

Toshiba Bipolar Digital Integrated Circuit Silicon Monolithic

TD62081AP, TD62081AF, TD62082AP, TD62082AF TD62083AP, TD62083AF, TD62084AP, TD62084AF

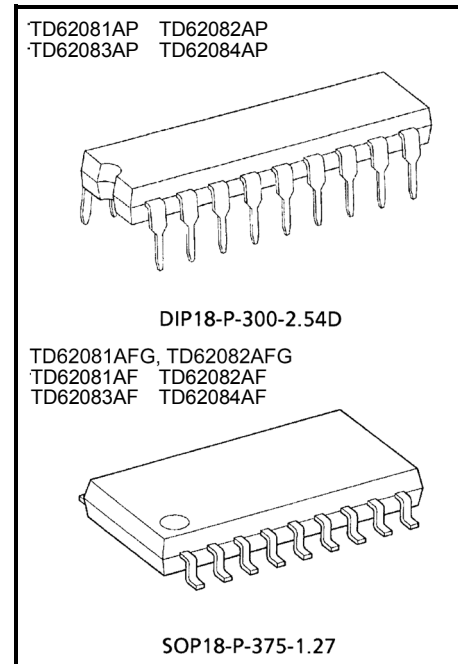
8ch Darlington Sink Driver

The TD62081AP/AF Series are high-voltage, high-current darlington drivers comprised of eight NP darlington pairs. All units feature integral clamp diodes for switching inductive loads. Applications include relay, hammer, lamp and display (LED) drivers.

Features

- Output current (single output)
500 mA (max) (TD62081AP/AF series)
- High sustaining voltage output
50 V (min) (TD62081AP/AF series)
- Output clamp diodes
- Inputs compatible with various types of logic.
- Package type-AP: DIP-18 pin
- Package type-AF: SOP-18 pin

| Type | Input Base Resistor | Designation |
|--------------|-----------------------------------|------------------------|
| TD62081AP/AF | External | General purpose |
| TD62082AP/AF | 10.5-k Ω + 7 V Zener diode | 14 V to 25 V PMOS |
| TD62083AP/AF | 2.7 k Ω | TTL, 5 V CMOS |
| TD62084AP/AF | 10.5 k Ω | 6 V to 15 V PMOS, CMOS |

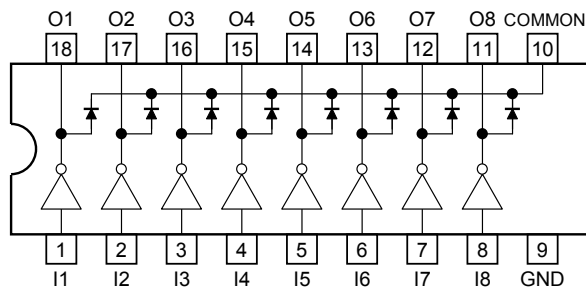


Weight

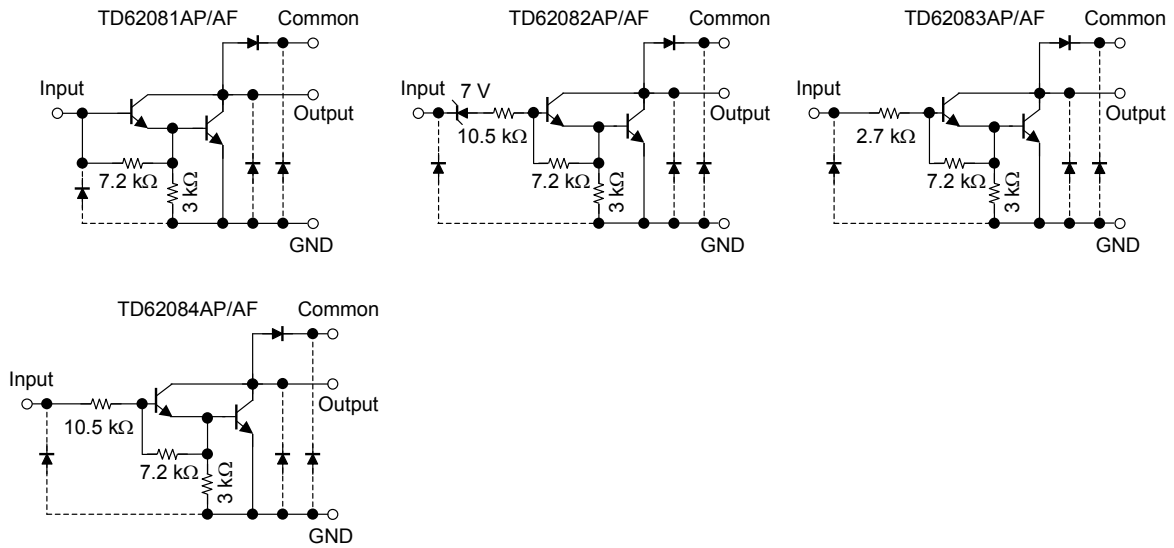
DIP18-P-300-2.54D: 1.47 g (typ.)

