

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

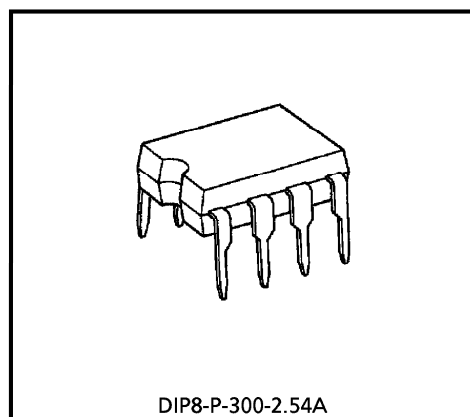
# TA8026AP

## FLASHER CONTROLLER

The TA8026AP is designed as an automotive flasher controller. It can issue a rapid-flashing warning when a lamp failure occurs.

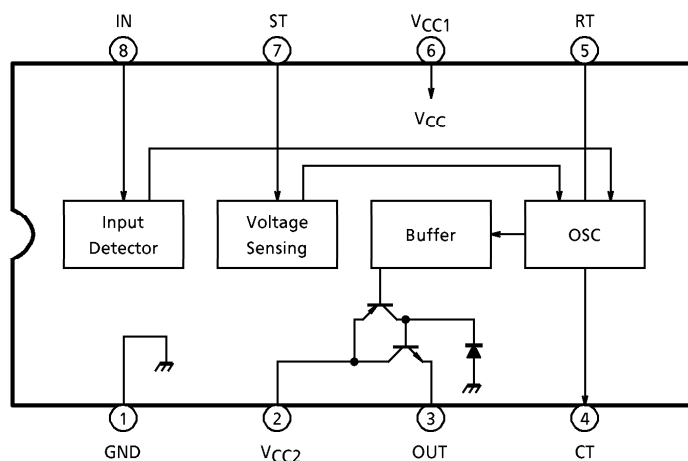
It operates accurately in wide ranges of supply voltages and operating temperatures. It incorporates an accurate reference voltage circuit which compensates for lamp current characteristic variations due to supply voltage changes.

- Large output current :  $I_{OUT} = 300\text{mA}$  (Max.)
- Low standby current :  $I_{CC} = 1.0\text{mA}$  (Typ.)
- Reference voltage characterized by small temperature drift.
- Built-in circuit that compensates for variations in lamp voltage characteristics.
- Output from combination of PNP and NPN transistors with suppression diode.
- Wide operating temperature :  $T_a = -40$  to  $110^\circ\text{C}$
- DIP - 8 pin.



Weight : 0.45g (Typ.)

## BLOCK DIAGRAM AND PIN LAYOUT



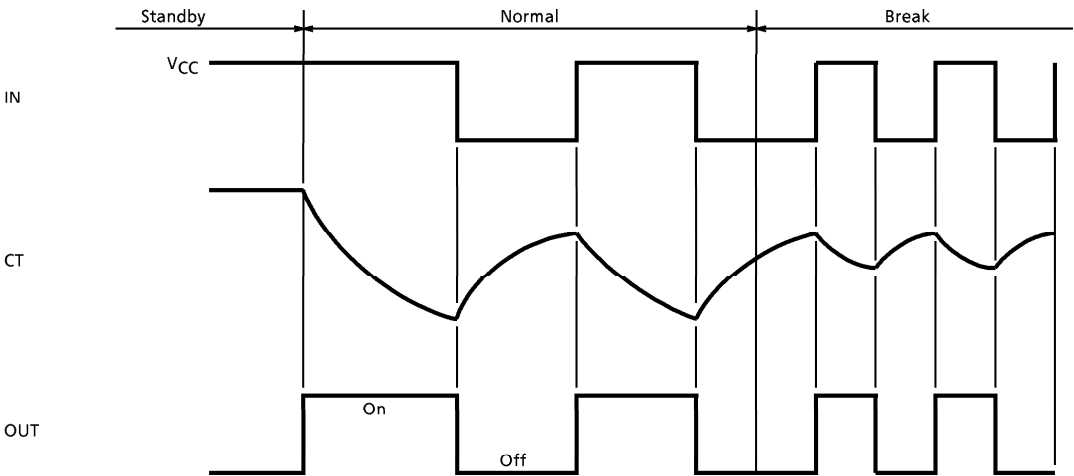
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PIN DESCRIPTION

