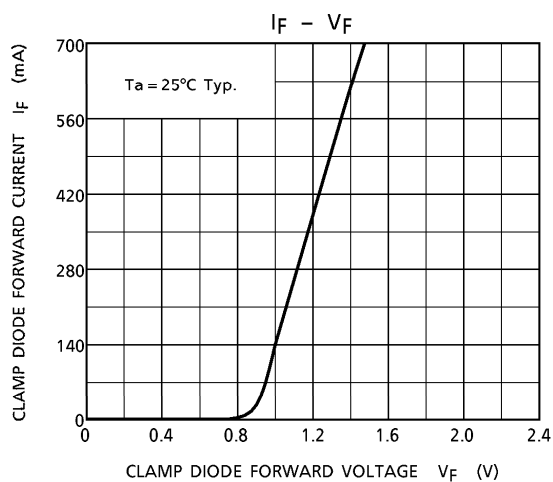
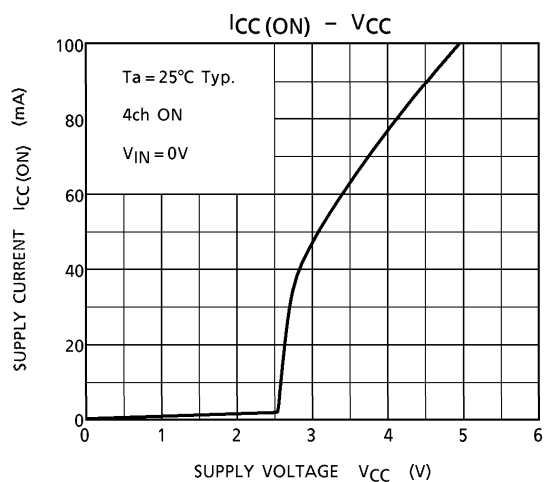
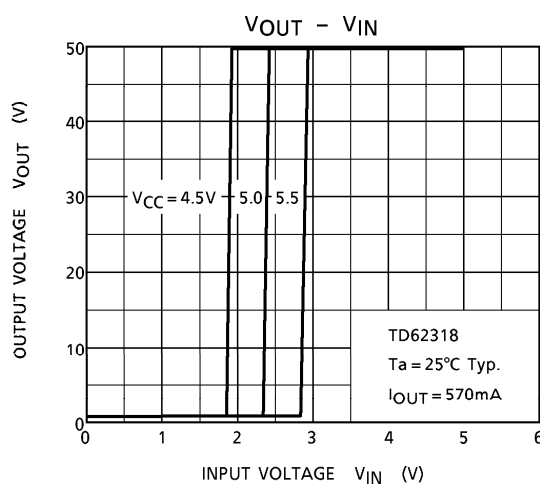
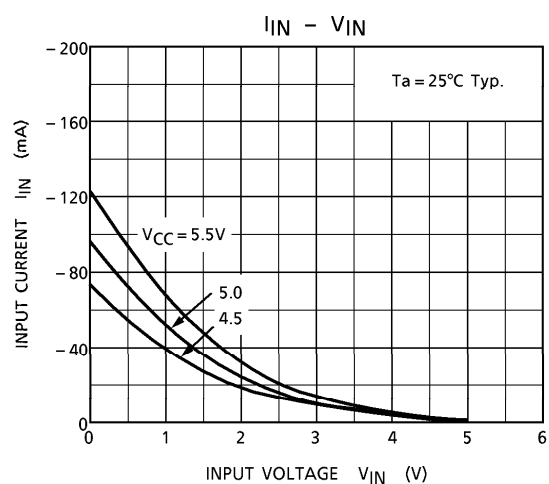
**5.  $V_F$** 