SOP18-P-375-1.27 : 0.41 g (typ.)

Pin Connection (top view)



Schematics (each driver)



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

Maximum Ratings (Ta = 25°C)

| Characteristics | Symbol | Rating | Unit |
|-----------------------------|-------------------|------------|-------|
| Output sustaining voltage | $V_{CE(SUS)}$ | -0.5 to 50 | V |
| Output current | I_{OUT} | 500 | mA/ch |
| Input voltage | V_{IN} (Note 1) | -0.5 to 30 | V |
| Input current | I_{IN} (Note 2) | 25 | mA |
| Clamp diode reverse voltage | V_R | 50 | V |
| Clamp diode forward current | I_F | 500 | mA |
| Power dissipation | AP | 1.47 | W |
| | AF | 0.96 | |
| Operating temperature | T_{opr} | -40 to 85 | °C |
| Storage temperature | T_{stg} | -55 to 150 | °C |

Note 1: Except TD62081AP/AF

Note 2: Only TD62081AP/AF

Recommended Operating Conditions (Ta = -40 to 85°C)

| Characteristics | | Symbol | Test Condition | Min | Typ. | Max | Unit |
|-----------------------------|---------------------|---------------|---|-----|------|------|-------|
| Output sustaining voltage | | $V_{CE(SUS)}$ | | 0 | — | 50 | V |
| Output current | AP | I_{OUT} | $T_{pw} = 25 \text{ ms, Duty} = 10\%$ 8 circuits | 0 | — | 347 | mA/ch |
| | | | $T_{pw} = 25 \text{ ms, Duty} = 50\%$ 8 circuits | 0 | — | 123 | |
| | AF | | $T_{pw} = 25 \text{ ms, Duty} = 10\%$ 8 circuits | 0 | — | 268 | |
| | | | $T_{pw} = 25 \text{ ms, Duty} = 50\%$ 8 circuits | 0 | — | 90 | |
| Input voltage | Except TD62081AP/AF | V_{IN} | | 0 | — | 30 | V |
| Input voltage (Output on) | TD62082AP/AF | $V_{IN(ON)}$ | | 14 | — | 30 | V |
| | TD62083AP/AF | | | 2.5 | — | 30 | |
| | TD62084AP/AF | | | 8 | — | 30 | |
| Input voltage (Output off) | TD62082AP/AF | $V_{IN(OFF)}$ | | 0 | — | 7.4 | V |
| | TD62083AP/AF | | | 0 | — | 0.5 | |
| | TD62084AP/AF | | | 0 | — | 1.0 | |
| Input current | Only TD62081AP/AF | I_{IN} | | 0 | — | 5 | mA |
| Clamp diode reverse voltage | | V_R | | — | — | 50 | V |
| Clamp diode forward current | | I_F | | — | — | 400 | mA |
| Power dissipation | AP | P_D | | — | — | 0.52 | W |
| | AF | | | — | — | 0.4 | |

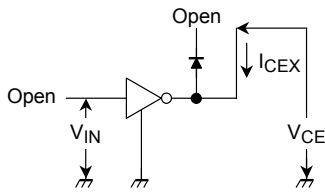
Electrical Characteristics (Ta = 25°C)

