

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TD62107P, TD62107BP, TD62107F

4CH HIGH-CURRENT DARLINGTON SINK DRIVER

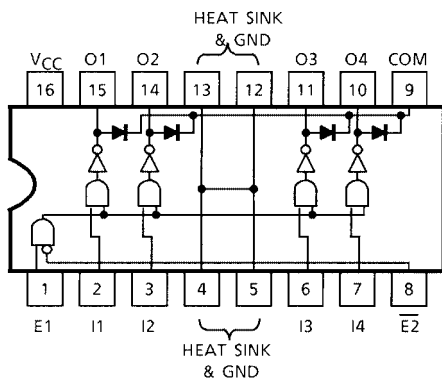
The TD62107P / BP / F are high-voltage, high-current darlington drivers and enable inputs which can gate the outputs. All units feature integral clamp diodes for switching inductive loads. The TD62107P / BP / F have a wide supply voltage range and all input are compatible with TTL and 5-V CMOS. Application include relay, hammer, lamp and stepping moter drivers. Please observe the thermal condition for using.

FEATURES

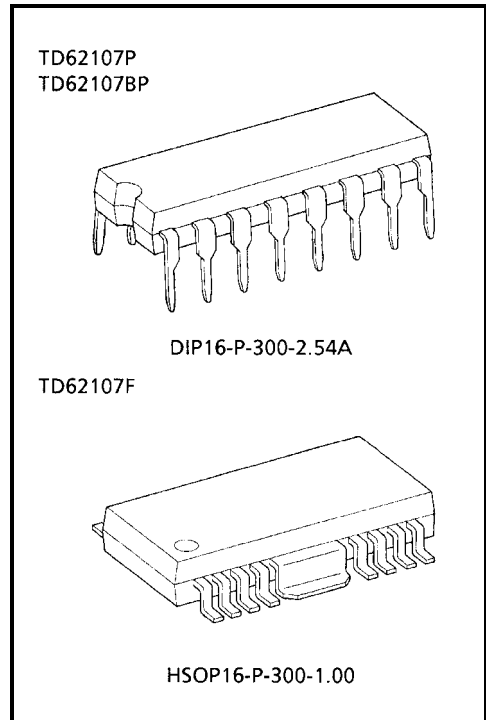
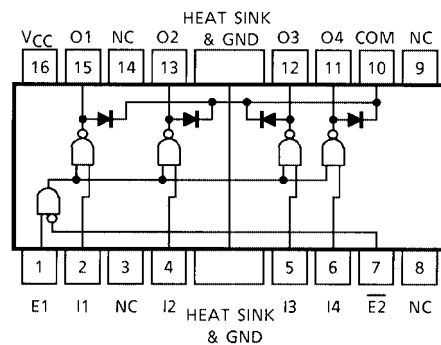
- Output current (single output) 750mA (MAX)
- High sustaining voltage output
 - 80 V MIN. (TD62107BP)
 - 45 V MIN. (TD62107P)
 - 35 V MIN. (TD62107F)
- Output clamp diodes
- Enable inputs E1, E2
- Wide supply voltage range $V_{CC} = 4.75\sim 17$ V
- Input compatible with TTL and 5-V CMOS
- GND terminal = heat sink
- Package type-P, BP : DIP-16pin
- Package type-F : HSOP-16pin

PIN CONNECTION (TOP VIEW)

TD62107P / TD62107BP

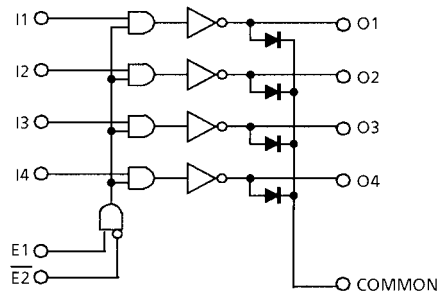


TD62107F



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

SCHEMATICS (EACH DRIVER)

