

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

## TD62783AP,TD62783AFW,TD62784AP,TD62784AFW (Manufactured by Toshiba Malaysia)

### 8CH HIGH-VOLTAGE SOURCE DRIVER

The TD62783AP / AFW Series are comprised of eight source current Transistor Array.

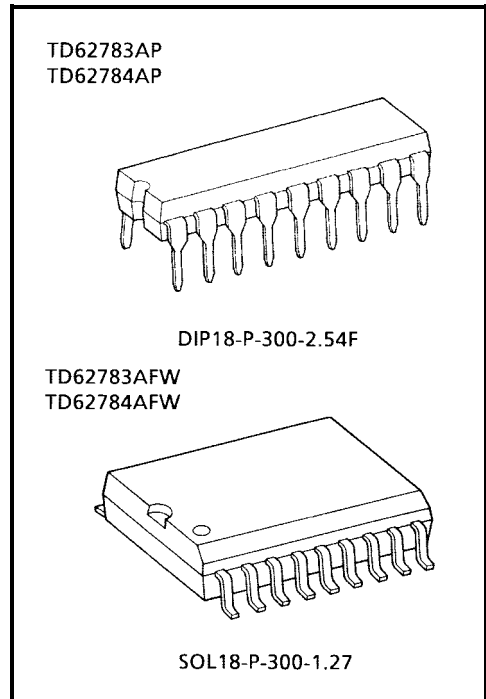
These drivers are specifically designed for fluorescent display applications.

Applications include relay, hammer and lamp drivers.

### FEATURES

- High output voltage      Type-AP, AFW :  $V_{CC} = 50 \text{ V MIN.}$   
                                         Type-F :  $V_{CC} = 35 \text{ V MIN.}$
- Output current (single output)  $I_{OUT} = -500 \text{ mA MIN.}$
- Output clamp diodes
- Single supply voltage
- Input compatible with various types of logic
- Package Type-AP : DIP-18 pin
- Package Type-AFW: SOL-18 pin

| TYPE            | DESIGNATION       |
|-----------------|-------------------|
| TD62783AP / AFW | TTL, 5 V CMOS     |
| TD62784AP / AFW | 6~15 V PMOS, CMOS |

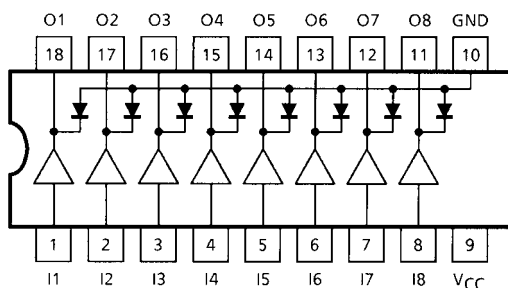


Weight

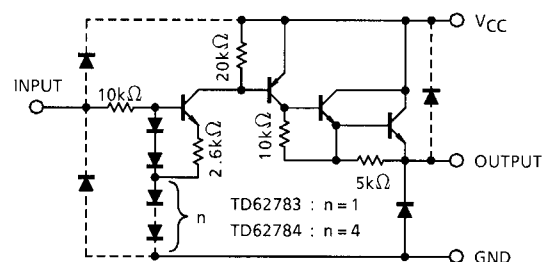
DIP18-P-300-2.54F : 1.478 g (Typ.)

SOL18-P-300-1.27 : 0.48 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)

| CHARACTERISTIC              |     | SYMBOL                   | RATING               | UNIT    |
|-----------------------------|-----|--------------------------|----------------------|---------|
| Supply Voltage              |     | V <sub>CC</sub>          | 50                   | V       |
| Output Current              |     | I <sub>OUT</sub>         | −500                 | mA / ch |
| Input Voltage               |     | V <sub>IN</sub> (Note 1) | 15                   | V       |
|                             |     | V <sub>IN</sub> (Note 2) | 30                   |         |
| Clamp Diode Reverse Voltage |     | V <sub>R</sub>           | 50                   | V       |
| Clamp Diode Forward Current |     | I <sub>F</sub>           | 500                  | mA      |
| Power Dissipation           | AP  | P <sub>D</sub>           | 1.47                 | W       |
|                             | AFW |                          | 0.92 / 1.31 (Note 3) |         |
| Operating Temperature       |     | T <sub>opr</sub>         | −40~85               | °C      |
| Storage Temperature         |     | T <sub>stg</sub>         | −55~150              | °C      |

