

## Features

- Lamp Outage Indication for Car and Trailer
- Temperature and Supply Voltage Compensated Flashing Frequency
- Relay Driver Output with High Current Carrying Capacity and Low Saturation Voltage
- Minimum Lamp Load for Flasher Operation > 10W

## 1. Description

The bipolar integrated circuit ATA2069 is designed for the use in relay-operated automotive flasher modules and makes it possible to detect the outage of flasher bulbs on the vehicle itself and also on a trailer.

Vehicles with a trailer hook are equipped with additional pilot lamps in the dashboard.

ATA2069 is off (i.e., the relay is deactivated) as long as the flasher switch (at contact +49a) is open. As soon as this switch is closed, the IC starts reliably with the bright phase.

There are two thresholds integrated: one threshold is defined to be  $21 + 10W$  and is designed for the lamp outage detection of 1 of 2 lamps. If the current is below this threshold, the IC switches to frequency doubling, just like the standard flashers (e.g. U2043B).

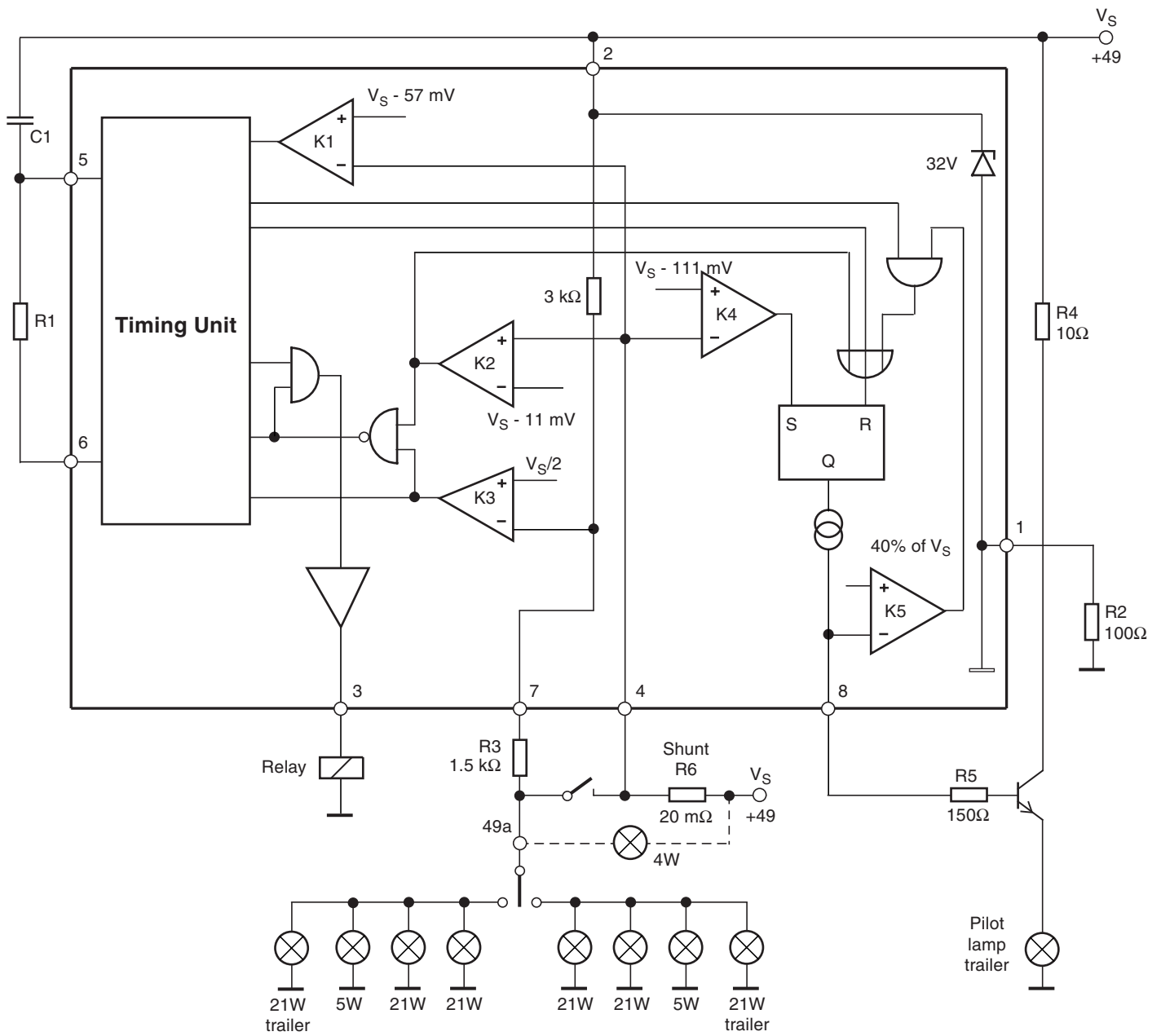
The other threshold is defined to be  $42 + 10W$  and is designed for the outage detection of 1 of 3 lamps; if this happens, the additional trailer pilot lamp is switched off, but there is no frequency doubling. 50 ms after the start of the bright phase, the comparator measures the voltage drop at the shunt and latches this value for the rest of the bright phase. The output of this pilot lamp (pin 8) is short-circuit protected against GND. In case of a short circuit the external transistor is switched off after 52 ms for the rest of the current flasher cycle, but it is enabled again for the next cycle.