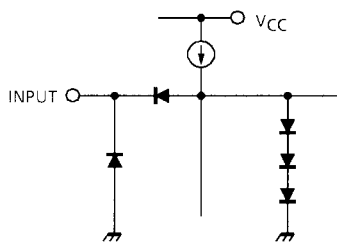


TRUTH TABLE

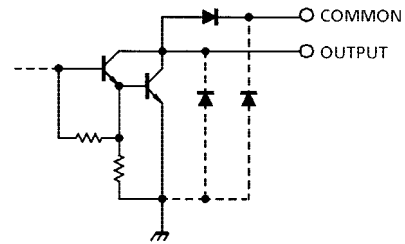
| E1 | $\overline{E2}$ | I1 ~ I4 | O1~O4 |
|----|-----------------|---------|-------------|
| L | L | L or H | Disable OFF |
| L | H | L or H | Disable OFF |
| H | L | L or H | Enable In |
| H | H | L or H | Disable OFF |

In = I1 ~ I4

INPUT EQUIVALENT CIRCUIT



OUTPUT EQUIVALENT CIRCUIT



Note: The input and output parasitic diodes cannot be used as clamp diodes.

MAXIMUM RATINGS (Ta = 25°C)

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|-----------------------------|-----------|----------------------|------|
| Supply Voltage | V_{CC} | -0.5~17 | V |
| Output Sustaining Voltage | P | -0.5~45 | V |
| | BP | -0.5~80 | |
| | F | -0.5~35 | |
| Output Current | I_{OUT} | 750 | mA |
| Input Voltage | V_{IN} | -0.5~ $V_{CC} + 0.5$ | V |
| Clamp Diode Reverse Voltage | P | 45 | V |
| | BP | 80 | |
| | F | 35 | |
| Clamp Diode Forward Current | P, F | 500 | mA |
| | BP | 750 | |
| Power Dissipation | P, BP | 2.7 (Note 1) | W |
| | F | 1.4 (Note 2) | |
| Operating Temperature | T_{opr} | -40~85 | °C |
| Storage Temperature | T_{stg} | -55~150 | °C |

Note 1: On Glass Epoxy PCB (50 × 50 × 1.6 mm Cu 50%)

Note 2: On Glass Epoxy PCB (60 × 30 × 1.6 mm Cu 30%)

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

| CHARACTERISTIC | | SYMBOL | CONDITION | MIN | TYP. | MAX | UNIT | |
|-----------------------------|-------|-----------------------|--|------------------|------|-----------------|------|-----|
| Supply Voltage | | V _{CC} | | 4.75 | — | 15 | V | |
| Output Sustaining Voltage | P | V _{CE (SUS)} | | 0 | — | 45 | V | |
| | BP | | | 0 | — | 80 | | |
| | F | | | 0 | — | 35 | | |
| Output Current | P, F | I _{OUT} | T _{pw} = 25ms, Duty = 75%, 1 Circuit | 0 | — | 500 | mA | |
| | BP | | T _{pw} = 25ms, Duty = 10%, 4 Circuits | 0 | — | 750 | | |
| | P, BP | | T _{pw} = 25ms, 4 Circuits | Duty = 30% | 0 | — | | 400 |
| | | | | Duty = 40% | — | — | | 300 |
| Input Voltage | | V _{IN} | | 0 | — | V _{CC} | V | |
| Clamp Diode Reverse Voltage | P | V _R | | — | — | 45 | V | |
| | BP | | | — | — | 80 | | |
| | F | | | — | — | 35 | | |
| Clamp Diode Forward Current | P, F | I _F | | — | — | 500 | mA | |
| | BP | | | — | — | 750 | | |
| Power Dissipation | B, BP | P _D | | — | — | 1.0 | W | |
| | F | | | Ta = 85°C (Note) | — | — | | 0.7 |

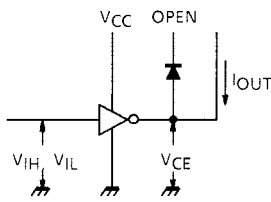
Note: On Glass Epoxy PCB (60 × 30 × 1.6 mm Cu 30%)