| PIN No. | SYMBOL           | DESCRIPTION                                                                                                             |
|---------|------------------|-------------------------------------------------------------------------------------------------------------------------|
| 1       | GND              | Grounded                                                                                                                |
| 2       | V <sub>CC2</sub> | Power supply pin (2)                                                                                                    |
| 3       | OUT              | Open-emitter output of complementary combination of PNP and NPN transistors.                                            |
| 4       | CT               | A capacitor is connected between V <sub>CC</sub> and CT. This layout determines the flashing interval of the flasher.   |
| 5       | RT               | A resistor is connected between RT and CT. This layout determines the flashing interval of the flasher.                 |
| 6       | V <sub>CC1</sub> | Power supply pin (1)                                                                                                    |
| 7       | ST               | Current detection pin. The lamp current is detected through a shunt resistor connected between V <sub>CC1</sub> and ST. |
| 8       | IN               | Detection pin for lamp operation.                                                                                       |

TIMING CHART



**MAXIMUM RATINGS** (Ta = 25°C)

| CHARACTERISTIC        | SYMBOL           | RATING                | UNIT |
|-----------------------|------------------|-----------------------|------|
| Supply Voltage        | V <sub>CC</sub>  | 28                    | V    |
| Power Dissipation     | P <sub>D</sub>   | 300 *                 | mW   |
| Output Current        | I <sub>OUT</sub> | 300                   | mA   |
| Input Voltage         | V <sub>IN</sub>  | - 0.3~V <sub>CC</sub> | V    |
| Operating Temperature | T <sub>opr</sub> | - 40~110              | °C   |
| Storage Temperature   | T <sub>stg</sub> | - 55~150              | °C   |
| Lead Temperature-time | T <sub>sol</sub> | 260 (10s)             | °C   |

\* Ta ≤ 110°C

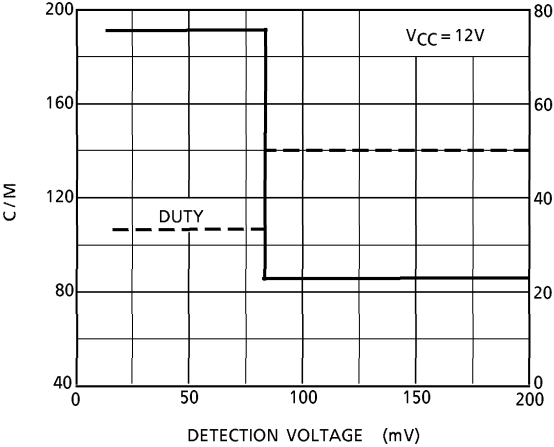
**ELECTRICAL CHARACTERISTICS** (V<sub>CC</sub> = 12V, Ta = - 40 to 110°C)