**6.  $t_{ON}$ ,  $t_{OFF}$** 


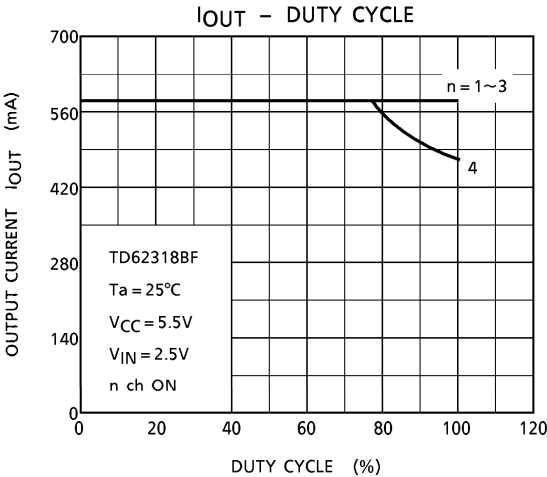
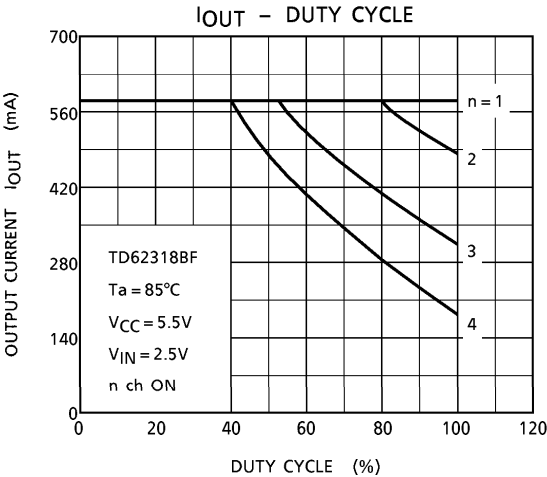
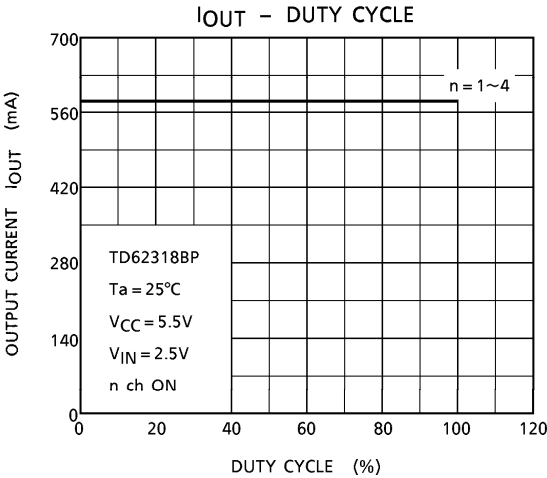
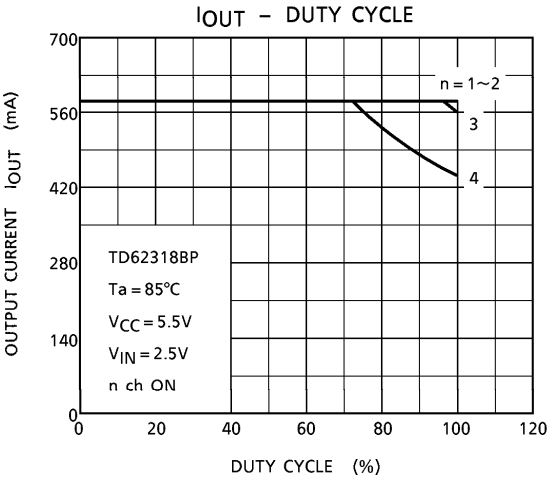
(Note 1) Pulse Width  $50\mu s$ , Duty Cycle 10%、  
Output Impedance  $50\Omega$ ,  $t_r \leq 5ns$ ,  $t_f \leq 10ns$