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

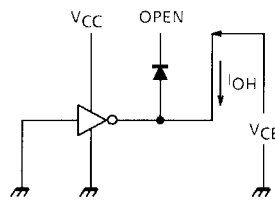
| CHARACTERISTIC | | SYMBOL | TEST CIR-CUIT | TEST CONDITION | MIN | TYP. | MAX | UNIT | |
|-----------------------------|------------|-----------|---------------|--|---|------|----------|---------------|---------------|
| Input Voltage | "H" Level | V_{IH} | 1 | | 2.0 | — | V_{CC} | V | |
| | "L" Level | V_{IL} | | | — | — | 0.8 | | |
| Output Current | "H" Level | P | I_{OH} | 2 | $V_{CE} = 45\text{ V}$, $T_a = 75^\circ\text{C}$ | — | — | 100 | μA |
| | | BP | | | $V_{CE} = 80\text{ V}$, $T_a = 85^\circ\text{C}$ | — | — | 100 | |
| | | F | | | $V_{CE} = 35\text{ V}$, $T_a = 85^\circ\text{C}$ | — | — | 100 | |
| Output Voltage | "L" Level | P, F | V_{OL} | 3 | $I_{OUT} = 50\text{ mA}$ | — | — | 1.3 | V |
| | | BP | | | $I_{OUT} = 750\text{ mA}$ | — | — | 1.6 | |
| Input Current | "H" Level | I_{IH} | 4 | $V_{IN} = 13\text{ V}$ | — | — | 100 | μA | |
| | "L" Level | I_{IL} | 5 | $V_{IN} = 0.4\text{ V}$ | — | — | -0.3 | mA | |
| Clamp Diode Reverse Current | P | I_R | 6 | $V_R = 45\text{ V}$ | — | — | 100 | μA | |
| | | | | $V_R = 80\text{ V}$ | — | — | 100 | | |
| | | | | $V_R = 35\text{ V}$ | — | — | 100 | | |
| Clamp Diode Forward Voltage | P, F | V_F | 7 | $I_F = 500\text{ mA}$ | — | — | 2.0 | V | |
| | BP | | | $I_F = 750\text{ mA}$ | — | — | 2.0 | | |
| Supply Current | Output "H" | I_{CC} | 4 | $V_{CC} = 13\text{ V}$, $V_{IN} = 0\text{ V}$, OUTPUT OPEN | — | — | 13 | mA | |
| | Output "L" | | 5 | $V_{CC} = 13\text{ V}$, $V_{IN} = 5\text{ V}$, OUTPUT OPEN | — | — | 17 | | |
| Turn-On Delay | P | t_{ON} | 8 | $V_{CC} = 5\text{ V}$, $R_L = 90\ \Omega$ $C_L = 15\text{ pF}$, $V_{OUT} = 45\text{ V}$ | — | 5 | — | μs | |
| | BP | | | $V_{CC} = 5\text{ V}$, $V_{OUT} = 80\text{ V}$ $R_L = 160\ \Omega$ | — | 0.4 | — | | |
| | F | | | $V_{CC} = 5\text{ V}$, $R_L = 70\ \Omega$ $C_L = 15\text{ pF}$, $V_{OUT} = 35\text{ V}$ | — | 5 | — | | |
| Turn-Off Delay | P | t_{OFF} | 8 | $V_{CC} = 5\text{ V}$, $R_L = 90\ \Omega$ $C_L = 15\text{ pF}$, $V_{OUT} = 45\text{ V}$ | — | 5 | — | μs | |
| | BP | | | $V_{CC} = 5\text{ V}$, $V_{OUT} = 80\text{ V}$ $R_L = 160\ \Omega$ | — | 1.7 | — | | |
| | F | | | $V_{CC} = 5\text{ V}$, $R_L = 70\ \Omega$ $C_L = 15\text{ pF}$, $V_{OUT} = 35\text{ V}$ | — | 5 | — | | |