## Flasher with Trailer Control

### ATA2069

**Figure 1-1. Block Diagram**



2. Pin Configuration

Figure 2-1. Pinning

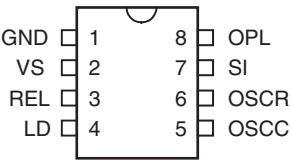


Table 2-1. Pin Description

| Pin | Symbol | Function               |
|-----|--------|------------------------|
| 1   | GND    | IC ground              |
| 2   | VS     | Supply Voltage         |
| 3   | REL    | Relay driver           |
| 4   | LD     | Lamp failure detection |
| 5   | OSCC   | Cap. oscillator        |
| 6   | OSCR   | Res. oscillator        |
| 7   | SI     | Start input (49a)      |
| 8   | OPL    | Output pilot lamp      |

### 3. Absolute Maximum Ratings

Stresses beyond those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

| Parameters                               | Pin | Symbol     | Value       | Unit |
|------------------------------------------|-----|------------|-------------|------|
| Supply voltage                           | 2   | $V_S$      | 16.5        | V    |
| Junction temperature                     |     | $T_J$      | 150         | °C   |
| Ambient temperature range                |     | $T_{amb}$  | –40 to +95  | °C   |
| Storage temperature range                |     | $T_{stg}$  | –55 to +150 | °C   |
| Thermal resistance junction ambient DIP8 |     | $R_{thjc}$ | 110         | K/W  |
| Thermal resistance junction ambient SO8  |     | $R_{thjc}$ | 160         | K/W  |