| Characteristics | Symbol | Test Circuit | Test Condition | Min | Typ. | Max | Unit | |
|--------------------------------------|-----------------------|--------------|---|-----------------------|------|------|------|----|
| Output leakage current | I _{CEX} | 1 | V _{CE} = 50 V | Ta = 25°C | — | — | 50 | μA |
| | | | | Ta = 85°C | — | — | 100 | |
| | | | | V _{IN} = 6 V | — | — | 500 | |
| | | | | V _{IN} = 1 V | — | — | 500 | |
| Collector-emitter saturation voltage | V _{CE (sat)} | 2 | I _{OUT} = 350 mA, I _{IN} = 500 μA | — | 1.3 | 1.6 | V | |
| | | | I _{OUT} = 200 mA, I _{IN} = 350 μA | — | 1.1 | 1.3 | | |
| | | | I _{OUT} = 100 mA, I _{IN} = 250 μA | — | 0.9 | 1.1 | | |
| Input current | I _{IN (ON)} | 2 | V _{IN} = 17 V | — | 0.82 | 1.25 | mA | |
| | | | V _{IN} = 3.85 V | — | 0.93 | 1.35 | | |
| | | | V _{IN} = 5 V | — | 0.35 | 0.5 | | |
| | | | V _{IN} = 12 V | — | 1.0 | 1.45 | | |
| | I _{IN (OFF)} | 4 | I _{OUT} = 500 μA, Ta = 85°C | 50 | 65 | — | μA | |
| Input voltage (Output on) | V _{IN (ON)} | 5 | V _{CE} = 2 V, I _{OUT} = 300 mA | — | — | 13 | V | |
| | | | V _{CE} = 2 V, I _{OUT} = 200 mA | — | — | 2.4 | | |
| | | | V _{CE} = 2 V, I _{OUT} = 250 mA | — | — | 2.7 | | |
| | | | V _{CE} = 2 V, I _{OUT} = 300 mA | — | — | 3.0 | | |
| | | | V _{CE} = 2 V, I _{OUT} = 125 mA | — | — | 5.0 | | |
| | | | V _{CE} = 2 V, I _{OUT} = 200 mA | — | — | 6.0 | | |
| | | | V _{CE} = 2 V, I _{OUT} = 275 mA | — | — | 7.0 | | |
| | | | V _{CE} = 2 V, I _{OUT} = 350 mA | — | — | 8.0 | | |
| DC current transfer ratio | h _{FE} | 2 | V _{CE} = 2 V, I _{OUT} = 350 mA | 1000 | — | — | | |
| Clamp diode reverse current | I _R | 6 | Ta = 25°C (Note) | — | — | 50 | μA | |
| | | | Ta = 85°C (Note) | — | — | 100 | | |
| Clamp diode forward voltage | V _F | 7 | I _F = 350 mA | — | — | 2.0 | V | |
| Input capacitance | C _{IN} | — | | — | 15 | — | pF | |
| Turn-on delay | t _{ON} | 8 | R _L = 125 Ω, V _{OUT} = 50 V | — | 0.1 | — | μs | |
| Turn-off delay | t _{OFF} | | R _L = 125 Ω, V _{OUT} = 50 V | — | 0.2 | — | | |