Note 1: Only TD62783AP / AFW

Note 2: Only TD62784AP / AFW

Note 3: On Glass Epoxy PCB (75 × 114 × 1.6 mm Cu 20%)

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

| CHARACTERISTIC              |            |                 | SYMBOL                | TEST CONDITION                                                |                      | MIN | TYP. | MAX  | UNIT    |   |
|-----------------------------|------------|-----------------|-----------------------|---------------------------------------------------------------|----------------------|-----|------|------|---------|---|
| Supply Voltage              |            |                 | V <sub>CC</sub>       | —                                                             |                      | —   | —    | 50   | V       |   |
| Output Current              |            |                 | I <sub>OUT</sub>      | Ta = 85°C<br>T <sub>j</sub> = 120°C<br>T <sub>pw</sub> = 25ms | Duty = 10% 8Circuits | —   | —    | −260 | mA / ch |   |
|                             |            |                 |                       |                                                               | Duty = 50% 8Circuits | —   | —    | −59  |         |   |
|                             |            |                 |                       |                                                               | Duty = 10% 8Circuits | —   | —    | −180 |         |   |
|                             |            |                 |                       |                                                               | Duty = 50% 8Circuits | —   | —    | −38  |         |   |
| Input Voltage               |            | TD62783AP / AFW | V <sub>IN</sub>       | —                                                             |                      | —   | —    | 12   | V       |   |
|                             |            | TD62784AP / AFW |                       | —                                                             |                      | —   | —    | 24   |         |   |
| Input Voltage               | Output On  | TD62783AP / AFW | V <sub>IN</sub> (ON)  | —                                                             |                      | 2.0 | 5.0  | 15   | V       |   |
|                             |            | TD62784AP / AFW |                       | —                                                             |                      | 4.5 | 12.0 | 30   |         |   |
|                             | Output Off | TD62783AP / AFW | V <sub>IN</sub> (OFF) | —                                                             |                      | 0   | —    | 0.8  |         |   |
|                             |            | TD62784AP / AFW |                       | —                                                             |                      | 0   | —    | 2.0  |         |   |
| Clamp Diode Reverse Voltage |            |                 | AP                    | V <sub>R</sub>                                                | —                    |     | —    | —    | 50      | V |
|                             |            |                 | AFW                   |                                                               | —                    |     | —    | —    | 35      |   |
| Clamp Diode Forward Current |            |                 | I <sub>F</sub>        | —                                                             |                      | —   | —    | 400  | mA      |   |
| Power Dissipation           |            |                 | AP                    | P <sub>D</sub>                                                | Ta = 85°C            |     | —    | —    | 0.76    | W |
|                             |            |                 | AFW                   |                                                               | Ta = 85°C (Note)     |     | —    | —    | 0.48    |   |

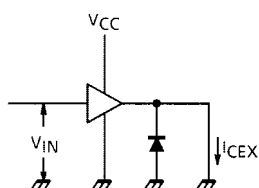
Note: On Glass Epoxy PCB (75 × 114 × 1.6 mm Cu 20%)