### 4. Electrical Characteristics

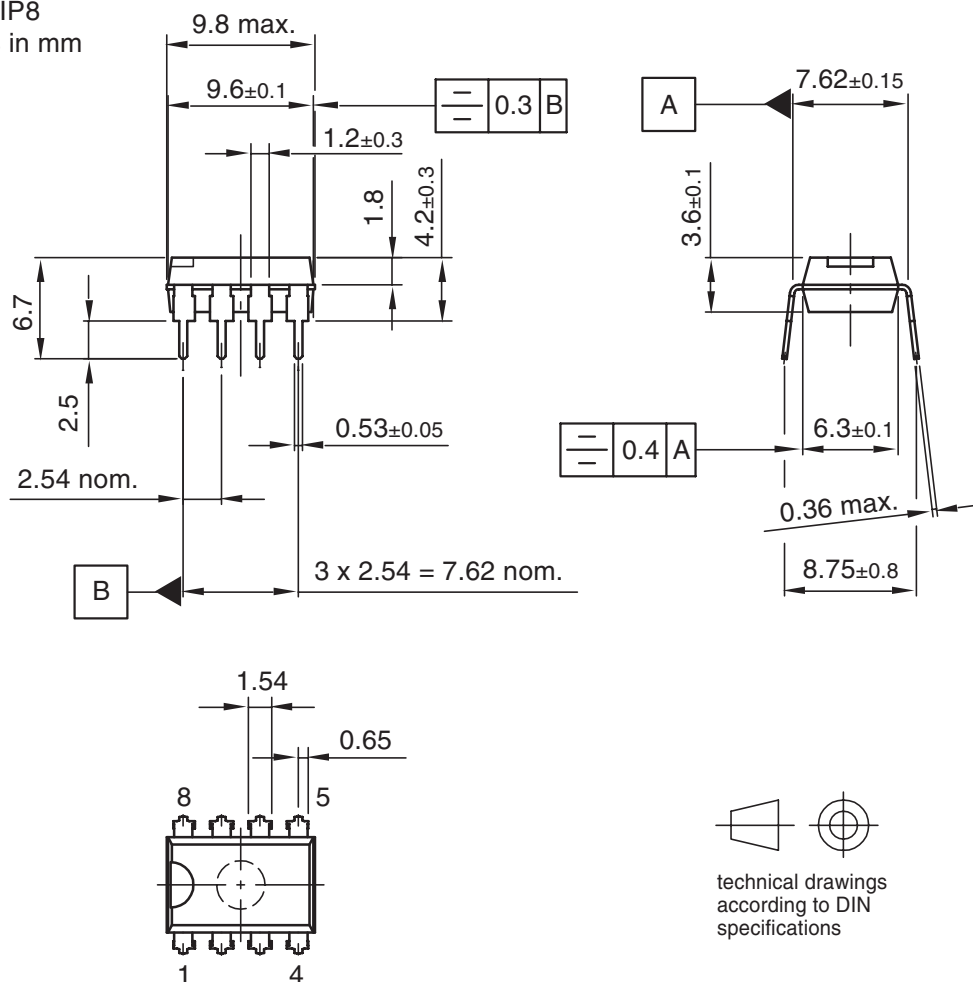
| Parameters                                                                 | Test Conditions                             | Pin | Symbol       | Min.               | Typ.             | Max.                 | Unit           |
|----------------------------------------------------------------------------|---------------------------------------------|-----|--------------|--------------------|------------------|----------------------|----------------|
| Supply voltage range                                                       |                                             | 2   | $V_S$ (+49a) |                    | 9 to 15          |                      | V              |
| Relay output current                                                       |                                             | 3   | $I_{Rel}$    |                    |                  | 300                  | mA             |
| Relay saturation voltage                                                   | $I = 130$ mA<br>$I = 250$ mA                | 3   | $V_{Rel}$    |                    |                  | 1<br>1.5             | V<br>V         |
| Relay leakage current                                                      |                                             | 3   | $I_{Relr}$   |                    |                  | 100                  | μA             |
| Values for $T = 25^\circ\text{C}$                                          |                                             |     |              |                    |                  |                      |                |
| Start delay                                                                |                                             |     | $t_{on}$     |                    |                  | 10                   | ms             |
| Delay time for output OPL                                                  |                                             | OPL | $t_{Del}$    | 45                 |                  | 55                   | ms             |
| Switch off delay time output OPL in case of short circuit                  |                                             | OPL | $t_{Del}$    | 1.5                |                  | 2.4                  | ms             |
| Voltage threshold for short circuit detection at output OPL                |                                             | OPL | $V_{th}$     | 36                 |                  | 44                   | % of $U_S$     |
| Output current at OPL                                                      |                                             | OPL | $I_O$        | 10                 |                  | 25                   | mA             |
| Saturation voltage at OPL                                                  |                                             | OPL | $V_{SATO}$   |                    |                  | 300                  | mV             |
| Control signal threshold K1 for outage detection without trailer operation | $V_S = 9$ V<br>$V_S = 13$ V<br>$V_S = 15$ V |     | $V_{k1}$     | 47.5<br>54.2<br>58 | 50<br>57<br>61   | 52.2<br>59.9<br>64.1 | mV<br>mV<br>mV |
| Control signal threshold K4 for outage detection with trailer operation    | $V_S = 9$ V<br>$V_S = 13$ V<br>$V_S = 15$ V |     | $V_{k4}$     | 96<br>109<br>115   | 98<br>111<br>118 | 100<br>113<br>120    | mV<br>mV<br>mV |
| Frequency tolerance                                                        |                                             |     | Delta f1     | –5                 |                  | +5                   | %              |
| Bright period                                                              | Basic frequency                             |     | Delta f1     | 47                 |                  | 53                   | %              |
| Bright period                                                              | Frequency doubling                          |     | Delta f2     | 37                 |                  | 45                   | %              |
| Frequency increase                                                         | Lamp outage                                 |     | f2           | $2.15 \times f$    |                  | $2.3 \times f$       | Hz             |
| Leakage increase                                                           | 49a to GND                                  |     | RI           |                    |                  | 5                    | kΩ             |
| Lamp load                                                                  |                                             |     | PL           | 10                 |                  |                      | W              |