TEST CIRCUIT

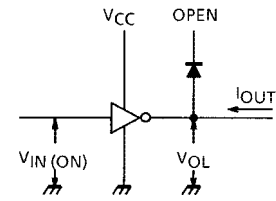
1. V_{IH} , V_{IL}



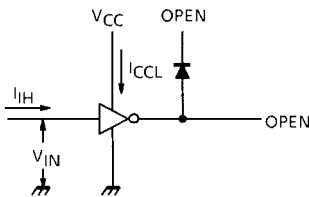
2. I_{OH}



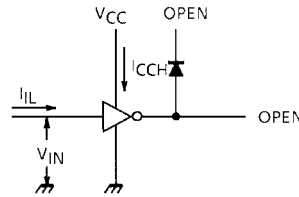
3. V_{OL}



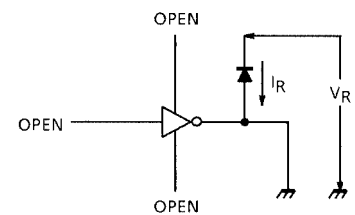
4. I_{IH} , I_{CCL}



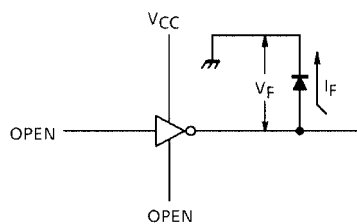
5. I_{IL} , I_{CCH}



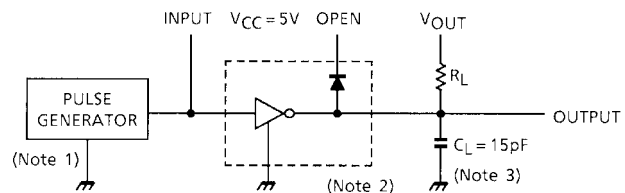