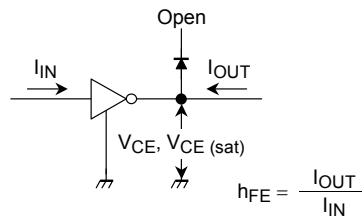
Note: V_R = V_R max

Test Circuit

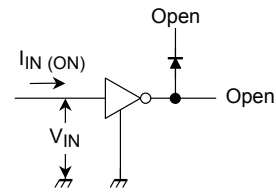
1. I_{CEX}



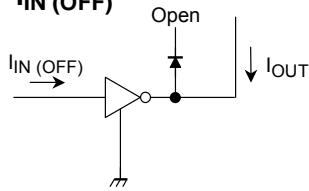
2. $V_{CE(sat)}$, h_{FE}



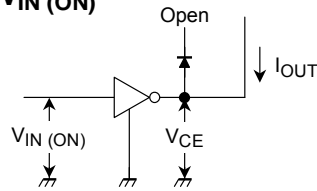
3. $I_{IN(ON)}$



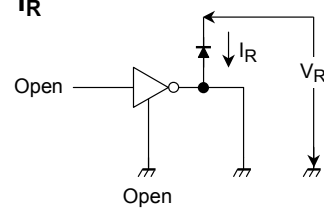
4. $I_{IN(OFF)}$



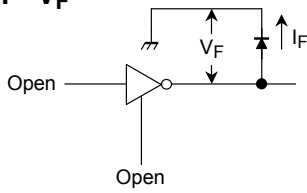
5. $V_{IN(ON)}$



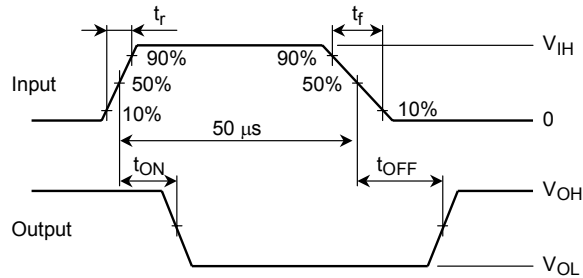
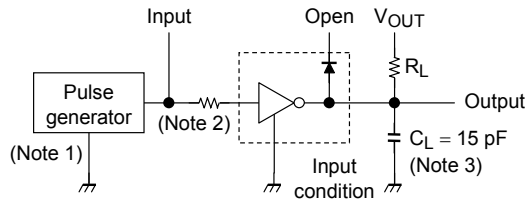
6. I_R



7. V_F



8. t_{ON} , t_{OFF}



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: See below.

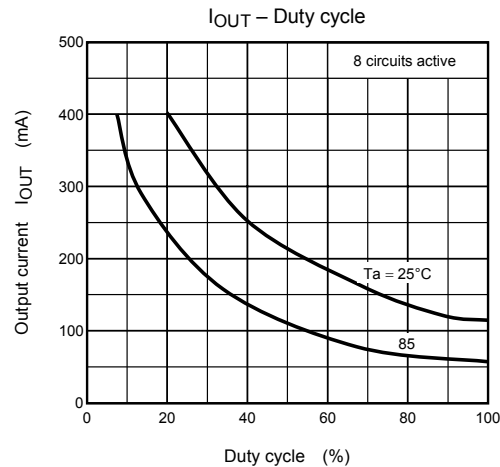
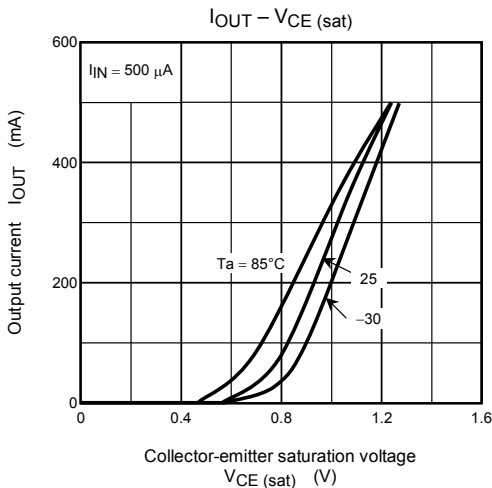
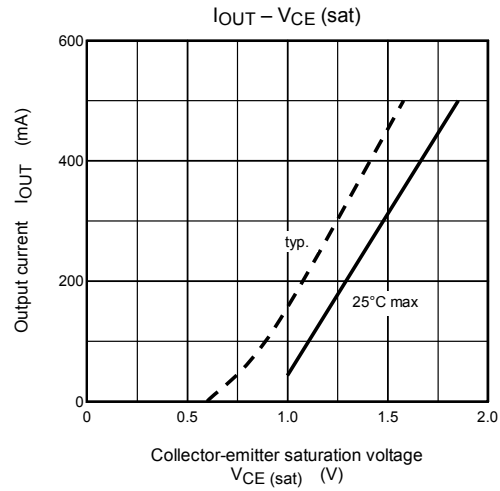
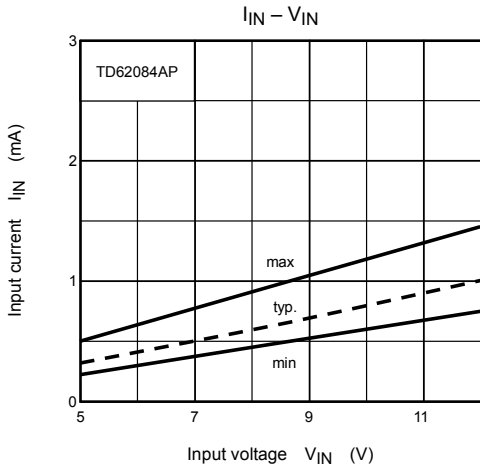
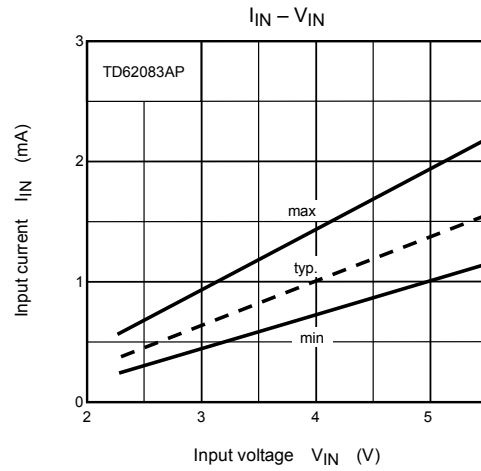
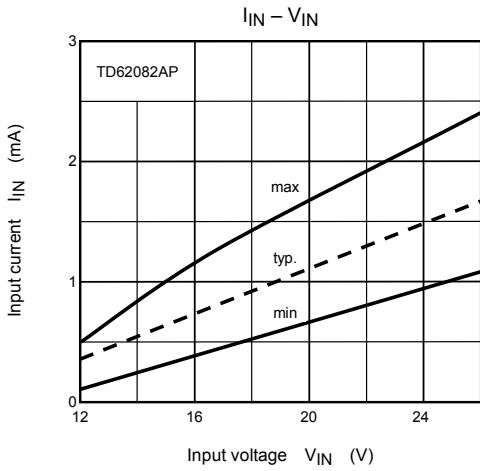
Input condition