**ELECTRICAL CHARACTERISTICS (Ta = 25°C)**

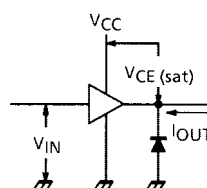
| CHARACTERISTIC              |                 | SYMBOL                | TEST CIR-<br>CUIT | TEST CONDITION                                                                                                     | MIN | TYP. | MAX  | UNIT       |
|-----------------------------|-----------------|-----------------------|-------------------|--------------------------------------------------------------------------------------------------------------------|-----|------|------|------------|
| Output Leakage Current      |                 | I <sub>CEX</sub>      | 1                 | V <sub>CC</sub> = V <sub>CC</sub> MAX. V <sub>IN</sub> = 0.4 V<br>Ta = 25°C                                        | —   | —    | 100  | μA         |
| Output Saturation Voltage   |                 | V <sub>CE</sub> (sat) | 2                 | V <sub>IN</sub> = V <sub>IN</sub> (ON),<br>I <sub>OUT</sub> = -350 mA                                              | —   | —    | 2.0  | V          |
|                             |                 |                       |                   | V <sub>IN</sub> = V <sub>IN</sub> (ON),<br>I <sub>OUT</sub> = -225 mA                                              | —   | —    | 1.9  |            |
|                             |                 |                       |                   | V <sub>IN</sub> = V <sub>IN</sub> (ON),<br>I <sub>OUT</sub> = -100 mA                                              | —   | —    | 1.8  |            |
| Input Current               | TD62783AP / AFW | I <sub>IN</sub> (ON)  | 3                 | V <sub>IN</sub> = 2.4 V                                                                                            | —   | 36   | 52   | μA         |
|                             |                 |                       |                   | V <sub>IN</sub> = 3.85 V                                                                                           | —   | 180  | 260  |            |
|                             | TD62784AP / AFW |                       |                   | V <sub>IN</sub> = 5 V                                                                                              | —   | 92   | 130  |            |
|                             |                 |                       |                   | V <sub>IN</sub> = 12 V                                                                                             | —   | 790  | 1130 |            |
| Input Voltage               | TD62783AP / AFW | V <sub>IN</sub> (ON)  | 4                 | V <sub>CE</sub> = 2.0 V                                                                                            | —   | —    | 2.0  | V          |
|                             | TD62784AP / AFW |                       |                   | I <sub>OUT</sub> = -350 mA                                                                                         | —   | —    | 4.5  |            |
|                             | TD62783AP / AFW | V <sub>IN</sub> (OFF) |                   | I <sub>OUT</sub> = -500 μA                                                                                         | 0.8 | —    | —    |            |
|                             | TD62784AP / AFW |                       |                   |                                                                                                                    | 2.0 | —    | —    |            |
| Supply Current              |                 | I <sub>CC</sub> (ON)  | 3                 | V <sub>IN</sub> = V <sub>IN</sub> (ON), V <sub>CC</sub> = 50 V                                                     | —   | —    | 2.5  | mA /<br>ch |
| Clamp Diode Reverse Current |                 | I <sub>R</sub>        | 5                 | V <sub>R</sub> = 50 V                                                                                              | —   | —    | 50   | μA         |
| Clamp Diode Forward Voltage |                 | V <sub>F</sub>        | 6                 | I <sub>F</sub> = 350 mA                                                                                            | —   | —    | 2.0  | V          |
| Turn-On Delay               |                 | t <sub>ON</sub>       | 7                 | V <sub>CC</sub> = V <sub>CC</sub> MAX. R <sub>L</sub> = 125 Ω<br>C <sub>L</sub> = 15 pF, R <sub>L</sub> = 88 Ω (F) | —   | 0.15 | —    | μs         |
| Turn-Off Delay              |                 | t <sub>OFF</sub>      |                   |                                                                                                                    | —   | 1.8  | —    |            |

## TEST CIRCUIT

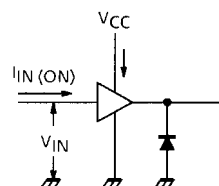
### 1. $I_{CEX}$



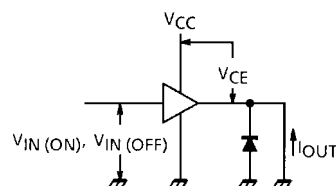
### 2. $V_{CE(sat)}$



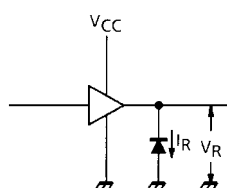
### 3. $I_{IN(ON)}$ , $I_{CC}$



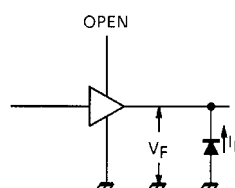
### 4. $V_{IN(ON)}$ , $V_{IN(OFF)}$



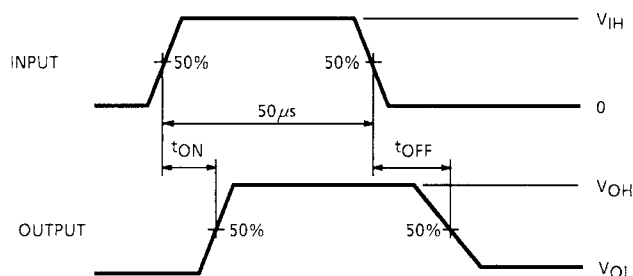
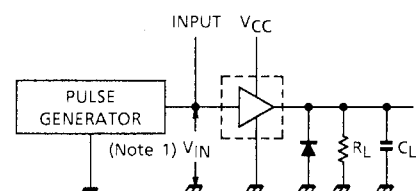
### 5. $I_R$