6. I_R



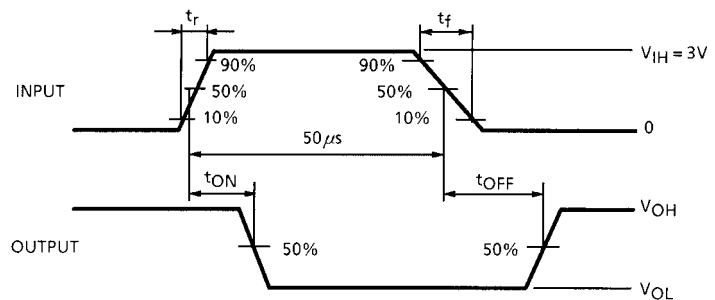
7. V_F



8. t_{ON} , t_{OFF}



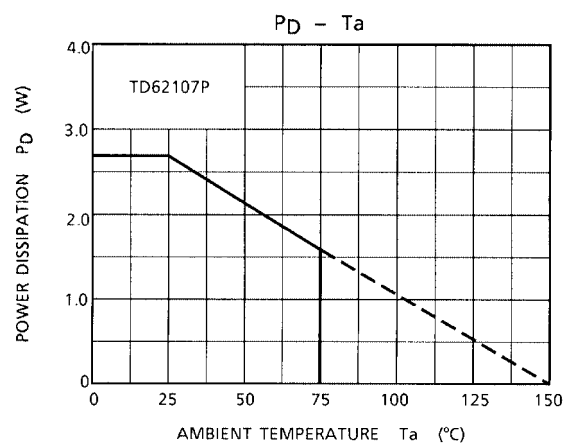
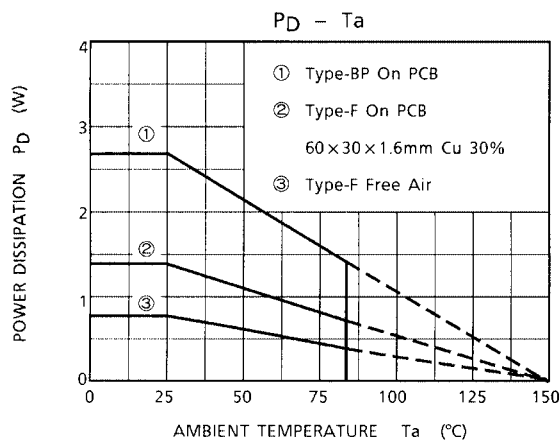
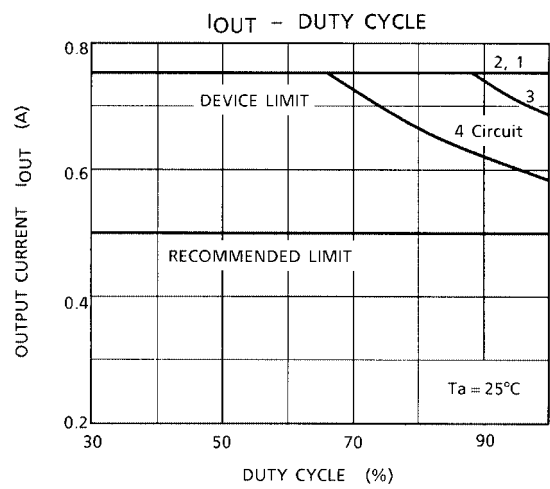
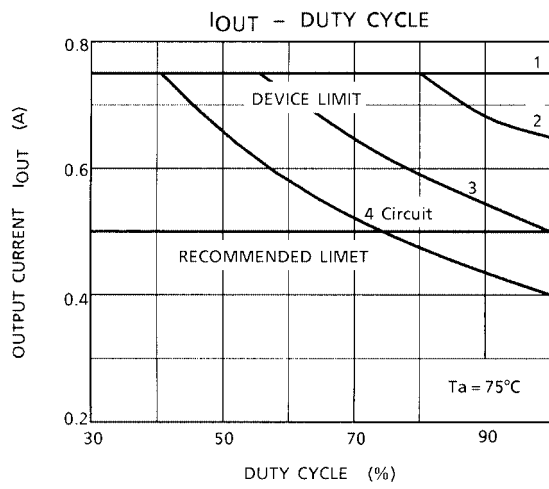
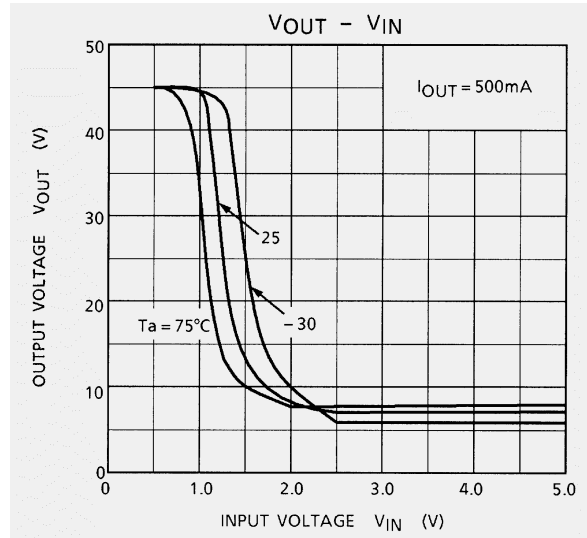
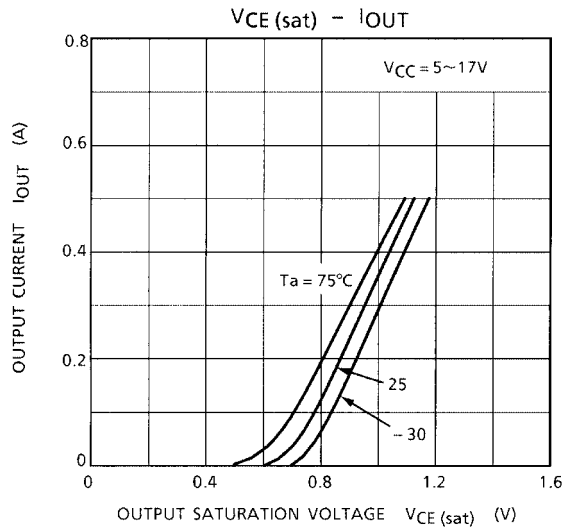
Input condition