| CHARACTERISTIC                           | SYMBOL                             | PIN             | TEST CONDITION                                           | MIN.  | TYP.  | MAX.  | UNIT              |
|------------------------------------------|------------------------------------|-----------------|----------------------------------------------------------|-------|-------|-------|-------------------|
| Operating Voltage                        | V <sub>opr</sub>                   | V <sub>CC</sub> |                                                          | 6     | —     | 18    | A                 |
| Current Consumption                      | I <sub>CC</sub>                    | GND             | Standby, Ta = 25°C                                       | 0.6   | 0.9   | 1.4   | mV                |
|                                          |                                    |                 | Output on, Ta = 25°C                                     | 2.5   | 4.0   | 6.0   |                   |
| Output Voltage                           | V <sub>OH</sub>                    | OUT             | R <sub>L</sub> = 82Ω                                     | —     | —     | 1.3   | V                 |
| Leakage Current                          | I <sub>LEAK</sub>                  | OUT             | V <sub>OUT</sub> = 0V                                    | - 100 | —     | —     | μA                |
| Input Current                            | I <sub>IN</sub>                    | CT              | V <sub>IN</sub> = V <sub>CC</sub> ~ V <sub>CC</sub> - 5V | - 10  | —     | 10    | μA                |
|                                          |                                    | ST              | V <sub>IN</sub> = V <sub>CC</sub>                        | - 10  | —     | 10    |                   |
|                                          |                                    | IN              | V <sub>IN</sub> = 12V                                    | —     | —     | 20    | mA                |
|                                          |                                    |                 | V <sub>IN</sub> = 0V                                     | - 1.5 | - 2.5 | - 3.5 |                   |
| Input Voltage                            | V <sub>IL</sub>                    | IN              |                                                          | —     | —     | 0.4   | × V <sub>CC</sub> |
|                                          | V <sub>IH</sub>                    |                 |                                                          | 0.6   | —     | —     |                   |
| Detection Voltage                        | V <sub>TH</sub>                    | ST              | V <sub>CC</sub> = 8V                                     | 16    | 21    | 26    | mV                |
|                                          |                                    |                 | V <sub>CC</sub> = 11V                                    | 25    | 31    | 37    |                   |
|                                          |                                    |                 | V <sub>CC</sub> = 14V                                    | 30    | 36    | 42    |                   |
|                                          | ΔV <sub>TH</sub> /T                | ST              |                                                          | - 60  | —     | 60    | μV/°C             |
|                                          | ΔV <sub>TH</sub> /ΔV <sub>CC</sub> |                 |                                                          | 2.7   | 3.3   | 3.9   | mV/V              |
| Condition Detect Voltage                 | *1<br>V <sub>THO</sub>             | ST              | V <sub>CC</sub> = 8V                                     | 3     | 7     | 11    | mV                |
|                                          |                                    |                 | V <sub>CC</sub> = 11V                                    | 5     | 10    | 15    |                   |
|                                          |                                    |                 | V <sub>CC</sub> = 16V                                    | 8     | 13    | 18    |                   |
| Flashing Interval                        |                                    | OUT             | C <sub>T</sub> = 3.3μF, R <sub>T</sub> = ADJ *2          | 690   | 706   | 723   | ms                |
| Flashing Interval<br>(At fail detection) |                                    | OUT             |                                                          | 315   | 324   | 333   |                   |
| On Duty                                  |                                    | OUT             |                                                          | 45    | 50    | 55    | %                 |
| On Duty<br>(At fail detection)           |                                    | OUT             |                                                          | 30    | —     | 50    |                   |

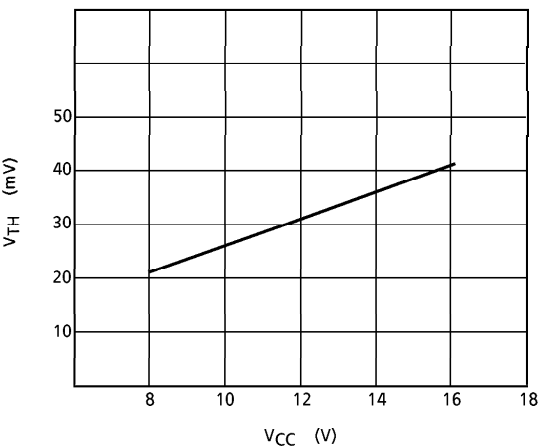
\*1 : The minimum detection voltage to be able to operate.

\*2 : Adjust the flashing interval to 706ms by changing R<sub>T</sub> while keeping C<sub>T</sub> = 3.3μF at room temperature.