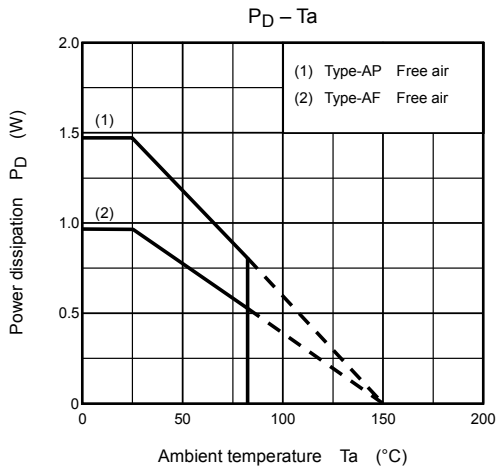
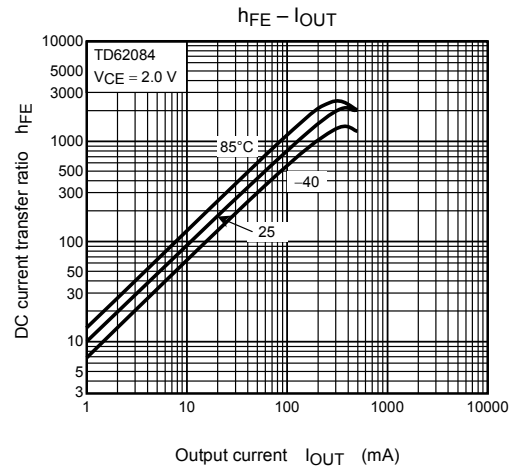
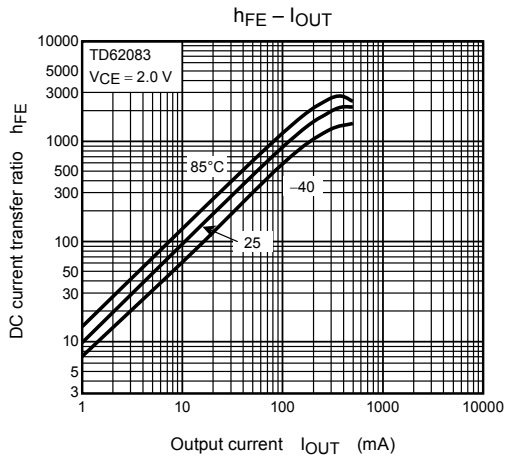
| Type Number | R1 | V_{IH} |
|--------------|----------------|----------|
| TD62081AP/AF | 2.7 k Ω | 3 V |
| TD62082AP/AF | 0 Ω | 13 V |
| TD62083AP/AF | 0 Ω | 3 V |
| TD62084AP/AF | 0 Ω | 8 V |

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, COMMON and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.