- Note 1: Pulse Width 50 μ s, Duty Cycle 10%
Output Impedance 50 Ω , $t_r \leq 5$ ns, $t_f \leq 10$ ns
- Note 2: $V_{IH} = 3$ V, $E1 = V_{IH}$, $\overline{E2} = \text{GND}$,
 $V_{CC} = 5$ V
- Note 3: C_L includes probe and jig capacitance

PRECAUTIONS for USING

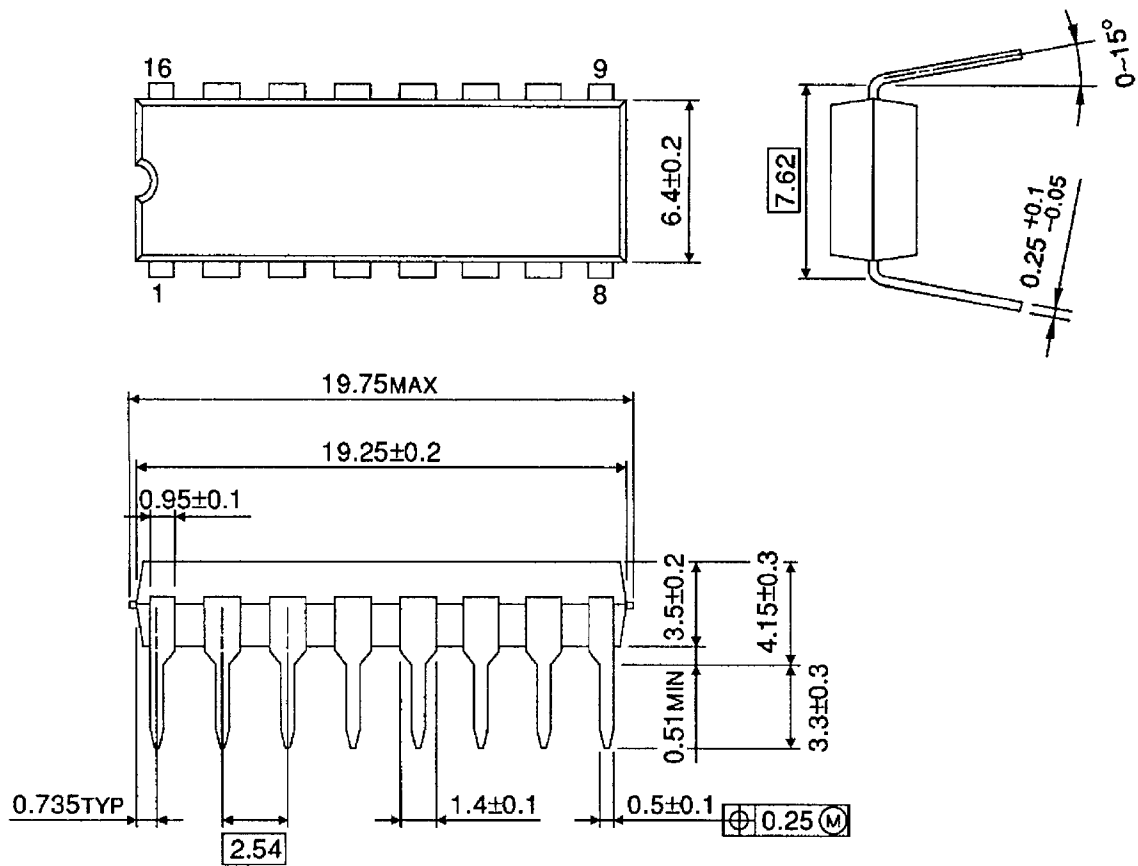
This IC does not include built-in protection circuits for excess current or overvoltage. If this IC is subjected to excess current or overvoltage, it may be destroyed. Hence, the utmost care must be taken when systems which incorporate this IC are designed. Utmost care is necessary in the design of the output line, VCC, COMMON and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.