(Note 2)  $C_L$  includes probe and jig capacitance

**PRECAUTIONS for USING**

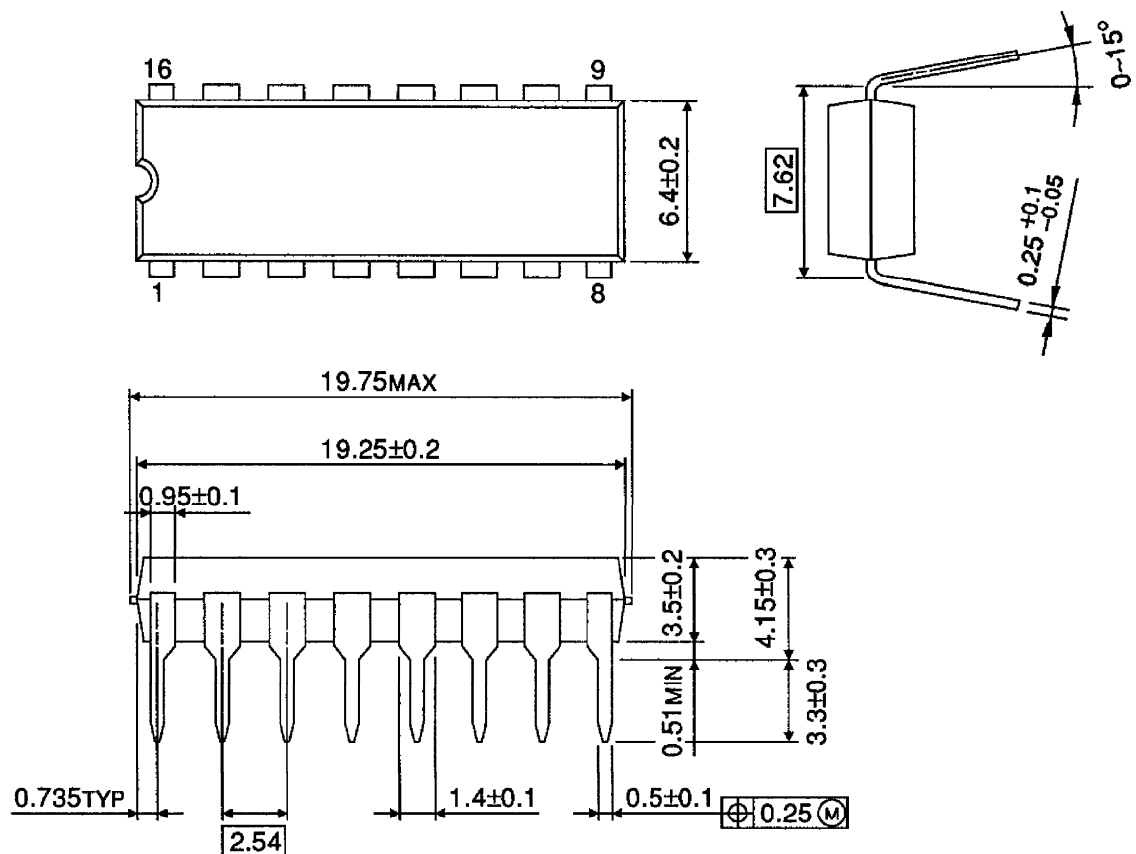
Utmost care is necessary in the design of the output line,  $V_{CC}$ , COMMON and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.





## OUTLINE DRAWING DIP16-P-300-2.54A

Unit : mm

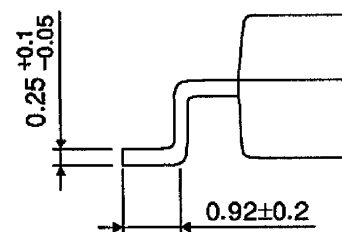
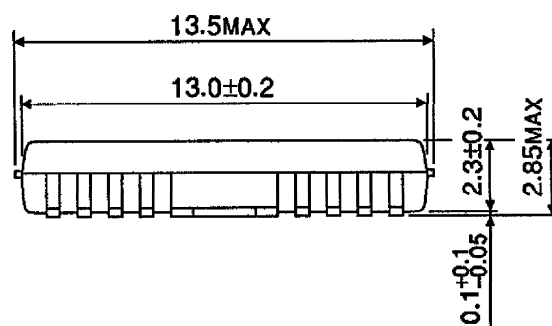
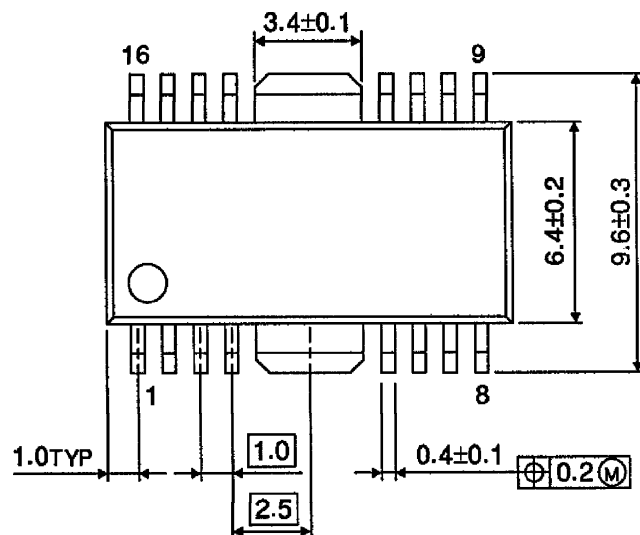


Weight : 1.11g (Typ.)

**OUTLINE DRAWING**

HSOP16-P-300-1.00

Unit : mm



Weight : 0.50g (Typ.)

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