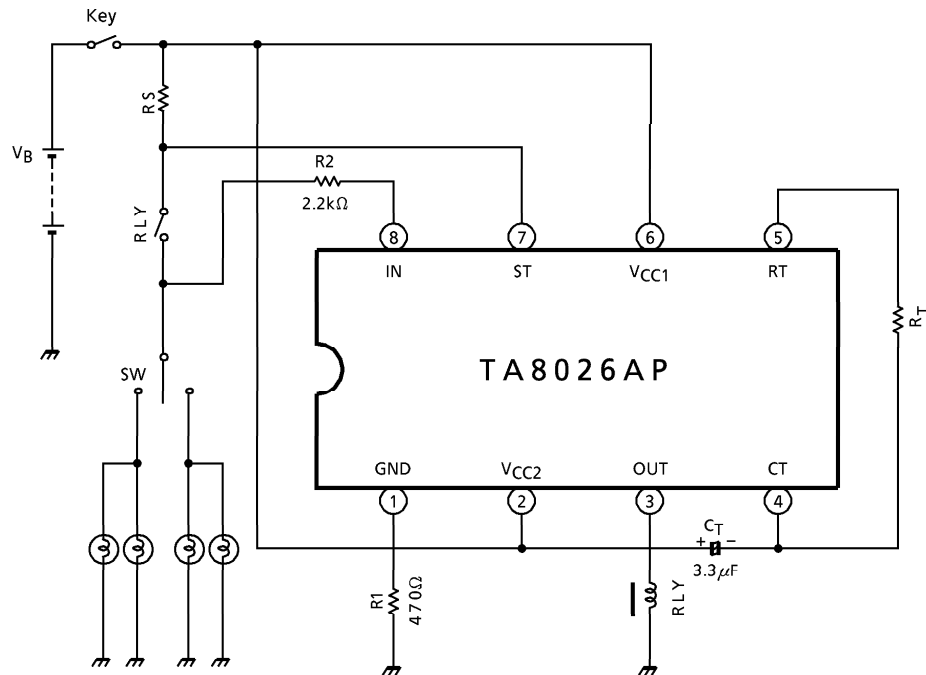
FLASHING FREQUENCY CHARACTERISTICS



DETECTION VOLTAGE CHARACTERISTICS



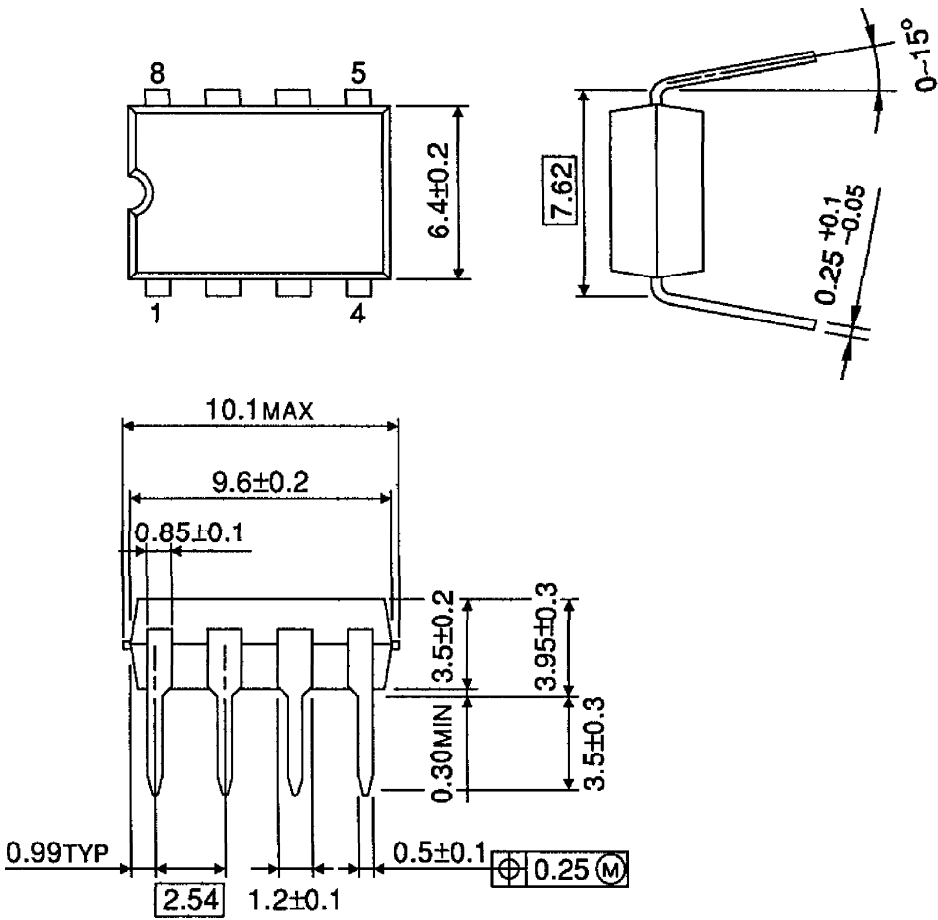
## EXAMPLE OF APPLICATION CIRCUIT



Note : The tolerance of R<sub>1</sub> and R<sub>2</sub> is within  $\pm 5\%$ .

OUTLINE DRAWING  
DIP8-P-300-2.54A

Unit : mm



Weight : 0.45g (Typ.)