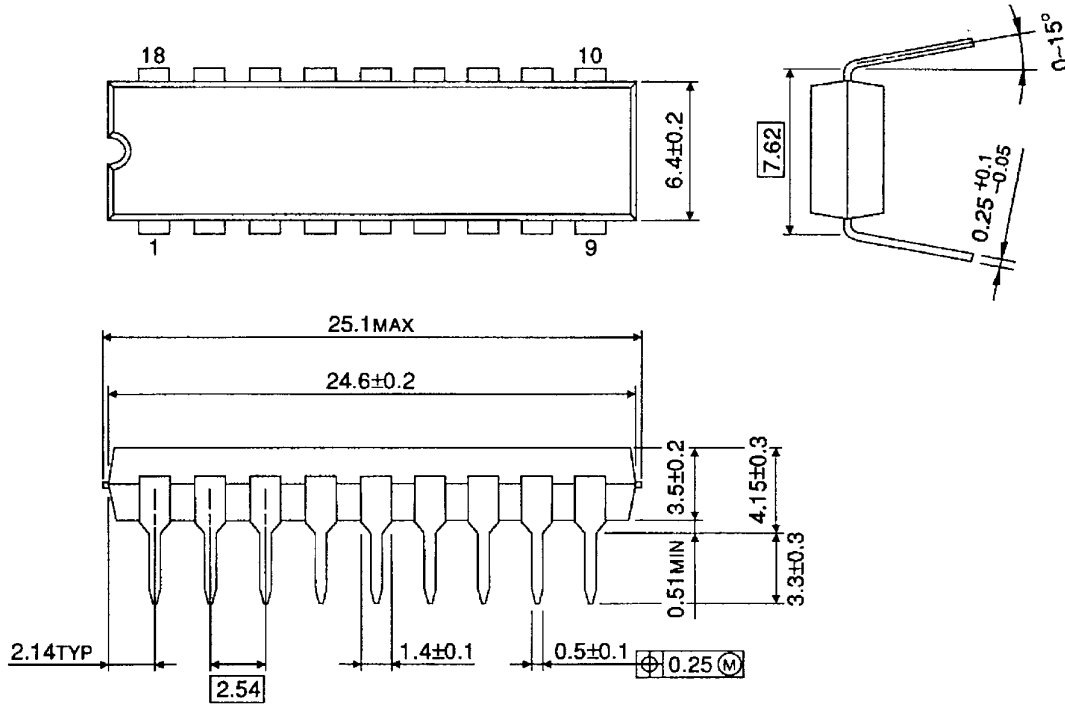




Package Dimensions

DIP18-P-300-2.54D

Unit : mm

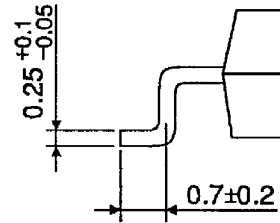
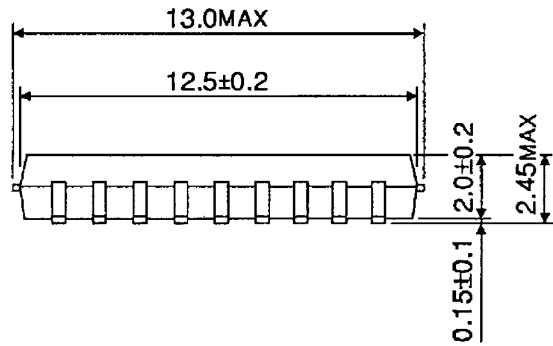
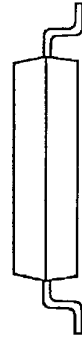
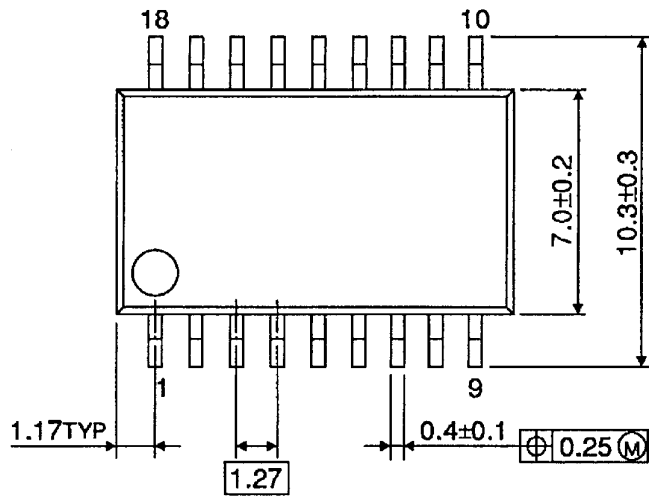


Weight: 1.47 g (typ.)

Package Dimensions

SOP18-P-375-1.27

Unit : mm



Weight: 0.41 g (typ.)

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