## 5. Ordering Information

| Extended Type Number | Package | Remarks                   |
|----------------------|---------|---------------------------|
| ATA2069-3ASY         | DIP8    | Tubed, Pb-free            |
| ATA2069-TASY         | SO8     | Tubed, Pb-free            |
| ATA2069-TAQY         | SO8     | Taped and reeled, Pb-free |

## 6. Package Information

Package: DIP8  
Dimensions in mm

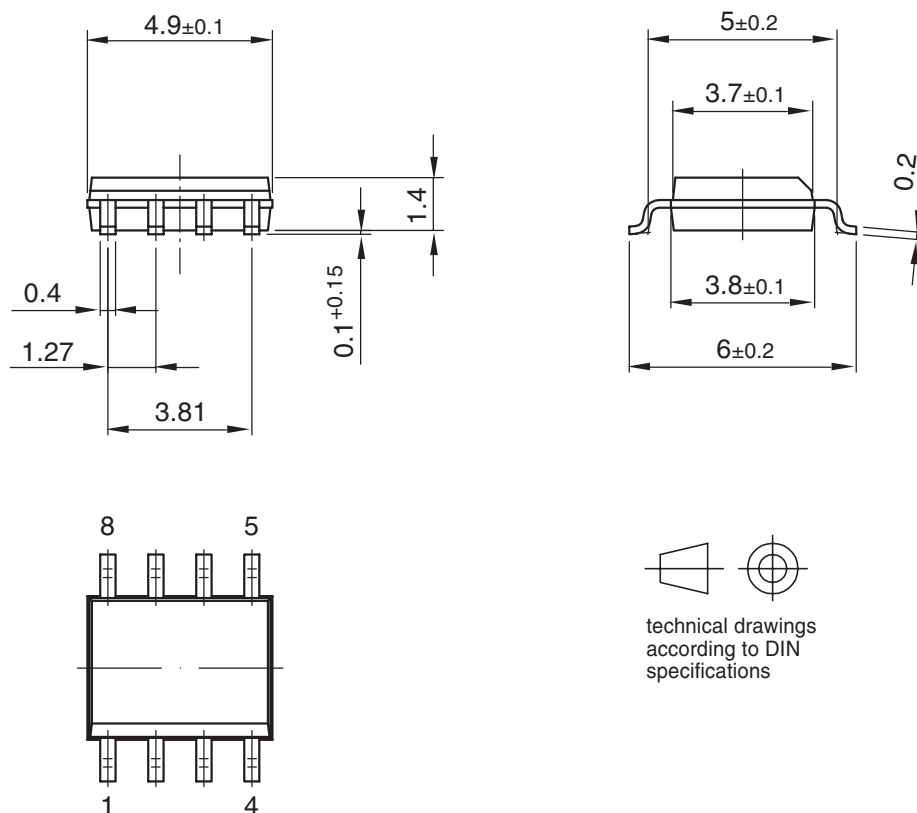


Drawing-No.: 6.543-5040.01-4

Issue: 1; 16.01.02

Package: SO 8

Dimensions in mm



technical drawings  
according to DIN  
specifications

Drawing-No.: 6.541-5031.01-4

Issue: 1; 15.08.06

## 7. Revision History

Please note that the following page numbers referred to in this section refer to the specific revision mentioned, not to this document.

| Revision No.     | History                                                                                                                                        |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| 4917C-AUTO-10/07 | <ul style="list-style-type: none"> <li>Put datasheet in a new template</li> <li>Section 5 "Ordering Information" on page 5 changed.</li> </ul> |
| 4917B-AUTO-03/06 | <ul style="list-style-type: none"> <li>Section 5 "Ordering Information" on page 5 changed.</li> </ul>                                          |



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