### 6. $V_F$



### 7. $t_{ON}$ , $t_{OFF}$



Note 1: Pulse width 50  $\mu$ s, duty cycle 10%

Output impedance 50  $\Omega$ ,  $t_r \leq 5$  ns,  $t_f \leq 10$  ns

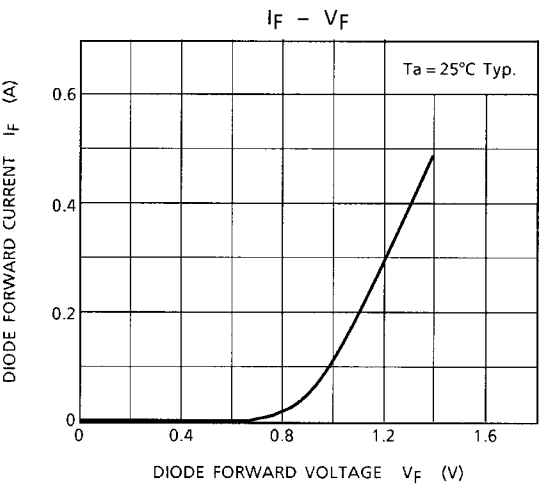
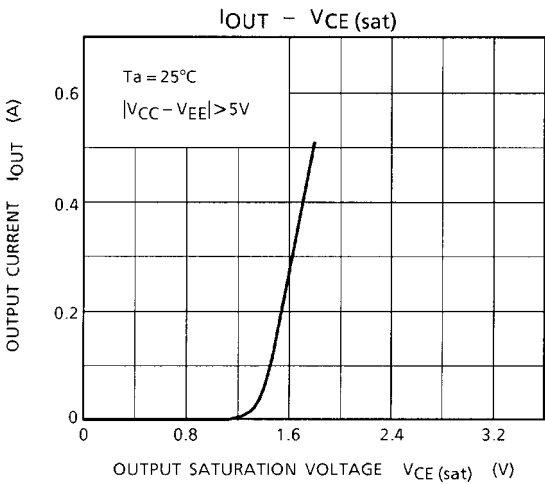
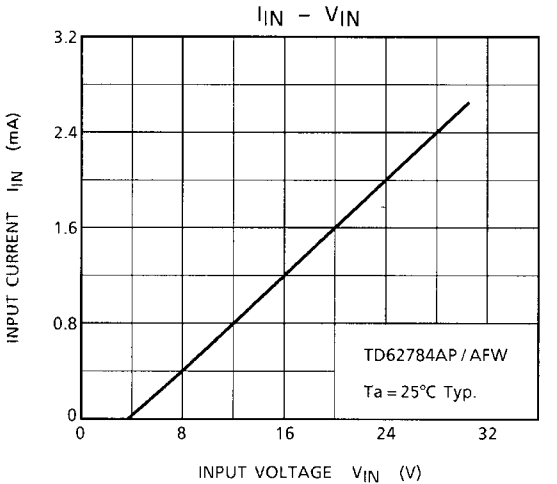
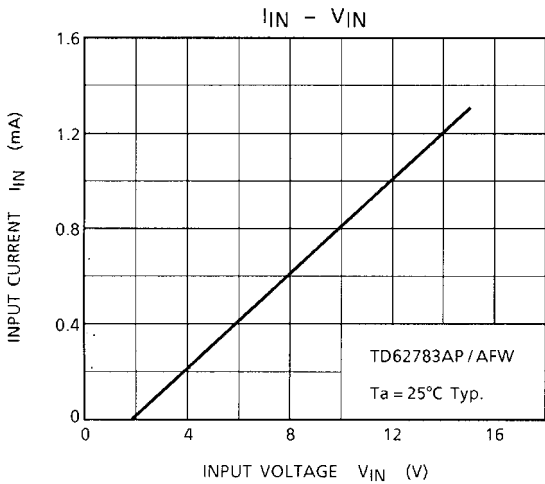
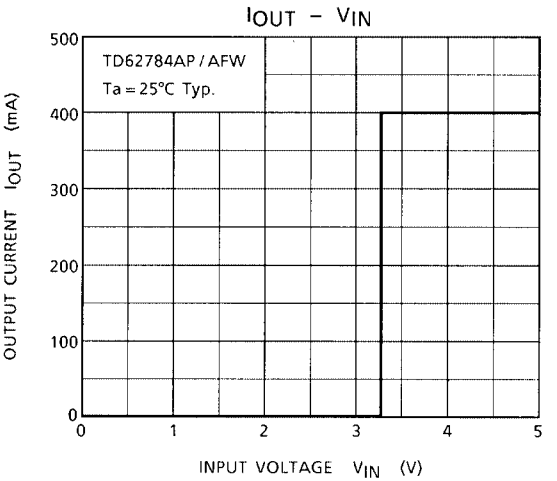
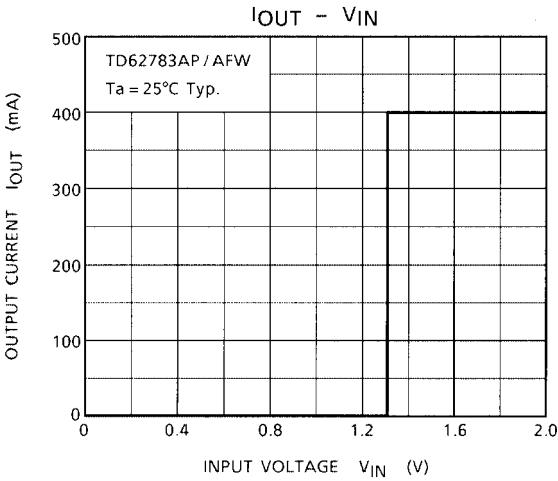
Note 2:  $C_L$  includes probe and jig capacitance