PACKAGE DIMENSIONS

DIP16-P-300-2.54A

Unit : mm

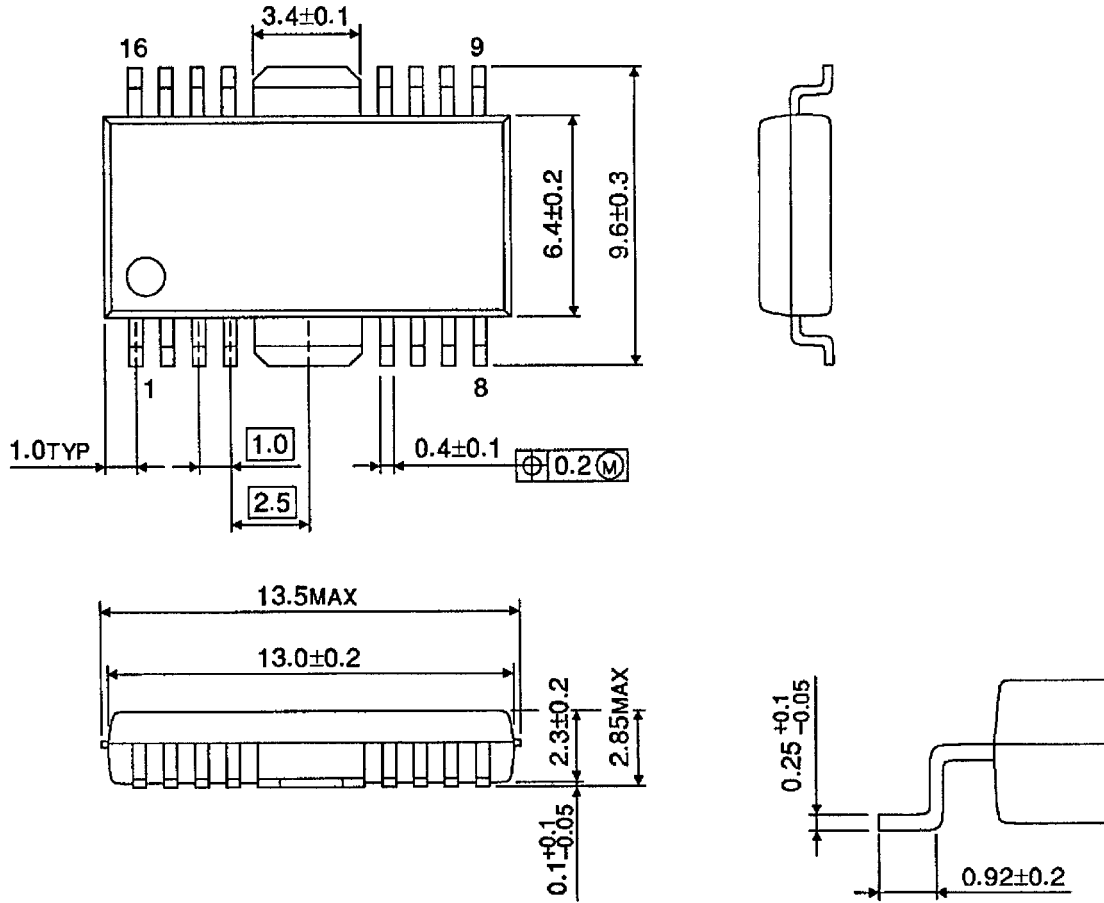


Weight: 1.11 g (Typ.)

PACKAGE DIMENSIONS

HSOP16-P-300-1.00

Unit : mm



Weight: 0.50 g (Typ.)

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000707EBA

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