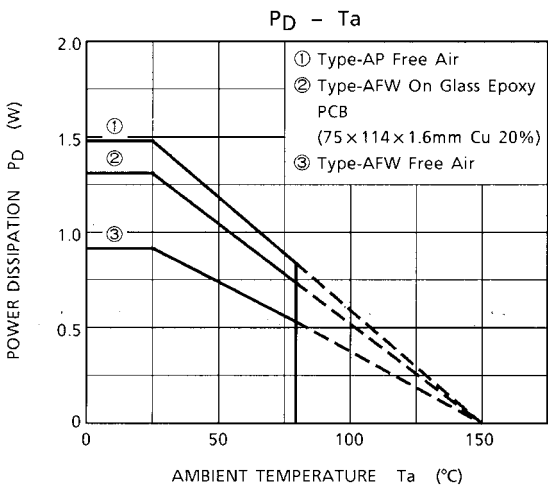
## PRECAUTIONS for USING

This IC does not integrate protection circuits such as overcurrent and overvoltage protectors.

Thus, if excess current or voltage is applied to the IC, the IC may be damaged. Please design the IC so that excess current or voltage will not be applied to the IC.

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

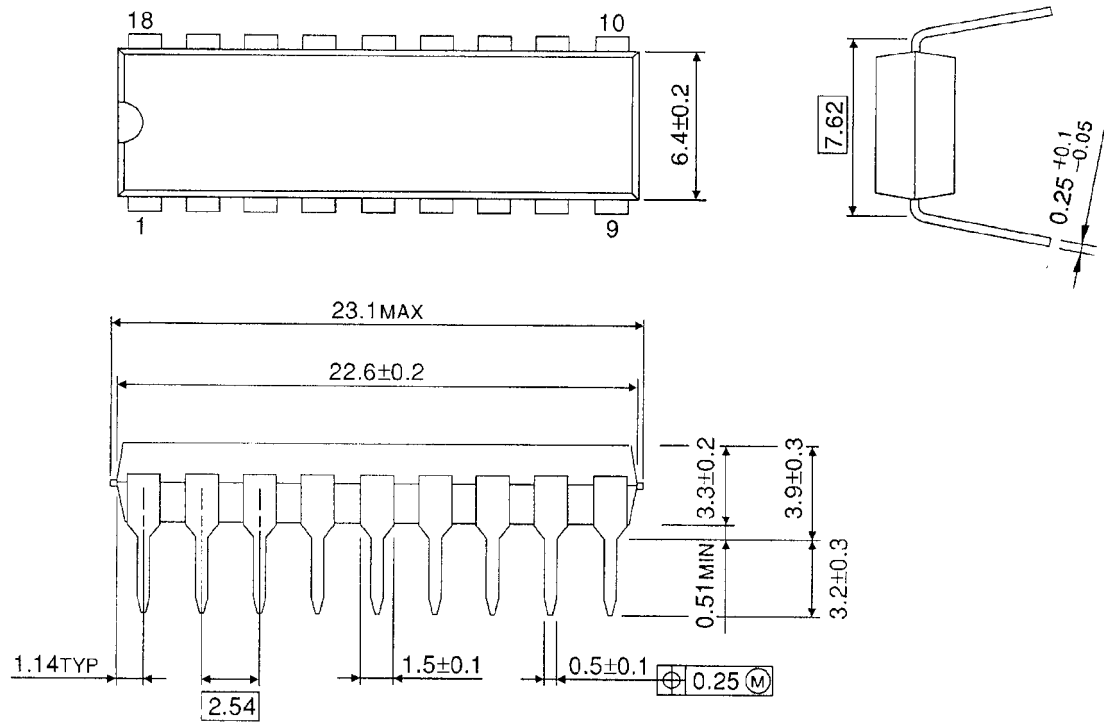




**PACKAGE DIMENSIONS**

DIP18-P-300-2.54F

Unit: mm

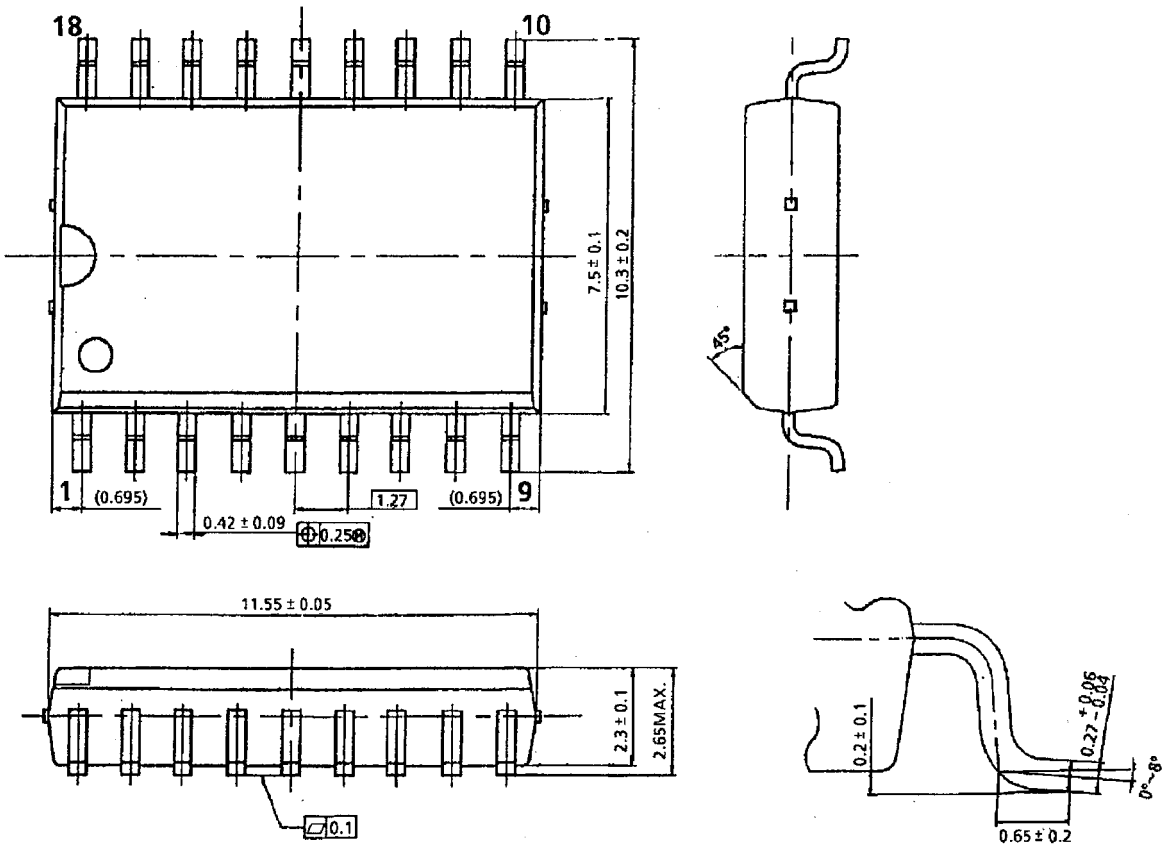


Weight: 1.478 g (Typ.)

PACKAGE DIMENSIONS

SOL18-P-300-1.27

Unit: mm



Weight: 0.48 g (Typ.)

**RESTRICTIONS ON PRODUCT USE**

000707EBA

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